KENTUCKY RIVERPORTS, HIGHWAY & RAIL FREIGHT STUDY

CHAPTER 1

AN INTRODUCTION TO KENTUCKY'S RIVERPORTS, HIGHWAY, AND RAIL FREIGHT STUDY

In partnership with the Kentucky Cabinet for Economic Development (CED), the Kentucky Transportation Cabinet (KYTC) initiated this *Kentucky Riverports, Highway, and Rail Freight Study* to help find better ways to support waterborne commerce and to further economic growth across the Commonwealth. The inland river system, particularly the Ohio River feeding into the Mississippi River, is essential for the movement of freight into, through, and beyond Kentucky. As shown in **Figure 1-1**, alongside four developing public port facilities, seven operating public ports across the Commonwealth provide access to 1,590 miles of Kentucky's navigable inland waterways, an important part of a larger, interconnected freight network.

Figure 1-1: Kentucky's Public Riverports and Multimodal Freight System

At a high level, this study is intended to help identify how Kentucky can better use these waterways to spur economic growth. The study is organized into six tasks, as illustrated in **Figure 1-2**, culminating in a series of technical memoranda and this report. Project materials are available on the KTYC Planning website.[1]

Figure 1-2: Kentucky Riverports Six Study Tasks

Throughout this study, the project team conducted extensive coordination with individual port directors, industry representatives, and key stakeholders. A 14-person steering committee met at study milestones. Moreover, two rounds of in-person port visits were conducted to inventory existing conditions and understand strategic visions for each facility. Three virtual summits were held to present technical findings, engage with industry leaders, and establish/enrich contacts. Each engagement opportunity supplemented technical analyses, discussed throughout this document. **Appendix 1.1** describes data used in the technical memoranda of the study in relation to this final report and how available market forecasts and findings can be interpreted in context.

[1] Online at https://transportation.ky.gov/MultimodalFreight/Pages/Kentucky-Riverports,-Highway-and-Rail-Freight-Study.aspx

1.1 REPORT ORGANIZATION

This report is organized into five chapters:

Chapter 1: Why Are Riverports and Waterborne Commerce Important to Kentucky's Economy? defines existing riverport hinterland market areas and current trends influencing markets and trade patterns, exploring supply chains and the role of Kentucky's public ports in the larger economy. **Technical Memorandum 1** provides a more robust discussion of the current state of individual ports with statistics about 2018 commodity flows through each region.

Chapter 2: What Is Changing in Kentucky's Waterborne Economy? discusses anticipated market changes looking towards 2045 and how individual ports should respond. **Technical Memorandum 2** explores the TRANSEARCH forecasts[2] for each port in greater depth.

Chapter 3: How Prepared Are Kentucky's Riverports for the Future? assesses strengths, weaknesses, opportunities, and threats (SWOT) then recommends steps to successfully adapt to the future. **Technical Memorandum 3** includes an overview SWOT assessment for the statewide system.

Chapter 4: What Actions Can Be Taken and What Are the Benefits? presents the business case for investing in ports (costs and benefits), looking at the statewide public port network and individual facilities. Scenarios to preserve, modernize, and expand the system are discussed, followed by policy recommendations. Additional discussions on the investment strategies are included in **Technical Memorandum 4**.

Chapter 5: How We Can Build a Home Market around the Riverports? dives deeper into economic development initiatives, recommending mechanisms to support increased funding needs and to increase market capture.

The five chapters are supplemented by a marketing toolkit, which contains marketing strategies and promotional materials to assist each port in its upcoming business development efforts.

[2] TRANSEARCH is a comprehensive, subscription-based freight database developed to forecast future freight demands by origin, destination, commodity, and mode.

WHY ARE RIVERPORTS AND WATERBORNE COMMERCE IMPORTANT TO KENTUCKY'S ECONOMY?

This chapter provides the historical context of waterborne commerce and its value to the Commonwealth of Kentucky. It also stresses how waterborne commerce provides value today to Kentucky industries as well as an overview of each riverport. Most importantly, **Chapter 1** lays the groundwork for subsequent chapters: systemwide and individual port analyses of strengths, weaknesses, opportunities, and threats (SWOT); five-year capital improvement needs to preserve, modernize, and expand riverport services; and policy recommendations for the Kentucky Riverport system.

Note that this report includes in its appendices source data describing riverport infrastructure, markets, and operations. To make the full body of this information available for Kentucky's riverport stakeholders, tables are included; some of which are not otherwise referenced in this report.

1.2 A CRITICAL JUNCTURE FOR WATERBORNE COMMERCE

This study occurs at a critical juncture in the overall development of both Kentucky's waterborne commerce economy and the nation's evolution in its use of waterways. Vital changes are occurring in commodity markets, trading partners, competitors, and technologies that shape Kentucky's waterway system. **Figure 1-3** and **Figure 1-4** look at the past highlights of a rich, dynamic history of change along the inland river system, which continues to influence the Commonwealth's economy.

1.2.1. Two Centuries of Evolution

Figure 1-3: Steamboat on the Ohio River near Maysville, 1899. Photo by J.T. Kackley. Kentucky Historical Society

Trade has continued to evolve along the Ohio River since the first flatboat carrying a commodity (flour) traversed the Ohio and Mississippi Rivers to the Port of New Orleans in 1782. As early as 1816, the burgeoning U.S. Board of Fortifications identified Kentucky rivers as essential to the defense of the United States. Following the Industrial Revolution, Kentucky's economy was able to build on the infrastructure of the steamboat era to arrive at a new and competitive waterborne economy. In 1830, the Louisville and Portland Canal was opened to bypass the Falls of the Ohio River—a canal that also still operates today, though modernized in 1962 as part of the McAlpine Locks and Dam. In 1870, plans for the comprehensive lock and dam system were initiated, revolutionizing trade on the Ohio River. That same lock and dam system remains a vital part of the Marine Transportation System today, helping manage navigation from Pittsburgh to Southeast Pass.

Seen within this historic context, three key facts resonate today:

- Kentucky's riverports can adapt to changing market conditions and policy environments.
- Changing uses of the Ohio River drive innovation and opportunity for Kentucky's economy.
- Strategic investment in riverport infrastructure is a long-standing success factor for Kentucky's economy. Despite wars and economic repressions, Kentucky's economy was able to build on the infrastructure of the steamboat era to arrive at a new and competitive waterborne economy. While today's infrastructure grew from historic investments, the continued use of aging infrastructure requires significant investments.

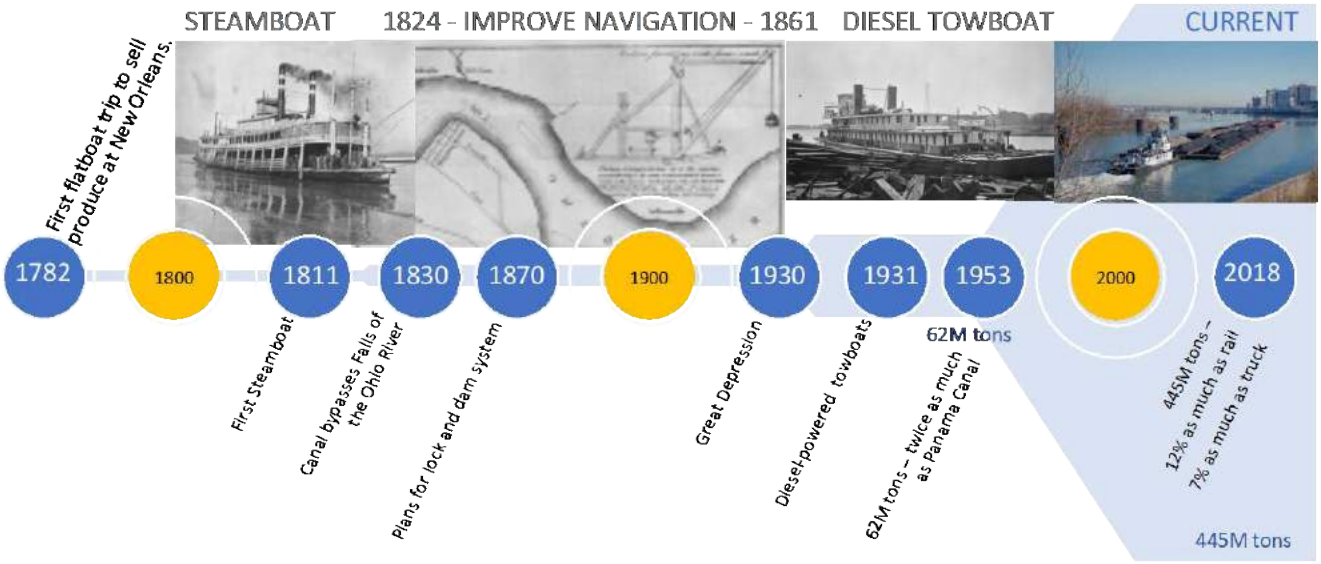

Figure 1-4: Short History of Kentucky's Waterways

(Image sources: explorekyhistory.ky.gov, wisconsinhistory.org, library.wisc.edu, Wikimedia.org)

Whether it is the transition from steam to diesel or from coal to the more sustainable resources of the future, stakeholders in Kentucky's waterways have proven they are more than capable of meeting the challenges of an ever-changing world.

1.2.2. Twenty Years of Shifting Commodity Trends

In the last 20 years, Kentucky's prominence in the national waterway market has been declining, underlain by a dependence on a few diminishing commodities. According to the U.S. Department of Transportation's (USDOT) Freight Analysis Framework (FAF), Kentucky's overall share of the U.S. waterborne transportation market has fallen significantly over the last two decades.[3] In 1997, approximately 14% of the nation's waterborne trade involved Kentucky. As recently as 2017, just over 7% of waterborne commodities were traded with Kentucky, representing a decrease of approximately 22 million tons during this period.[4]

The most notable shift in Kentucky's waterborne commerce market relative to the nation has been a sharp drop in coal, gasoline, and fuel oils, commodities upon which the Commonwealth has historically been dependent. In **Table 1-1**, FAF shows tonnage of coal, gasoline, and fuel oils falling 48% in Kentucky, while at the same time increasing by 67% nationally from 1997 to 2017. **Table 1-1** also shows a steep decline in minerals (sand, stone, and nonmetallic mineral products)—declining 95% in tonnage from 1997 to 2017 while nationally increasing by approximately 2%. **Appendices 1.3** and **1.4** show changes in the composition of Kentucky's waterborne economy (in terms of percentages of commodities) from 1997 to 2017 (according to FAF).

Table 1-1: Major Shifts in Kentucky's National Waterways Market Position per FAF

Key Market	% Change in National Waterborne Market Size (Tons 1997-2017)	% Change in Kentucky Waterborne Market Size (Tons 1997-2017)
Fuels: Coal, Gasoline, Fuel Oils	*+ 67%*	*– 48%*
Minerals: Sand, Stone & Non-Metallic Minerals	*+ 2%*	*– 95%*
Manufactured Goods: Plastic/Rubber, Textiles, Machinery	*+ 1700%*	*+ 1100%*
Perishables: Grains & Alcoholic Beverages	*– 6%*	*Sustained at 1997 Level*

Consistent with losing national market share in waterborne trade, goods transported by water to Kentucky declined by 31% between 1997 and 2017. Moreover, many historically strong commodities diminished, including coal, fuel oils, and gasoline, signifying that such goods should be prioritized less by Commonwealth riverports for future infrastructure investment. **Table 1-2** summarizes differences in commodity volumes between 1997 and 2017 FAF data sets, arranged from high to low by the amount of growth.

[3] FAF data from 2017 are used for this part of analysis because it is a national database with 20 years of history. Note that FAF uses STCG commodities while TRANSEARCH uses STCC commodities.
[4] Note that FAF does not capture a large share of chemical commodities.

Table 1-2: Shifts in Kentucky Waterborne Commerce Market Composition, 1997-2017

Commodities	1997 Tons	2017 Tons	1997 Share	2017 Share	Growth
34-Machinery	0	14	0%	0%	>100%
08-Alcoholic beverages	0	100	0%	0%	>100%
16-Crude petroleum	1	1,775	0%	7%	>100%
36-Motorized vehicles	0	4	0%	0%	>100%
32-Base metals	69	2,096	0%	8%	>100%
24-Plastics/rubber	0	2	0%	0%	>100%
30-Textiles/leather	3	31	0%	0%	>100%
02-Cereal grains	83	453	0%	2%	>100%
29-Printed prods.	0	0	0%	0%	>100%
41-Waste/scrap	239	1,202	1%	5%	>100%
03-Other ag prods.	275	701	1%	3%	>100%
12-Gravel	1,782	4,085	5%	15%	>100%
39-Furniture	0	0	0%	0%	88%
19-Coal-n.e.c.	572	875	1%	3%	53%
13-Nonmetallic minerals	1,366	1,856	4%	7%	36%
33-Articles-base metal	2	2	0%	0%	-13%
15-Coal	17,389	12,836	45%	48%	-26%
35-Electronics	6	4	0%	0%	-39%
21-Pharmaceuticals	0	0	0%	0%	-66%
20-Basic chemicals	888	229	2%	1%	-74%
27-Newsprint/paper	0	0	0%	0%	-79%
23-Chemical prods.	4	1	0%	0%	-80%
28-Paper articles	1	0	0%	0%	-87%
40-Misc. mfg. prods.	3	0	0%	0%	-90%
18-Fuel oils	1,929	170	5%	1%	-91%
14-Metallic ores	115	9	0%	0%	-92%
37-Transport equip.	2	0	0%	0%	-94%
05-Meat/seafood	0	0	0%	0%	-95%
17-Gasoline	9,638	159	25%	1%	-98%
07-Other foodstuffs	79	0	0%	0%	-99%
11-Natural sands	2,896	17	7%	0%	-99%
26-Wood prods.	15	0	0%	0%	-99%
06-Milled grain prods.	9	0	0%	0%	-100%
04-Animal feed	65	0	0%	0%	-100%
31-Nonmetal min. prods.	1,364	2	4%	0%	-100%
22-Fertilizers	100	0	0%	0%	-100%
01-Live animals/fish	0	0	0%	0%	-100%
09-Tobacco prods.	0	0	0%	0%	-100%
10-Building stone	0	0	0%	0%	-100%

While overall market trends point to a strong dependence on falling markets, specifically fossil fuels, Kentucky can realize significant economic opportunities by cultivating small but growing markets. From **Table 1-2**, relative growth markets for Kentucky's waterways have been in manufactured goods—including plastics, rubber, textile products, and machinery—which have seen an eleven-fold increase in their utilization of Kentucky's waterways and a seventeen-fold increase in waterway utilization nationally. Grains and alcoholic beverages are another potential growth market, having maintained their tonnage of waterborne trade with Kentucky despite the national downturn of approximately 6% in tonnage on U.S. waterways. Crude petroleum has also increased its prominence on Kentucky waterways since 2017.

