

8 FREIGHT SYSTEM NEEDS

Kentucky has an integrated multimodal freight system that facilitates the efficient, reliable, and safe movement of freight. The challenge to KYTC will be to maintain, operate, and expand the system to meet current and future needs.

To help KYTC plan and invest more effectively and create a transportation system that is well-prepared for the future, it is important to thoroughly assess needs for freight movement and forecast future freight demands. Using the information presented in the previous four chapters, this chapter:

- Identifies the strengths and weaknesses of the existing freight transportation system
- Identifies the future needs of the freight transportation system

The purpose of identifying the needs of Kentucky's freight system is to better inform the decision-making process. The needs discussed in this chapter have been considered in developing the policy and strategy recommendations in **Chapter 9** and will help to make implementation of the outcomes more successful.

8.1 COMMONALITIES

The previous chapters presented information on various aspects related to the Kentucky freight transportation system: existing inventory, goals and performance measures, current conditions, and future trends and challenges. While the content of each of the previous chapters varied, commonalities regarding the freight transportation system could be gleaned from each. This section presents those commonalities and identifies them as a strength or weakness of the Kentucky freight transportation system.

8.1.1 Strengths

A review of the commonwealth's competitive advantages and critical challenges helps identify the strengths of the Kentucky freight system. The strengths are discussed below, grouped into six categories: business climate, connectivity, funding, location, system capacity, and system operations/condition.

8.1.1.1 Business Climate

Kentucky's current economy is comprised of business sectors that rely on transportation to move raw materials, components, and finished goods. Kentucky is a major player in the auto industry with four assembly plants. Louisville is home to two Ford assembly plants: the KTP and the LAP. In Georgetown, Toyota opened its first assembly plant outside of Japan in 1988, the TMMK. Lastly, Bowling Green has

been the exclusive production home of Chevrolet's high-performance flagship Corvette since 1981.⁷⁴ The location of these assembly plants has led to over 440 automotive suppliers locating in Kentucky.

Kentucky is also home to two major air cargo hubs operated by integrated express carriers DHL and UPS. DHL operates its North American hub at Cincinnati/Northern Kentucky International Airport, while UPS operates its Worldport hub at Louisville International Airport. Kentucky benefits not only from the direct economic activity that the hubs provide, but also from the growth in the warehousing and distribution industry spurred by the presence of these hubs. Like the auto assembly plants, the location of DHL and UPS in Kentucky has led to hundreds of other companies locating near these hubs. This has created a friendly business climate for future growth in these sectors and provides support for a robust and reliable freight transportation system throughout Kentucky.

8.1.1.2 Connectivity

Kentucky has good connectivity across the commonwealth. Ten interstates, two east-west (I-24 and I-64) and three north-south (I-65, I-71, and I-75), and a parkway system serve the state. I-69 corridor is proposed to traverse Kentucky from Indiana to Tennessee, but the completion for this stretch of interstate is dependent on available funding. In addition to key highway connections, Kentucky is also well-connected by water and rail, having over 1,980 designated navigable inland waterway miles (USACE) and 3,200 route miles of rail track. Its freight rail network includes railroads that run east-west and north-south across the state.

Kentucky not only has good connectivity across the commonwealth itself, but is also well-connected to other regions of the U.S. Two of the nation's busiest north-south interstate corridors (I-75 and I-65) run through Kentucky and connect industries across North America from Canada to Mexico. Kentucky also is home to major portions of I-64, which is a major east-west corridor stretching from Norfolk, Va. to St. Louis, Mo.⁷⁵ The commonwealth's entire inland waterway system provides a waterway link to Canada via the Great Lakes and to Mexican and South American markets via the deep water ports of New Orleans, La. and Mobile, Ala. In addition, Kentucky's inland ports and terminals provide direct access to the agricultural markets of the Midwestern and North Central states, to the industrial and consumer markets of the Northeast, and to the distribution networks of the South.

8.1.1.3 Funding

Approximately, 60 percent of the Kentucky Road Fund comes from state motor vehicle fuel taxes, and KYTC is constitutionally limited to using fuel tax revenue to fund roadway projects. The Kentucky Road Fund is supplemented by a vehicle sales tax, also called a usage tax, which typically yields about 25 percent of annual revenue. Registration and licensing fees paid by commercial trucking companies generate 10 percent of revenues, with the remaining 5 percent from vehicle and driver licensing and other fees.

