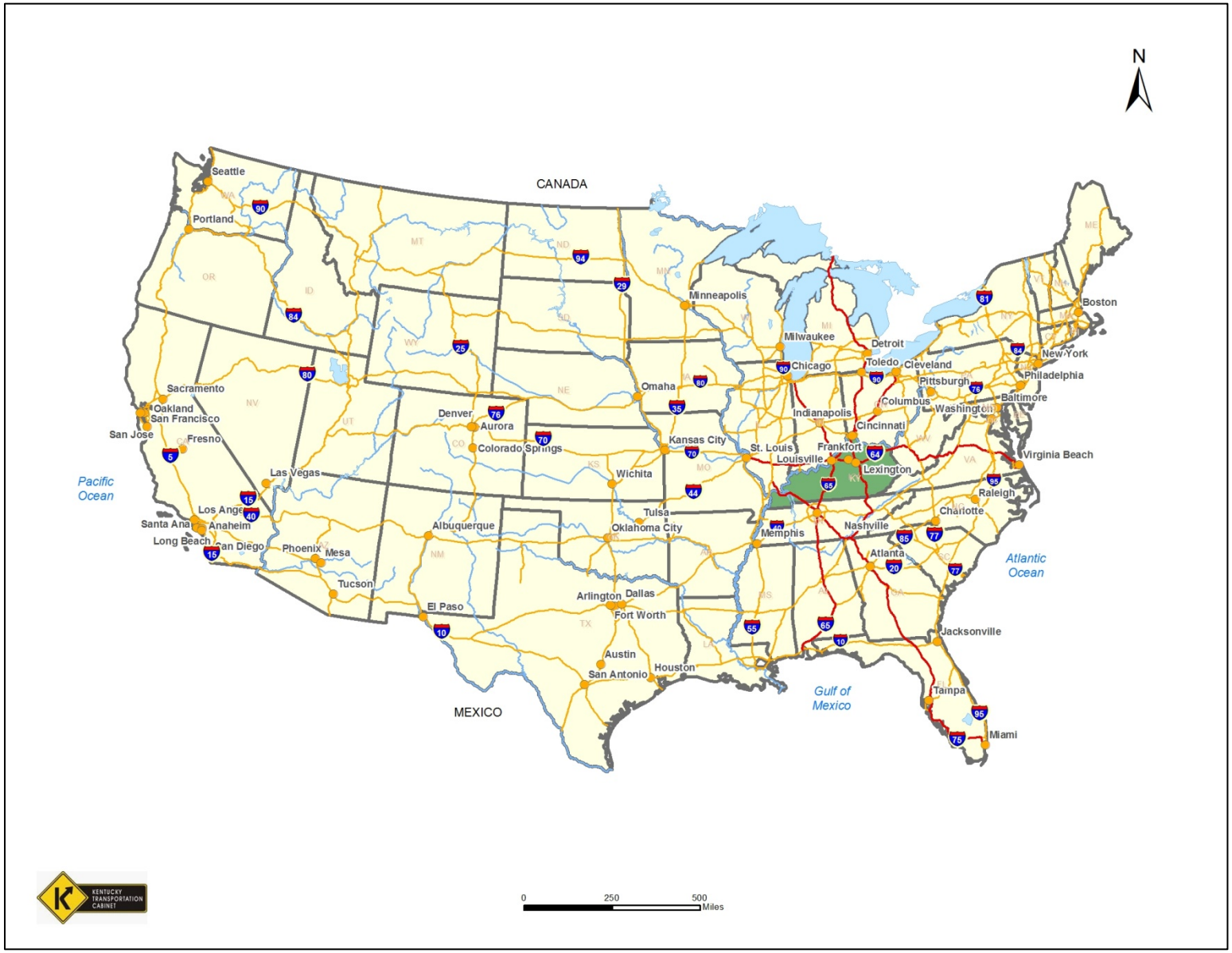
Kentucky's Long-Range Statewide Transportation Plan:
Planning to Make a Difference in America's Tomorrow



2014-2035

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Chapter 1.0

1.0 Why Should You Read This?

1.1 Crossroads State

Kentucky is located in the center of the eastern United States bordered by seven states and three major rivers—the Mississippi, Ohio, and Big Sandy. Kentucky's location within the nation's major highway, rail, inland water and air transportation routes places it within 500 miles of most major industrial centers in the central and the eastern United States as shown in **Figure 1.1A**. This combination of central location and accessibility to major multimodal transportation routes makes Kentucky a uniquely attractive environment for business, industry and tourism – a true "crossroads" state.

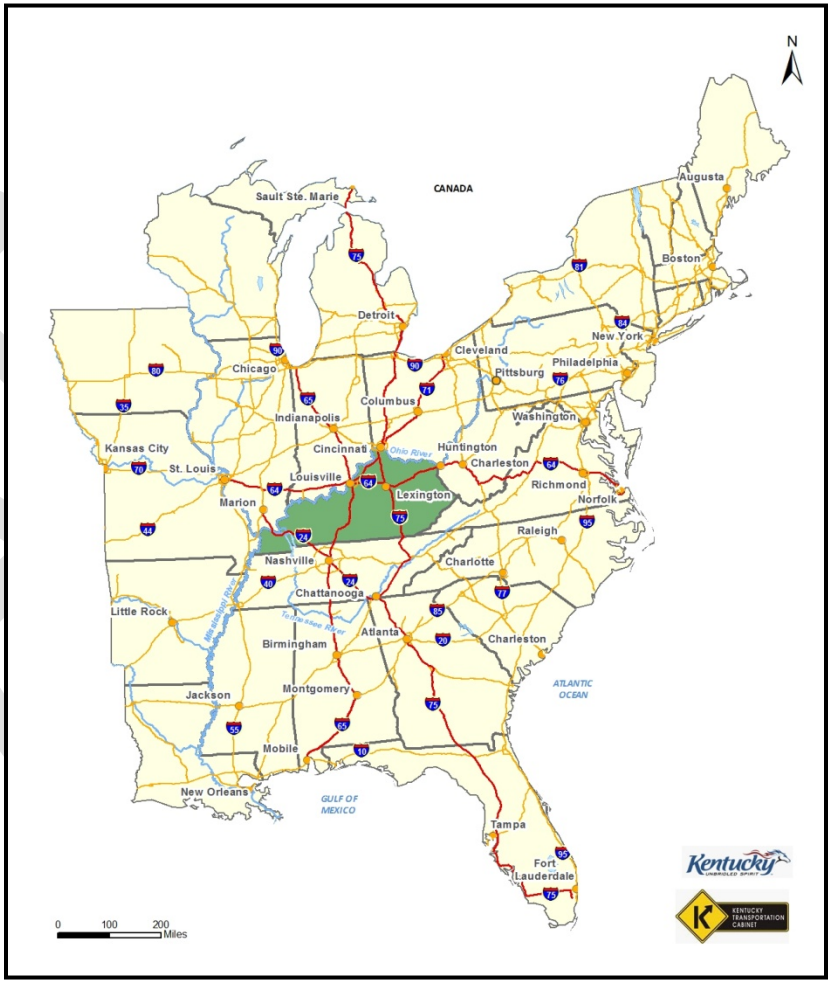


Figure 1.1A – Kentucky – A Crossroad State

1.2 Unique State

The 40,000 square miles within Kentucky's borders encompass a geographic diversity that presents a multitude of challenges for the development of an efficient, effective transportation system. **Figure 1.2 A** shows the various regions and points of interest within Kentucky. The Eastern Region of the state is rugged and mountainous, covered with forests, dissected by streams, plagued by spring flooding and rockslides and in need of safe connections to the state's urban centers and interstate highways. The Western Region, bordered by the Ohio and Mississippi Rivers, is a rural, low plains area subject to frequent flooding. While Kentucky Lake and Lake Barkley provide plentiful recreation and tourism opportunities, the area would benefit from improved connections to regional centers for increased economic opportunities.

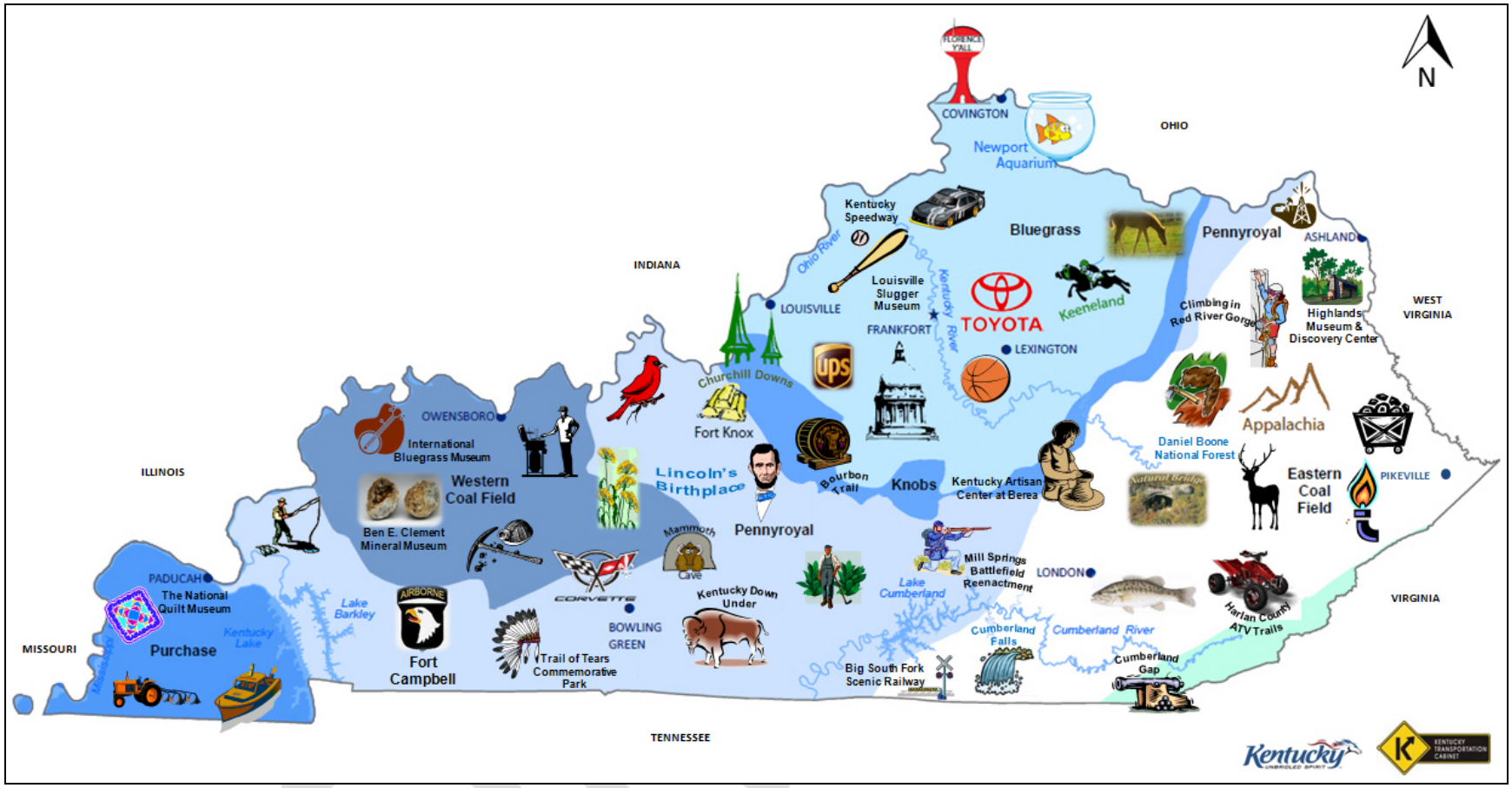


Figure 1.2 A – Kentucky Geographical and Point of Interest Map

The Northern Region boasts a combination of small mountains, verdant horse farms and more highly developed areas. The Southern Region is comprised of rolling hills and fertile farmland. Networks of caves and caverns, including Mammoth Cave National Park, are natural treasures that also affect the surface development of the towns and small cities that dot the landscape.

Kentucky's people are as diverse as its landscape. The Commonwealth is comprised of citizens from a variety of race, age and economic groups throughout 120 counties. While some counties located in the more urban areas of the state have experienced substantial population growth in the past decade, several counties in very rural areas have lost population.

A safe and reliable transportation system that connects across this diversity is vital to Kentucky's future economic growth, national competitiveness and overall quality of life. To provide a safe and reliable transportation system for the next twenty years, state and regional transportation planning must be both coordinated and comprehensive. The development of an effective transportation plan must take into consideration Kentucky's unique geographic and demographic challenges as well as evolving transportation systems and the demands of the 21st century. A dynamic global economy, rapidly developing technologies, security concerns, congestion and safety issues, coordinated land use, limited funding and escalating costs are some of the most significant factors to be considered.

The dependence on the transportation system for the state's economic quality of life has long been recognized in Kentucky. As early as 1953, this realization led to the development of the Commonwealth's first long-range transportation plan. Titled *A Highway Program for Kentucky*, the report boldly stated that "continued change is characteristic of a dynamic economy, and highway affairs must keep pace. Continued planning and restudy of all pertinent matters by all highway agencies is essential to properly advise legislators and the public on the needed changes of the future."

As part of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the US Department of Transportation (USDOT) required each state DOT to develop a "continuing, cooperative, and comprehensive" statewide multimodal planning process, to include the development of a long-range statewide transportation plan. As a result, a Long-Range Statewide Transportation Plan (LRSTP) was developed by the Kentucky Transportation Cabinet (KYTC) in 1995 and updated in 1999. Both plans included policy direction and specific projects for each transportation mode for two timeframes: a short-range element of up to six years and a long-range element of six to twenty years. A 2006 LRSTP update shifted away from a hybrid policy/project-oriented format to one that is purely process-based, providing a basis for meeting the vision for Kentucky's transportation system by clearly identifying goals, policies and needs as well as the necessary analysis tools. The *2014 Long-Range Statewide Transportation Plan (LRSTP)* is an update of this policy-based format.

Although primarily a statewide policy plan, the 2014 LRSTP also incorporates, by reference, the long-range Metropolitan Transportation Plans (MTPs) of Kentucky's nine Metropolitan Planning Organizations (MPOs), which include fiscally-constrained projects and components as well as policy.

With each update, the KYTC has evolved its planning process to meet the challenges of limited resources and the demands of future transportation users while taking advantage of the opportunities for the application of improved technologies in our transportation network. 2014 LRSTP improvements include enhancing the public input and participation process, refining the project identification and prioritization process, incorporating performance management principles and tools and finding ways to incorporate and address federally required planning factors.

1.3 Where Are We Going?

Transportation is the way we move people and things from one place to another. Kentucky's transportation system is inextricably woven into the fabric of the state's quality of life. The environment, education, economy, health care, and the time we enjoy with our families and friends are all, to varying degrees, affected by and dependent upon our transportation system. Because we need to travel to our jobs, take our children to school, go to the grocery store, obtain medical attention, attend recreational activities or just visit our relatives and friends, transportation is and will always be important. **Figure 1.3 A** depicts examples of trips we make that utilize our transportation system. While the majority of our trips will be taken via automobile, we must be cognizant of the fact that they may involve any of a variety of other transportation modes.

Figure 1.3 A – Transportation and Our Trips

While the transportation system provides the means for trips, those trips take time -- a valuable and limited resource, both in business and in our personal lives. An efficient transportation system allows people and goods (Freight) to get to the workplace enables produce to arrive at its destination before it spoils, and provides access to emergency services in times of crisis when every moment can mean the difference between life and death.

1.4 What Trips Do Our Goods Make?

Kentucky's leaders and transportation officials understand the essential role transportation plays in the state's economic and social well-being. An effective transportation system facilitates the distribution of raw materials and finished products from one point to another. It increases productivity and improves delivery performance. We rely on it to bring goods to our stores and services to our doorstep, and to make sure Kentucky exports are delivered to customers across the nation and around the world.

Figure 1.4 A shows freight movement (trips taken by our goods) by truck to, from and through Kentucky as part of the Freight Analysis Framework (FAF) to help meet the needs that improve our quality of life.

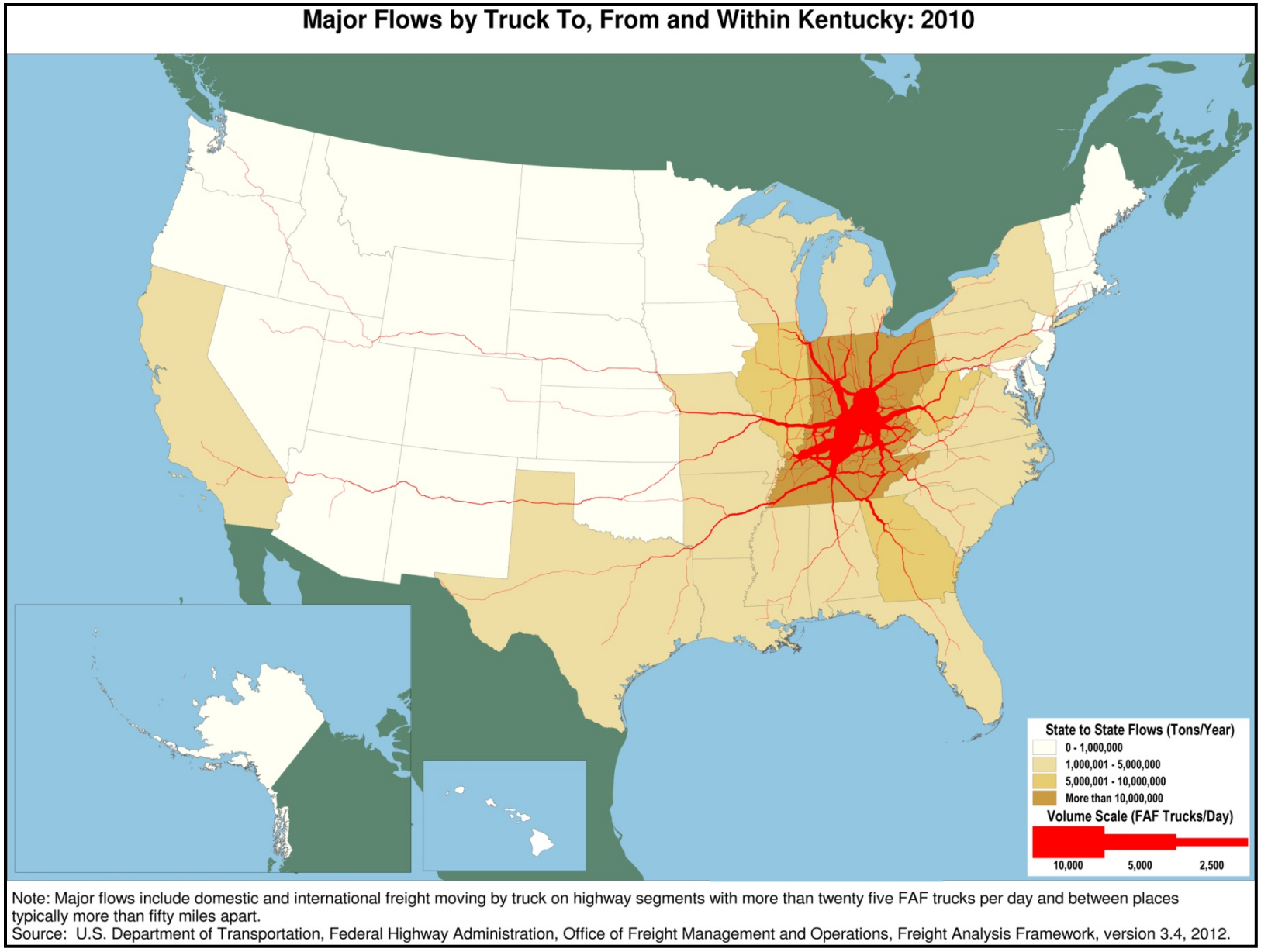


Figure 1.4 A – Kentucky – Freight (Goods) Routing to, from and through Kentucky via Truck

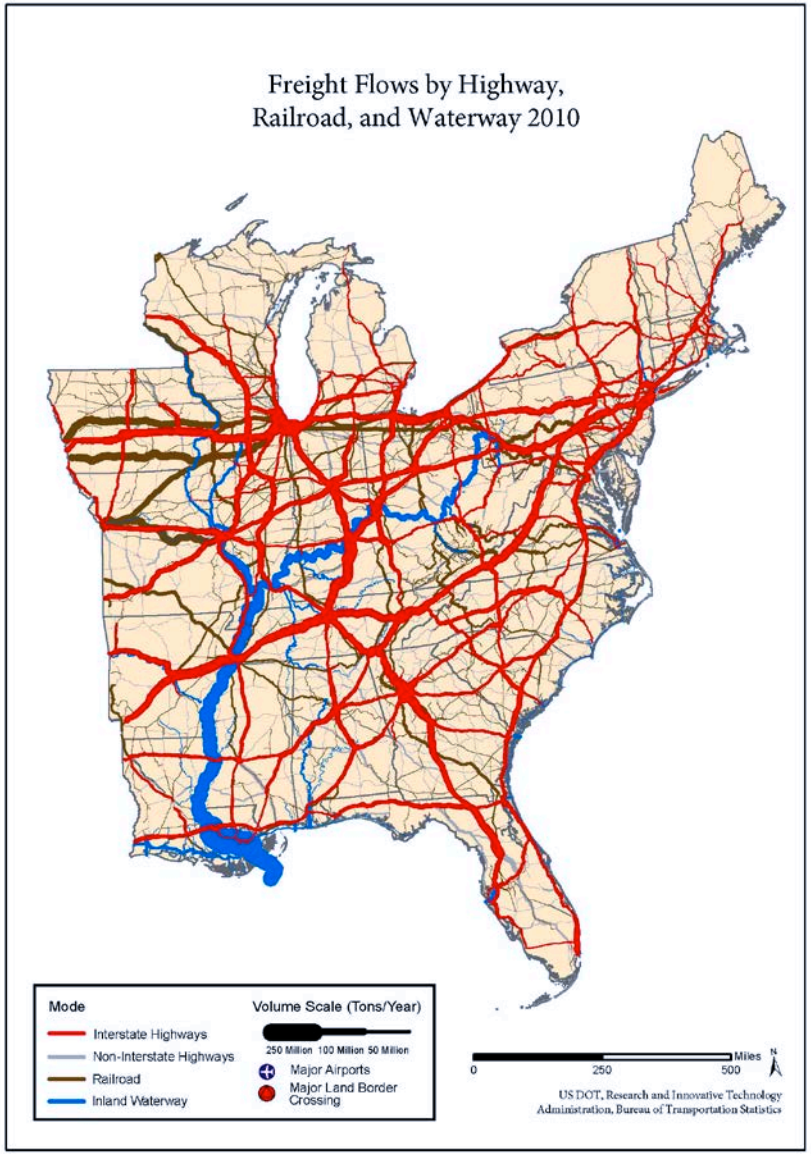


Figure 1.4 B – Kentucky Crossroads State for Freight

Figure 1.4 B provides a regional view of the movement of freight by highway, railway and waterway. This map shows the significant role Kentucky plays as a "Cross Roads" state in the transfer of goods from a regional and national perspective. We must always keep in mind that regardless of the trip our goods take, most start with a truck and end with a truck.

As we look to the future, our transportation system can only function when adequate investment is made to develop and maintain its infrastructure. This investment of resources does not necessarily mean that KYTC controls or funds all its elements. For safe and successful trips to continue over the next twenty years, it will require efficient use of all KYTC resources to support the critical publicly-owned elements of the transportation system as well as close working partnerships with private sector owners of other transportation system components such as rail, aviation and waterways.

While the KYTC cannot foresee all challenges Kentucky's transportation system will encounter over the next twenty years, this Plan represents its policy, priorities, and direction for addressing, within funding limitations, the major issues and obstacles it may face through 2035.

The KYTC hopes that you find this document educational and a valuable long term resource for transportation in Kentucky.

Chapter 2.0

2.0 Who We Are

The specific transportation needs of individual Kentuckians will often vary based on factors such as age, gender, income, race and commuting patterns. An accurate, fact-based portrait of the Commonwealth is the foundation of any plan that hopes to provide the best possible service to Kentucky residents and the most efficient use of their tax dollars.

2.1 Population Trends

The 2010 US Census data places Kentucky's total population at 4,339,367. This is a 7.1% increase in population from 2000 Census data numbers as shown in **Figure 2.1 A**. While this rate of increase was 23% lower than the previous decade, it is similar to a nationwide 27% decrease in growth rate during the same period.

In the interest of providing the most useful information for statewide transportation planning, Kentucky's population was examined based on six age groups rooted in their common needs within the transportation system and are represented graphically in **Figure 2.1 B**.
Those in the youngest age group, children under 19 years old, are likely to be reliant on others for transportation. Along with young adults 20-24 years of age who are still relatively new to driving, they may also be heavy users of transit, pedestrian and bicycling amenities. 25-54 year old adults are likely to be commuting by car for work as well as driving their children to school and related activities. Mature adults, 55-64 years of age, will likely still be commuting but will probably have fewer child-related trips. Retired adults 65-84 years old may no longer have commuting needs, but they are likely still active and mobile.

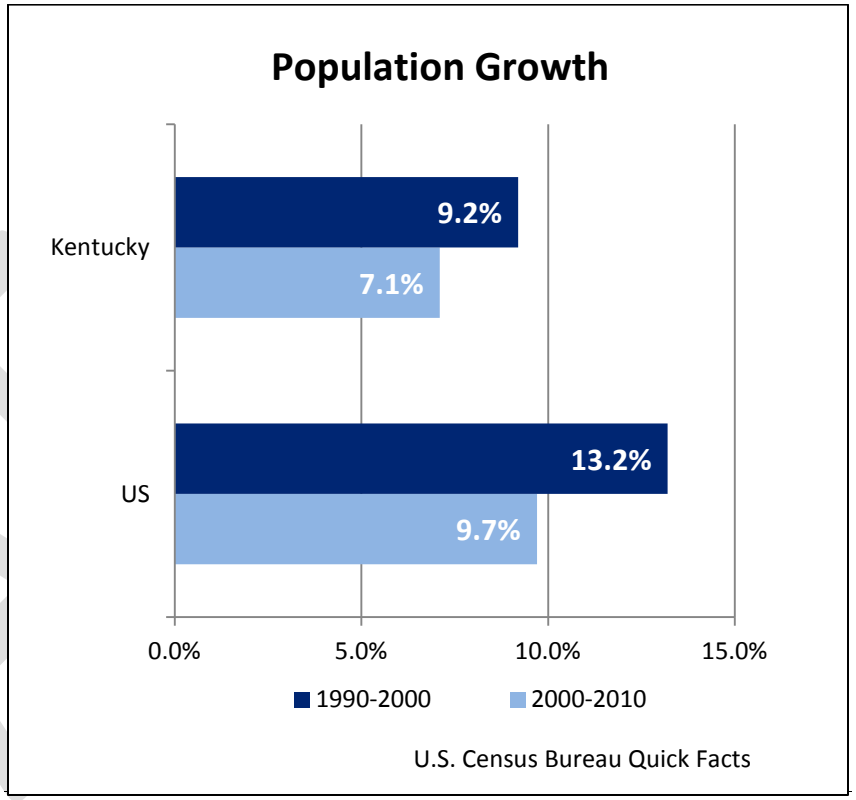


Figure 2.1 A – Population Change in Kentucky verses United States from 2000-2010

Kentuckians 85 years of age and older typically are more likely to have health issues that directly affect their mobility. As such, they may also become more reliant upon public transit services to meet their mobility needs.

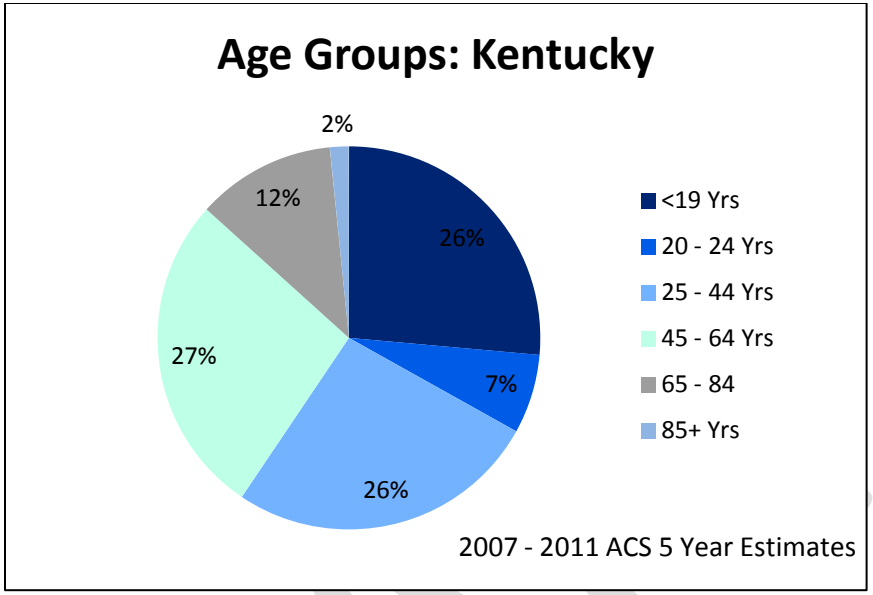


Figure 2.1 B – Kentucky Population by Age Group(Average 2007-2011)

Population trends in Kentucky through 2035 show the under 19, 25-44 and 45-64 age groups as the three largest in raw numbers, with each displaying a similar ongoing pattern of slow growth as shown graphically in **Figure 2.1 C**. The college-age and 85 and over age groups show a similar slow growth trend and are also the two smallest population groups. Although not the largest category in numbers, a significant level of growth projected for the 65–84 year age group could have important implications with regard to the types of demands placed on the state's transportation system over the next two decades and the projects necessary to meet them.

As shown in **Figure 2.1 D**, between 2000 and 2010, eight Kentucky counties -- Jessamine, Shelby, Oldham, Boone, Bullitt, Warren, Scott and Spencer -- exhibited population gains in excess of 20%, with an additional 14 counties showing gains of more than10%. Conversely, 36 counties exhibited population decline during the same period. Breathitt, Fulton, Harlan and Clay exhibited the largest declines at more than 10%. Another six showed a population decline of 5% or more. While Kentucky remains a predominantly rural state, recent population data shows that Kentucky is following national trends with respect to migration out of rural America and into more urbanized areas.

While Kentucky's population is predominantly white, it is following the national trend of increasing representation by minority populations. While the state's Black/African American population continues to be the largest minority group, the state's Hispanic population continues to

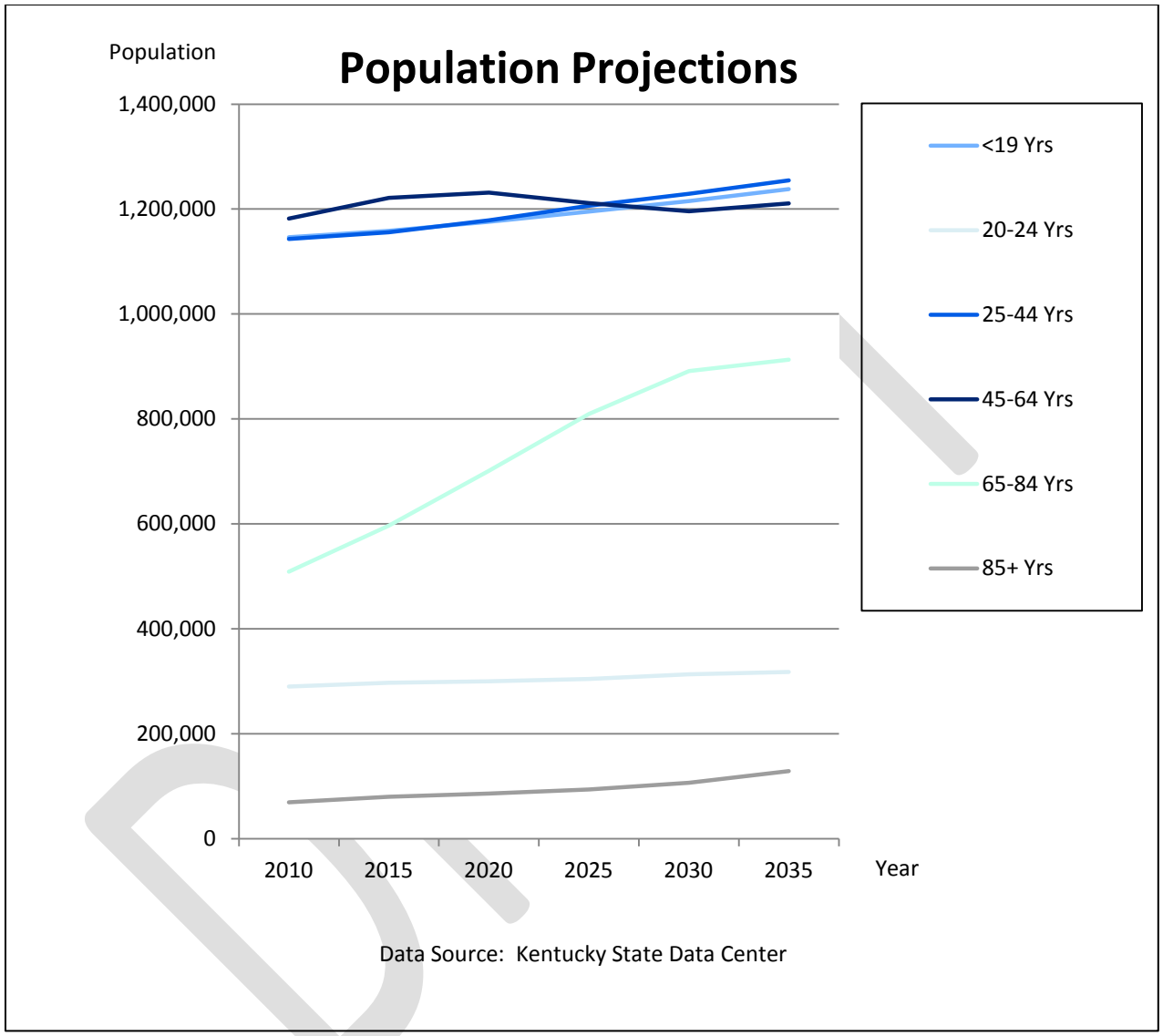


Figure 2.1 C - Kentucky Population Projections from 2010 through 2035

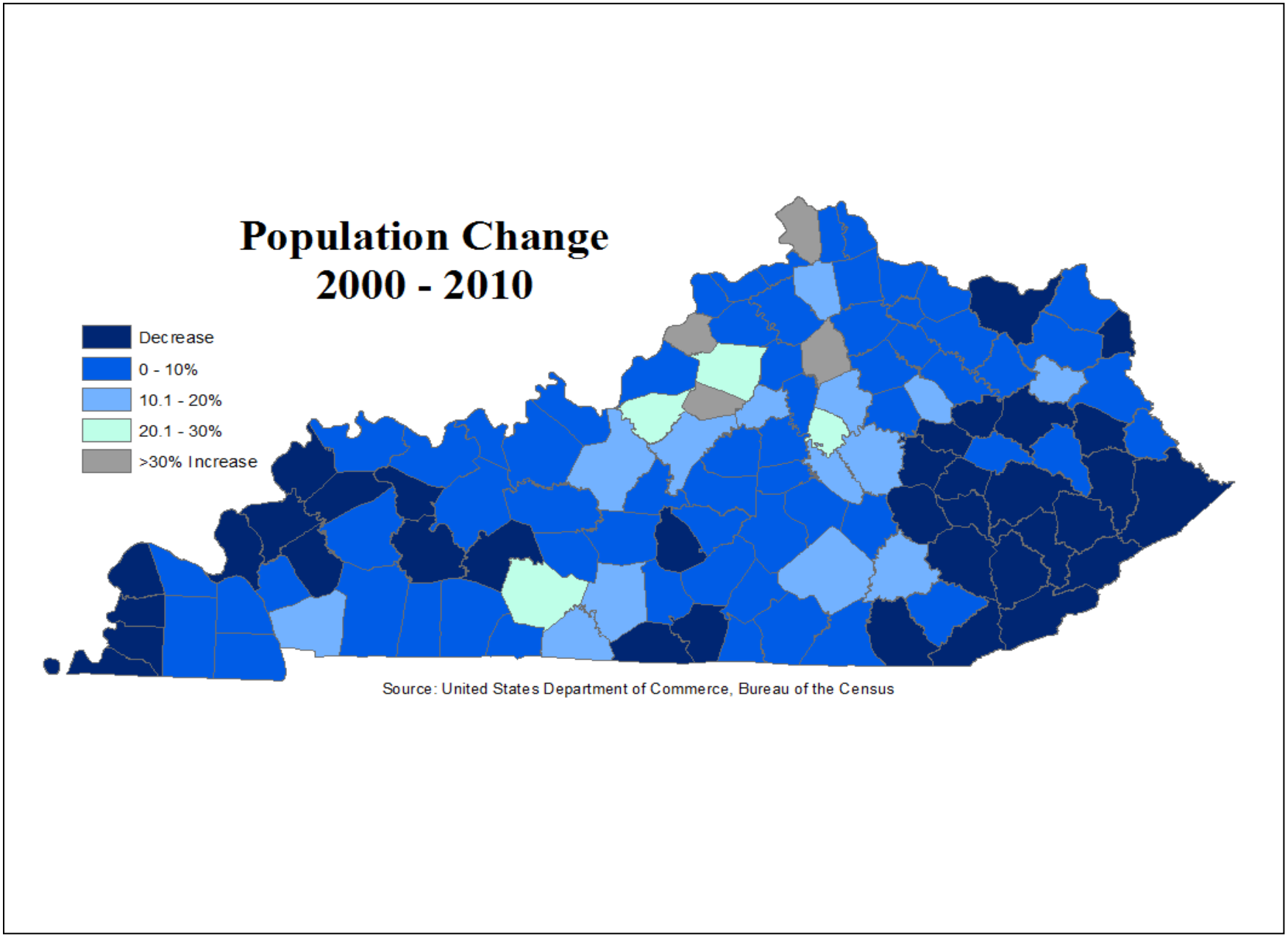


Figure 2.1 D – Kentucky Population Percent Change by County

increase, now accounting for almost 3% of Kentucky's total population. The distribution of the minority population from the total population is provided graphically in **Figure 2.1 E**.

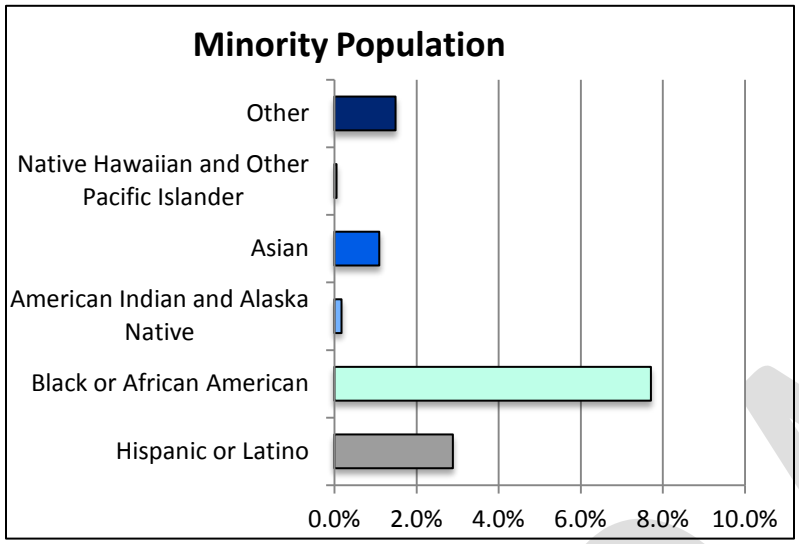


Figure 2.1 E – Minority Population Percentage in Kentucky from 2010 Census Data

English remains the predominantly spoken language throughout the state. In 15 Kentucky counties, up to 5% of the population 5 years and older report speaking "English only", with the highest rates found in Fayette County (11%) and Warren County (9%). Statewide, 2.09% report that they "speak English less than very well". Spanish-speaking constituents make up the largest percentage of this group at 1.2%, with "Other Indo European languages" at 0.38% and "Asian and Pacific Islander languages" at 0.37%.

In addition to the Environmental Justice populations of race, color, national origin or income, KYTC makes special efforts to identify areas with low education rates, limited access to vehicles or a high percentage of elderly residents. This practice is an effort to identify and mitigate disproportionate effects of highway projects that may be borne by these more susceptible populations. Those at risk populations are shown in **Figure 2.1 F**.

2.2 Income

Kentucky's median household income is $42,610 per year, compared to $53,046 nationwide (ACS 2007-2011). While the majority of Kentucky counties fell below the national median, eight counties -- Campbell, Kenton, Woodford, Shelby, Scott, Spencer, Boone and Oldham -- exceeded it.

Kentucky posted an individual poverty rate of 18.6%, compared to 14.9% nationwide (ACS 2007-2011). 101 of Kentucky's 120 counties show an individual poverty rate higher than the national rate of 14.9% These high poverty areas are predominantly located in the Appalachian region of Eastern Kentucky and are illustrated in **Figure 2.2 A**. **Figure 2.2 B** also provides the median household income for Kentucky with similar results being apparent in the Appalachian region of Eastern Kentucky.

The Appalachian Region includes 54 of Kentucky's 120 counties. Over 426 miles of highway within them are designated as part of the Appalachian Development Highway System (ADHS). This system was developed to generate economic development in previously isolated areas, supplement the interstate system, connect Appalachia to the interstate system and provide better access to both regional and nation-wide markets. KYTC has completed 398.5 miles of roadway eligible for ADHS, and 18.8 miles remain under construction. An additional nine miles are in the design phase, including projects on US-119 in Letcher County and US-460 in Pike County. The estimated cost to complete these sections of roadway is approximately $613 million as determined by the KYTC Division of Planning.

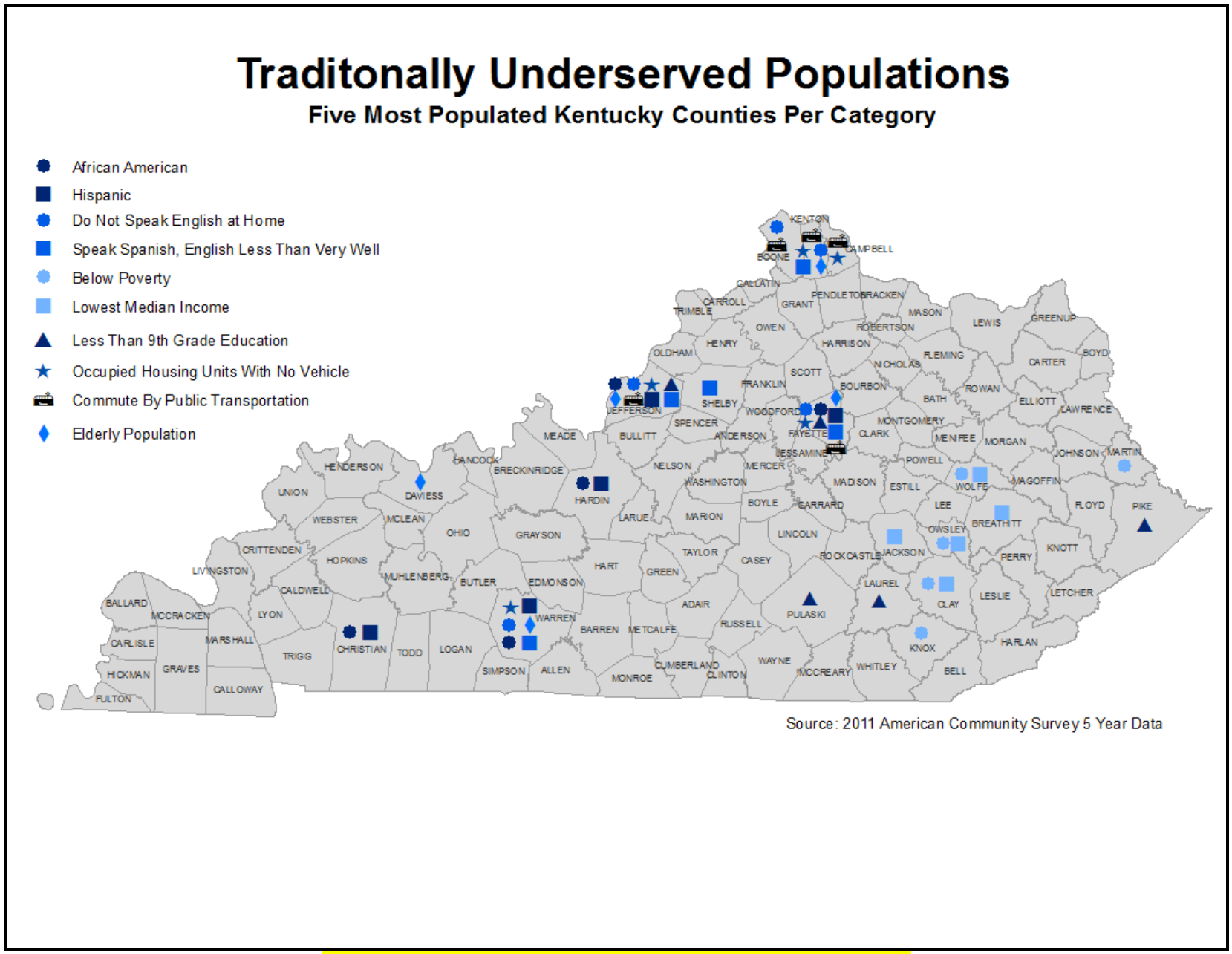


Figure 2.1 F –Traditionally Underserved Populations

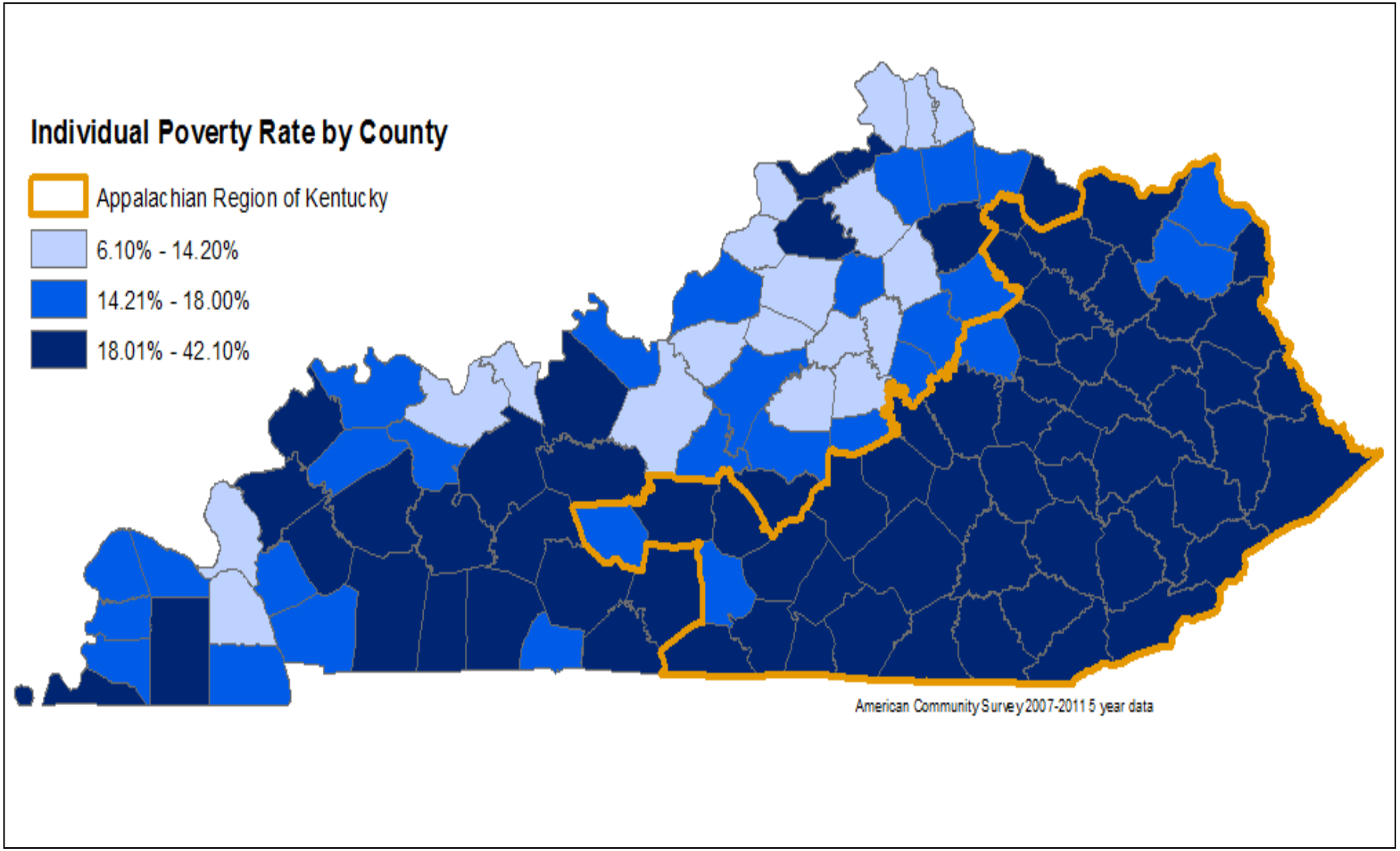


Figure 2.2 A – Individual Poverty Rate by Kentucky County

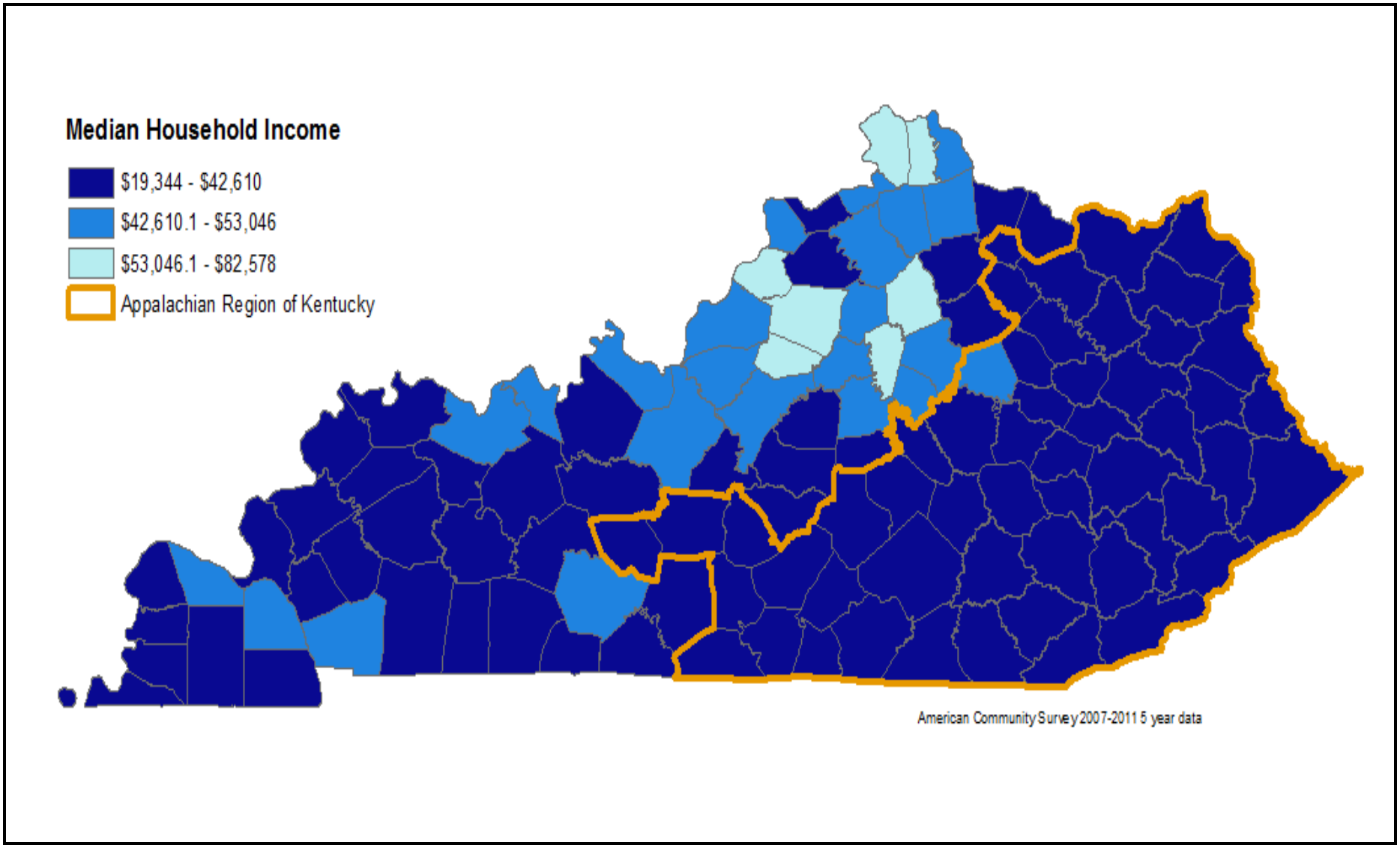


Figure 2.2 B – Median Household Income by Kentucky County

2.3 Commuting Characteristics

On average, a Kentuckian's travel time is approximately 22.6 minutes to work, compared to the national average of 25.4 minutes as reported by the American Community Survey (2007-2011 5 year data). This comparison is illustrated below in **Figure 2.3 A**.