1.2.3. Two Years of Supply Chain Issues

The long-term downward trend of the coal market and other fossil fuel industries is pushing Kentucky and its ports to pivot to offset the ongoing decline. More immediately, the COVID-19 pandemic and recent climate change challenges highlighted the crucial importance of adaptability, flexibility, and reliability of the supply chain to support Kentucky's overall economy.

The supply chain challenges of the COVID economy shifted away from prioritizing fuel efficiency toward faster, more flexible modes of transport, emphasizing speed as e-commerce experienced a rapid expansion. This moved shipping modes away from maritime and barge transport and toward rail, truck, and air transport. Thus, water-based transport must consider new strategies to increase reliability and flexibility to be competitive. These challenges do not preclude waterway transport as an option for large e-commerce clients such as Amazon.

Figure 1-5 illustrates how overall barge volumes carrying Kentucky's top commodities—coal, petroleum, farm/food products, and chemicals—all declined sharply during 2020. The influence of the pandemic demonstrates that though demand for many of Kentucky's core waterborne commodities has been considered largely inelastic, there can be disruptions that affect the demand pattern in both the near and long term.

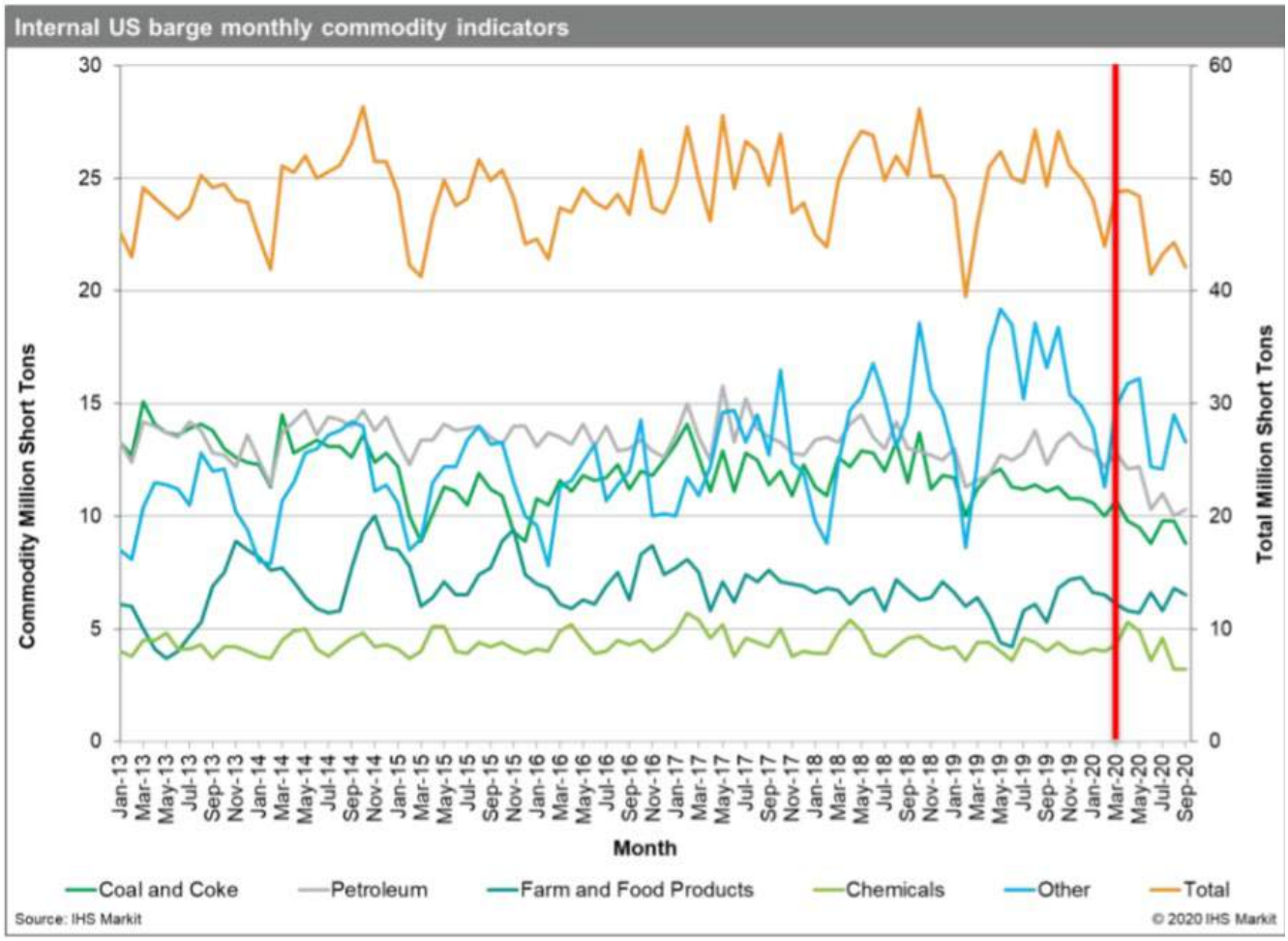

Figure 1-5: COVID-19 Impact on Barge Volumes

Throughout this study, several emergency events underscored how Kentucky's inland waterways are critical to global trade networks:

- Closure of the I-71/I-75 Brent Spence Bridge following a truck fire (November 2020), shut down portions of the Ohio River near Cincinnati
- Blockage of the Suez Canal by a grounded container vessel during March 2021, which continues to disrupt global supply chains already strained by the pandemic
- High-water incidents and supply chain disruptions from Hurricane Ida throughout September 2021 led to additional delays throughout the inland waterway system

1.3 KENTUCKY RIVERPORTS TODAY

TRADE WITH ASIA

Asian markets show significant growth in demand, consuming record-setting levels of American soy, with 65% of that volume moving on the inland waterway system.

Kentucky remains centrally located to move goods to two-thirds of the U.S. population. Its extensive network of interstates and parkways, Class I, II, and III rail infrastructure, and waterways ensure that industry in the Commonwealth remains vital to the rest of the country.

Kentucky ports provide access to the Gulf of Mexico via the Ohio, Tennessee, and Mississippi rivers and from there, the world. The regional and global connectivity of Kentucky's riverports competitively positions nearby farmers to reach domestic markets but also the growing markets of Asia and Latin America. Outbound agricultural shipments are feeding the world while fertilizers and other chemicals traveling inbound continue to support the agricultural industry.

Kentucky's waterborne transportation economy plays a vital role both in the Commonwealth's business competitiveness and in the U.S. economy overall. In 2018, Kentucky traded over 89 million tons of freight using inland waterways, valued at over $18 billion.[5] About 79% of Kentucky's waterborne trade (by tonnage) is exchanged with trading partners outside of the Commonwealth, pointing to the importance of Kentucky's waterborne commerce to the larger national economy. Table 1-3 and Table 1-4 demonstrate the top sources of inbound and outbound waterborne trade with Kentucky in 2018 by both tonnage and value.

Table 1-3: Top 10 Inbound Waterborne Trading Partners in 2018 per TRANSEARCH

Origin	1,000 Tons	% Of Tons	$ Million	% Of Value
Charleston, WV	4,835	21%	$ 2,772	24%
Wheeling, WV	3,237	14%	$ 137	1%
New Orleans, LA	2,971	13%	$ 2,812	25%
St. Louis, MO	1,567	7%	$ 92	1%
Evansville, IN	1,509	7%	$ 370	3%
Clark Co., IN	1,388	6%	$ 35	0%
Cleveland, OH	1,092	5%	$ 434	4%
Memphis, TN	1,077	5%	$ 725	6%
Tupelo, MS	893	4%	$ 186	2%
Cincinnati, OH	821	4%	$ 290	3%
Others	3,587	16%	$ 3,527	31%
Total Inbound	**22,976**	**100%**	**$ 11,379**	**100%**

[5] IHS Markit TRANSEARCH 2021 purchased for KYTC.

Table 1-4: Top 10 Outbound Waterborne Trading Partners in 2018 per TRANSEARCH

Destination	1,000 Tons	% Of Tons	$ Million	% Of Value
New Orleans, LA	10,107	21%	$ 1,448	27%
Nashville, TN	9,550	20%	$ 338	6%
Baton Rouge, LA	4,145	9%	$ 280	5%
Charleston, WV	3,586	8%	$ 472	9%
Clark Co., IN	3,419	7%	$ 127	2%
Cincinnati, OH	2,284	5%	$ 673	12%
Lake Charles, LA	1,870	4%	$ 45	1%
Wheeling, WV	1,268	3%	$ 63	1%
Pittsburgh, PA	1,124	2%	$ 202	4%
Memphis, TN	1,085	2%	$ 37	1%
Others	8,713	18%	$ 1,762	32%
Total Outbound	**47,151**	**100%**	**$ 5,447**	**100%**

Kentucky exchanged over $4.2 billion of trade on the Mississippi River System with the New Orleans region in 2018, accounting for more than 25% of all value traded with Kentucky by water.[6] An additional $3.2 billion was exchanged with the Charleston, West Virginia region, accounting for another 20% of the value of goods moving by water in Kentucky. (**Appendix 1.1** includes a summary of all the 2018 TRANSEARCH findings for top commodities and trading partners for Kentucky across all modes.) However, Kentucky's waterways carry a small share by volume compared to other modes moving goods to, from, though, and within Kentucky. **Figure 1-6** demonstrates modal shares of Kentucky's overall freight tonnage in 2018.

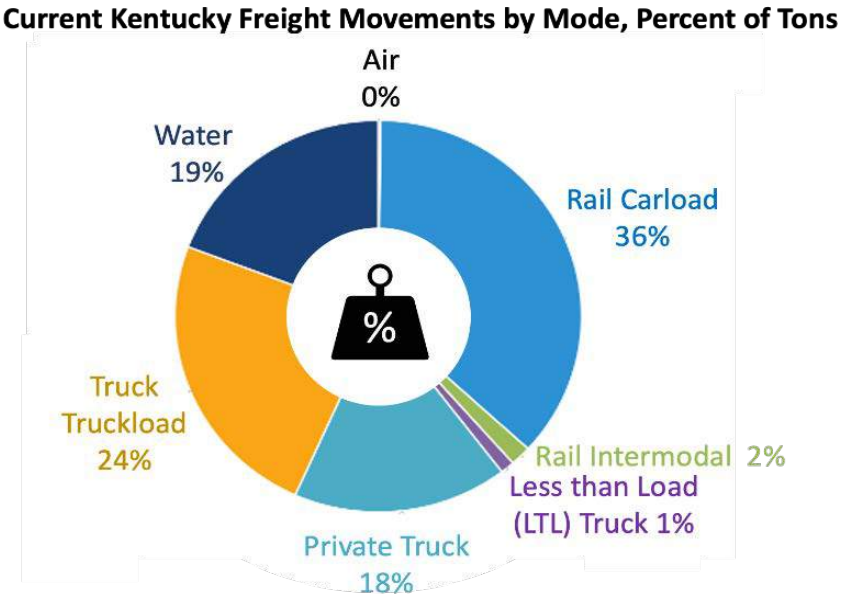

Figure 1-6: Modal Shares of Kentucky Freight per TRANSEARCH

[6] Regions as defined as U.S. Bureau of Economic Analysis (BEA) region.

Access to the Ohio, Tennessee, and Mississippi rivers means Kentucky's river ports are an integral piece of its overall freight system, particularly in terms of carrying heavy cargo and as a connector in multimodal routes. Kentucky's eleven public ports and hundreds of private ports provide access to 1,590 miles of inland waterways. With the fourth-largest waterway network in the nation, the system carried more than 89 million tons of freight worth over $18 billion in 2018.

Offering low-cost and reliable transportation for a wide range of materials, Kentucky waterways serve a variety of businesses in the state. Business at the ports helps attract investments; many companies have established locations and other facilities in the Commonwealth, fueling job creation for Kentucky's residents. As part of an interconnected system, the impacts made by Kentucky riverports resonate around the world, such as with the barge pilots accessing each port, the Kentucky businesses importing and exporting raw materials, their employees, as well as the families in Asia consuming American products. At the center of this complex web of influence, each Kentucky riverport plays a unique role in attracting and maintaining business and creating Kentucky jobs.

1.4 EFFICIENCIES OF WATERBORNE TRADE

While waterways move more slowly than other modes, the costs of moving goods by water are significantly less than by other modes of transportation.

- Trucks commonly move individual loads shorter distances—generally less than 500 miles—at a relatively high cost per ton.
- Rail moves larger volumes of goods greater distances—generally more than 500 miles—at a medium to low cost per ton.

Domestic (U.S. flag) commercial water transportation is comparable to rail for shipment sizes and travel distances. However, it moves goods at the lowest cost per mile, providing a distinct advantage to Kentucky given its seven public riverports. Agricultural products, raw materials, fuels, and other critical elements of the economy depend on Kentucky's waterways to power supply chains in Kentucky and throughout the nation.

Kentucky's waterborne transportation system overall saves approximately 2.3 billion vehicle-miles of travel (VMT) and over 43 million vehicle-hours of travel (VHT) each year in ground transportation costs.[7] Annually, these reductions correlate with over 4,000 fewer commercial truck crashes and over 3 million fewer tons of pollutants.

[7] Economic benefits and impacts derived using KYTC TREDIS model with TRANSEARCH data as shown in **Appendix 1.1**.

WATERWAYS ARE MORE EFFICIENT THAN OTHER MODES

The National Waterways Foundation noted that a single 15-barge tow and towboat of the type commonly utilized on Kentucky's inland waterway network moves the freight equivalent of six locomotives and 216 railcars. This same 15-barge tow moves the equivalent to 1,050 large semis / tractor trailers as shown in **Figure 1-7**.

