



CHAPTER 2

WHAT IS CHANGING IN KENTUCKY'S WATERBORNE ECONOMY?

Changes in Kentucky's waterborne commodity mix, trading partners, and economic role can have profound implications for both the port communities and the "hinterlands" within a 90-mile one-way drive from the nearest public riverport. This chapter offers a detailed assessment of economic and market changes anticipated for Kentucky's waterborne economy to the year 2045, including key growth and decline markets for each port, significant shifts to expect in trading partners, ways that specific investments in Kentucky's public riverports can be responsive to this change, and how Kentucky's positioning for future change relates to practices of other states. **Technical Memorandum 2** provides additional detail on these forecasts, both statewide and for individual port hinterlands. The remaining chapters of the study will then directly address the benefits and impacts of investing in riverports under these changing conditions, key actions to support market capture, and strategic objectives for implementing a riverport hinterland investment and market strategy to 2045.



Figure 2-1: Covered barge at Eddyville Riverport

2.1 CONNECTING KENTUCKY TO 2045 NATIONAL MARKETS

Under any economic scenario, Kentucky's waterborne transportation economy will continue to play a vital role both in the Commonwealth's business competitiveness and in the United States economy for the foreseeable future. Under the most likely scenario, even with projected declines, Kentucky will continue to trade over 64 million tons of freight using inland waterways in 2045, valued at over \$20 billion.¹ The percentage of Kentucky's waterborne trade (by tonnage) exchanged with trading partners outside of the Commonwealth is projected to increase from 78% in 2018 to 85% in 2045, pointing to the ongoing long-term importance of Kentucky's waterborne commerce to the larger national economy.

Even with declining tonnages overall, the value of freight Kentucky exchanges with the New Orleans region is expected to increase from \$4.2 billion in 2018 to \$5.5 billion in 2045, increasing its share of Kentucky's overall waterborne commerce by 3% (from 25% to 28%). Kentucky's other waterborne trading relationships are expected to become increasingly diverse, with major current trading partners reducing their share of waterborne trade with Kentucky and new partners playing more of a role. Most notably declines in coal markets are expected to cause trade with the Charleston, West Virginia region to decline from 20% of the overall value of Kentucky's water commerce in 2018 to less than 11% in 2045 as new trading partners—such as Chattanooga, TN; Knoxville, TN; and Greenville, MS—rise into the top ten trading partners.

2.1.1 Changes in Trading Partners

Tables 2-1 and 2-2 demonstrate the top sources of inbound and outbound trade with Kentucky anticipated in 2045 by both tonnage and value. For comparison, Tables 1-3 and 1-4 in Chapter 1 show the 2018 top waterborne trading partners.

Table 2-1: Top 10 Inbound Waterborne Trading Partners in 2045 per TRANSEARCH

Origin	1000 Tons	% Of Tons	\$ Million	% Of Value
New Orleans, LA	3,246	15%	\$3,618	27%
Charleston, WV	2,995	14%	\$1,665	12%
Evansville, IN	2,084	10%	\$455	3%
Tupelo, MS	1,759	8%	\$321	2%
Wheeling, WV	1,605	7%	\$58	0%
Memphis, TN	1,502	7%	\$1,014	8%
St. Louis, MO	1,327	6%	\$135	1%
Lafayette, LA	1,086	5%	\$3,886	29%
Cincinnati, OH	1,043	5%	\$429	3%
Louisville, KY (Out-of-State Portion of Region)*	889	4%	\$90	1%
Others	3,872	18%	\$1,726	13%
Total Inbound	21,408	100%	\$13,397	100%

¹ Source: IHS Markit TRANSEARCH 2021.

Table 2-2: Top 10 Outbound Waterborne Trading Partners in 2045 per TRANSEARCH

Destination	1000 Tons	% Of Tons	\$ Million	% Of Value
New Orleans, LA	9,513	29%	\$1,877	33%
Nashville, TN	6,861	21%	\$284	5%
Baton Rouge, LA	4,163	13%	\$394	7%
Charleston, WV	1,774	5%	\$502	9%
Clark Co, IN	1,579	5%	\$628	11%
Cincinnati, OH	871	3%	\$26	0%
Lake Charles, LA	680	2%	\$48	1%
Wheeling, WV	648	2%	\$47	1%
Pittsburgh, PA	585	2%	\$6	0%
Memphis, TN	541	2%	\$12	0%
Others	5,939	18%	\$1,803	32%
Total Outbound	33,154	100%	\$5,627	100%

Projected declines will require riverports to place a growing emphasis on capturing and serving those commodities and trading partners where market size is expected to increase. Key trading partners with projected growth in waterborne commerce with Kentucky from 2018 to 2045 include:

- Tupelo, MS expected to trade more than 862,000 tons of freight
- Evansville, IN expected to increase by 342,000 tons
- Baton Rouge, LA expected to increase by 202,000 thousand tons
- Knoxville, TN expected to increase by more than 120,000 tons
- Houston, TX expected to increase by more than 100,000 tons

These top five growing trade partners are expected to increase their trade with Kentucky by 17% by tonnage, representing over 1.6 million tons valued at over \$2.6 billion in the 2018-2045 period. **Table 2-3** presents trade volume projections for the top ten growth markets. **Section 2.2** of this chapter will further explore which of Kentucky's riverport hinterlands are expected to experience trade with each of these partners, and in which waterborne commodities.

Table 2-3: Top 10 Growth Partners in Waterborne Trade with Kentucky

Trading Partner	Market Size		Projected Growth in Tonnage 2018-2045	
	1000 Tons in 2018	1000 Tons in 2045	Difference	% Growth 2018-2045
Tupelo, MS	946	1,807	862	91%
Evansville, IN	2,421	2,764	342	14%
Baton Rouge, LA	4,751	4,953	202	4%
Knoxville, TN	440	562	122	28%
Houston, TX	714	818	104	15%
Little Rock, AR	189	288	99	53%
Huntsville, AL	186	253	66	36%
Fort Smith, AR	12	30	18	154%
Peoria, IL	67	83	16	24%
Tampa, FL	6	20	15	256%

2.1.2. Changes in Waterborne Commodities

Despite a significant contraction in market size, the energy, chemical, agriculture/food/lumber, and metals/minerals supply chains described in Chapter 1 are expected to remain highly dependent on Kentucky's waterways.

- The agriculture/lumber/food supply chains represent a projected growth area in which overall economic trends are expected to favor an increase in Kentucky's waterborne commerce market. For these commodities, tonnage traded with Kentucky by water is expected to move nearly 12 million tons of lumber, agriculture or livestock, and food products valued at nearly \$2.6 billion—up from the 6.1 million tons and \$1.4 billion traded with Kentucky by water in 2018.
- Growth is also expected in demand for waterborne trade of chemicals and allied products with Kentucky, by 2045 expected to be trading 4.7 million tons valued at nearly \$5.9 billion; up from the 3.8 million valued at \$3.9 billion traded in 2018.
- While volumes are anticipated to decline in supply chains related to energy and mining, Kentucky waterways are projected to continue to play an important role. For the energy sector in 2045, Kentucky's waterways are expected to move nearly 18 million tons of coal, petroleum, coal products, and crude petroleum/natural gas, valued at more than \$5 billion. While down from 42 million tons valued at \$7.1 billion in 2018, commodities in this supply chain will still account for significant shares in Kentucky's top waterborne commodities by volume.
- Supply chains involving the use of nonmetallic minerals, metallic ores, and primary metal products are also expected to decline in volume but are expected to heavily utilize Kentucky's waterways, moving nearly 25 million tons of freight valued at over \$4.9 billion in 2045; down from 32 million tons valued at \$4.3 billion in 2018.

Table 2-4 and Table 2-5 demonstrate the top commodities traded with Kentucky from outside the Commonwealth in 2045 by water by tonnage and value. (Note the tables demonstrate national trade and do not account for intra-state trade, which is also included in the above-referenced totals). For comparison, Table 1-6 and Table 1-7 in Chapter 1 provide corresponding values for 2018.

Table 2-4: Top 10 Inbound Waterborne Commodities in 2045 per TRANSEARCH

Inbound Commodity	1000 Tons	% Of Tons	\$ Million	% Of Value
Petroleum or Coal Products	5,150	24%	\$3,417	26%
Chemicals or Allied Products	3,680	17%	\$5,244	39%
Nonmetallic Minerals	3,204	15%	\$39	0%
Coal	2,522	12%	\$78	1%
Lumber or Wood Products	1,890	9%	\$331	2%
Primary Metal Products	1,780	8%	\$3,116	23%
Crude Petroleum or Natural Gas	1,283	6%	\$565	4%
Metallic Ores	498	2%	\$45	0%
Agricultural Production & Livestock	454	2%	\$145	1%
Clay, Concrete, Glass or Stone	431	2%	\$84	1%
Others	517	2%	\$334	2%
Total Inbound	21,409	100%	\$13,398	100%

Table 2-5: Top 10 Outbound Waterborne Commodities in 2045 per TRANSEARCH

Outbound Commodity	1000 Tons	% Of Tons	\$ Million	% Of Value
Nonmetallic Minerals	13,389	40%	\$122	2%
Agricultural Production & Livestock	7,522	23%	\$1,586	28%
Coal	4,130	12%	\$128	2%
Clay, Concrete, Glass or Stone	2,209	7%	\$575	10%
Petroleum or Coal Products	2,186	7%	\$989	18%
Food or Kindred Products	1,568	5%	\$289	5%
Primary Metal Products	943	3%	\$1,269	23%
Chemicals or Allied Products	941	3%	\$584	10%
Waste or Scrap Materials	190	1%	\$62	1%
Metallic Ores	59	0%	\$4	0%
Others	16	0%	\$19	0%
Total Outbound	33,153	100%	\$5,627	100%

As market conditions point to less global demand for waterborne trade with Kentucky, riverports will have to adapt for new commodities. Key commodity groups with projected growth in waterborne commerce with Kentucky from 2018 to 2045 include the above-mentioned supply chains in agriculture/food production/lumber and chemicals/allied products as well as primary and fabricated metal products. **Table 2-6** below gives an overview of the commodities projected to grow in waterborne trade with Kentucky from 2018 to 2045, showing the growth in overall trade by tonnage for each.

Table 2-6: Commodities with Projected Growth in Waterborne Tonnage Traded with Kentucky, 2018-2045

Commodity Group	Market Size		Projected Growth in Tonnage 2018-2045	
	1000 Tons in 2018	1000 Tons in 2045	Difference	% Growth 2018-2045
Agricultural Production & Livestock	4,406	7,976	3,570	81%
Food or Kindred Products	728	1,776	1,048	144%
Lumber or Wood Products	920	1,890	969	105%
Chemicals or Allied Products	3,754	4,621	868	23%
Primary Metal Products	2,380	2,723	343	14%
Fabricated Metal Products	12	17	6	51%
Combined Total	12,200	19,003	6,803	56%

These six commodity groups are the only ones with a projected increase in waterborne trade between Kentucky and the rest of the United States over time. For these six combined, waterborne trade with Kentucky is expected to increase by nearly 56% in terms of tonnage, increasing by 6.8 million tons of additional water trade valued at nearly \$12.8 billion worth of freight annually by 2045. **Section 2.2** of this chapter will further explore how growth in commodity markets relates to each of Kentucky's hinterland areas.