Figure 2.3 A – Average Travel Time for those in Kentucky verses those in the United States from 2007-2011

As a predominantly rural state, a personal automobile is the primary method by which workers commute. There are over 1,675,000 occupied housing units in Kentucky, of which more than 130,000 people have no personal vehicles available. 7.4% of workers 16 years of age and older use other means than a personal vehicle to travel to work. Of these, approximately 55,000 people work at home, almost 40,000 people walk, about 22,000 people use public transportation, and another 20,000 people travel to work using "other means" as identified by the American Community Survey from 2007-2011 and represented graphically in **Figure 2.3 B**. The largest gap between Kentucky and the nation is in the use of public transportation, which has a rate four times higher nationally than in the state of Kentucky.

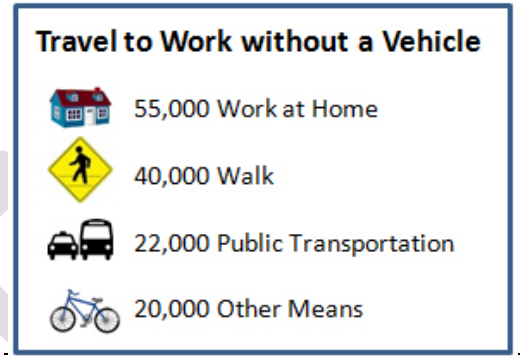


Figure 2.3 B – Kentucky Average Daily Population Traveling to Work without a Vehicle from 2007-2011

Chapter 3.0

KENTUCKY TRANSPORTATION AT A GLANCE

120 Counties
15 Regional Area Development Districts (Rural Planning) / 9 Metropolitan Planning Organizations / 12 KYTC Highway Districts
2010 Census Population of 4,339,367
Land area of 39,728 square miles

Airways (2013)

- 6 air carrier airports -
  - 5 passenger air carrier airports including two int'l airports
  - 1 unscheduled passenger air carrier airport
- 53 general aviation airports
- Over 10.2 million passengers annually
- Over 5.53 million tons of air cargo transported annually
- Only state that is headquarters for 2 major air cargo companies

Highways (2013)

- Over 79,321 miles of public roads and streets (2012)
- 10 interstate highways and ten state parkways
- 27,625 miles of state-maintained highways
- 47.2 billion vehicle miles of travel annually (2012)
- 3,691 miles of Federal/State Truck Network in Kentucky with an average of 14% trucks on this network
- Over 14,000 bridges including 9,000 state-maintained bridges
- 3,294 miles on the National Highway System
- 2,989,812 licensed drivers with 120,203 being CDL holders
- 275 million tons of freight hauled by truck annually (2011)
- 487 miles of Trans American bike route US-BR-76

Public Transportation (2013)

- 25 rural public transportation services
- 9 urban bus/transit systems
- Regional coordinated human service delivery program with 15 regions
- Over 31 million passengers annually
- Approximately 3 million elderly and disabled passengers annually

Waterways (2013)

- 95 million tons of cargo transported (2012)
- 1,269 miles of navigable waterways
- 12 public riverports (7 active and 5 developing)
- Over 100 private terminals
- 10 ferry operations
- 14 locks and dams for navigation
- 8th in the nation for tons moved on waterways (2012)

Railways (2011)

- 13 freight railroads: 5 Class I, 1 regional, and 7 local
- 2,648 miles of railroad track (2013)
- 267 million tons carried by rail annually through Kentucky
- 2,038 Highway-Railroad at-grade crossings
- 4 Amtrak stations + 1 Amtrak bus to rail station
- 11,016 Amtrak passengers annually (2013)

3.0 Transportation At-A-Glance

For the purpose of this LRSTP and for Kentucky's long-range planning purposes, the needs, available funding, cabinet policies and strategic plans for these transportation systems will be addressed through incorporating by reference the following documents and resources. The following order of discussion for these modes is based upon the degree by which KYTC interfaces directly with each of these modes.

3.1 Highways

- *Kentucky's FY 2014 – FY 2020 Enacted Highway Plan* – a Kentucky General Assembly approved project based plan as required by the KRS, Chapter 176. This plan is the means by which the Kentucky General Assembly provides the KYTC an outline for scheduled project phases over the fiscal years defined above. A new Enacted highway plan is anticipated every two years with funding levels constrained over a two year period. This plan can be reviewed at http://transportation.ky.gov/Program-Management/Pages/2014-Highway-Plan.aspx.

- *Kentucky Recommended Highway Plan (2014)* – a KYTC Department of Highways Plan approved by the Governor as required by the Kentucky Revised Statutes (KRS), Chapter 176. This plan is the channel through which major highway improvement project phases scheduled for the next six years are recommended to the Kentucky General Assembly during the 2014 Session. A new Recommended Highway Plan is updated every two years and submitted for review and approval by the Kentucky General Assembly in the development of the Enacted Highway Plan. This plan is fiscally constrained for two out of the six year period. The current plan can be accessed at http://transportation.ky.gov/Program-Management/Pages/2014-Highway-Plan.aspx.

- Kentucky Transportation Cabinet (KYTC) Department of Highways is charged with the implementation of the Kentucky Enacted Highway Plans by providing a safe and reliable transportation system that delivers economic opportunity and enhances the quality of life for all Kentuckians. The KYTC website is at http://transportation.ky.gov/Pages/default.aspx.

- American Association of State Highway and Transportation Officials (AASHTO) is a nonprofit, nonpartisan association representing highway and transportation departments in the 50 States, The District of Columbia and Puerto Rico. Its primary goal is to foster the development, operation, and maintenance of an integrated national transportation system representing all five transportation modes. AASHTO website is http://www.transportation.org/Pages/Organization.aspx. The AASHTO 2001 Green Book was adopted by FHWA and is at http://www.fhwa.dot.gov/programadmin/022305.cfm.

- U.S. Dept. of Transportation Federal Highway Administration (FHWA) is a Federal Agency that provides stewardship over the construction, maintenance and preservation of the Nation's highways, bridges and tunnels. FHWA also conducts research and provides technical assistance to state and local agencies in an effort to improve safety, mobility, and livability, and to encourage innovation. More information is available on their website at https://www.fhwa.dot.gov/.

3.2 Public Transportation

- Public transportation services are available in all Kentucky counties. The core needs of public transit riders remain the same – employment and medical needs.

- Kentucky has 25 rural public transportation services and 9 small urban and large urban city bus/transit systems which provide 31 million trips per year. Of these trips, 3 million are for elderly and persons with disabilities, taking them for dialysis, cancer treatment, and other needed services.

- The KYTC Office of Transportation Delivery (OTD) is responsible for seeking grant funds; the oversight and implementation of various statewide public transit grants; and coordinating human service transportation such as non-emergency medical transportation. More information on Public Transit in Kentucky can be found on the Office of Transportation Delivery/KYTC website at *http://transportation.ky.gov/transportation-delivery/pages/default.aspx*.

  The public transportation program in Kentucky is a two-year program which identifies capital and operating improvements to Kentucky's public transportation system. This program uses local, limited state general funds and federal transit funds. All federal funds for Kentucky's major transit systems do not flow through KYTC, but directly to the public transit system in Kentucky's urban areas. More information on the Federal Transit Administration (FTA) and federal transit funds and programs can be found at http://www.fta.dot.gov/.

3.3 Airways

- *Kentucky Aviation System Plan (1998)* – a 20 year plan of airport construction projects and operational enhancements at Kentucky's regional and city airports without a financial commitment. This plan is generally updated about every 10 years. No link to date.

- *Air Service at Kentucky's Commercial Airports Research Report No. 390 (2011)* – a review by the Legislative Research Commission (LRC) for the Program Review and Investigations Committee of FAA policy and procedures affecting airport financial conditions and funding issues at the three largest airports in Kentucky. This report can be found at http://www.lrc.ky.gov/lrcpubs/RR390.pdf.

- Kentucky Transportation Cabinet Department of Aviation (KDA) is charged with providing a safe and secure air transportation system that ensures the mobility of people and goods, enhances economic prosperity, and preserves the quality of our environment and communities. More information about the KDA can be found at http://transportation.ky.gov/Pages/default.aspx.

3.4 Railways

- *Kentucky Statewide Rail Plan (KSRP) 2002* – this plan identified system-wide strategies and policies, developed specific goals and objectives, and provided a vehicle to identify future rail issues in order to meet requirements for federal funding, should federal funds become available. The plan is currently being updated and is scheduled to be completed in the summer of 2014. The current plan can be accessed at http://transportation.ky.gov/Railroads/Pages/Kentucky-Statewide-Rail-Plan.aspx.

- KYTC's Division of Planning maintains information on active rail lines in the state, passenger rail lines, tourist/excursion rail lines, rail GIS data, short line railroad assistance, railroad annual reports, Rails to Trails, and other rail resources. Links to the most recent statewide rail map and ongoing updates can be accessed at http://transportation.ky.gov/Railroads/Pages/default.aspx.

- KYTC's Utilities and Rails Branch of the Division of Right-of-Way maintains information on and administers the federal highway-railway at-grade crossing safety programs and other rail project coordination. This and other information can be accessed at http://transportation.ky.gov/Right-of-Way-and-Utilities/Pages/Railroad-Programs.aspx.

- The Association of American Railroads (AAR) represents North American railroads and Amtrak, and maintains a large amount of information about railroads. This information can be accessed at https://www.aar.org/Pages/Home.aspx.

- The American Short Line and Regional Railroad Association (ASLRRA) represent the interests of North American short line and regional railroad members in legislative and regulatory matters. Their site contains information on meetings, seminars, news publications, safety and training. Information can be accessed at http://www.aslrra.org/home/index.cfm.

- Amtrak, the National Railroad Passenger Corporation, offers passenger rail service in Kentucky on routes: The Cardinal, between New York City and Chicago (including a stop in Washington DC), and The City of New Orleans, between Chicago and New Orleans. Their website with timetable, station, route, and ticketing information can be accessed at http://www.amtrak.com/.

- Kentucky Operation Lifesaver works to prevent death and injuries at highway-railroad at-grade crossings and on railroad right-of-way through education, enforcement, and engineering. Information about this non-profit, public education program can be accessed at http://www.kyol.org/.

3.5 Waterways

- *Kentucky Riverport Improvement Project (2008)* – a study that made recommendations to provide a comprehensive and wide-reaching plan of action to enable Kentuckians to utilize waterways assets to compete in regional, national, and global markets. It also provided a plan to improve their quality of life through better utilization of the state's water transportation assets, especially its public riverports. This study recommended education of policymakers and the general public regarding the importance of Kentucky's public riverports and their influence on the state's economy. This study is available at http://transportation.ky.gov/Riverports/Pages/Riverport-Studies.aspx.

- *Toward A Full Accounting of the Beneficiaries of Navigable Waterways* (2011) – a study developed by the Center for Transportation Research, University of Tennessee Waterborne Commerce Statistics Center and is accessible at http://nationalwaterwaysfoundation.org/study/BeneficiariesofNavigableWaterways14Jan11Ver.pdf.

- *Waterborne Commerce of the United States (WCUS)* - a series of publications which provide statistics on the foreign and domestic waterborne commerce moved on the United States waters and is located at http://www.iwr.usace.army.mil/About/TechnicalCenters/WCSCWaterborneCommerceStatisticsCenter.aspx.

- *Kentucky Water Transportation Corridors Public Riverport Development and Intermodal Access* (2000) - a report that highlights the specific capital and infrastructure needs of the existing riverports to remain competitive and attract new business. http://transportation.ky.gov/Riverports/Pages/Riverport-Studies.aspx.

- U.S. Department of Transportation Maritime Administration, America's Marine Highway Program is located at http://www.marad.dot.gov/ships_shipping_landing_page/mhi_home/mhi_home.htm#.

- Water Transportation Advisory Board (WTAB) can be found at http://transportation.ky.gov/Riverports/Pages/Water-Transportation-Advisory-Board.aspx.

- U.S. Dept. o f Transportation Federal Highway Administration, Ferry Boat Discretionary Grant Program (FBD) ended in 2012. It was replaced by the Ferry Boat Formula Funds Grant Program (FBP) in 2013 and is located at http://www.fhwa.dot.gov/specialfunding/fbp/distribution.cfm.

- KYTC's Division of Planning maintains information about ferry boat operations within the state, including locations, schedules, contact information, and rates where applicable. This and other information can be accessed at http://transportation.ky.gov/Ferries/Pages/default.aspx.

- KYTC's Division of Planning maintains information about riverports within the state, the most recent riverport study, a link to the Kentucky Association of Riverports (KAR), and other riverport resources. This information can be accessed at http://transportation.ky.gov/riverports/Pages/default.aspx.

3.6 Bicycle/ Pedestrian Transportation

- In 2013, nearly 7,500 Kentucky Share the Road License plates were sold or renewed. This specialty plate has generated over $300,000 for bicycle and pedestrian safety/education programs (administered through the Paula Nye Memorial Grant from 2009-2013). Further information on this program is available at the following link http://transportation.ky.gov/Bike-Walk/Documents/PaulaNye_Memorial_BicyclePedestrian_Education%20Grant%202013.pdf.

- 1,778 bicycles utilized state funded ferry boats in 2013 per information collected by KYTC.

- Kentucky has 36.5 miles of converted rails to trail paths as of 2013. Kentucky ranks 45th in total rail-trail mileage. The following website provides further information on trails in Kentucky http://www.kyrailtrail.org/.

- In 2013, approximately 0.2% of the adult population commuted to work via bicycle and 2.2% of the adult population commuted to work by walking. In 2014, Kentucky was ranked eighth in the country for recorded per capita spending on bicycle/pedestrian type projects and fifth in the country for the percentage of federal transportation dollars dedicated to bicycle and pedestrian spending. The national average is 2.1% and Kentucky spent 3.2%. The Alliance for Biking and Walking 2014 Benchmarking Report is available at the following website http://bikewalkalliance.org/resources/benchmarking.

3.7 Modes and Interconnectivity

The following are maps of various modes of transportation as they connect to themselves and other modes. This interconnectivity between modes is critical to the overall effectiveness of our combined transportation network. It is through the utilization of these various systems of transportation that the movement of both people and freight improves the overall quality of life for all Kentuckians.

Figure 3.7 A shows the access to and connection between the interstates, parkways and other arterials.

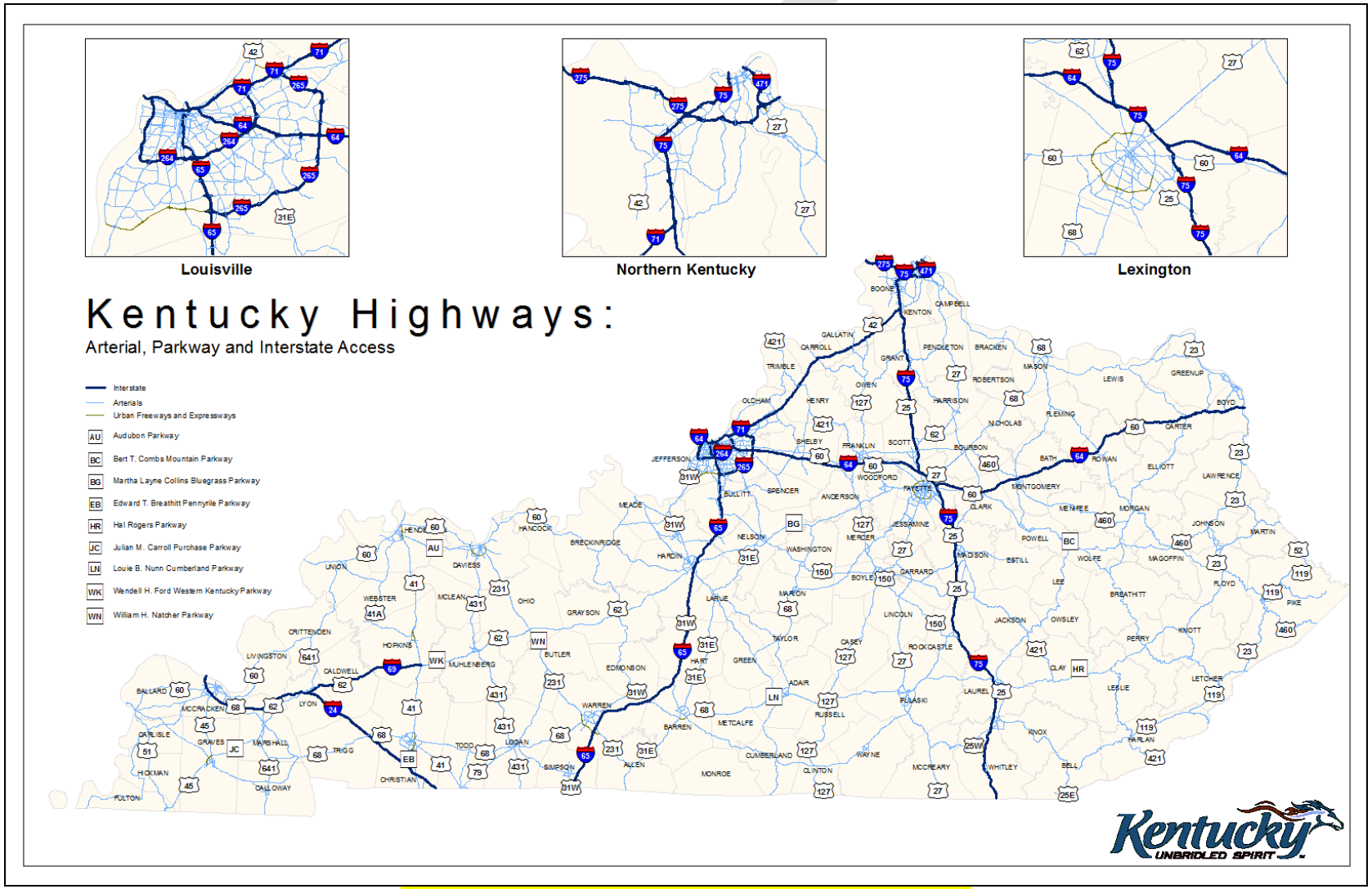


Figure 3.7 A – Kentucky Highway Arterial Map

Figure 3.7 B shows the location of the Air Carrier and General Aviation Airports throughout Kentucky as well as their associated runway lengths and connections to the highway system.

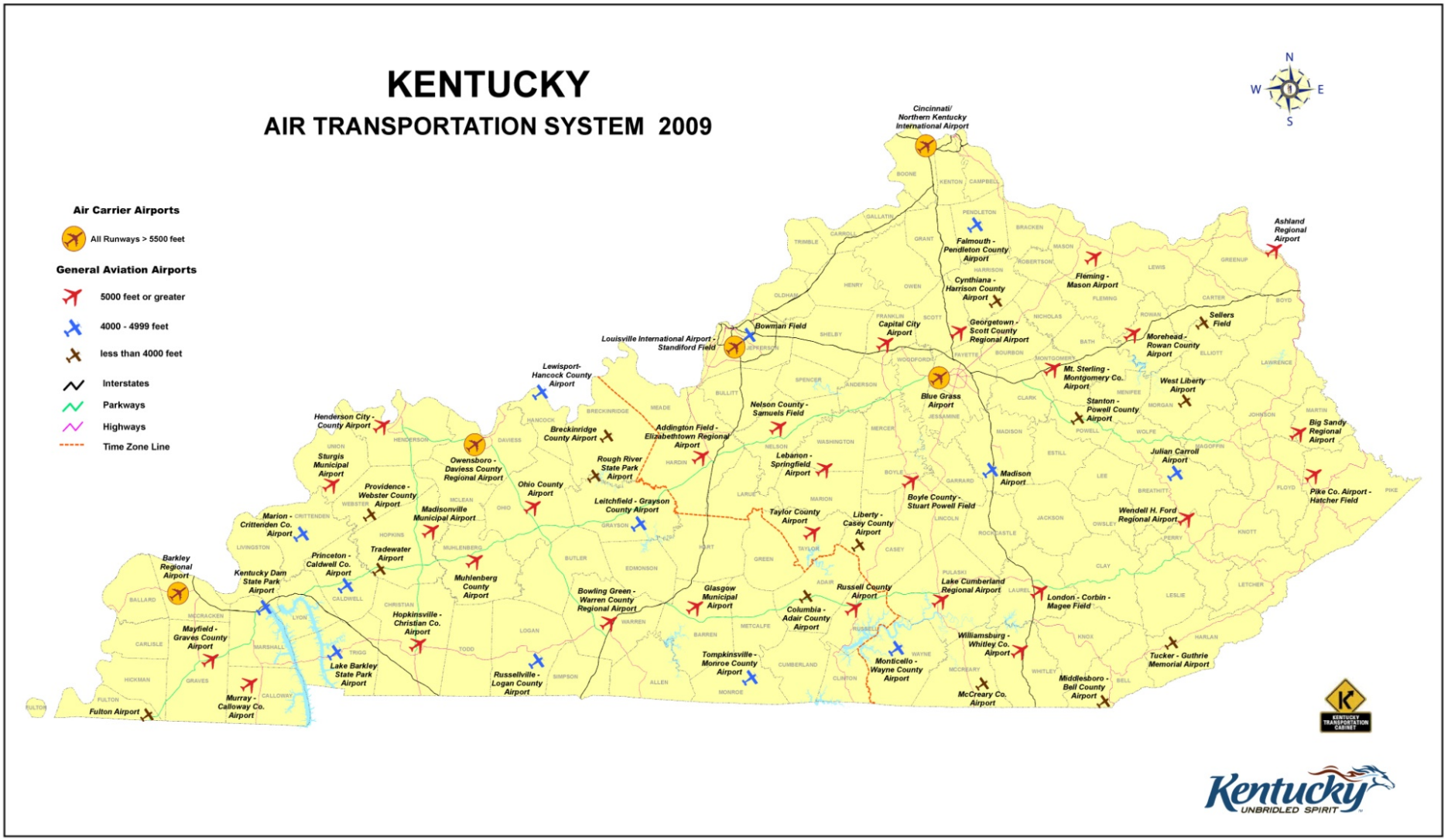


Figure 3.7 B – Kentucky Airport Location Map

Figure 3.7 C illustrates the location of the riverports within Kentucky and their geographical association with the highway system in Kentucky.

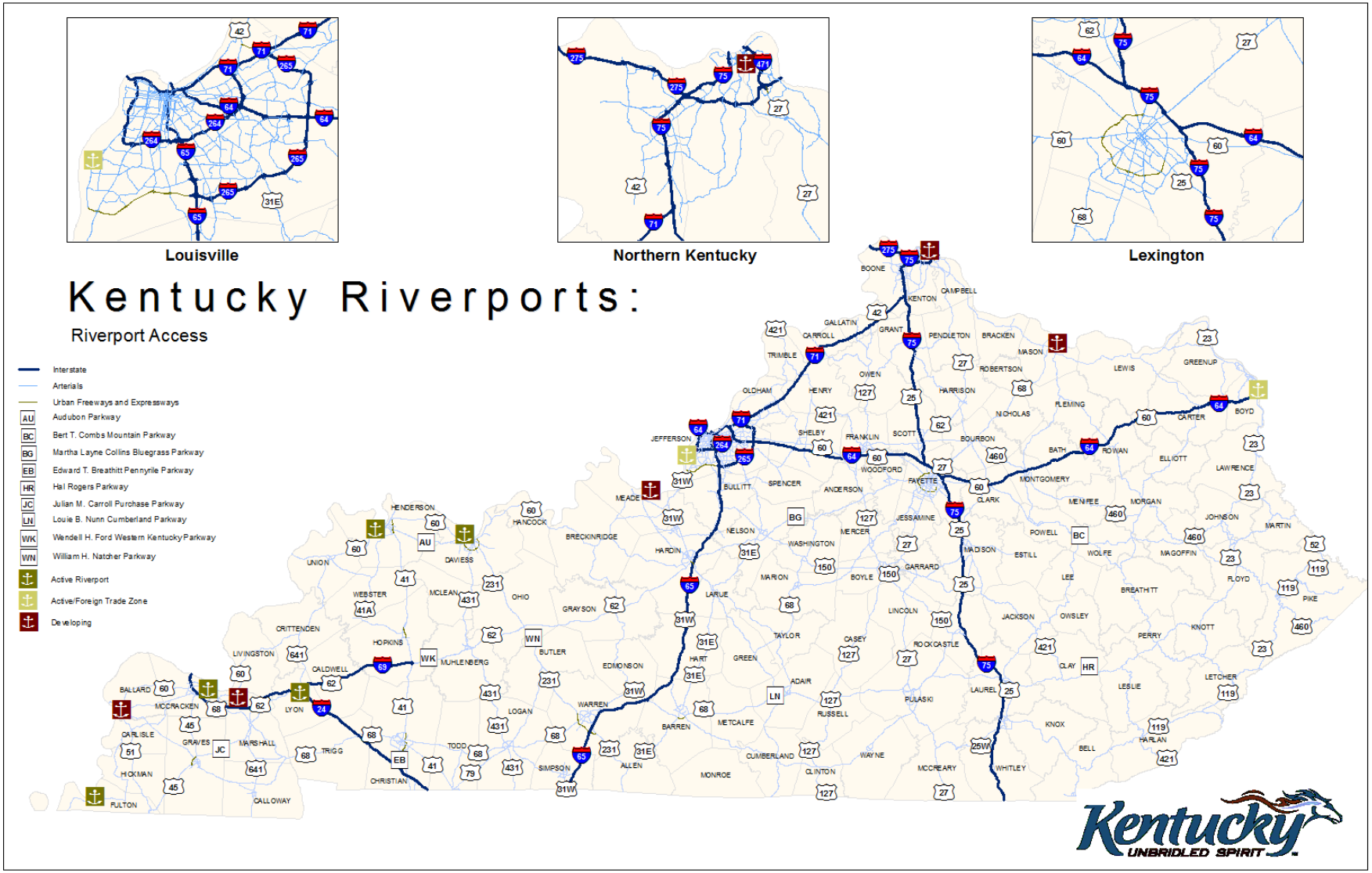


Figure 3.7 C – Kentucky Riverport Location Map

Figure 3.7 D provides the geographical association between the railroads and the highway system within the state of Kentucky.

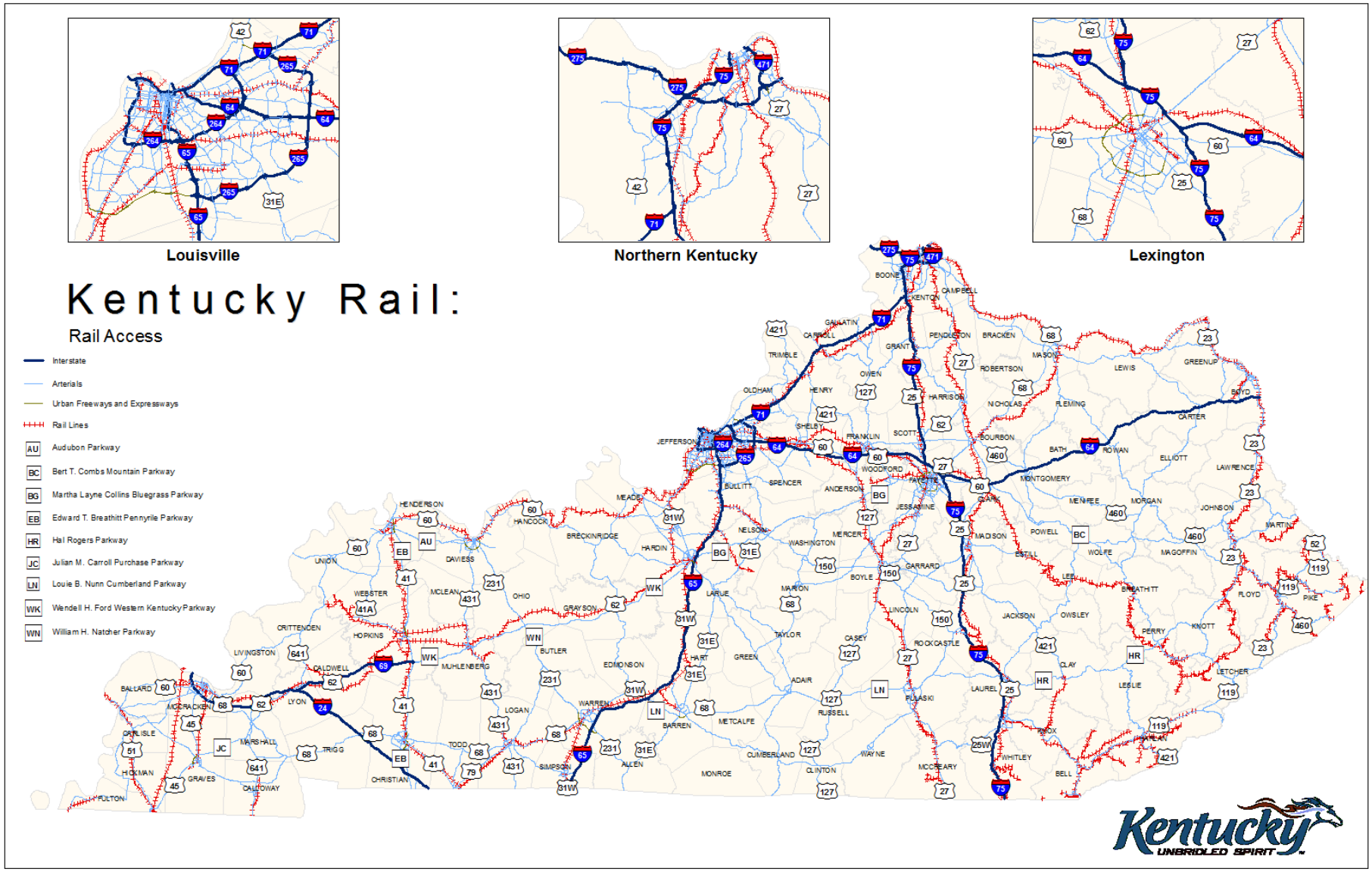


Figure 3.7 D – Kentucky Railroad Network Map

Figure 3.7 E shows the location of the all the urban motor vehicle mass transit carriers throughout Kentucky. These transit providers primarily utilize the local and regional highway system network.

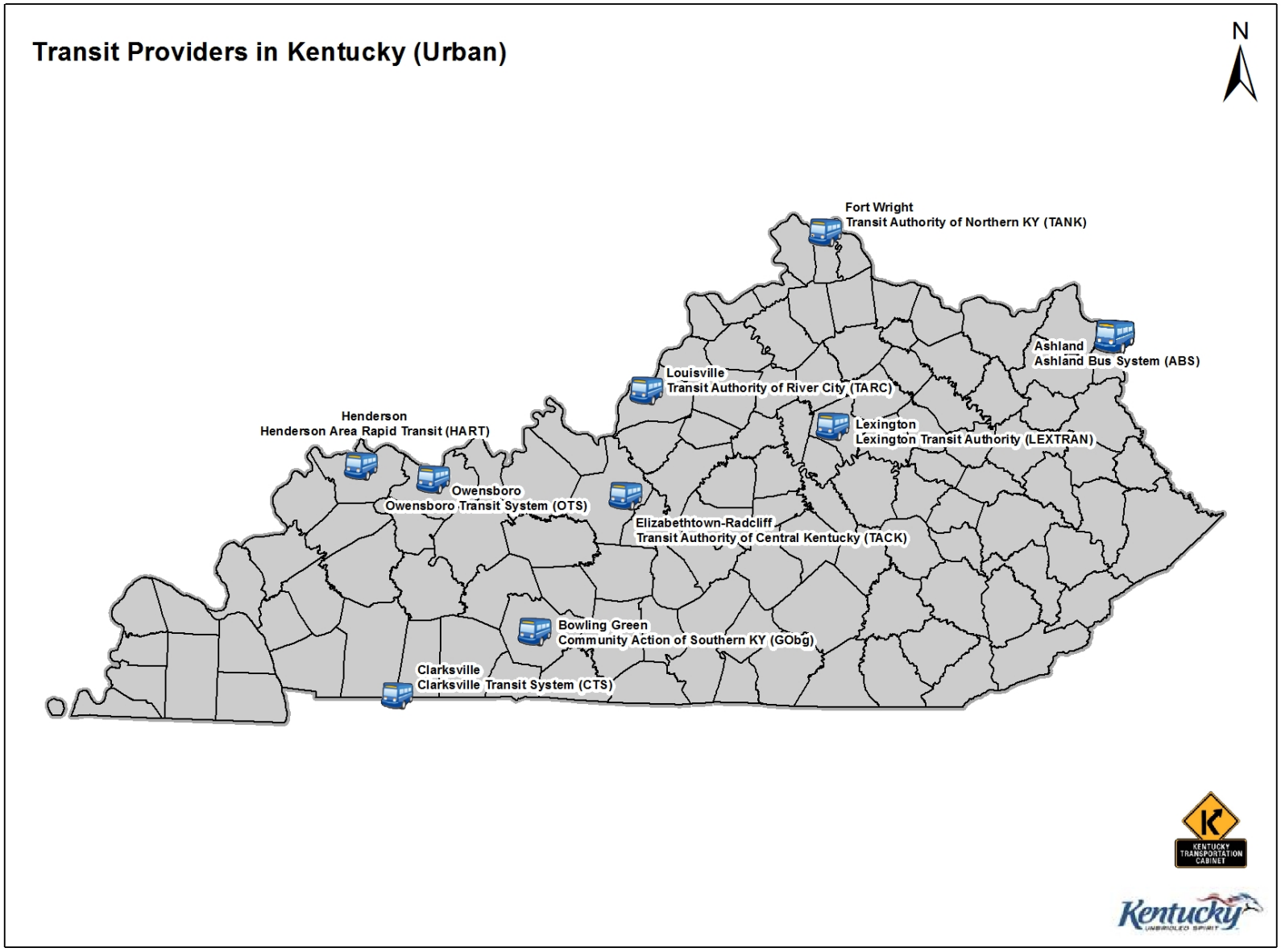


Figure 3.7 E – Kentucky Urban Mass Transit Providers Map

Figure 3.7 F illustrates the rural motor vehicle mass transit provider boundaries throughout Kentucky.

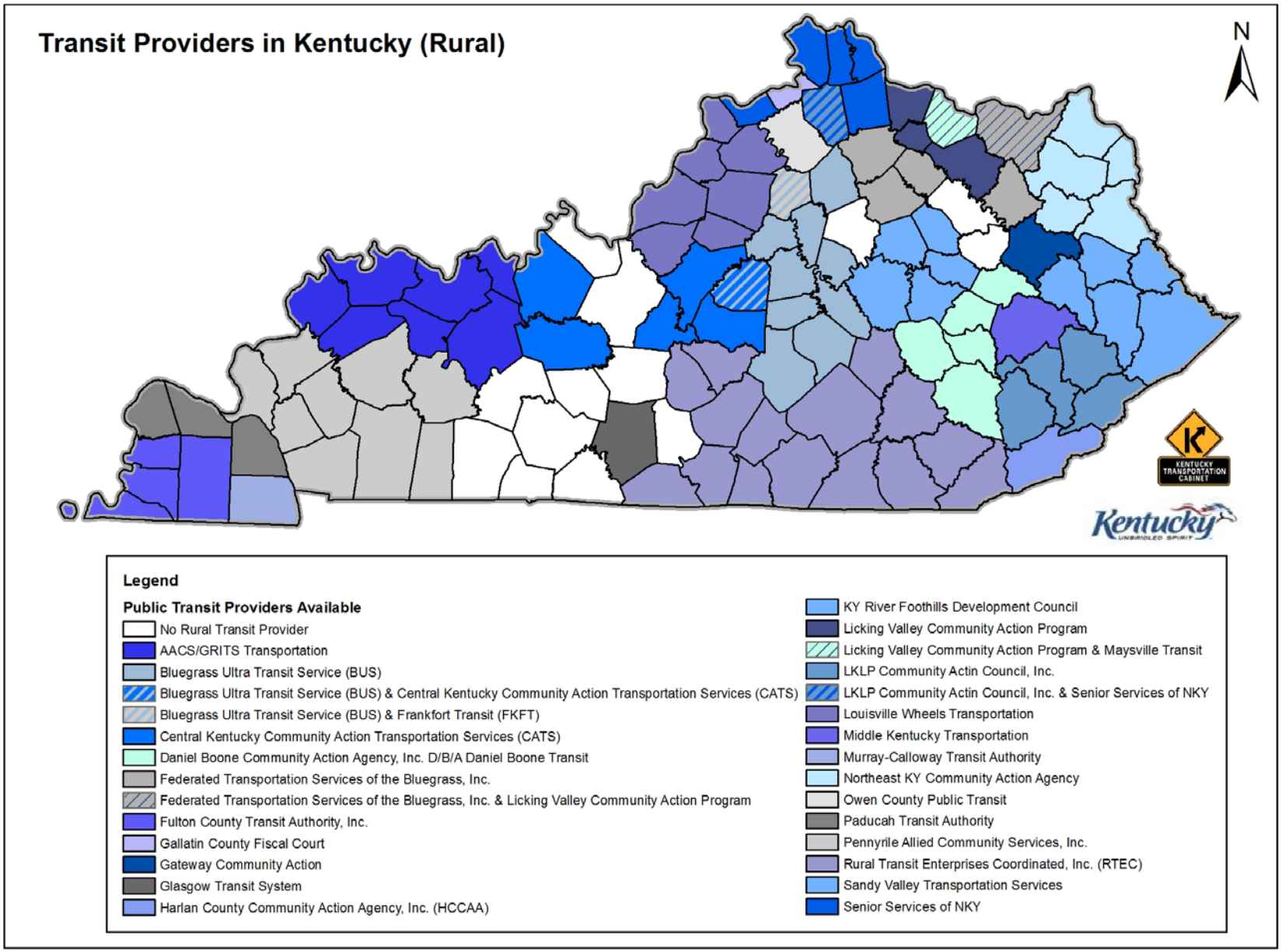


Figure 3.7 F – Kentucky Rural Public Mass Transit Boundary Map

Figure 3.7 G provides the location of the current Trans-America Bike Trail and the connectivity to the highway system throughout Kentucky. This bike trail is identified with a Bike Route (BR) abbreviation in Kentucky and identified as US-BR-76.

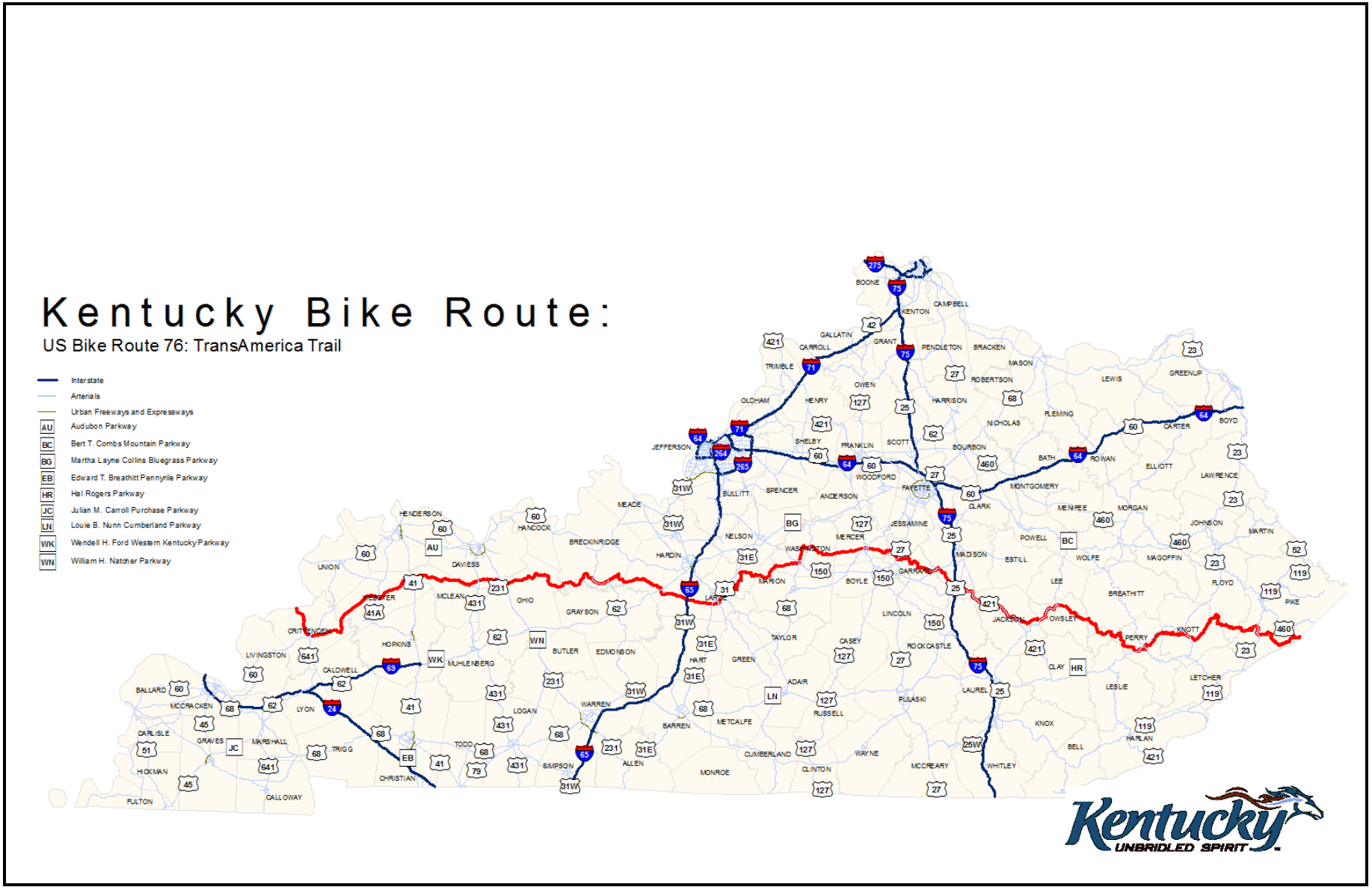


Figure 3.7 G – Kentucky Trans-America Bike Trail US-BR-76 Map

Chapter 4.0

4.0 Vision, Mission, Goals and System Performance

4.1 Federal Framework

Three previous federal transportation funding bills, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the Transportation Equity Act for the 21st Century (TEA-21) and the Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) required state Departments of Transportation to carry out a continuing, cooperative and comprehensive statewide multimodal transportation planning process, including the development of a long-range statewide transportation plan. With its passage in July 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) built upon these programs and policies, providing the framework for a streamlined and performance-based approach to transportation system development and maintenance.

MAP-21 reforms and refocuses the federal transportation program to improve safety, create jobs and support economic growth. This performance-based program is intended to accelerate project delivery, promote innovation and strengthen America's highway and public transportation systems. It includes performance goals for increasing safety, improving system condition and reliability, reducing congestion, enhancing freight movement, promoting environmental sustainability and reducing delays in project design and construction.

4.2 The KYTC Mission

The KYTC is committed to meet or exceed the needs and expectations of the users of Kentucky's transportation system – residents, business owners, employees and students.

The Cabinet's mission is to ***"provide a safe, efficient, environmentally sound and fiscally responsible transportation system that delivers economic opportunity and enhances the quality of life in Kentucky"*** *(2003 Strategic Plan).* The vision which guides the work of the Cabinet in achieving this mission is "Working together to lead the Southeast in providing a transportation infrastructure and transportation services for the 21st century that deliver new economic opportunities for all Kentuckians".

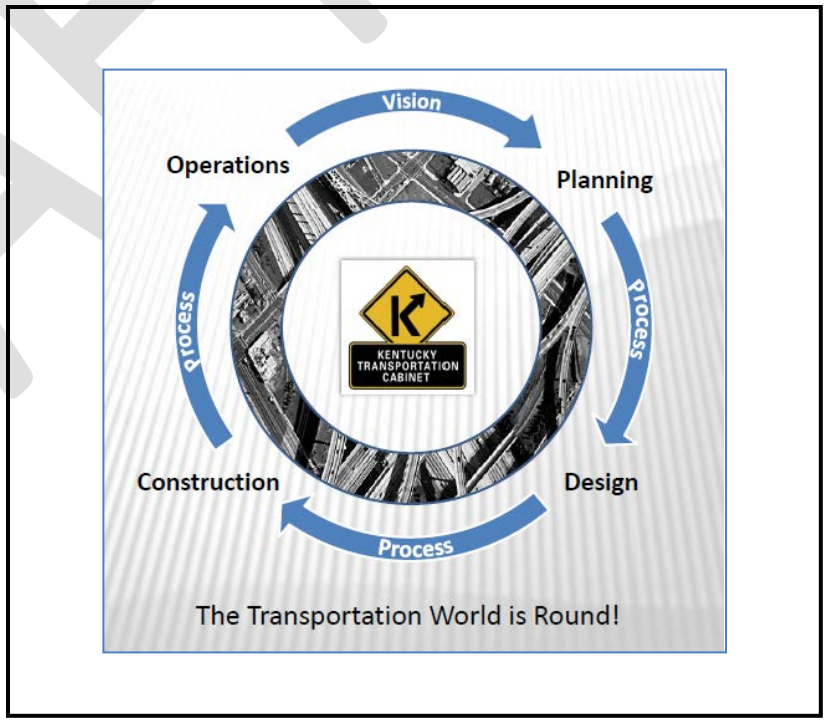


Figure 4.2 A – KYTC Project Life Cycle

As shown in **Figure 4.2 A,** the work that the KYTC conducts in pursuing its mission moves in a continuous cycle rather than a linear path. This process links the four main areas of transportation system development and maintenance -- planning, design, construction and operations -- to deliver a safe, efficient, environmentally sound and fiscally responsible transportation system that facilitates safe and efficient movement of people and goods.

A knowledge-driven process based on valid, broad-based input is essential to the effective decision-making required to address the maintenance and improvement of Kentucky's transportation system. This input comes from political, public and technical sources as graphically displayed in **Figure 4.2 B**.

Analysis of the existing system's form and function as well as the impacts of anticipated improvements is the primary source of technical input. Political input includes guidance, as well as financial support, from state and national political leadership. Public input is generated from all users of the system, including those citizens in communities which are directly affected by proposed improvements.

4.3 Public Input Process

The concerns of Kentucky residents and business partners were of prime importance in the development of the state's *2014 Long Range Statewide Transportation Plan*. The KYTC solicited their input to ascertain their principal transportation needs over the coming twenty years and produced a policy-based plan addressing them. The KYTC undertook an extensive

Figure 4.3 A – KYTC "Your Turn" Survey Logo

engagement process that included a statewide public survey and the participation of three focus groups the association of these groups is shown in **Figure 4.2 B**.

From January 9 through February 25, 2013, the KYTC conducted its "Your Turn" survey to collect citizens' concerns, issues and comments regarding the transportation system in the Commonwealth of Kentucky. **Figure 4.3 A** shows the KYTC survey logo associated with the public outreach effort. This survey served as the first public involvement activity for the update of the LRSTP. The survey was available in on-line and paper formats in both English and Spanish. An awareness campaign was conducted through print, social and broadcast media, and through direct community contacts to procure a statewide response that reflected the varying demographics of the state.

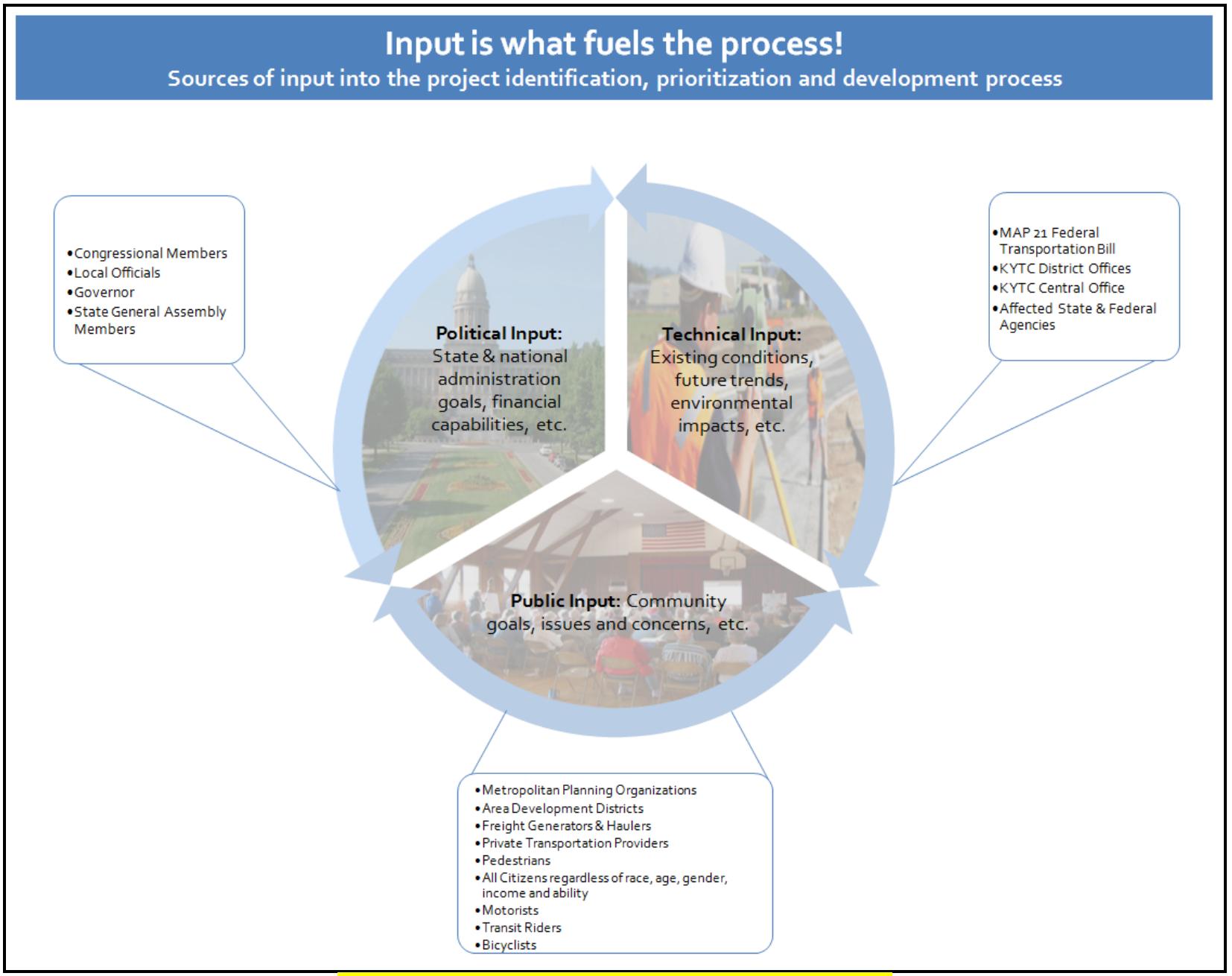


Figure 4.2 B – KYTC Public Engagement Process

> *"Thank you for taking the time to collect citizen input into transportation planning. I appreciate being able to provide input through an online survey because it's difficult to get to a meeting in person at times."*
>
> Survey Participant, Warren County

Completed surveys were received from 16,185 respondents, which included responses from every county in Kentucky as shown graphically in **Figure 4.3 B**. This was the first campaign of its kind for the KYTC to achieve such a widespread participation.

The core questions of the survey were developed to identify the preferences for improvements to Kentucky's transportation system and the tolerance for increasing revenues to pay for those improvements. Survey participants were asked to rate their top issues concerning the transportation system. Responses indicated a strong preference for maintaining and improving the existing highway system, with a focus on bridges and roadway surfaces, as well as a significant interest in the development of multimodal options where possible.

When questioned about the outcomes of projects to be considered, participants expressed a strong desire that these projects improve the safety of the system and support economic development, be cost effective considering the anticipated benefits and provide congestion relief.

When participants were asked how strongly they would support a variety of funding sources for transportation improvements, government bonds was the multiple choice option selected most.

Based upon written comments, however, it is evident that the KYTC needs to better educate the public that bonds are not new sources of revenue, but loans that require repayment from existing and future funding generated from fuel and motor vehicle taxes. Survey results also indicated a growing sentiment that tolls on roads and bridges may be acceptable in certain situations.

In addition to their responses to the 19 survey questions, approximately one-third of participants provided additional comments and opinions, summarized in the form of a word cloud as shown in **Figure 4.3 C.**

Three focus groups with unique membership were formed to gain additional insight. The Vision 2035 group, created in November of 2013, comprised of present and past KYTC leaders, included the current and two former Secretaries of Transportation. The second group was the standing Statewide Planning Group, which includes transportation planners from Kentucky's fifteen Area Development Districts (ADDS), nine Metropolitan Planning Organizations (MPOs) and twelve KYTC District Offices. The third group was the Transportation Stakeholders Committee, comprised of 50 representatives from a wide spectrum of transportation modes operating within the state as well as stakeholders such as economic development, military affairs and human services agencies.