As in most states, the majority of the Kentucky Road Fund is funded through taxes on motor vehicle fuels. However, unlike most states, Kentucky uses a percentage tax rate based on the wholesale cost of fuel, with a per gallon statutory floor of \$0.246 per gallon. This amount includes a \$0.064 fixed

⁷⁴ Williams, Betsy. "Auto Companies Accelerate Investment in Kentucky". April 23, 2002. Accessed on March 22, 2016. <http://businessclimate.com/kentucky-economic-development/auto-companies-accelerate-investment-kentucky>

⁷⁵ <http://www.thinkkentucky.com/kyedc/pdfs/kytrannw.pdf>

component plus a variable component, which is based on the average wholesale prices of gas. The rate cannot increase by more than 10 percent of the variable rate established at the close of the previous fiscal year. As of May 2015, 15 states including Kentucky have instituted a variable component to their fuel tax. These states have seen their fuel tax rate rise sometime in the last 2 years, while among the 31 states levying a fixed-rate fuel tax, the average length of time since the last fuel tax increase is 16 years. If the fuel tax is going to provide an adequate amount of revenue to fund transportation, the tax rate needs to be periodically adjusted to at least keep pace with the growth rate in the cost of infrastructure maintenance and construction.⁷⁶ Kentucky is doing this by utilizing a variable-rate fuel tax. The state's current tax rates for fiscal year (FY) 2015 stand at about \$0.246 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 but started falling as the wholesale price fell beginning in January 2014.

Kentucky's federal highway program will be largely matched with "toll revenue credits" through FY 2020. Toll revenue credits are attributed to Kentucky by federal highway law, in accordance with calculations that consider past levels of state fund investment, such as state-sponsored toll roads, in the federal highway system. The credits do not generate cash and cannot be accounted for as such; however, they do permit KYTC the flexibility to use 100 percent federal funding on federal-aid projects. By doing so, KYTC can allocate more of its own state funding for state-funded projects.

Kentucky made available \$1.6 million per year in grant funding from FY 2011 through FY 2016 to short line railroads to help fund track improvements and at-grade highway-rail crossing reconstructions in the commonwealth. While this is a non-recurring funding source, another \$3.2 million was included in the transportation budget for FY 2017 and FY 2018 to make additional rail safety improvements. In recent years, the state has provided 80 percent of the funding with the railroads making up the remaining 20 percent.

Kentucky made available \$500,000 per year in grant funding from FY 2013 through FY 2016 to operating public riverports for dredging and maintenance of access. Since this program began, it has employed a 50/50 match funding requirement. However, due to the relatively small amount of funding, some riverports have provided much more than 50 percent funding to ensure project completion. While this is a non-recurring funding source, another \$1 million was included in the transportation budget for FY 2017 through FY 2018.

8.1.1.4 Location

Kentucky's strategic location facilitates the distribution of goods and materials to a massive industrial and consumer market. Kentucky is at the center of a 34-state distribution area in the eastern U.S. Kentucky's borders are within a day's truck drive or within 600 miles of over 60 percent of the nation's population, personal income, and manufacturing business establishments. In addition, Kentucky is an attractive location for air cargo hubs due to its generally temperate weather and short travel times. From the UPS Louisville hub, approximately 75 percent of the U.S. population is reachable within a 2-hour flight, and a 4-hour flight allows for access to 95 percent of the U.S. population.

Kentucky also lies at the hub of the nation's inland waterways. Positioned advantageously on both the Ohio and Mississippi rivers, its location offers unique advantages for efficient freight transport of bulk

⁷⁶ <http://www.itep.org/pdf/gastaxincreases0515.pdf>

materials, agricultural products, chemicals, minerals, metals, manufactured goods, wood, and containerized freight.