2.1.3. Comparison with National Trends

Because USDOT has not yet published a current national FAF forecast of waterborne trade flows, it is not possible to compare the TRANSEARCH forecasts for Kentucky's trade with a comparable national forecast, synonymous with **Table 1-2** in **Chapter 1**. However, the Kentucky forecasts shown in **Table 2-1** through **Table 2-6** can be understood within the larger context of national trends. Trends can identify major sectors of waterborne freight growth and decline which can drive Kentucky's regional and local riverport market capture and economic development strategies.

For example, the overall rise in demand for grains, alcohol, food, and kindred products suggests not only that riverports may market directly to firms shipping these goods by water, but also work with local economic development entities to attract and retain their trading partners. These supply chain opportunities may be even more significant in manufacturing sectors such as rubber, plastic, and machinery where Kentucky's waterborne commerce share is anticipated to be small but increasing. The increase can be greatly enhanced if firms that supply manufacturers of these goods locate within the hinterland areas, thereby attracting new local customers for the port.

Table 2-7 gives a summary interpretation of the observed trends together with the forecast trends above to inform statewide strategies for port market development. **Section 2.2** of this chapter will further explore market dynamics for individual riverports as related to investment and infrastructure needs. **Chapters 3** and **4** will further explore how attraction and capture of new markets through riverport investment may enhance both the Kentucky and national economy, and **Chapter 5** will address concepts for developing local "home markets" for riverports in this changing economic context.

Table 2-7: Markets to Watch – Strategic Implications of Market Forecasts

Key KY Waterborne Trade Market	Historic Changes 1997-2017 (FAF) as Described in Chapter 1	Anticipated Forecast Changes 2018-2045 (Transearch)	Strategic Implications
Fuels: Coal, Gasoline, Fuel Oils	 Waterborne trade with Kentucky declined by 48% even as national market increased by 67%	Kentucky is expected to lose an additional 62% of its market by 2045 in coal, petroleum, and gas fuel waterborne trade.	Ports dependent on coal, petroleum, shipping stone, gravel, and non-metallic minerals for significant shares of business should explore new markets in trade partners trafficking in grains, food, plastics, rubber, and other manufactured goods.
Minerals: Sand, Stone & Non-Metallic Minerals	 Waterborne trade in sand, stone and non-metallic minerals with Kentucky declined by 95% and there was no significant decline in the national market.	Kentucky is expected to lose an additional 26% of its market in non-metallic mineral waterborne trade and clay, concrete, glass, and stone.	Ports should work with KY Cabinet for Economic Development and local economic development authorities to identify manufacturers, buyers, and suppliers of waterborne goods, especially plastics, rubber, machinery, and chemical & allied products to attract and grow firms in riverport hinterlands of Kentucky's riverports.
Manufactured Goods: Plastic/Rubber, Textiles, Machinery	 Waterborne trade in plastic/rubber, textiles and machinery increased 17x nationally and 11x in Kentucky.	Kentucky is projected to experience a 23% increase in waterborne trade in chemical and allied products (which include plastics, rubber, and similar goods). A 9% increase in tonnage of machinery traded with Kentucky by water is also projected.	
Perishables: Grains & Alcoholic Beverages	 Despite a 6% national decline in waterborne trade of grains and alcoholic beverages from 1997-2017, Kentucky retained this market during the 20-year historic period.	In the period from 2018 to 2045, Kentucky is projected to increase its waterborne trade in food and kindred products by 144% and its trade in agricultural products and livestock by 81%	

2.1.4. Supporting Data

Appendix 2.1: Includes dot-density maps showing the geographic distribution of waterborne commodity growth markets for each Kentucky riverport hinterland.

Appendix 2.2: Includes a detailed reporting of commodity and trading partner forecasts for 2045 trade conditions—both statewide and for each riverport—including inbound, outbound, and internal waterborne trade in Kentucky. Key elements include:

Appendix 2.2a: Summary of top inbound and outbound waterborne commodities, as well as water-divertible commodities currently transported by truck or by rail. Organized by commodity type and trading partner, this appendix compares tonnage and value of waterborne and water-divertible commodities in 2018 to projected tonnage and value in 2045.

Appendix 2.2b: Summary of internal trade within Kentucky in 2045 by commodity for both waterborne and potentially divertible truck traffic based on commodity types.

Appendix 2.2c: Summary of market change projected from 2018-2045 by tonnage and value for waterborne commodities and trading partners.

Appendix 2.2d: Summary of projected market tonnage growth by commodities and trading partners for waterborne and potentially water-divertible rail and truck trade with Kentucky from 2018-2045.

Appendix 2.2e: Summary of 2018 Riverport Markets by commodity and trading partner, broken down for the hinterlands of each of Kentucky's 11 riverport areas.

Appendix 2.2f: Summary of truck-divertible growth markets for hinterlands of each of Kentucky's 11 public riverport areas for the period 2018-2045.

Appendix 2.2g: Detailed summary of growing and declining commodities at the 4-digit commodity detail for hinterlands of each of Kentucky's 7 public operating riverports.

Appendix 2.3: Includes notes from in-person interviews with Kentucky public riverport directors and key team members conducted in April 2021.

Appendix 2.4: Details on-site port capital improvement needs.

Appendix 2.5: Explains how 90 mile/minute hinterland calculations apply.

Appendix 2.6: Explains the Truck Trips Development Methodology

Chapter 5 of this report as well as the accompanying Marketing Toolkit will further explore ways to utilize these market and forecast summaries together with available sourcing databases and go-to-market strategies to develop call lists, identify new port customers, and directly generate business for Kentucky's public riverports.

2.2 IMPLICATIONS OF CHANGE FOR THE RIVERPORT SYSTEM

This section describes in detail (1) how each of Kentucky's public riverports may experience changes in the waterborne commerce markets (as shown in **Section 2.1** above) and (2) implications these changes have for capital programming, market capture, and other strategies at each port. The analysis given below offers strategic guidance for riverport stakeholders in support of recommendations both for the Commonwealth and individual riverports to be given in **Chapter 4**.

The observations below are reflective of the most detailed forecasts to date for each riverport interpreted within the context of site visits to each public riverport conducted in 2020 and 2021. The findings explicitly address new infrastructure needs (**Appendix 2.3**), with specific on-site port capital improvement needs shown in **Appendix 2.4**. The analysis offers a strategic overview of how the infrastructure needs and market conditions for each riverport relate to each port's overall positioning in the face of anticipated economic change to the year 2045. All forecasts given pertain either to (1) explicit projections for waterborne demand in commodities handled by (or potentially handled by) a public riverport or (2) explicit projections of divertible freight that may be captured by riverports.

2.2.1. Restructuring of the Coal Economy and The Public Riverports

The restructuring of the Ohio River waterborne commodity market in Kentucky as described in **Section 2.1** above has profound implications for each of Kentucky's public riverports. While only some of the public riverports handle coal directly (with private riverports handling a significant share), the magnitude of the waterborne coal market has effects on each public riverport. In some cases, riverports do not handle coal directly, but face concerns regarding competition as private coal-handling ports may compete for minerals, crops, and agricultural products currently handled by the public riverport. These instances highlight the importance of modernizing port properties to ensure cost-competitive movement of those non-coal commodities that may grow in their reliance on the river.

In other cases, conversion from coal to different commodities is already posing new investment needs (such as Hickman and Louisville where there is a need to upgrade conveyance equipment to handle outbound grain instead of inbound coal). The decline in the waterborne movement of petroleum, fuel oils, and bituminous coal can be understood not as a disappearance of coal and petroleum from Kentucky's economy but as a change in the types of commodities made with these inputs. Just as the forecasts in **Section 2.1** show steep declines in the bituminous coal currently moved by water, growth is projected in many coal and petroleum-derived products carried by truck.

The following analysis of each public riverport's 90-mile hinterland market considers (1) projected market changes in commodities each port currently handles and targets for new business and (2) projected growth in potentially divertible commodities and trading partners which a port could feasibly target.

Appendix 2.2g shows a detailed hinterland forecast of specific waterborne commodities where river trade is expected to grow and decline for each of the seven public operating riverports in Kentucky to the year 2045.

2.2.2. Potential Diversion to Waterborne Mode

CHANGES IN PETROLEUM AND COAL MARKETS

While Kentucky is expected to lose between 20 and 30 million tons of waterborne coal traffic by 2045, some coal and petroleum derived products currently moving by truck could represent market capture opportunities for riverports. Petroleum and coal derived products like asphalt, liquified natural gas (LNG) and chemicals used refining petroleum and LNG are often carried by truck or rail but may represent market capture opportunities for some riverports as shown in the following section.

One of this study's emphases is on divertible freight: commodities that can be shifted from truck or rail to the waterway system. Not all goods can be diverted to water from another mode without an effect on consumer prices. Growth in a divertible commodity cannot lead to market capture for a port unless (1) a port begins offering better performance and amenities than the current mode, (2) a competing mode suffers a decline in performance or increase in price, or (3) market growth exceeds the capacity of the currently preferred mode. For example, containers transported from Michigan to Chicago are more cost-effectively moved by truck instead of via Lake Michigan due to the time and cost to transfer the box between truck and vessel. Further, the roll-on/roll-off Lake Express service between Muskegon, MI and Milwaukee, WI does not accommodate trucks. Likewise, Kentucky's north-south bulk aggregate can be moved domestically by container but is more cost-effectively moved in barges, given its weight and value. Unless investments in specific capabilities can change these competitive dynamics, divertible freight is unlikely to change the size of the waterborne market from what is shown in the forecasts. Investment in on-port amenities is emphasized in this section as potential opportunities for divertible freight market capture.

The below analysis considers truck- and rail-divertible commodities as well as trading partners for each port.

- **Potential Rail to Water Capture Market:** Diversion from rail to water is a consideration given rail typically moves goods longer distances and competes with water in markets such as the north-south Mississippi Valley corridor between Kentucky and the Gulf Coast. However, rail commodities typically traded with Canada are subject to U.S. customs regulations, which may complicate the opportunity for modal diversion.²
- **Potential Truck to Water Capture Market:** Diversion from truck is also considered. Given the shorter distance associated with truck flows and the variety of origins and destinations—including Mexico and Canada—truck diversion is seen as a more viable source of market capture for Kentucky's public ports. On average, trucks carry almost 90% of divertible commodities moving between Kentucky riverports and other regions around the United States. For this reason, divertible truck commodities are described with respect to specific trading partners in the following analysis of each public riverport market.

² For further information, see <https://www.cbp.gov/bulletins/41genno37.pdf>.

Potential capture markets for competitive diversion to riverports are defined to include water-divertible goods from truck on moves less than 400 miles and water-divertible goods from rail for moves more than 400 miles.³ The potential for modal capture from rail is dependent on the distance and cargo value; however, such shifts can also depend on the specific trading partners. The analysis also considered modal shares (truck versus rail) for each origin-destination pair. This allowed the team to conduct a TRANSEARCH analysis of goods between BEA sectors based on goods moved, mode, and distance.⁴

The results of the analysis show that dry bulk goods are the preferred divertible commodities. Moreover, **Technical Memorandum 2** discusses international market impacts on the Kentucky economy with insights on coal, aluminum, agricultural products, unfinished lumber, and manufactured goods. Finally, dry bulk transportation market conditions help determine port impacts.

Specific insights and forecasts on both currently waterborne and potentially divertible commodities are presented for each port in the following subsections, complementing forecast data in **Technical Memorandum 2**. The commodity forecasts presented below in **Section 2.2.3** to **Section 2.2.13** represent market dynamics in ways not previously addressed in **Technical Memorandum 2** or the port profiles; they do not directly correlate due to three key differences in the approach.