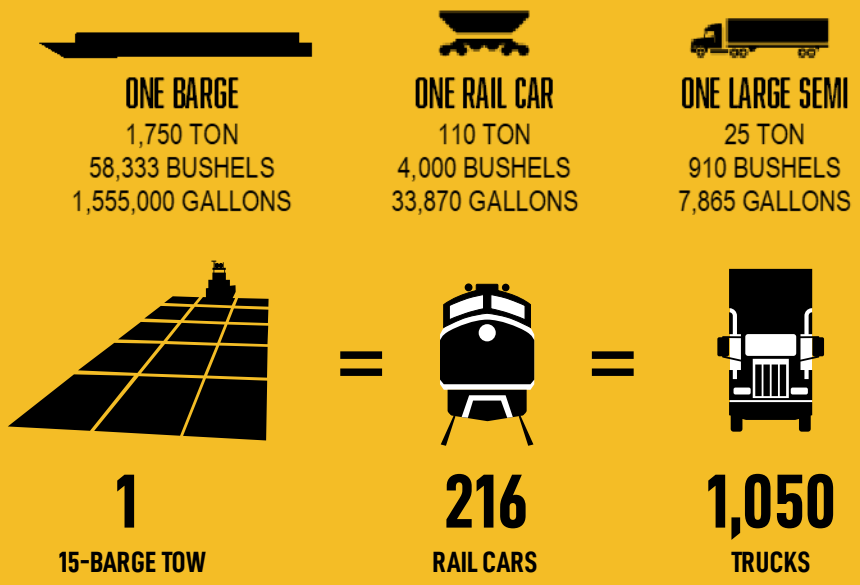

Figure 1-7: Equivalent Freight Efficiency

From 1997 to 2017, Kentucky's riverports saved the U.S. economy over $74 billion; Table 1-5 summarizes the national transportation cost savings enabled by modal efficiencies of Kentucky's riverport system.

Table 1-5: Cost Savings by KY Riverports 1997-2017

Cumulative Savings to Ground Transportation Systems Enabled by Use of KY Waterborne Transportation during 1997-2017 [8] (In $ Millions)	
Vehicle Operations (Truck & Rail)	$36,120
Business Time & Reliability	$24,308
Safety/Reduction in Crashes	$4,046
Shipper/Logistics (lost time of goods awaiting delivery)	$314
Social/Environmental Benefits	$9,664
TOTAL	**$74,453**

[8] Benefits from VMT and VHT savings derived from TRANSEARCH 2018 origin-destination patterns for Kentucky waterborne markets interpolated to 1997 using compound annual growth from 1997-2017 in FAF. USDOT accepted per-mile and per-hour factors for crashes, emissions and value of time, mileage applied. KYTC TREDIS model used to calculate cumulative totals.

Of the $74 billion cumulative benefit from Kentucky's waterways, approximately 58% of the savings accrue in Kentucky (due to the percentage of shipments either inbound to Kentucky shippers or internal to Kentucky as shown in TRANSEARCH). This translates into a $43 billion cumulative 20-year benefit Kentucky has enjoyed from the riverports between 1997 and 2017, or an annual undiscounted value of approximately $1.7 billion of savings to Kentucky's economy by moving goods by water instead of by rail and truck.

The efficiencies offered by Kentucky's waterway system account for approximately $1.5 billion in annual business sales from Kentucky, contributing $627 million annually to Kentucky's gross domestic product (GDP)—sustaining over 6,000 jobs and enabling Kentuckians to earn over $365 million in annual wage income.[9] These savings benefit Kentucky's households and businesses, enabling them to produce and consume products, sustain profits, employ workers, and pay wages supporting Kentucky's economic performance.

1.5 SUSTAINING INDUSTRY AND SUPPLY CHAINS

Kentucky's waterways are important because of the quantifiable efficiency they offer to the economy and the specific industries and supply chains they serve. The energy, chemical, agriculture/food/lumber, and metals/minerals supply chains are highly dependent on Kentucky's waterways.

- For the energy sector, Kentucky's waterways moved over 42 million tons of coal, petroleum, coal products, and crude petroleum/natural gas, valued at more than $7.1 billion during 2018. Effectively 65% of goods in these commodity groups traded with Kentucky currently move by water.
- Supply chains involving the use of nonmetallic minerals, metallic ores, and primary metal products also heavily utilize Kentucky's waterways, moving 32 million tons of freight valued at over $4.3 billion during 2018. These flows accounted for 34% of goods in these commodity groups traded with Kentucky.
- Kentucky waterways are likewise very important to Kentucky's chemical and allied manufacturing supply chains, moving 3.8 million tons by water in 2018, valued at more than $3.9 billion and accounting for 33% of all goods in chemical and allied manufacturing commodities traded with Kentucky.
- Waterborne commerce factors prominently in the agriculture/ lumber/food supply chains as well—which collectively utilized the waterways to move over 6.1 million tons worth of lumber, agriculture, livestock, and food products valued at over $1.4 billion during 2018. This represents 11% of Kentucky's trade in this supply chain.

Table 1-6 and Table 1-7 demonstrate the top waterborne commodities traded with Kentucky in 2018 by tonnage and value.

[9] Excludes stimulus effects of grant money or outlays to directly employ workers/vendors at port properties.

Table 1-6: Top 10 Inbound Waterborne Commodities 2018 per TRANSEARCH

Inbound Commodity	1,000 Tons	% Of Tons	$ Million	% Of Value
Petroleum or Coal Products	6,136	27%	$ 4,108	36%
Coal	5,071	22%	$ 158	1%
Nonmetallic Minerals	3,287	14%	$ 39	0%
Chemicals or Allied Products	2,744	12%	$ 3,364	30%
Crude Petroleum or Natural Gas	1,597	7%	$ 703	6%
Primary Metal Products	1,322	6%	$ 2,385	21%
Metallic Ores	958	4%	$ 81	1%
Lumber or Wood Products	920	4%	$ 161	1%
Waste or Scrap Materials	356	2%	$ 112	1%
Agriculture Production & Livestock	239	1%	$ 77	1%
Others	345	2%	$ 192	2%
Total Inbound	**22,975**	**100%**	**$ 11,380**	**100%**

Table 1-7: Top 10 Outbound Waterborne Commodities 2018 per TRANSEARCH

Outbound Commodity	1,000 Tons	% Of Tons	$ Million	% Of Value
Nonmetallic Minerals	20,067	43%	$ 195	4%
Coal	14,342	30%	$ 446	8%
Agriculture Production & Livestock	4,167	9%	$ 904	17%
Petroleum or Coal Products	3,063	6%	$ 1,173	22%
Clay, Concrete, Glass or Stone	2,576	5%	$ 648	12%
Primary Metal Products	1,059	2%	$ 1,326	24%
Chemicals or Allied Products	1,010	2%	$ 566	10%
Food or Kindred Products	624	1%	$ 114	2%
Waste or Scrap Materials	144	0%	$ 47	1%
Metallic Ores	77	0%	$ 6	0%
Others	21	0%	$ 22	0%
Total Outbound	**47,150**	**100%**	**$ 5,447**	**100%**

1.5.1. Supporting Kentucky's Industrial Sectors

Understanding the commodities and supply chains utilizing Kentucky's waterway system illuminates how the waterways support jobs, business sales, income, and profitability within Kentucky. The USDOT Bureau of Transportation Statistics (BTS) uses *Transportation Satellite Accounts* (TSAs) to demonstrate how it is possible to track what each industry in the U.S. consumes from each mode of transportation to produce a dollar of output.[10]

To produce each dollar of output, each sector of the US economy must make outlays in in-house, for-hire, pipeline, or other transportation services. **Figure 1-8** illustrates that these outlays vary by industry and mode of transportation. As shown, the wholesale and retail trade sector used the most transportation ($344 billion); it required the most transportation (8.9 cents) to produce one dollar of output.

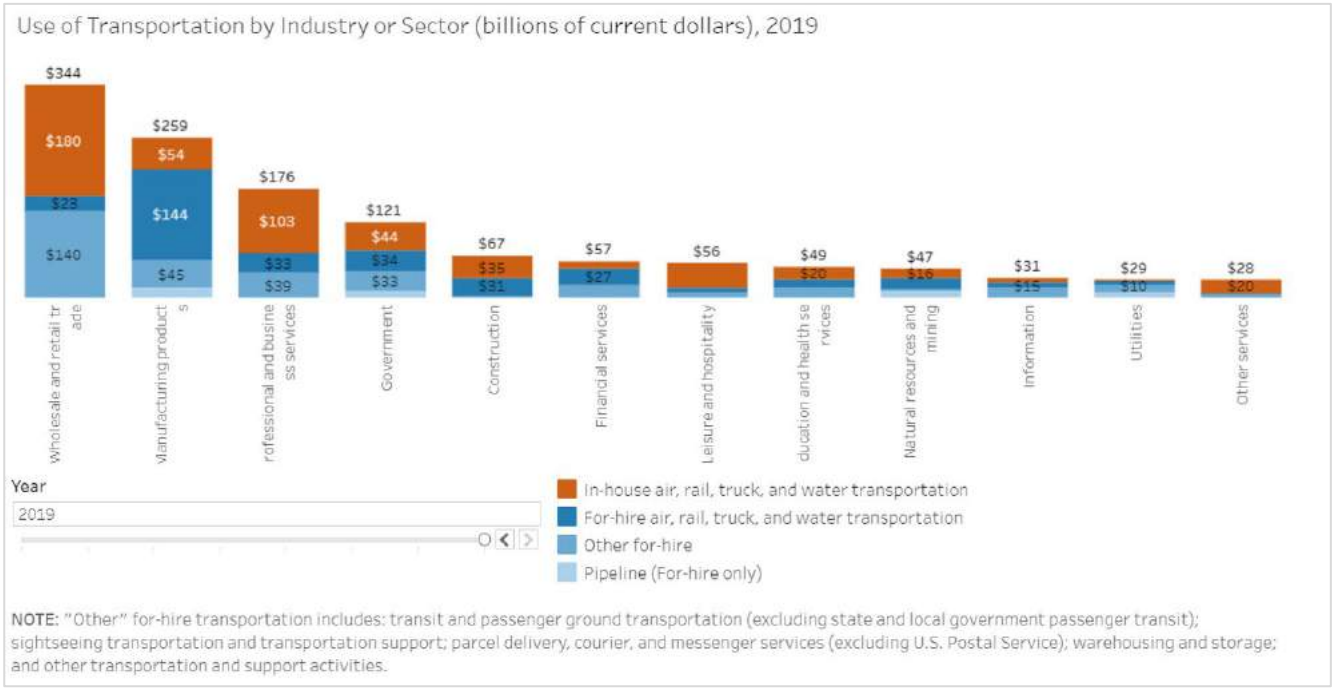

Figure 1-8: Transportation Costs by Industry for BTS TSA's

By applying the input-output data available from KYTC's Transportation Economic Development Information System (TREDIS) software, it is possible to quantify how each of Kentucky's major industries depends on each mode of transportation. These data further demonstrate how riverports fit into Kentucky's current economic success. The following graphics illustrate where Kentucky's overall freight-dependence is located, and which industry sectors are the most dependent on water transportation.

[10] USDOT, BTS, Transportation Economic Trends, available at www.bts.gov/product/transportation-economic-trends

Figure 1-9 identifies the counties in Kentucky that produce the most business output. Green and yellow shading show urban areas where the highest concentrations of business activity are compared to public riverports, shown with red stars.

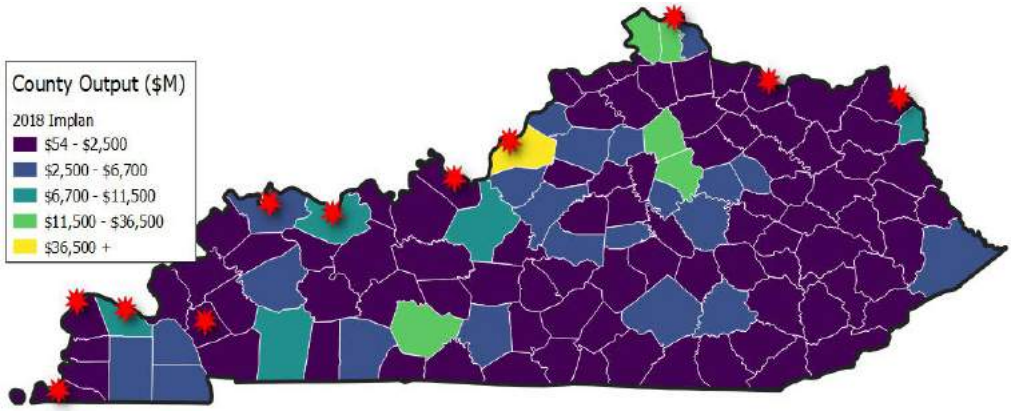

Figure 1-9: Business Output by County per TREDIS

The bar chart in **Figure 1-10** demonstrates overall which statewide industries by employment are the most dependent on freight to produce output. As shown, Manufacturing is the most freight-dependent, followed by Agriculture/Mineral Extraction.