8.1.1.5 System Capacity

The size of Kentucky's transportation system is a strength. There is a well-connected system for handling highway freight traffic. Kentucky has significant rail infrastructure with five Class I railroads, one Class II railroad, and 13 Class III railroads to move freight across the state. Rail transportation in Kentucky is increasingly intermodal, providing numerous transloading opportunities between train, truck, and barge.⁷⁷ The commonwealth has nine USACE designated commercially navigable waterways, including the Mississippi River and the Ohio River. There are five commercial airports in Kentucky, including two major cargo airports (Louisville International Airport and Cincinnati/Northern Kentucky International Airport), providing Kentucky the third ranking in the nation in total air cargo shipments. There are also 26 other regional airports with runway lengths greater than 5,000 feet, making them capable of handling air cargo shipments.

In addition to Kentucky having a strong existing transportation system, future improvements are being made in the Jackson Purchase Region of the commonwealth to further strengthen the system. Improvements are being made to what has been designated as I-69. This system of roadways is expected to accommodate additional trucking volumes and connect the Hickman Riverports with the Interstate Highway System.

8.1.1.6 System Operations/Condition

According to 2012 data from FHWA, Kentucky has the ninth best roads in the country, with only 9.7 percent of all federal-aid highway miles in poor or mediocre condition. The MRP Report, which is an annual survey of roads conducted by the KYTC Division of Maintenance, indicates scores improved from 1999 to 2007 but have been up and down since. The target grade has been surpassed in 5 of the last 6 years. This indicates a marked improvement from earlier data—Kentucky did not meet its target goal from 1999 through 2006. Interstates and NHS roads have consistently had the best ratings, being over the KYTC target grade for each of the past 13 years.

8.1.2 Weaknesses

A review of Kentucky's competitive advantages and critical challenges helps identify the weaknesses in the freight system. The weaknesses are discussed below, grouped into six categories: business climate, connectivity, funding, location, system capacity, and system operations/condition.

8.1.2.1 Business Climate

Historically, Kentucky is a net exporter of energy; however, with decreasing coal production and stagnant energy demand, Kentucky's position as an energy exporter has been declining since 1990. The average delivered cost of coal from Central Appalachia was highest among all coal producing regions due to the cost of production.⁷⁸ Nationwide, competition from cheap foreign coal, coal regulations, and rail

⁷⁷ <http://www.thinkkentucky.com/kyedc/pdfs/kytrannw.pdf>

⁷⁸ <http://www.coalage.com/features/3129-coal-transportation-costs-could-hinder-resurgence-of-coal-generation.html#.VOJ3ZC5d6uT>

capacity constraints are making imports more attractive than domestic coal, especially to East Coast power plants.

8.1.2.2 Connectivity

Navigable rivers in Kentucky depend on the lock and dam system. For instance, the purpose of the Ohio River's locks and dams is to maintain a minimum depth of 9 feet for commercial navigation. The locks and dams constructed in the 1930's and 1940s are aging and are in need of major rehabilitation or replacement.

The timing for I-69 completion in other states is uncertain. The connectivity of I-69 across the U.S. between Michigan and Texas depends on the incomplete sections of the corridor.

8.1.2.3 Funding

While having a variable-rate fuel tax is a strength for Kentucky, it should be noted that relying heavily on the fuel tax to fund the Kentucky Road Fund could be a disadvantage if revenues aren't adequate to fund transportation. Revenues fluctuate depending on the price of the gasoline and fuel consumption rates. Revenue planning may be difficult because of price uncertainties, especially if an unexpected drop in fuel prices was to occur.

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. Kentucky has traditionally been a donor state from the perspective of the federal fuel tax. Therefore, Kentucky receives a smaller share of funding from the Federal Highway Trust Fund than they paid into it.