> *"Planning is the first step of good management. If I define where I want to be in 2035, can someone else pick it up and run with it to meet the target? This plan must define the way we do business and be so profound that someone else will not want to change it."*
>
> Vision 2035 Member

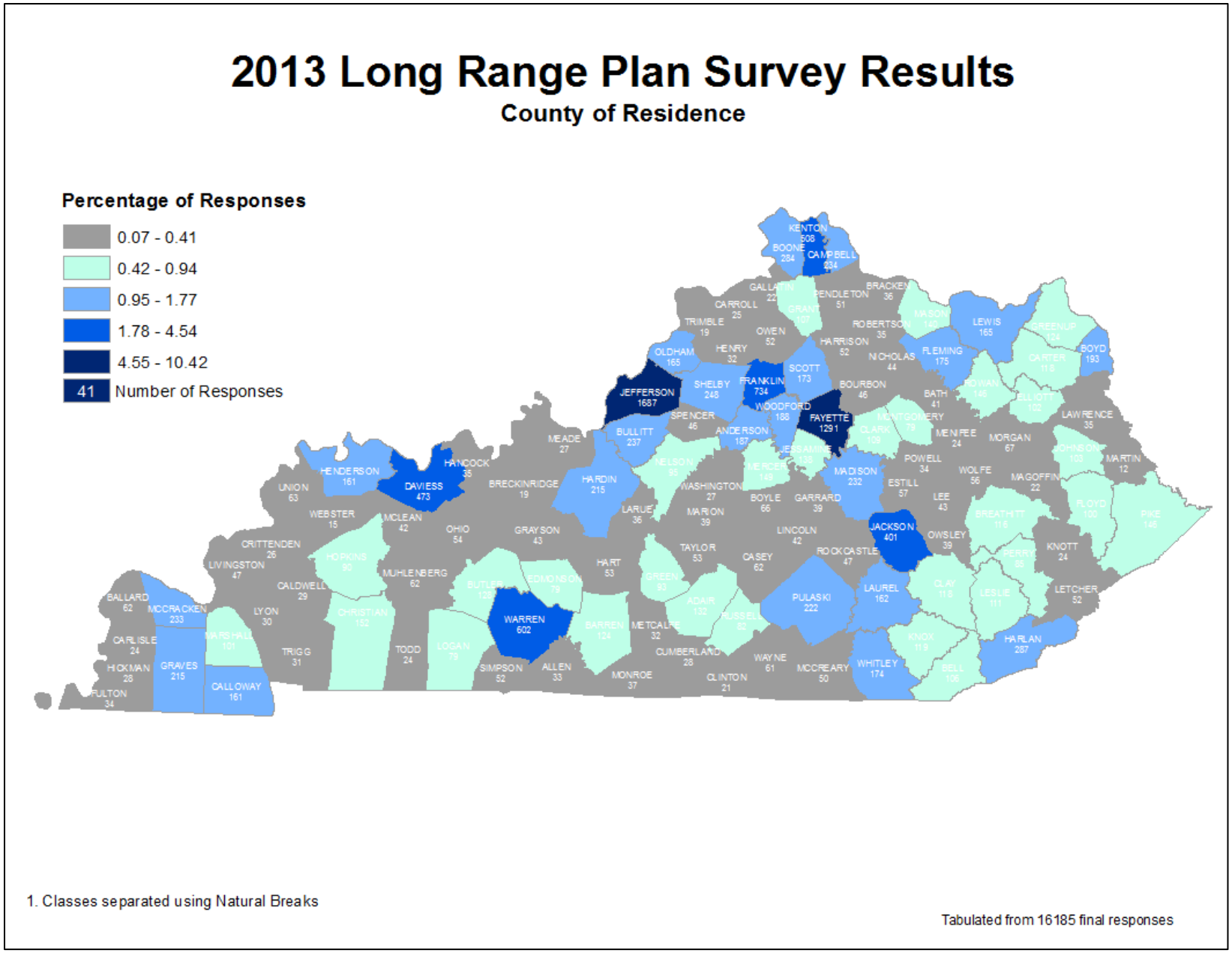


Figure 4.3 B – KYTC "Your Turn" Transportation Survey Responses by Kentucky County

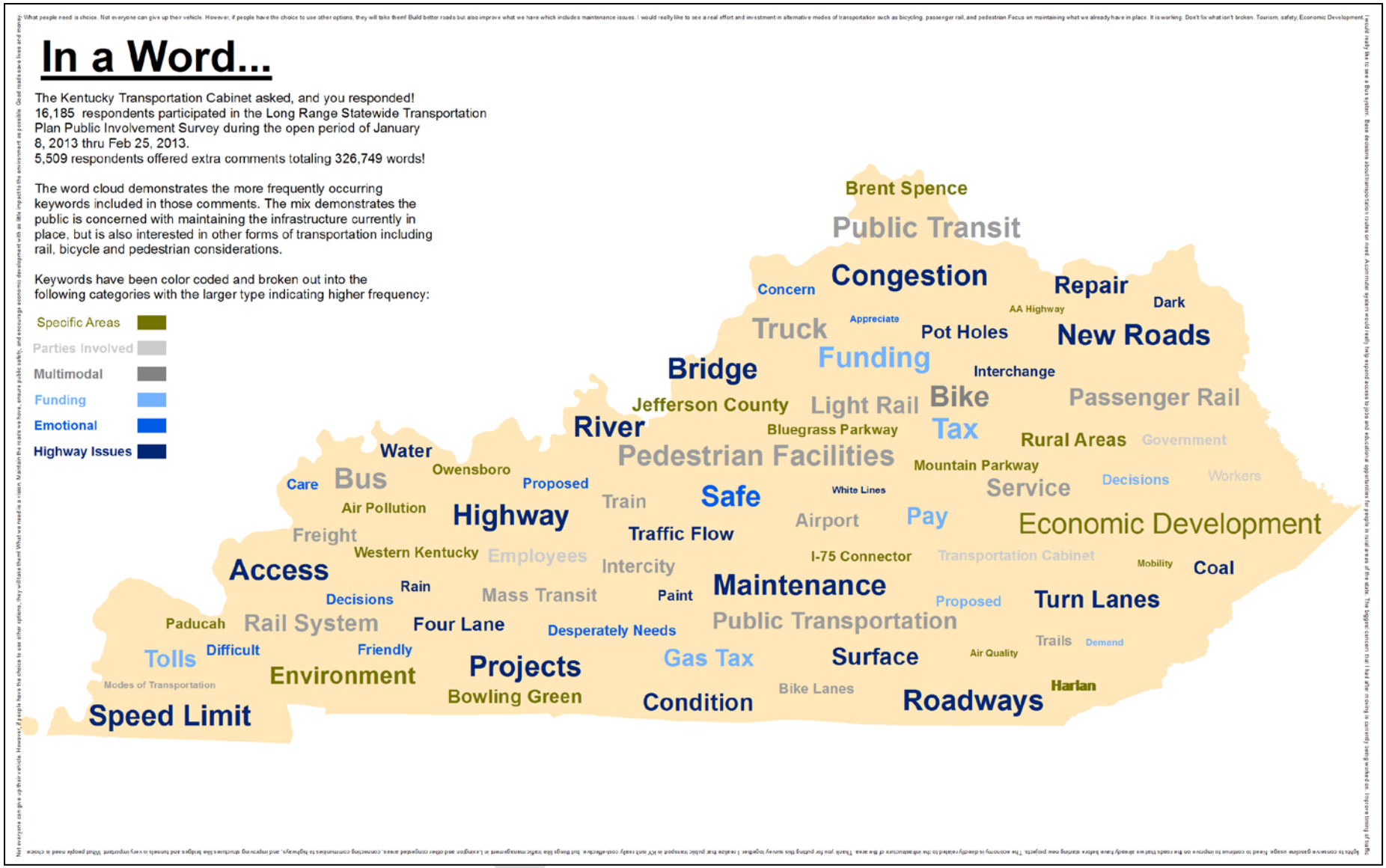


Figure 4.3 C – KYTC "Your Turn" Transportation Survey Responses -In A Word

Within their meetings, all three groups engaged in discussion of the issues and concerns regarding the current and future state of Kentucky's transportation system. Focusing on the development of the 2014 LRSTP, these groups provided input into drafting the LRSTP Vision and Goals as well as its narrative structure. During the course of the development and distribution of the "Your Turn" survey, these groups served as the proving ground for the survey instrument and provided encouragement for broad participation throughout the state. Upon development of draft sections of the LRSTP document in late 2013, these groups were once again engaged to provide final comments.

In addition to creating the overall vision for the 2014 LRSTP, input gathered from elected officials, residents, business owners and other local and regional stakeholders was used by the KYTC to develop a "destination postcard". As defined by Chip and Dan Heath in their book *Switch*, a destination postcard is "**a vivid picture from the near-term future that shows what could be possible".**

A combination of the desires of the system's users, the resources of the KYTC leadership and measureable performance outcomes are used to produce the desired outcome – or "destination" -- for the form and function of Kentucky's transportation system.

"When looking at the destination of 2035, the transportation system will have to be inclusive of all users, dependable, and sustainable in good repair. While we may be planning for tomorrow, it starts today."

Stakeholders Committee Member

Analysis of the input from the survey and the focus groups resulted in a clear picture of the "destination postcard" for Kentucky's future transportation system as shown in **Figure 4.3 D**.

4.4 Reaching the Destination

Performance-based planning and programming (PBPP) is a system-level, knowledge-driven process that builds upon the concept of "performance management". Performance management is the strategic approach that uses data to support decisions which help to achieve the desired outcomes. Those desired outcomes support the overall aims of a transportation plan---the LRSTP Goals and Vision. Performance management is credited with improving project and program delivery, informing investment decision-making, focusing staff on leadership priorities, and providing greater transparency and accountability to the public. The transportation system decisions of the KYTC are organized around a "Pyramid of Performance" as shown in **Figure 4.4 A**. The capstone of the pyramid is a vision for the KYTC, followed up with goals that provide the framework of the decision-making process for project identification, prioritization, development, delivery and maintenance. The specific regional objectives and priorities developed by the KYTC District Offices, Kentucky's Area Development Districts (ADDS) and Metropolitan Planning Organizations (MPOs) support the Cabinet's goals and vision and all elements are supported by a foundation of performance measures and established targets for each performance measure. Ongoing communication and data collection and analysis within this structure, both upward and downward, enables adjustments resulting from ongoing analysis of the process and thereby improves the delivery of the system.

Figure 4.3 D – Destination Postcard for Kentucky

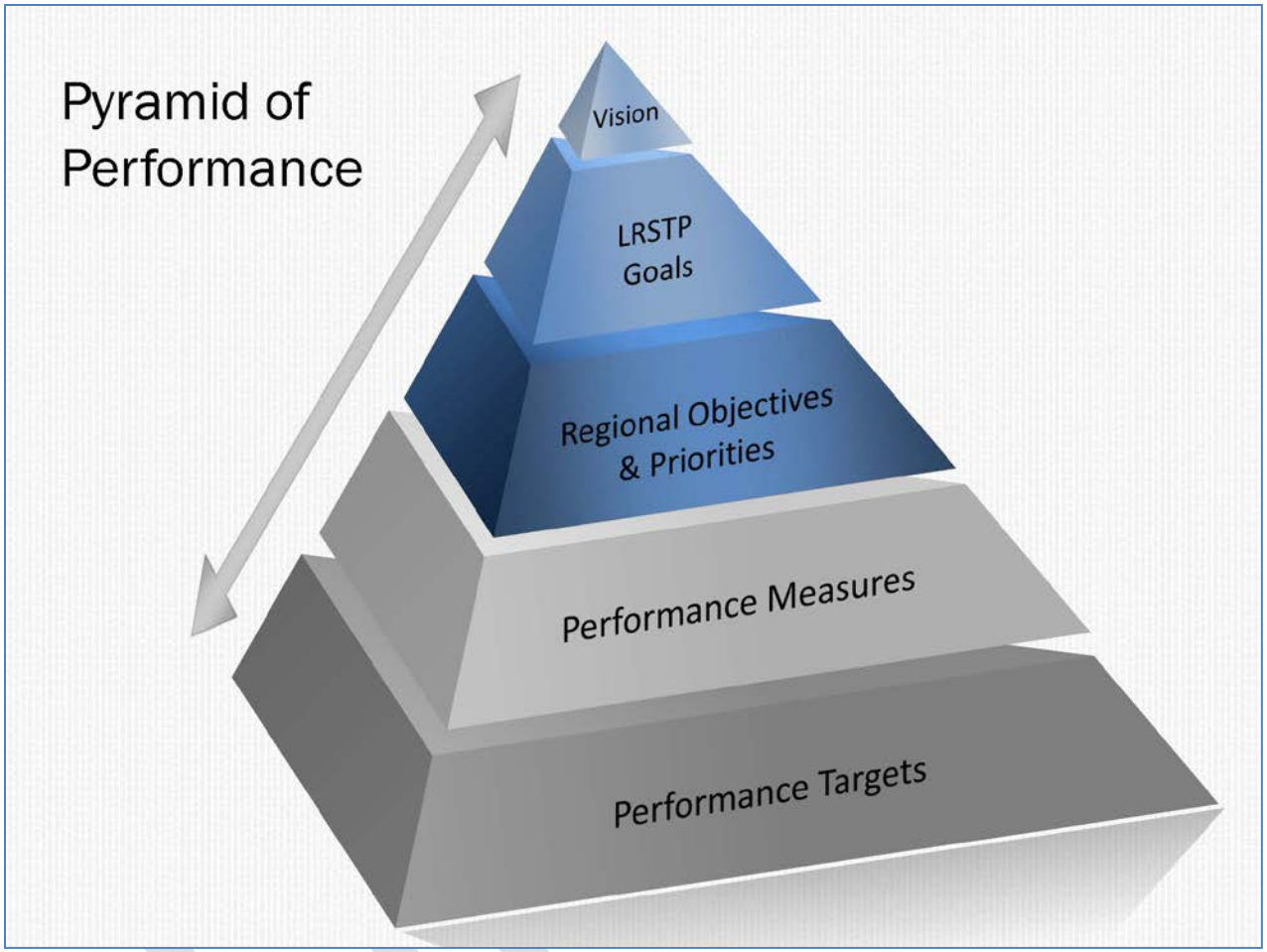


Figure 4.4 A – KYTC Pyramid of Performance

Through the process of creating a vision, developing goals, setting objectives and priorities on a regional level, creating accountability through performance measurement and the setting of specific performance targets, the KYTC can develop an impressive Long-Range Statewide Transportation Plan that meets Kentucky's transportation needs. These needs were expressed by the public, the local and state political leadership, the KYTC, local and regional transportation and planning professionals, and other valuable stakeholders.

4.5 Creating the Vision

Through the 2014 LRSTP process, a vision for the transportation system was generated: ***"A well-maintained, multi-modal transportation system that delivers safe and reliable trips which improve Kentucky's quality of life"*.**

4.6 Setting the Goals

Goals are the guide to direct the KYTC toward its vision. Input from the "Your Turn" survey and the focus groups, along with guidance from MAP-21, were the basis for long-range goals specifically developed to address the challenges facing Kentucky's transportation system over the next twenty years.

The process by which decisions are made, projects are funded, and how they are delivered became the central question of the goal development process. Goals of two distinct types were developed: project goals and process goals.

Project goals are used to measure the effectiveness of proposed system improvements. These goals, for both people and freight, include:

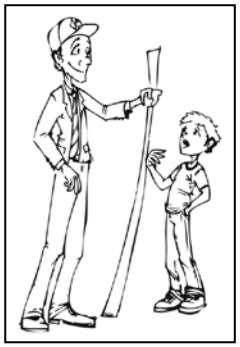
- Providing a safe and secure system
- Maintaining and improving existing infrastructure on a continual basis
- Ensuring dependable, effective and efficient facilities
- Improving local, regional and global connectivity and access
- Including all appropriate modes of transportation within a fully-integrated system

Process goals set performance standards for the methods and practices to be used to deliver improvements and to maintain the system. These process goals include consideration of:

- Dependable access to markets, jobs and resources
- Consideration of human and natural resources
- Efficient and flexible use of available resources
- Transparent decision-making processes

Together these goals provide the framework of the decision-making process for project identification, prioritization, development, delivery and maintenance. **Figure 4.6 A** provides a visual interpretation of the KYTC in implementing process and project goals. These goals are emphasized throughout the text of the 2014 LRSTP. The specific regional objectives and priorities developed by the KYTC District Offices, the ADDs and the MPOs support the goals and vision of the 2014 LRSTP. The vision, goals, and regional objectives and priorities are in turn supported by a foundation of performance management.

The Gatekeeper and the Stick



The Gatekeeper and the Stick are a visual interpretation of the distinction between project and process goals. Transportation investments are embodied by the Child. Stick – or project – goals measure the effectiveness of potential improvements to the transportation system. Gatekeeper – or process – goals focus on how THE KYTC will deliver these improvements.

Figure 4.6 A – KYTC Goals Implementation

4.7 Defining the Priorities

Among the primary objectives and priorities established for the 2014 LRSTP, safe movement of people and goods is paramount. Access and connections from communities to existing and planned regional transportation networks will be especially important in encouraging tourism and economic development. The importance of providing opportunities for public input into the planning and prioritization processes is also specifically recognized. In fact, the growing importance of multi-modal transportation options (i.e., airways, cycling, pedestrian, public transit, rail and water) has been identified by both the KYTC staff and members of the public.

4.8 Establishing the Performance Measures

The 2014 LRSTP will operate under the guidelines and recommendations of the American Association of State Highway and Transportation Officials (AASHTO) for highway design and construction throughout the US. These include standards for safety, pavement and bridge conditions, management, congestion mitigation, air quality and overall system performance.

4.9 Setting Performance Targets

The KYTC will define quantitative values for specific performance measures for the state's transportation system as a whole as well as for its individual elements. Delays and reliability are the two primary factors within the system performance and freight performance categories. Safety will be evaluated by the number and rate of both fatalities and serious injuries. The pavement structural health index will be used along with the condition of both interstate International Roughness Index (IRI) and non-interstate (IRI) pavements to monitor pavement conditions. Delays and emission reduction will be considered under standards for congestion mitigation and air quality.

4.10 KYTC Organizational Framework

The KYTC's organizational framework shown as **Figure 4.10 A** illustrates that Kentucky's modal management structure is answerable directly to the Secretary of Transportation. The State Highway Engineer leads the Department of Highways including its 12 Highway District Offices as shown in **Figure 4.10 B**. The KYTC Aviation and Transportation Delivery (Transit) functions are led by their respective commissioners. Though not readily obvious from the chart, the Office of Transportation Delivery serves in close cooperation with the Kentucky Cabinet of Health and Family Services (CHFS) to dovetail transit operations with healthcare transport delivery services. Providing these services as part of the on-going public transit program has saved the state and federal governments millions of dollars over the past decade.

The Department of Highways serves to facilitate modal collaboration through its planning function with waterway, rail, and bike/pedestrian concerns coordinated by the Division of Planning. In recent years, the Department of Highways has recognized that the long-term delivery of transportation programs is a complementary process whereby highways, transit, aviation, waterways, and bike/pedestrian issues are addressed in a non-competitive manner. As the KYTC envisions the future of freight and passenger mobility in Kentucky, the belief is that every mode has a role and there will be plenty of opportunities for all.

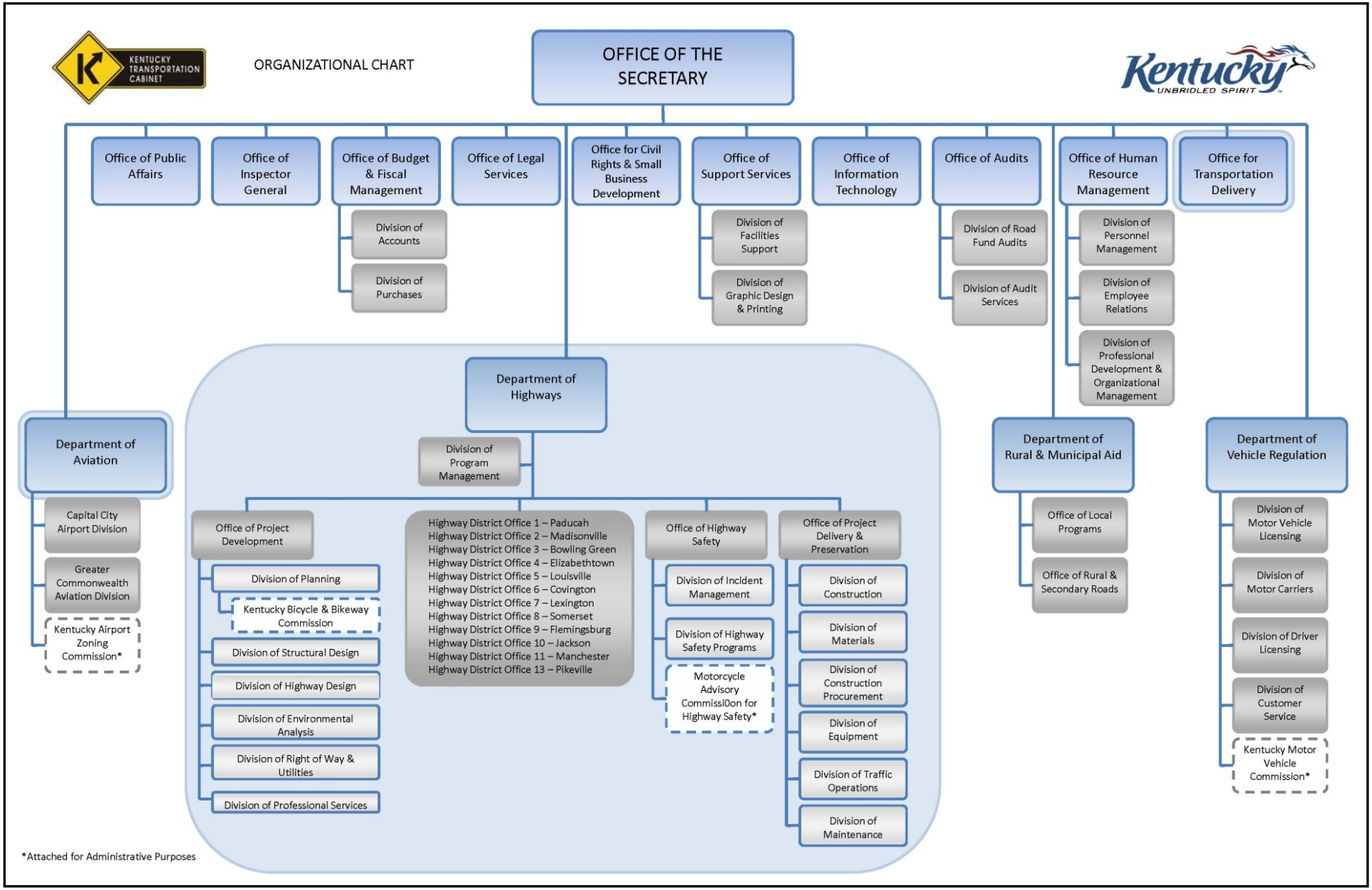


Figure 4.10 A – KYTC Organizational Chart

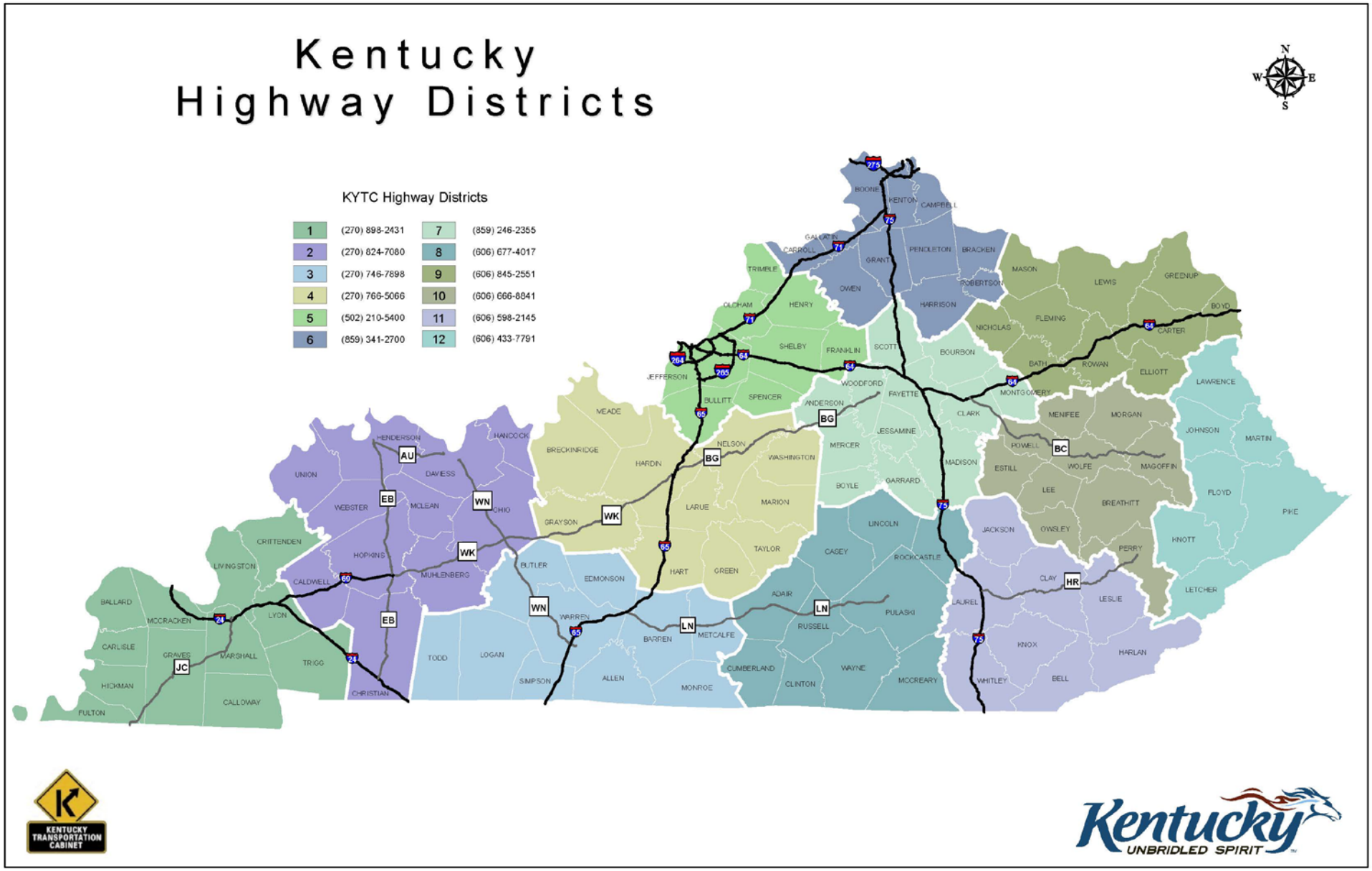


Figure 4.10 B – KYTC Highway District Boundary Map

Within the Department of Highways, KYTC has established a performance management work group to develop performance targets against the backdrop of the KYTC long-range planning effort. The goals of the long-range planning process are embodied in the performance metrics that, in turn, feed our fledgling performance-based planning and programming activities (PBPP). The KYTC strives for these processes to work effectively together to generate Kentucky's Six Year Highway Plan, the short-range list of priority projects which is an element of the State Biennial Budget.

Within the PBPP process, the KYTC will use programmatic data and performance targets to assess basic maintenance and asset management funding commitments, with some funding dedicated to the enhancement of economic development opportunities within the state. All of this must be closely communicated with Kentucky's governor and legislature in order to develop the support necessary for successful program development and implementation.

The whole performance-based approach to highway program delivery requires the on-going cyclical monitoring, evaluation, needs definition, needs prioritization, and funding constraint processes. This cycle is simply expressed as Plan, Do, Check, and Act (PDCA). The PDCA cycle is data-driven and its success is built upon the constant communication of the results and lessons learned at each key decision point as illustrated in **Figure 4.10 C**.

In comparison, the entire life cycle of a project, as previously discussed and shown in **Figure 4.2 A,** is in itself a PDCA cycle. The "Plan" step of the PDCA cycle encompasses the identification of transportation needs and the prioritization of improvements to meet those needs, the "Do" step involves the design and construction of those prioritized improvements, the "Check" step involves the monitored operation of the system, while the "Act" step is the link between the operations of the system to the planning for future improvements.

Integrated at all levels of the PBPP and as illustrated in the Pyramid of Performance shown in **Figure 4.10 D**, PDCA cycles roll continuously through the all levels of the process between the outputs and the desired outcomes. Through data collection and analysis and the communication of lessons learned, the PDCA cycle is used to confirm that the outputs (improvements to the transportation system) support the desired outcomes---the goals and the vision. The KYTC is daring to use PBPP process appropriately and well in its efforts to attain the destination postcard for the 2014 LRSTP----

***a well-maintained, multimodal transportation system which will deliver safe and reliable trips that will improve the quality of life for all Kentuckians*.**

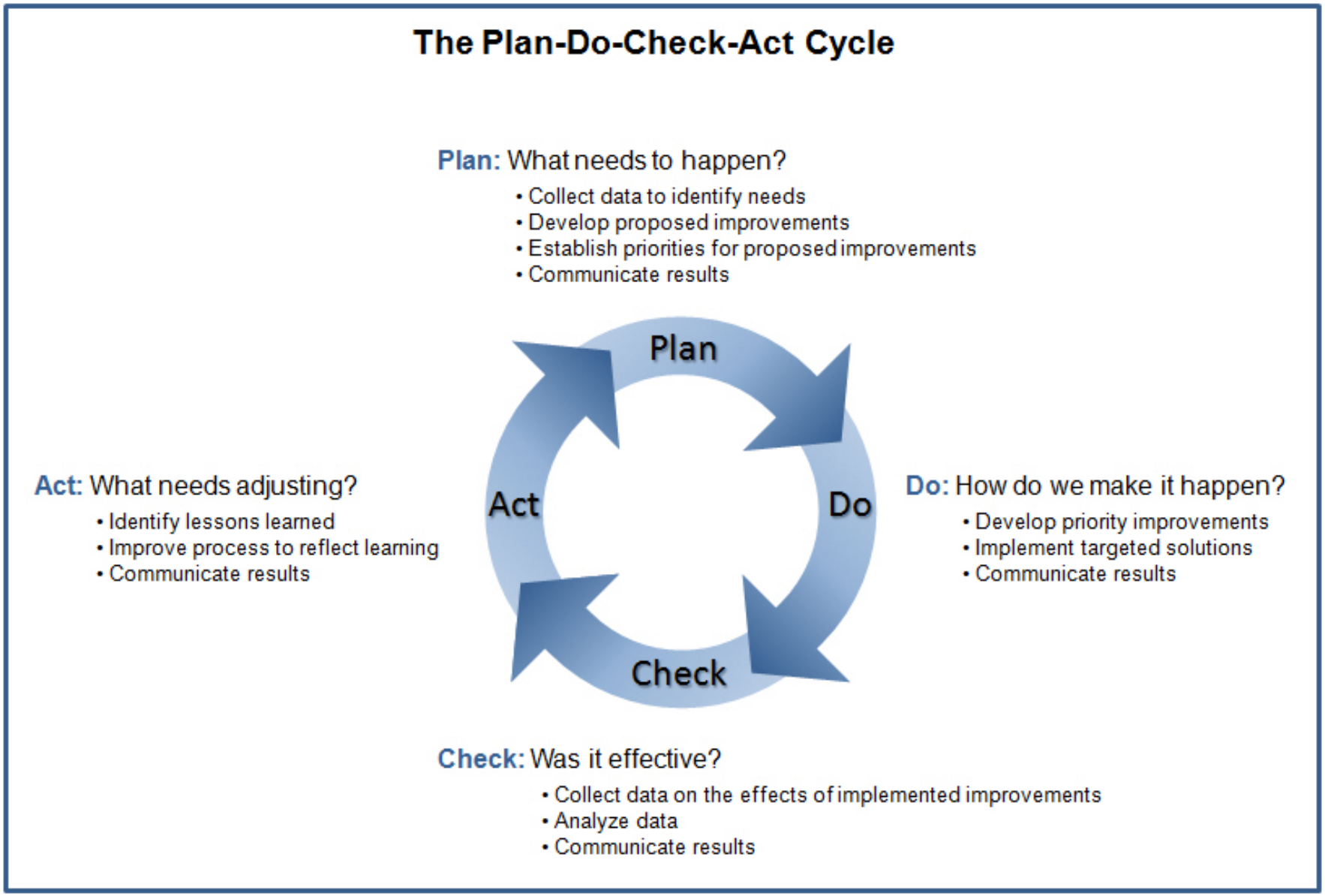


Figure 4.10 C – Plan-Do-Check-Act Cycle of Performance-Based Planning & Programming

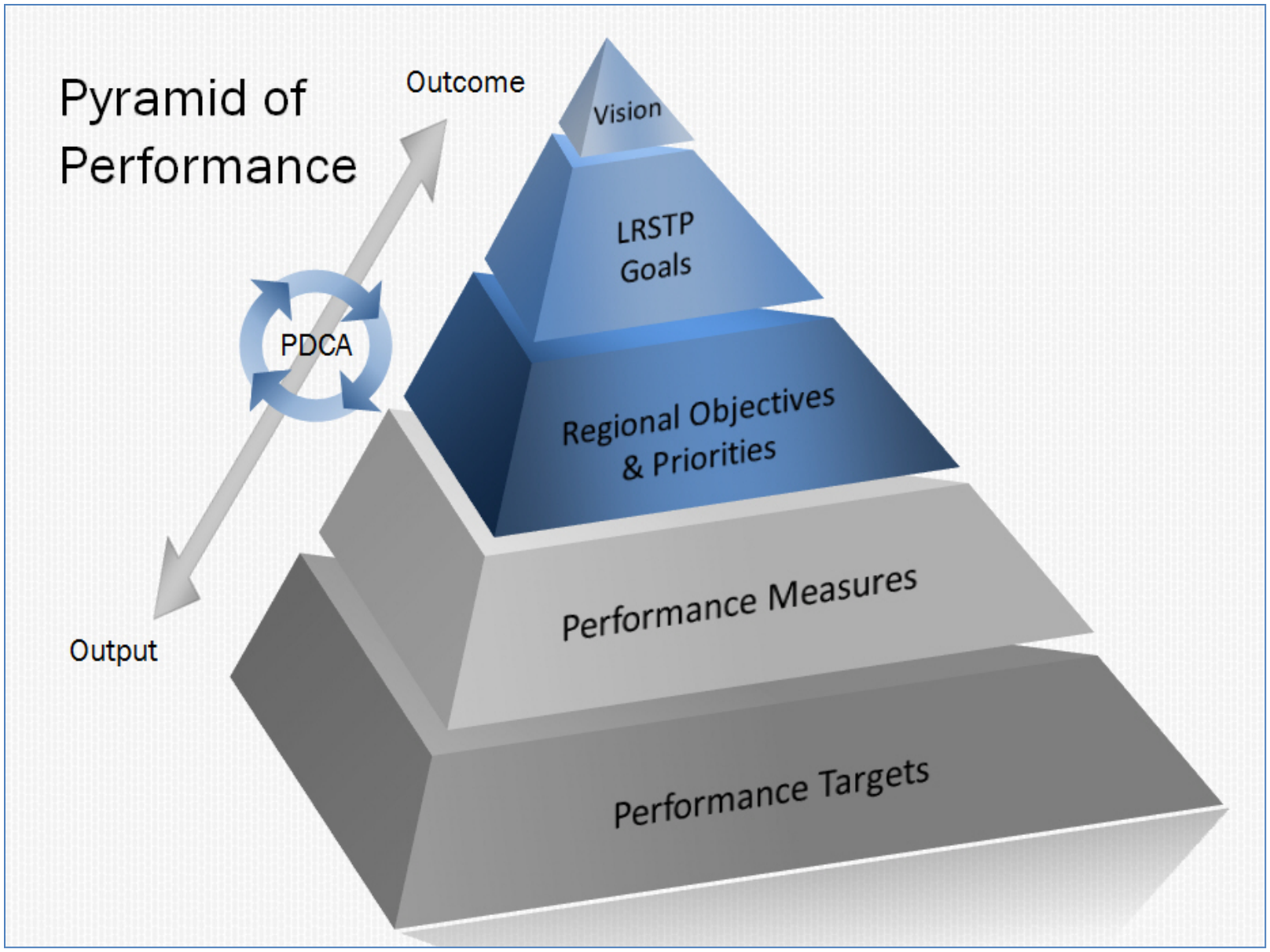


Figure 4.10 D – The Role of the Plan-Do-Check-Act Cycle in Performance-Based Planning & Programming

Chapter 5.0

5.0 Transforming Needs to Realities

5.1 Performance Based Planning and Programming Process

5.1.1 PBPP Overview

Performance-based planning and programming (PBPP) is a system-level, knowledge-driven process that builds upon the concept of "performance management". Performance management is the strategic approach that uses data to support decisions which help to achieve the desired outcomes. Those desired outcomes support the overall aims of a transportation plan---the goals and the vision.

PBPP includes a range of activities and products undertaken by a transportation agency together with other agencies, stakeholders, and the public as part of a 3C (cooperative, continuing, and comprehensive) process. It includes development of: long range transportation plans (LRTPs), other plans and processes (including those Federally-required, such as Strategic Highway Safety Plans, Asset Management Plans, the Congestion Management Process, Transit Agency Asset Management Plans, and Transit Agency Safety Plans, as well as others that are not required), and programming documents, including State and metropolitan Transportation Improvement Programs (STIPs and TIPs).

Using data to support investment decision-making, PBPP process attempts to ensure that transportation investment decisions are made – both in long-term planning and short-term programming of projects – based on their ability to meet established goals. The PBPP process also provides a tool to educate the public, political leadership, and other stakeholders on the costs and potential performance results of different strategic investments in the transportation system.

5.1.2 Performance Evaluation and Target Setting

The federal transportation legislation, Moving Ahead for Progress in the 21st Century (MAP-21), requires the United States Department of Transportation (U.S. DOT) to identify national-level performance measures for various performance management areas related to safety, pavements, bridges, freight, emissions, performance, and congestion. The 2014 LRSTP will operate under the guidelines and recommendations of the American Association of State Highway and Transportation Officials (AASHTO) for highway design and construction throughout the United States. As indicated as part of the "pyramid of performance" shown in **Figure 5.1.2 A**, and previously discussed in Chapter 4, these include the recommended performance measures for safety, pavement and bridge conditions, management, congestion mitigation, air quality and overall system performance.

As illustrated in **Figure 5.1.2 B**, the KYTC has selected specific targets for each performance measure. For each specific target, the KYTC will define quantitative values for specific performance measures for the state's transportation system as whole as well as for its individual elements.

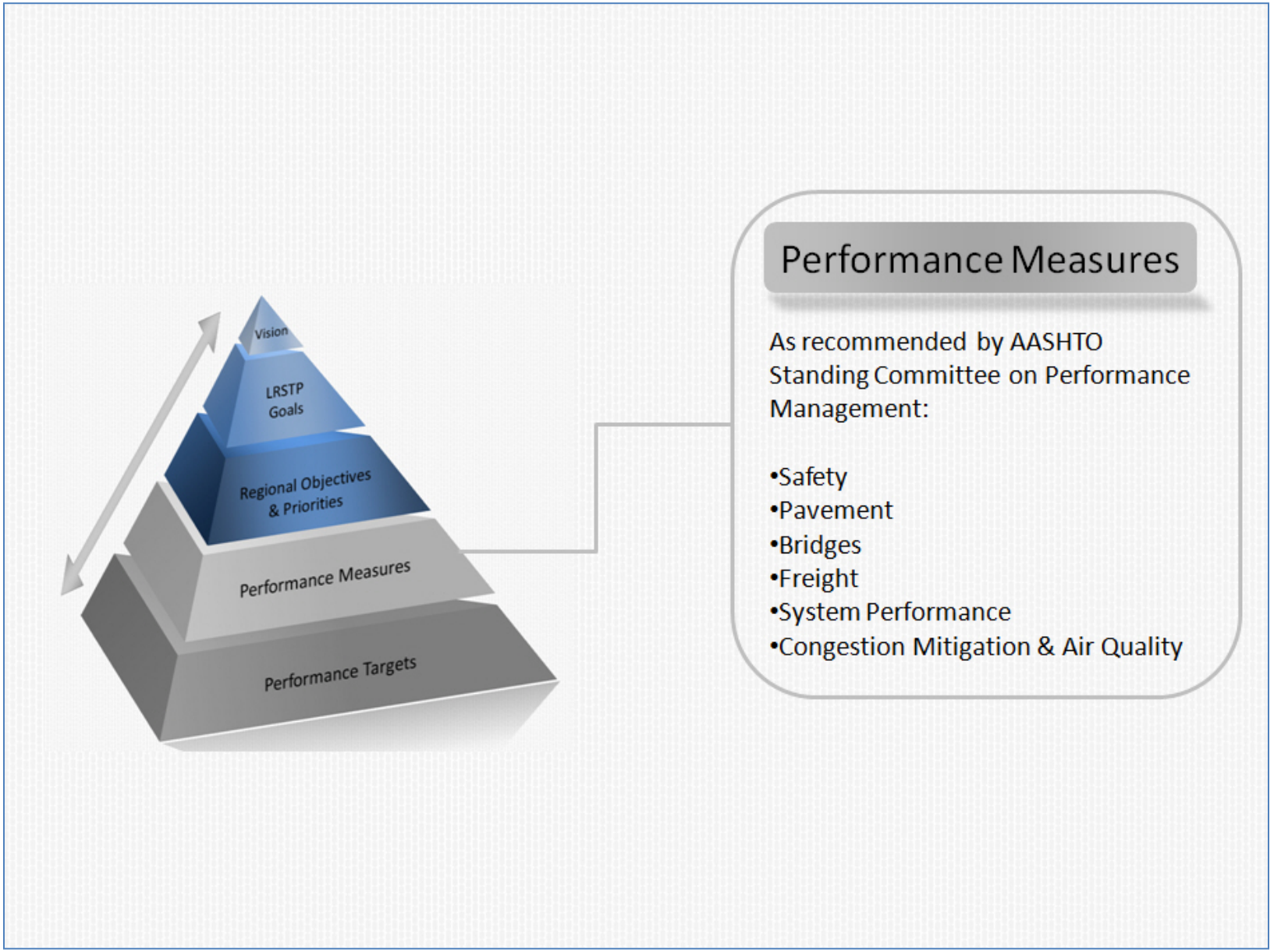


Figure 5.1.2 A - KYTC Performance Measures as Part of the PBPP Process

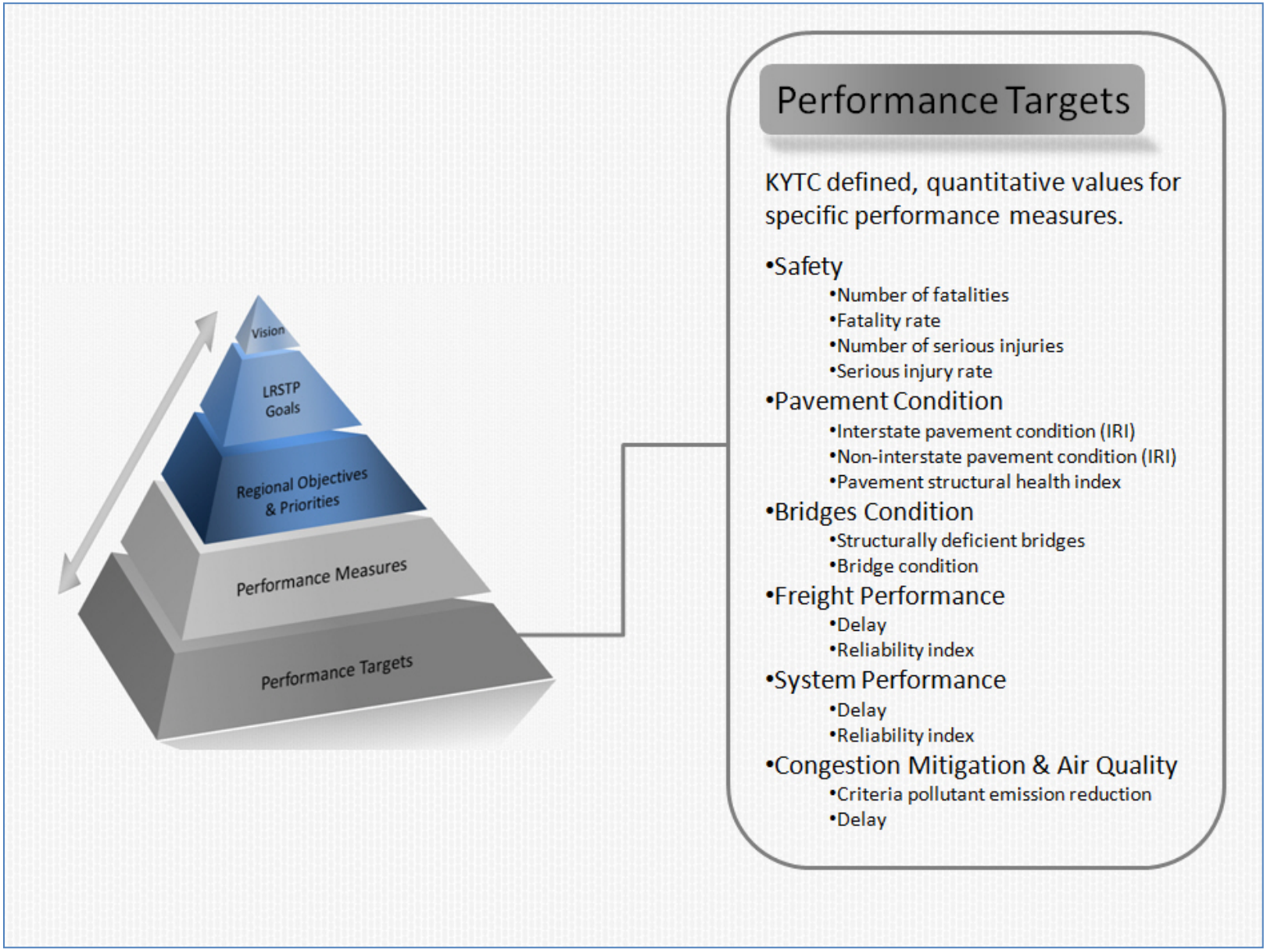


Figure 5.1.2 B - KYTC Performance Targets as Part of the PBPP Process

Safety will be assessed by the number and rate of both fatalities and serious injuries. Delays and reliability are considered the two primary factors within the system performance and freight performance categories. The pavement conditions will be monitored by the KYTC pavement structural health index, as discussed in greater detail in 5.2 Modal Application of PBPP under 5.2.1 Highways, along with the interstate International Roughness Index (IRI) and non-interstate (IRI) pavements. The standards to be considered for congestion mitigation and air quality include delays and emission reduction.

These performance measures and their associated targets become the framework to performance-based planning and programming (PBPP) for each state's transportation system. PBPP refers to the application of performance management within the planning and programming processes of transportation agencies to achieve desired performance outcomes for the multimodal transportation system. The data collected regarding each of these targets is the foundation upon which the performance of the investments into the transportation system is determined and supports the decision-making in place to achieve desired performance outcomes.

5.1.2-1 Data Management

- ***GOAL:*** **Ensure that the process which develops and maintains the transportation system considers the use of transparent decision-making that effectively addresses the public's transportation needs.**
- **GOAL: Ensure that the process which develops and maintains the transportation system considers the efficient and flexible use of available resources to meet the transportation needs of the state.**

Data is a collection of facts expressed in numbers, words, measurements, observations or even just general descriptions. Data is considered in virtually every decision made in development and maintenance of the transportation system. This data is collected in part as required by FHWA through CFR statute that mandates we collect highway information in order to review and compare similar type highway systems through functional classification

Differing issues require different types (and amounts) of data and the availability of these data sets allow for decision makers to assess what is needed for a particular issue. This data also has secondary and sometimes tertiary uses that may not have been readily apparent when it was first collected but are beneficial now.

Over a number of years, the KYTC has developed several robust data sets as presented in **Table 5.1.2 A** to provide useful analytical information for making sound planning and engineering decisions.

As discussed in detail in *Chapter 4: Vision, Mission, Goals, and System Performance*, the on-going performance management of the transportation system examines how well the KYTC is achieving its vision and goals through certain quantifiable indicators or measures ----safety, pavement condition, bridge condition, freight movement, system performance, congestion mitigation, and air quality.

KYTC Databases			
Database	**Acronym**	**Contents**	**Custodian**
Highway Information System	HIS	• GIS of all Public Routes with ownership, road name, pavement type, etc. • Roadway System Information like; Functional Class, State System, Truck Network, Appalachian Development System, etc. • Roadway Features like; Lane widths, Shoulder types, Median type and width • Analysis Date such as: Evaluation Homogeneous sections, HPMS Sample Sections, etc.	KYTC Planning
Pavement Management System	PMS	• Pavement Type • Pavement Condition • Pavement Testing • Pavement Rating	KYTC Maintenance
Operations Management System	OMS	• Equipment Inventory • Personnel • Materials • Work Order Route Locations • Sign Locations	KYTC Maintenance
Bridge Maintenance System	Pontis	• Bridge Location • Bridge Rating (Sufficiency) • Bridge Clearance • Other key bridge information (type, length, width, etc.) • National Bridge Inventory Report	KYTC Maintenance
Traffic Count Processing Database	TRADAS	• Annual Average Daily Traffic (AADT) • Vehicle Classification Information • Truck Volume and Truck Percentage • Vehicle Miles Traveled • Weigh In Motion	KYTC Planning
Asset Collection System	Mandli	• Roadway Images • Roadway Inventory Extraction • Pavement Rutting • Pavement Faulting	KYTC Maintenance
Rail Crossing Inventory	RCI	• Rail Crossing Locations • Inspection Records	KYTC Right of Way and Utilities
Transportation Enterprise Database	TED	• KYTC Data Clearinghouse for data sharing and reporting	KYTC Office of Information Technology

Table 5.1.2 A – KYTC Databases and Contents

Each performance measure includes specific, quantifiable targets. For example, for the performance measure of bridge condition, a target is set for the acceptable decrease in the number of bridges that are structurally deficient within the highway system. Other targets would include a reduction in the number of traffic crashes or the reduction in traffic delay for commuters and/or freight delivery. The information collected and made available through these electronic databases is the foundation upon which the performance of the investments into the transportation system is measured.

5.1.2-2 The Highway Project Identification and Prioritization Process

- **GOAL: Ensure that the process which develops and maintains the transportation system adequately considers the use of transparent decision-making that effectively addresses the public's transportation needs.**

- **GOAL*:* Ensure that the process which develops and maintains the transportation system adequately considers the efficient and flexible use of available resources to meet the transportation needs of the state.**

The main objective of the statewide transportation planning process is to develop a multimodal plan which identifies improvements that make the best use of limited financial resources to improve safety and efficiency. The 2014 LRSTP attempts to highlight the major challenges of the entire system and present a plan to address those challenges. This approach is bound by Kentucky's Constitution that does not provide for the use of road funds for non-highway related expenses and specific state funding is not provided for most other transportation programs. As such, this plan's main focus is on the highway system and the consequences Kentucky will face if adequate funding is not made available.

> *"Take politics out of transportation related decisions and make these data driven decisions. You will see an immediate increase in the efficient use in transportation dollars."*
> Jefferson County Survey Participant

The 2014 LRSTP goals provide the framework for the decision-making process of project identification, prioritization, development, delivery and maintenance.

5.1.2-2.1 The Prioritization Process

Since the 1970s, Kentucky has implemented a statewide transportation planning process that solicits public input at the local and regional levels. In response to the directives of ISTEA and subsequent reauthorizations acts, as discussed previously in Chapter 4, this process has expanded to include more comprehensive public involvement in the identification, evaluation and prioritization of transportation needs. The current process now also includes coordination between Kentucky's nine Metropolitan Planning Organizations (MPO), fifteen Area Development Districts (ADD), twelve KYTC Highway District Offices (HDO) and other planning agencies, as well as with the Kentucky Division of Air Quality to assure compliance with the State

> *"KYTC needs to effectively communicate to the public why we need the money and how we're going to use it. Then we make certain to go back and show them how we made a return on that investment."*
> Vision 2035 Member

Implementation Plan (SIP), the plan in which a state This knowledge-driven process identifies transportation needs and establishes priorities for input into the LRSTP, the Statewide Transportation Improvement Program (STIP) and the Six-Year Highway Plan. Throughout this process, local and state officials are consulted and the public is involved as represented graphically in **Figure 5.1.2 C**.