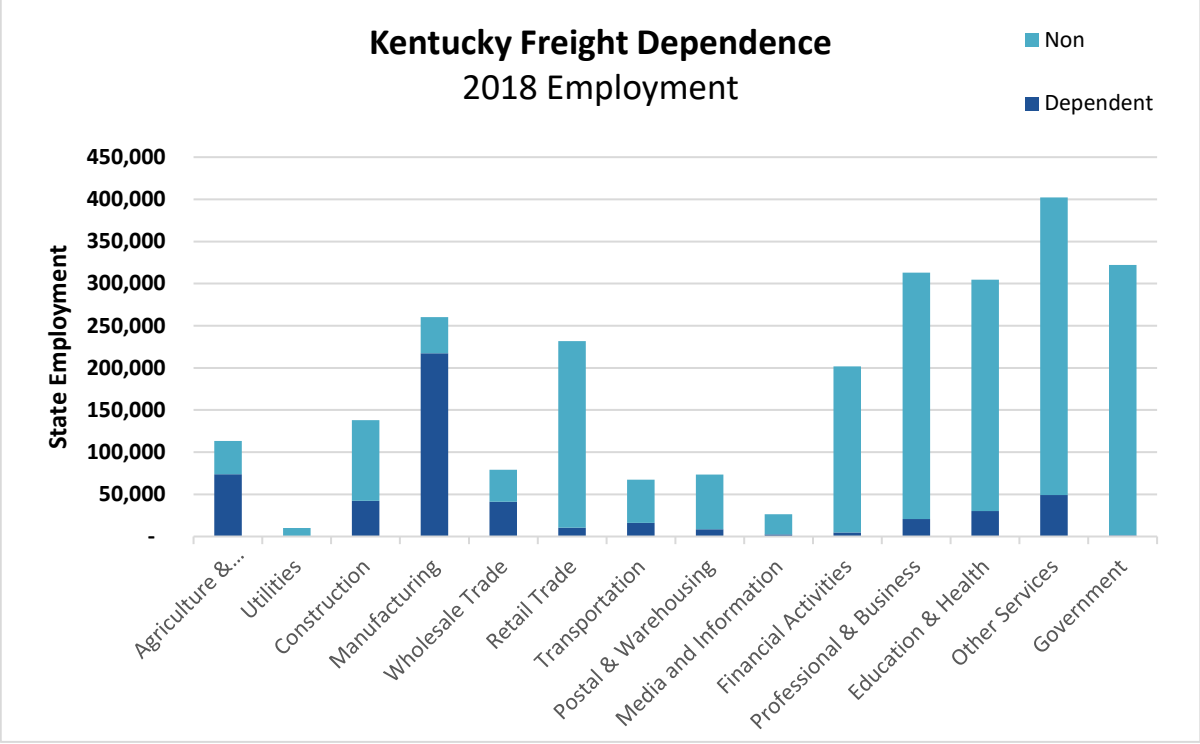

Figure 1-10: Kentucky Freight Employment Dependence by Industry per TREDIS

Figure 1-11 highlights how major industries rely on different freight modes. As shown, each is primarily dependent on trucking; for example, the Agriculture/Mineral Extraction industry in the far-left column spends 77% of its total transportation costs on trucking. The purple shade reveals that Kentucky's Agriculture/Mineral Extraction, Utilities, and Transportation sectors have the highest outlays on water transportation per dollar of output produced.

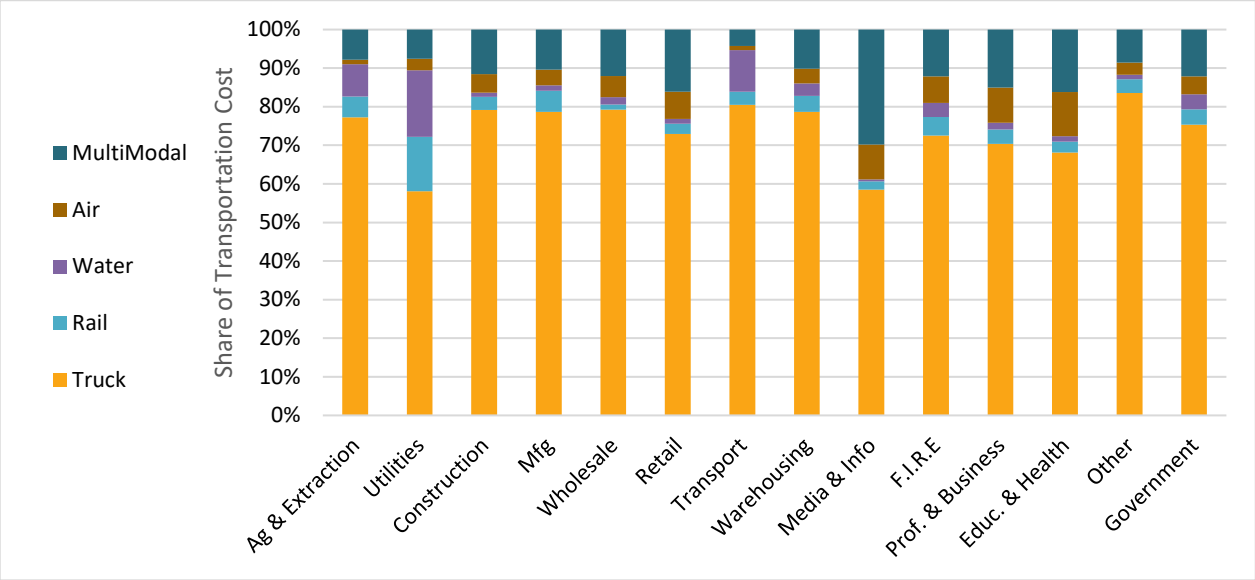

Figure 1-11: Share of Modal Transportation Cost per Industry per TREDIS

Figure 1-12 illustrates which counties in Kentucky require the largest outlay in freight transportation to produce a dollar of output. Counties shown yellow have the highest freight outlays per dollar of output, showing concentrations of the most freight-dependent industries.

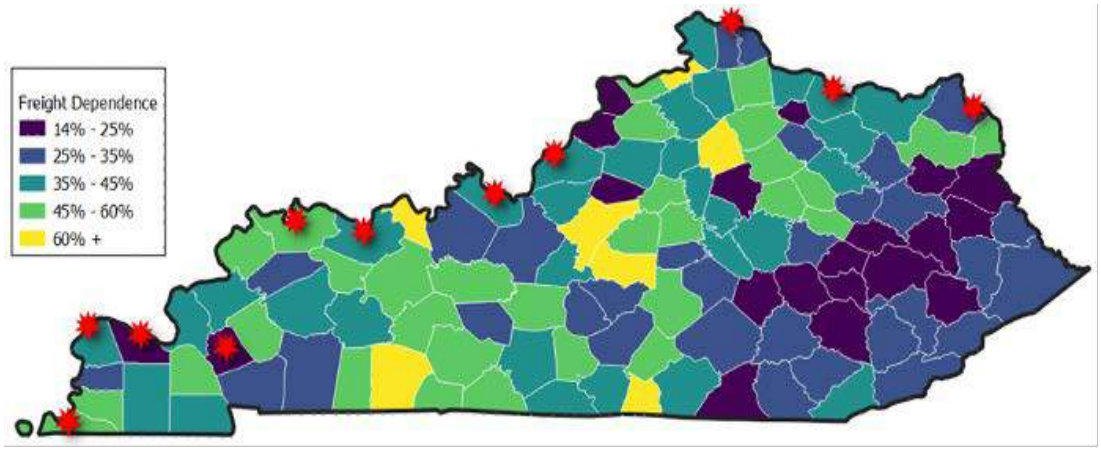

Figure 1-12: Kentucky Freight Dependence by County per TREDIS

These findings further underscore the role of the commodity movements shown previously in **Table 1-6** and **Table 1-7** in supporting Kentucky's ability to make and sell its products and services. Notably, the most water-dependent sectors include utilities and agriculture/food, which are staple sectors without which the other sectors would be unable to produce anything in the economy.

1.6 KENTUCKY'S SEVEN OPERATING PUBLIC RIVERPORTS

The *Kentucky Riverports, Highway and Rail Freight Study* offers insight into each of Kentucky's public riverports obtained through site visits, surveys, and discussions—forming the foundation for much of this report and its findings. While **Technical Memorandum 1** contains additional information, this section provides a high-level overview with basic facts for each of the seven operating ports, arranged alphabetically.

The "hinterland" concept appears throughout these discussions and future chapters. A port market hinterland is an area for which cargo can be potentially drawn to and from competitively. In this report each hinterland is defined by counties that can be reached within a 90-mile driving radius[11]. **Figure 1-13** combines the individual port hinterlands onto a single statewide map that illustrates the overlap; nearby ports serve some of the same market draw areas, sometimes fostering a competitive relationship between public facilities.

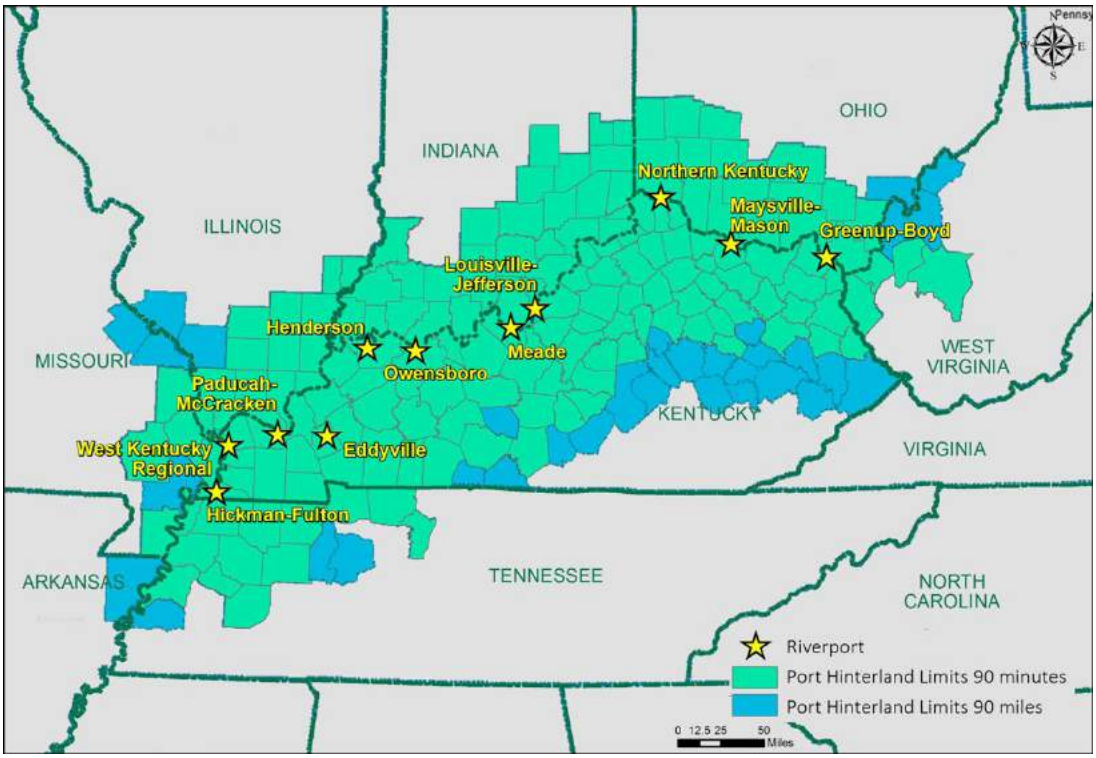

Figure 1-13: Kentucky Public Riverports and Statewide Market Hinterland

[11] The initial analysis in the technical memoranda, port profiles and summits proceeding this report considered a 90-minute drive time when assessing hinterlands. However, because drive times can be subject to peak or seasonal capacity or speed issues and may change in the future, the final analysis in this report regards the hinterland as a fixed 90-mile driving distance. Reporting 90-mile hinterlands enables consistent reporting of base and future market and economic conditions appropriate for the forecasting and impact assessments done in this and subsequent chapters. This relationship to the initial analysis is fully described in **Appendix I.1** and **Figure 1-10** demonstrates both the current 90-minute drive time and the set 90-mile hinterland as applied throughout this report. The figure can aid in understanding differences in how markets are presented between the initial memoranda and the current report.

1.6.1. Eddyville Riverport

The Eddyville Riverport and Industrial Development Authority (ERIDA) was established in 1976 in the city of Eddyville in Lyon County. The 252-acre port sits on Lake Barkley on the Cumberland River where it supports the agricultural business community in transporting grains and fertilizers to, from, and through the surrounding rural area of western Kentucky. The terminal operations area offers 2700 feet of water frontage and sits on river mile 43 on the Cumberland River. The riverport currently has a public dock, grain facility, and fertilizer operation. Key facts are summarized in **Figure 1-14**, including the extent of its hinterland area. Independent of this study, ERIDA completed a master plan for their facility in 2020, addressing future land use, policy recommendations, and a marketing strategy for both the port and the nearby industrial park.

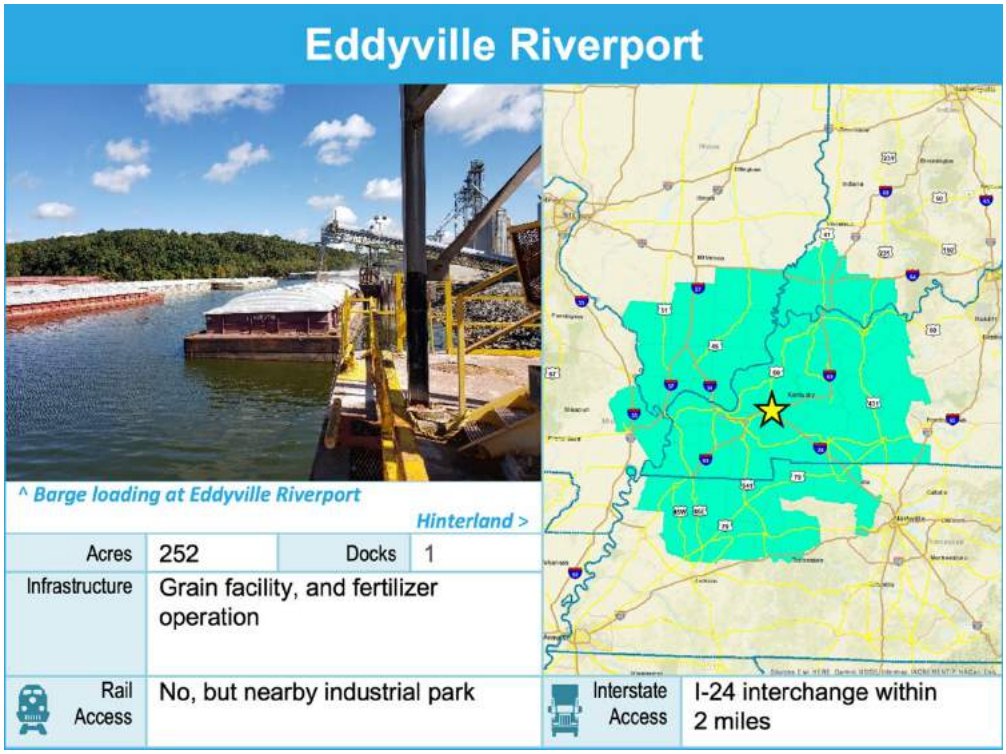

Figure 1-14: Eddyville Riverport Profile

These services have attracted several local Kentucky businesses: Agri-Chem, a farmer-owned agricultural business; family-owned and operated BGB Trucking; and Paducah Barge, which operates out of Eddyville's port facilities. The port and Paducah Barge are partnered with the local technical school, promoting a curriculum tailored to a future career in the industry. The Eddyville Riverport and Industrial Development Authority has also attracted other nationally recognized businesses such as DHL Supply Chain to its nearby industrial park. These businesses provide not only jobs in the Eddyville community and surrounding areas but also supplies and connections to national and international markets for Kentucky's farmers. Some of the top traded waterborne commodities within the Eddyville Riverport hinterland are coal, nonmetallic minerals, agricultural production & livestock, petroleum or coal products, and chemicals or allied products.