- 1) The 90-mile hinterland definition is adopted in this final analysis because it is consistent from base to future traffic conditions and does not vary based on future, seasonal, or periodic congestion. (**Appendix 2.5** provides complete documentation of how hinterland markets given in this final report relate to initial estimates in earlier technical memoranda, port profiles, and summit presentations.)
- 2) Broader overall commodity groupings are shown herein to allow for a more holistic view of the market with two-digit commodity (STCC) level to enable a concise summary. (A complete appendix of all commodities at the four-digit STCC as summarized in **Technical Memorandum 2** would be too cumbersome to include in a single document. The source data from IHS Markit used for the below analysis are available at the four-digit STCC level in a MS Access database provided to both KYTC and the KAR with this report.)
- 3) Data herein focuses on the waterborne share of specific commodities handled by individual riverports versus mode-neutral freight totals given in the earlier documents.

For these reasons the overall growth rates, commodity definitions, and groupings are not directly comparable to **Technical Memorandum 2**, but instead provide additional information not previously reported.

³ Water-divertible commodities are defined as commodities that (1) are known to move by water in the US and (2) are traded with regions that can be reached by a waterway.

⁴ The analysis does not consider a potential subsidy for a service comparable to the 64-Express or former Port of Albany container-on-barge service. Each of these services was awarded a Federal Highway Service Congestion Mitigation and Air Quality Program grant.

2.2.3. Eddyville Riverport

In Lyon County, Eddyville Riverport serves the Tennessee and Cumberland Rivers and has a nearby industrial park. Based on volume, the current regional intermodal split is 60 percent truck, 35 percent rail, and five percent water. The expected (2045) regional intermodal split is 74 percent truck, 24 percent rail, and two percent water; the relative use of trucking is expected to increase.

Current commodities handled at the port and targeted for ongoing market capture are dry bulk goods that include fertilizer, grain, sand/gravel, and soybeans (major and minor bulk goods). The expected growth between 2018 and 2045 for waterborne trade in these port commodities within the hinterland forecast is shown in **Table 2-8**. In addition, **Table 2-8** provides the current and future shares of commodity flow (inbound and outbound).⁵ Given that sand/gravel anticipates stagnant growth in waterborne trade, the riverport can benefit from adapting its infrastructure and operations for growing markets in grain and soybeans and consider new/other commodities that can be moved by water instead of or in addition to truck and rail.

Table 2-8: Eddyville Top Waterborne Commodities—Expected Growth, Current and Future In/Outbound Shares

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Fertilizer	3%	80/20	94/6
Grain	40%	63/37	69/31
Sand/Gravel	-1%	0/100	0/100
Soybean	24%	3/97	5/95



In addition to the commodities currently handled at Eddyville’s port (**Table 2-8**), the overall hinterland can anticipate growth in waterborne travel demand for natural oils (including soybean oils) and petroleum refining products which may complement the growth in grains and soybeans currently handled (**Appendix 2.2g**). The market decline in coal and petroleum in the hinterland (forecast to decline by more than 18 million tons by 2045) may not affect Eddyville as directly as some ports; however, it is likely to make competition with private ports more intense, highlighting the importance of modernization to ensure efficient and cost-competitive operations for agricultural commodities.

Table 2-9 provides volume estimates for divertible freight movements. It lists the top three potentially divertible commodities for each of the top three trading

⁵ For each port discussion, figures in **Technical Memorandum 2** show change for inbound and outbound commodity flow.

partners.⁶ Forecasts show 1.48 million tons of new petroleum/coal products moving between two geographic areas over the 37-year analysis period (2018-2045): within 90 miles of the Eddyville riverport to/from the Nashville BEA region.

Table 2-9: Eddyville Regional Divertible Truck Commodities – Tons Difference

Nashville, TN	Tons Diff	Huntsville, AL	Tons Diff	Greenville, MS	Tons Diff	Other Partners	Tons Diff
Petroleum or Coal Products	1,480,761	Nonmetallic Minerals	533,640	Agricultural Production & Livestock	313,068	Petroleum or Coal Products	205,467
Clay, Concrete, Glass or Stone	637,020	Agricultural Production & Livestock	154,166	Nonmetallic Minerals	531	Agricultural Production & Livestock	177,455
Agricultural Production & Livestock	81,819	Clay, Concrete, Glass or Stone	11,434	Clay, Concrete, Glass or Stone	305	Clay, Concrete, Glass or Stone	155,691
Other Commodities	56,854	Other Commodities	19,270	Other Commodities	175	Other Commodities	313,989
Total	2,256,454	Total	718,510	Total	314,079	Total	852,602

Diversion from truck is possible for commodities based on the difference in shipping time, cost, and the value of goods. In this case, the drive time from Eddyville to Nashville is 1.5 hours for the 103-mile route in contrast to barge transit time of 3-4 days based on the navigation conditions.

In summary, the growth in Eddyville’s current market favors a strong case for maintaining the port’s capacity to competitively handle agricultural commodities such as grain and soybeans which will grow consistent with national and global demand. However, amenities and strategies aimed at making water transportation more competitive for petroleum and coal-derived products as well as nonmetallic minerals traded with partners in Nashville, TN; Huntsville, AL; and Greenville, MS can access growing trade markets supported by national forecasts. Growth in housing and construction markets both in Eddyville’s hinterland and in these waterborne trade markets are key indicators to watch when seeking new port users that may be attracted from truck to rail.

Finally, ERIDA recently applied for a grant through Kentucky CED and the Kentucky Association for Economic Development Product Development Initiative to further develop its industrial park, providing further growth potential for the riverport and industrial development authority.⁷ Local and state economic development agencies can leverage the port in Eddyville by seeking prospects known to trade in agricultural commodities and trading in coal or nonmetallic mineral products with the above-referenced growth markets.

⁶ For each port discussion, regional commodities were assessed from 2018 TRANSEARCH data which is a database of commodities greater than that which is handled by the port.

⁷ Source: “Community leaders talk industrial park, U.S. 641 project,” The Herald Ledger, September 8, 2021. Available at https://www.heraldedger.com/uncategorized/community-leaders-talk-industrial-park-u-s-641-project/article_8dc6b14a-11cb-5b58-8d52-94a70a840c5c.html.

2.2.4. Greenup-Boyd County Riverport

The Greenup-Boyd County Riverport is a small riverport on the Ohio River with 14 developed and 15 undeveloped acres near Wurtland, KY, which means it has the capacity to grow. By volume, the current regional modal split is 67 percent truck, 24 percent rail, and 9 percent water. The expected (2045) regional intermodal split is 77 percent truck, 17 percent rail, and six percent water; the relative use of trucking is expected to increase.

The riverport currently handles inbound dry bulk goods including aggregates and minerals (minor bulk goods) whose markets are expected to decline despite post-pandemic growth in the construction/housing market and a projected Compound Annual Growth Rate (CAGR) of 12.4% in the global mining market.⁸ The expected growth in commodities currently traded and targeted by this port between 2018 and 2045 for this port commodity is shown in **Table 2-10** along with current and future shares of commodity flow (inbound and outbound).

Table 2-10: Greenup-Boyd County Waterborne Commodities— Expected Growth, Current and Future In/Outbound Shares

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Aggregates/ Minerals	52%	33/67	33/67



Aggregates and minerals are expected to grow as a key market for Greenup-Boyd. In addition to the commodities currently handled at Greenup-Boyd shown in **Table 2-10**, the overall hinterland can anticipate growth in waterborne travel demand for metal and ceramic products and chemical preparations. While the aggregates shown in **Table 2-10** represent concrete, other mineral products (such as gypsum and metallic ores) also may represent growth markets for this waterborne market (**Appendix 2.2g**). The market decline in coal and petroleum in the hinterland (forecast to decline by more than 14 million tons by 2045) highlights the importance of modernization to ensure efficient and cost-competitive operations for minerals and related growth commodities.

⁸ Source: "Global Mining Market Report 2021," Cision PR Newswire, May 5, 2021. Available at Global Mining Market Report 2021 (prnewswire.com).

Table 2-11 lists the top three divertible freight trading partners with the top three potentially divertible commodities listed for each.

Table 2-11: Greenup-Boyd Regional Divertible Truck Commodities – Tons Difference

Charleston, WV	Tons Diff	Detroit, MI	Tons Diff	Knoxville, TN	Tons Diff	Other	Tons Diff
Petroleum or Coal Products	61,999	Agricultural Production & Livestock	51,399	Agricultural Production & Livestock	38,283	Agricultural Production & Livestock	34,671
Clay, Concrete, Glass or Stone	35,946	Clay, Concrete, Glass or Stone	39,676	Nonmetallic Minerals	32,294	Lumber or Wood Products	23,293
Lumber or Wood Products	23,605	Nonmetallic Minerals	29,998	Clay, Concrete, Glass or Stone	8,839	Clay, Concrete, Glass or Stone	13,713
Other Products	15,326	Other Products	(26,175)	Other Products	(1,296)	Other Products	(61,754)
Total	136,877	Total	94,898	Total	78,120	Total	9,922

Diversion is considered for commodities given the difference in transportation, cost, and the value of goods. In this case, the drive time from Greenup-Boyd to Charleston is 1.5 hours for the 93-mile trip versus the transit time for barge being 3-4 days based on the navigation conditions.

In summary, growth is projected for Greenup-Boyd’s target market in aggregates and minerals, despite the significant reduction in the local market for bituminous coal and petroleum refining products. Investments that enable the port to be competitive with truck transportation in terms of cost and reliability for moving derivative petroleum and coal products (other than bituminous), non-metallic mineral products, and lumber or wood products, especially with partners in the surrounding regions—Charleston, WV; Detroit, MI; and Knoxville, TN—can optimally position Greenup-Boyd to sustain projected changes in the market. Planned investment in additional warehousing is advantageous for existing and new commodities, but long-term needs including expansion on undeveloped land can also play a role in enhanced port capacity supportive of regional economic development. Such opportunities complement the 2021 Robert C. Byrd Institute’s (Marshall University) grant “...to provide services to dislocated workers, new entrants to the workforce, including students or the long-term unemployed, incumbent workers looking to improve their career prospects...” with hands-on career training for a region hard hit by downturns in the coal industry. This includes the Advanced Construction Manufacturing and Construction Skills Training initiative.⁹

⁹ “RCBI receives \$1.49 million grant for targeted workforce training initiative,” The Herald Dispatch, October 1, 2021. Available at https://www.herald-dispatch.com/business/rcbi-receives-1-49-million-grant-for-targeted-workforce-training-initiative/article_d2c9af81-ba9a-56b3-96de-437babb1cc1e.html

2.2.5. Henderson County Riverport

Henderson County Riverport covers 102 acres along the Ohio River with a designated Foreign Trade Zone. The current regional modal split by volume is 49 percent truck, 47 percent rail, and four percent water. The expected (2045) regional intermodal split is 60 percent truck, 37 percent rail, and three percent water. That is, the relative use of trucking is expected to increase.

The riverport currently handles inbound aluminum, steel coils, and fertilizer; outbound dry bulk goods including soybeans and grain; as well as break/neo-bulk (palletized/project cargo) products. The expected growth between 2018 and 2045 for these port commodities is shown in **Table 2-12**. In addition, **Table 2-12** provides the current and future shares of commodity flow (inbound and outbound) for the riverport to consider. While waterborne demand for steel and aluminum is expected to grow to 2045, the riverport can also consider investments to serve a growing market for grain, soybeans, and other agricultural products as well.