The transition of a transportation need to a realized transportation improvement flows as if through a funnel, which is shown graphically in **Figure 5.1.2 D**. Each transportation need identified through the consultation process is documented through a Project Identification Form (PIF) that is incorporated into an electronic database of all Unscheduled Needs List (UNL) projects. The current UNL consists of more than 2,500 projects with an estimated cost of more than $58 billion for the highway element of the state transportation system. The UNL is analyzed continuously to determine if needs are still "active" or if they should be placed as "inactive" outside of the prioritization process. High priority projects are then selected from the Unscheduled Needs List as candidate projects to be prioritized for consideration of being selected for the KYTC Recommended Six-Year Highway Plan.

With the intent to complement the metropolitan and regional planning efforts that provide the public and political input, the KYTC established a District Transportation Planning (DTP) process within the consultation process in 2011. This DTP process is an integral element of the overall PBPP process in which the "Plan step" of a PDCA cycle asks "What needs to happen?" In efforts to answer this question, the DTP provides for a professional engineering review of quantifiable data related to UNL projects. Capitol provides its process for addressing air pollution.
Focused within the twelve individual KYTC Districts, this review uses an automated mapping tool that includes technical input from various sources such as the Highway Information System (HIS), crash data, congestion, bridge information and others. This mapping tool provides a technically sound view of the current form and function of the state highway system that is then used to establish project priorities based on observable system gaps or weaknesses. Historical rankings and current demand conditions are also considered. Each District then compiles a list of its own 30 to 50 highest priority projects, known as the Unscheduled Projects List (UPL).

In the next step of the process, a final list of fiscally constrained projects is detailed as part of the Recommended KYTC Six-Year Highway Plan and forwarded to the state legislature and the governor for their examination and approval. Once the Six Year Highway Plan is approved and enacted, each new project undergoes a Data Needs Analysis (DNA) process which solidifies project alternatives and cost estimates and identifies any project development concerns, such as environmental impacts, that need to be addressed.

Rolling into the "Do" step of a PDCA Cycle, the projects then proceed into the design, right-of-way acquisition and utility relocation phases toward an eventual letting date for construction. As part of the "Check" step, the new or refurbished facility is maintained by the state until its preservation is no longer effective and a replacement or new facility is required. The "Act" step is the link between the operations of the system to the planning for future improvements thus beginning the cycle anew.

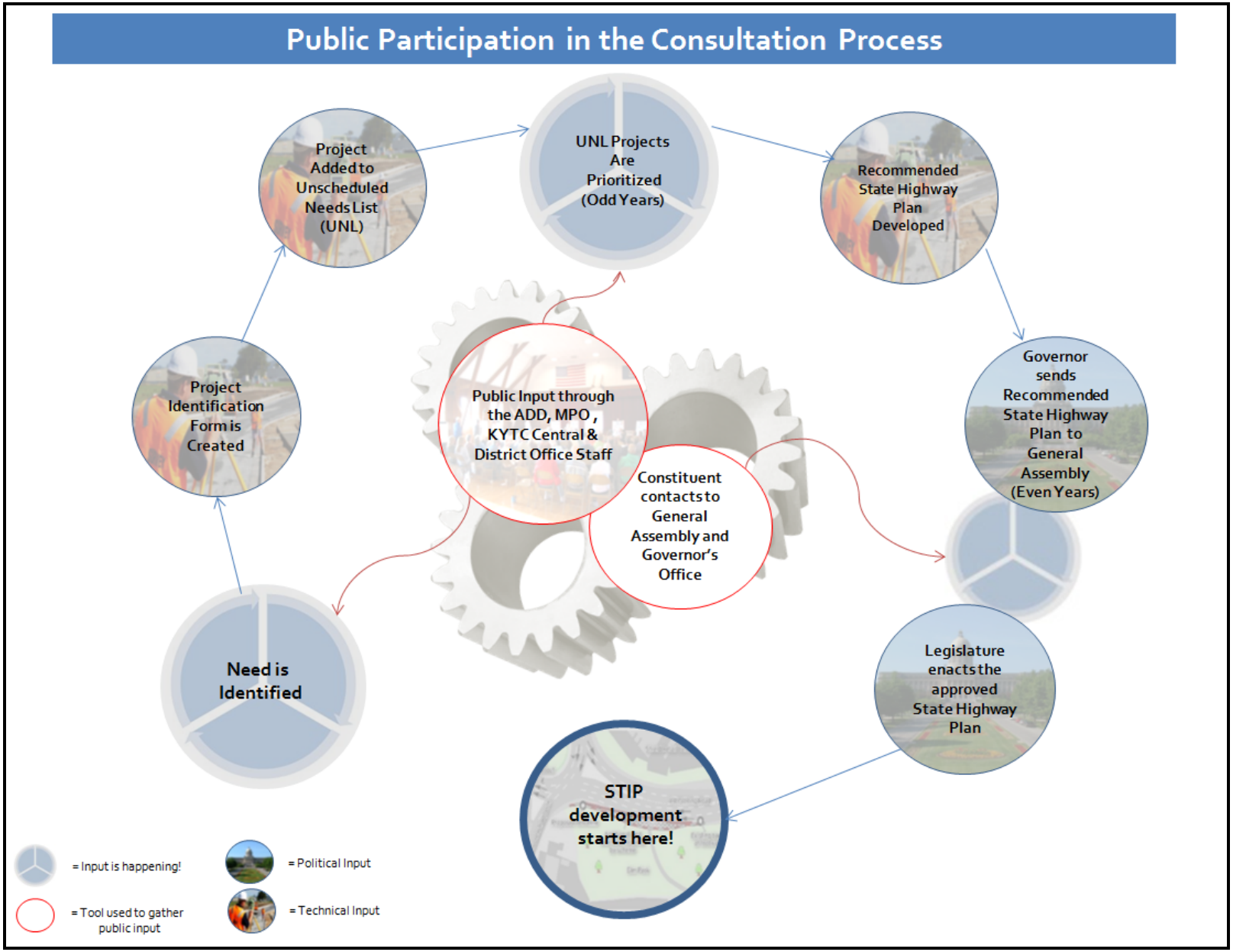

Public Participation in the Consultation Process
Project Added to Unscheduled Needs List (UNL)
UNL Projects Are Prioritized (Odd Years)
Recommended State Highway Plan Developed
Governor sends Recommended State Highway Plan to General Assembly (Even Years)
Legislature enacts the approved State Highway Plan
STIP development starts here!
Need is Identified
Project Identification Form is Created
Public Input through the ADD, MPO , KYTC Central & District Office Staff
Constituent contacts to General Assembly and Governor's Office
= Input is happening!
= Tool used to gather public input
= Political Input
= Technical Input

Figure 5.1.2 C: Public Participation in the Consultation Process (from the 2014 KYTC Public Involvement Plan)

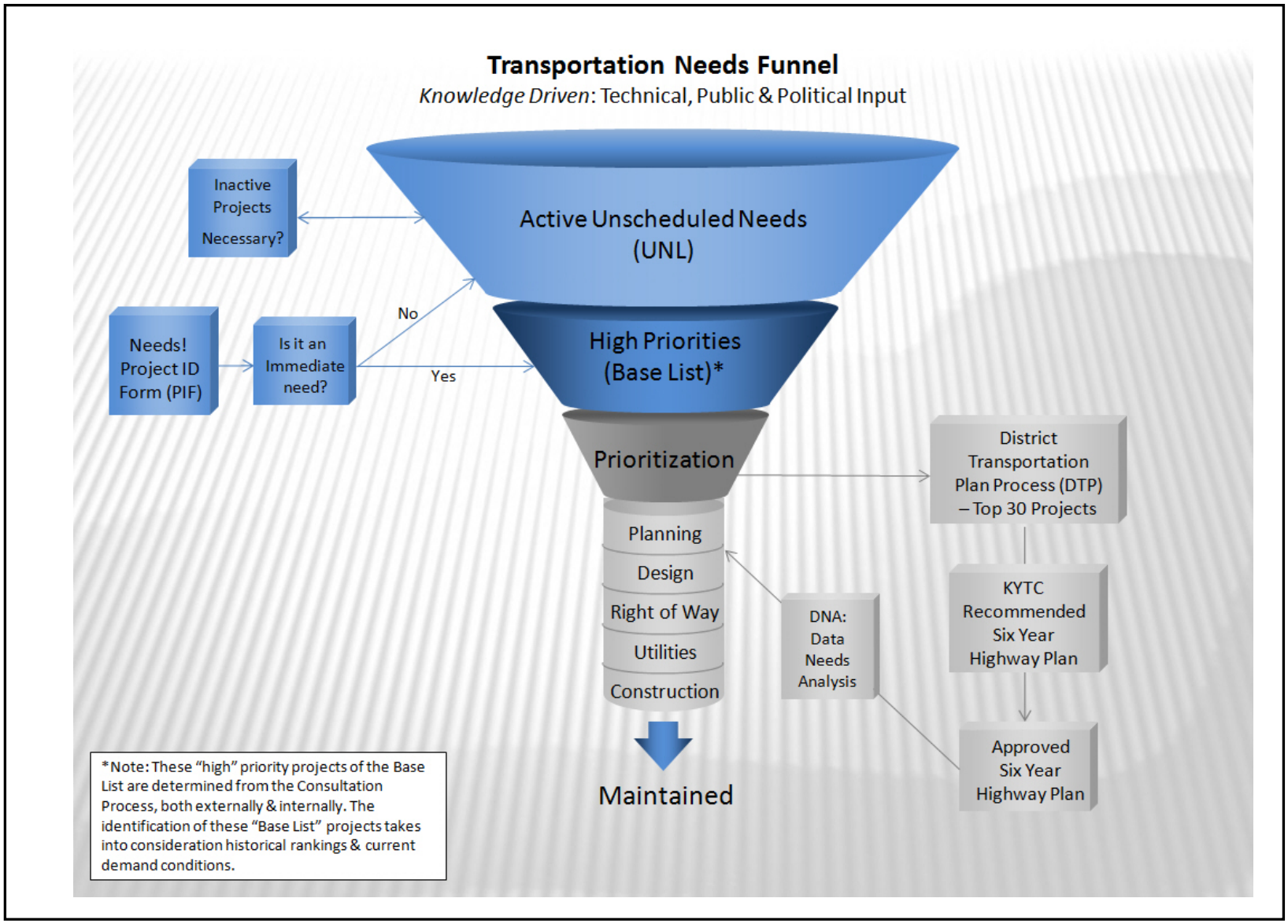


Figure 5.1.2 D: Transportation Needs Funnel: From a Need to a Delivered Project

5.1.3 Environment

5.1.3-1Considerations

- ***GOAL:* Ensure that the process which develops and maintains the transportation system adequately considers the human and natural resources of the state.**

> *"Protecting the environment is very important to consider when planning transportation-related projects."*
> Wolfe County Survey Participant

Transportation affects our quality of life. With this in mind, the development and operation of our transportation system must be balanced in such a way as to provide access to the resources that we need while minimizing negative impacts on our environmental resources. The KYTC recognizes the relationship between the elements of the natural environment as well as those of the human environment.

As illustrated in **Figure 5.1.3 A**, in the development and operation of the transportation system, the KYTC must consider the natural environmental issues which include water, air, noise, and land as well as those animals and plants that are considered threatened or endangered species. Additionally, the KYTC must consider human environmental issues such as those illustrated in **Figure 5.1.3 B.** These factors are diverse and include but are not limited to the following: community activity centers (e.g., schools, churches, and hospitals), Resource Conservation and Recovery Act (RCRA) sites (e.g., underground chemical/petroleum tanks), and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites such as areas of former industrial activity that require the removal of hazardous materials. Other human environmental considerations include archeology sites, historic sites, socioeconomic impacts and environmental justice.

Within the KYTC, the Division of Environmental Analysis (DEA) facilitates the KYTC's goal of adequately considering the human and natural resources of the state by ensuring that environmental impacts associated with planning, design, construction, operation, and maintenance projects are identified and addressed in accordance with applicable state and federal laws. With this information, the KYTC is best positioned to understand the potential implications of its actions and make the best possible decisions. The KYTC strives to minimize or mitigate any resulting impacts to the human or natural environment that cannot be avoided.

The DEA executes these duties through the review, preparation, and oversight of environmental documents, contracts, or actions as required by state and federal environmental laws and regulations. The DEA also provides a single point of contact through the District Environmental Coordinator to the general public and to KYTC personnel for environmental guidance, information, and concerns. Policies and procedures are regularly evaluated to identify more efficient ways to incorporate environmental considerations into practice.

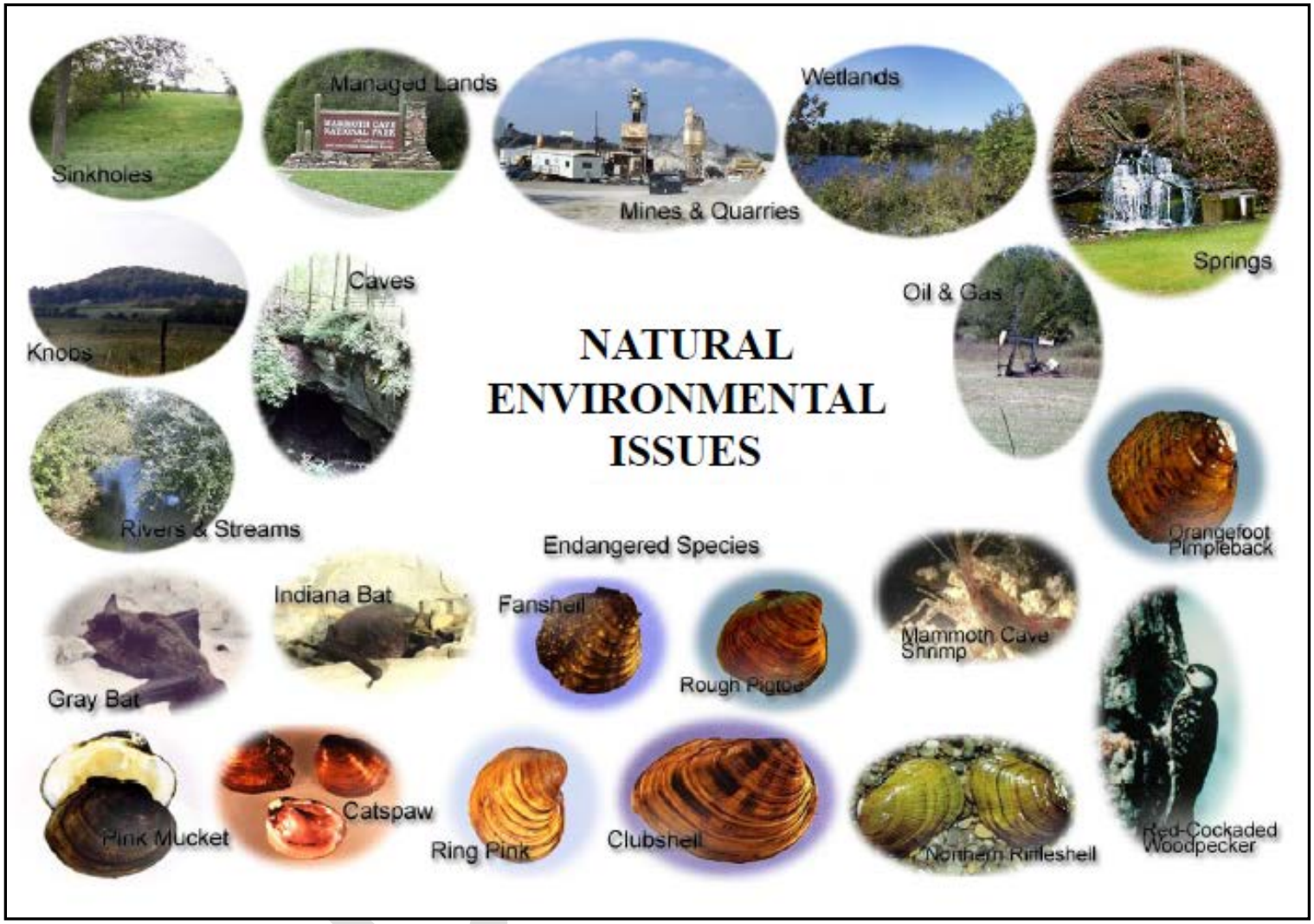


Figure 5.1.3 A – Kentucky Natural Environmental Considerations

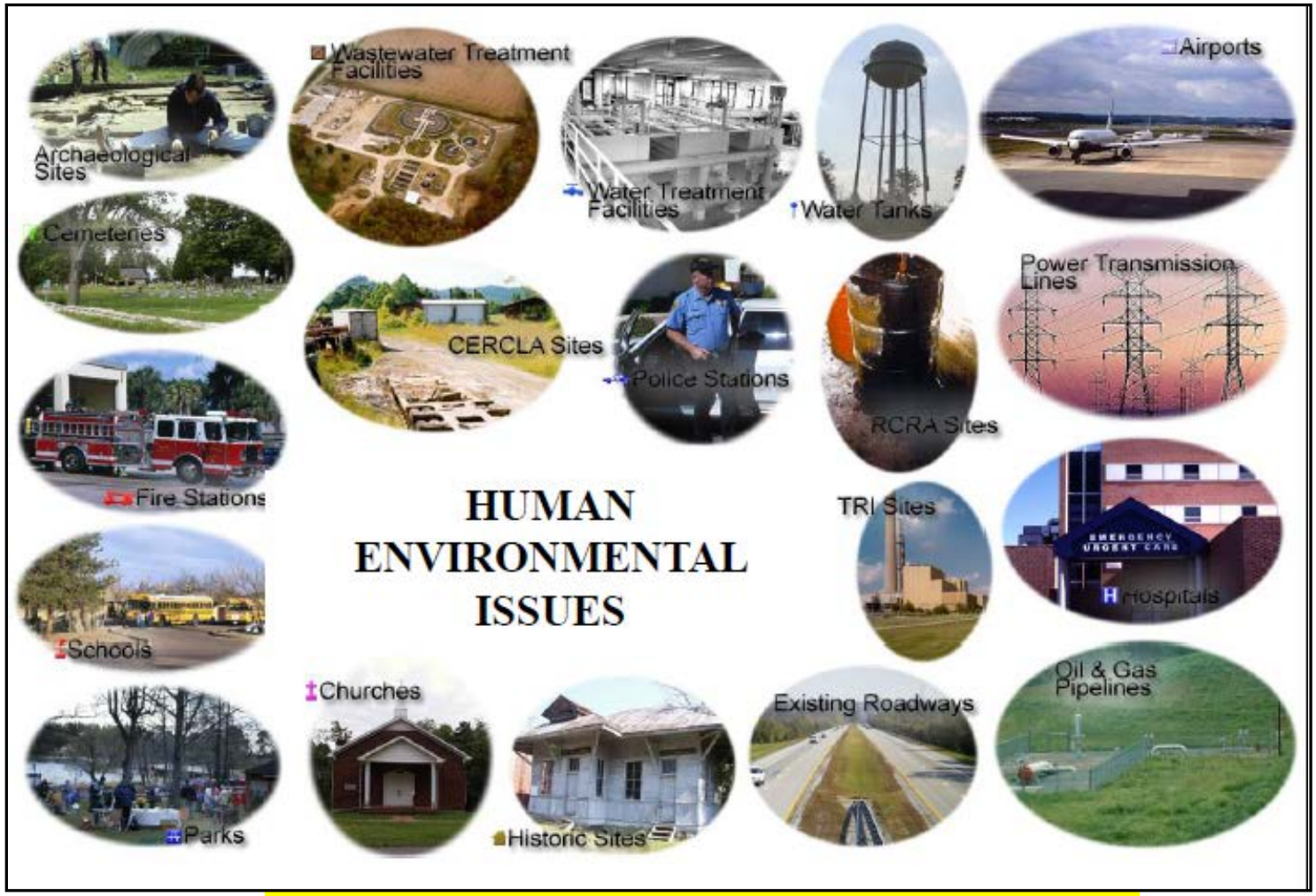


Figure 5.1.3 B – Kentucky Human Environmental Considerations

"I think that Kentucky should be at the forefront of community-focused and environmentally-responsible development in transportation. Kentucky's communities are filled with wonderful people who should be able to travel safely and whose travel should promote the health of Kentuckians and our world."
Fayette County Survey Participant

Early in the project development process, KYTC project teams invite public officials and other stakeholders to identify and address potential impacts to environmental resources. KYTC has also developed a web-based portal so that those interested in historic preservation can easily request to become Section 106 consulting parties. This opportunity can be accessed at http://transportation.ky.gov/environmental-analysis/pages/consulting-party-projects. Stakeholder involvement greatly enhances the KYTC's understanding of the circumstances surrounding individual projects and local priorities.

The KYTC strives for constructive relationships with regulatory agencies to facilitate meaningful review and project approvals. These relationships are formalized through interagency agreements and built on trust. These valuable partnerships mutually enhance the mission of each participating agency, resulting in improved outcomes for the citizens of the Commonwealth.

5.1.3-2 Air Quality

Although Kentucky is largely a rural state, air quality is still a major concern. The KYTC's top priority is the health and safety of the Commonwealth's citizens. The KYTC knows that emissions from motor vehicles that use our highways are one of the leading causes of air pollution. The KYTC works with local, state, and federal agencies to reduce air pollution to help minimize the effect upon the health of Kentuckians. Due to the Clean Air Act Amendment of 1990, 41 percent of the total emissions of six principal air pollutants have decreased in the past 20 years. Those six pollutants are ground level ozone (smog), fine particulate matter ($PM_{2.5}$), lead, carbon monoxide, nitrogen dioxide, and sulfur dioxide. More information concerning specific air pollutants can be found at http://www.epa.gov/air/criteria.html.

The Air Quality Index (AQI) is a tool for reporting how clean or polluted a community's air is, and what associated health effects might be a concern. The AQI focuses on health effects a person may experience within a few hours or days after breathing polluted air. The Environmental Protection Agency (EPA) calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide. Additional information on the AQI can be found at http://airnow.gov/ or http://air.ky.gov/Pages/AirQualityIndexMonitoring.aspx.

The Environmental Protection Agency (EPA) created National Ambient Air Quality Standards (NAAQS) which are used to designate areas as attainment, nonattainment, or attainment with an approved maintenance plan. A status of attainment means that an area has never had an air quality problem with any of the six principal air pollutants. A status of nonattainment means that an area is in violation of at least one of the six principal air pollutants and must take action to correct the issue. A status of attainment with an approved maintenance plan means that it has been demonstrated to the EPA that an area which was once designated nonattainment is no longer in violation of any of the six principal air pollutants and a plan is in place to prevent reversion into nonattainment. Improvements in air quality over the past 20 years have resulted in some areas being removed from nonattainment status. The 2013 air quality status of counties within Kentucky is illustrated in **Figure 5.1.3 C**.

In the past twenty years, the air quality in the state has improved. To continue this improvement over the next twenty years, the KYTC has various programs to encourage pollution reduction. Through air quality model analysis, the KYTC works closely with local air quality and transportation agencies to make sure that planned transportation projects that add capacity do not exceed the Motor Vehicle Emission Budgets (MVEBs) which are set for Transportation Conformity purposes. The Park-n-Ride program helps people interested in carpooling or vanpooling to find designated state or privately owned parking sites. Federal Congestion Mitigation and Air Quality (CMAQ) Improvement Program funds are designated for areas with air quality concerns. Congestion Mitigation Strategies are used to help identify and select long range planning projects to minimize or improve pollution levels. The Division of Planning has a full-time bicycle and pedestrian coordinator who works to encourage more people to walk and/or bike instead of using motorized vehicles (see the Bicycle and Pedestrian Section in Chapter 5). The Division of Planning also has a freight coordinator who works with riverports, railroads, trucking companies, and ferryboats to promote development of multimodal and intermodal transportation systems thereby reducing the number of trucks on the highways (see additional information regarding freight in various modes in Chapter 3 and Chapter 5)

> *"Louisville is ranked as a city with the top 20 worst air quality in America and we know automobile traffic contributes hugely to this. What is the transportation department doing to address this?"*
> Jefferson County Survey Participant

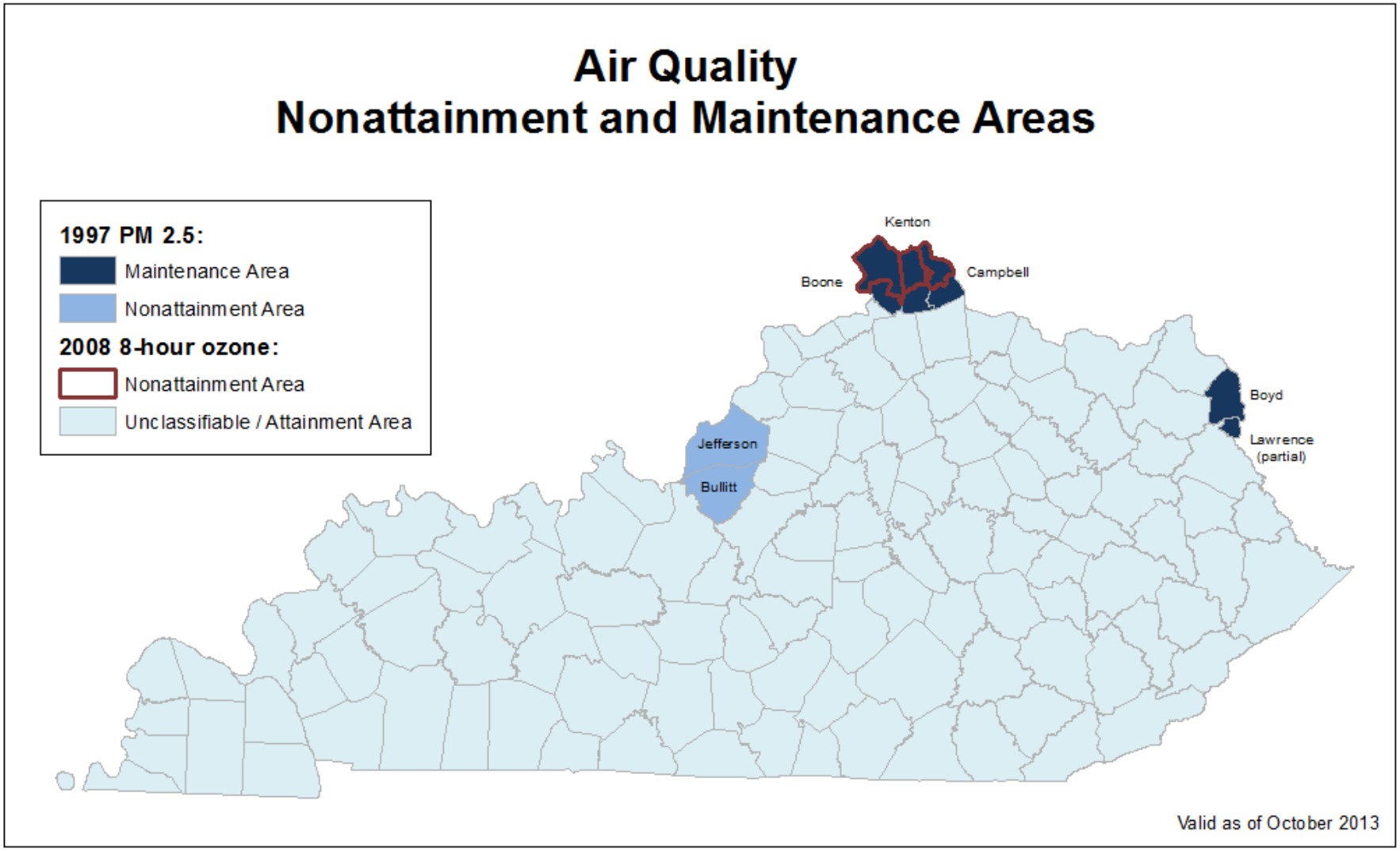


Figure 5.1.3 C – Kentucky Air Quality Attainment Map

5.1.4 Transportation Funding

- ***GOAL:*** **Ensure that the process which develops and maintains the transportation system adequately considers the efficient and flexible use of available resources to meet the transportation needs of the state.**

5.1.4-1 Sources of Funds

Funding transportation needs can be a complicated matter due to restrictions attached to the funding source by the legislative process at both the federal and state levels. The purpose and use of public funds is defined by legislative bodies through the budgeting process, while environmental, labor and procurement laws affect processes and expenditures for all aspects of transportation projects from planning through maintenance. Funding for water, rail, aviation, and transit modes of transportation must be sought from other public or private sources.

The Kentucky Road Fund is funded through four revenue sources: fuel taxes, usage taxes and registration and licensing fees. Approximately, 60% comes from state taxes on motor vehicle fuels as shown graphically in **Figure 5.1.4 A**. Kentucky uses a floating tax rate based on the wholesale cost of fuel, with a per gallon ceiling of $0.31 and a floor of $0.21. Current tax rates stand at about $0.31 per gallon of gasoline and about $0.28 per gallon of diesel and other fuels. These rates have risen over the past several years as wholesale prices have continued to increase.

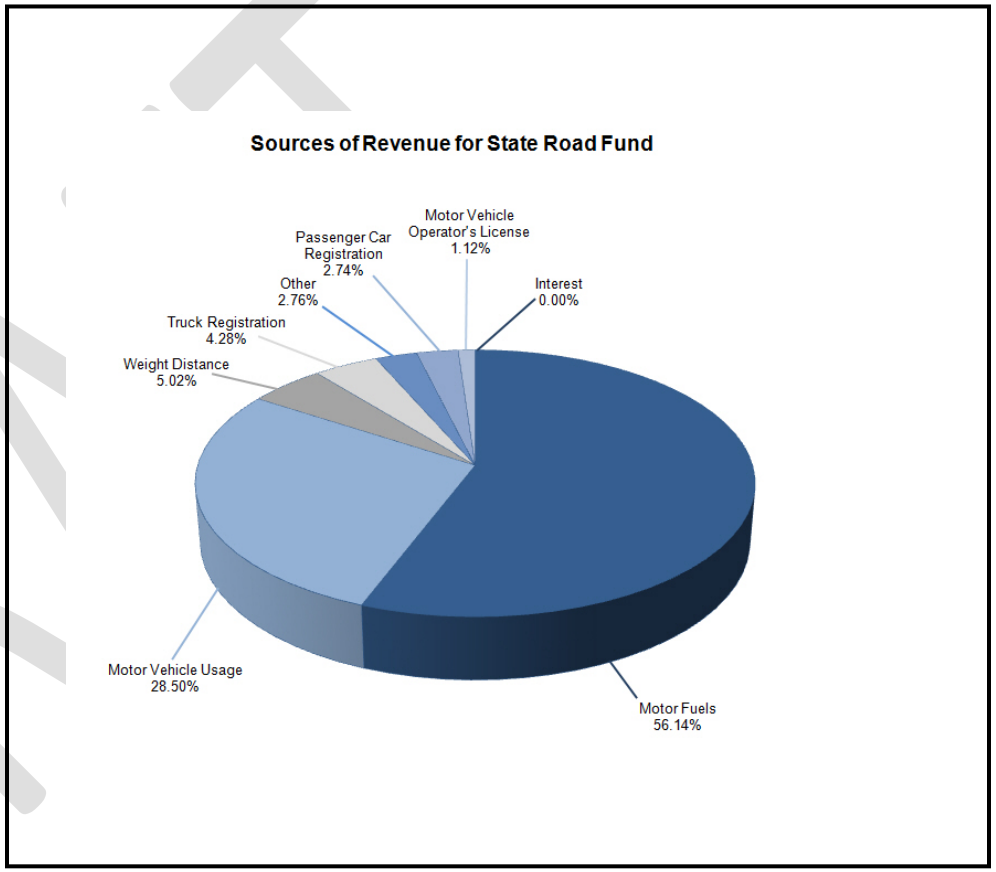


Figure 5.1.4 A - Revenue Sources for Transportation Funding in Kentucky

The Road Fund is supplemented by a vehicle sales tax, also called a usage tax, which makes up 25% of annual revenue. Registration and licensing fees paid by commercial trucking companies generate 10% of fund revenues, with the remaining 5% from vehicle and driver licensing and other fees.

State bonds are another potential source of transportation funding. Their use, however, is often misunderstood. The sale of bonds is a financing tool in which funds must be repaid with interest. The debt service costs associated with these bonds reduce the cash available to build and maintain Kentucky's transportation infrastructure. Over the next two decades, the KYTC must reserve over $150 million annually to cover the principal and interest on debts already acquired. Total revenues for FY2013 are approximately $1.5 billion, of which more than 10% goes toward debt service repayment. If revenues do not grow significantly over the next two decades, debt service will consume a larger and larger percentage of available transportation dollars.

In addition to the state fuel tax, a federal fuel tax (18.4 cents per gallon on gasoline and 24.4 cents per gallon of diesel fuel) is collected for the Federal Highway Trust Fund. As a general statement it would be correct to state Kentucky has traditionally been a donor state from the perspective of the federal fuel tax. In recent years, the Highway Trust Fund dedicated revenues have been supplemented by General Fund transfers by Congress to maintain a desired spending. The co-mingling of funds makes it impossible to know the true composition of the Federal Highway Trust Fund that Kentucky has received. Additionally, recent Federal transportation legislation has included minimum guarantees (TEA-21) and equity bonuses (SAFETEA-LU) which have narrowed the gap between donors and states that donate.

> *"The best way to raise funds for transportation improvements would be a gas tax because the people using the roads should be the ones to pay for it."*
> Survey Participant, Christian County

The Federal Transportation Act recently passed by Congress (MAP-21) brought some stability to transportation funding. Looking ahead into the next two decades, significant short term challenges to funding will continue as recent economic difficulties and debates over sequestration in the federal budget continue. The nation's slow recovery from the 2008 recession has negatively affected transportation infrastructure capabilities since virtually all funding comes from federal and state Road Funds, which are dependent on consumption-based revenues.

> *"Spend transportation money wisely. Any transportation infrastructure should be paid for by the end users. The money generated by that end user, i.e. cars, trucks, rail, bike, water or air, should be invested into that mode of transportation."*
> Survey Participant, Hardin County

In recent years, nationwide fuel consumption has decreased as vehicle fleets become more fuel-efficient and the number of vehicle miles traveled declines. Kentucky has experienced the same trends and infrastructure funding needs are outpacing Road Fund revenue growth. In addition, federal highway funds for Kentucky have remained flat and are likely to decrease in the future as Federal Highway Trust Fund receipts decline. General consensus nationwide is that consumption-based revenues are not sustainable and will not sufficiently support the

nation's transportation infrastructure funding needs into the In lieu of sufficient tax and fee based funding, transportation agencies are turning to other sources such as public and private investment and infrastructure user fees such as tolls. Kentucky has used tolls in the construction of its highway system in the past. In 1954 the state opened its first toll road for motorized vehicles, the Kentucky Turnpike from the Jefferson County line to Elizabethtown, which was eventually incorporated into I-65. Kentucky's parkway system also began as a toll road system. Constructed beginning in the late 1960's, most of these roads were tolled through the next four decades to supplement the repayment of bonds sold to fund the construction. The last tolling stations were removed in 2006.

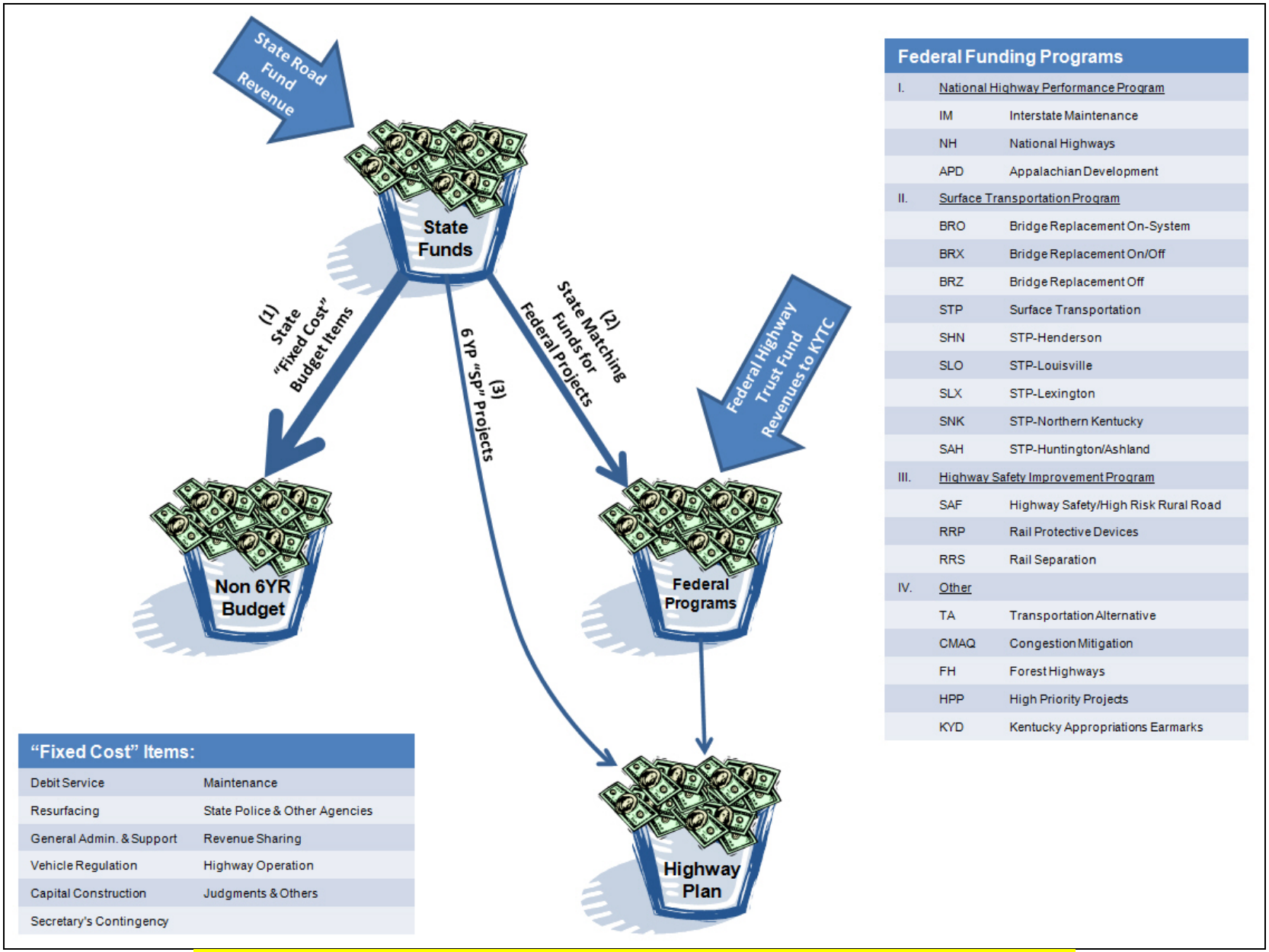
In recognition of deficiencies in traditional State Road Fund and Federal Highway Trust Fund as sources of future funding, the Kentucky General Assembly established the Kentucky Public Transportation Infrastructure Authority (KPTIA) in 2009. KPTIA was specifically created to address the unique funding requirements of large, complex highway projects within the Commonwealth and between Kentucky and Indiana. The enabling statutory authority permits KPTIA to sell revenue bonds that are to be repaid with revenues derived from completed projects, most likely from user fees such as tolls. KPTIA's first endeavor is a bi-state project with the state of Indiana to develop and construct two new Ohio River bridges and to re-configure the complex junction of I-65, I-64 and I-71 in downtown Louisville.

future.

The Kentucky portion of the Louisville/Southern Indiana Ohio River Bridges (LSIORB) project will be financed through a combination of traditional federal funds and innovative financing methods including Grant Anticipation Revenue Vehicle (GARVEE) bonds, a Transportation Infrastructure Finance and Innovation Act (TIFIA) loan from US Department of Transportation and revenue bonds to be repaid through tolls collected from users of these new facilities. A federally approved plan is in place to make the proposed Ohio River Bridges toll roads. Without these multiple funding sources, it would be difficult to find the revenue to cover Kentucky's estimated billion dollar share of project costs.

5.1.4-2 Use of Funds

Kentucky historically collects approximately $1.5 billion annually in Road Fund revenues from all sources. As shown in **Figure 5.1.4 B**, these revenues are supplied from the State Road fund and also from the Federal Highway Trust Fund. Within the State Funds "basket" these funds are distributed first to cover the fixed and operating costs of the KYTC such as Maintenance, Resurfacing, and Debt Service. Funds are then drawn from the "basket" to serve as the 20 percent match toward Federal Highway Trust Fund projects within the state as per the Federal Funding Programs. Once the fixed/operating costs and the matching funds have been assigned, then the remaining funds in the State Funds "basket" are used to fund state road improvement projects which are included in the Six Year Highway Plan.



"Fixed Cost" Items:	
Debit Service	Maintenance
Resurfacing	State Police & Other Agencies
General Admin. & Support	Revenue Sharing
Vehicle Regulation	Highway Operation
Capital Construction	Judgments & Others
Secretary's Contingency	

Federal Funding Programs		
I.	National Highway Performance Program	
	IM	Interstate Maintenance
	NH	National Highways
	APD	Appalachian Development
II.	Surface Transportation Program	
	BRO	Bridge Replacement On-System
	BRX	Bridge Replacement On/Off
	BRZ	Bridge Replacement Off
	STP	Surface Transportation
	SHN	STP-Henderson
	SLO	STP-Louisville
	SLX	STP-Lexington
	SNK	STP-Northern Kentucky
	SAH	STP-Huntington/Ashland
III.	Highway Safety Improvement Program	
	SAF	Highway Safety/High Risk Rural Road
	RRP	Rail Protective Devices
	RRS	Rail Separation
IV.	Other	
	TA	Transportation Alternative
	CMAQ	Congestion Mitigation
	FH	Forest Highways
	HPP	High Priority Projects
	KYD	Kentucky Appropriations Earmarks

Figure 5.1.4 B - The Flow of State and Federal Highway Funding in Kentucky

Figure 5.1.4 C further illustrates the distribution of the Road Funds as per the example of FY 2013. Of the total expenditures of the FY 2013 Road Funds, over 50 percent was spent toward the highway system while the remainder was spent on the Fixed/Operating costs associated with the work of the KYTC.

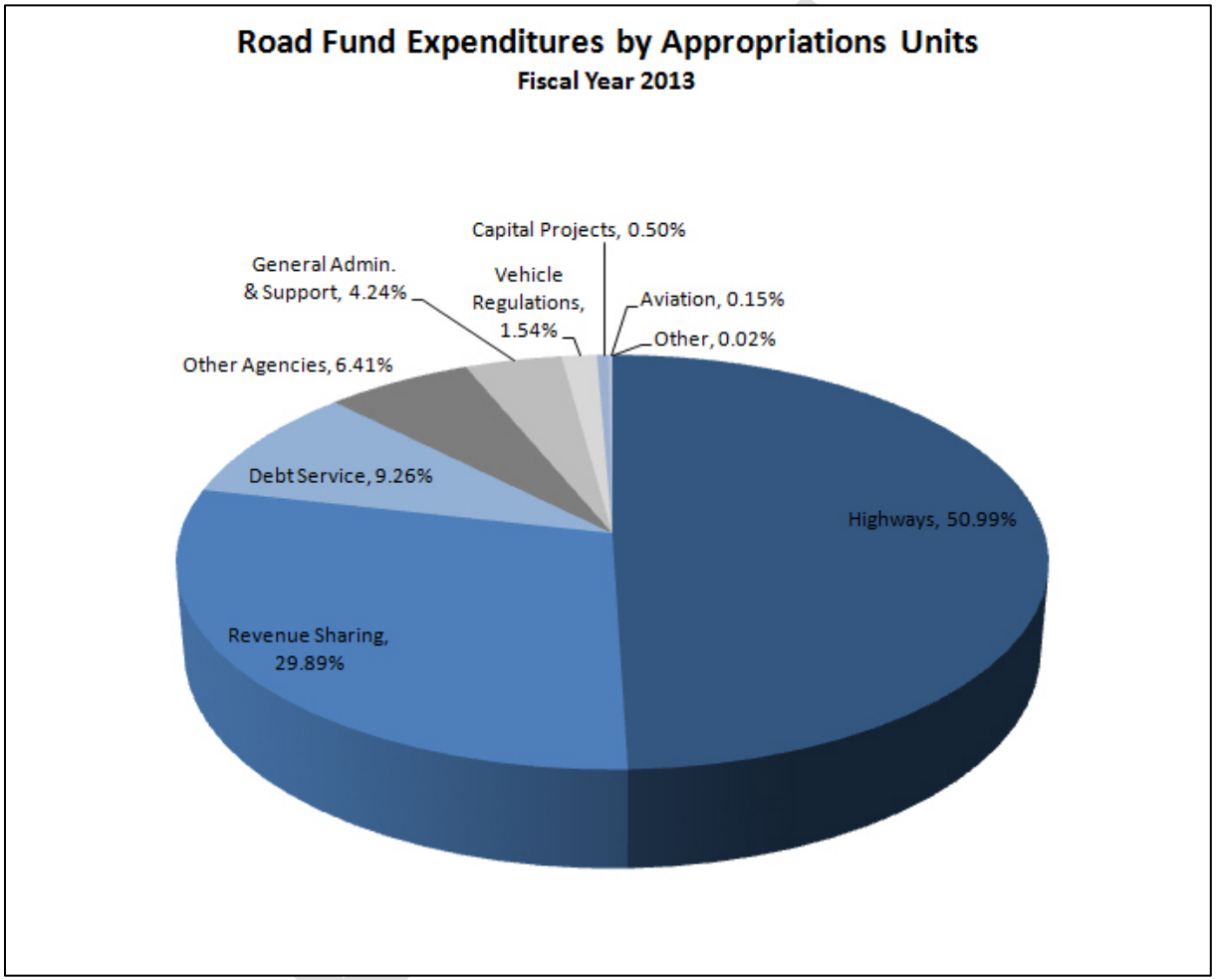


Figure 5.1.4 C – Road Fund Expenditures by Appropriations Units (FY 2013)

Of the expenditures dedicated from the Road Fund toward highways, **Figure 5.1.4.D** shows the distribution of those funds during FY 2013 across the multiple activities supporting the maintenance, operation, and development of the state's highway system. A little over 40 percent of the expenditures is dedicated to cover the cost of construction of new facilities and reconstruction of existing facilities while over a third of the expenditures is dedicated toward the maintenance of the existing system

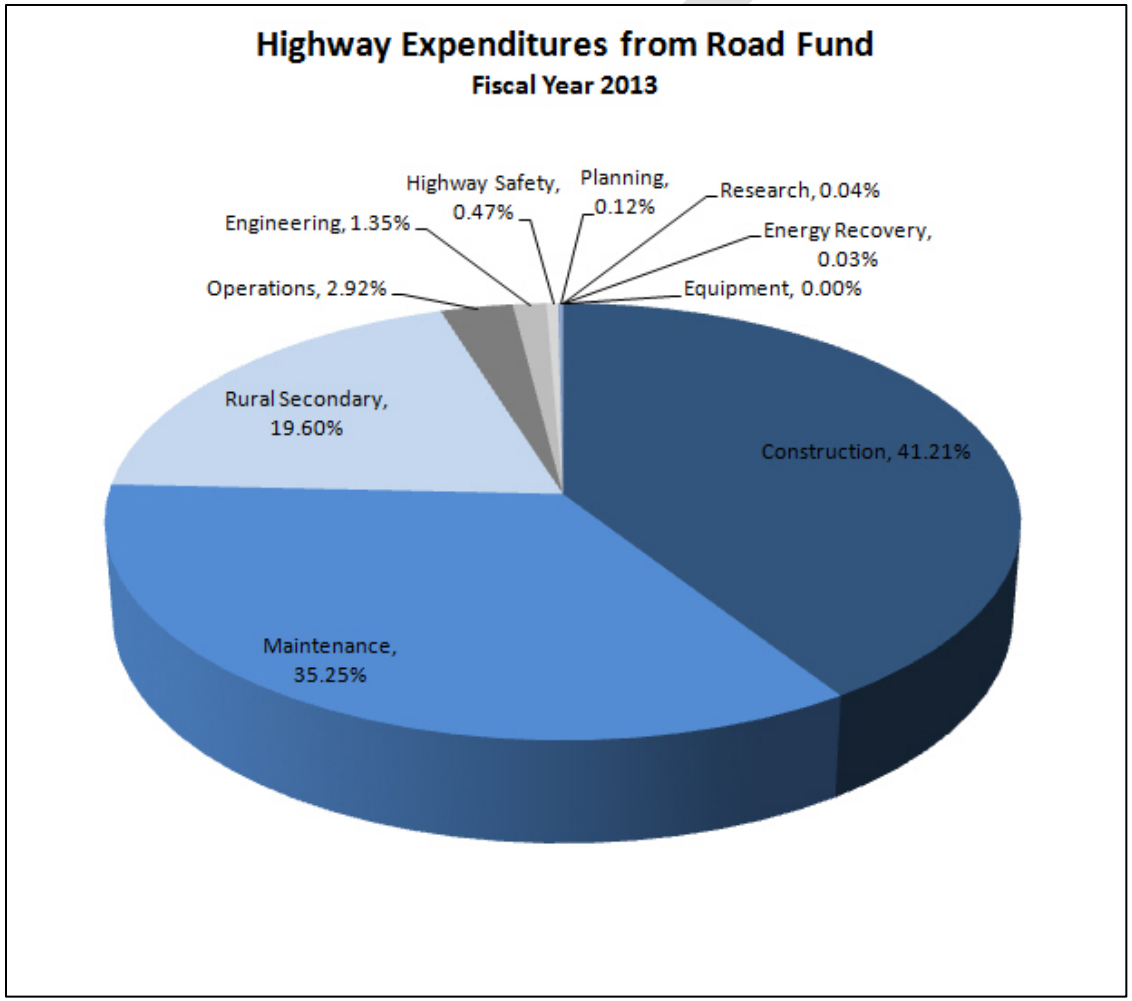


Figure 5.1.4 D - Highway Expenditures from Road Fund (FY 2013)

At the direction of Kentucky's Governor and General Assembly, the KYTC has spent $ 7.56 billion in transportation system construction and maintenance in the past five fiscal years, **Table 5.1.4 A** depicts fiscal year KYTC expenditures funded by State Road Funds, Federal Highway Trust Funds and Restricted Funds.

Approximately 70% of these construction dollars were expended on federally funded projects, with about 50% of the total used to fund system preservation projects such as major resurfacing, bridge deck replacement and similar activities. The maintenance dollars represent Kentucky Road Fund money used exclusively for snow and ice removal, mowing, right-of-way clearing, striping, replacement and repair of guardrail, signs and signals, and minor highway resurfacing projects. The KYTC Annual Budget Reports can be accessed at http://transportation.ky.gov/Budget-and-Fiscal-Management/Pages/Financial-Reports.aspx

With a UNL of over 2,500 proposed highway projects at a total estimated cost in excess of $58 billion, the cost of Kentucky's highway needs will always exceed the available revenue.

FY	Construction	Maintenance	Economic Development Bonds	GARVEE Bonds	Total
2009	$ 0.9154 billion	$ 300.0 million	$84.5 million	$97.2 million	$1.3971 billion
2010	$ 1.0124 billion	$ 329.8 million	$80.3 million	$53.4 million	$1.4759 billion
2011	$ 0.9038 billion	$ 339.1 million	$118.3 million	$52.7 million	$1.4139 billion
2012	$ 1.0451 billion	$ 332.4 million	$177.5 million	$34.0 million	$1.5890 billion
2013	$ 1.0573 billion	$ 317.9 million	$165.4 million	$146.4 million	$1.6870 billion

Table 5.1.4 A – KYTC Historic Construction/Maintenance Expenditures for Kentucky

5.2 Modal Application of Performance Based Planning and Programming (PBPP)

While highways will long remain the core of the KYTC scope of work, the KYTC is involved in bicycle and pedestrian facilities, aviation, public transit, and interfaces with rail and waterway transportation. These relationships will continue to evolve over the next twenty years as the interaction increases among all transportation modes to provide safe and reliable trips for people and freight.

The KYTC receives very limited funds for pedestrian, bicycle, aviation, and public transit programs and does not regularly receive federal or state funds for rail or water transportation programs. Considering these funding limitations, specific needs for these non-highway modes have not been included in this document. However, references to those mode-specific plans have been provided so that we may provide a link to more complete data and identified needs for those programs.

To aid in the discussion, a list of acronyms are provided in Chapter 7 and a glossary is available in Chapter 8 to provide clarification regarding terminology commonly used within the industry of a specific mode of transportation.

5.2.1 Highways

5.2.1-1 Basic Maintenance Overview

- ***Goal:* Provide for the safe and secure movement of people and freight.**
- ***Goal:* Provide for the improvement and maintenance of the existing transportation infrastructure.**
- ***Goal:* Provide a dependable transportation system that effectively and efficiently moves people and freight.**
- ***Goal:* Provide reliable connectivity and access - locally, regionally, and globally - for people and freight.**
- ***Goal*: The KYTC ensures that the process which develops and maintains a transportation system adequately considers dependable access to markets, jobs, and resources.**

Asset Management and preservation of existing infrastructure is critical to the KYTC effectively maintaining our highway system. Kentucky's road network is comprised of over 79,000 miles of public roads which is the primary element of the state's transportation system. The road network includes a wide variety of highway types, from multilane interstates to rural routes, each with unique challenges to be considered. The KYTC is responsible for the maintenance of over a third of the mileage of that network. The responsibility for maintaining this asset includes the preservation (upkeep) of approximately 67,000 lane miles of pavement and striping, 14,000 bridges, 3,200 traffic signals, and 550,000 signs that are considered the existing infrastructure of KYTC. That responsibility includes KYTC keeping the network clear of snow and ice in the winter and mowing the rights of way in the spring and summer.