Figure 1-15 illustrates supporting freight infrastructure in the vicinity. Located two miles from U.S. 62, I-24, 1.5 miles southeast of the port entry road, I-69 approximately 6 miles away via I-24 W, and only four miles from the Paducah & Louisville (P&L) Railroad mainline, this connectivity allows the Eddyville port to expand its reach to major urban areas throughout the nation.

Figure 1-15: Eddyville Freight Infrastructure in the Vicinity

1.6.2. Greenup-Boyd County Riverport

Established in 2001, the Greenup-Boyd County Riverport Authority is located on the banks of the Ohio River in Wurtland and currently serves a unique niche in handling a specialty imported aggregate. This riverport is located on the Ohio River at river mile 332. It covers 29 acres with 1,120 feet of river frontage plus two additional properties nearby, totaling 35 more acres. Rail service via CSX Railroad is offered on-site at the port facilities while its convenient location—only a mile from U.S. 23—offers access to communities and businesses in eastern Kentucky, West Virginia, southern Ohio, and beyond. **Figure 1-16** summarizes key facts for the facility.

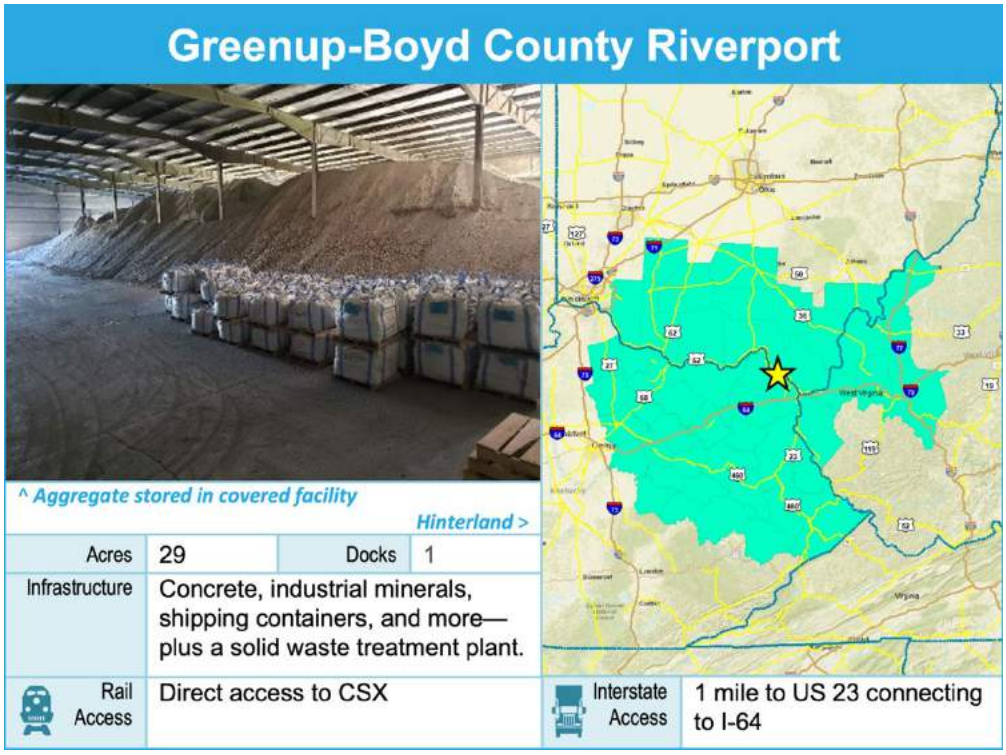

Figure 1-16: Greenup-Boyd County Riverport Profile

The Greenup-Boyd County Riverport developed as a high-volume throughput port serving the needs of the coal industry. With the demise of coal, the regional economy and freight volumes have fallen significantly. Today, the port facilities provide jobs through its stevedore arrangement[12] with McGinnis, Inc. as well as through businesses that have purchased and developed land in the port's industrial park. These businesses have brought industrial and service jobs to the community—such as Vesuvius U.S.A. in metals and ceramics, mineral processing by Great Lakes Minerals, and concrete supplies and services from the Wells Group (General Concrete, Inc). Moreover, some of the top traded waterborne commodities within this riverport hinterland are coal, petroleum or coal products, nonmetallic minerals, clay/concrete/glass/stone, and crude petroleum or natural gas.

[12] A stevedore is a contractor engaged at a dock to manage terminal operations, loading and unloading cargo from ships.

Figure 1-17 illustrates the port location and freight routes in the vicinity, highlighting rail connections and designated truck routes to the nearest interstate connection (I-64, 13 miles south). There is also a general aviation airport nearby.

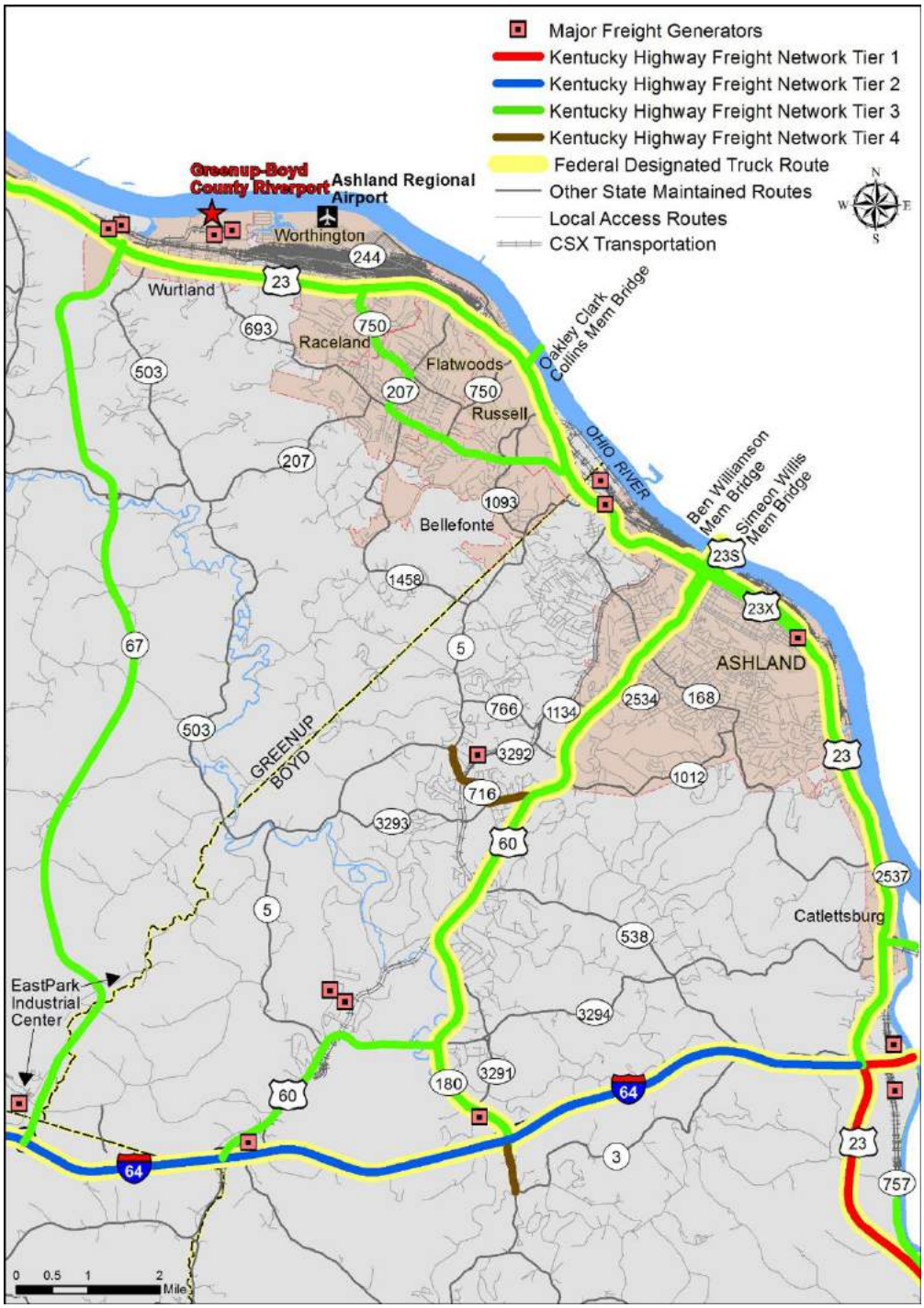

Figure 1-17: Greenup-Boyd County Freight Infrastructure in the Vicinity

1.6.3. Henderson County Riverport

Operational since 1981, Henderson County Riverport overlooks the Ohio River in the City of Henderson in Henderson County. It lies at river mile 808 on a 102.5-acre property with 40 acres utilized for terminal operations. The Henderson County Riverport offers 4,000 feet of river frontage. One mile away from the port lays US-60, and also connects with US-41 approximately three miles from the port. Some of the top traded waterborne commodities within the Henderson County Riverport hinterland are coal, nonmetallic minerals, agricultural production/livestock, petroleum or coal products, and chemicals or allied products. **Figure 1-18** summarizes key facts for the port.

Figure 1-18: Henderson County Riverport Profile

Henderson also operates a Foreign Trade Zone which allows clients to store imported goods then defer—and often reduce or even eliminate—duty payments on those goods until the client decides to clear them through customs into the U.S. market.

Long-term business clients include Eastern Alloys, which maintains a zinc alloy manufacturing plant, and the international aluminum remelting corporation Hydro Aluminum. In 2015, Security Seed and Chemical constructed a new nitrogen fertilizer loading and distribution center at the riverport that can service nitrogen crop nutrient needs for the tri-state regional farming community.

As shown in **Figure 1-19**, the port is located only 1.5 miles from U.S. 60 with access to I-69, one mile from the Henderson City-County Airport. The port also offers on-site connection via CSX Railroad, providing businesses with a variety of multimodal shipping options. An ongoing bi-state project is under development to connect I-69 between Henderson, KY and Evansville, IN with a new Ohio River crossing.

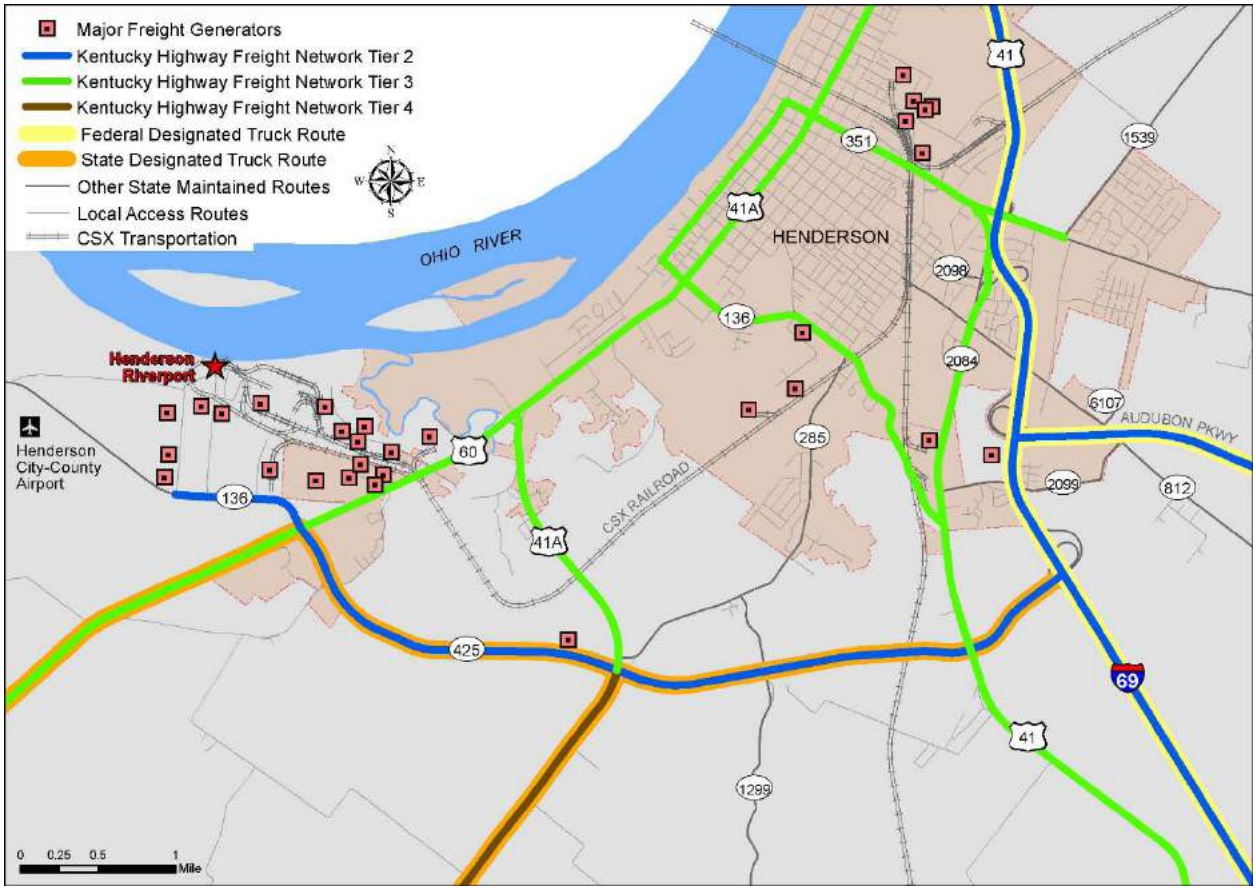

Figure 1-19: Henderson Freight Infrastructure in the Vicinity

1.6.4. Hickman-Fulton County Riverport

Established in 1964 by ordinance of the City of Hickman and Fiscal Court of Fulton County, the Hickman-Fulton County Riverport is the only Kentucky public riverport currently operating on the Mississippi River. This riverport offers 1,400 feet of linear river frontage at river mile 922 on the Mississippi River and is located roughly 20 miles from I-69. Founded in 1964, it sits on 10 acres with an additional 210 adjacent acres available for purchase and development. The top waterborne commodities by volume passing through the port's hinterland consist of nonmetallic minerals, coal, agricultural production/livestock, chemicals or allied products, and petroleum or coal products. The commodities handled at the port consist of fertilizer, coke, grain, steel wire rod, steel shapes, and other general cargo commodities.