Table 2-12: Henderson County Riverport Waterborne Commodities—Expected Growth, Current and Future In/Outbound Shares

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Fertilizer	-3%	39/61	47/53
Grain	39%	62/38	82/18
Steel/aluminum	37%	57/43	79/21
Soybean	21%	6/94	8/92



In addition to the commodities currently handled at Henderson (**Table 2-12**), the overall hinterland can anticipate growth in waterborne travel demand for natural oils, petroleum refining products, forest materials, and concrete (**Appendix 2.2g**). The hinterland market decline in coal (forecast to decline by more than 19 million tons by 2045) may not affect Henderson as directly as some ports given its current market; however, the change is likely to make competition with private ports more intense, highlighting the importance of modernization to ensure efficient and cost-competitive operations.

Table 2-13 lists the top three divertible freight trading partners with the top three potentially divertible commodities listed for each. Tonnages represent the total difference between 2018 volumes and 2045 forecasts between respective regions.

Table 2-13: Henderson County Riverport Divertible Truck Commodities – Tons Difference

Nashville, TN	Tons Diff	Huntsville, AL	Tons Diff	Chicago, IL	Tons Diff	Other	Tons Diff
Petroleum or Coal Products	1,134,929	Nonmetallic Minerals	233,151	Agricultural Production & Livestock	142,660	Clay, Concrete, Glass or Stone	154,764
Clay, Concrete, Glass or Stone	601,723	Agricultural Production & Livestock	128,505	Clay, Concrete, Glass or Stone	79,963	Agricultural Production & Livestock	139,517
Agricultural Production & Livestock	67,065	Clay, Concrete, Glass or Stone	10,819	Nonmetallic Minerals	69,429	Agricultural Production & Livestock	110,335
Other Products	(128,056)	Other Products	14,589	Other Products	(16,946)	Other Products	397,058
Total	1,675,661	Total	387,064	Total	275,106	Total	801,674

Diversion is considered for commodities given the difference in transportation, cost, and the value of goods. In this case, the drive time from Henderson to Nashville is about 2 hours for the 150-mile trip versus 5+ days by barge depending on navigation conditions.

In summary, metallic ores are expected to continue to grow as a waterborne commodity for Henderson, fueled by increasing demand by Kentucky-based auto parts suppliers and other manufacturers for metals. However, agricultural and food products are also expected to grow as are some chemical commodities. Competitiveness to serve these commodity markets efficiently is a key consideration for Henderson’s long-term capital strategies as coal-handling riverports will likely seek to enter markets currently served by the public riverports. New equipment, improved loading and offloading capability, on-site rail infrastructure, and additional warehouse space could be considered to continue supporting goods movement. Specific port investments will be most effective if scoped in consultation with existing and new regional businesses such as Pratt Industries’ two new nearby paper mill facilities with 1.15 million square feet.¹⁰

¹⁰ Source: “Henderson Welcomes Pratt Industries,” Henderson Economic Development, September 2021. Available at investor_insider_091721.pdf (hendersonkyedc.com).

2.2.6. Hickman-Fulton County Riverport

Hickman’s riverport is located on the Mississippi River with no locks south of St. Louis, enabling the port to offer highly competitive waterborne shipping costs relative to other Mississippi River ports. By volume, the current regional modal split is 69 percent truck, 29 percent rail, and two percent water. The expected (2045) regional intermodal split is 77 percent truck, 21 percent rail, and two percent water. The relative use of trucking is expected to increase.

The riverport currently handles dry bulk goods including pet coke and grain (outbound) as well as sand (inbound). The expected change between 2018 and 2045 for these port commodities is shown in **Table 2-14** along with current and future shares flow (inbound and outbound) for each.

Table 2-14: Hickman-Fulton County Riverport Waterborne Commodities – Expected Growth, Current and Future In/Outbound Shares

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Grain	29%	1/99	1/99
Petroleum Coke	-51%	5/95	10/90
Sand	-16%	8/92	15/85



Given that waterborne markets for petroleum/coal products and sand (nonmetallic minerals) are expected to decrease, the riverport can consider investment for grain (agricultural products) as well as other waterborne commodities projected to grow to 2045.

In addition to the commodities currently handled at Hickman (**Table 2-14**), the overall hinterland can anticipate growth in waterborne travel demand for natural oils, fertilizers, aggregates (cement and concrete products), and some petroleum refining products (not petroleum coke), which may complement the growth in grains (**Appendix 2.2g**). The hinterland market decline in waterborne gravel and sand (a decline of over 1.4 million tons by 2045) will directly affect Hickman to a larger degree than the decline in petroleum coke (coal or petroleum products) and blast furnace/coke. The decline in bituminous coal (projected to decline by over 5 million tons to 2045) is likely to make the overall waterborne market more competitive and highlights the importance of modernization to respond to the need to shift to new growth markets, especially in food and agricultural commodities, fertilizers, and aggregates.

Table 2-15 lists the top three divertible freight trading partners with the top three potentially divertible commodities listed for each.

Table 2-15: Hickman-Fulton County Regional Divertible Truck Commodities

Nashville, TN	Tons Diff	Huntsville, AL	Tons Diff	Greenville, MS	Tons Diff	Other	Tons Diff
Petroleum or Coal Products	606,579	Nonmetallic Minerals	534,419	Agricultural Production & Livestock	405,441	Petroleum or Coal Products	536,450
Clay, Concrete, Glass or Stone	438,877	Agricultural Production & Livestock	72,362	Nonmetallic Minerals	991	Clay, Concrete, Glass or Stone	262,353
Agricultural Production & Livestock	51,416	Petroleum or Coal Products	11,351	Lumber or Wood Products	42	Agricultural Production & Livestock	137,379
Other Products	(152,151)	Other Products	16,491	Other Products	(688)	Other Products	(312,392)
Total	944,721	Total	634,623	Total	405,786	Total	623,790

Diversion is considered for commodities given the difference in transportation, cost, and the value of goods. In this case, the drive time from Hickman to Greenville is almost five hours for the 276-mile trip versus 8 or more days by barge based on navigation conditions.

In summary, two of the three commodities that Hickman-Fulton County Riverport currently handles are expected to decline. Consequently, long-term sustainability is a priority for marketing and infrastructure choices. Planned investment to support greater traffic in goods other than sand or petroleum coke (such as in improved unloading conveyor systems) is advantageous for existing and new commodities. The degree to which new infrastructure can support the movement of grain, natural oils, fertilizers, and aggregates may optimally position Hickman for projected waterborne growth commodities. Long-term needs to facilitate further traffic growth in a wider mix of commodities are understood as ongoing priorities supportive of regional economic development. While forecasts do not point to manufactured goods as a natural growth area for divertible and waterborne freight in the Hickman hinterland area, if economic development strategies of the type described in **Chapter 5** can establish a home market for waterborne inputs to manufacturing sectors, the port can benefit from such strategies. Modernization of the port to support a shifting market entails on-site port investment in addition to consideration of more frequent flooding on the Mississippi (and Ohio) River.¹¹

¹¹ Source: "Flooding on the Mississippi River Becoming More Common and Severe," Delta Business Journal, June 15, 2018. Available at <https://deltabusinessjournal.com/flooding-on-the-mississippi-river-becoming-more-common-and-severe/>.

2.2.7. Louisville Riverport

The Louisville Riverport is a large riverport along the Ohio River in a metropolitan area with barge fleeting, cargo handling, and ground storage capabilities. The ongoing “Phase 5” expansion will add 100+ acres about a mile from the port’s riverfront facilities. The current regional modal split is 63 percent truck, 35 percent rail, and two percent water. The expected regional modal split is 68 percent truck, 30 percent rail, and two percent truck. That is, the relative use of trucking is expected to increase.

The riverport currently handles dry bulk goods including fertilizer as well as gypsum, minerals, and steel coils. The expected growth between 2018 and 2045 for these port commodities is shown in **Table 2-16**, along with current and future shares of commodity flow.

Table 2-16: Louisville Regional Riverport Waterborne Commodities—Expected Growth, Current and Future In/Outbound Shares

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Fertilizer	-5%	64/36	88/12
Gypsum	52%	66/34	68/32
Steel products (coils)	295%	100/0	100/0



Despite some decline in waterborne fertilizer demand, the other commodities that the riverport handles are expected to grow to 2045, the share of inbound and outbound commodity flows for gypsum and steel products will remain relatively stable.

In addition to the commodities currently handled at Louisville’s port (**Table 2-16**), the overall hinterland can anticipate growth in waterborne travel demand primary forest materials, gravel and sand, concrete products, natural oils (both soybean and cottonseed), and grain (**Appendix 2.2g**). The hinterland market decline in waterborne bituminous coal (projected to decline by more than 14 million tons) and in waterborne petroleum refining products will indirectly affect Louisville. Furthermore, while the specific commodity of steel products (coils) is poised to grow robustly to 2045, Louisville can expect competition for this commodity from private coal-handling ports that may seek to shift to these growing markets.

Table 2-17 lists the top three divertible freight trading partners with the top three potentially divertible commodities listed for each.

Table 2-17: Louisville Riverport - Regional Divertible Truck Commodities

Nashville, TN	Tons Diff	Knoxville, TN	Tons Diff	Detroit, MI	Tons Diff	Other Locations	Tons Diff
Petroleum or Coal Products	570,712	Nonmetallic Minerals	243,004	Primary Metal Products	189,921	Nonmetallic Minerals	146,816
Clay, Concrete, Glass or Stone	136,394	Agricultural Production & Livestock	110,092	Clay, Concrete, Glass or Stone	75,832	Nonmetallic Minerals	115,944
Agricultural Production & Livestock	45,263	Clay, Concrete, Glass or Stone	40,501	Chemicals or Allied Products	47,712	Agricultural Production & Livestock	96,465
Other Products	(18,130)	Other Products	7,977	Other Products	20,117	Other Products	871,890
Total	734,239	Total	401,574	Total	333,583	Total	1,231,115

Diversion is considered for commodities given the difference in transportation, cost, and the value of goods. In this case, the drive time from Louisville to Knoxville is 3.5 hours for the almost 250-mile trip versus the transit time for barge of 7+ days based on navigation conditions.

The takeaway is that while the Louisville Riverport is expanding facilities, it could use additional waterfront berth space, unloading capability, and warehousing to expand its capabilities further, capture modal share, and support local economic development. This includes for bulk products and potentially manufactured goods, given the development of the Park Hill Industrial Corridor, the JLL Income Property Trust's acquisition of an existing one-million-square-foot plus distribution center near Louisville, and the recently announced \$5.8 billion plan to build twin battery manufacturing plants in nearby Hardin County.¹²

¹² Source: "What to know about Ford's \$5.3B, 5,000-job battery park in Hardin County, Kentucky," Courier Journal, September 28, 2021. Available at <https://www.courier-journal.com/story/news/2021/09/28/what-to-know-about-fords-new-battery-park-kentucky/5890741001/>

2.2.8. Maysville-Mason County Riverport

The Maysville-Mason County Riverport is a developing riverport on the Ohio River in northeast Kentucky. For the hinterland region, the current modal split for regional goods by volume is 59 percent truck, 40 percent rail, and one percent water. The projected modal split for the region is 64 percent truck, 35 percent rail, and one percent water.

The expected growth between 2018 and 2045 for waterborne commodities that are generated by, are destined for, or pass through the hinterland area is shown in **Table 2-18**. In addition, **Table 2-18** provides the current and future shares of commodity flow (inbound and outbound) to consider.