As part of its maintenance responsibility, the KYTC collects and analyzes data on the condition of the pavement, bridges, striping, signals, and signs. Using the "plan-do-check-act" cycle as described previously in Chapter 4 of this plan, the KYTC investigates what is the current status of these vital components and implements targeted solutions to improve the operation of the transportation system.

5.2.1-2 Pavement

Smooth, comfortable and well maintained roadways are expected by residents and important to the safety and economy of the state. The KYTC maintains a system of roadways comprised of 27,500 centerline miles and approximately 67,000 lane miles, as previously noted. Maintaining and improving the condition of the roadway network is the primary objective of the Operations and Pavement Management Branch (OPM). The OPM collects detailed information related to pavement roughness, cracking, rutting, and other distresses. On a project level, this data is used to determine treatments which would extend pavement life or address defects. At a higher level, this data can summarize the overall health of the pavement network. Commonly used measures of pavement health include roughness and condition.

> *"If we can maintain our roads, we will spend less money on repairing vehicles caused by the road conditions. Our roadways are important and each project should be looked at based on the importance and the amount of people that would be affected. Existing roadways should be reused and maintained."*
>
> Survey Participant, Rowan County

5.2.1-2.1 Pavement Roughness

Pavement roughness is related to the degree of comfort or discomfort experienced while traveling. The most common measure of pavement roughness is the **International Roughness Index (IRI)**. Higher IRI values indicate rougher pavement. As illustrated in **Figure 5.2.1 A**, currently over 40% of Kentucky's pavements are considered rough. This has several negative impacts on motorists including: degraded driving experience, higher fuel consumption, increased vehicle damage, reduced safety, and pavement related delays.

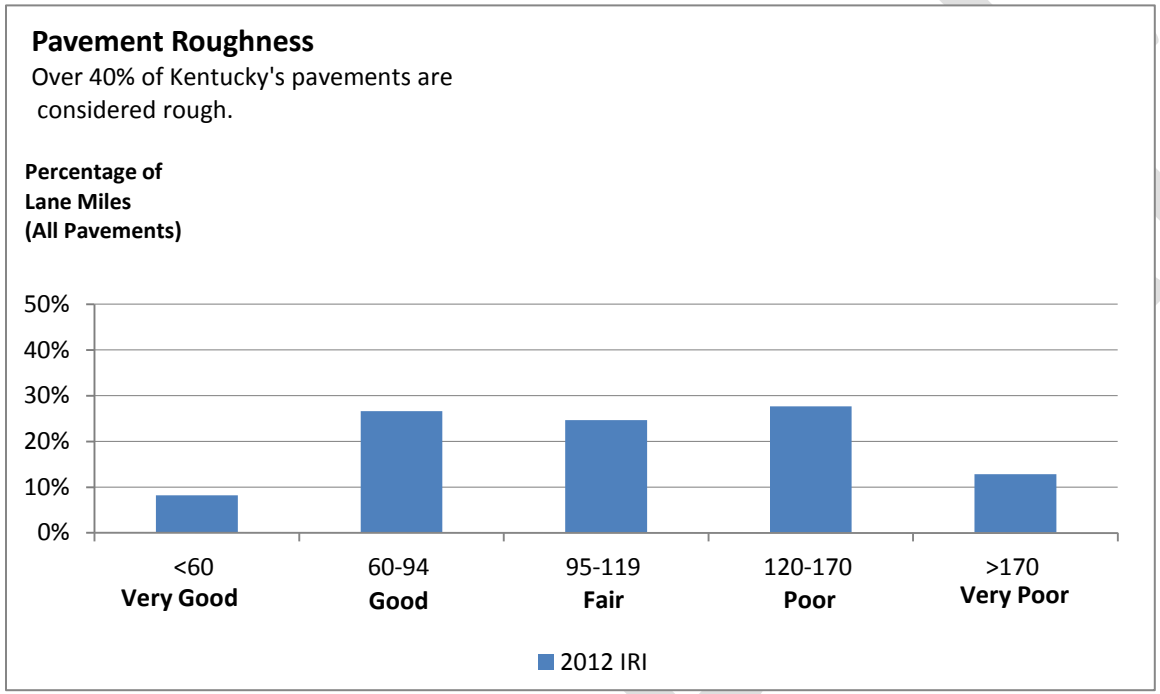


Figure 5.2.1 A – KYTC Pavement Roughness

5.2.1-2.2 Pavement Condition

On an average day, the total distance driven on Kentucky's entire state roadway network exceeds 100 million miles. Ideally, each of these miles would be driven on pavements in good condition. As a practical matter, however, priorities must be established which allow for the most efficient and flexible use of available resources. Since the ultimate purpose of Kentucky roadways is to serve the public, the KYTC places a higher emphasis on maintaining pavements with higher traffic volumes. To accomplish this, we use 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 as presented in **Figure 5.2.1 B**.

> *"Although new roadways are important, I believe maintenance of current roadways is much more important."*
>
> Survey Participant, Ballard County

Good

- Low IRI value
- Smooth ride
- Minor to no distress
- Not in need of resurfacing

Fair

- Moderate IRI value
- Moderately smooth ride
- Moderate distresses
- May need resurfacing within two to five years

Poor

- High IRI value
- Rough riding pavement
- Moderate to severe distresses
- Needs resufacing or rehabiliation within one year

Figure 5.2.1 B– Range of Pavement Conditions

The KYTC has set a goal of increasing the percentage of good and fair pavements to a target of 92% by 2035. We are currently below that target with only 81% of pavements in the good and fair category as presented in **Figure 5.2.1 C**.

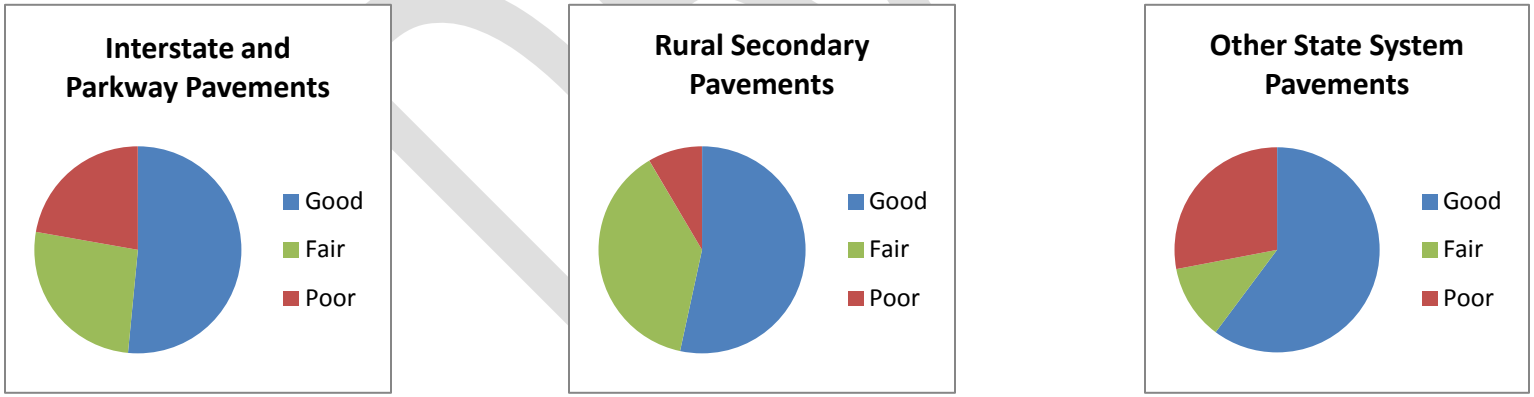


Figure 5.2.1 C– 2013 Pavement Conditions in KY by Roadway Functional Class

5.2.1-2.3 Pavement Performance

Faced with the scenarios in **Figure 5.2.1 D** and **Figure 5.2.1 E**, achieving better pavement performance requires a long-term commitment to a two-pronged pavement management approach. First, the KYTC must maintain pavements in good condition so that they last longer before rehabilitation is needed. Just as one would perform preventive maintenance on a car in order to extend its life, so must Kentucky embrace a strategy of preventive maintenance for roadway pavement which ensures the longest possible period of sustained performance. Second, the KYTC must reconstruct or rehabilitate pavement sections that have already deteriorated to a poor condition. Because these projects are much more expensive to complete, this effort should be coordinated with our long-term planning processes to incorporate other strategic goals such as increased capacity, improved traffic flow and enhanced safety, addressing as many of these goals as possible.

In some instances, however, it will be necessary to carry out rehabilitation or reconstruction solely for the purpose of improving the pavement condition.

FY 2012 Pavement Preservation Needs

• Interstates	$312 million
• Parkways	$131 million
• State Primary Rehab	$81 million
• SP & SS Resurfacing	$305 million
• RS Resurfacing	$77 million
• Preventive Maintenance	$12 million
Total	**$918 million**

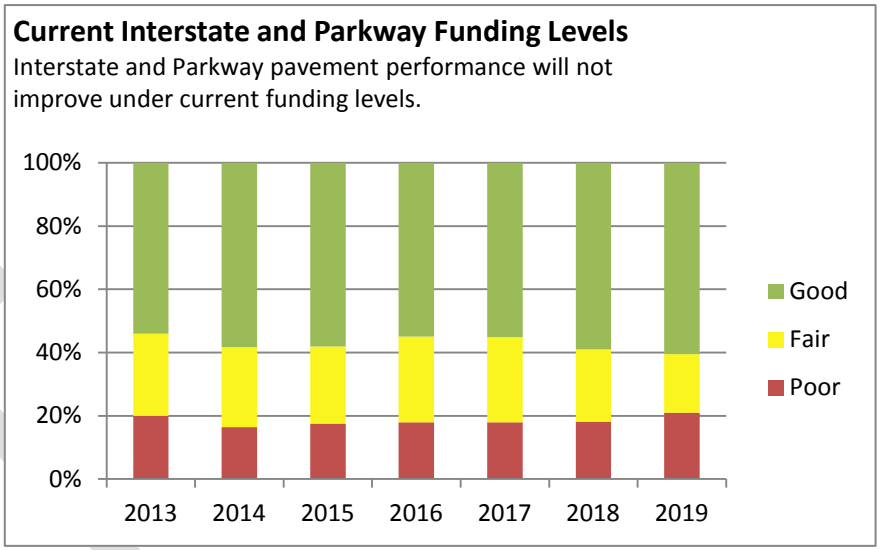


Figure 5.2.1 D – Future Pavement Performance Levels for Interstates & Parkways at Current Funding

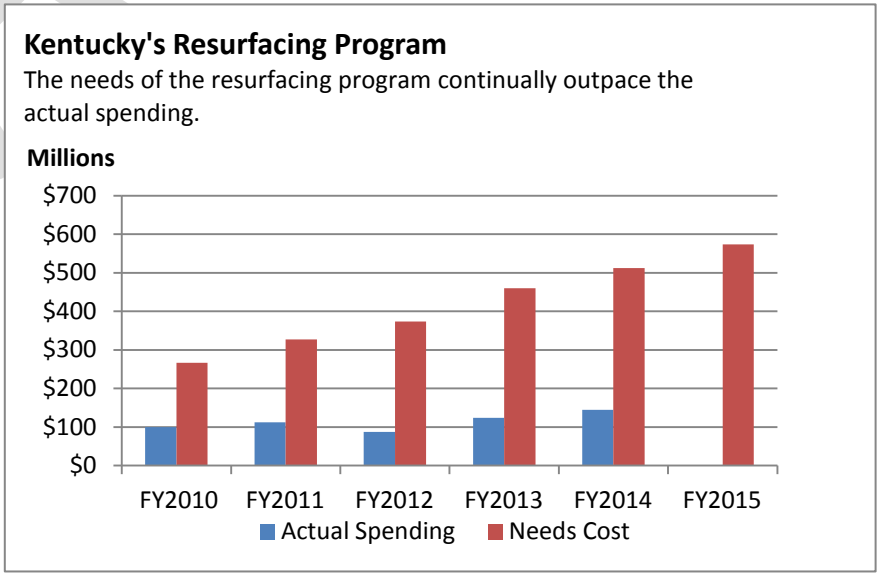


Figure 5.2.1 E – KYTC Resurfacing Program: Needs vs. Spending

5.2.1-2.4 Pavement Preservation

One of the major challenges to an effective pavement preservation program is overcoming the desire to address pavement needs in a "worst-first" manner. While this strategy would seem to prioritize funding on those pavements most in need of attention, it would also result in more rapid deterioration of pavements currently in good to fair condition. In the end, the number of miles in poor condition would increase more rapidly than could be addressed with available funding, as has been the trend since 2009. This is due to the fact that it is much more expensive to repair pavements in poor condition than to prevent them from becoming poor in the first place.

This concept is illustrated in **Figure 5.2.1 F.** When pavements are relatively new and in good condition, preservation treatments can be performed to extend the pavement life. This can eliminate or significantly delay the need to perform a major rehabilitation or reconstruction in later years. The associated savings varies depending on the type of treatment, but historic data indicates that a savings of $8 can be attained for every $1 invested in preservation.

An effective pavement management program must ensure a balance between preservation, rehabilitation, and reactive maintenance. Sufficient funding is not available to focus solely on the reconstruction of pavements in poor condition; nor is it acceptable to simply perform reactive maintenance. The KYTC must utilize a variety of treatments to optimize system performance in a cost effective manner and extend the availability of the roads to the public.

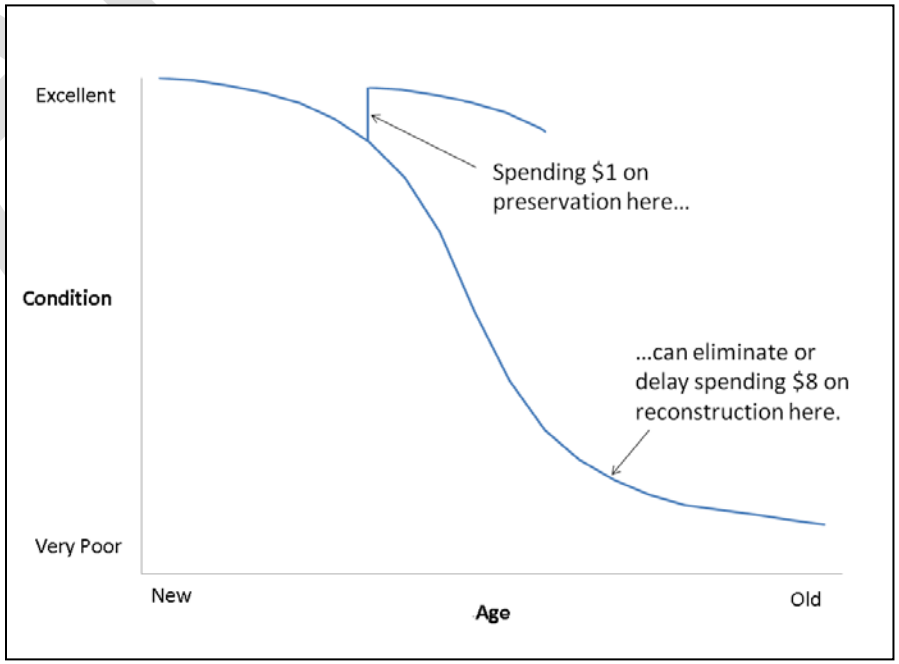


Figure 5.2.1 F: Pavement Preservation Concept

5.2.1-3 Bridges

Taking care of Kentucky highways includes keeping approximately 14,000 bridges in a safe condition for the traveling public. The KYTC plays a vital role in this by maintaining an accurate inventory of all of Kentucky's state, local and privately maintained bridges. The KYTC is responsible for making sure that all bridges are inspected on a 2-year cycle.

Based on the findings of these inspections, the KYTC advises and makes recommendations to counties, cities and railroads about repairs needed to their bridges. Additionally, Contract Ready Proposals (CRPs) are developed for bridge maintenance and repairs on state-maintained bridges.

The KYTC is also responsible for determining the safe load-carrying capacity of all public bridges and the posting of notification signage when it is determined that a bridge cannot safely carry the legal roadway weights. Proper sign posting procedures are necessary to remain in federal compliance and retain Kentucky's eligibility for federal bridge funds. To date, only about 65% of Kentucky's bridges have been load-rated.

> *"I believe that more money has to be spent on performing various maintenance activities, especially preventative maintenance, on the bridges in Kentucky." If the bridges were not there, what good would a "perfect" stretch of asphalt be?"*
>
> Survey Participant,
> Madison County

Currently about 17% of counties and 32% of cities which maintain bridges are not in compliance with load posting requirements. A concerted effort to load rate all bridges in Kentucky is underway to get all counties and cities into compliance and therefore eligible for federal bridge funds.

> *"We live in West Kentucky, in a sense completely surrounded by rivers and water. Our infrastructure, livelihood and survival depend on crossing these rivers on aging, antiquated bridges. In the event of a major earthquake, we could literally be cut off for months. Bridge maintenance and expansion should be a major consideration moving forward."*
> Survey Participant,
> McCracken County

5.2.1-3.1 Bridge Condition

In assessing overall bridge condition, the KYTC assigns a rating based on the lowest rating of the three major bridge components – the deck, superstructure, and substructure. A bridge with one or more of these major components in poor condition is rated as poor. For a bridge to be rated in good condition overall requires that all three components be rated in good condition.

As of 2013, there were 939 bridges rated in poor condition in Kentucky. Each day approximately 3.3 million vehicles travel across bridges rated in poor condition.

5.2.1-3.2 Improving Bridge Performance

The KYTC spends about $30 million annually on bridge repairs and maintenance. Most of these funds come from the KYTC Bridge Maintenance account with the rest coming from Rural Secondary Funds and Federal Interstate Maintenance Funds. Approximately $80,000 per year is made available to counties across the state for county maintained bridges.

Within the KYTC budget, approximately $70 million per year in the Six Year Highway Plan is devoted to the replacement of existing bridges through the BRO, BRZ, and BRX programs. The KYTC also manages the construction of major new and replacement bridges throughout the state. In Western Kentucky, the KYTC is in the process of constructing two major four-lane bridges on US 68 that will replace the existing two-lane bridges over Lake Barkley and Kentucky Lake. In 2013, the bridge over the Ohio River connecting Wickliffe, Kentucky to Cairo, Illinois underwent a major rehabilitation that will extend its life expectancy for at least ten more years. The Milton-Madison Bridge over the Ohio River and the US 60 Bridge over the Tennessee River at Ledbetter, Kentucky were also replaced by 2014. In partnership with the state of Indiana, a new bridge is being constructed in downtown Louisville to carry I-65 traffic to southern Indiana and another to connect I-265 (Gene Snyder Expressway) in eastern Jefferson County with southern Indiana.

The KYTC has recently increased its preventive maintenance efforts on state-maintained bridges by issuing CRPs for bridge washing. These projects involve cleaning the steel girders, drains, deck gutter lines, abutment caps, pier caps and bearing devices and applying concrete sealants and water-resistant grease to all components as necessary. This preventive maintenance prolongs the life expectancy of the bridge by several years by reducing corrosion and wear to the structure through exposure to salt, dirt and other contaminants. Most of these contracts are funded through Bridge Maintenance funds (FE02), which have not been increased for more than eight years.

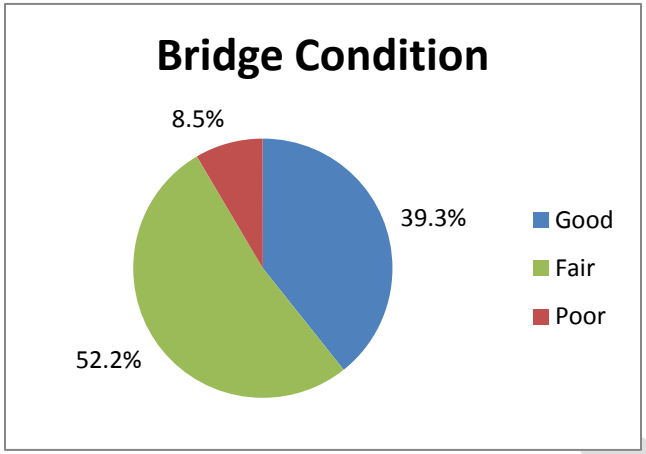
Over the next 25 years, the KYTC will support continuing trends toward a decrease in the number of Poor bridges and an increase in those rated Good by being more proactive and devoting more resources to preventive maintenance. This will require an increase in bridge maintenance funds as well as more time and manpower devoted to routine bridge maintenance activities

5.2.1-3.2 Culverts

Similar to bridges, culverts with a length of 20 feet or more are also inspected on a 24 month schedule by the KYTC. As of 2013, Kentucky had approximately 2,900 culverts on state and local roads that met the minimum standard for length requiring inspection.

Through the biannual inspection process, culverts in Kentucky are also rated for overall condition. In 2013, 83 culverts (2.8%) were rated in Poor condition, 1540 (53.1%) in Fair condition, and 1280 (44.1%) in Good condition. **Figure 5.2.1 G** provides a graphical representation of the condition for both the bridges and the culverts in Kentucky in 2013.

> *"I think funding for maintenance of existing roadways and bridges should always have a higher priority than building new roads and bridges. It is also a problem when vehicles must sit at a red light for a full minute, or more, when no traffic is coming in the other direction. This increases the use of fuel, which in turn, increases the cost to the consumer of that fuel and increases pollution."*
>
> Survey Participant,
> Franklin County



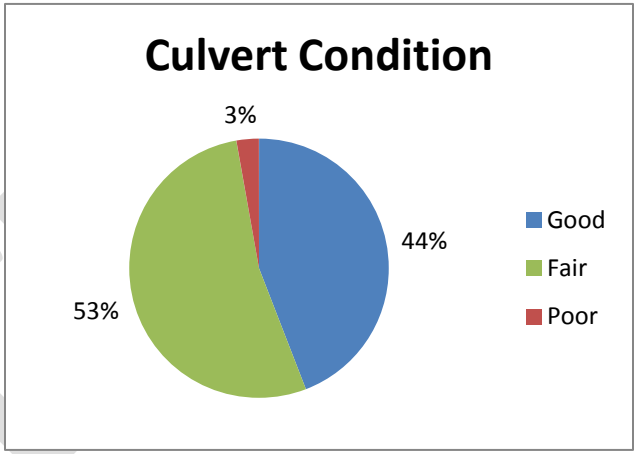


Figure 5.2.1 G - 2013 Bridge and Culvert Conditions in Kentucky

5.2.1-4 Signs, Signals, and Striping

Kentucky has adopted the *Manual on Uniform Traffic Control Devices* (MUTCD) as the standard for traffic control devices -- signs, signals and pavement markings -- along public highways. The purpose of the MUTCD is to provide uniformity to the meaning and application of traffic control devices across the nation.

5.2.1-4.1 Signs

Proper signage is an integral part of Kentucky's transportation system, with a primary purpose of guiding motorists to the desired destinations safely and effectively. The KYTC maintains an estimated 550,000 signs across the state to alert drivers to our state traffic laws, warn them of unexpected situations, and provide guidance and direction.

The Federal Highway Administration (FHWA) requires states to implement a system to ensure that regulatory and warning signs are legible at night. The KYTC has begun a process that will create an inventory, which includes sign age and location, and has initiated the development of a deterioration model for signs based on sheeting type, color, orientation and age. Using these tools, the KYTC will be able to determine when signs must be replaced in order to maintain an acceptable level of retro-reflectivity.

"The proper maintenance of existing roads and infrastructure is paramount. Proper striping, surfaces, marking and signage should be maintained first. Improve roadway surface markings through greater use of reflectors and improved paints."

Survey Participant,
Fayette County

5.2.1-4.2 Signals

Traffic signals are a key component of the KYTC's efforts to manage congestion along our highway system. Over 3,200 traffic signals are currently installed along the state highway system. Approximately 70% of these devices are maintained by the KYTC with the remaining 30% maintained and operated by larger local governments (such as Metro Louisville and Lexington-Fayette Urban County Government). At a replacement cost of approximately $75,000 per device, these installations represent an investment value of approximately $245,000,000.

In order to maximize the efficiency of traffic flow along certain corridors, many of our traffic signals have been incorporated into coordinated signal systems. Simply, a coordinated signal system is a group of nearby traffic signals that communicate with each other to provide favorable signal timings to motorists with the primary goal of moving traffic efficiently through a corridor or within a defined area. To this end, the KYTC currently maintains approximately 175 coordinated signal systems statewide.

The KYTC current performance goal is to update coordinated signal system timing a minimum of once every three years to maximize efficiency of traffic operations through these critical areas. In addition, the KYTC can remotely communicate with 60% of the traffic signals statewide which allows the KYTC to address timing and other operational issues from our offices. Such communication and monitoring systems will become a more critical component in the operation and maintenance of traffic signals in the future as these systems reduce the amount of field work necessary for traffic signal system timing maintenance and decrease the amount of time that traffic signals are not operating as designed.

5.2.1-4.3 Pavement Markings

Like other traffic control devices, pavement markings provide guidance and information to the road user. In some cases, markings are used to supplement other traffic control devices and in other cases, by themselves to convey regulatory, guidance or warning messages. Under most conditions, markings provide important information while requiring minimal diversion of attention from the roadway. The most common pavement markings include lane and stop lines, crosswalk markings, crosshatching and arrow/word markings.

> *"Top priorities that I see are repairing/maintaining existing roads (fix potholes, etc. that could be dangerous) and maintain lighting/striping for better vision at night."*
>
> Survey Participant,
> Simpson County

Reflective beads are imbedded into pavement markings to make them more visible at night. The amount of light reflected back from vehicle headlights to the source is known as retro-reflectivity, one of the key characteristics associated with pavement marking performance. Currently, the KYTC ensures quality pavement markings through performance specifications which require minimum retro-reflectivity within an initial proving period. Beyond that period, markings are replaced as needed based on the recommendations of local engineers in the field. Factors that can negatively impact the long-term durability and performance of markings include material characteristics, traffic volumes, weather, snowplow activity and location. The KYTC continues to partner with the Kentucky Transportation Center to evaluate pavement marking issues across the Commonwealth.

In recent years, the KYTC has predominantly used paint for long-line striping due to its low initial cost. In the future, however, more durable products may be used if the higher

initial costs can be justified. By 2035, the KYTC will have more advanced pavement marking management systems that will help determine the appropriate marking material for specific sections of roadway based on projected costs, ensure performance and retro-reflectivity determine an appropriate replacement cycle based on past performance. These advanced systems will help ensure that the KYTC makes the best use of funds for pavement marking installation and maintenance.

5.2.1-4.4 *Roadside Maintenance*

In addition to signs, signals and pavement markings, the KYTC maintains the smaller elements of the roadside appurtenances through its Roadsides and Permitting functions.

Roadside maintenance broadly encompasses everything from the edge of pavement to the edge of right-of-way including vegetation, pipe inlets and outlets, rock cuts, fences, guardrail, weigh stations and rest areas. Maintaining each of these elements plays a role in the stability and preservation of Kentucky's highway network. In addition to their connection to overall system performance, FHWA requirements mandate some of the operational aspects of our rest areas, weigh stations and roadside features.

> *"Treat roads as something for everyone to access, as major, contributing elements to our cities and towns."*
>
> Survey Participant,
> Jefferson County

As is the case with signs, the KYTC will have implemented a system by 2035 that identifies the location, condition and potential remaining service life of other assets that include pipes, guardrails and many other roadside features. This system will be used to establish funding needs and make more informed project decisions.

Another vital part of proper network maintenance is the regulation of what touches it, whether it is a residential driveway, a pipeline underneath or a utility line overhead — all of which fall under the Permitting function. The standards to which these are built can adversely affect the physical and/or operational condition of our network.

5.2.1-5 Enhancing Mobility

Kentucky's highway system is comprised of over 79,000 miles of public roads and streets, including nine interstate highways and nine state parkways. The KYTC maintains 27,500 miles or 67,000 lane miles of Kentucky's highway system, with the remaining 65 percent maintained by cities and counties. To keep Kentucky moving, the KYTC must address the issues of safety, congestion and freight movement.

> *"Kentucky roadways need to be improved and better maintained to promote public safety. Many roads in Kentucky were designed and built many years ago. Today there is more traffic traveling Kentucky roads and the roads are not suited or designed to accommodate the growing times of today."*
>
> Survey Participant,
> Allen County

5.2.1-6 Safety

***GOAL:* Provide for the safe and secure movement of people and freight.**

The Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), enacted by the federal government in 2006, established a requirement that each state develop a Strategic Highway Safety Plan (SHSP). The SHSP is a data-driven comprehensive plan, updated every four to five years, that integrates the four E's of transportation safety: enforcement, engineering, education, and emergency response.

Kentucky's plan establishes statewide goals, objectives and key emphasis areas, developed in consultation with federal, state, local and private sector stakeholders, and outlines measurable strategic opportunities to reduce fatalities and serious injuries on state roadways. Kentucky's original 2006 SHSP dealt with safety issues including aggressive and impaired driving, commercial vehicle safety, Drive Smart safety corridors, incident management, roadway departure, occupant protection, young drivers, traffic records and legislative issues. The most recent federal highway authorization bill, Moving Ahead for Progress in the 21st Century (MAP-21), sets additional requirements that measure the plan's performance and report on progress toward achieving its goals.

Kentucky roadway departure crashes accounted for over 70% of the roadway fatalities from 2006 to 2012, compared to national rates of just over 50%, leading to Kentucky's designation by the FHWA as a Roadway Departure focus state. During this same period, intersection-related crashes accounted for another 14% of roadway fatalities -- an average of 112 per year -- and 25% of injury crashes. As a result of this data, roadway departure and intersection crashes are primary focus emphasis areas of the HSIP. HSIP funding closely reflects the significance of this data, with 66% of annual funding in Kentucky targeted to address roadway departure issues and 17% towards intersection safety improvements.

> *"Safety should be #1 priority. Fixing hazardous stretches of road whether they be blind curves or narrow heavily traveled roadways should be done statewide. Potholes should be attended to ASAP to avoid blowouts/bent wheels and to prevent some motorist from being stranded."*
>
> Survey Participant, Rowan County

5.2.1-6.1 Enforcement

In 2005 statewide roadway fatalities stood at 985 and trends indicated an increase to as many as 1,200 by 2011. One of the KYTC's first efforts in support of the new 2006 SHSP was an endorsement of seat belt legislation that almost immediately reversed this trend line. The legislation assigned "primary" status to Kentucky's existing seat belt law, allowing law enforcement to cite drivers for a restraint violation even when no other violation existed. The law improved seat belt usage from 65% to 85% in the years since its passage, saving an estimated 2,000 lives and is represented graphically in **Figure 5.2.1 H**.

The Kentucky Office of Highway Safety, a division of the KYTC, has recommended program funding of nearly $3 million in federal FY 2014 to state and local agencies to be designated for increased enforcement throughout the Commonwealth. This included $1,219,850 for impaired driving, $354,800 for occupant protection and $1,387,320 for speed control.

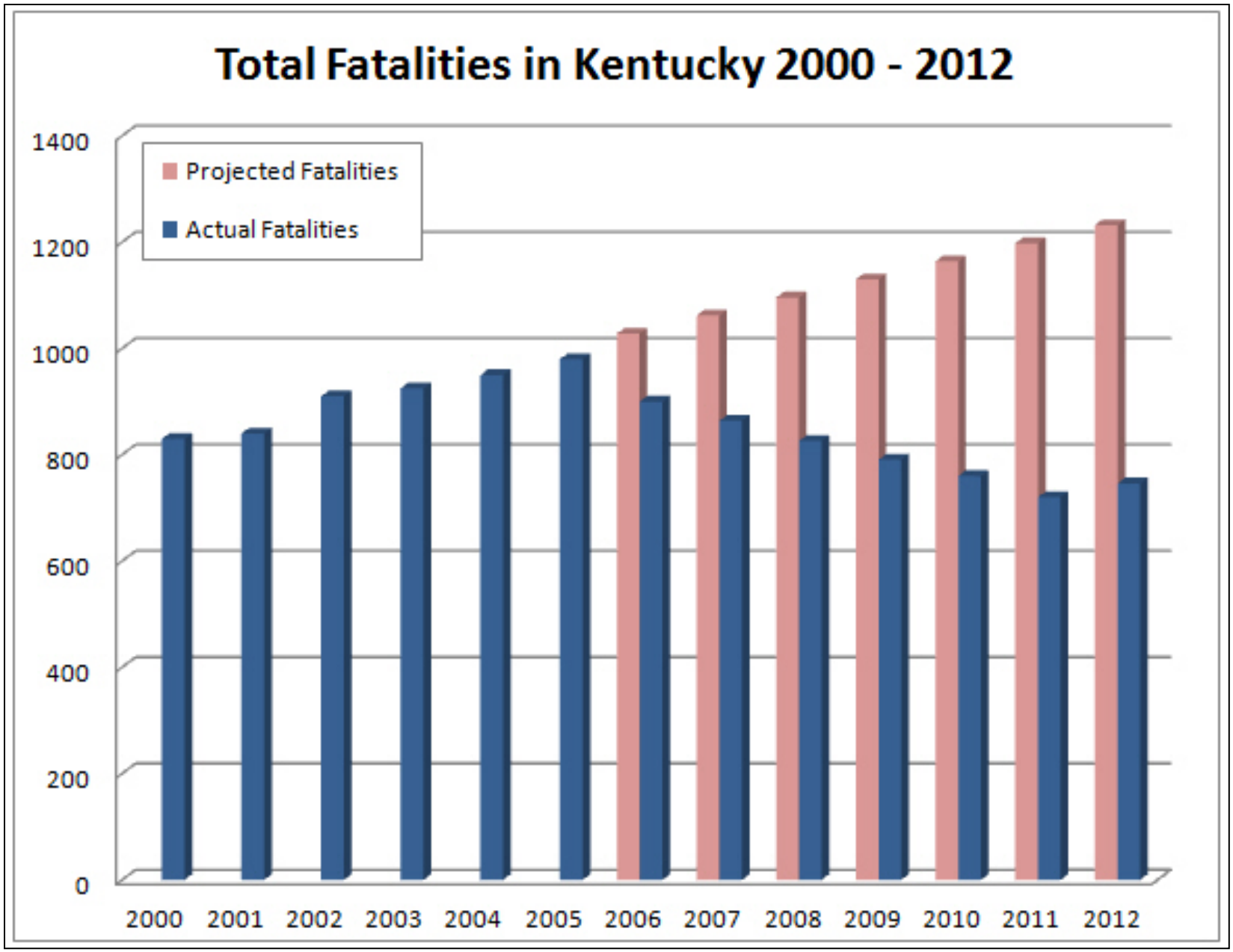


Figure 5.2.1 H - Total Highway Fatalities in Kentucky (2000-2012)

5.2.1-6.2 Engineering

The Highway Safety Improvement Program (HSIP) was established by SAFETEA-LU as a FHWA core program and included a significant increase in funding for infrastructure-related safety improvement projects. The HSIP requires a data-driven, strategic approach to improving safety on all public roads, focusing on performance consistent with the Strategic Highway Safety Plan (SHSP). Using information such as crash and roadway data, the HSIP prioritizes highway improvement projects that address specific crash types and patterns. HSIP uses targeted countermeasures that predict a significant return on funds invested in terms of crash reduction. Under MAP-21, HSIP funding to Kentucky has nearly doubled to a current level of nearly $39 million per year, further reinforcing the importance of a data-driven spending programs.

In 2009, the Towards Zero Deaths (TZD) initiative was developed by the American Association of State Highway and Transportation Officials (AASHTO), endorsed by the Governor's Highway Safety Association (GHSA), the Federal Highway Administration (FHWA), and adopted by several states, including Kentucky. The overall strategy of TZD is based on two elements: cultural change and building the foundation of safety. AASHTO has taken a lead role in the development of TZD, setting an overall goal of decreasing fatalities by 50% by 2030 – an attainable goal which will be adopted by the KYTC into its next SHSP.

The ultimate measure of the success of the HSIP and TZD initiatives will be a significant statewide decline in the number of fatalities, serious injuries and collisions. **Figure 5.2.1 I** graphically illustrates the history of collisions in Kentucky from 2000 through 2012.

5.2.1-6.3 Education

The Kentucky Office of Highway Safety provides programs throughout the Commonwealth, including videos, presentations and simulators, which educate Kentucky drivers about distracted, aggressive and impaired driving, seat belt safety, young and mature drivers, child passenger safety and more. Approximately $1 million dollars is dedicated annually toward these efforts.

5.2.1-6.4 Emergency Response

Approximately $4 million is annually dedicated by the KYTC to highway incident management and the Safety Assistance for Freeway Emergencies (SAFE) Patrol. The Division of Incident Management provides travel information to Kentucky's 511 traveler information system and alerts other agencies and cabinet officials when highway incidents occur. SAFE Patrol operators provide gas and oil, inflate or change flat tires, provide a "jump" for dead batteries and other minor automotive repairs to motorists on Kentucky roadways. They also assist law enforcement by directing traffic, removing roadway debris, monitor suspicious activity and tag abandoned vehicles.

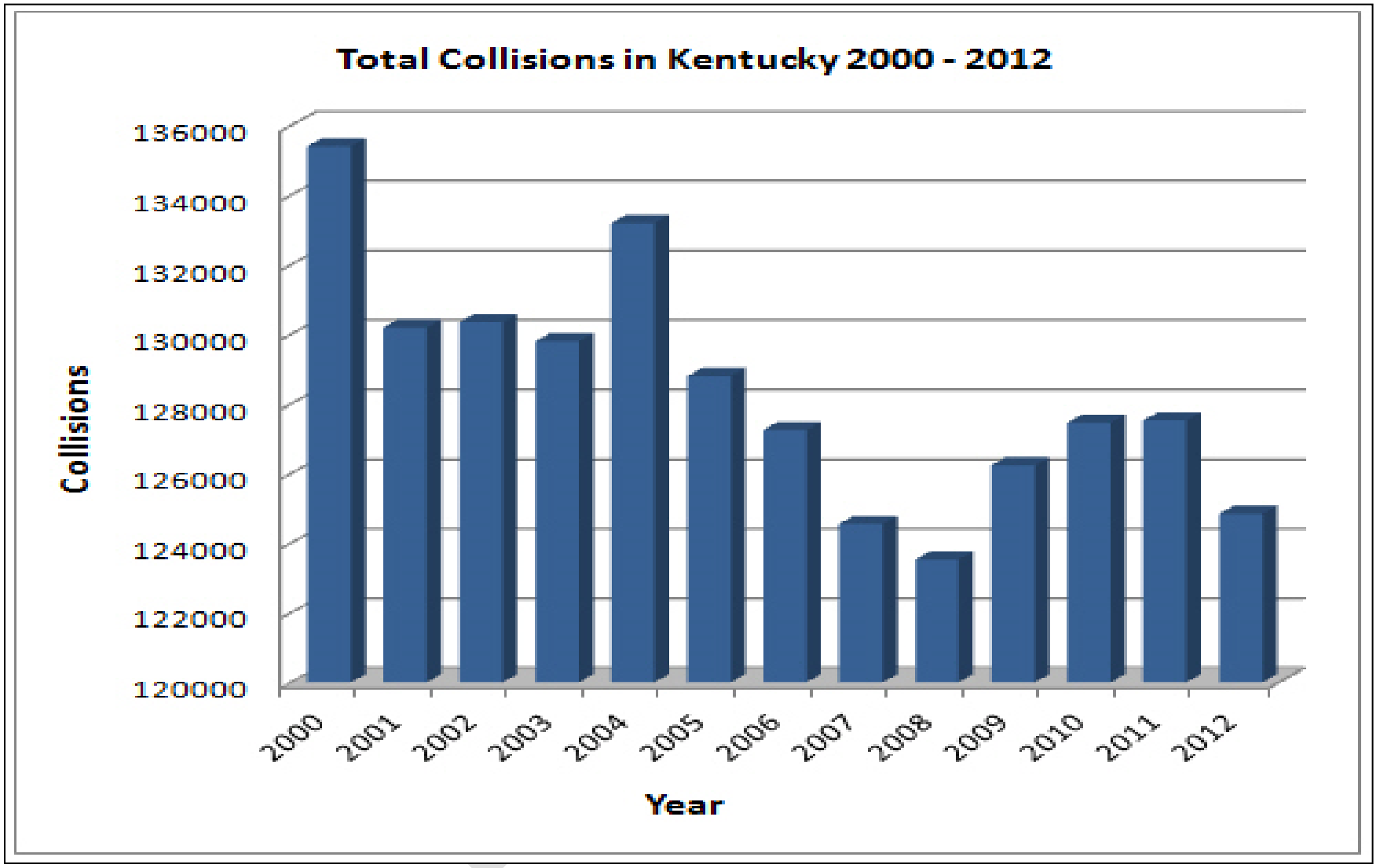


Figure 5.2.1 I - Total Highway Collisions in Kentucky (2000-2012)

5.2.1-6.5 Security

Improving safety and security remains the public's highest concern for Kentucky's transportation system. Coordination among all agencies is necessary to address the many factors related to improving safety and security. Some of those factors include: increasing the use of safety equipment, improving driver skills and driver awareness, improving road and pavement conditions, decreasing congestion through innovative traffic control methods, monitoring and addressing roadway conditions under inclement weather conditions, deployment of Intelligent Transportation Systems (ITS) to facilitate traffic flow, and increasing communication to the public. All of these factors also serve to increase the security of our transportation systems.

The KYTC is responsible for the aggressive management of transportation assets and the transportation infrastructure during a threat of, or immediately following, an emergency or disaster incident which is critical to the safety of all state residents and transients. This function includes providing for coordinated plans, policies, and actions of state and local governments to ensure the access and safety of the public traveling on the transportation system during all hazards. Once the threat or hazard no longer exists, KYTC is also responsible for prompt inspections of the transportation infrastructure and for facilitation of orderly re - entry into the area after an evacuation. Other missions may not involve evacuations, but are equally important. These may include responding to weather conditions, or re - routing traffic to protect travelers from hazardous material. Hazards requiring action by KYTC include:

- Tornados
- Winter Storms
- Wildfires
- Flooding
- Dam Failure
- Hazardous Materials
- Earthquakes
- Weapons of Mass Destruction
- National Security Emergencies

5.2.1-7 Congestion

- ***GOAL:* Provide a reliable transportation system that effectively and efficiently moves people and freight.**
- ***GOAL:* Provide reliable connectivity and access - locally, regionally, and globally - for people and freight.**
- ***GOAL:* Provide for the safe and secure movement of people and freight.**

A major challenge facing the KYTC is lessening congestion and its effects on keeping Kentucky moving. Congestion can be an issue anywhere, whether it is a recurring event such as daily commuter traffic tie-ups or non-recurring due to crashes or weather conditions. It can create travel delays, negatively impact the economy and air quality and increase the potential for crashes. While it is unlikely that congestion can ever be eliminated, the KYTC continues to address the issue at every opportunity and seek innovative and cost-effective mitigation solutions wherever possible.

Traditional mitigation measures such as building new roads or adding traffic lanes may no longer provide the greatest value for the Commonwealth's transportation funds. Instead, the KYTC will better serve transportation system users by pursuing alternatives that expand capacity along currently established corridors and non-traditional options that result in fewer vehicles on the road network that will likely include technological advancements in both vehicle operation and transportation systems. The ultimate solution is a system where the road network, vehicles and users can effectively communicate with each other to improve efficiency.

Traffic signals are a key component of the KYTC efforts to manage congestion. To many, traffic signals are an ultimate remedy for traffic problems at intersections. However, unwarranted installations can actually adversely impact both the safety and efficiency of vehicular, bicycle and pedestrian traffic. As a result, the KYTC normally considers the installation of traffic signal devices primarily when circumstances indicate that it may be difficult for road users to safely determine their own right-of-way. Even so, Kentucky's state highway system includes over 3,200 traffic signals. Approximately 70% of these devices are maintained by the KYTC, with the remaining 30% falling under the authority of Kentucky's larger cities like Louisville and Lexington.

In order to maximize the efficiency of traffic flow along certain corridors, many signals have been incorporated into coordinated systems. These systems enable traffic signals in close proximity to communicate with each other to provide favorable signal timings that move traffic efficiently through a corridor or within a defined area. About 175 coordinated signal systems are currently maintained by the KYTC statewide.

The KYTC performance goal is to update signal system timing at least once every three years to maximize efficiency through these critical areas. The KYTC also communicates with 60% of the traffic signals statewide, enabling remote monitoring of discrepancies in timing and other operational issues, reducing the amount of field work necessary and dramatically decreasing the amount of time that traffic signals are not operating as designed.

The use of Intelligent Transportation Systems (ITS) and coordinated weather response are other strategies for dealing with congestion along the highway network. ITS is a broad

term referring to many of the electronic devices along our highways. These interconnected devices provide real-time traffic flow information to the KYTC, which is in turn relayed to the traveling public via electronic signs along the roadway, the 511 telephone system, the KYTC website and various media outlets. By 2035, however, direct communication between the sensors and vehicles is expected to be commonplace.

The National ITS Architecture was used as a guide to update Kentucky's Statewide ITS Architecture. National ITS Architecture defines the components of the surface transportation system, how they interact and work together, and what information they exchange to provide ITS services. It includes much of the upfront analysis and planning information necessary to deploy ITS including project definition and requirements, information exchange requirements, system evaluation criteria, cost development information, communications analysis and the benefits of deployment of specific ITS applications. National ITS Architecture recommendations and projects were mapped against the goals in Kentucky's ITS Strategic Plan to determine which were most directly associated with accomplishing those goals, and specific project recommendations were developed. An update of Kentucky's Statewide ITS Architecture was completed in 2014.

"The double crossover interchange…implemented at the Harrodsburg/New Circle intersection greatly reduces congestion and makes the area safer…Inventive solutions such as this should be researched and implemented across the state."

Survey Participant, Jessamine County

Among the most visible of the KYTC ITS programs and projects are several operational freeway traffic management centers. These centers use digital message signs, cameras, 511, the Highway Advisory Radio System (HARS), pavement sensors, weather stations, and the Safety Assistance for Freeway Emergencies (Safe) Patrol to improve traffic conditions and safety along Kentucky highways.

Coordinated weather responses bring the KYTC crews on duty during the most severe weather to ensure that the traveling public remains safe and emergency crews can operate effectively. During the winter months, the KYTC crews are supplemented by contractor forces to ensure that roads are addressed in a timely fashion. The state maintained system is prioritized so that highly-traveled and emergency routes are kept as clear as possible while lower priority roads are treated as staffing allows. The KYTC spends approximately $30 million annually on salt and other chemicals, contractors, equipment and employee overtime pay to keep Kentucky's road network operational during winter storms.

The KYTC web-based "Congestion Toolbox" identifies additional strategies and technologies to address moving traffic more efficiently (http://transportation.ky.gov/Congestion-Toolbox/Pages/default.aspx). In addition to more traditional solutions, the toolbox includes innovative ideas like the double crossover diamond interchange, in which both directions of traffic on an interchange crossroad move to the opposite side of the roadway, facilitating left-turn movements onto the freeway. The newly constructed interchange at Harrodsburg Road with New Circle Road in Lexington is an example of this innovative alignment. Single point urban interchanges, where all turns are made from a single traffic signal centered in the overpass, have been installed at several interchanges across the state. Reconstruction of intersections into roundabouts is yet another option, in which a circular intersection is created around a central island, slowing traffic and moving it in a single direction to multiple intersections.

A congestion mitigation strategy often overlooked is simply reducing the number of vehicles on the road. For example, water transport of freight is the most fuel-efficient method of transportation, and a single 15-barge tow can carry as much as nearly 900 trucks, while a standard unit railroad train can transport as much freight as almost 400 trucks.
The number of personal vehicles may also be reduced by encouraging businesses to permit flexible or non-standard work schedules, which would not necessarily reduce the number of vehicles but would distribute traffic flow on the system over a wider period of time. Encouraging an increase in telecommuting and improving pedestrian and cycling facilities would also help reduce the total number of system users.

5.2.1-8 Freight Movement

- ***GOAL:*** **Ensure that the process which develops and maintains the transportation system considers the dependable access to markets, jobs, and resources.**
- ***GOAL*****: Provide reliable connectivity and access - locally, regionally, and globally - for people and freight.**
- ***GOAL*****: Provide for the safe and secure movement of people and freight.**

Kentucky is ideally located near the center of the country and along major national freight corridors for carrying goods and commodities by highway, rail, river and air. These major corridors provide reliable local, regional and global access for people and freight crucial to the current and future economy of the state. Freight movements benefit not only the businesses being served but also the transportation, warehousing and logistics industries providing the service as well as the local economies of the areas in which they are located. As a crucial element of economic development, availability of an effective freight network provides a direct benefit to the Commonwealth, its residents and businesses.

> *"The Commonwealth should look toward the future for development of transportation facilities and services. I feel that river and rail freight/cargo transportation systems will be of increasing importance due to the economics of these types of transportation."*
>
> Survey Participant,
> Floyd County

Most of Kentucky's freight activity takes place on a regional basis, originating both within and from surrounding states, and requires regional and multi-state cooperation to produce the most efficient and effective transportation system possible. For example, the air cargo facility for Cincinnati, Ohio is physically located at the Cincinnati/Northern KY airport in Hebron, Kentucky. As a result, planning in the area must include both states as well as the Ohio Kentucky Indiana Regional Council of Governments (OKI). Other KYTC partners in freight planning activities include local Metropolitan Planning Organizations (MPOs), regional Area Development Districts (ADDs), and freight planners from surrounding states.

Trucks move about 70% of freight (aka goods) flow, by value, through Kentucky. Because they carry the largest share of freight, the trucks are very visible and the public often expresses a desire for freight to be shifted to the other modes whenever possible. **Figure 5.2.1 J** provides a graphical representation for the movement of freight via tonnage through various modes throughout the nation for 2011, While **Figure 5.2.1 K** illustrates the movement of freight nationwide along the National Highway Network (NHN) by truck. Since trucking provides such a large economic benefit to the economy, it is not reasonable to completely remove them from highways. We must always keep in mind that regardless of the trip our goods take, they all start with a truck and end with a truck.