Figure 1-20 presents key facts for the port. Hickman-Fulton has attracted some of industry's largest corporations as clients. Some of these corporations include steel Industries, one of the nation's leading manufacturers of wire products; Cargill Inc., which provides grain marketing assistance to the area's farming community via storage and transportation; SGL Carbon Group, one of the world's leading manufacturers of carbon-based products; Harold Coffey Construction Co., Inc.; and Bunge North America, Inc. (soon to be CGB Enterprises, Inc.).

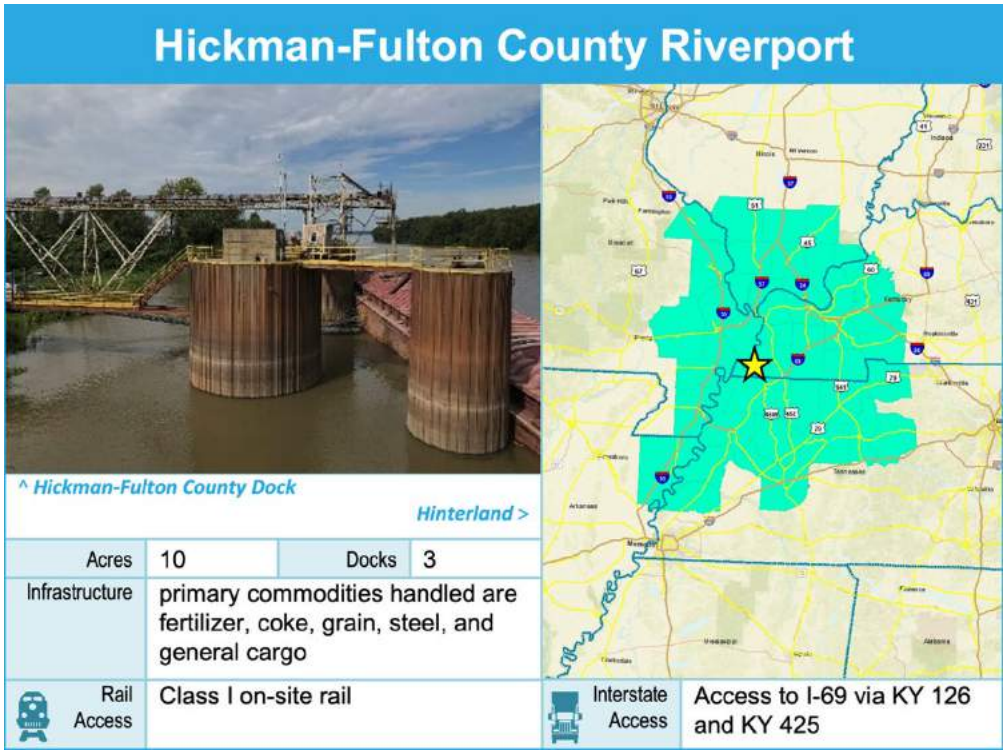

Figure 1-20: Hickman-Fulton County Riverport Profile

Strategically located in the geographic center of a major grain-producing area, the port aspires to collaborate with surrounding stakeholders to continue to identify opportunities for growth in waterway barge service to better serve Kentucky's grain and associated industries.

Situated on KY 94, the port is 18 miles from U.S. 51. On-site service by the TennKen short line railroad provides connections to Dyersburg, Tennessee, and the Canadian National (CN) Railway. **Figure 1-21** illustrates modal connections in the vicinity.

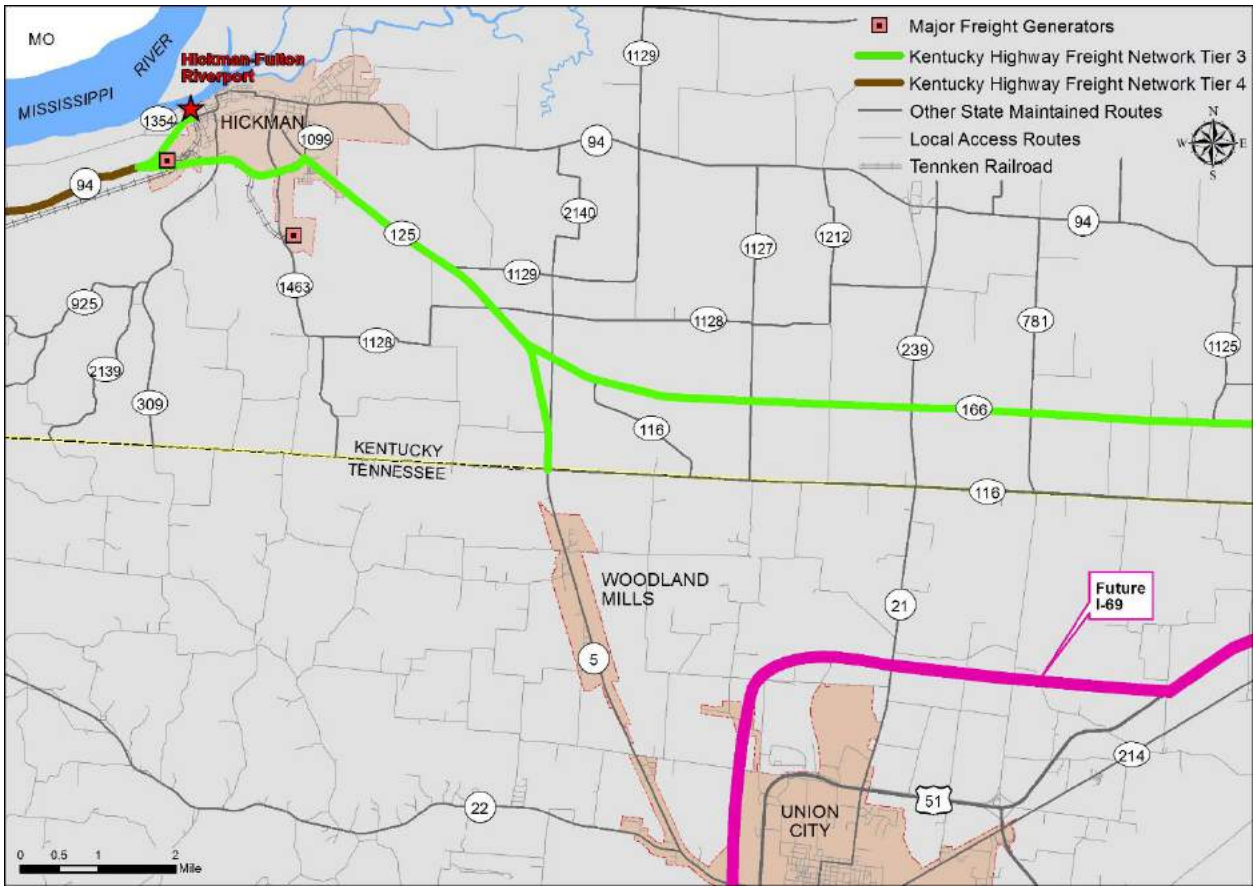

Figure 1-21: Hickman-Fulton Freight Infrastructure in the Vicinity

1.6.5. Louisville Riverport

The Louisville-Jefferson County Riverport Authority was initiated in 1965 in the bustling city of Louisville on the Ohio River. The site is 2,000 acres and is located at river mile 618 on the Ohio River with total river frontage being approximately 8,000 feet. With I-264 nearby, connecting to I-64, I-71, I-65, and US-31 West, as well as thirteen miles of on-site railroad track connecting to CSX, Norfolk Southern, and Paducah & Louisville (P&L) Railroads, the port provides numerous options to link their clients with multimodal land networks that reach far and wide. The port facilities are also located within minutes of the UPS Worldport at Louisville Muhammad Ali International Airport, which is Louisville's biggest employer and connects Kentucky's ports and people to aviation shipping facilities around the world. The top waterborne commodities by volume passing through the port's hinterland consist of coal, nonmetallic minerals, petroleum or coal products, agricultural production/livestock, as well as clay/concrete/glass/stone.

The port is home to over 120 diverse companies that employ over 6,500 Kentuckians in industries including advanced manufacturing, logistics, business services, and retail. Just a few of their many client businesses include Honeywell Logistics, Coca-Cola Bottling Consolidated, Kentucky Trailer, Louisville Kitchen, and Dollar General Store. Along with Henderson County Riverport, Louisville also brings another Foreign Trade Zone to Kentucky, expanding the geographic options and facilities making Kentucky an attractive option for businesses that seek to import and store goods most economically.

Figure 1-22 summarizes key facts for the port; **Figure 1-23** highlights key components of the multimodal freight network in the vicinity.

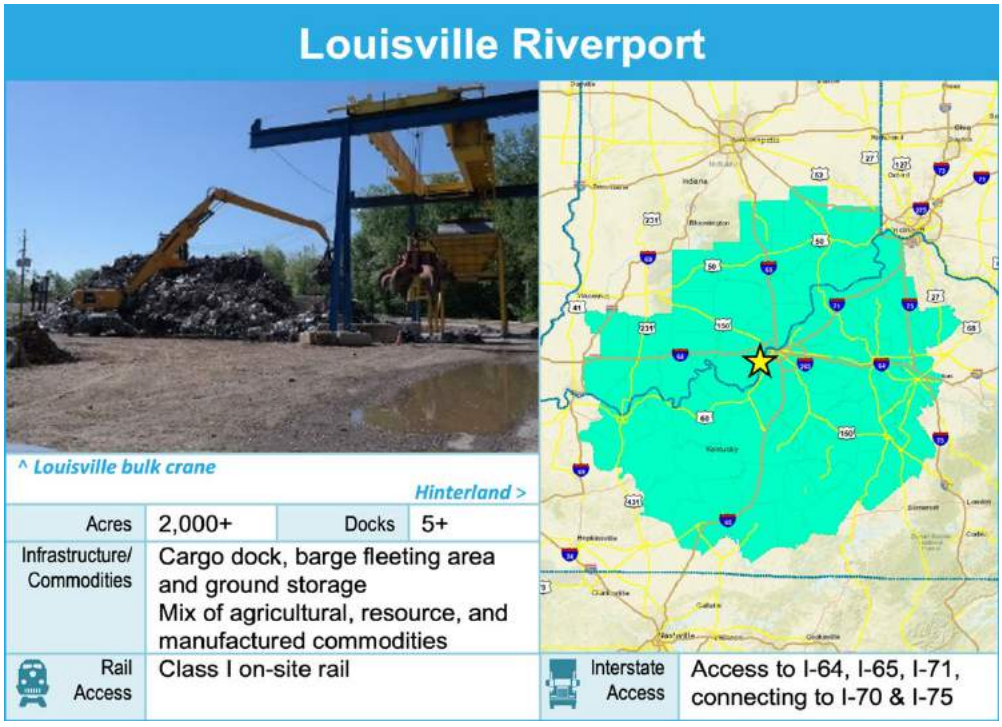

Figure 1-22: Louisville Riverport Profile

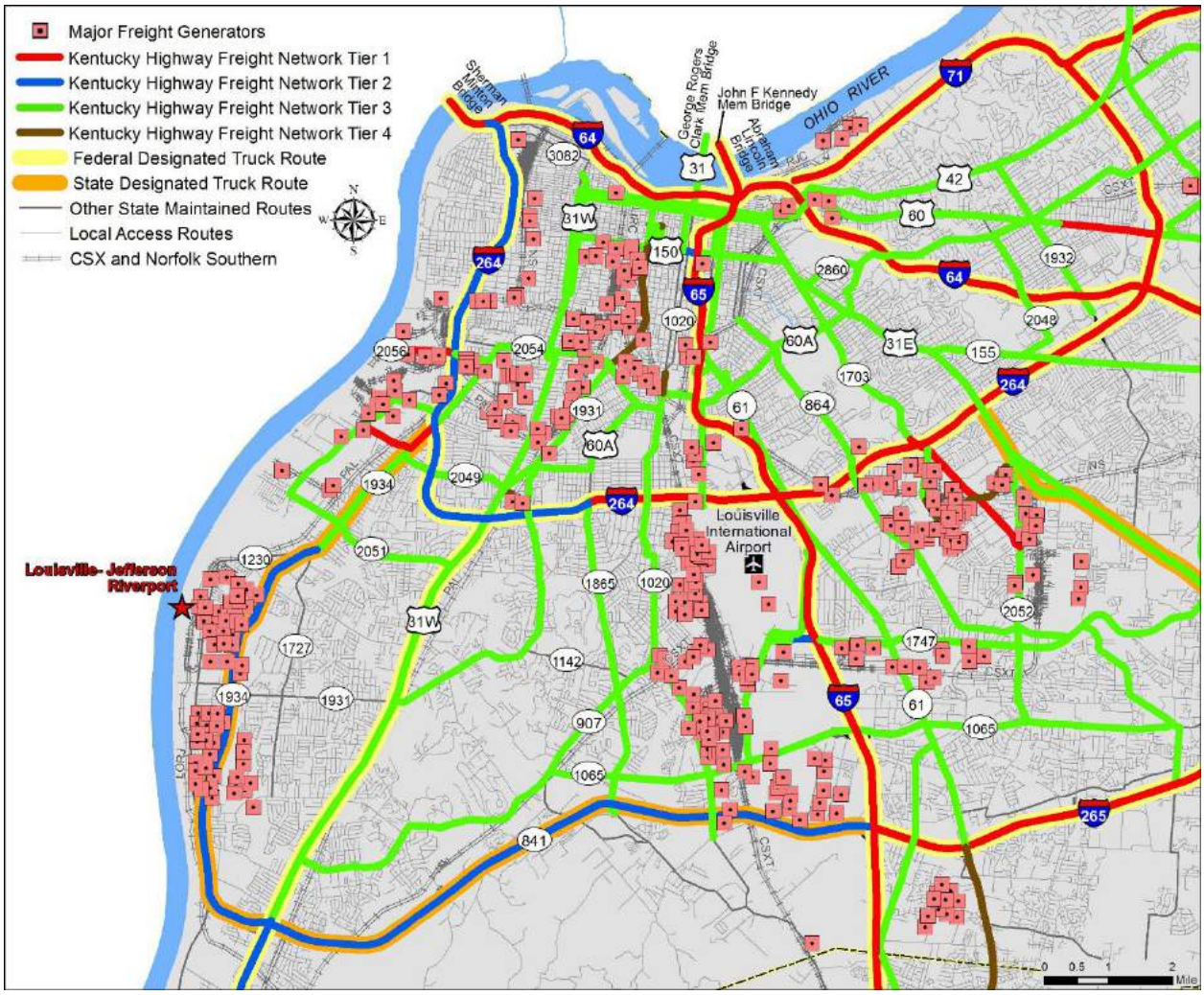

Figure 1-23: Louisville Freight Infrastructure in the Vicinity

1.6.6. Owensboro Riverport

The Owensboro Riverport Authority is based on the Ohio River in the city of Owensboro in Daviess County. It lies at river mile 759 on a 420-acre property that forms the northwest boundary of the city. The river frontage at Owensboro Riverport is 4700 feet. Nearby is access to I-64 via US-231. Owensboro-Daviess County Regional Airport is a regional airport located approximately 5 miles away from the riverport. Owensboro Riverport was founded in 1966, beginning operations in 1975 as both an operating and proprietor port. Originally it was established as an agriculturally based riverport but has been expanding opportunities for aluminum as a primary depot. **Figure 1-24** summarizes key facts for the facility.