Table 2-18: Maysville-Mason County Potential Waterborne Commodities—Regional Growth with In/Outbound Shares

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Bituminous Coal	-64%	89/11	68/32
Petroleum Refining Products	-21%	13/87	20/80
Gravel Or Sand	-27%	39/61	62/38
Broken Stone Or Riprap	-24%	65/35	59/41
Blast Furnace Or Coke	16%	74/26	90/10
Crude Petroleum	4%	91/9	53/47
Oil Kernels, Nuts Or Seeds	44%	1/99	1/99
Primary Iron Or Steel Products	26%	61/39	66/34
Grain	44%	0/100	0/100
Fertilizers	11%	100/0	99/1
Lime Or Lime Plaster	-17%	26/74	59/41
Misc. Industrial Organic Chemicals	40%	82/18	97/3
Other Commodities	75%	82/18	82/18

There is expected regional growth in the agricultural and food products (especially grains and natural oils) as well as for chemical or allied products and other commodities. There are expected declines in waterborne demand for coal and petroleum, sand, and other mineral products. Given these factors, the development of new inland marine facilities is recommended to emphasize the needs of agriculture and food sectors (and supply chains using these products).

Table 2-19 lists the top three divertible freight trading partners with the top three potentially divertible commodities listed for each.

Table 2-19: Maysville-Mason County Regional Divertible Truck Commodities

Detroit, MI	Tons Diff	Knoxville, TN	Tons Diff	Charleston, WV	Tons Diff	Other Locations	Tons Diff
Primary Metal Products	140,674	Nonmetallic Minerals	189,053	Clay, Concrete, Glass or Stone	76,184	Nonmetallic Minerals	86,964
Clay, Concrete, Glass or Stone	129,872	Agricultural Production & Livestock	62,024	Lumber or Wood Products	37,189	Clay, Concrete, Glass or Stone	57,262
Chemicals or Allied Products	94,381	Clay, Concrete, Glass or Stone	36,099	Petroleum or Coal Products	32,514	Clay, Concrete, Glass or Stone	47,547
Other Products	(22,448)	Other Products	(68,445)	Other Products	20,004	Other Products	235,786
Total	342,479	Total	218,731	Total	165,891	Total	427,559

Diversion is considered for commodities given the difference in transportation, cost, and the value of goods. In this case, the drive time from Maysville to Detroit is 5 hours for the 320-mile trip versus the transit time for barge being more than seven days via the Mississippi River, Lake Michigan, and Lake Huron based on the navigation conditions.

In summary, future riverport investments will be most effective when directed towards existing growth markets related to agricultural and food commodities already projected to have growth in waterborne demand. However, if economic development strategies can attract and retain new clients into the hinterland for commodities not currently forecast for growth (such as paper manufacturing or chemical and allied commodities including plastics and fabrics supporting health care products such as the developing PatienTech, LLC facility nearby), the port may create a wider market space than is currently forecast.¹³ Consideration for investments in declining commodity markets will hinder long-term economic growth for the region, which has historically been lower than the U.S. average.

HEALTH CARE PRODUCTS

Kentucky's growing sector in health care technology products creates increasing demand for plastics, rubber, and chemicals used to make mattresses, pads, and medical devices.

Establishments like the PatienTech, LLC facility in the Maysville-Mason County hinterland represent potential opportunities to use the river to transport a growing volume of chemical and allied products. The 2021 site visit to the Maysville-Mason County Riverport area, found market opportunities related to healthcare products.

¹³ Source: "PatienTech moving forward." Available at <https://thinkmaysvilleky.com/?p=1024>.

2.2.9. Meade County Riverport

The Meade County Riverport, managed by the Brandenburg Industrial Development Authority, is a redeveloping marine cargo facility southwest of Louisville along the Ohio River. By volume, the current regional modal split is 67 percent truck, 30 percent rail, and three percent water. The expected (2045) regional intermodal split is 72 percent truck, 26 percent rail, and two percent water. Again, the relative use of trucking is expected to increase.

The expected growth between 2018 and 2045 for regional commodities is shown in **Table 2-20**. In addition, **Table 2-20** provides the current and future shares of waterborne commodity flow (inbound and outbound) for the riverport to consider.

Table 2-20: Meade County Potential Waterborne Commodities—Regional Growth with In/Outbound Shares

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Bituminous Coal	-69%	85/15	78/22
Gravel Or Sand	8%	20/80	15/85
Broken Stone Or Riprap	-57%	8/92	29/71
Petroleum Refining Products	-13%	93/7	74/26
Grain	46%	1/99	1/99
Oil Kernels, Nuts Or Seeds	29%	9/91	13/87
Gypsum Products	45%	51/49	52/48
Blast Furnace Or Coke	10%	50/50	71/29
Primary Forest Materials	106%	100/0	100/0
Primary Iron Or Steel Products	37%	57/43	57/43
Fertilizers	1%	72/28	92/8
Metal Scrap Or Tailings	4%	65/35	87/13
Other Commodities	70%	90/10	90/10

There is expected regional growth in mining and mineral sectors, including gypsum and primary iron or steel products as well as forestry products and some agricultural commodities including grain and fertilizers. There are expected declines in coal, petroleum refining products, and stone/riprap (despite some potential growth in non-bituminous coal and petroleum products). Given these factors, it is recommended that the development of new inland marine facilities emphasize the needs of growing markets and consider the direction of commodity flow.

Table 2-21 lists the top three divertible freight trading partners with the top three potentially divertible commodities listed for each.

Table 2-21: Meade County Regional Divertible Truck Commodities

Nashville, TN	Tons Diff	Detroit, MI	Tons Diff	Chicago, IL	Tons Diff	Other Products	Tons Diff
Petroleum or Coal Products	1,000,381	Primary Metal Products	179,710	Agricultural Production & Livestock	126,096	Nonmetallic Minerals	122,422
Clay, Concrete, Glass or Stone	199,722	Clay, Concrete, Glass or Stone	54,418	Clay, Concrete, Glass or Stone	69,288	Agricultural Production & Livestock	120,599
Agricultural Production & Livestock	58,193	Chemicals or Allied Products	29,349	Rubber or Miscellaneous Plastics	34,877	Nonmetallic Minerals	105,094
Other Products	(93,225)	Other Products	11,219	Other Products	36,238	Other Products	869,183
Total	1,165,072	Total	274,696	Total	266,498	Total	1,217,297

Diversion is considered for commodities given the difference in transportation, cost, and the value of goods. In this case, the drive time from Meade County to Detroit is 6 hours for the 400-mile trip, compared to 7+ days by barge.

In summary, appropriate strategies entail aligning the port infrastructure capability with the projected commodity growth sectors, as well as planned industrial development in Meade County. This includes commodities associated with developments like the Glendale Ford plant and the Nucor Steel establishment, as well as key business locations such as the Buttermilk Falls Industrial Park and the Consolidated Grain and Barge Company. Investments and marketing entail accounting for the shift from declining commodity markets into emerging opportunities.

2.2.10. Northern Kentucky Port

The Northern Kentucky Port Authority is a developing port managed by an authority on the Ohio River near Cincinnati, Ohio.¹⁴ By volume, the current regional modal split is 72 percent truck, 27 percent rail, and one percent water. The expected regional modal split is 75 percent truck and 25 percent rail. Currently, the one percent traded by water is not handled by an active public riverport facility and is likely due to private operators.

The expected growth between 2018 and 2045 for regional waterborne commodities is shown in **Table 2-22**. In addition, it provides the current and future shares (inbound and outbound) of key commodity flows.

Table 2-22: Northern Kentucky Potential Waterborne Commodities—Regional Growth with In/Outbound Shares

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Bituminous Coal	-64%	93/7	68/32
Gravel Or Sand	10%	20/80	16/84
Petroleum Refining Products	-23%	95/5	83/17
Broken Stone Or Riprap	-46%	42/58	62/38
Blast Furnace Or Coke	17%	75/25	90/10
Oil Kernels, Nuts Or Seeds	44%	2/98	2/98
Primary Iron Or Steel Products	26%	65/35	70/30
Grain	47%	1/99	1/99
Fertilizers	11%	100/0	99/1
Lime Or Lime Plaster	-55%	0/100	1/99
Misc. Industrial Organic Chemicals	25%	88/12	98/2
Metal Scrap Or Tailings	15%	60/40	80/20
Other Commodities	80%	85/15	86/14

There is expected regional growth in a host of waterborne agricultural products including grain, fertilizers, and oil/nut kernels. Growth in waterborne mining and extraction commodities like primary iron or steel products and blast/furnace coke can offer potential markets for this developing riverport. By contrast, bituminous coal, petroleum refining products, and stone/riprap are waterborne commodities expected to decline as a riverport market in the hinterland. Given these factors, it is recommended that the development of any new inland marine facilities emphasize the needs of growing markets and consider the direction of commodity flow.

¹⁴ Northern Kentucky will likely operate as part of the Port of Cincinnati.

Table 2-23 lists the top three divertible freight trading partners with the top three potentially divertible commodities listed for each.

Table 2-23: Northern Kentucky Regional Divertible Truck Commodities

Detroit, MI	Tons Diff	Knoxville, TN	Tons Diff	Chicago, IL	Tons Diff	Other	Tons Diff
Primary Metal Products	165,901	Nonmetallic Minerals	234,074	Nonmetallic Minerals	91,183	Nonmetallic Minerals	99,907
Clay, Concrete, Glass or Stone	117,229	Agricultural Production & Livestock	47,564	Agricultural Production & Livestock	53,188	Clay, Concrete, Glass or Stone	61,137
Chemicals or Allied Products	96,946	Clay, Concrete, Glass or Stone	44,784	Clay, Concrete, Glass or Stone	45,946	Clay, Concrete, Glass or Stone	57,842
Other Products	(8,121)	Other Products	35,246	Other Products	70,590	Other Products	424,079
Total	371,954	Total	361,668	Total	260,907	Total	642,965

Diversion is considered for commodities given the difference in transportation, cost, and the value of goods. In this case, the drive time from Northern Kentucky to Detroit is about four hours for the 260-mile trip versus 8+ days by barge via the Mississippi River, Lake Michigan, and Lake Huron.

The takeaway is that a future riverport, if developed, can integrate an understanding of growing agricultural, food production, mineral, and chemical markets into its long-term programming. There appears to be enough growth to accommodate new entrants to the market. Further, a future riverport can benefit from limiting its intended dependence on declining markets, including coal, despite its historical precedence as an energy product in Kentucky. The restructuring of the energy economy will play a critical role in targeting markets and infrastructure for riverport development in Northern Kentucky.

2.2.II. Owensboro Riverport

The Owensboro Riverport covers 420 acres along the Ohio River with a Foreign Trade Zone designation. The current regional modal split by volume is 46 percent truck, 51 percent rail, and three percent water. The expected (2045) regional intermodal split is 61 percent truck, 38 percent rail, and one percent water. The relative use of trucking is expected to increase.

The riverport currently handles dry bulk goods including fertilizer and jeep frames inbound plus surplus metals (aluminum) and steel outbound. These markets are expected to grow as a result of the post-COVID economy in part due to the need for agricultural products and automotive parts. The expected growth between 2018 and 2045 for these port commodities is shown in **Table 2-24** alongside current and future shares of commodity flow (inbound and outbound).

Table 2-24: Owensboro Regional Riverport Waterborne Commodities—Expected Growth, Current and Future In/Outbound Shares

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Agricultural Production & Livestock	47%	7/93	9/91
Aluminum	61%	97/3	96/4
Structural Metal Products (Jeep Frames)	20%	93/7	100/0



Because markets for current commodities are expected to continue growing with additional growth in the waterborne commerce market for automotive parts, the riverport can benefit from investment in equipment and facilities to sustain and increase volumes.