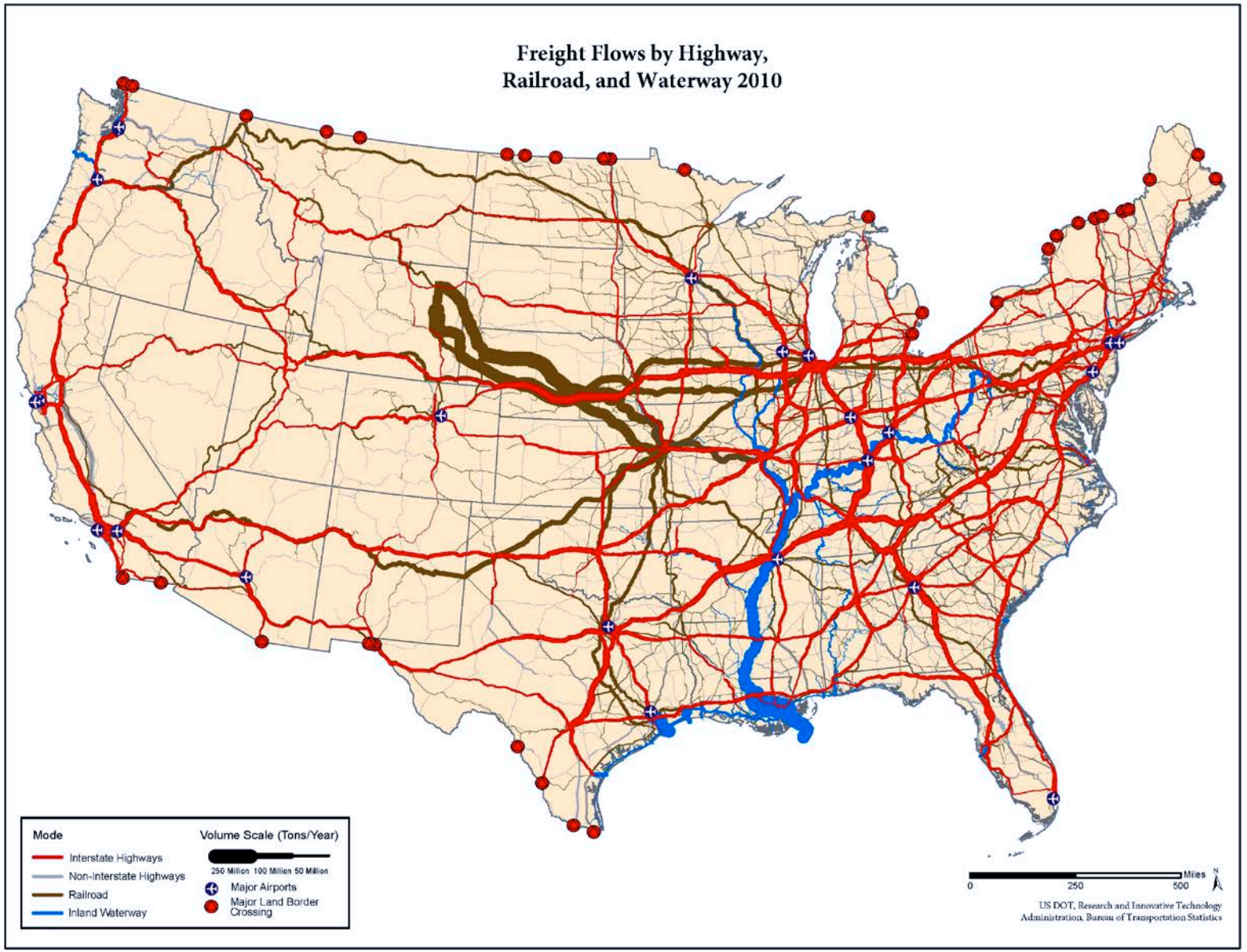
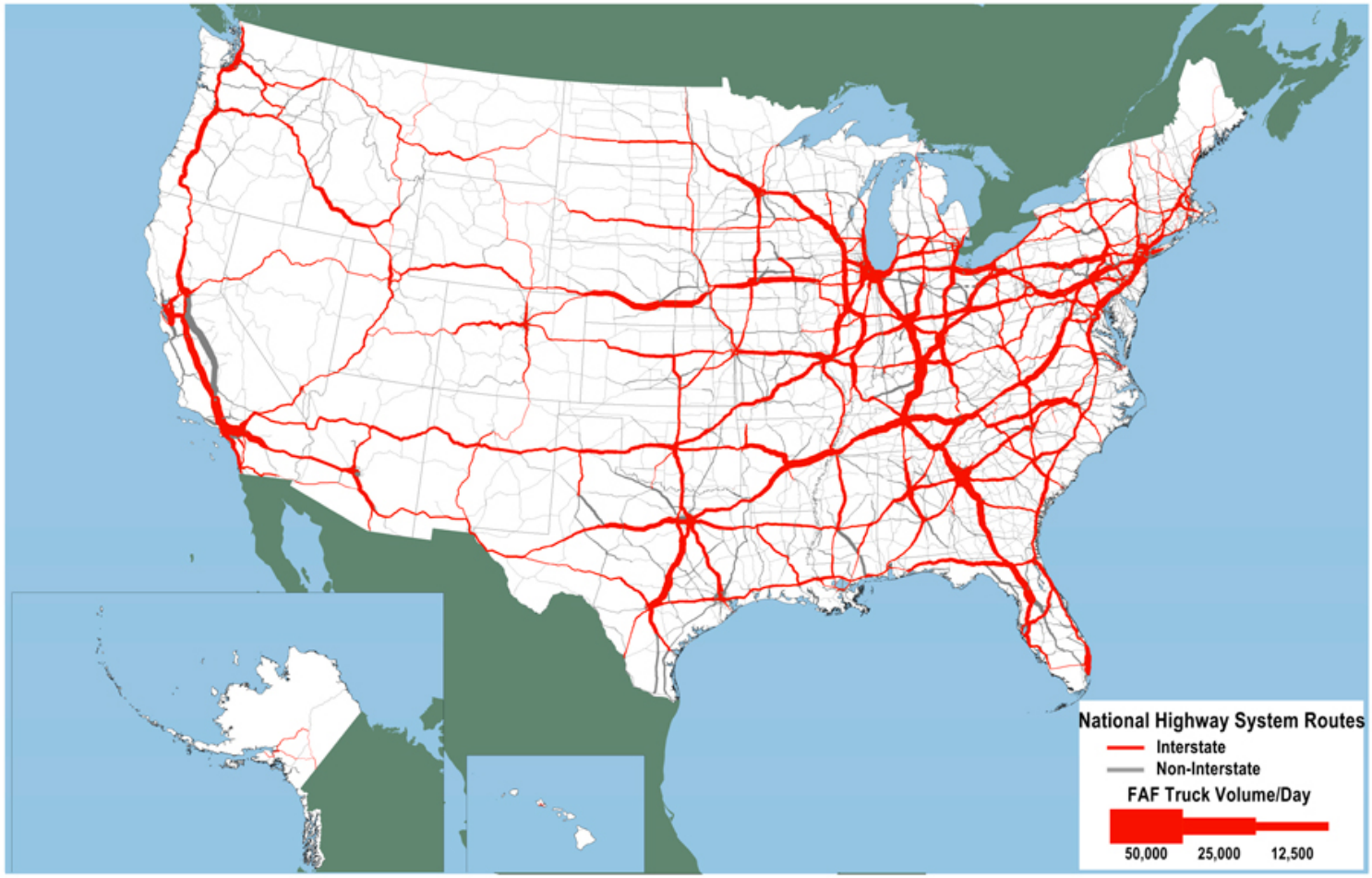


Figure 5.2.1 J – 2010 National Freight Movement by tonnage on Highways, Railways and Inland Waterways

Average Daily Long-Haul Freight Truck Traffic on the National Highway System: 2007



Note: Long-haul freight trucks typically serve locations at least 50 miles apart, excluding trucks that are used in movements by multiple modes and mail.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

Figure 5.2.1 K – Long Haul Freight Movement on National Highway Network by Truck in 2007

Figure 5.2.1 L shows the movement of goods by truck with Kentucky composing at least a portion of the freight route as part of the National Freight Analysis Framework (FAF). The KYTC does continue to strive, however, to encourage use of all modes of transportation in the transfer of our goods.

Rail cars carry about 8% of Kentucky freight value but 26% of freight tonnage over some 2,500 miles of track across the state. While much of that freight is coal, products shipped by rail in Kentucky also include new automobiles, aluminum, grain, chemicals and peanut products. Kentucky's waterways are also a great transportation resource. More than 25% of the nation's waterborne commerce is shipped on the Ohio River, which flows along the state's northern boundary. The Mississippi River on Kentucky's western border connects the state to deep-water ocean ports. Kentucky's seven riverports provide services for transfers of commodities between barges and trucks or rail cars for more local transportation. Kentucky ranks third in the nation in total air cargo shipments as a result of the freight sorting and distribution centers at the Louisville and Cincinnati/Northern KY airports.

Kentucky's Constitution requires Highway Funds to be spent only on roadways. With this in mind, the selection of specific freight transportation modes to be used by the private sector for improvements is an economically driven private sector decision. This decision to utilize a particular mode of transportation is made collaboratively by shipping corporations and their customers. The KYTC can, however, play a part in improving access to freight facilities through its process of identifying roadway improvements.

As part of its MAP-21 reauthorization, Congress recognized the importance of a strong freight network to ensure competitiveness in the global economy. Freight goals include reducing congestion, increasing productivity and economic efficiency and improving safety, security and resilience. MAP-21 provides incentives to prioritize freight movement highway projects by increasing the federal share of funding for freight-related projects and only funding those projects identified in state freight plans. The Kentucky Statewide Intermodal Freight Plan, created in 2006 and updated in 2007, focuses on addressing highway congestion and bottlenecks while promoting other transportation modes to divert freight traffic from highways. The plan can be accessed at http://transportation.ky.gov/planning/documents/Freight%20Plan%20Extended%208%202007.pdf. An update to the plan is currently underway, with anticipated completion in the summer of 2014 that will include goals for maintaining and promoting intermodal programs throughout the state.

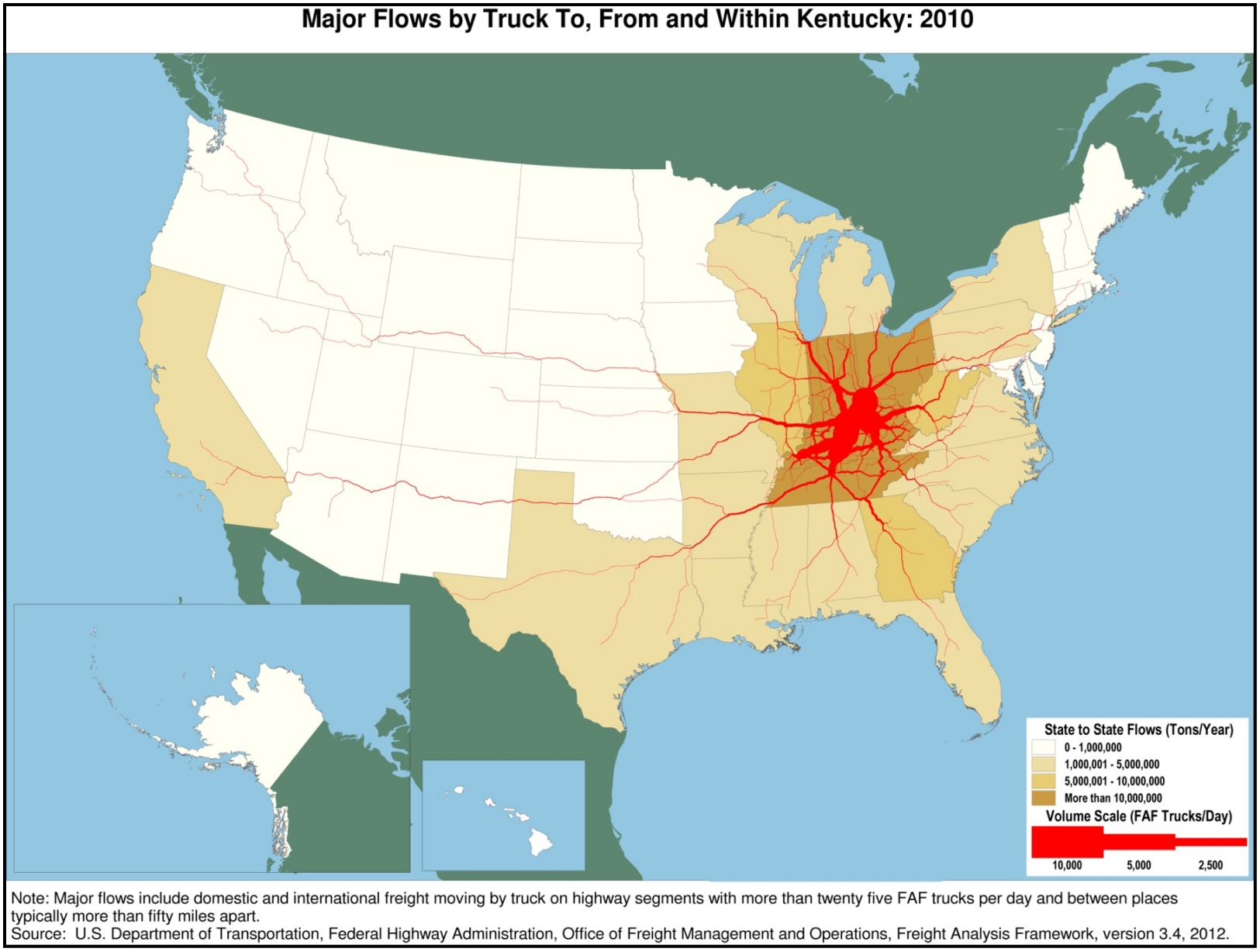


Figure 5.2.1 L – National Freight (Goods) Routing to, from and through Kentucky via Truck

5.2.2 Public Transit

- ***GOAL:*** **Adequately consider all modes of transportation in the creation of an integrated system for the dependable movement of people and freight.**
- ***GOAL*****: Provide for reliable local, regional, and global access for people and freight.**
- ***GOAL*****: Provide for the safe and secure movement of people and freight.**
- ***GOAL:*** **Ensure that the process which develops and maintains the transportation system adequately considers the dependable access to markets, jobs, and resources.**

"I believe that a successful transportation network must include the non-automobile transportation alternatives. Transit service (both rail and bus) along with bike-ways and sidewalks truly enhance a transportation network and provide ways to travel without a car."
Warren County Survey Participant

5.2.2-1 Overview of Public Transit

Kentucky's public transit bus systems provide approximately 31 million transportation passenger trips annually. Almost 3 million trips per year are for the elderly and persons with disabilities, transporting them for medical treatment and other needed services. Additionally, public transit routes for commuters, whose primary purpose is employment, operate throughout the state of Kentucky. Intercity services, connecting our rural areas and smaller communities with larger communities have also become an important part of public transit in Kentucky. Regardless of the distance of the trip, the success of transit services in Kentucky is dependent upon a highway system that is well maintained and provides high mobility.

Kentucky has 25 rural public transportation providers that are identified by service area boundary statewide in **Figure 5.2.2 A**. Given the involved nature of this map, this image was also broken up into four regions that are shown with Counties from left to right in **Figure 5.2.2 B** - Western Rural, **Figure 5.2.2 C** - Central Rural, **Figure 5.2.2 D** – Bluegrass Rural and **Figure 5.2.2 E** – Western Rural.

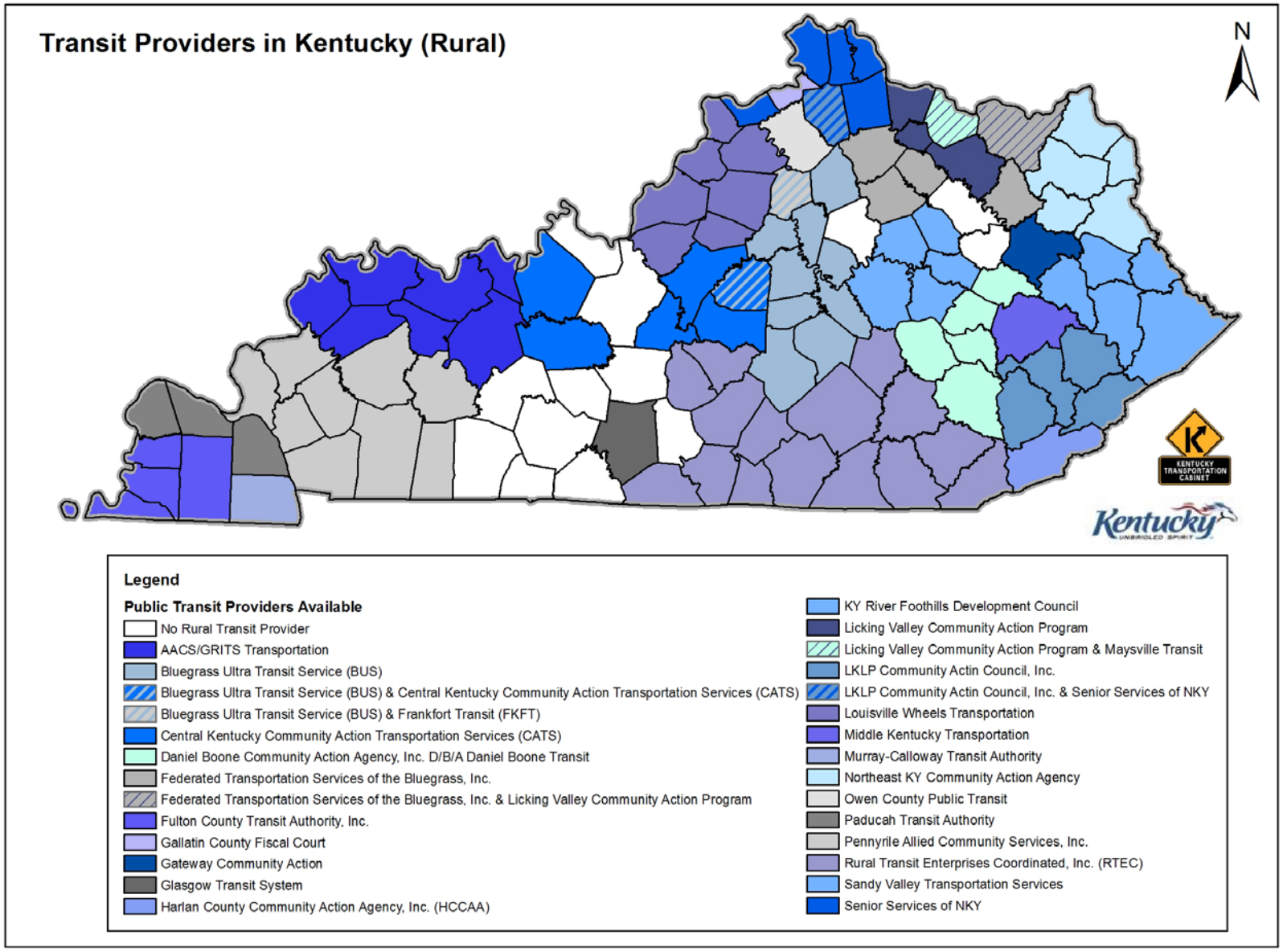


Figure 5.2.2 A - Rural Transit Providers in Kentucky

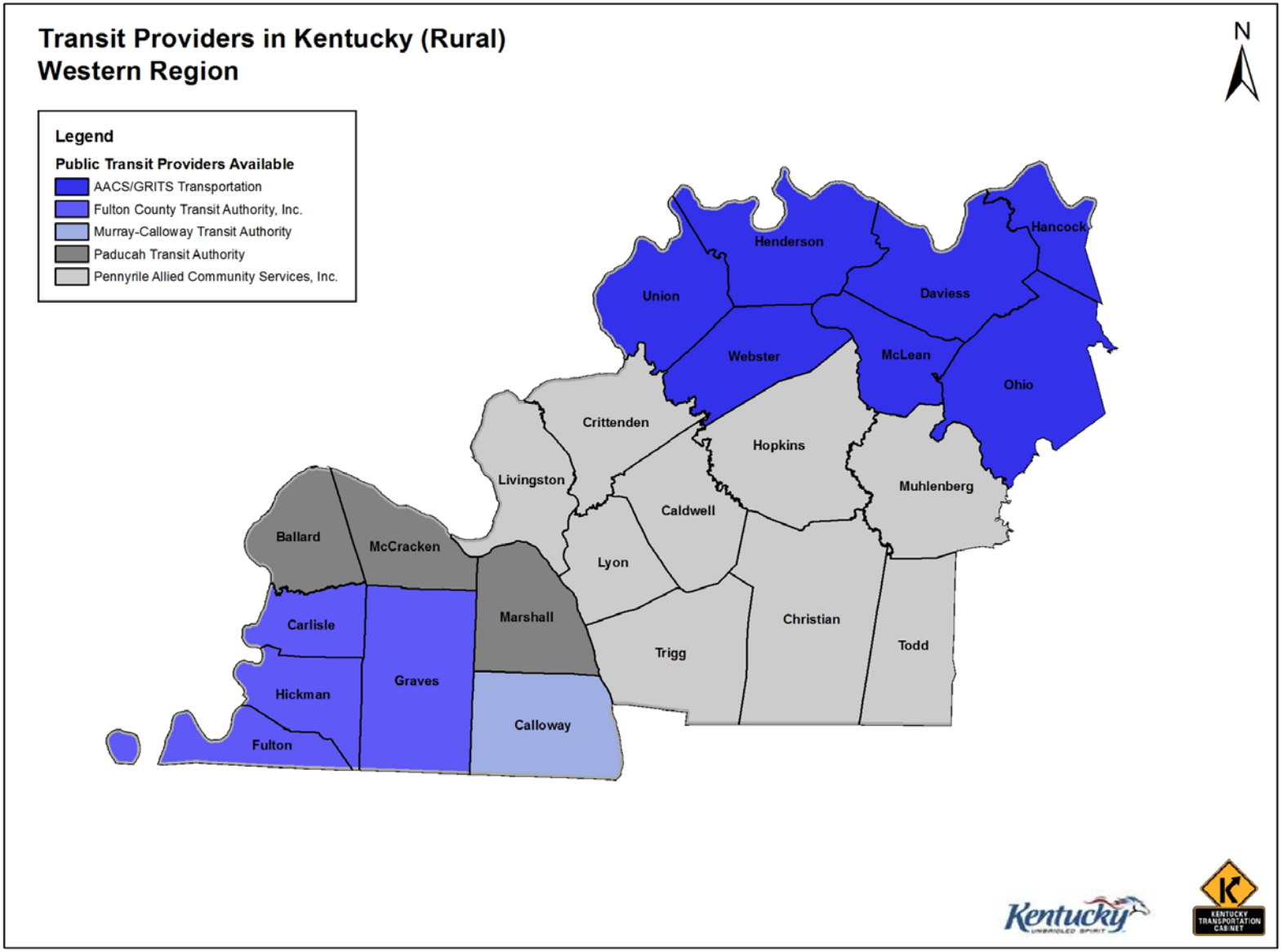


Figure 5.2.2 B – Kentucky Western Region Rural Transit Providers

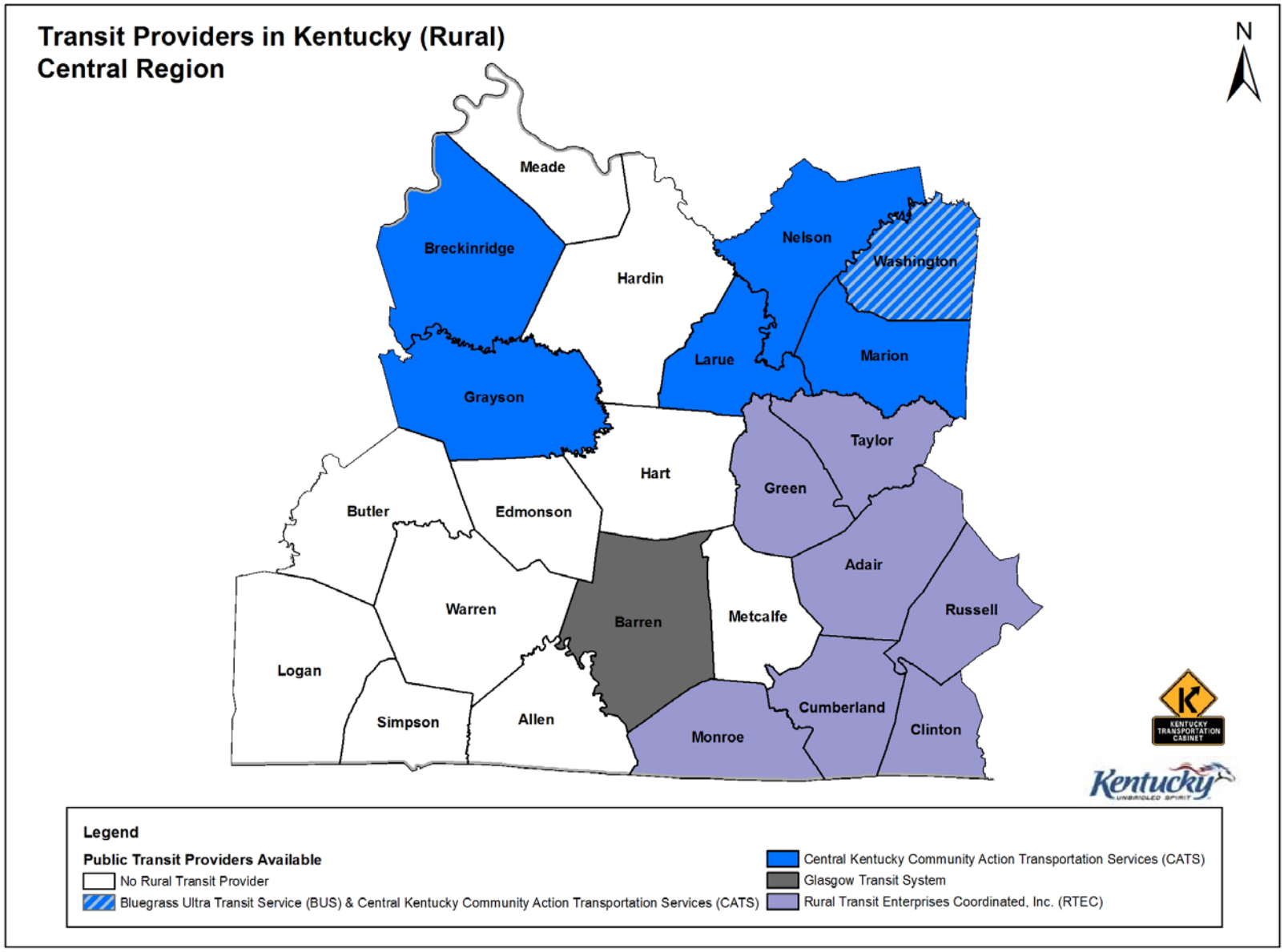


Figure 5.2.2 C – Kentucky Central Region Rural Transit Providers

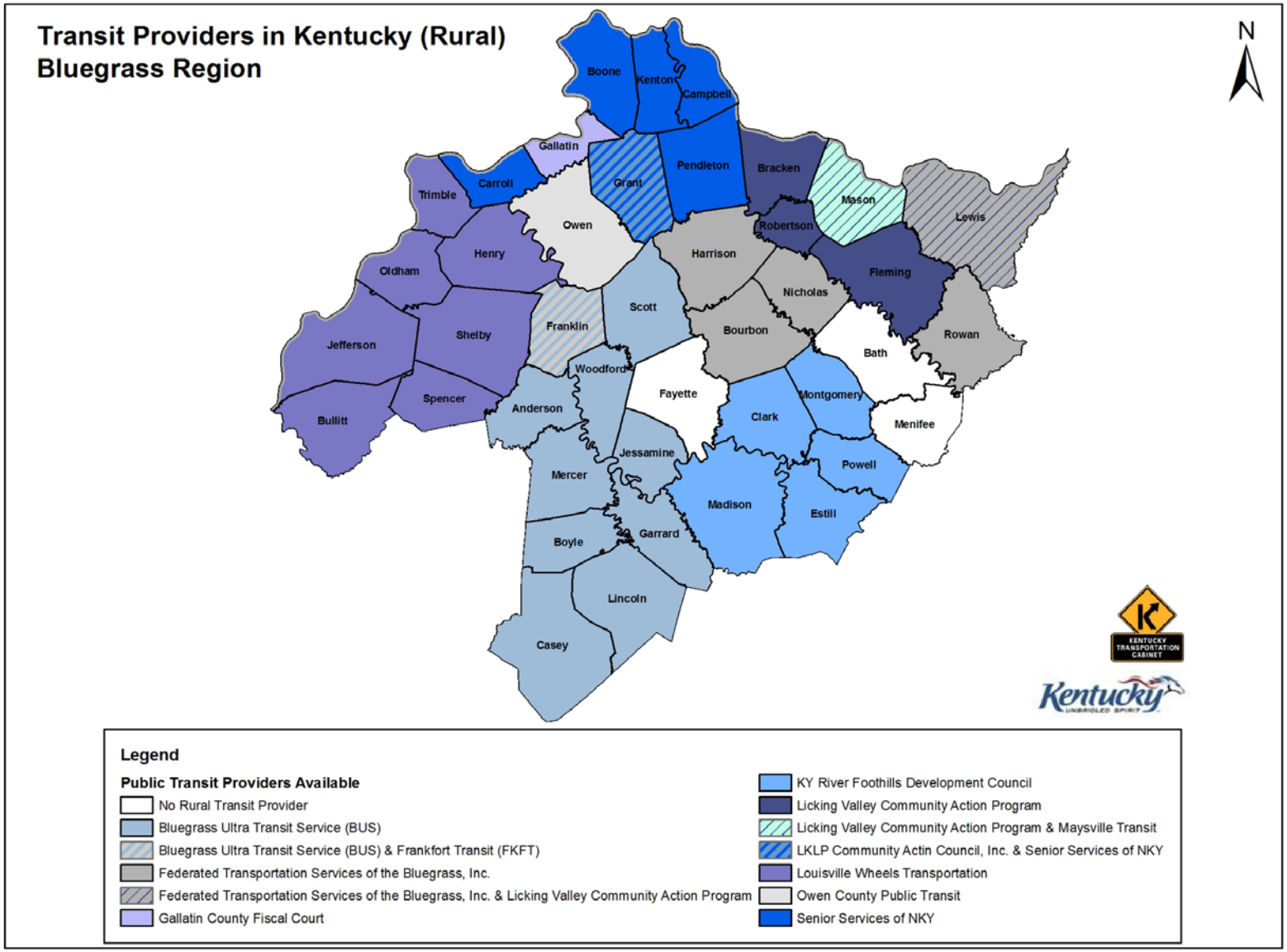


Figure 5.2.2 D – Kentucky Bluegrass Region Rural Transit Providers

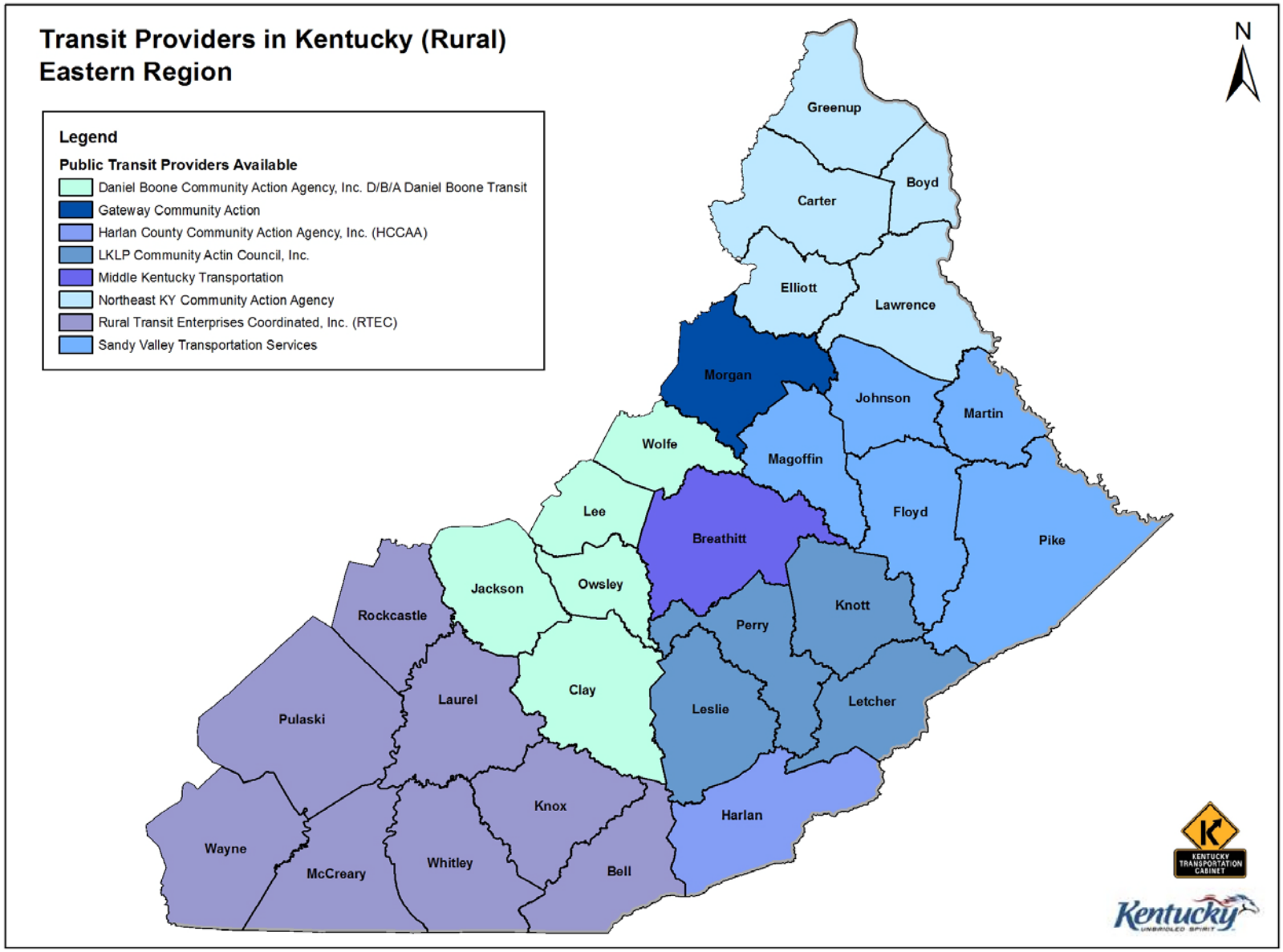


Figure 5.2.2 E – Kentucky Eastern Region Rural Transit Providers

Listed within **Table 5.2.2 A**, Kentucky has 9 small urban and large urban city bus/transit systems located throughout the state as shown in **Figure 5.2.2 F**. The larger systems provide fixed route services with complementary Para-transit that accommodate the disabled. These systems strive to reduce the time a rider has to wait for the next bus and increase the frequency of routes while attempting to maintain diverse accessibility for their citizens. Smaller cities usually operate a deviated fixed route system in which there are regular stops and times, but the bus may go off the route for a pickup or drop off and then return to the route. Rural systems use demand-response type services in which a call must be made to schedule a trip.

Short Name	National Transit Database ID	Location	Long name	Website
LEXTRAN	4017	Lexington	Lexington Transit Authority	http://lextran.com/
TARC	4018	Louisville	Transit Authority of River City	http://www.ridetarc.org/
TANK	4019	Fort Wright	Transit Authority of Northern KY	http://www.tankbus.org/
GObg	4184	Bowling Green	Community Action of Southern KY	http://www.casoky.org/transportation
ABS	4016	Ashland	Ashland Bus System	http://www.ashlandky.gov/index.php/abs-home
HART	5107	Henderson	Henderson Area Rapid Transit	http://www.cityofhendersonky.org/index.aspx?NID=199
OTS	4020	Owensboro	Owensboro Transit System	http://www.owensboro.org/transit
TACK	n/a	Elizabethtown-Radcliff	Transit Authority of Central Kentucky	No website
CTS	4092	Clarksville	Clarksville Transit System	http://www.clarksvilletransit.org

Table 5.2.2 A - Urban Fixed Route Transit Systems in Kentucky

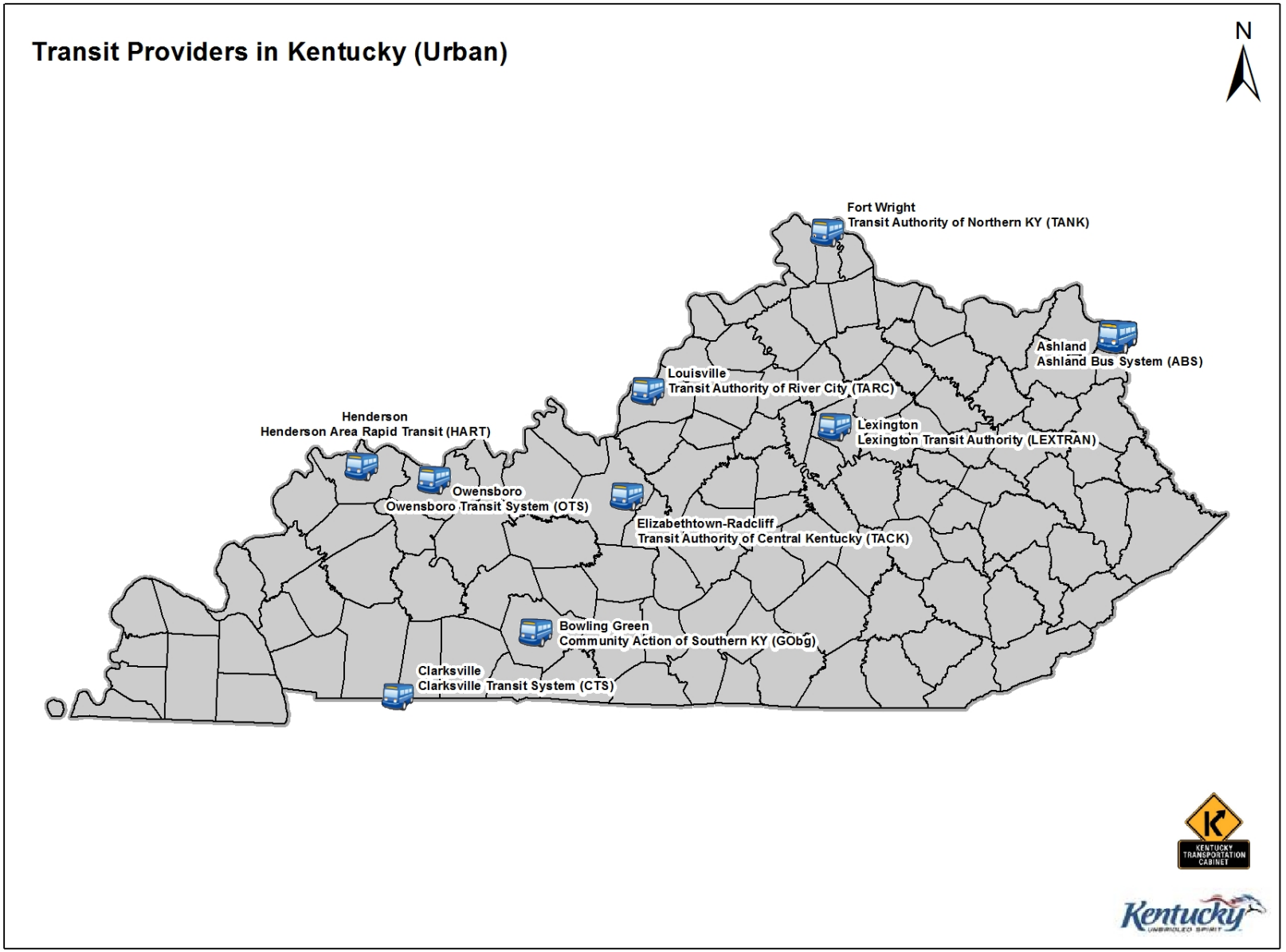


Figure 5.2.2 F - Urban Fixed Route Transit Systems in Kentucky

Public transit agencies in rural areas and small communities throughout the Commonwealth are providing intercity services which allow rural citizens to make connections with scheduled intercity bus service. For example, Louisville WHEELS Transportation operates a regular intercity bus route from Bullitt County to Louisville to provide access to Louisville's Transit Authority of River City (TARC), Greyhound commercial bus terminals and the Louisville International Airport. Leslie, Knott, Letcher, Perry (LKLP) Community Action Council in Eastern Kentucky provides intercity routes among the cities of Hazard, Whitesburg, Hyden, and Hindman. Other rural systems across the state provide "feeder services" into routes that eventually arrive at Greyhound commercial bus terminals or other connecting points such as Amtrak passenger rail stations.

All Kentucky counties are covered with public and/or specialized transportation services. The core needs of public transit riders remain the same – employment and medical needs. As illustrated in **Figure 5.2.2 G** and **Figure 5.2.2 H**, ridership is increasing across the nine urban transit systems in Kentucky since 2006.

All Kentucky counties are covered with public and specialized transportation services. The core needs of public transit riders remain the same – employment and medical needs.

Some specialized transit providers for the elderly or persons with disabilities, such as the senior citizen centers, only transport their own patrons. However, there are more accessible vehicles and different types of accessible vehicles than ever in the Commonwealth, and drivers are receiving intensive training on serving the elderly and persons with disabilities. As awareness of all the transportation services for the general public grows, the same service for the elderly and persons with disabilities should also grow.

"Public Transportation providers and brokers in Kentucky need continued support. I have many family members and friends that rely heavily on public transit agencies to get to medical appointments and attend necessary programs."
Rockcastle County Survey Participant

Incentives and tools are needed to communicate with and educate the public, local and state leadership on the benefits of public transit. A balanced public transit system is needed to meet all these needs. However, Local, State, and Federal funds are being reduced or are not keeping up with inflation. Some public transit providers have had to raise fares, while cutting hours and routes creating affordability concerns for users on low or fixed income. Federal assistance may help keep fares low, but fares can still be a problem for some individuals.

"As I advance in age, public transportation may rise on my list of priorities."
Madison County Survey Participant

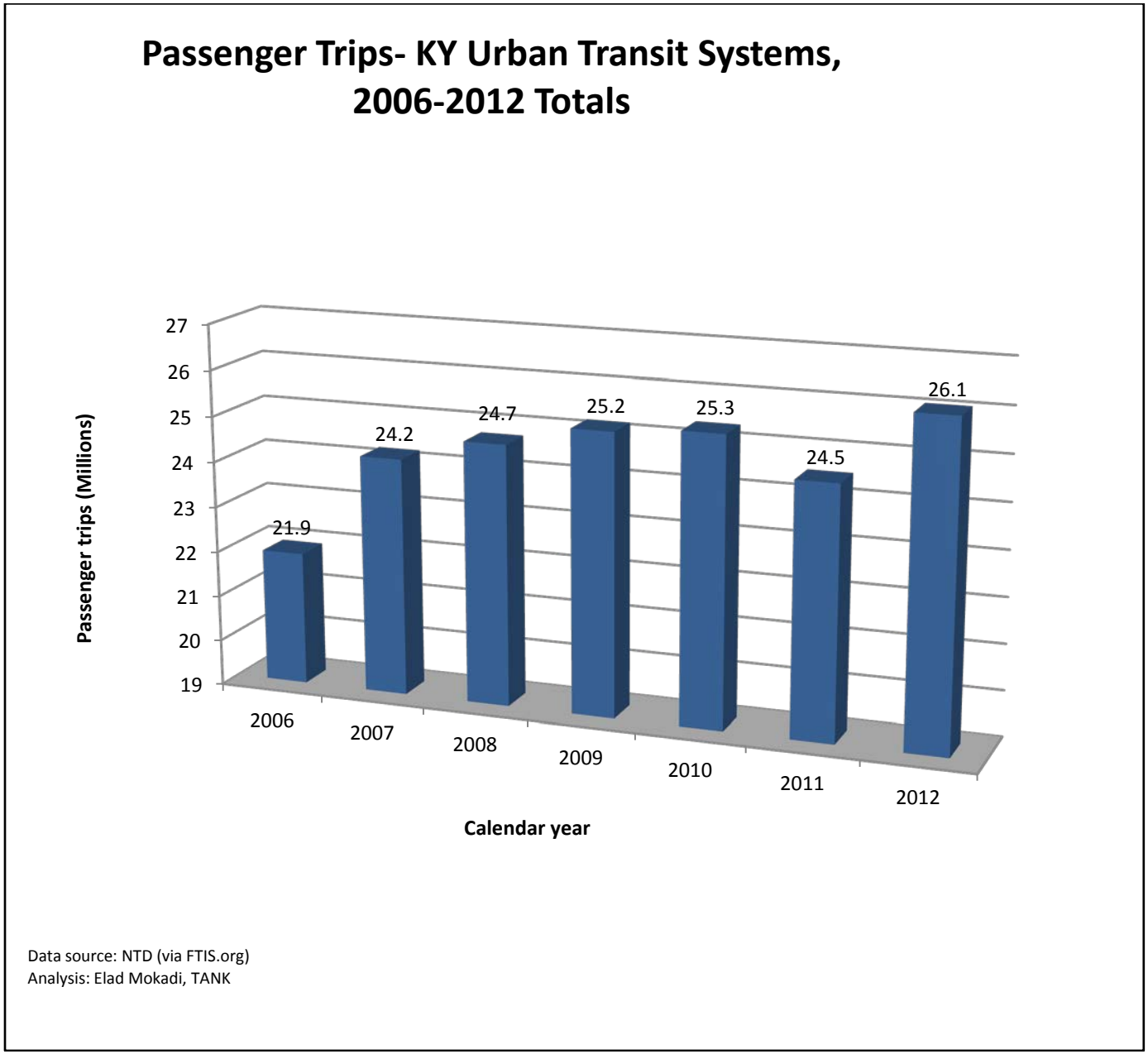


Figure 5.2.2 G - Total Passenger Trips for Urban Transit Systems in Kentucky

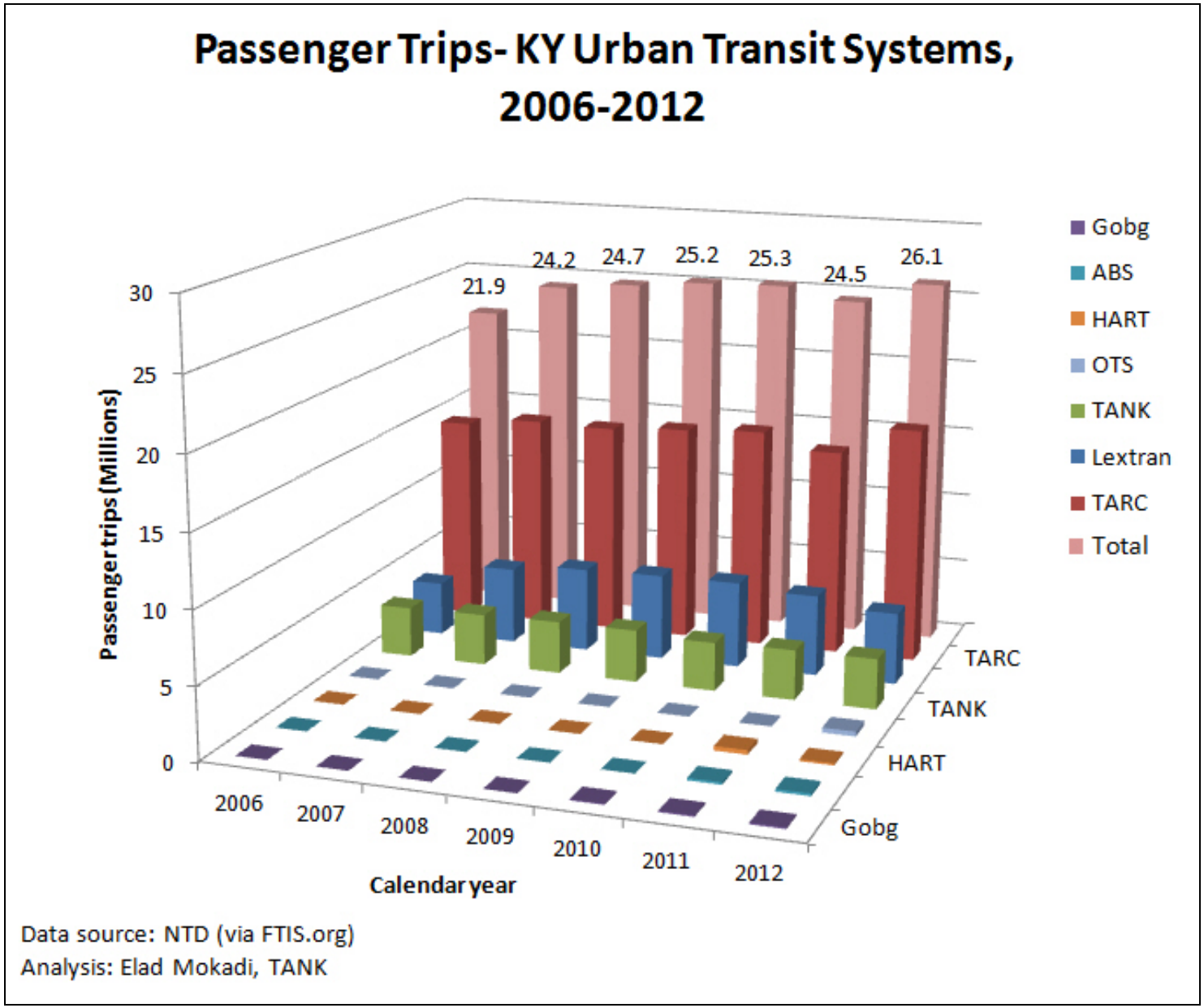


Figure 5.2.2 H - Passenger Trips of the Urban Transit Systems in Kentucky

5.2.2-2 KYTC Office of Transportation Delivery

The Office of Transportation Delivery (OTD) administers FTA programs in Kentucky. The OTD is responsible for seeking grant funds; the oversight and implementation of various statewide public transit grants; and coordinating human service transportation such as non-emergency medical transportation.

In regards to administering federal transit grants, KYTC/OTD has the primary responsibility for the following:

- Develop and implement public transportation programs throughout the state;
- Ensure adherence to federal program guidelines by all sub-recipients through periodic monitoring and oversight;
- Notify eligible and/or potential local entities of the availability of programs;
- Develop project selection criteria; Solicit applications;
- Ensure fair and equitable distribution of program funds;
- Ensure the maximum feasible coordination of transit resources at both the state and local levels; and
- Ensure a process whereby private transit and para-transit operators are provided an opportunity to participate to the maximum extent feasible.

However, all federal funds for Kentucky's major transit systems do not flow through KYTC, but directly to the public transit systems in each of Kentucky's urban areas.

In addition to public transportation, the OTD is responsible for the Human Service Transportation Delivery (HSTD) program. HSTD coordinates transportation services for the Department for Medicaid Services, Department for the Blind, and the Department for Vocational Rehabilitation. The coordinated transportation delivery program consists of 15 service regions, providing transportation services for all 120 counties. Kentucky's regional coordinated transportation system provided over 3.2 million trips in 2012 for the purpose of non-emergency medical transportation. The Office of Transportation Delivery has received a grant for $1.6 million to help with the transportation needs of our veterans, current military, wounded warriors and their families.

The OTD also collects operational statistical information from each of the rural and non-urbanized transit systems that include trips, miles, fuel, days, accessibility, etc. The statistics are reported to the USDOT/Federal Transit Administration (FTA) through the National Transit Database (NTD). The NTD is used by the Government and Congress to allocate public transit funding for each state. Revenue miles are also used within the NTD when funding is allocated. Larger transit systems do not report to the Cabinet, but report directly to FTA via the NTD.

5.2.2-3 Safety

To achieve the highest practical level of safety and security for all modes of transit is a goal of transit safety and oversight. Accident prevention and preventive maintenance for facilities and vehicles are strict requirements for all public transit systems in the Commonwealth. Safety issues are now expanding into the areas of hazardous materials, emergency preparedness, and criminal and terrorist threats.

The OTD with guidance and direction of the FTA is developing a statewide Public Transit Safety Plan to include all rural and non-urbanized area transit systems that will identify risks and minimize exposure to hazards. This plan will expand on what many public transit agencies are already jointly carrying out with their local communities through emergency preparedness. Performance targets will be developed or enhanced as part of this measure. FTA is developing minimum safety performance standards for transit vehicles which will be incorporated into the Public Transit Safety Plan. Also, The Drug and Alcohol Testing Program for public transit drivers, dispatchers, maintenance personnel, etc. is a valuable tool in maintaining the safety of the riding and driving public.

5.2.2-4 Future Needs

Public transit has been and will continue to be a quality of life issue. A dedicated source of funding is needed for public transit in Kentucky as in other States. Services are being reduced or eliminated because of the need for local funding and matches. In rural areas of the Commonwealth, especially, it is difficult for counties and communities to maintain public transit services and nearly impossible to expand these services because they do not have the local matches to access the federal funds. **Table 5.2.2 B** provides greater insight into funding issues facing public transit in Kentucky when compared to the other surrounding states. This table was created from the *2011 State's Support of Non-Highway Modes of Transportation: Investigation and Synthesis* by the KTC and can be viewed at the following link: http://www.ktc.uky.edu/projects/states-support-of-non-highway-modes-of-transportation-investigation-and-synthesis/.

The OTD, with guidance from the USDOT and the Federal Transit Administration (FTA), is developing a Transit Asset Management Plan (TAM) to implement a strategic approach for assessing needs and prioritizing investments to help bring the Commonwealth's public transit systems into a State of Good Repair. Under this plan, objective standards for measuring the condition of capital assets (equipment, rolling stock, infrastructure and facilities) will be set and performance measures established.

Public Transportation Mode[+]									
State	**Dedication of Fuel Tax Revenues to Highway Modes**	**State Agency**	**Financial Support**	**Bonding Authority**	**Dedicated Funding**	**Technical and/or Marketing Support**	**Operating Assistance**	**Capital Assistance**	**Distribution of Funds**
Kentucky	Constitutional	KYTC: Office of Transportation Delivery	Yes	Yes	No	Yes	No	Yes	Discretionary
Illinois	No – Multimodal	IDOT: Division of Public and Intermodal Transportation	Yes	Yes	Yes	Yes	Yes	Yes	Formula
Indiana	Statutory	INDOT: Office of Transit	Yes	Yes	No	Yes	Yes	Yes	Formula
Missouri	Constitutional	MoDOT: Transit Section	Yes	Yes	Yes	Yes	Yes	Yes	Formula
Ohio	Constitutional	ODOT: Office of Transit	Yes	Yes	No	Yes	Yes	Yes	Formula and Discretionary
Tennessee	No – Multimodal	TDOT: Office of Passenger Transportation	Yes	No	Yes	Yes	Yes	Yes	Formula and Discretionary
Virginia	No – Multimodal	Department of Rail and Public Transportation (DRPT)	Yes	Yes	Yes	Yes	Yes	Yes	Formula and Discretionary
West Virginia	Constitutional	WVDOT: Division of Public Transit	Yes	Yes	No	Yes	Yes	Yes	Discretionary
California	No – Multimodal	Caltrans: Division of Mass Transportation	Yes	Yes	Yes	Yes	Yes	Yes	Formula and Discretionary
Oregon	Constitutional	ODOT: Public Transit Division	Yes	Yes	Yes	Yes	Yes	Yes	Formula and Discretionary
Pennsylvania	Constitutional	PennDOT: Bureau of Public Transportation	Yes	Yes	Yes	Yes	Yes	Yes	Formula and Discretionary

[+]Reference: *2011 State's Support of Non-Highway Modes of Transportation: Investigation and Synthesis* by the Kentucky Transportation Center (KTC) using 2009 data.