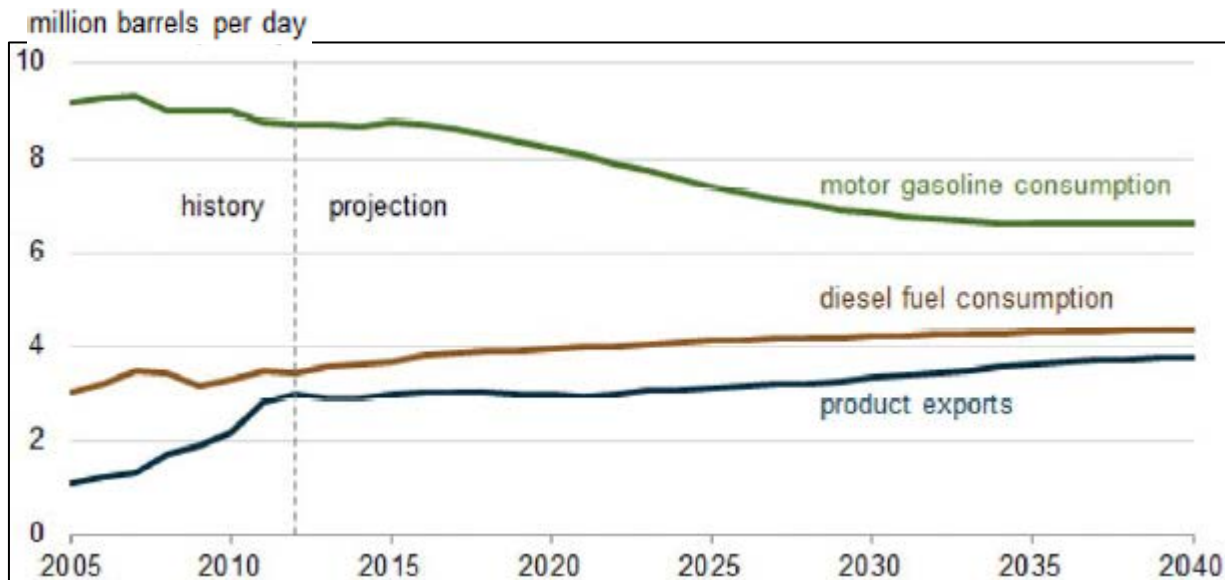
The federal gasoline tax has not been increased since 1993, and it is not indexed to inflation. The inflation rate from 1993 until 2015 was 64 percent.⁷⁹ The buying power of the federal gasoline tax has significantly reduced over the years.

As shown in **Figure 8-1**, U.S. motor gasoline consumption has declined since 2010. Drivers of this reduction include more fuel-efficient vehicles and electric/hybrid vehicles. Motor gasoline consumption is projected to further decline through 2040, and one of the primary contributing factors is more stringent fuel economy standards. These standards will require new light-duty vehicles to average approximately 49 miles per gallon in vehicle model year (MY) 2025, versus their current compliance estimate of about 33 miles per gallon in MY 2012.⁸⁰ Decreasing motor gasoline consumption will likely reduce the fuel tax revenues at federal and state levels if there are minimal or no increases in the fuel tax rate or additional funding resources are not identified.

⁷⁹ US Inflation Calculator. <http://www.usinflationcalculator.com>. Accessed on March 24, 2016.

⁸⁰ Mallik, Arup. U.S. Energy Information Administration. "Fuel Economy Standards Drive Down Projected Gasoline Use; Diesel Use, Product Exports Use". June 26, 2014.

Figure 8-1: U.S. Motor Gasoline and Diesel Fuel Consumption and Product Exports (2005-40)



Source: U.S. Energy Information Administration, Annual Energy Outlook 2014

8.1.2.4 Location

While Kentucky's geography provides many economic advantages, it also presents challenges with mountainous terrain, areas prone to flooding, and air quality issues.

8.1.2.5 System Capacity

A number of inactive short line railroads in the Paducah area tie into the Paducah & Louisville Railway, which connects with the CN and CSXT railroads. Improvements on these inactive short line railroad corridors must be a key initiative of KYTC's freight partners.⁸¹

There are also challenges facing the capacity of the Kentucky highway system. FAF flow analysis shows significant projected growth in freight volumes between 2007 and 2040. Significant growth takes place on I-71/I-75 between the Brent Spence Bridge and the I-71/I-75 split, as shown in **Figure 5-7** in **Chapter 5**. I-75 is a direct link to Canadian ports of entry, so this corridor is particularly crucial for Kentucky's exports to Canada. Additionally, I-65 and I-64 are projected to experience substantial freight growth.

8.1.2.6 System Operations/Condition

According to Kentucky's MRP Report, rural secondary roads did not meet the target MRP score in any of the years studied. The average grade for rural secondary roads from 1999 to 2012 was slightly under 74. In addition, the percentages of pavements in good condition and fair condition have been trending downward and the number of structurally deficient bridges has been increasing. These factors indicate a weakness in the operations on the roadway system. This is especially true for intermodal connectors and last mile connections, which are often maintained by several different entities. Investment in

⁸¹ <http://www.nado.org/wp-content/uploads/2012/03/panama.pdf>

connectors is frequently in competition for ever decreasing transportation funding with other high-profile projects.