In addition to the commodities currently handled at Owensboro (**Table 2-24**), the overall hinterland can anticipate growth in waterborne travel demand for chemicals, liquors, primary forest materials, gravel and sand, concrete products, natural oils (both soybean and cottonseed), and grain (**Appendix 2.2g**). The hinterland market decline in waterborne bituminous coal (projected to decline by more than 16 million tons) and in waterborne stone and riprap may add to the competitive dynamics of the Owensboro hinterland market. Furthermore, while overall waterborne traffic in aluminum products is poised to grow by 61%, bauxite and aluminum ores are projected to decline by over 425,000 tons by 2045. For this reason, Owensboro’s outlook (and associated infrastructure and market strategies) will benefit from carefully monitoring supply chains related to aluminum in relation to its specific customers, utilizing the Marketing Toolkit

and the GOTO Market strategies as well as sourcing recommendations of **Chapter 5** in pursuing its long-term market.

Table 2-25 lists the top three divertible freight trading partners with the top three potentially divertible commodities listed for each.

Table 2-25: Owensboro Riverport Regional Divertible Truck Commodities

Nashville, TN	Tons Diff	Huntsville, AL	Tons Diff	Chicago, IL	Tons Diff	Other Locations	Tons Diff
Petroleum or Coal Products	1,152,878	Nonmetallic Minerals	173,922	Agricultural Production & Livestock	161,821	Agricultural Production & Livestock	144,659
Clay, Concrete, Glass or Stone	594,679	Agricultural Production & Livestock	129,169	Clay, Concrete, Glass or Stone	86,669	Agricultural Production & Livestock	132,152
Agricultural Production & Livestock	71,161	Clay, Concrete, Glass or Stone	10,125	Rubber or Miscellaneous Plastics	28,471	Agricultural Production & Livestock	114,978
Other Products	(202,871)	Other Products	20,334	Other Products	(17,184)	Other Products	549,693
Total	1,615,847	Total	333,550	Total	259,778	Total	941,481

Diversion is considered for commodities given the difference in transportation, cost, and the value of goods. In this case, the drive time from Owensboro to Chicago is 6 hours for the 330-mile trip versus the transit time for barge being about five days based on navigation conditions.

In summary, the Owensboro Riverport can consider new warehouse space to provide covered storage to customers to support continued growth in Owensboro. However, long-term needs for increased throughput capacity are a recommended consideration for future investment. Currently, the automobile parts market is expected to grow by at least two percent CAGR over the next five years.

2.2.12. Paducah-McCracken County Riverport

The Paducah-McCracken County Riverport is located at the confluence of the Tennessee and Ohio rivers in western Kentucky. By volume, the current regional modal split is 64 percent truck, 34 percent rail, and two percent water. The expected (2045) regional intermodal split is 75 percent truck, 24 percent rail, and one percent water. That is, the relative use of trucking is expected to increase.

The riverport currently handles sand, fertilizer, pet coke, and gravel (inbound) as well as aluminum, steel, and manufactured goods (outbound). The expected growth between 2018 and 2045 for these port commodities is shown in **Table 2-26**, alongside current and future shares of commodity flows (inbound and outbound).

Table 2-26: Paducah-McCracken County Riverport Waterborne Commodities—Expected Growth, Current and Future In/Outbound Shares

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Agricultural Production & Livestock	31%	2/98	2/98
Aluminum/Steel	29%	74/26	73/27
Petroleum Coke	-49%	13/87	23/77
Gravel	-11%	15/85	24/76



Given that agricultural products are expected to increase, and that gravel is expected to decrease, the riverport can consider investments supporting improved dry bulk handling (addressed in **Chapters 3 and 4**). In addition to the commodities currently handled at Paducah-McCracken County Riverport (**Table 2-26**), the overall hinterland can anticipate growth in waterborne travel demand in natural oils, kernels, nuts and seeds; petroleum refining products; fertilizers; cement; and chemicals (**Appendix 2.2g**). The hinterland market decline in gravel (shown in **Table 2-26**) represents over 1 million tons of lost waterborne traffic for the Paducah-McCracken County Riverport hinterland by 2045. Additionally, waterborne bituminous coal is projected to decline by nearly 18 million tons by 2045. This will affect the Paducah-McCracken County Riverport hinterland market both directly and indirectly through a changed competitive environment and more intense competition from private ports.

Table 2-27 lists the top three divertible freight trading partners with the top three potentially divertible commodities listed for each.

Table 2-27: Paducah-McCracken County Riverport Regional Divertible Truck Commodities

Nashville, TN	Tons Diff	Huntsville, AL	Tons Diff	Greenville, MS	Tons Diff	Other Locations	Tons Diff
Petroleum or Coal Products	1,256,097	Nonmetallic Minerals	530,352	Agricultural Production & Livestock	404,026	Petroleum or Coal Products	534,294
Clay, Concrete, Glass or Stone	630,065	Agricultural Production & Livestock	131,070	Nonmetallic Minerals	1,622	Clay, Concrete, Glass or Stone	179,209
Agricultural Production & Livestock	66,342	Clay, Concrete, Glass or Stone	10,660	Primary Metal Products	220	Agricultural Production & Livestock	152,701
Other Products	33,487	Other Products	19,891	Other Products	(263)	Other Products	79,276
Total	1,985,990	Total	691,972	Total	405,605	Total	945,479

Diversion is considered for commodities given the difference in transportation, cost, and the value of goods. In this case, the drive time from Paducah to Nashville is two hours for the 137-mile trip versus at least five days by barge.

In summary, the Paducah-McCracken County Riverport can benefit from strategies and investment aimed at the needs of growth markets such as aluminum and steel in addition to potential divertible commodities as shown in **Table 2-27**, in contrast to petroleum coke and gravel. Market strategies can benefit from insights from the City of Paducah's and the Paducah Chamber of Commerce's targeted 15-county markets, with a focus on commodities that may support manufacturing and healthcare supply chains in the region (with associated potential markets for plastics, rubber, and chemical and allied commodities as inputs to production).

2.2.13. Western Kentucky Regional Riverport

The Western Kentucky Regional Riverport is a planned riverport on the Mississippi River near Wickliffe, just south of the confluence of the Mississippi and Ohio rivers. By volume, the current regional modal split is 74 percent truck, 24 percent rail, and two percent water. The expected regional modal split is 81 percent truck, 17 percent rail, and two percent water. There is likely to be an increasing reliance on truck transportation.

The expected growth between 2018 and 2045 for regional commodities is shown in **Table 2-28** that provides the current and future shares of commodity flow (inbound and outbound) for the riverport to consider.

Table 2-28: Western Kentucky Regional Riverport Potential Waterborne Commodities – Regional Growth

Commodity	Overall Growth	In/Outbound Split (%) - 2018	In/Outbound Split (%) - 2045
Bituminous Coal	-74%	2/98	4/96
Broken Stone or Riprap	-52%	3/97	8/92
Gravel or Sand	-18%	6/94	11/89
Oil Kernels, Nuts Or Seeds	20%	2/98	2/98
Grain	33%	1/99	1/99
Fertilizers	43%	90/10	93/7
Petroleum Refining Products	41%	92/8	88/12
Misc. Coal or Petroleum Products	-52%	5/95	10/90
Portland Cement	75%	3/97	3/97
Concrete Products	55%	10/90	10/90
Chemical Preparations, Nec	63%	99/1	100/0
Potassium or Sodium Compound	6%	12/88	12/88
Other Commodities	27%	53/47	55/45

There is expected regional growth in a host of waterborne agricultural commodities including fertilizers, grain, oil kernels/nuts/seeds that may utilize this developing riverport in addition to a host of mineral and mining products including petroleum refining products, concrete, and cement commodities. Chemicals (including plastics and rubber) also represent growth areas in waterborne commerce for the hinterland. Port infrastructure and market strategies focusing on the supply chains of these types of goods will likely be more productive than those which may focus on declining commodities such as bituminous coal and stone/riprap.

Table 2-29 lists the top three divertible freight trading partners with the top three potentially divertible commodities listed for each.

Table 2-29: Western Kentucky Regional Riverport – Divertible Truck Commodities

Nashville, TN	Tons Diff	Huntsville, AL	Tons Diff	Greenville, MS	Tons Diff	Other Locations	Tons Diff
Petroleum or Coal Products	597,349	Nonmetallic Minerals	443,749	Agricultural Production & Livestock	413,312	Petroleum or Coal Products	552,104
Clay, Concrete, Glass or Stone	471,000	Agricultural Production & Livestock	96,745	Nonmetallic Minerals	1,583	Clay, Concrete, Glass or Stone	157,637
Agricultural Production & Livestock	51,797	Petroleum or Coal Products	9,110	Primary Metal Products	220	Agricultural Production & Livestock	138,377
Other Products	(177,552)	Other Products	17,434	Other Products	(580)	Other Products	(333,122)
Total	942,594	Total	567,039	Total	414,535	Total	514,997

Diversion is considered for commodities given the difference in transportation, cost, and the value of goods. In this case, the drive time from Wickliffe to Huntsville is 4.5 hours for the 250-mile trip versus 4+ days by barge via the Mississippi River and Tennessee-Tombigbee Waterway.

In summary, the future riverport will benefit from infrastructure capabilities and market strategies targeting key (1) agricultural supply chains utilizing fertilizers, grain, and seeds/kernels, (2) construction supply chains utilizing concrete and related products, (3) energy supply chains that may utilize targeted petroleum manufacturing goods currently moved by water and (4) manufacturing supply chains that may utilize targeted chemical products (such as rubber and plastics). In addition to the above-mentioned waterborne commodities already forecast to grow due to national and global trends, local economic development initiatives can offer additional “home-grown” markets. For example, the local paper mill can create a potential market for waterborne inputs to pulp and paper-related commodities. A critical question is whether there is enough market share for those currently handling these commodities, especially once the new port in Cairo, Illinois is developed. Further, the future riverport can benefit by limiting its intended dependence on declining markets—including bituminous coal, despite its historical precedence as an energy product in Kentucky (possibly seeking market shares in currently truck-dependent secondary coal and petroleum-derived products instead).

2.2.14. Assumptions about Modal Split

One of the factors affecting expected trade growth by commodity in each port is the intermodal split. This can be determined by direct rail access and other factors including proximity to rail. However, in almost all cases, expected truck share increases and water decreases as illustrated for each port hinterland in Figure 2-2.