Table 5.2.2 B –Public Transit Funding Comparison in Kentucky and Other States

As of 2013, preliminary information from the early stages of development of the TAM show over $57 million dollars immediately needed for replacement vehicles and over $10 million for facility renovations and expansions for rural and small urban systems. Asset Management will enable the Cabinet and OTD to try to balance the competing needs of operations, maintenance, reinvestment and system expansion. It will help to allocate limited resources between competing needs and competing uses. This document is in its preliminary stages and was developed through a survey of the State's rural and small public transit systems.

Additional information on the activities and responsibilities of the OTD as well as links to the transit resources across the state can be found at http://transportation.ky.gov/transportation-delivery/pages/default.aspx.

Maintaining the existing public transit system will continue to be a priority in the future. To help provide and sustain the best public transit services possible, the Cabinet and the Office of Transportation Delivery (OTD) will follow Federal guidelines in maintaining the Commonwealth's public transit infrastructure - including equipment, vehicles and transit facilities - in a State of Good Repair. Objective standards for measuring the condition of capital assets will be used to ensure that public transit systems in the Commonwealth are operating in a consistent, high-quality state and capital assets are functioning at their ideal capacity within their design life. Technology will continue to be used and expanded upon in order to improve the efficiency and effectiveness of operations and prolong the useful, safe life of transit vehicles.

Currently, there is a high investment backlog because of a significant gap between capital reinvestment needs and available federal and state funding. If needs are not addressed, there could be extended service disruptions or reductions.

Expanded services will also be needed and must involve coordination of services and resources to include updating and improving Infrastructure (vehicles, facilities, technology). The enhancement of mobility for the state's seniors and individuals with disabilities will remain a priority for the Cabinet and OTD as these populations continue to grow. Section 5310 of Chapter 53 of title 49 of the United States Code is one of the Cabinet's oldest and most valuable grant programs. The goal of the Section 5310 program is to improve mobility for seniors and individuals with disabilities by removing barriers to transportation services and expanding the transportation mobility options available. Vehicles that serve to help these efforts are awarded annually to organizations throughout the Commonwealth. The program requires coordination with other Federally-assisted programs and services in order to make the most efficient use of Federal resources.

Public Transit can integrate further with other modes of transportation. Highway resources should be considered for High Occupancy Vehicle lanes, bus only lanes, wider shoulders for bus operations, etc. Sidewalks, bike paths and multi-use pathways should also be considered to accommodate public transit. Park and ride lots, vanpools and other clean air initiatives are also working with public transit agencies in joint efforts.

In the future, livable communities with reliable transit service and joint transit oriented development efforts will be emphasized as supported by the FHWA and the FTA.

Public transit can be a valuable partner and should be at the table in State and local land use and economic decisions. Transit, labor and social service organizations should coordinate resources to meet economic, educational, job-related and social needs in the most efficient and effective way possible. A dedicated source of funding for public transit in Kentucky, as other states have, could give the State a competitive edge when vying for national projects.

5.2.2-5 Light Rail and Intercity Passenger Rail

The OTD partnered with the Georgia and Tennessee Departments of Transportation for a feasibility study regarding a high speed passenger rail corridor from Atlanta to Louisville (Atlanta-Chattanooga-Nashville-Louisville). The November 2011 study entitled, "High-Speed Rail Planning Study Atlanta-Chattanooga-Nashville-Louisville" investigated capital costs, funding and financing opportunities, operation and maintenance costs, ridership, revenue, operating ratios, and conducted a benefit-cost analysis. It concluded that capital costs for this corridor would be approximately $16 billion while the yearly operating and maintenance costs would run in excess of $250 million.

The Transit Authority of River City (TARC) in Louisville, which is the largest transit system in the state, has also explored the concept of light rail in the Louisville area. They have found that funding and ridership continues to be the major hurdles to development of light rail in 2004.

5.2.2–6 References and Links

Kentucky Public Transit Directory (a copy can be requested through the Office of Transportation Delivery/KYTC)
Office of Transportation Delivery/KYTC website: http://transportation.ky.gov/transportation-delivery/pages/default.aspx.

"State's Support of Non-Highway Modes of Transportation" by the Kentucky Transportation Center http://www.ktc.uky.edu/projects/states-support-of-non-highway-modes-of-transportation-investigation-and-synthesis/.

5.2.3 Aviation

"We need to continue working with the FAA to get more general aviation airport runways lengthened to 5,000 linear feet. Having at least a 5,000 linear foot runway opens an airport to more business aviation and thus enhances a community's economic potential. This minimum runway length of 5,000 feet is critical due to being required by insurance companies insuring the aircraft carrying freight and business leaders."
KBT Stakeholder Meeting Members

Air transportation in Kentucky is divided into five categories: General Aviation, Commercial Passenger Service, Air Cargo Service, Military Service, and Emergency Medical Service.

5.2.3-1 General Aviation

Kentucky's Air Transportation system includes a network of 53 public use general aviation airports. A general aviation airport is one that does not have regularly scheduled passenger service and is not military. These airports provide our citizens with access to the National Airspace System (NAS) and are economic development magnets. Operations at these airports include the following:

- Business aircraft
- Freight supplies for local manufacturing
- Recreation flying
- Police and military activities
- Medical evacuation (Medevac) operations
- Traffic reporting
- Crop dusting
- Aerial photogrammetric services
- Wildlife surveys
- Disaster relief
- Training at Nation-leading aviation education program

The state organization charged with the oversight of these 53 general aviation airports is the Kentucky Transportation Cabinet (KYTC) through the Department of Aviation (KDA). The KDA also operates and maintains the Commonwealth's air fleet, is responsible for the four state-owned airports (Capital City Airport in Frankfort and three State Park airports). Within the KDA is the Kentucky Airport Zoning Commission (KAZC), which reviews and permits the construction of all structures built on or near airports. The KDA also inspects approximately 250 private airports and heliports for safety compliance and is involved in all airport projects involving the Federal Aviation Administration (FAA) and local airport boards.

5.2.3-1.1 Future Concerns

Of primary and singular importance is a consistent and dedicated funding source as it is critical for the maintenance, safety and continued growth of our state's aviation transportation system. In order to keep our general aviation airports safe, vibrant and competitive with neighboring states, the following points need to be considered as we build a winning strategy over the next decade.

5.2.3-1.2 Current and Future Funding

Even though the vast majority of dollars spent on general aviation airport projects are appropriated through the FAA Airport Improvement Program (AIP), a reliable and consistent state funding mechanism is critical. In order to maintain operations at the current level, it is estimated that, over the next 22 years, the state funding needed for the continued operation of aviation in Kentucky will exceed $220 million ($10 million per year) per the KDA. This State funding stream is used in a variety of important ways, including required state match funding for FAA grants (currently 90% FAA, 7.5% KDA & 2.5% Local funds), safety and maintenance projects, state funded airport improvement projects and the day-to-day operation of the KDA. Further discussion on funding and financial assistance in Kentucky and other surrounding states for aviation programs can be found in the *2011 State's Support of Non-Highway Modes of Transportation: Investigation and Synthesis* study done by the Kentucky Transportation Center (KTC), which can be accessed at http://www.ktc.uky.edu/projects/states-support-of-non-highway-modes-of-transportation-investigation-and-synthesis/.

In 1998, the Kentucky General Assembly created the Aviation Economic Development Fund (AEDF). Sales tax on jet fuel is deposited into this fund and is only to be used for aviation related needs. However, a cap of $1 million per year is placed on each commercial carrier and this amount has generally been reached within the first quarter each year, thus limiting the full resources available. Further increasing the cap on the jet fuel tax should be considered to help address growing funding needs. By ensuring the funds collected through AEDF are only used for aviation purposes, these funds can then aid in aviation facility development, replacement, and rehabilitation projects. This is a critical component in the development of a competitive and robust economic program to attract further manufacturing to the Commonwealth.

5.2.3-1.3 Current and Future Infrastructure

The infrastructure of General Aviation Airports is a two part challenge – improvement of existing airports infrastructure and investment in new airport infrastructure.

5.2.3-1.4 Maintenance and Improvement

It is critical that we maintain our existing airport infrastructure (existing airport systems, hangars, fuel pumps, etc.) for added safety purposes through a consistent state funding stream since many of our airports do not have the financial capability to perform necessary maintenance and improvements. The KDA's Pavement Managing System has been in place since 2010, and it will continue to be extremely helpful regarding runway, taxiway and apron maintenance. This system is utilized to help identify and prioritize funding to support pavement maintenance.

5.2.3-1.5 Other Areas of Concern

The following are important topics that also directly impact existing general aviation airports.

- Runway Length – Kentucky needs to continue working with the FAA to get more general aviation airport runways lengthened to 5,000 linear feet. Having at least a 5,000 linear foot runway opens an airport to more business aviation and thus enhances a community's economic potential. This specific runway length of 5,000 feet is critical due to being required by companies insuring business aircraft carrying freight and/or corporate decision makers. See **Figure 5.2.3 A** for the location of the Air Carrier and General Aviation Airports throughout Kentucky and their associated runway lengths.
- Access Roads and Signage – Access roads that connect Kentucky citizens to general aviation airports must be adequately maintained. In addition, enhanced directional signage is needed at some airports.
- Tourism – Kentucky needs to continue to promote the existing general aviation airports for the role they play in advancing our Commonwealth's tourism industry. KDA currently operates The Capital City Airport and three State Park Airports including: Lake Barkley State Park, Rough River State Park and Kentucky Dam Village State Park.
- Declining Registered Aircraft - In Kentucky in 2010, the total number of registered aircraft was 2,082 with a total of 5,969 licensed pilots. Over the last decade, this total number of registered aircraft in Kentucky has declined by 5% which is consistent with the national economic conditions as well as aircraft owners deciding to follow more favorable tax laws in contiguous states per the Federal Aviation Administration. This is detrimental to general aviation airports in Kentucky since the majority of their general revenue generated comes from selling airplane fuel and renting hangars. Also, this negatively impacts the surrounding economy, through reduced business to the supportive service industry and decreased direct corporate travel to the area. **Table 5.2.3 A** shows how Kentucky compares to surrounding states with regards to funding sources as noted by *2011 State's Support of Non-Highway Modes of Transportation: Investigation and Synthesis* by the KTC.

5.2.3-1.6 New Facilities

The second part of Kentucky's airport infrastructure challenge deals with adding new general aviation facilities. For the forecast period ending in 2032, the highest percentage of aircraft growth is projected to be in jet aircraft for the business sector with 4% growth, per the National Business Aviation Association. To keep our general aviation airports competitive with surrounding states, meet the need of this growing market, and expand economic development opportunities, Kentucky should continue to focus on the following enhancements:

- More airport hangars,
- New/improved terminal buildings,
- New/improved fuel systems,
- Enhanced apron space for airport parking.

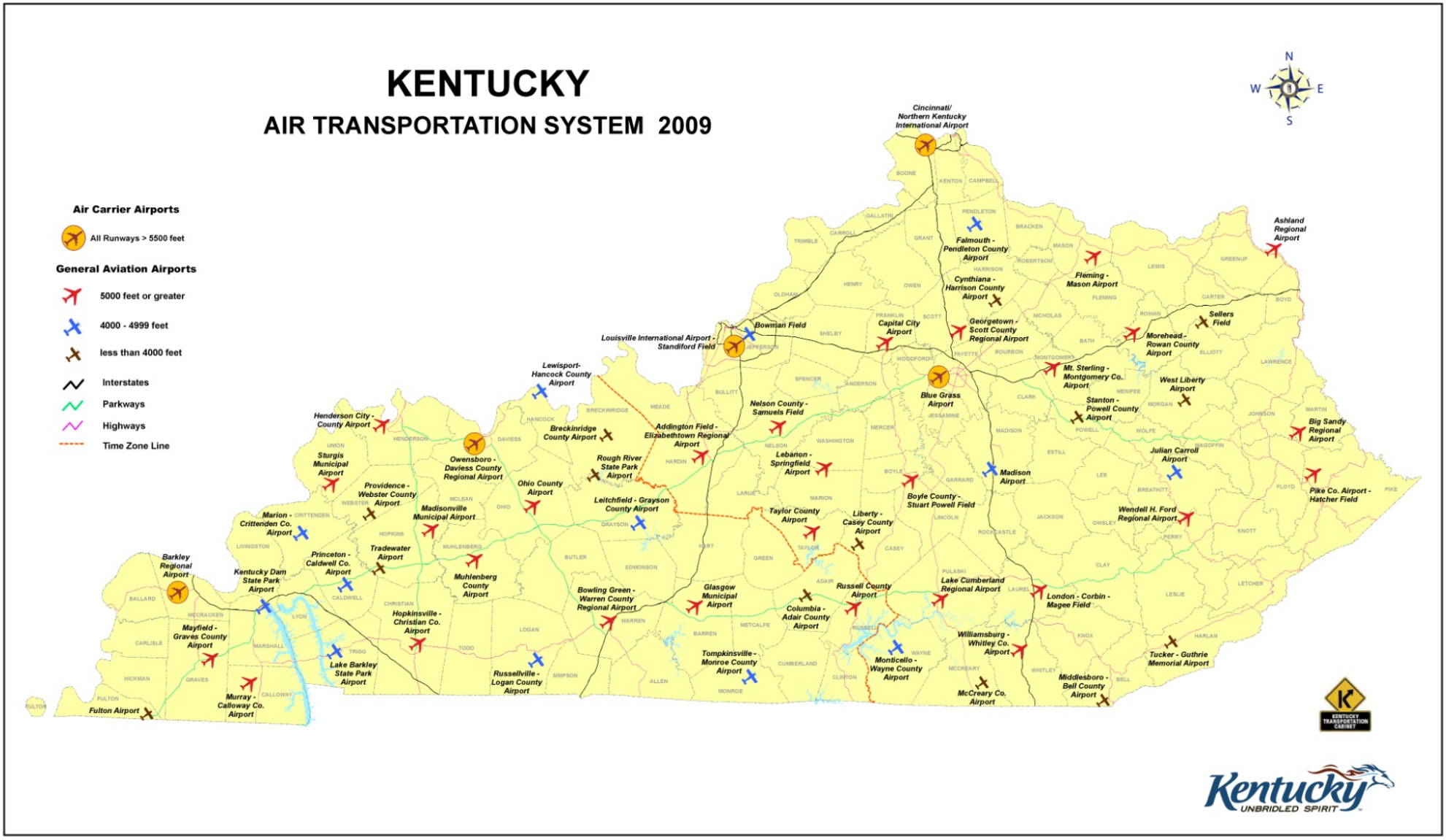


Figure 5.2.3 A – Airport Facilities in Kentucky

In addition to new facilities within existing general aviation airports, new general aviation airports are also recommended by the Kentucky Department of Aviation and Economic Development. When compared to surrounding states, **Table 5.2.3 A** also shows Kentucky ranks near the bottom for the number of general aviation airports.

Aviation Mode – Airports and Funding*				
State	**Number of Airports Eligible for AIP** Funding**	**Dedication of Fuel Tax Revenues to Highway Modes**	**Dedicated Trust Fund for Aviation**	**Personal Property Tax**
Kentucky	57	Constitutional	Yes	Yes
Illinois	88	No-Multimodal	No	No
Indiana	67	Statutory	No	No
Missouri	76	Constitutional	Yes	Yes
Ohio	100	Constitutional	No	No
Tennessee	69	No – Multimodal	No	Yes
Virginia	50	No – Multimodal	Yes	Yes
West Virginia	25	Constitutional	Yes	Yes

*Reference: *2011 State's Support of Non-Highway Modes of Transportation: Investigation and Synthesis* by the Kentucky Transportation Center (KTC) using 2009 data. **AIP – Federal Aviation Administration -Airport Improvement Program

Table 5.2.3 A –Aviation Funding Comparison in Kentucky and Other States

5.2.3-2 Commercial Passenger Service

There are six airports in Kentucky that are certified to provide air carrier (scheduled passenger) service: Cincinnati-Northern Kentucky International Airport (CVG), Louisville International Airport (SDF), Blue Grass Airport (in Lexington, LEX), Owensboro-Daviess County Regional Airport (OWB), Barkley Regional Airport (in Paducah, PAH), and Bowling Green-Warren County Regional Airport (BWG). With the exception of the BWG Regional Airport, all airports offer scheduled airline service. Annual Service Volumes of those five airports with scheduled passenger air carrier service is shown below in **Table 5.2.3 B.** In 2011, the Kentucky Legislative Research Commission, Program Review and Investigations Committee adopted the "*Air Service at Kentucky's Commercial Airports*" report that was developed with the support of Kentuckians for Better Transportation (KBT) among others. This report reviewed the three largest airports, with a specific focus on their financial status to include influences from FAA policies and procedures as well as funding issues and incentives. This report can be reviewed in its entirety at http://www.lrc.ky.gov/lrcpubs/RR390.pdf .

Each of these six airports serves as major economic engines in their communities. The three largest airports - CVG, SDF, and LEX - prepare economic impact reports for their respective airports and from the most recent information available, these three airports contribute more than 85,000 jobs and $9.6 billion in economic impact to the state.

Annual Service Volumes of Major Commercial Airports

Airport	Total Number of Passengers (2013)	Total Aircraft Operations (take-offs and landings) (2013)
Cincinnati/Northern Kentucky International (CVG)	5,718,255	137,671
Louisville (SDF)	3,404,080	146,260
Lexington (LEX)	1,104,354	64,718
Paducah (PAH)	40,202	27,394
Owensboro (OWB)	30,795	16,192

Table 5.2.3 B - Annual Service Volumes for Kentucky Airports with Scheduled Passenger Air Carrier Service

5.2.3-3 Air Cargo Service

A key element of the state's aviation sector is air cargo activities. UPS's air hub headquarters, called Worldport, is located at Louisville International Airport (SDF). This airport is the 7th largest airport in the world for total cargo tonnage at 4.88 million tons annually. This airport also has nearly half of their aircraft operations occurring for cargo aircraft. DHL Express, an international express company, has its U.S. headquarters at the Cincinnati - Northern Kentucky International Airport.

Table 5.2.3 C shows how much air cargo was handled by the six air carrier airports in Kentucky in 2013.

Major Commercial Airports		
Airport	**Total Aircraft Operations (take-offs and landings) (2013)**	**Total Tons of Cargo Handled (2013)**
Cincinnati/No. Ky. International (CVG)	137,671 (22,746 Cargo Only)	655,479
Louisville (SDF)	146,260 (70, 200 Cargo Only)	4,880,000
Lexington (LEX)	64,718	91
Paducah (PAH)	27,394	2.5
Owensboro (OWB)	16,192	N/A
Bowling Green (BWG)	80,000 (147 Cargo Only)	1102

Table 5.2.3 C – Annual Air Cargo Service Volumes of Major Commercial Airports

5.2.3-4 Military Service

Kentucky has one of the largest presences of military rotary-wing (helicopter) aircraft in the U.S. Army. The U.S. Army Air Assault Division (101st Airborne) is located at Ft. Campbell with approximately 150 aircraft based at that location. Ft. Knox hosts an Army Reserves Attack Helicopter Battalion which consists of over 20 aircraft. The Kentucky National Guard headquarters houses their aviation assets at the Boone National Guard Center in Frankfort with 20 aircraft. Fixed wing (non-helicopter) assets are also located at each of these military facilities along with the Air National Guard C-130 Wing located at Standiford Field (SDF) at Louisville International Airport.

These aircraft utilize airports within the state for training and during periods of disaster. Utilization plans have been developed for these aircraft in the event of a disaster along the New Madrid fault line located on the western boundary of the state. Aviation fuel supplied from our local airports is crucial to continued operations in the event of a disaster. All airports need to be configured to supply fuel from their tanks with a generator in the event of a catastrophic power failure.

5.2.3-5 Emergency Medical Service

Following closely in utilization of general aviation services is the air medical industry. Kentucky has one of the largest per capita Helicopter Emergency Medical Service (HEMS) capabilities in the nation. Across the state, these providers have become a vital community-based asset that ensures a higher level of health care to many in need of medical attention whether they are transferred from a hospital or from the scene of an emergency. Due to topographic limitations affecting access in rural areas, air medical services to trauma centers have become vital to Eastern Kentucky. Three major providers are located throughout Kentucky which consists of over 30 aircraft. There are regional maintenance and training facilities located in Somerset and Danville, which provide maintenance for numerous aircraft. There are over 140 heliports in the Commonwealth devoted to this segment of aviation. The continued need for these services will require a safety and standards infrastructure to provide and maintain safety of flight for the public being transported in helicopters for emergency medical care.

5.2.3-6 Technology & Education

5.2.3-6.1 Technology

There are three emerging developments in technology that are quickly evolving to change the face of day-to-day airport operations.

- Satellite-Based Navigation Systems - The development of GPS navigation and on-board technology improvements in the past decade has increasingly enabled pilots to navigate in nearly all weather conditions and fly an instrument approach procedure to many of the state's smaller airports. With the FAA's goal of implementing 500 GPS approaches per year nationally, it puts pressure on Kentucky to improve airport conditions so that these procedures can be designed and implemented for the smaller community airports. A big plus to the state is that GPS navigation requires little or no ground based equipment investment. The availability of these procedures for smaller communities is a vital component that can help foster economic development.

- NEXTGEN - The next generation air traffic control systems (NextGen) is changing the way all aircraft move about the sky in the U.S. by shortening routes, saving time and fuel, reducing traffic delays, increasing capacity, and permitting controllers to monitor and manage aircraft with greater safety margins. This is a significant paradigm shift for monitoring aircraft movements in our state and nation.
- Unmanned Aerial Systems (UAS) – Further development and growth of Remotely Piloted Vehicles (RPV), commonly referred to as the "drone" sector of aviation, is anticipated to continue in the coming years. These unmanned vehicles are already used heavily by the military. Kentucky should consider additional economic development opportunities in testing, manufacturing and implementing this rapidly expanding sector of aviation as it evolves into the private sector.

5.2.3-6.2 Aviation Education

Kentucky has what is generally recognized by the aviation community as the finest aviation education program in the nation. In order to keep our state aviation system strong in the coming decades, we need to train the next generation of pilots, aircraft mechanics, aircraft owners, aeronautical engineers, airport managers, etc. The Institute for Aerospace Education (IAE), the Aviation Museum of Kentucky, and other organizations work hand-in-hand to make this happen.

An example of our continued success in education is with the continued addition of Kentucky public high schools teaching aviation/aerospace courses as part of the IAE consortium (headquarters in Kentucky). In the upcoming 2014-2015 school year, 2 additional public high schools will be added to the list of 23 public high schools already incorporating the IAE courses into their curriculum. This aviation education program is heavy in science, technology, engineering and math (STEM). Therefore, program graduates who do not pursue an aviation career, will still have a solid academic foundation for other engineering and science fields. An enhanced state support for this program, across many functional areas of government is recommended. Many of these educational resources can be found at: http://transportation.ky.gov/Aviation/Pages/Educational-Resources.aspx.

5.2.3-7 References and Links

5.2.3-7.1 General Information

1. AEDF KRS 183.525 - http://www.lrc.ky.gov/Statutes/statute.aspx?id=5791 and http://www.lrc.ky.gov/record/13rs/HB130.htm.
2. Air Service at Kentucky's Commercial Airports Study Jan. 2011 - http://www.lrc.ky.gov/lrcpubs/RR390.pdf.
3. Aircraft Owners and Pilots Association – http://www.aopa.org .
4. Airport Master Record 50/10 = http://www.gcr1.com/5010WEB/.
5. American Association of Airport Executives - http://www.aaae.org/.
6. AN ACT-appropriations providing Aviation Development debt service and funds- http://openstates.org/ky/bills/2014RS/HB236/ .
7. Association of Air Medical Association – www.aams.org.
8. Aviation Heritage Park - http://aviationheritagepark.com.

9. Commission on Accreditation for Medical Transport Systems - www.camts.org.
10. FAA FY2013 AIP Entitlement funds for Kentucky site- http://www.faa.gov/airports/aip/grantapportion_data/.
11. General Aviation Manufacturers Association – www.gama.aero.
12. Kentucky Airport Zoning Commission – http://transportation.ky.gov/Aviation/pages/zoning-commission.aspx.
13. Kentucky Aviation Association - http://www.aviationkaa.org/.
14. Kentucky Monthly Aviation Fuel Tax Form - http://revenue.ky.gov/NR/rdonlyres/AFA36727-8F5A-4D3D-8304-E4D26E5D8C18/0/51A130713.pdf.
15. National Association of State Aviation Officials – http://nasao.org.
16. National Business Aviation Association – http://nbaa.org.
17. NextGEN - http://www.faa.gov/nextgen/.
18. No Plane No Gain: http://www.noplanenogain.org.
19. Federal Aviation Administration – Associate Administrator of Airports -Offices with Link to: Office of Airport Safety and Standards - http://www.faa.gov/about/office_org/headquarters_offices/arp/offices.
20. Satellite Navigation - GPS/WAAS Approaches - http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/gnss/approaches/.
21. Special District HB1 – Special Purpose Government Entities (SPGE)-Office of the Governor: Department for Local Governments: https://kydlgweb.ky.gov/Entities/SPGE_Info.cfm.
22. States' Support of Non-Highway Modes of Highway Transportation; Investigation and Synthesis - http://www.ktc.uky.edu/files/2013/01/States-Support-final.pdf.
23. Unmanned Aircraft Systems - http://www.faa.gov/about/initiatives/uas/.

5.2.3-7.2 Education

1. Eastern Kentucky University - http://aviation.eku.edu.
2. Embry-Riddle Aeronautical University - http://worldwide.erau.edu/locations/louisville/index.html.
3. Kentucky Council on Postsecondary Education STEM Program - http://cpe.ky.gov/committees/stem/.
4. Somerset Community College Aviation Maintenance & Technology - http://somerset.kctcs.edu/en/Academics/Programs_of_Study/Copy_of_Aviation_Technology.aspx.
5. The Aviation Museum of Kentucky Inc. - Summer Aviation Camps - www.aviationky.org.
6. The Institute for Aerospace Education – www.iae.aero.
7. Wing Design Competition - http://www.iae.aero/wdc.

5.2.3-7.3 Government

1. Federal Aviation Administration - http://www.faa.gov/
2. Department of Aviation - http://transportation.ky.gov/aviation/Pages/default.aspx.
3. National Transportation Safety Board - http://ntsb.gov/.
4. Transportation Security Administration – http://www.tsa.gov/.

5.2.4 Railways

"Better freight rail transportation will help reduce long-haul heavily-loaded trucks on our highways and improve their longevity and reduce maintenance costs." Daviess County Survey Participant

5.2.4-1 General Rail

The average distance a ton of freight can be transported by rail on one gallon of fuel is 476 miles. According to 2012 annual reports submitted to KYTC by companies operating within the state, there are more than 2,600 miles of railroad track in Kentucky. The 2010 data shows that 72.7 million tons of rail freight originated in Kentucky and 37 million tons of rail freight terminated in Kentucky. By weight, most of Kentucky's freight rail industry services the coal industry, but many other commodity types are transported along the state's extensive rail system. Some of these other commodity types include automobiles and automotive parts, agriculture products, sand, recycled metals, oil, and natural gas, just to name a few. Energy will be a factor for the future of rail in Kentucky. Alternative energy sources such as natural gas are being used instead of coal for power generation nationally. Domestic coal shipments are on the decline, while crude oil and container-on-rail shipments are on the rise.

There are five Class I railroads operating on over 2,000 miles of track in Kentucky - CSX Transportation (CSXT), Norfolk Southern (NS), Canadian National (CN), Burlington Northern-Sante Fe (BNSF), and Union Pacific (UP). These Class I railroads operate large, multi-state networks connecting Kentucky's businesses to markets across the nation. Paducah and Louisville Railway (PAL) is a Class II railroad (also known as a regional railroad) providing service between the two cities that give the company its name. There are also seven Class III railroads (also known as short line railroads), which own more than 300 miles of track within the state. These short line railroads provide businesses with a connection to the Class I railroads, gaining them access to national and international markets.

Kentucky has over 4,000 freight rail employees working in the state at an average wage (including benefits) of $106,860. Each freight rail job supports 4.5 jobs elsewhere in the economy. There are also more than 14,000 railroad retirement beneficiaries in the state receiving a combined $273 million in annual benefits per the Association of American Railroads.

Rail connections to highway and waterway freight transportation modes are made at "intermodal" facilities. These facilities provide opportunities for transfer of freight between modes. For example, a container arriving at an ocean port may be shipped by rail to Kentucky and then be transferred from the railroad car to a tractor-trailer for local delivery. Kentucky has at least five facilities specializing in distribution of containers and another five facilities specializing in transferring new automobiles to rail cars. Many types of intermodal facilities specialize in bulk transfer of other materials such as coal, grains, limestone, or other commodities between truck, barge, and rail car. Kentucky's freight railroads operate more than ten of these bulk loading facilities. These facilities are all part of the Kentucky intermodal freight network contributing to the Cabinet's goal of providing a reliable transportation system that effectively and efficiently moves freight. (*See also the LRSTP sections on Freight and Waterways for more information concerning transportation by these modes.*)

Passenger Rail service in Kentucky is provided by Amtrak with rail service in four Kentucky cities. The Cardinal serves the cities of Maysville, South Shore (South Portsmouth), and Ashland en route between Chicago, IL and New York City, NY. The City of New Orleans provides service between Chicago and New Orleans, Louisiana, passing through Fulton, Kentucky. In addition, bus service is provided in Louisville, connecting Louisville to The Cardinal in Indianapolis, IN.

There are four tourist or excursion rail lines in Kentucky. They are Big South Fork Scenic Railway in Stearns, Bluegrass Scenic Railroad and Museum in Versailles, Kentucky Railway Museum in New Haven, and My Old Kentucky Dinner Train in Bardstown and Lexington. These rail lines provide a localized passenger service as entertaining tourist activities.

5.2.4-2 General System Planning, Funding, and Development

The Kentucky Statewide Rail Plan was last updated in 2002. This plan developed specific goals and objectives for KYTC's Railway Program, while identifying system-wide strategies and means to recognize future rail issues. This plan can be accessed at: http://transportation.ky.gov/Railroads/Pages/Kentucky-Statewide-Rail-Plan.aspx. A new plan is anticipated in 2014 to develop goals for maintaining and promoting rail programs throughout the state.

Improvements to the railway network in Kentucky are most often funded by the private railroad corporations. The Kentucky legislature has provided some opportunities for matching private expenditures and providing tax credits for regional or short line railroads (Class II or Class III) for improvements to their rail infrastructure. Kentucky's 2012 budget included funds for short line railroads to improve safety at railroad crossings. While KYTC is restricted by the Constitution to spend Highway Fund moneys only on roadways, highway access to railroads is evaluated to identify improvements that could be made to roadways to better meet KYTC's goal of providing an integrated system for the dependable movement of people and freight.

Table 5.2.4 A shows the current railway system in Kentucky and how it compares to that of the surrounding states with regard to funding mechanisms. This information was provided by the *2011 States' Support of Non-Highway Modes of Transportation: Investigation and Synthesis* report by the KTC and can be found at the following link. http://www.ktc.uky.edu/projects/states-support-of-non-highway-modes-of-transportation-investigation-and-synthesis/.

Rail Mode*						
State	**Dedication of Fuel Tax Revenues to Highway Modes**	**State Agency**	**State-Supported Passenger Rail Service**	**State Infrastructure Bank**	**Most Recent State Rail Plan**	**Dedicated Trust Fund For Rail[1]**
Kentucky	Constitutional	Division of Planning[#]	No	No	2002	No
Illinois	No – Multimodal	Department of Public and Intermodal Transportation – Bureau of Railroads[##]	Yes	No	2010	Yes[###]
Indiana	Statutory	INDOT Rail Office	Yes	Yes, not active	2009	No
Missouri	Constitutional	Division of Multimodal Operations – Railroad Section	Yes	Yes, active	2011[####]	No
Ohio	Constitutional	Ohio Rail Development Commission[#####]	No	Yes, active	2010	No
Tennessee	No – Multimodal	Multimodal Transportation Resources Division – Office of Freight and Rail Transportation[**]	Yes	Yes, not active	2003	Yes[***]
Virginia	No – Multimodal	Department of Rail and Public Transportation	Yes	Yes, not active	2008	Yes
West Virginia	Constitutional	Public Service Commission – Rail Division	Yes	No	2009	No
North Carolina	No – Multimodal	NCDOT Rail Division	Yes	Yes, not active	2009	Yes
Michigan	No – Multimodal	Intermodal Policy Division[****]	Yes	Yes, active	2011	Yes
Texas	Other[*****]	TxDOT – Rail Division	Yes	Yes, active	2010	No

*Reference: *2011 State's Support of Non-Highway Modes of Transportation: Investigation and Synthesis* by the Kentucky Transportation Center (KTC) using 2009 data. #- Some KYTC rail responsibilities are handled by the Utilities and Rail Branch, as well as the Office of Transportation Delivery. ## – Illinois Commerce Commission has regulatory oversight. ###- No State trust fund; trust funds for high-speed rail and passenger rail have been created for federal funding. #### – The Missouri Plan is actually a Statewide Transportation Improvement Program that includes a chapter on rail projects, but is not a rail-specific planning document. A new state rail plan is underway. ##### - The Public Utilities Commission of Ohio handles safety and regulatory oversight. ** – Rail Safety Oversight Section, Office of Project Planning Division also have rail-related responsibilities. ***– The Short Line Rehabilitation Program. **** – Other agencies with roles in rail programs: Statewide Transportation Planning Division; Freight Services and Safety Division; Passenger Transportation; Transportation Planning; Finance and Administration; Office of High Speed Rail and Innovative Project Advancement. ***** – The Texas Constitution restricts use of fuel taxes to roadways and administration of traffic laws; a quarter of the revenues, however, are allocated to the Available School Fund.

Table 5.2.4 A - Railway Funding Comparison in Kentucky and Other States

5.2.4-3 KYTC and Rail Coordination

The Utilities and Rail Branch of the Division of Right of Way administers KYTC's Railroad Coordination Program and Railroad Crossing Safety Program. These programs provide the link between KYTC and railroad companies when highway projects come in contact with rail facilities. This includes projects that are at-grade, over, or under railroad right of way and those projects that are adjacent to railroad right of way. When a road project adjoins or encompasses a railroad facility (such as a railroad track or railroad right of way), the owner of that facility becomes an active partner in the project's development. The KYTC coordinates the project's design as it impacts the railroad and compensates the railroad for the costs of their involvement in the project.

The Railroad Coordination program is managed by the Rail Coordinator within the KYTC Division of Right of Way and Utilities. The Rail Coordinator is the KYTC's liaison to the various railroads in Kentucky, providing information about future KYTC projects to the railroad companies involved, while preparing and executing agreements that outline how a highway project may affect them. This is achieved through early and continual communication between the KYTC and the railroad companies. Prospective designs are provided to the railroads so that they may review and comment on how the project will impact their facilities. Once both parties are satisfied with the design, an agreement is executed to finalize the efforts. Once the project goes to construction, the Rail Coordinator also helps to address any issues or conflicts that may arise during construction.

> *"Encourage freight-train shipping as it is more cost-effective for the current facilities and the environment. It means less tractor-trailers on the highways which would conserve the roads."*
> Jefferson County Survey Participant

Another aspect of the Rail Coordination program is highway-railroad at-grade crossing surface rehabilitation. Just like road surfaces, the surface of a highway-railroad at-grade crossing will deteriorate over time, requiring maintenance and restoration. Under state statute, the crossing surfaces between the edges of the crossties are the responsibility of the owning railroad. The Rail Coordinator brings concerns of rough crossings to the attention of the owning railroad company so that those crossings may be improved. Occasionally, it is in the best interest of the state for KYTC to be more actively involved in the rehabilitation of a highway-railroad at-grade crossing. This is particularly true in the case of high traffic roadways, due to the heavy usage and loading on the surface. In these instances, the KYTC may request a specific crossing surface be utilized. If a specialty surface is required, KYTC may enter into a cost sharing agreement with the railroad to provide funds or materials for all or part of the crossing surface. These types of agreements are uncommon.

There are over 2,000 open, public at-grade highway-railroad crossings in Kentucky. There are even more highway-railroad at-grade crossings on private roadways that serve homes and businesses. These private highway-railroad at-grade crossings may include an agreement between the private landowner and the railroad, but the KYTC has no involvement with private crossings. Whether they are public crossings or private crossings, the surface of highway-railroad at-grade crossings is the responsibility of the owning railroad. In most cases, the railroad has permitted the roadway to cross the railroad right of way. When the KYTC is made aware of rough crossings, the concerns are passed along to the respective railroads so that they may address them.

"If a citizen knows of a rough crossing, the best course of action is to contact the associated railroad. Every crossing must have a small sign displayed listing the crossing's unique number (called a DOT number) along with a phone number. Citizens may call this telephone number to deliver the message of a rough crossing, noting the specific DOT number." KBT Stakeholder Meeting Member

5.2.4-4 KYTC Railroad Safety

The KYTC is a steward of Kentucky's State and Federal roadways, so safety is always a priority and concern. Crossings of vehicular traffic and trains are locations where safety is of particular concern. Nationally, warning devices at highway-railroad at-grade crossings are generally accepted to lessen the probability of accidents but they cannot prevent highway-railroad at-grade crossing accidents. If a crossing can be closed or if the movement of vehicles and trains can be separated, then these efforts improve public safety by reducing the potential for motor vehicle and train collisions.

The KYTC Railroad Safety Coordinators are responsible for maintaining an inventory of highway-railroad at-grade crossings on public roads throughout Kentucky. A detailed inventory of each of these crossings is gathered and used to assess the crossings for safety needs. The Railroad Safety Coordinators facilitate the programming of funds for identified safety improvement projects and oversee the execution of these projects.

Each open public at-grade crossing is inventoried every 3 years and the information for each crossing is kept in a Railroad Crossing Inventory database. This database uses a nationally recognized formula to calculate hazard using the field data gathered by the coordinators, which ultimately is used to determine which crossings receive safety devices. The number of cars, number of trains and number of crashes are factors considered in prioritizing crossings as part of this formula.

Closing crossings or separating vehicle-train movements is not always feasible. When these options are not practicable, the Railway-Highways Crossing Program (Section 130) can be utilized to facilitate the installation of warning devices at highway-railroad at-grade crossings. Information about this program can be found at http://safety.fhwa.dot.gov/xings/. Since 1973, Congress has provided dedicated limited federal funds for states through this program to implement safety improvement projects at highway-railroad at-grade crossings. Such improvements may include flashing lights, gates, other warning devices, and sometimes specialty surface material. The Section 130 Program may also be used to support states, localities, and railroads in closing crossings. At the current level of funding, Kentucky has the capacity to improve approximately 6 to 8 crossings a year.

5.2.4-5 Light Rail

Light rail or light rail transit (LRT) is typically an urban form of public transport with a “light” passenger capacity that operates primarily along exclusive rights of way and has vehicles capable of operating as a single train or as multiple units coupled together.

The Transit Authority of River City (TARC) in Louisville, the largest transit system in Kentucky has explored the concept of light rail and ridership. TARC stopped their light rail study, *Transportation Tomorrow* in 2004 due to funding and ridership hurdles in the study. Funding continues to be the major hurdle to proceeding through the next steps.

5.2.4-6 High Speed Rail

High-speed rail is a type of rail transport that operates at significantly faster speeds than traditional rail traffic and carries a heavier volume of traffic compared to light rail. High Speed Rail uses an integrated system of specialized rolling stock and dedicated tracks.

High-speed passenger rail could be convenient and would reduce travel time from remote areas in Eastern Kentucky to cities like Louisville and Lexington. At the current time, however, there are no plans for the Commonwealth to establish a high-speed passenger rail system.

While the KYTC is aware of the need for improved transportation facilities throughout Kentucky, the cost of high-speed passenger rail system infrastructure is extremely high and is even more expensive to operate and maintain. Kentucky, like much of the nation, faces a budget crisis and must continue to fund basic, vital services on limited funds.

Presently, all of the active rail lines in Kentucky are privately owned and used for moving freight with the exception of a few small tourist/recreational lines scattered throughout the state and Amtrak trains that run through Kentucky operate on freight rail tracks. Freight railroad companies are cautious about allowing passenger rail equipment to utilize their tracks due to the laws regulating them. In order to accommodate passenger rail, freight railroad companies will need to slow down their current operations and increase traffic on rail lines that are often congested and possibly already operating at capacity. In addition, the general condition of the existing rail lines in Kentucky often limits trains to traveling at a maximum of 15 miles per hour (mph), which is not competitive with automobile travel.

To achieve truly high-speed passenger rail service over 80 mph, dedicated passenger tracks would need to be constructed, requiring massive funds to purchase land and to build track. The KYTC has studied the high-speed passenger rail alternative several times in the past. Most recently in March 2012, the KYTC participated in a feasibility study that considered a high speed corridor from Nashville to Louisville. It concluded that capital costs for this corridor would be approximately $16 billion, while the yearly operating and maintenance costs would run in excess of $250 million. There is a common assumption that the construction of a high-speed passenger rail system would help the population save money on expenses such as gasoline, car payments, insurance, etc. Since the majority of state government funding comes from collecting taxes from citizens, the necessary funds to construct a sustainable high-speed passenger rail system would involve substantial tax increases. The same high initial and maintenance costs are also issues with light rail services in our major cities. At this time, the KYTC believes that state funds can be used more efficiently to assist the citizens of Kentucky with other modes of transportation and other mobility issues rather than high-speed or light rail systems. Additional discussion on high-speed passenger rail is provided within this chapter in the Public Transit Section.

5.2.4-7 Rail and other modes

Rail plays a significant role in the transportation of freight (aka goods) that benefits our citizens. The interfacing of railways with that of waterways and highways is critical to the vitality of our economy through added reliability and redundancy within our transportation system. **Figure 5.2.4 A** shows from a statewide level, the connection between railways and riverports within Kentucky, while **Figure 5.2.4 B** provides a graphical representation of the association between railways and Kentucky's Arterial Highway System from a statewide perspective in Kentucky.

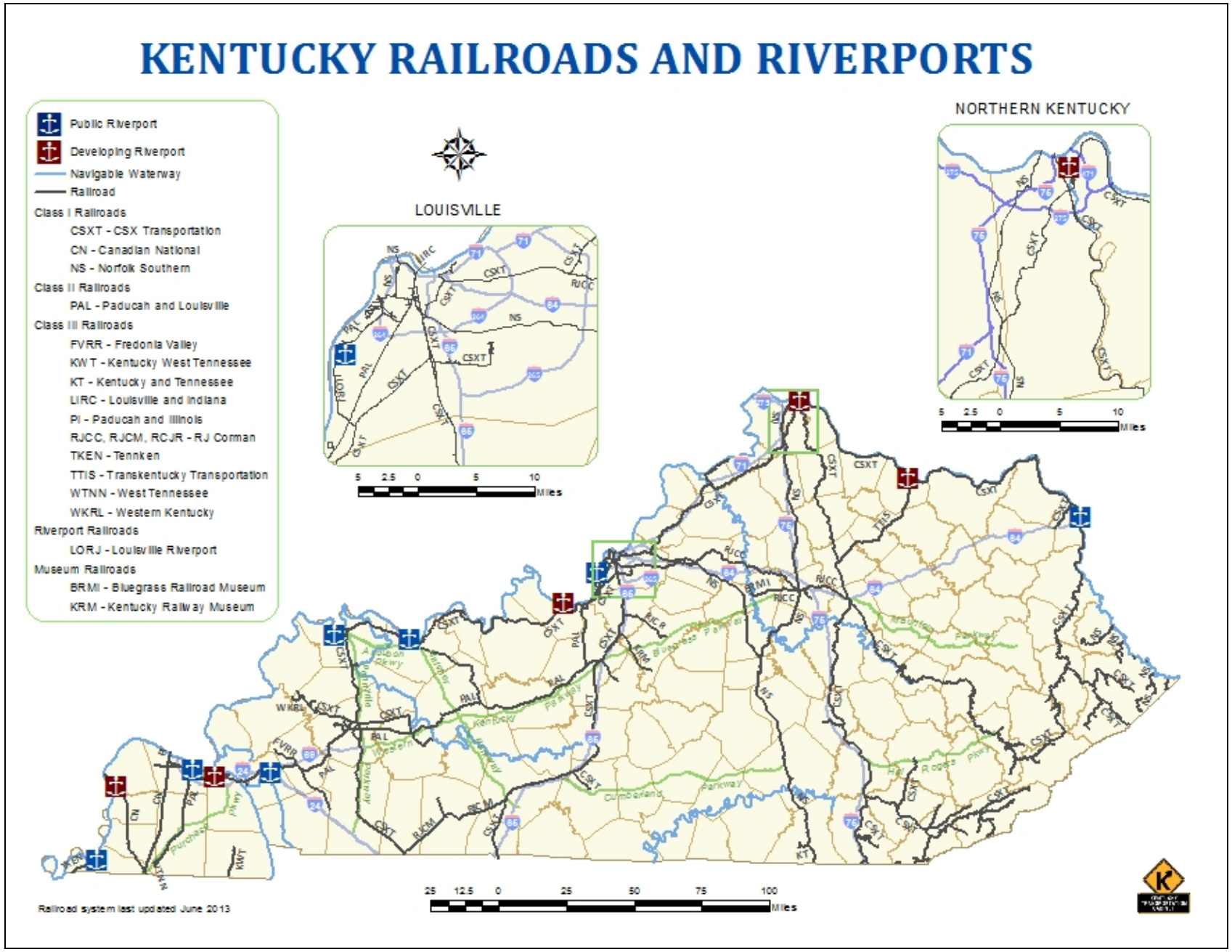


Figure 5.2.4 A – Kentucky Railway and Riverport Statewide Connectivity Map

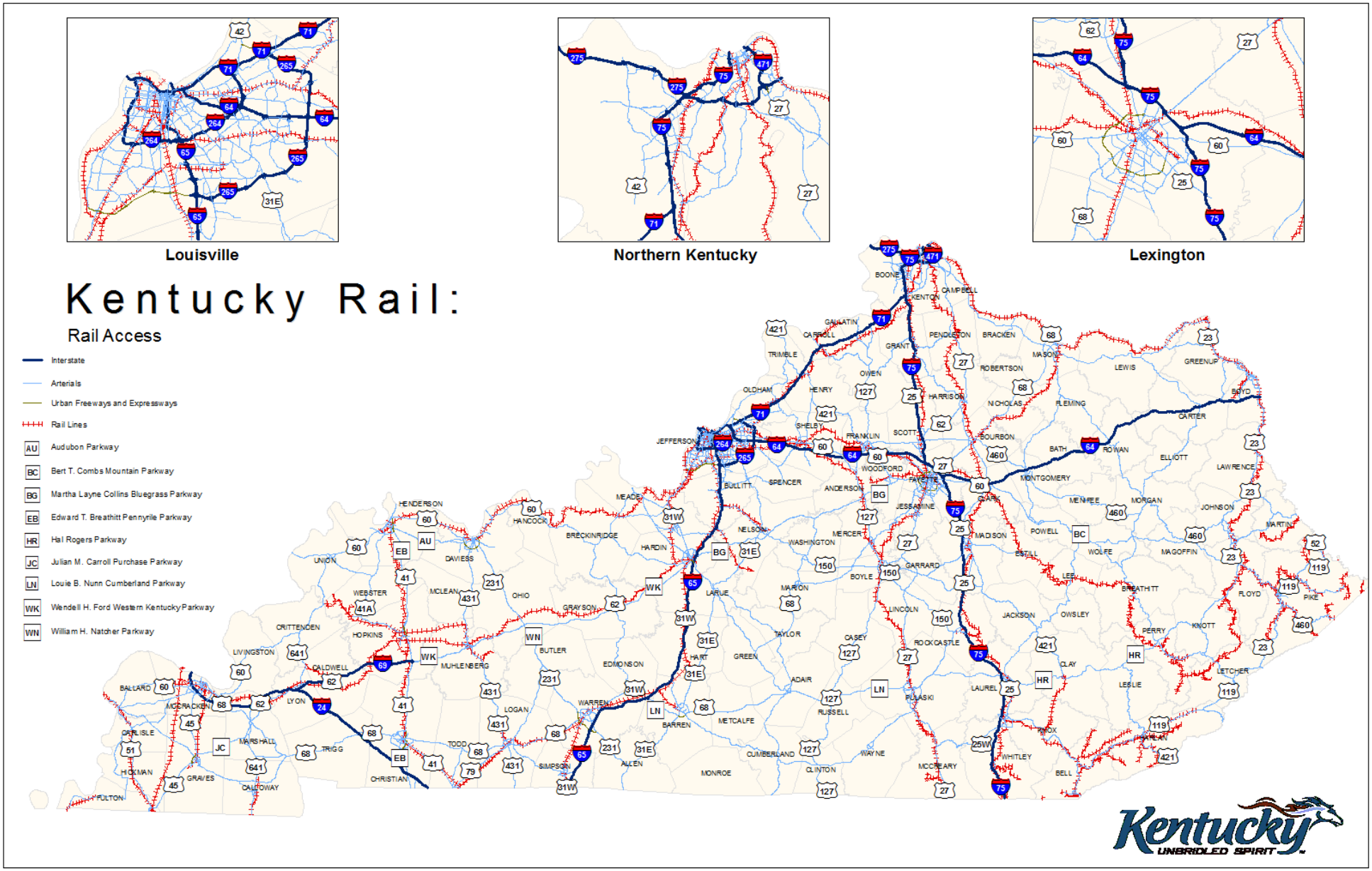


Figure 5.2.4 B – Kentucky Railway and Highway System Statewide Connectivity Map

5.2.4-8 References and Links

5.2.3-8.1 General Information

1. *Kentucky Statewide Rail Plan, 2002*: http://transportation.ky.gov/Railroads/Pages/Kentucky-Statewide-Rail-Plan.aspx.
2. Kentucky Short-line Railroad Assistance programs: http://transportation.ky.gov/Railroads/Pages/Shortline-Railroad-Assistance.aspx.
3. KYTC Statewide Rail Program web page: http://transportation.ky.gov/Railroads/Pages/default.aspx .
4. AMTRAK Interactive Route Atlas: http://www.amtrak.com/interactive-route-atlas.
5. Association of American Railroads US Freight Railroad Industry Snapshot: https://www.aar.org/keyissues/Pages/Railroads-And-States.aspx#.Ue1jom3b18E.
6. Association of American Railroads Freight Railroads in Kentucky statistics: https://www.aar.org/keyissues/Documents/Railroads-States/Kentucky-2010.pdf.
7. United States Department of Transportation Rail Freight Shipments by state: http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/state_transportation_statistics/state_transportation_statistics_2011/html/table_03_04.html.
8. Federal Highway Administration Railway-Highways Crossing (Section 130) Program - http://safety.fhwa.dot.gov/xings/.

5.2.5 Waterways

"I think improvement of riverports for more river transportation will have a big impact on transportation cost for business and industry." Lyon County Survey Participant

5.2.5-1 Overview Navigable Waterways

Construction of locks and dams on the nation's main rivers and tributaries began in the 1920's. The locks and dams are a crucial part of the approximately 12,000 miles of inland waterway transportation system we use across the nation. Originally developed with a primary focus on moving bulk goods to market at a significant savings to producers and consumers alike, other significant benefits have been realized over time. Increased recreation opportunities, flood control, hydroelectric power generation, and water supply for municipal and agricultural use are additional benefits waterways provide.

Kentucky has over 1,100 miles of navigable waterways that provide a channel for commerce and transportation of people and goods. Kentucky's waterways are a valuable transportation resource, providing a waterway link between the Great Lakes, Canada, Mexico and the Panama Canal. As noted in **Table 5.2.5 A** over 92 million tons of cargo, predominantly coal and aggregates, were transported through Kentucky's waterways during 2011.

The Ohio River provides 664 miles of navigable waterway along the northern boundary of Kentucky and makes up a large portion of the federally-designated Marine Highway Corridor M-70. The Mississippi River, providing 80 miles of navigable waterways on the state's western border, is part of Marine Highway Corridor M-55. Designation in the Marine Highway System identifies an opportunity to alleviate freight-related congestion on existing parallel land routes, which leads to reduced emissions, energy conservation, improved safety, and reduced road maintenance costs. The Marine Highway Corridors may also contribute to increased economic and commercial activity in the region by removing barriers to efficient freight transportation.

Commodity	Tons	Value (Billions)
Coal	48,300,000	$1.75
Petroleum	7,341,000	$4.80
Aggregates	21,426,000	$0.20
Grains	3,748,000	$0.71
Chemicals	3,234,000	$2.20
Ores/Minerals	1,845,000	$0.34
Iron/Steel	3,011,000	$0.97
Others	3,639,000	$0.34
Total	92,544,000	$11.40

Source: U.S. Army Corps of Engineers Waterborne Commerce Statistics 2011

Table 5.2.5 A – Waterway Commodities

Figure 5.2.5 A denotes the equivalent units of rail and tractor-trailer (semi) traffic that one river barge is capable of moving. For more information on America's Marine Highway Program, please visit the following website at http://www.marad.dot.gov/ships_shipping_landing_page/mhi_home/mhi_home.htm#.