The National Bridge Inventory lists the I-71/I-75 Brent Spence Bridge between Northern Kentucky and Cincinnati as “functionally obsolete” due to concerns with capacity, sight distance, and safety. These concerns have led its replacement project to be considered a high priority for the KYTC, the Ohio Department of Transportation, and the Ohio-Kentucky-Indiana Regional Council of Governments (OKI).

Other modes of transportation, including rail and waterways, also are facing operational challenges. The commonwealth does not own rail assets and therefore service locations, investments, and shipping rates and schedules are all controlled by the railroad companies themselves. Also, the freight rail reorganization bypasses large sections of the Ohio River Basin, limiting inland connectivity. Potential exists for the creation of a container-on-barge terminal on a waterway in the western part of Kentucky; however, the challenges include an aging and less reliable lock and dam system and the breakdown of the container recycling circuit. Because containers are not currently shipped down the Ohio River, containers being shipped up the Ohio River would stockpile. Kentucky’s involvement in the movement of Post-Panamax freight remains uncertain unless commitments to infrastructure investment are made.⁸² Post-Panamax container ships are vessels that have a capacity range of 4,000 TEU to 15,000 TEU.

8.2 FUTURE NEEDS

As freight volumes grow, the ability of the multimodal freight system to be resilient and responsive to the freight community’s needs will be increasingly critical to Kentucky’s economic future. Freight network needs were identified through an analysis of the strengths and challenges of the Kentucky freight system. The following needs have been identified:

- Initiate a commonwealth-wide program to impact Kentucky’s ability to compete in regional, national, and global markets for many years to come, based on the recommendations in the 2008 Kentucky Riverport Improvement Project report. One of the recommendations is to conduct a detailed, comprehensive study of the economic impacts of water transportation to better understand the importance of the commonwealth’s ports and waterways to its economy and quality of life.
- Support and work with private rail carriers to provide a safe, reliable, efficient, and effective rail transportation system for the movement of freight within the commonwealth, as well as connect Kentucky to domestic and international markets. An example is preservation of the eastern Kentucky rail lines despite the majority of coal coming from western Kentucky in the future.
- Prepare western Kentucky for the flow of Post-Panamax freight, including developing coordinated plans of action and improvements to ports, railroads, and interstate highways.

⁸² http://docs.pianc.us/smart11/docs/wed/trackd/SMART%20RIVER_Brock_Final.pdf

- Improve the commercial vehicle crash rates with serious injury on Kentucky interstates and U.S. highways that have a KAB of greater than 25 percent. This includes multiple sections of I-71, I-69, and US 41.
- Improve key highway bottlenecks, such as the I-65 at I-64/I-71 interchange in Louisville and the I-71 and I-75 interchange (Cincinnati). Although the I-71 and I-75 interchange is located in Ohio, this bottleneck has significant implications for northern Kentucky freight.
- Build resiliency and redundancy into the freight transportation system to protect current and future investments and to maintain safe operational capabilities during and after extreme weather events or earthquakes. Adaptation of vulnerable freight transportation infrastructure and facilities will require policy changes and investment.
- The ability of KYTC and its partners to understand current and potential future supply chain needs is crucial to making optimal investments in future freight infrastructure. Freight investment in Kentucky must be balanced between heavy-volume interstate highways and U.S. highways and last mile connectors that serve more local freight generators, which are critical to maintaining the supply chain and economic growth throughout the commonwealth.
- Improve the capacity and operations of the rural freight system. Kentucky's agricultural producers rely heavily on rural infrastructure to transport farm products, as crops are moved from production regions by truck, rail, or barge to elevators and processing facilities.
- The routes identified as critical freight corridors are within KYTC's span of control and should become a known part of the planning process.
- Continue working with the FAA to lengthen additional GA airport runways 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.
- Seek opportunities to incorporate Intelligent Transportation Systems (ITS), Information Technology (IT), and other new technologies into freight transportation planning and freight projects.