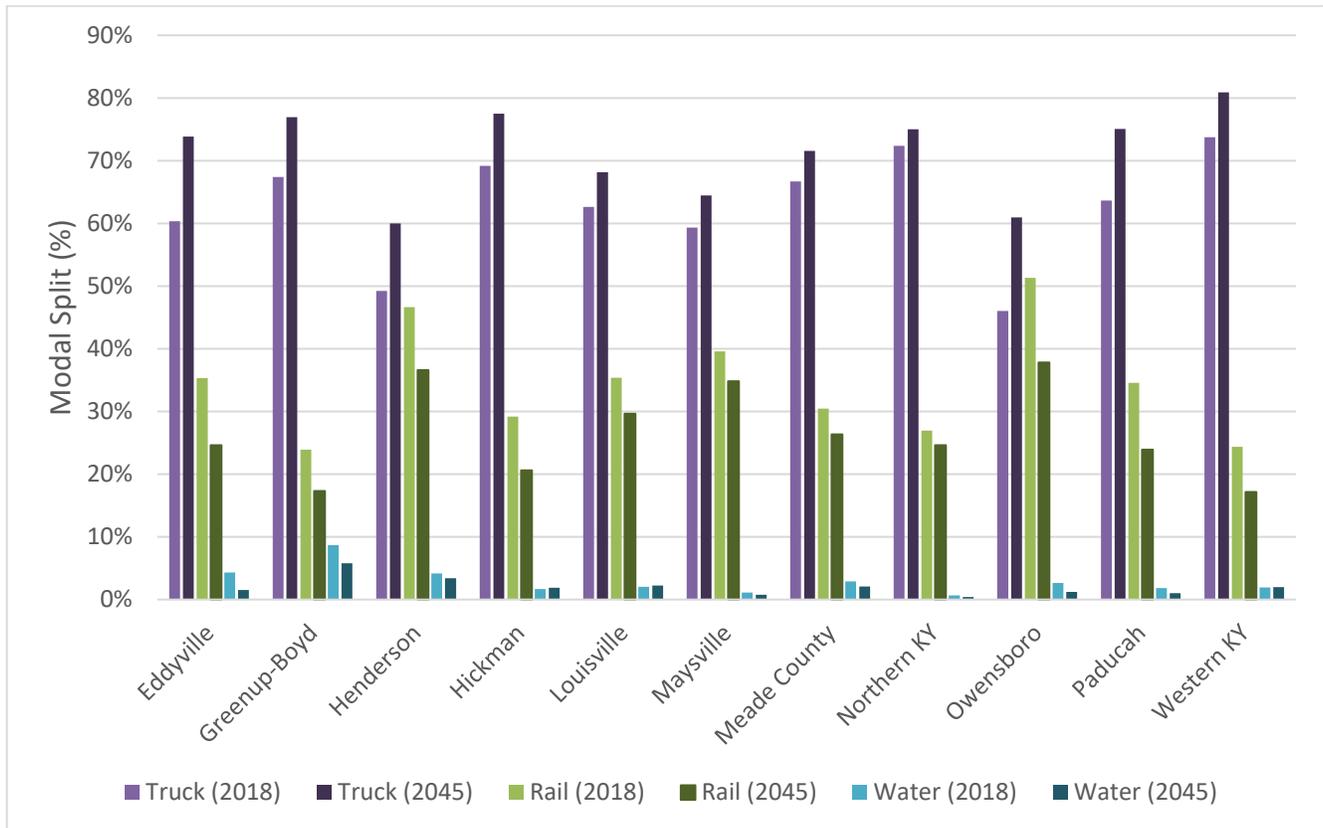


Figure 2-2: Riverport Intermodal Split Comparison (2018 & 2045)

However, the likely modal diversion is from truck, given origins and destinations for Kentucky riverport hinterland commodities moved by rail are in Canada. Consistent truck origins and destinations include Nashville, TN; Greenville, MS; Huntsville, AL; Chicago, IL; and Detroit, MI.

2.3 OTHER STATES' RESPONSES TO SYSTEMIC CHANGE

The market restructuring described in **Section 2.1** is not unique to Kentucky but is a feature of the overall Ohio River system—and to some extent, of the overall waterborne transportation sector. For Kentucky's public riverports to serve an integral role in a river system involving its Ohio River partners, it is helpful to understand how other states are responding to changing markets.¹⁵ Furthermore, beyond the Ohio River system, states in the larger Mississippi River system and even deep-water coastal ports have also been developing innovative ways for ports to collaborate in funding the infrastructure, services, and initiatives necessary for changing markets.

In recent years both Illinois and Tennessee decision-makers have been re-examining the ways that they can increase their investments in port and port-related improvements. Some of their decisions have entailed more direct allocation of state funds, supporting and/or creating grant programs, and finding ways to leverage existing funding programs in more strategic ways. Explored further during the March 2021 virtual summit, each has helped to improve the overall multimodal functionality of their larger transportation systems.

¹⁵ **Technical Memorandum 3** compares financial assistance programs provided by peer states of Ohio, Indiana, Illinois, Missouri, Tennessee, Virginia, and Florida.

2.3.1. Illinois: Investing in a Multimodal Vision

ILLINOIS VISION

Illinois' vision for transportation is for all modes to be integrated, coordinated, planned, and built with the idea that present and future travel options are user-focused, economically supportive, and ecologically sensitive.

Source: IDOT "Planning" at idot.illinois.gov/transportation-system/transportation-management/planning/index

In 2017, the Illinois Department of Transportation (IDOT) added a marine transportation section to its Long-Range Transportation Plan (LRTP). This *Marine Systems Transportation Plan* included an economic impact analysis that helped identify and communicate to legislators the need for additional port funding that resulted in \$150 million directly allocated for ports in 2019. While as of March 2021 guidance and applications for the capital investment program were still being developed, all nineteen Illinois public port districts will be eligible to apply for these funds. The stated goals for these funds are to address safety, modal connectivity, state of good repair, economic competitiveness, mode shift, and environmental sustainability. Additional funds were also made available in the form of a one-time fund of \$24 million through the competitive port investment program as well as through State Planning Research funds.¹⁶

IDOT invested in research to collect usable data to describe the condition of their public ports and ports' role in the multimodal network supporting Illinois' economy. This story was presented to the appropriate audience in a way that resonated with them; in this case, the result of that resonance was more funding available directly to public ports to address clearly targeted measures—many of which coincide with larger multimodal system performance measures being pursued by IDOT.¹⁷

¹⁶ Murray, B.J., Section Chief, Marine & Aviation Transportation Program Planning, IDOT, *Session 3: What's New in the Neighborhood? Updates from Adjacent State Riverports*, presented at the Second Kentucky Summit on Economic Development Strategies to Leverage Kentucky Riverports and Freight Network, March 24 - 26, 2021.

¹⁷ "Our Story," Illinois Department of Transportation (IDOT), 2021 [Online]. Available: <https://idot.illinois.gov/about-idot/our-story/index> (accessed Oct. 2, 2021).

2.3.2. Tennessee: Supporting Ports Through Supporting Multimodal Infrastructure

One of the ways that the Tennessee Department of Transportation (TDOT) has found to increase business for Tennessee's waterways has been by leveraging state-based funds through Competitive Rail Connectivity Grants. These grants are part of a larger Transportation Equity Fund intended to strategically expand rail access and opportunities throughout the state while providing the following benefits:

- Impact job creation and capital investment by industries that require rail access
- Enhance the marketability of available industrial sites
- Reduce highway and bridge maintenance costs by diverting heavy freight from the roadway network to rail

In 2018, \$10.3 million (with a 10% match) in these competitive rail connectivity grants were opened to rail authorities, port authorities, local governments, industrial development corporations, and other government entities. The types of projects that were eligible to be funded included spurs, sidings, truck-rail trans-load and river-rail trans-load facilities, and bridge rehabilitation projects, with a \$2 million limit per project application.

In 2019, TDOT announced that three of these grants were awarded to projects that benefitted the operation of Tennessee riverports.

- The City of Memphis and Shelby County Port Commission were awarded funds to build 4900 feet of new track and four switches to serve the riverport and its customers on President's Island.
- Cheatham County, in the Nashville area, was granted funds for a project that includes improvements to 2000 feet of current rail bed and line, as well as the construction of a rail spur to serve a new, multi-modal barge port on the Cumberland River. The spur itself will be approximately 2600 feet along with around 650 feet of storage/loading tracks on the county-owned site.
- Marion County, in the Chattanooga area, was awarded funds towards building a rail spur to facilitate an expansion at Colonial Chemicals and the Nickajack Port Industrial Park.¹⁸

While several of these projects still have other hurdles to jump before they can reach completion, they serve to illustrate how Tennessee has been able to leverage funds for rail improvements to bolster rail infrastructure while also improving public port access and functionality.

¹⁸ Pallme, D., Assistant Chief of Freight & Logistics Environment & Planning Bureau, TDOT, *Session 3: What's New in the Neighborhood? Updates from Adjacent State Riverports*, presented at the Second Kentucky Summit on Economic Development Strategies to Leverage Kentucky Riverports and Freight Network, March 24 - 26, 2021.

2.4 CHANGES IN FUNDING AND POLICY ENVIRONMENT

Changes in Kentucky's waterborne commerce markets will require Kentucky's riverports to navigate federal and state policies and funding opportunities to adapt their infrastructure to the new realities. Other states are providing examples of ways to leverage funding programs and economic development strategies in new ways. More funding is being made available through the passage of new federal policies and programs. Potential exists for new, mutually beneficial partnerships between riverports and economic development programs, like those offered by Kentucky Innovation and the Kentucky CED Development. All these changes represent real options and possibilities for the future adaptation and development of Kentucky's riverports and their important role in Kentucky's economy.

2.4.1. Changes and Funding at the Federal Level

A key consideration for investing in riverports is the evolving versions of the federal infrastructure bills that have been making their way through the halls of Congress. The *Infrastructure Investment and Jobs Act* (2021) authorizes \$450 million for port infrastructure and \$5 million annually for marine highways (short sea shipping). Such funding can help the riverports consider new directions including domestic marine services that help reduce highway congestion by removing truckloads.

Other changes in the funding landscape are also indicative of some policymakers beginning to prioritize investment in transportation infrastructure.

One big change to how construction and rehabilitation projects on inland waterways are being funded took effect in December 2020 with the *Water Resources Development Act*. Before the passage of this act, commercial operators paid 50% of the cost of new construction and major rehabilitation projects on waterways via a 29¢ per gallon diesel fuel tax that was deposited into the Inland Waterways Trust Fund and then evenly matched by federal funds. The *Water Resources Development Act* changed this ratio to a 35% commercial operator contribution, now matched with a 65% contribution of federal funds. This is estimated to provide an additional \$1 billion for inland waterway construction and rehabilitation projects over a 10-year period, which will provide benefits that can filter throughout the US inland waterways system as a whole.¹⁹

USDOT's Maritime Administration's (MARAD) Marine Highway Grant Program is of particular interest to Kentucky because the Ohio River is Marine Highway designated route M-70 (**Figure 2-3**), which allows public entities along that route to apply for a new or expanded marine highway service.

¹⁹ Calhoun, D., "WCI and Its Mission: Funding for the Inland Waterways System," Presented in *Session 2: Changes in Federal Transportation and Trade Policies* at the Second Kentucky Summit on Economic Development Strategies to Leverage Kentucky Riverports and Freight Network, March 24 - 26, 2021.



Figure 2-3: Map of America's Marine Highway Routes

Once that application has been approved to be designated as a Marine Highway Project, that project becomes eligible to apply for Marine Highway Grant funding. Facilities in both Paducah and Brandenburg have been recipients of these grants in years past. The program was founded under the *Clean Energy Act*; so public benefits gained from funded projects are calculated, such as the number of truck-miles traveled that are removed from the highways as well as reductions in road maintenance, carbon emissions, congestion, and fatalities.

State or local government agencies, ports, tribal authorities, or metropolitan or regional planning organizations can sponsor project applications. To receive designation, the project must use US documented vessels loaded and unloaded at a US port or Canadian port in the Great Lakes region. Most significantly, Marine Highway Grant funds can be used for the development and expansion of port and landside infrastructures—such as cargo handling equipment, the development and expansion of documented vessels, and planning, preparation, and design efforts in support of marine highway projects (other than market-related studies).