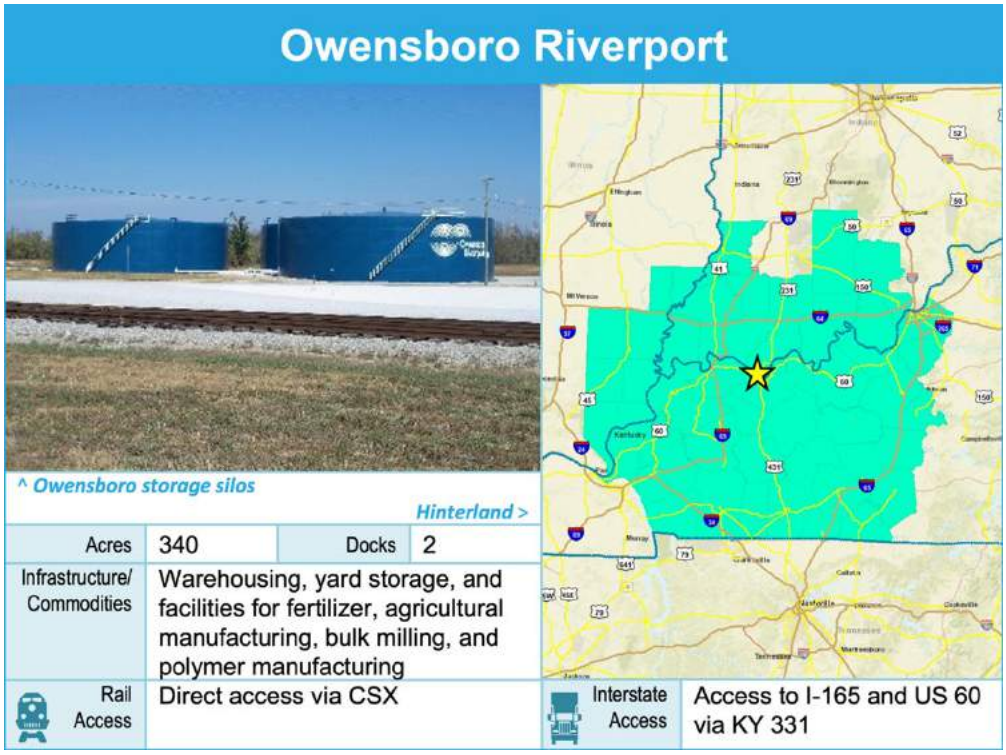

Figure 1-24: Owensboro Riverport Profile

Estimates suggest that just the terminal operations at Owensboro Riverport have directly created 102 area jobs and $15.8 million annually in economic activity; it has indirectly created 449 jobs and $88.7 million annually in economic activity for Kentucky.[13] In addition to bringing another geographical option to the Foreign Trade Zones available throughout Kentucky's port system, it is also a delivery point on both the London Metal Exchange and the Chicago Mercantile Exchange, making Owensboro Riverport the ideal home for companies involved in the shipping and processing of aluminum products. It is also a Homeland Security Port given the types and volume of chemicals handled. The top waterborne commodities by volume passing through the Owensboro Riverport's hinterland consist of coal, nonmetallic minerals, agricultural production/livestock, petroleum or coal products, and chemicals or allied products.

Figure 1-25 illustrates key freight connections in the vicinity. The city received a federal BUILD grant in 2018 to upgrade the KY 331 (Industrial Drive) connection to accommodate freight traffic. CSX provides rail connectivity to the port with a 5,700-foot rail loop that can handle 84 railcars on-site.

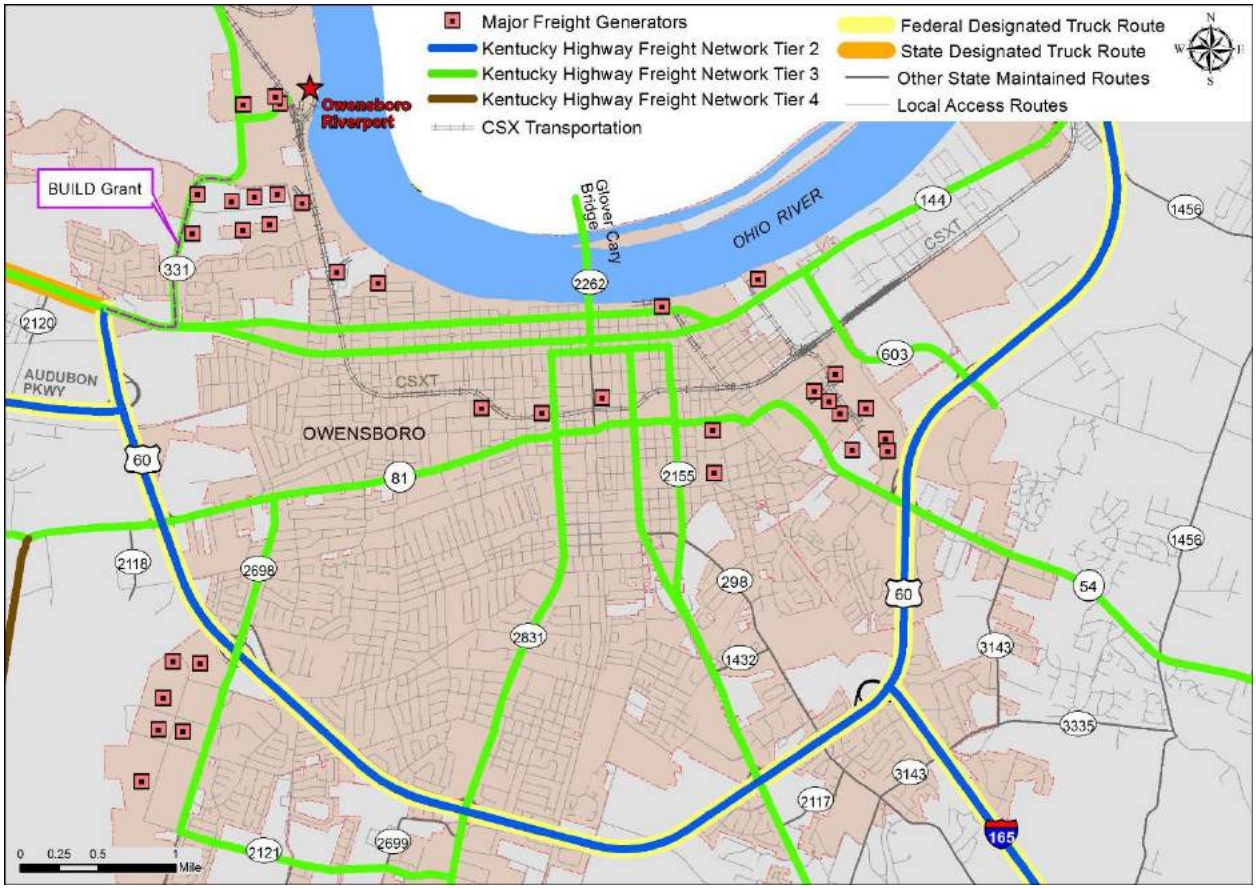

Figure 1-25: Owensboro Freight Infrastructure in the Vicinity

[13] Online at http://www.owensbororiverport.com/operations

1.6.7. Paducah-McCracken County Riverport

The Paducah-McCracken Country Riverport Authority was established in 1964 in the city of Paducah in McCracken County. The port's 48-acre facilities are at the confluence of the Tennessee and Ohio rivers, between river mile 1.3 and 2 on the Tennessee River. with nearby access to the Cumberland and Mississippi rivers as well. The port boasts 2,300 feet of river frontage, two berths, and multiple mooring facilities. Paducah-McCracken County Riverport is also a standalone Foreign Trade Zone. The facility is connected to US-60 and US-60 via Wayne Sullivan Drive, a four-lane primary city access route. Moreover, I-24 is located only 4 miles from the port. The top waterborne commodities by volume passing through the Paducah-McCracken County Riverport's hinterland consist of coal, nonmetallic minerals, agricultural production/livestock, chemicals or allied products, and petroleum or coal products. Twenty-three barge companies have operating or corporate headquarters near the port, and a rolling fleet of loaders, forklifts, trucks, and portable conveyors transport goods throughout the property while also providing a livelihood to many in the surrounding area. **Figure 1-26** summarizes key facts for the port.

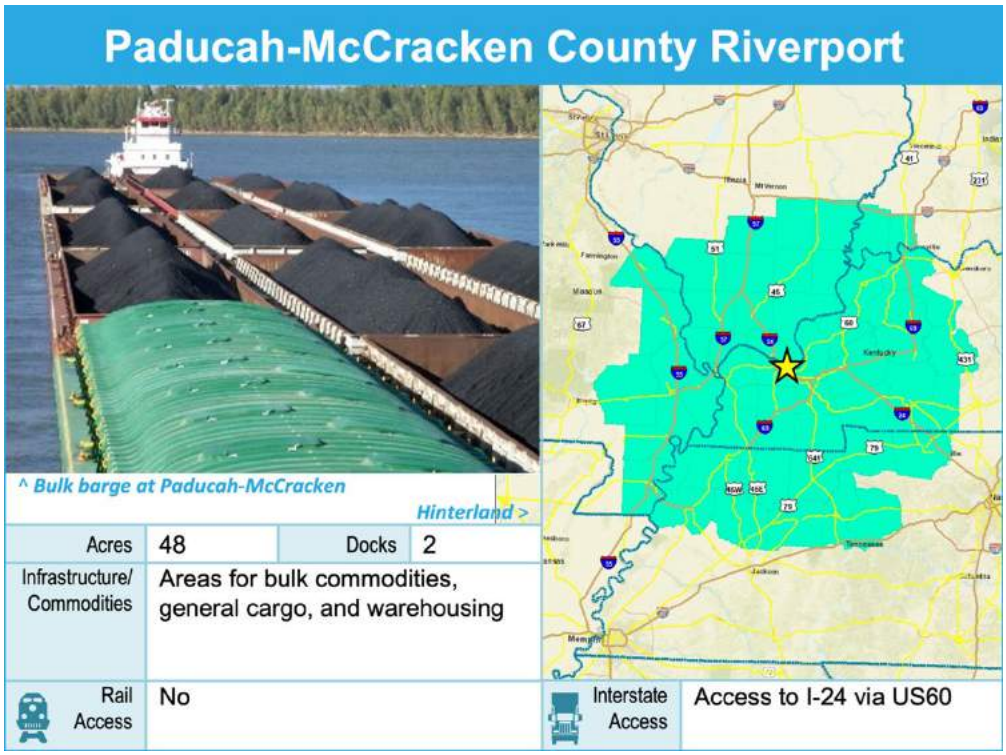

Figure 1-26: Paducah-McCracken County Riverport Profile

Pine Bluff Materials is a key tenant for bulk operations. The port received a federal grant in 2020 to obtain equipment necessary to begin regularly scheduled container-on-barge (COB) service.

U.S. 60X and KY 1954 (John Puryear Dr) provide four- to five-lane connections to I-24 (Exit 11), U.S. 60, and U.S. 62. Several bridges provide cross-river mobility in the vicinity. While there is no on-site rail access, Barkley Regional Airport is 14 miles to the west. **Figure 1-27** shows freight infrastructure in the region.

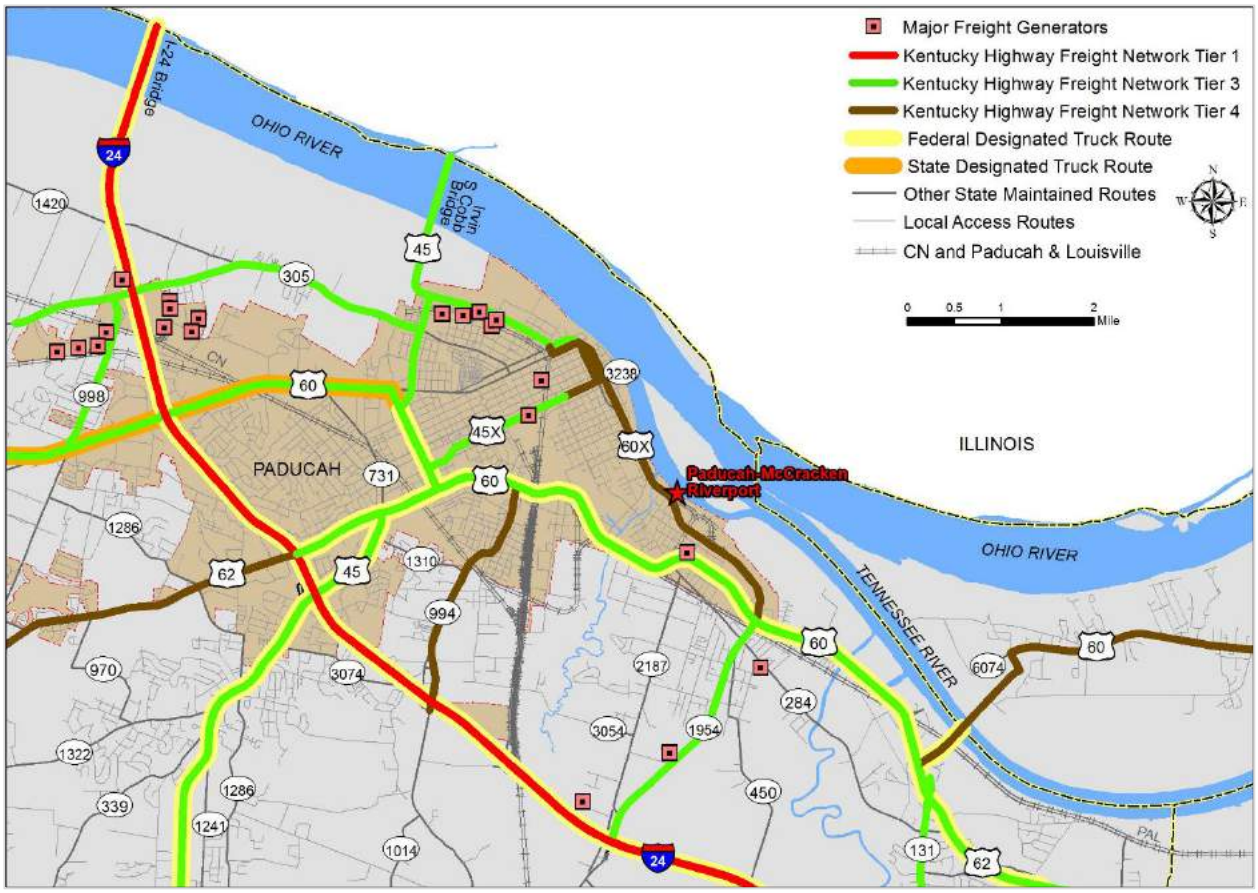

Figure 1-27: Paducah-McCracken Freight Infrastructure in the Vicinity

1.7 KENTUCKY'S FOUR DEVELOPING PUBLIC RIVERPORTS

In addition to the seven operating ports described above, public riverport authorities exist for four other locations shown in **Figure 1-28** that do not have on-the-ground infrastructure at the time of this study. For simplicity, these are categorized as "developing" ports though each situation is unique. Discussions are arranged alphabetically.