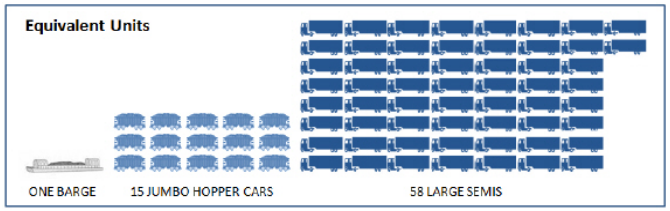


Figure5.2.5 A – Freight Mode Equivalent Unit Comparison

5.2.5-2 Riverports

"Nothing duplicates the service that riverports are able to provide the communities within their region." KBT Stakeholder Meeting

Kentucky's numerous private and public riverports offer connectivity between navigable waterways, rail and major highway corridors; access to equipment to trans-load freight between the transportation modes; and storage facilities. Public riverports are established by authority granted through KRS 65.520; any governmental unit, alone or in unison may establish a public riverport with approval by KYTC.

Figure 5.2.5 B depicts the locations of the seven operating public riverports and the five developing riverports along the navigable waterways network. Approximately 90% of Kentucky's population lives within 100 miles of a riverport. Riverports indeed have statewide reach and influence.

More information about Kentucky's riverports can be accessed at: http://transportation.ky.gov/Riverports/Pages/default.aspx.

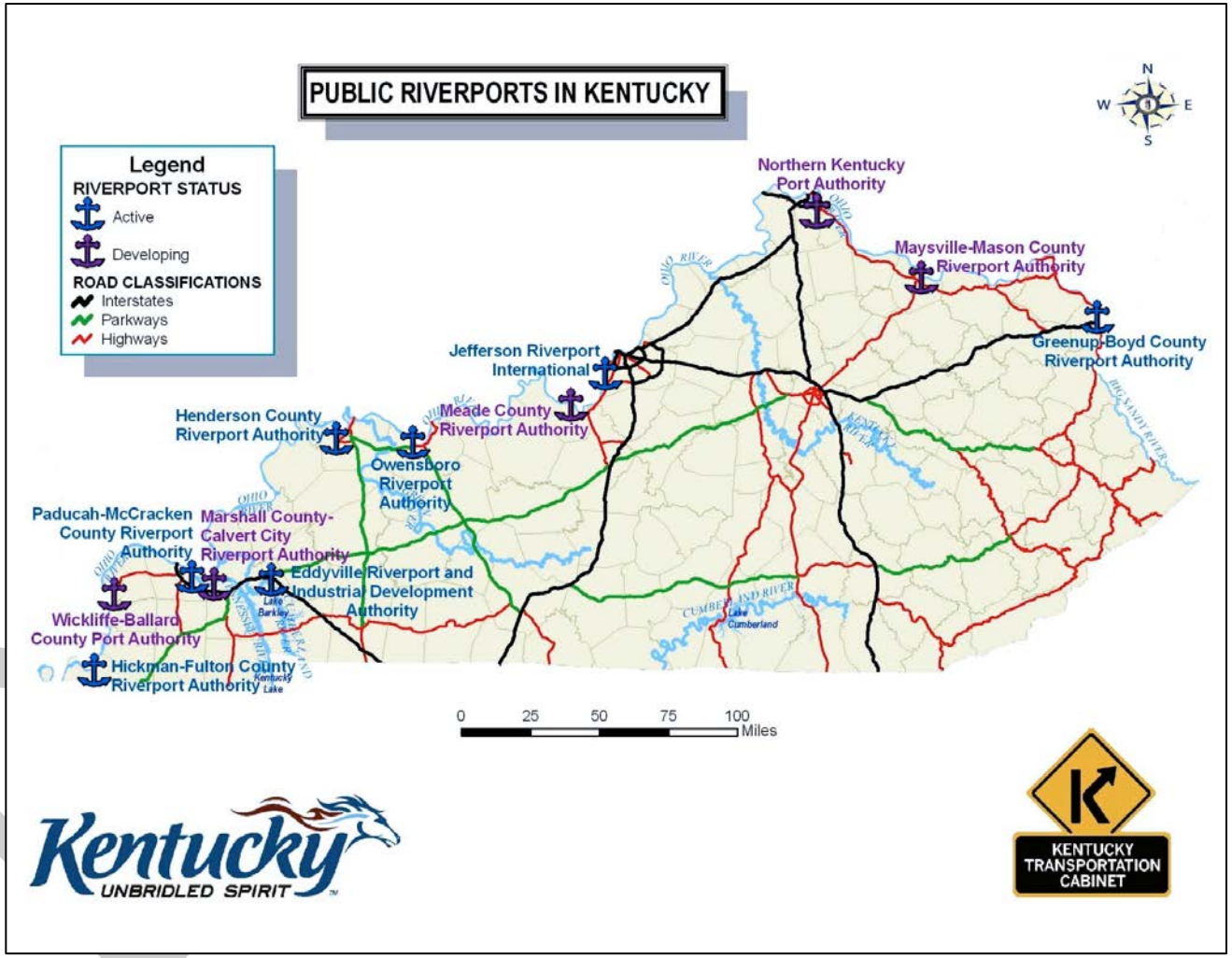


Figure 5.2.5 B – Public Riverports in Kentucky

5.2.5-3 Ferry Operations

Kentucky utilizes a ferry boat system to accommodate river crossings where construction of a bridge is not a feasible or desirable alternative. There are ten ferry boats operating within or along the state's borders, seven of which provide river crossings at no charge. Ferry boats are considered "moving bridges" by the KYTC, and provide crossings on the Ohio, Mississippi, Green, Kentucky, and Cumberland Rivers. Funding is provided by KYTC to facilitate operation of seven of the ferry boats. The federal government provides funding and operation of the two ferry boats located in Mammoth Cave National Park. The Anderson Ferry, which crosses the Ohio River in northern Kentucky, is privately owned and operated. The ferry boats meet an important need as part of the Kentucky transportation system, and **Table 5.2.5 B** provides the ferry traffic counts for 2013.

Figure 5.2.5 B shows the current location of all the public ferry boats in Kentucky, while the following web link provides their ferry boat schedules: http://transportation.ky.gov/Ferries/Documents/FerryboatSchedule.pdf. For additional information on Kentucky ferry boat operations, see the web link at http://transportation.ky.gov/Ferries/Pages/default.aspx.

The federal government has provided some funding to assist ferry operators with capital projects through the Ferry Boat Formula Grant Program. More information about this federal program is available at http://www.fhwa.dot.gov/map21/guidance/guidefbp.cfm.

5.2.5-4 System Planning, Funding, and Development

The U.S. Army Corps of Engineers is responsible for the planning, construction, and operation of the lock and dam infrastructure on the nation's navigable waterways. Funding for these responsibilities comes from the barge industry and the federal budget.

Unlike Kentucky's highway system, KYTC has no legislative authority over waterways or riverports. The KYTC is constitutionally constrained to spend Highway Funds on roadways and cannot expend funds directly on inland waterways infrastructure. The KYTC routinely evaluates highway access to riverports, rail lines, and intermodal facilities to identify improvements that could be made that meet the KYTC's goal of providing an integrated system for the dependable movement of people and freight.

Kentucky Ferry Boat Traffic Counts							
2013	Augusta	Cave In Rock	Dorena Hickman	Reeds	Rochester	Turkey Neck Bend	Valley View
Vehicles Moved	38,185	135,922	14,391	10,661	21,192	70,645	79,931

Table 5.2.5 B – Ferry Boat Operations in Kentucky

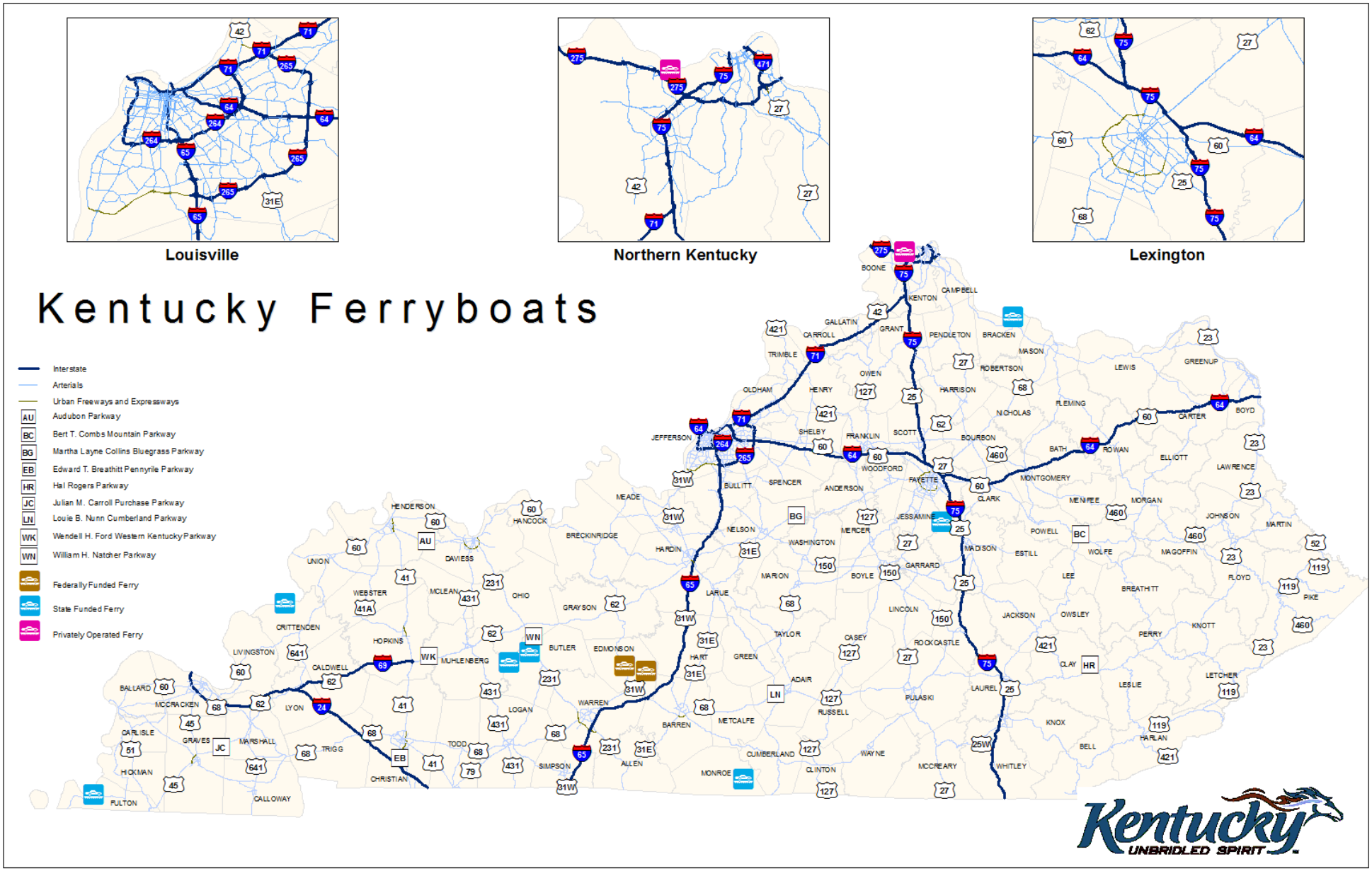


Figure 5.2.5 B - Ferry Boat Locations in Kentucky

Further assistance from KYTC could be considered in the form of support for consistent and sustained legislative funding to maintain existing inland waterways infrastructure.

The *2008 Kentucky Riverport Improvement Project* study made recommendations to provide a comprehensive and wide-reaching plan of action to enable Kentuckians to compete in regional, national, and global markets. It also provided a plan to improve the quality of life through better utilization of the state's water transportation assets, especially its riverports. This study recommended education of policymakers and the general public regarding the importance of Kentucky's public riverports and their influence on the state's economy. The Kentucky Legislature implemented three of the study's recommendations by creating the Water Transportation Advisory Board (WTAB) in 2011, creating a funding mechanism for public riverport capital improvements, and creating a funding mechanism for marketing assistance for the purpose of promoting Kentucky's riverport services. The WTAB advises transportation officials, the Cabinet for Economic Development, the Kentucky Governor's Office, the Kentucky Legislature, and other governmental policymakers concerning matters affecting waterways. As of the 2013 session, the Kentucky General Assembly has twice appropriated funding for riverport improvement grants tasking the WTAB with prioritizing the funds for optimum utilization.

To help gain a great understanding of funding issues facing waterways in Kentucky, **Table 5.2.5 C** shows how Kentucky compares to the surrounding states and others with regards to funding, taxes, etc. This table also provides a breakdown of funding issues as noted from the *2011 State's Support of Non-Highway Modes of Transportation: Investigation and Synthesis* developed by the KTC for KBT.

5.2.5-5 References and Links

5.2.5-5.1 General Information

1. *Kentucky Riverport Improvement Project,* 2008, and *Kentucky Water Transportation Corridors Public Riverport Development and Intermodal Access*, 2000, may be accessed at: http://transportation.ky.gov/Riverports/Pages/Riverport-Studies.aspx.
2. KYTC Ferries web page: http://transportation.ky.gov/Ferries/Pages/default.aspx.
3. *Toward a Full Accounting of the Beneficiaries of Navigable Waterways* 2011, Center for Transportation Research, university of Tennessee: http://www.nationalwaterwaysfoundation.org/study/BeneficiariesofNavigableWaterways14Jan11Ver.pdf.
4. U.S. Dept. o f Transportation Federal Highway Administration, Ferry Boat Program Discretionary Grant Program: http://www.fhwa.dot.gov/discretionary/fbd2012info.htm.
5. U.S. Dept. of Transportation Maritime Administration, America's Marine Highway Program: http://www.marad.dot.gov/ships_shipping_landing_page/mhi_home/mhi_home.htm#.
6. Water Transportation Advisory Board web page: http://transportation.ky.gov/Riverports/Pages/Water-Transportation-Advisory-Board.aspx.
7. Waterborne Commerce Statistics Center: http://www.iwr.usace.army.mil/About/TechnicalCenters/WCSCWaterborneCommerceStatisticsCenter.aspx.

Waterways Mode[+]							
State	**Dedication of Fuel Tax Revenues to Highway Modes**	**State Agency**	**Financial Support^**	**Bonding Authority#**	**Dedicated Funding**	**Technical and/or Marketing Support**	**Public Port Authority**
Kentucky	Constitutional	DOT	Trust Fund Grants*	Yes	No	Trust Fund Grant* Advisory Board	Local
Illinois	No–Multimodal	None	Revolving Loan	Yes	Yes	None	Local
Indiana	Statutory	State Port Authority	Non-Recourse Bonds	Yes	No	Port Authority Marketing	State & Local
Missouri	Constitutional	DOT	Trust Fund Grants** Revolving Loan	Yes	No	Marketing Grants	Local
Ohio	Constitutional	DOT	State Infrastructure Loan	Yes	No	ODOT Technical Staff	Local
Tennessee	No–Multimodal	DOT	Fuel Tax Investment into Grants & Loans	Yes	Yes	Advisory Board	Local
Virginia	No–Multimodal	State Port Authority	Tax Credits	Yes	Yes	Port Authority Technical Studies	State
West Virginia	Constitutional	State Port Authority (Under DOT)	Revolving Loan	Yes	No	State-wide Education Program	State
Alabama	Constitutional	State Port Authority	Special Appropriations	Yes	No	Port Authority Marketing	State
Minnesota	Constitutional	DOT	Revolving Loan	Yes	No	MnDOT Technical Staff	Local
Oklahoma	No–Multimodal	DOT	---	Yes	Yes	State-wide Education Program	Local
Oregon	Constitutional	Economic Development	Revolving Loan Trust Fund Grants	Yes	No	Trust Fund Grants	Local

[+]Reference: *2011 State's Support of Non-Highway Modes of Transportation: Investigation and Synthesis* by the Kentucky Transportation Center (KTC) using 2009 data.
^ - Infrastructure /Capital Improvements.; # - Bonding Authority Vested in Public Ports.; * - Trust Funds are currently unfunded by State Legislature.; ** - Grants allow operational and administrative cost to be funded.

Table 5.2.5 C - Waterway Funding Comparison in Kentucky and Other States

5.2.6 Bicycle and Pedestrian Facilities

"We need either wider shoulders and/or bike lanes on more roadways. Kentucky is moving and people are becoming more active in their lives. Runners/walkers/ bikers need a safe place to go." Fayette County Survey Participant

5.2.6-1 Bicycle and Pedestrian Transportation

Bicycling and walking are basic, forms of transportation for all Kentuckians. These active transportation modes are important to the success of the transportation system and have related benefits that can improve our quality of life. All travelers are pedestrians at some point during their trip, even if it is only between their vehicle and a building. It is the policy of the KYTC to enhance operational efficiency, promote program goals, and enrich the quality of life through the development of a pedestrian and bicycle network within our commonwealth. Increased levels of bicycling and walking transportation can result in significant benefits in terms of health, physical fitness, the environment, and congestion.

Per Kentucky Revised Statutes (KRS) 189.010, bicycles are legal vehicles and, as such, are permitted on all roadways except where they are specifically prohibited (e.g., parkways and interstates). Bicycles can safely share the roadways with motor vehicles when appropriate consideration is made during the planning, design, construction, and maintenance of new or reconstructed roadways. Bicycle traffic should be expected on all roadways (except interstate highways and other fully controlled access highways), but each location merits a different type of accommodation.

The bicycle transportation system is composed of many facility types: shared roadways (bicycle and motorized vehicles share the road), bicycle lanes (a part of the roadway), multiuse paths (which may also accommodate pedestrians), bicycle paths (separated from the roadway), and off road trail systems (which may also accommodate horses, ATVs, and pedestrians). We work with communities and local governments to maximize potential for proper facilities for both bicyclists and pedestrians. The majority of the dedicated bicycle and pedestrian transportation facilities are located in Kentucky's metropolitan regions, although this system is continually expanding into Kentucky's rural and recreational areas. The KYTC continues to develop better, more efficient ways to build and manage the existing highway system to achieve maximum performance for all road users. The KYTC maintains information and resources on the development and operation of pedestrian and bicycle facilities at http://transportation.ky.gov/Bike-Walk.

5.2.6-2 Pedestrian and Bicycle Planning

Bicycle and pedestrian safety is of the utmost priority for the KYTC. The underlying principle of bicycle and pedestrian planning is to provide a strategy for a system that allows a choice in modes of transportation and a reasonable balance in accommodations. In 2002, the KYTC developed and adopted a Pedestrian and Bicycle Travel Policy that provides policy and guidance for incorporating pedestrian and bicycle accommodations on all new or reconstructed state-maintained roadways and requires consideration of bicycle and pedestrian transportation when planning the resurfacing of roadways-including shoulders. This policy can be found at the following link: http://transportation.ky.gov/Bike-Walk/Documents/Task%20Force%20FINAL%20June%2018_02%20policy%20rec%20to%20Sec%20Codell.PDF. Where guidance from local governments is available, their bicycle and pedestrian visions are incorporated.

Most of the Metropolitan Planning Organization (MPO) areas in Kentucky have their own bicycle/pedestrian plans, as do some regional and local planning agencies. The KYTC works with communities and local governments to help identify opportunities for bicycle and pedestrian accommodations, but it is the responsibility of the local community to develop and update bicycle and pedestrian plans for connectivity, logical termini, and long-term maintenance. The KYTC provides an inventory of existing bicycle and pedestrian plans within Kentucky under the Programs heading at http://transportation.ky.gov/bike-walk/Pages/Local-Info.aspx as well as a list of local entities that have created a bicycle and pedestrian plan under the Organization heading at the same link.

The KYTC has a full-time Pedestrian and Bikeway Coordinator to help ensure that all pedestrian/bikeway policies are implemented. The coordinator provides technical assistance to state and local health, transportation, tourism, and enforcement agencies as requested. This assistance includes pedestrian and bikeway project planning, design, construction, maintenance, and safety information, research, and program guidance. The coordinator facilitates the implementation of the Americans with Disability Act (ADA) by providing guidance on preferred design elements and best practices.

> *"People in this area would gladly use bicycles to get to and from work if bicycle lanes were available to keep them safe from harm. This would greatly save on energy and improve health of our community."*
> Mercer County Survey Participant

The KYTC has developed a Bicycle Level of Service (BLOS) analysis to better review and recommend routes for bicyclists on cross-state recreational touring road routes. These routes provide connectivity and may be included in local or regional bicycle networks. Some of these routes are part of a national bicycle corridor plan (Unites States Bicycle Route System). The BLOS also helps identify segments for improvements to local bicycle travel.

> *"Bike facilities can do a lot: reduce congestion and help with clean air and exercise. They should be a much larger piece of our transportation infrastructure."* Daviess County Survey Participant

The Kentucky Bicycle and Bikeway Commission (KBBC) was formed by the Kentucky legislature in 1992 (KRS 174.125). The Governor's office designates seven citizens to represent the interests of bicyclists in advising the KYTC on all matters pertaining to bicycles, bikeways, and their use, extent, and location; assist the bicycle and bikeway program in the exercise of its duties within the KYTC; and promote the best interests of the bicycling public, within the context of the total transportation system, to governing officials and the public at large. The KBBC oversees the Paula Nye Memorial Grant Program which is funded by the Share the Road license plate fees and is located at the following link http://transportation.ky.gov/Bike-Walk/Documents/PaulaNye_Memorial_BicyclePedestrian_Education%20Grant%202013.pdf. The Nye Grant supports programs pertaining to bicycle and pedestrian safety through the development of curriculum, training aids, and/or educational programs or projects directly related to bicycle safety and the health, recreational, economic, social, cultural, and other benefits arising from bicycling and walking.

5.2.6-3 References and Links

5.2.6-3.1 General Information

1. 2012 AASHTO Guide for Bicycle Facilities / http://aashtodesign.com/search/2012-aashto-bicycle-guide.
2. 1999 AASHTO guide for Pedestrian Facilities / http://aashtodesign.com/search/aashto-pedestrian-guide.
3. PEDSAFE, Pedestrian Countermeasure Selection System: http://www.walkinginfo.org/pedsafe/.
4. Designing Sidewalks and Trails for Access: http://www.fhwa.dot.gov/environment/sidewalk2/pdf.htm.
5. ITE Design and Safety of Pedestrian Facilities: http://safety.fhwa.dot.gov/ped_bike/docs/designsafety.pdf.
6. Pedestrian Facilities User Guide- Providing Safety and Mobility: http://drusilla.hsrc.unc.edu/cms/downloads/PedFacility_UserGuide2002.pdf.
7. An Analysis of Factors Contributing to "Walking Along Roadway" Crashes: Research Study and Guidelines for Sidewalks and Walkways: http://drusilla.hsrc.unc.edu/cms/downloads/WalkingAlongRoadways_Study_Guidelines.pdf.
8. Evaluation of Safety, Design, and Operation of Shared Use Paths: http://drusilla.hsrc.unc.edu/cms/downloads/Eval_SharedUsePaths_Final.pdf.

5.2.6-3.2 Education

- Safety Materials:

1. Safety material available for print: http://transportation.ky.gov/Bike-Walk/Pages/Safety.aspx.
2. Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations: http://drusilla.hsrc.unc.edu/cms/downloads/Effects_Un_MarkedCrosswalks_Summary.pdf.

- Health Impacts of Having a Walkable Community:

1. http://www.smartgrowthamerica.org/complete-streets/complete-streets-fundamentals/factsheets/health.
2. http://www.cdc.gov/nceh/publications/factsheets/ImpactoftheBuiltEnvironmentonHealth.pdf.
3. http://www.cdc.gov/transportation/recommendation.htm.

- Economic Impacts of Having a Walkable Community:

1. http://www.smartgrowthamerica.org/complete-streets/complete-streets-fundamentals/factsheets/economic-revitalization.
2. http://people.hofstra.edu/geotrans/eng/ch7en/conc7en/ch7c1en.html.
3. http://www.sctainfo.org/reports/Economic_Impacts_of_Walking_%26_Bicycling/Economic_Impacts_of_Walking_%26_Bicycling_January_2013.pdf.
4. http://www.americantrails.org/resources/economics/NCouterbanks.html.

- Cycling and Pedestrian Improvements / Cost:

1. http://katana.hsrc.unc.edu/cms/downloads/Countermeasure%20Costs_Report_Nov2013.pdf.
2. http://katana.hsrc.unc.edu/cms/downloads/Costs-for-Pedestrian-Bicycle-Infrastructure-Improvements.xlsx.
3. http://www.pedbikeinfo.org/data/library/casestudies_details.cfm?id=4876.
4. http://activeliving.org/.
5. http://www.homewyse.com/costs/cost_of_concrete_sidewalks.html.
6. http://www.mtc.ca.gov/planning/bicyclespedestrians/Ped_Districts/04-Generic-Cost-Estimating-Tool.pdf.
7. http://www.ktc.uky.edu/research/multmodal-transportation/.

Chapter 6.0

6.0 How do we get there?

While the KYTC cannot foresee all challenges Kentucky's transportation system will encounter over the next twenty years, this Plan represents its policy, priorities, and direction for addressing, within funding limitations, the major issues and obstacles it may face through 2035. With the understanding that Kentucky's quality of life and economic future is dependent upon transportation services, the 2014 LRSTP has captured the historical & collective efforts in the public and private sectors of the transportation system dedicated to providing safe and reliable trips for people and goods.

The 2014 LRSTP serves as a resource for statewide organizations, policymakers, and local communities to use as a way to understand the initiatives, priorities, and strategies needed to lead Kentucky's present transportation system into the future. This plan sets the table for the future of Kentucky's transportation system. The full meal with all its amenities will need to be prepared through the concerted efforts of the KYTC, US Congress, the Kentucky General Assembly, local governments, stakeholders and the citizens.

The future transportation system will be built upon the present transportation infrastructure. This system will:

- Include a greater emphasis upon investments that last longer and therefore cost less per year to operate.
- Include emerging technologies that continue to improve its operation and state of good repair
- Be responsive to the needs of a growing population that will be older, more urban, and more diverse than ever before in the state's history.
- Strive to be increasingly safer as is reflected in the past trend of the decreasing number of traffic fatalities along the state's roadway network.
- Be challenged by inadequate financial resources across all modes that require innovation in raising revenues.

As we look to the future, the reality is that transportation systems are never "completed" and can only function effectively when adequate investment is made to continuously develop and maintain the system. This investment of resources does not necessarily mean that KYTC controls or funds all the elements of the transportation system. For safe and successful trips to continue over the next twenty years, it will require efficient use of all KYTC resources to support the critical publicly-owned elements of the transportation system as well as close working partnerships with private sector owners of other transportation system components such as rail, aviation and waterways. This quilting together of resources could be the step toward a more holistic State Transportation Fund rather than the current State Road Fund and the myriad of other funding mechanisms. For such a State Transportation Fund to be fully effective then all modes across the public and private sectors will need to incorporate the Performance Based Planning and Programming (PBPP) process into the selection and prioritization of future improvements to appropriately target Kentucky's transportation needs.

Implementing this plan involves a significant amount of effort, much of which is already underway in the development and maintenance of the present system. This significant effort will be used to accomplish 2014 LRSTP long-range goals and to achieve the destination postcard.

Within the PBPP process, the 2014 LRSTP project goals will be used to measure the effectiveness of proposed system improvements. These goals, for both people and freight, include:

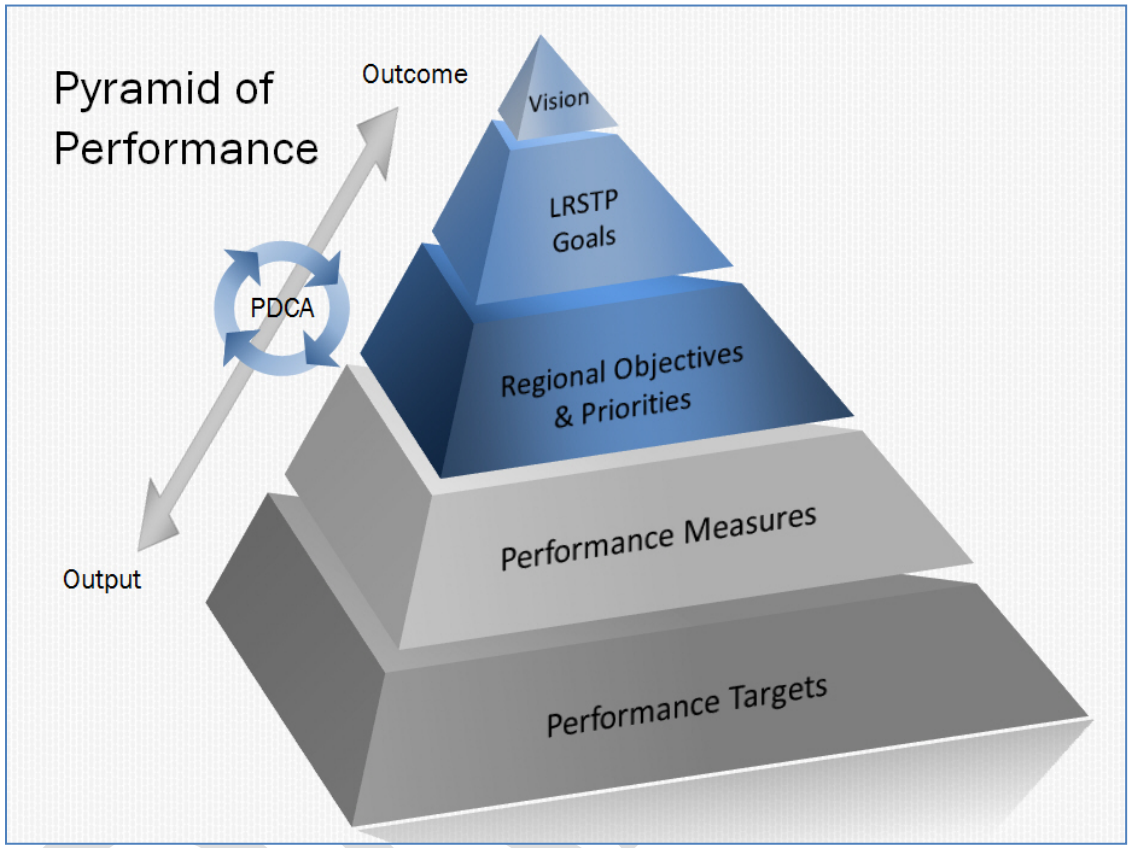
- Providing a safe and secure system.
- Maintaining and improving existing infrastructure on a continual basis.
- Ensuring dependable, effective and efficient facilities.
- Improving local, regional and global connectivity and access.
- Including all appropriate modes of transportation within a fully-integrated system.

Additionally, process goals will set performance standards for the methods and practices to be used to deliver improvements and to maintain the system. These process goals include consideration of:

- Dependable access to markets, jobs and resources.
- Consideration of human and natural resources.
- Efficient and flexible use of available resources.
- Transparent decision-making processes.

The Gatekeeper and the Stick

The Gatekeeper and the Stick are a visual interpretation of the distinction between project and process goals. Transportation investments are embodied by the Child. Stick – or project – goals measure the effectiveness of potential improvements to the transportation system. Gatekeeper – or process – goals focus on how THE KYTC will deliver these improvements.



The KYTC is committed to successful implementation of this plan & will focus on the appropriate resources to achieve that success particularly through the PBPP process and the Plan-Do-Check-Act (PDCA) cycles throughout the process. Through data collection and analysis and the communication of lessons learned, the PDCA cycle will be used to confirm that the outputs (improvements to the transportation system) support the desired outcomes---the goals and the vision. The KYTC is daring to use PBPP process appropriately and well in its efforts to attain the destination postcard for the 2014 LRSTP---- ***a well-maintained, multimodal transportation system which will deliver safe and reliable trips that will improve the quality of life for all Kentuckians*.**

Chapter 7.0

7.0 Acronyms

AAR – American Association of Railroads

AASHTO – American Association of State Highway and Transportation Officials

ABS – Ashland Bus System

ACS – American Community Survey

ADA – Americans with Disabilities Act

ADD - Area Development District

ADHS – Appalachian Development Highway System

AQI – Air Quality Index

ASLRRA – American Short Line and Regional Railroad Association

BLOS – Bicycle Level of Service

BNSF – Burlington Northern-Santa Fe railroad

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act

CMAQ – Congestion Mitigation and Air Quality Improvement Program

CN – Canadian National railroad

CFR – Code of Federal Regulations

CRASH - Collision Report Analysis for Safer Highways

CRPs – Contract Ready Proposals

CSXT – CSX Transportation railroad

DEA – Division of Environmental Analysis

DMI - Distance Measuring Instrument

DNA – Data Needs Analysis

DOT – Department of Transportation

DTP – District Transportation Plan

EPA – Environmental Protection Agency

ESRI - Environmental Systems Research Institute

FAA – Federal Aviation Administration

FBD – Ferry Boat Discretionary Grant Program

FHWA – Federal Highway Administration

FTA – Federal Transit Administration

FY – Fiscal Year

GARVEE – Grant Anticipation Revenue Vehicle

GHSA – Governor's Highway Safety Association

GIS – Geographic Information Systems

GIS - Geographic Information System

GOBG – Community Action of Southern Kentucky

HARS – Highway Advisory Radio System

HART – Henderson Area Rapid Transit

HDO – Highway District Office

HIS – Highway Information System

HPMS - Highway Pavement Management System

HSIP – Highway Safety Improvement Program

HTSD – Human Service Transportation Delivery Program

INDOT – Indiana Department of Transportation

ISTEA – Intermodal Surface Transportation Efficiency Act of 1991

ITS – Intelligent Transportation Systems

IRI – International Roughness Index

KAR – Kentucky Association of Riverports

KBBC- Kentucky Bicycle and Bikeway Commission

KBT – Kentuckians for Better Transportation

KDA – Kentucky Department of Aviation

KPTIA – Kentucky Public Transportation Infrastructure Authority

KRS – Kentucky Revised Statutes

KSRP – Kentucky Statewide Rail Plan

KTC – Kentucky Transportation Center

KYTC – Kentucky Transportation Cabinet

LEXTRAN – Lexington Transit Authority

LKLP – Leslie, Knott, Letcher, Perry Community Action Council

LRC – Legislative Research Commission

LRSTP – Long Range Statewide Transportation Plan

LRT – Light Rail Transit

LSIORB – Louisville/Southern Indiana Ohio River Bridges Project

MAP-21 – Moving Ahead for Progress in the 21st Century Act

MnDOT – Minnesota Department of Transportation

MPH – Miles Per Hour

MPO – Metropolitan Planning Organization

MTP – Metropolitan Transportation Plan

MUTCD – Manual on Uniform Traffic Control Devices

MVEB- Motor Vehicle Emission Budgets

NAAQC – National Ambient Air Quality Standards

NAS – National Airspace System

NBI - National Bridge Inventory

NCDOT – North Carolina Department of Transportation

NS – Norfolk Southern railroad

NTD – National Transit Database

ODOT – Ohio Department of Transportation

OKI – Ohio Kentucky Indiana Council of Governments

OMS - Operations Management System

OTD – Office of Transportation Delivery

OTS – Owensboro Transit System

PAL – Paducah and Louisville railroad

PBPP – Performance Based Planning and Programming

PDCA – Plan Do Check Act

PIF – Project Identification Form

PMS - Pavement Management System

RCI - Railroad Crossing Inventory

RCRA – Resource Conservation and Recovery Act

SAFE – Safety Assistance for Freeway Emergencies Patrol

SAFETEA-LU - Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)

SDE - Spatial Data Engine

SHSP – Strategic Highway Safety Plan

SIP – State Implementation Plan

STIP – Statewide Transportation Improvement Plan

TRI – Toxic Release Inventory

TAM – Transit Asset Management Plan

TANK – Transit Authority of Northern Kentucky

TARC – Transit Authority of River City

TED – Transportation Enterprise Database

TIFIA – Transportation Infrastructure Finance and Innovation Act

TIP – Transportation Improvement Plan

UNL – Unscheduled Needs List

UPL – Unscheduled Projects List

USDOT – United States Department of Transportation

Chapter 8.0

8.0 Glossary

Aggregate - Pieces of broken or crushed stone or gravel used to make concrete, or more generally in building and construction work.

Air Cargo (A/G) – (or airfreight carriers, and derivatives of these names) are airlines dedicated to the transport of cargo. Some cargo airlines are divisions or subsidiaries of larger passenger airlines.

Air Carrier - The commercial system of air transportation comprising large certificated air carriers, small certificated air carriers, commuter air carriers, on-demand air taxis, supplemental air carriers, and air travel clubs.

APRON - The hard-surfaced or paved area around a hangar and defined area on an airport or heliport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking...

Area Development District (ADD) - Kentucky's counties are grouped into 15 regions known as Area Development Districts (ADDs). The ADDs contract annually with the KYTC to facilitate a Public and Local Officials Transportation Committee. The primary objective is to obtain information identifying proposed regional needs for use in conjunction with the UNL and prioritized every two years, which is then provided as input to the Kentucky Transportation Cabinet's Biennial Highway Plan.

At-grade – Typically referring to railroad or other crossings where the road and railroad intersect on the same level or grade.

Class I Railroad - Class I Railroads, as defined by the Surface Transportation Board for 2012, are those having annual gross revenue of $452.7 million or more.

Class II Railroad - Class II Railroads, also referred to as regional railroads, are those having annual gross revenue greater than $36.2 million but less than $452.7 million.

Class III Railroad - Class III railroads are those having annual gross revenue less than $36.2 million.

Concrete overlay - This refers to the added concrete to the top of a concrete deck. Typically the top of a concrete bridge deck will last about 30 years. Then approximately a quarter of an inch of the top of the deck is scarified and then approximately an inch to an inch and a half concretely overlay is added. This added concrete overlay provides a new and better wearing surface and it protects the structural capacity of the deck.

Congestion Mitigation Air Quality (CMAQ) - A categorical Federal-aid funding program created with the ISTEA. This program directs funding to projects that contribute to meeting National air quality standards. CMAQ funds generally may not be used for projects that result in the construction of new capacity available to SOVs (single-occupant vehicles).

Contract Ready Proposals - This is a packet of notes, drawings, and sketches that are prepared in preparation for a bridge repair. This packet is sent to the Division of Construction Procurement to be advertised approximately two weeks before the letting.
Truck Network

Dam - A barrier that impounds water, generally used to retain water and manage water flow.

Data Needs Analysis (DNA) - The Kentucky Transportation Cabinet (KYTC) conducts Data Needs Analysis (DNA) Studies on projects that have had no previous planning activity or a study prior to the Design phase. The purpose of DNA studies is to better define the scope of the project, identify environmental concerns early in the process and determine if the funds allocated in the Highway Plan are adequate for the project.

Deep Water Ocean Port -Deepwater ports were initially defined in 1974 as "non-vessel, fixed or floating manmade structures that are used as ports or terminals for the loading, unloading, or handling of oil for transportation to a state."The definition later expanded to include facilities constructed at sea which are used as terminals to transfer natural gas, usually received in the form of Liquefied Natural Gas (LNG) from LNG carriers for delivery to deepwater ports, onshore storage facilities, and pipelines. Eleven such land-based import/export facilities and three such deepwater based LNG facilities have been constructed in the United States to date.

Demand-Response - Descriptive term for a service type, usually considered paratransit, in which a user can access transportation service that can be variably routed and timed to meet changing needs on an as-needed basis.

District Transportation Plan (DTP) - The Highway District Transportation Plan provides the support and process through which projects may progress from an idea to the Highway Plan. This will ensure that projects move forward, meet the Goals and Objectives of both the Cabinet and the Highway District, and have a data-driven foundation for their inclusion into a future Highway Plan. The intent is to complement the current metropolitan and regional planning processes, which provide for public involvement and local official input, with an engineering review. By providing quantifiable information related to needs and deficiencies across Kentucky's highway system, optimal decisions concerning the expenditure of available resources for KYTC projects can be made.

Endangered Species - The term "endangered species" means any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man.

Federal Highway Trust Fund - Dedicated federal fund specifically for transportation projects based primarily on motor fuel tax that was first created in 1956.

Federal Interstate Maintenance Funds - The Interstate Maintenance (IM) program provides funding for resurfacing, restoring, rehabilitating and reconstructing (4R) most routes on the Interstate System.

Floating Tax Rate - A tax rate that fluctuates over time based on an underlying benchmark or index that changes periodically.

511 - The Kentucky Transportation Cabinet Traveler provides Highway Information such as road closures, construction updates and crashes on its Website and via phone (511). It is provided to help motorists make better decisions about travel in Kentucky.

Fine Particulate Matter (PM 2.5) - Particulate matter consists of airborne solid particles and liquid droplets. Particulate matter may be in the form of fly ash, soot, dust, fog, fumes, etc. These particles are classified as "coarse" if they are smaller than 10 microns, or "fine" if they are smaller than 2.5 microns. Coarse airborne particles are produced during grinding operations, or from the physical disturbance of dust by natural air turbulence processes, such as wind. Fine particles can be a by-product of fossil fuel combustion, such as diesel and bus engines. Fine particles can easily reach remote lung areas, and their presence in the lungs is linked to serious respiratory ailments such as asthma, chronic bronchitis and aggravated coughing. Exposure to these particles may aggravate other medical conditions such as heart disease and emphysema and may cause premature death. In the environment, particulate matter contributes to diminished visibility and particle deposition (soiling).

Fixed Route - Term applied to transit service that is regularly scheduled and operates over a set route; usually refers to bus service GARVEE bonds - Specific to highways, a GARVEE is used as a term for a debt instrument that has a pledge of future Title 23 Federal-aid funding. Significantly, it is authorized for Federal reimbursement of debt service and related financing costs. States can thus receive Federal-aid reimbursements for a wide array of debt-related costs incurred in connection with an eligible debt financing instrument, such as a bond, note, certificate, mortgage, or lease; the proceeds of which are used to fund a project eligible for assistance under Title 23. Each of these instruments is considered a GARVEE when backed by future Federal-aid highway funding, but most frequently, a bond is the debt instrument used.

Functional Class - Functional classification groups streets and highways into classes or systems according to the character of service they are intended to provide. This classification recognizes that individual roads and streets do not serve travel independently. Rather, travel involves movement through a network of inter-related roads and streets. Because a highway network is limited and restrictive, the movement must be channeled through an efficient, hierarchical system of facilities that progress from a lower classification handling short, locally oriented trips to a higher classification as the trips become longer and connect regional and inter-regional traffic generators. The level of service provided by, and function performed by, each facility within this hierarchical system determines its functional classification. The classifications are as follows: Rural Principal Arterial, Rural Minor Arterial, Rural Collector Road, Rural Local Road, Urban Principal Arterial, Urban Minor Arterial, Urban Collector Street, Urban Local Road

General Aviation - That portion of civil aviation which *encompasses all facets of aviation except* air carriers holding a certificate of public convenience and necessity from the Civil Aeronautics Board and large aircraft commercial operators. The 92% of U.S. aircraft and more than 65% of U.S. flight hours flown by other than major and regional airlines or the military. Often misunderstood as only small, propeller-driven aircraft. Even a large jet or cargo plane operated under FAR Part 91 can be a general aviation aircraft.

Global Positioning System (GPS) - Satellite-based navigation.

Hangar - An enclosed structure for housing aircraft.

Heliport – A surface are small airport designed specifically for use by Helicopters

Highway Advisory Radio System - Governmental entities, as well as park districts and authorities, may be eligible to operate a Travelers' Information Station (TIS, also called Highway Advisory Radio) for the purpose of disseminating information by broadcast radio to travelers. A license is required before construction of, or operation of, a Travelers' Information Station. Travelers' Information Stations operate in the AM Broadcast Band (530 kHz - 1700 kHz) and are limited to a 10 watt transmitter output power, an antenna height no greater than 15 meters (49.2 feet), and a coverage radius of 3 km. These stations may not transmit commercial information. This service is not available to individuals or groups, but only to governmental entities and park districts. *See* 47 CFR 90.242 and 47 CFR 90.20(a).

Highway Information System (HIS) - Kentucky's Highway Information System (HIS) is a database containing information about highway system assets that is developed and maintained by the Transportation Cabinet. Individual databases are maintained as layers in the IMS and can be displayed individually or in combination for use in displaying information about the status of Kentucky's highway system

High Occupancy Vehicle Lanes - Vehicles carrying two or more people. The number that constitutes an HOV for the purposes of HOV highway lanes may be designated differently by different transportation agencies.

High-speed rail - A type of rail transport that operates significantly faster than traditional rail traffic, using an integrated system of specialized rolling stock and dedicated tracks.

Intermodal - The ability to connect, and the connections between, modes of transportation.

Light Rail - A streetcar-type vehicle operated on city streets, semi-exclusive rights-of-way, or exclusive rights-of-way. Service may be provided by step-entry vehicles or by level boarding.

Load Carrying Capacity - This is the weight limit in tons that has been determined that a bridge can safely carry. This is typically determined by our bridge load rating section using acceptable engineering calculations and\or engineering judgment based on the condition of the bridge. If a bridge has a posted weight limit of 15 tons, then it has been determined that bridge can safely carry 15 tons continuously.

Lock - A short confined section of a canal or other waterway in which the water level can be changed by the use of gates and sluices, used for raising and lowering vessels between two gates.

Manual on Uniform Traffic Control Devices (MUTCD) – The MUTCD defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. The MUTCD is published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F. The MUTCD, which has been administered by the FHWA since 1971, is a compilation of national standards for all traffic control devices, including road markings, highway signs, and traffic signals.

Metropolitan Planning Organization (MPO) - Federal transportation legislation requires that a Metropolitan Planning Organization (MPO) be designated for each urban area with a population of more than 50,000 people in order to carry out the metropolitan transportation planning process. Each urban area with a population greater than 200,000 is designated as a

Motor Vehicle Emission Budgets - The portion of the total allowable emissions defined in the submitted or approved control strategy implementation plan revision or maintenance plan for a certain date for the purpose of meeting reasonable further progress milestones or demonstrating attainment or maintenance of the National Ambient Air Quality Standards (NAAQS), for any criteria pollutant or its precursors, allocated to highway and transit vehicle use and emissions.

National Highway System (NHS) - This system of highways designated and approved in accordance with the provisions of 23 U.S.C. 103b). (23CFR500)

National Truck Network (NTN) – In compliance with the Surface Transportation Assistance Act of 1982 (STAA) and DOT Appropriations Act of 1983 and KRS 189.222, Kentucky has established a network of highways on which motor vehicles with increased dimensions (STAA vehicles) may operate. on state-maintained highways five (5) driving miles from the designated system and fifteen (15) miles from an interstate or parkway exit for the purpose of attaining reasonable access to terminals, facilities for food, fuel, repairs, or rest. The allowed access is reduced to one (1) driving mile from the designated system on public use highways which are not state-maintained.

New Madrid Fault Line – an active fault line located in southeastern Missouri, northeastern Arkansas, western Tennessee, western Kentucky and southern Illinois.

Ozone - Ozone is a colorless gas with a sweet odor. Ozone is not a direct emission from transportation sources. It is a secondary pollutant formed when VOCs and NOx combine in the presence of sunlight. Ozone is associated with smog or haze conditions. Although the ozone in the upper atmosphere protects us from harmful ultraviolet rays, ground-level ozone produces an unhealthy environment in which to live. Ozone is created by human and natural sources.

Para-transit - 1) Comparable transportation service required by the American Disabilities Act (ADA) for individuals with disabilities who are unable to use fixed route transportation systems. (49CFR37) (APTA1) 2) A variety of smaller, often flexibly scheduled-and-routed transportation services using low-capacity vehicles, such as vans, to operate within normal urban transit corridors or rural areas. These services usually serve the needs of persons that standard mass-transit services would serve with difficulty, or not at all. Often, the patrons include the elderly and persons with disabilities.

Project Identification Form (PIF) – This is a secured web application that houses the pertinent data used in tracking, analyzing and prioritizing UNL and UPL projects. The Division of Planning facilitates the development and revision of this application and processes.

Rural Secondary Program - The Rural Secondary (RS) Program is funded by 22.2% of the motor fuels tax revenue. These funds are used for the construction, reconstruction and maintenance of secondary and rural roads in each county. Allocation of RS funds is determined using the Fifths Formula. The Transportation Cabinet is responsible for expending all Rural Secondary Program funds.

State Primary System - Under KRS 177.020 the State Primary Road System classifies state-maintained roadways by the type of service and function they provide. 603 KAR 3:030 designates the following classes, State Primary System, State Secondary System, Rural Secondary System, Supplemental Roads

Section 106 Consulting parties - Section 106 of the National Historic Preservation Act states that Certain individuals and organizations with demonstrated interest in the undertaking may participate as consulting parties due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties. Consulting parties participate in the process of identifying historic properties that may be affected by the project, providing input regarding the effects that the project may have on these properties and assisting in the development of appropriate mitigative measures to resolve any adverse effects. Consulting parties as identified in 36 CFR 800.2(c)may include but not be limited to Federally recognized Indian Tribes, Tribal Historic Preservation Officers, National Park Service, and Local Governments.

Six Year Highway Plan – mandated by KRS 176.430 the Kentucky Transportation Cabinet develops a listing of both federal and state highway projects with associated phase, location, funding source, year, and cost as approved by the Kentucky General Assembly on a biennial basis.

Small Urban Areas - Areas of population greater than 5,000 but less than 49,999 qualify as small urban according to FHWA definitions.

State Implementation Plan - Produced by the state environmental agency, not the Metropolitan Planning Organization (MPO). A plan mandated by the Clean Air Act that contains procedures to monitor, control, maintain, and enforce compliance with the National Ambient Air Quality Standards (NAAQS). This plan must be taken into account in the transportation planning process.

State Road Fund - Dedicated state fund specifically for transportation projects based primarily on motor fuel tax.

Statewide Transportation Improvement Plan (STIP) - A staged, multi-year, statewide, intermodal program of transportation projects, consistent with the statewide transportation plan and planning processes as well as metropolitan plans, TIPs, and processes.

Substructure (bridge) - The substructure consists of all parts that support the superstructure including the Abutments or end-bents, Piers or interior bents, Footings, Piling

Superstructure (bridge) – The structural parts of the bridge that provide the horizontal span of the bridge. This is the portion of the bridge above the bridge bearings.

Telecommuting - Communicating electronically (by telephone, computer, fax, etc.) with an office, either from home or from another site, instead of traveling to it physically.

Terminal – A station where transport vehicles load or unload passengers or goods.

Threatened Species - The term "threatened species" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

TIFIA - The Transportation Infrastructure Finance and Innovation Act (TIFIA) program provides credit assistance for qualified projects of regional and national significance. Eligible applicants include state and local governments, transit agencies, railroad companies, special authorities, special districts, and private entities. The TIFIA credit program is designed to fill market gaps and leverage substantial private co-investment by providing supplemental and subordinate capital. Each dollar of Federal funds can provide up to $10 in TIFIA credit assistance and support up to $30 in transportation infrastructure investment.

Topographic - The art or practice of graphic delineation in detail usually on maps of natural and man-made features of a place or region especially in a way to show their relative positions and elevations

Towards Zero Deaths – The 2011-2014 Kentucky Strategic Highway Safety Plan
outlines measurable strategic opportunities to reduce fatalities and serious injuries on our roadways. The twelve emphasis areas are as follows: Aggressive Driving, Commercial Vehicle Safety, Drive Smart Safety Corridors, Impaired Driving, Incident Management, Roadway Departure, Occupant Protection, Young Drivers, Traffic Records, Legislative Issues, Distracted Driving and Motorcycles, and an Intersection emphasis area.

Transloading - The process of transferring a shipment from one mode of transportation to another.

Transportation Improvement Program (TIP) - A document prepared by a metropolitan planning organization that lists projects to be funded with FHWA/FTA funds for the next one- to three-year period.

Transportation Management Area (TMA) - There are now four TMAs in Kentucky: Louisville, Lexington, Cincinnati/Northern Kentucky, and Evansville/Henderson. The five non-TMA MPOs are Ashland, Bowling Green, Clarksville, Owensboro, and Radcliff-Elizabethtown.

Unscheduled Needs List (UNL) - The unconstrained list of all potential needs or deficiencies identified or suggested for consideration for future additions to the Unscheduled Projects List (UPL). Once used interchangeably with the Unscheduled Projects List, these potential projects represent qualitatively identified or perceived needs and/or deficiencies ("gaps"), which may or may not be supported with data, for which conceptual projects may have been developed but which have not been included in the prioritized UPL.

Unscheduled Project List (UPL) - The prioritized list of potential projects for consideration in future versions of the Biennial Highway Plan. Once used interchangeably with "Unscheduled Needs List" (UNL), these projects represent identified needs with data supported deficiencies for which conceptual projects may have been developed but for which there are no current funding commitments.

Urban Area – Areas of population greater than 5,000 can qualify as urban. 23 U.S.C. 101(a)(33),