The Ports of Cincinnati and Northern Kentucky received a Marine Highway Grant for M-70 barge service. This project will create a barge service to replace trucks between Nucor Steel's manufacturing facility in Gallatin County, KY and regional customers along the M-70. The grant funds will be used to convert a former casino barge to a manufacturing facility and another barge to be used for transportation and will replace 500 tractor-trailers a month from a 66-mile stretch of I-71, saving at least \$42,000 a year in highway maintenance costs.²⁰

²⁰ Pickering, T., "Maritime Administration Marine Highway Program Overview," Presented in *Session 2: Changes in Federal Transportation and Trade Policies* at the Second Kentucky Summit on Economic Development Strategies to Leverage Kentucky Riverports and Freight Network, March 24 - 26, 2021.

The most recent round of grant funding was announced in May 2021; \$12.6 million in total funding opportunities were opened for applications. It is significant to note that this amount has continued to rise with each subsequent round of funding, continuing to increase the total pool of federal funds available for port projects.²¹

2.4.2. Kentucky's Funding Programs

The Kentucky Riverports Improvement program (KRI) is an annually authorized legislative funding program totaling \$500,000 competitively awarded amongst its public riverports. The program requires a 50 percent match for grants by which the public riverports can fund dredging or improve facilities, infrastructure, and/or critical material-handling equipment. The program essentially provides improvements within a port property. A common concern about this program mentioned during interviews with port directors is the "use it or lose it" stipulation preventing the carryover of funds across years.

2.4.3. Highway Funding Program

State highway programs can play an integral role for off-site improvements by (1) improving access to nearby developable sites, (2) ensuring reliable and competitive access to ports from hinterland markets or inter-modal facilities, and (3) in some cases, ensuring appropriate ground access to riverport properties themselves. For this reason, riverport market stakeholders can understand changes in Kentucky's highway program as potential ingredients to infrastructure investment and amenity packages that help the ports adapt to significant market changes.

Kentucky's highways are funded through a Six-Year Highway Plan (SYP) that is developed by the KYTC and recommended to the Kentucky General Assembly every two years. For example, the funding breakdown for the estimated \$6.1 million budget for SYP FY 2020-2026 is illustrated in **Figure 2-4**.

²¹ Maritime Administration, "Notice of Funding Opportunity for America's Marine Highway Projects," *The Federal Register*, May 24, 2021 [Online]. Available: <https://www.federalregister.gov/documents/2021/05/24/2021-10914/notice-of-funding-opportunity-for-americas-marine-highway-projects> (accessed Oct. 2, 2021).

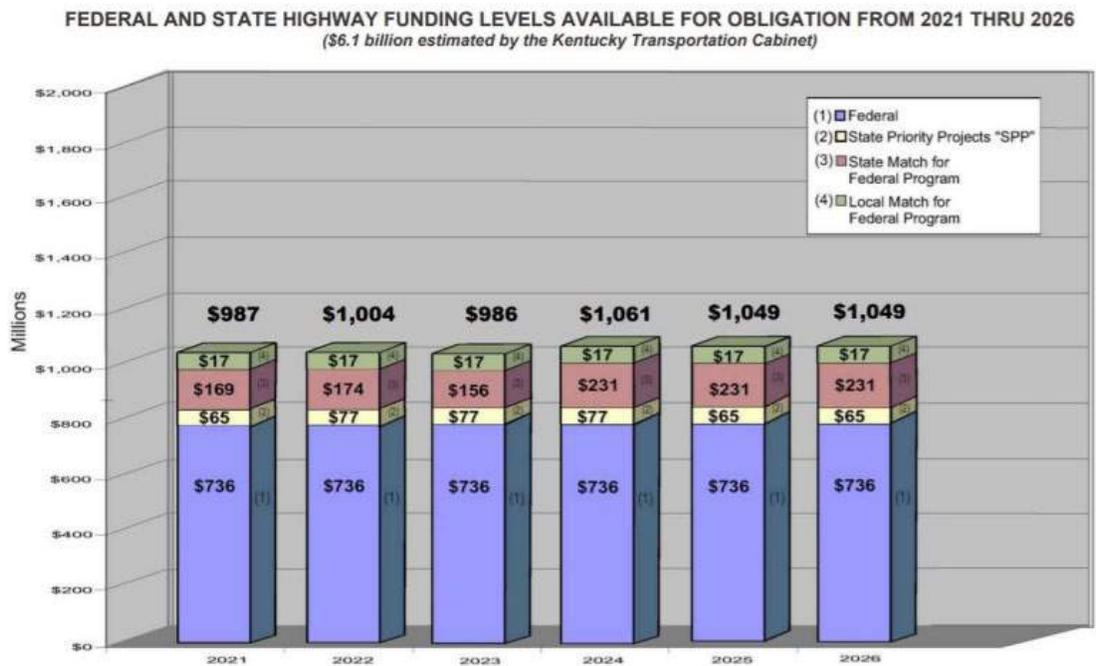


Figure 2-4: Six-Year Plan Funding Levels FY 2020-2026 (Source: KYTC)

It is important to put this budget in context by considering that Kentucky has the ninth-largest road system in the nation in terms of mileage and the seventh-largest inventory of state-maintained bridges, making the process of identifying and prioritizing capital improvement projects essential. KYTC uses its Strategic Highway Investment Formula for Tomorrow (SHIFT) process to ensure that highway projects are evaluated and prioritized by uniform standards. This process starts with a list of potential projects. Regional, state, and local transportation leaders sponsor a set number of projects for evaluation. The projects are then scored on a scale of 0-100 using a formula of five objective measures: safety, asset management, congestion, economic growth, and cost/benefit analysis. Projects of statewide significance are scored first, followed by regional projects that local transportation leaders can “boost” to account for subjective priorities.

Then KYTC combines both statewide and regional priorities to develop the Governor's recommended Highway Plan. This plan is then presented to the Kentucky General Assembly where lawmakers can refine recommendations based on any additional information or funding. What results becomes the Enacted Highway Plan that funds two years of projects and defines the following four years of spending priorities.

The most significant part of this process is understood in terms of the list of infrastructure needs that provides the basis for the overall selection process. The SHIFT process is a potential resource for developing new ground-access opportunities as the riverport market restructures. There are no new SHIFT projects explicitly recommended in the current study, however, SHIFT can play a role in funding strategies described in the final recommendation.

2.4.4. Economic Development Initiatives

Investing in new equipment and infrastructure to adapt to changing commodities, modes, and markets is only one strategic perspective. Like highway investment, economic development programs can offer significant resources to attract, create, expand, or retain riverport customers in growing market segments. Economic development programs offered through Kentucky Innovation promote opportunities for private companies to work with riverports in a variety of creative ways:²²

- 1) The **Kentucky Commercialization Ventures (KCV) program** helps commercialize university technology, expand applied research programs, and gain a higher share of federal research grants and private foundation research grants. Its goal is to work directly with inventors at public universities to help turn their ideas and research programs into marketable, scalable growth companies within the communities around the university system. Through its entrepreneurial residence program, KCV brings successful entrepreneurs—who have marketed and commercialized technology and sold it—into universities to help figure out what assets these universities have and what research could be commercialized and marketable.
- 2) The **Kentucky Innovation Investment Program (KIIP)** provides micro-grants and free professional services to better prepare Kentucky companies to win and manage federal Small Business Innovation Research (SBIR) or Small Business Technology Transfer (STTR) grants—the federal government's largest programs to fund commercialization. KIIP works directly with companies to help them get SBIR/STTR grants and then provides a matching program. The program has seen a lot of success among participating companies, which has generated jobs and helped to recruit and attract companies from outside the Commonwealth. KIIP just created an accelerator program within the SBIR/STTR grant program specifically focused on Department of Defense (DOD) grants. Because DOD SBIR/STTR awards come with a contract (i.e., if you can figure out how to make it work, they will buy it from you), they provide an exciting opportunity for Kentucky to grow and expand its DOD grant funding. Other capital and state funding opportunities include the Kentucky Enterprise Fund, Commonwealth Seed Capital, Angel Tax Credit/Fund Tax Credit, Kentucky Small Business Tax Credit, and Kentucky Small Business Credit Initiative.
- 3) The **Kentucky Innovation Network** works to establish regional networking hubs to connect and maximize the potential innovation in a region. It has already established regional hubs at three Kentucky riverports. Regional hubs serve as an entryway for any company looking to get involved in the innovation ecosystem. These hubs are public-private partnerships that identify and connect resources that exist in a community, creating a network of corporations, startups, and investors in the region, or in technologies,

²² Ellis, A., "Kentucky Innovation," Presented in *Session 7: Economic Development and Riverport Markets* at the Second Kentucky Summit on Economic Development Strategies to Leverage Kentucky Riverports and Freight Network, March 24 - 26, 2021.

university partners that are helping with commercialization and licensing, and government programs that promote innovation. There are several potential advantages to being aligned with the innovation hub program. If there is an innovation hub either at a port or in the adjacent community, the port could be more attractive to public and private investors because they may see the benefits of the link to new pools of talent and areas of innovation tied to investments in infrastructure and education. Also, if the hubs are in port communities, then the ports' communities may become more prosperous. When the cities become more prosperous, they could develop tax incremental finance districts, community improvement districts, business improvement districts, and partnerships with the ports and the ports could possibly receive direct revenue streams.

Another strategic perspective is economic development resources and relationships that would enable the ports to attract more public and private investment and strategize generating more return-on-investment. There could be significant benefits to attracting businesses that can benefit, in certain cases, from the expansion of existing port capabilities, as opposed to retooling a facility to handle new commodities.

Port operators provide one of the most important voices in the discussion about riverport economic development possibilities. One port official stated the economic function of a port very simply: "ports are catalysts for economic development."²³ He went on to explain that ports alone do not create large numbers of jobs. Ports provide options for sourcing commodities and in turn, make Kentucky a more advantageous location to do business, thus attracting jobs and other economic benefits.

A key component in capitalizing on this function is building the relationships and communication networks between the ports and CED. For example, a local manufacturer might be making large expenditures on truck transportation and could potentially benefit from services offered by a nearby port; however, if this information is known by an economic development program but never communicated to the port—an opportunity is lost on all sides. Another example is the added value of riverports for a business considering locating in Kentucky. Riverport directors want to become a more active partner with the Kentucky CED in developing a state-level strategy, such as those employed by Illinois, Ohio, and Indiana, to market the riverports for the mutual benefit of Kentucky as a whole. In sum, the message is about the potential in creating a stronger relationship with CED in terms of business recruitment and retention. It's about enabling Kentucky riverports to be more competitive and thus making Kentucky more competitive.

²³ Yates, M., Vice President Louisville Riverport Authority, Presented at *Session 7: Economic Development and Riverport Markets* at the Second Kentucky Summit on Economic Development Strategies to Leverage Kentucky Riverports and Freight Network, March 24 - 26, 2021.

2.5 CONCLUSION

Kentucky's waterborne economy is in the midst of a significant transformation from a system carrying primarily fossil fuels to a system that will have to be increasingly competitive for modally divertible freight including food, agricultural products, plastics, rubber, chemicals, machinery, and other goods. Each of Kentucky's public riverports is found to have specific commodity and trading market segments representing growth markets in both waterborne and divertible freight in the available 2045 forecasts. However, these changes require investment in new and modernized equipment on port properties, acquiring funding in a rapidly changing federal and state policy environment, and leveraging relationships with other states which are developing their own programs and strategies for responding to economic change.

The chapters ahead will explore the benefits of investing in Kentucky's riverports, the wider impacts that such investments can have on Kentucky's performance, key strategic actions that can be taken at both the system and individual port level to weather these changing times, and ultimately policy priorities to overcome the significant challenges of economic restructuring.