Kentucky's developing ports are actively seeking new ways to take advantage of existing infrastructure, develop new infrastructure and facilities, and increase water-based commodity transport. They are particularly focused on attracting the local high-volume commodities that can benefit most from the lower cost of waterway transportation. These developing ports are striving to build on the strengths already well-established by the Kentucky riverport system by creating jobs that pay livable wages, making state and local highways safer while lowering maintenance costs, and reducing the environmental impact of commodity transport.

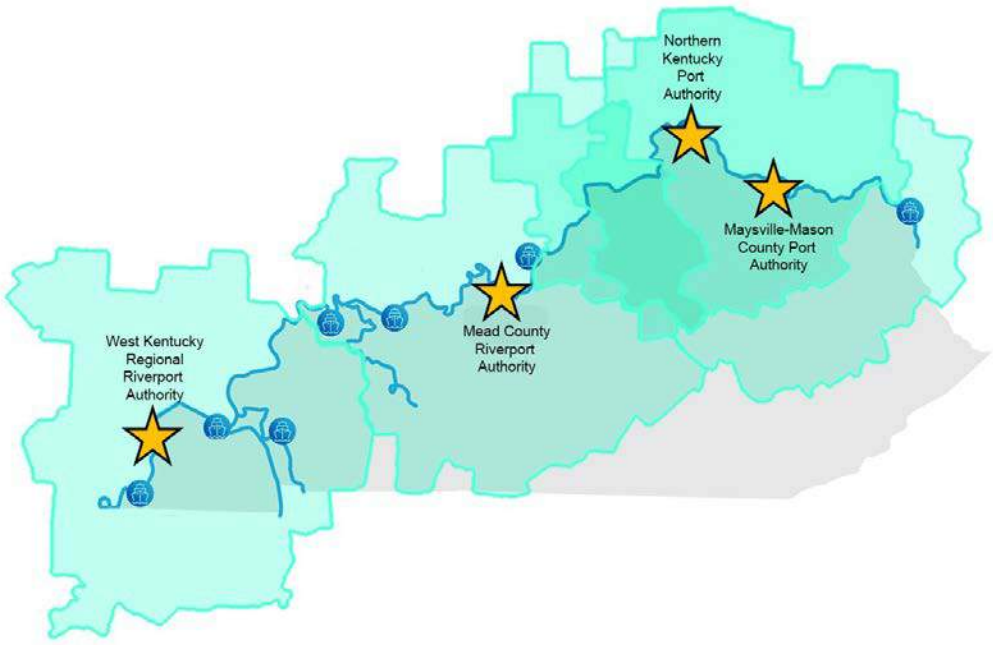

Figure 1-28: Kentucky's Four Developing Public Riverports Hinterlands

1.7.1. Maysville-Mason County Riverport

Chartered by Mason County in 1978, the Maysville-Mason County Riverport Authority is in Mason County in northeastern Kentucky. It has been under development for more than 40 years. While the exact location is not set, the 2015 *Marketing and Economic Development Analysis* identifies the Charleston Bottom area as the recommended site, located just north of the U.S. 68 William Harsha Ohio River Bridge. **Figure 1-29** illustrates the recommended port location and freight routes in the vicinity.

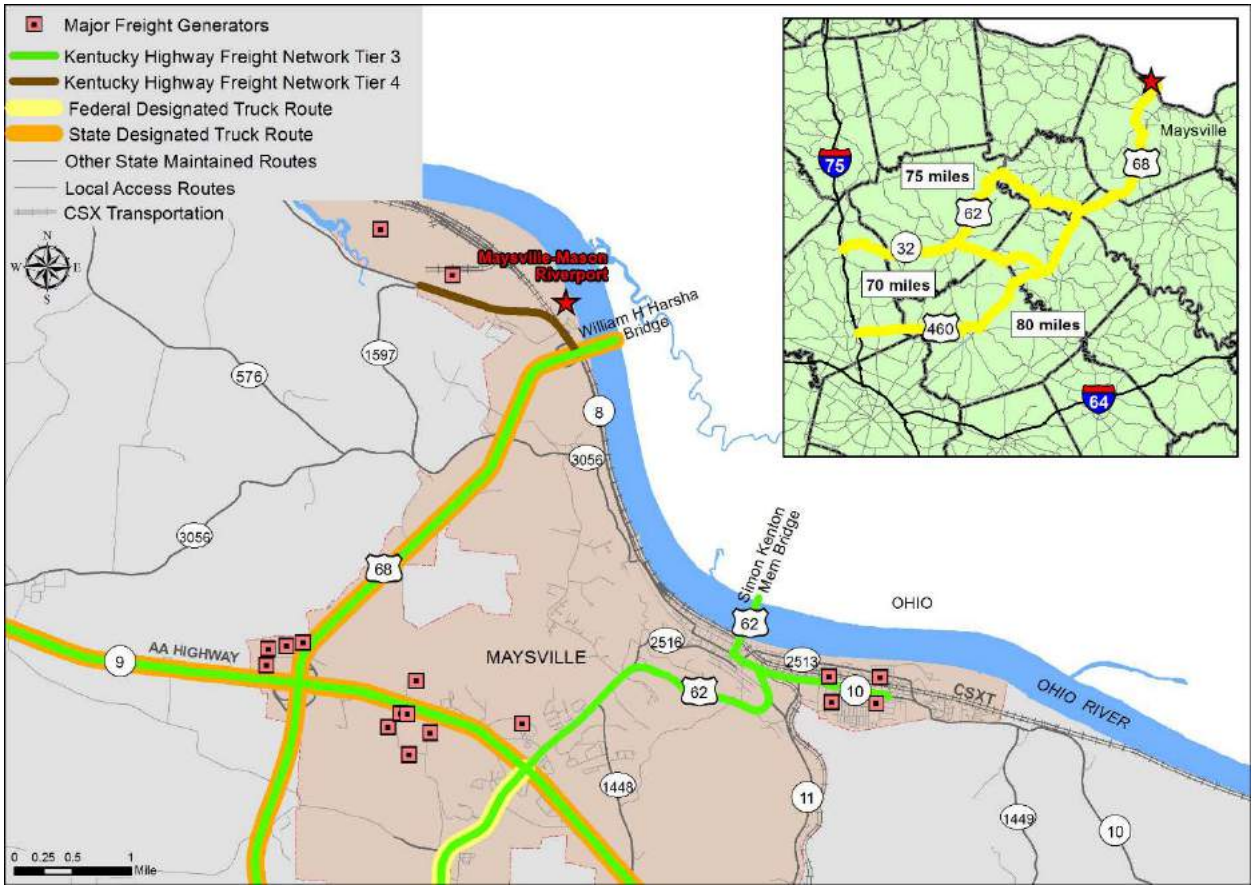

Figure 1-29: Maysville Freight Infrastructure Near Recommended Port Development Site

If located at the recommended site in the Charleston Bottom area, the port would offer easy rail and highway access and deep waterway bank access for mooring opportunities. Locating facilities on a high flood plain with low floodwater impacts would also contribute to the flexibility and resilience of water-bound commercial transport through the port. If located at the recommended site, the waterway that would be served would be the Ohio River between river mile points 410 and 420. CSX Transportation would provide rail service to the area. Fleming-Mason Airport is located approximately 10 miles southeast of the proposed site.

The market hinterland illustrated in **Figure 1-30** covers 74 counties on both sides of the Ohio River. Some of the hinterland's top waterborne commodities are coal, petroleum or coal products, nonmetallic minerals, chemicals or allied products, and primary metal products. Many top commodities are projected to grow within the hinterland, including broken stone/rip rap, mixed consumer products, grain, iron or steel products, industrial chemicals, and waste and scrap. Maysville-Mason also presents an opportunity to capitalize on various flows of potentially divertible freight in its market areas such as iron and steel, chemicals, oilseeds, liquified-gases, plastics, and fertilizers.

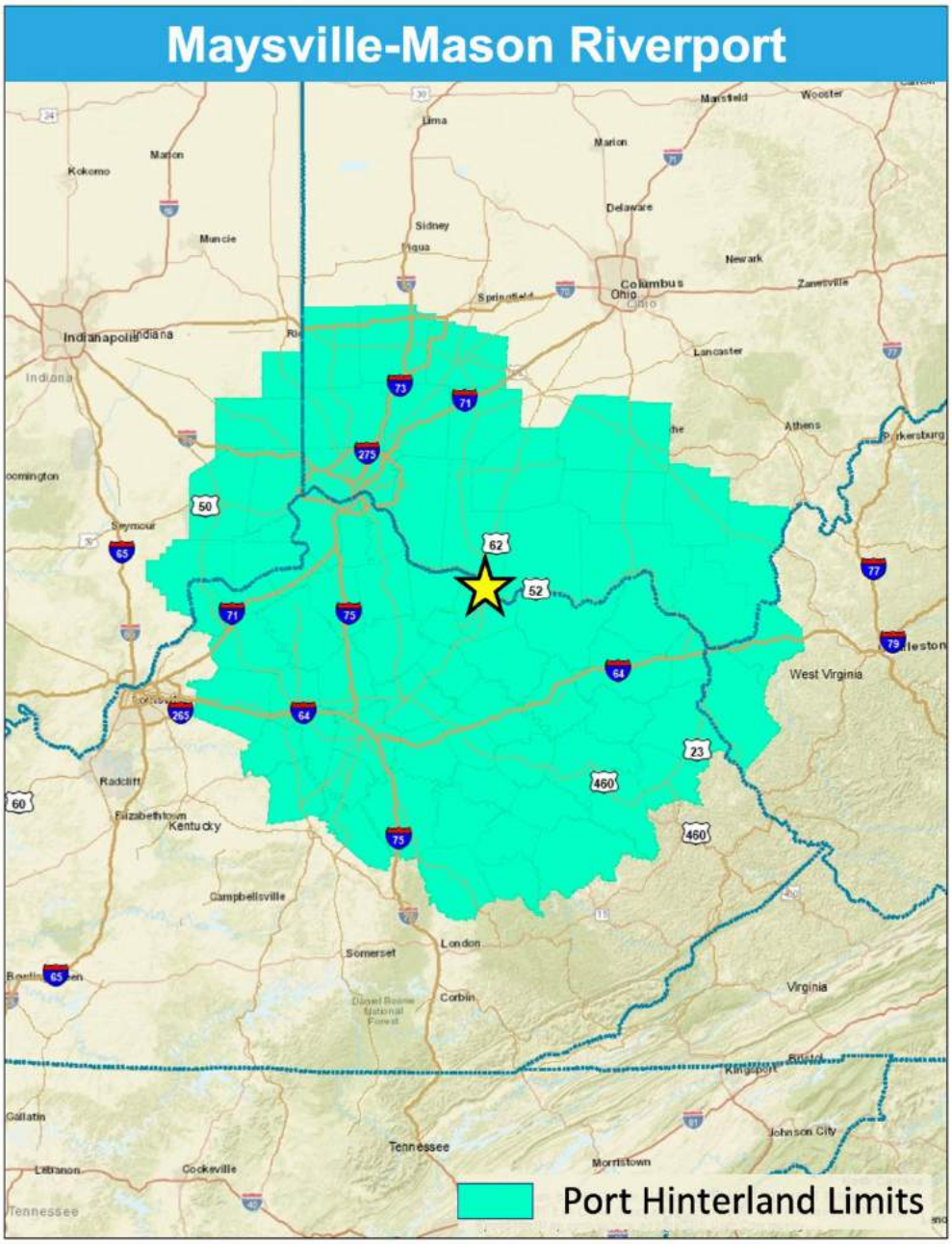

Figure 1-30: Maysville-Mason County Port Hinterland Area

1.7.2. Meade County Riverport

Prior to its recent acquisition, the Meade County Riverport covered 550 acres along the Ohio River. Nucor Steel is constructing a $1.7 billion steel plant using scrap steel as a feedstock to manufacture flat plate steel products. Because of the location where Nucor is building, the grain barge loading facility at the riverport was removed to accommodate Nucor's needs. Plans are underway to consider another grain barge loading operation at two different port locations; port leadership is seeking support to permit and fund the operation, estimated to cost $12 million.

As shown in **Figure 1-31**, this hinterland region represents 66 counties including portions of both Kentucky and Indiana. Commodities that are already being transported by waterway within the hinterland include coal, nonmetallic minerals, agricultural production/livestock, petroleum or coal products, and primary metal products. Divertible freight opportunities include iron and steel products, cement, stone, chemicals, refined petroleum products, and grain. If marketed and developed strategically, this also translates into the potential to attract businesses in these industries as well as the jobs and human capital that come with them.

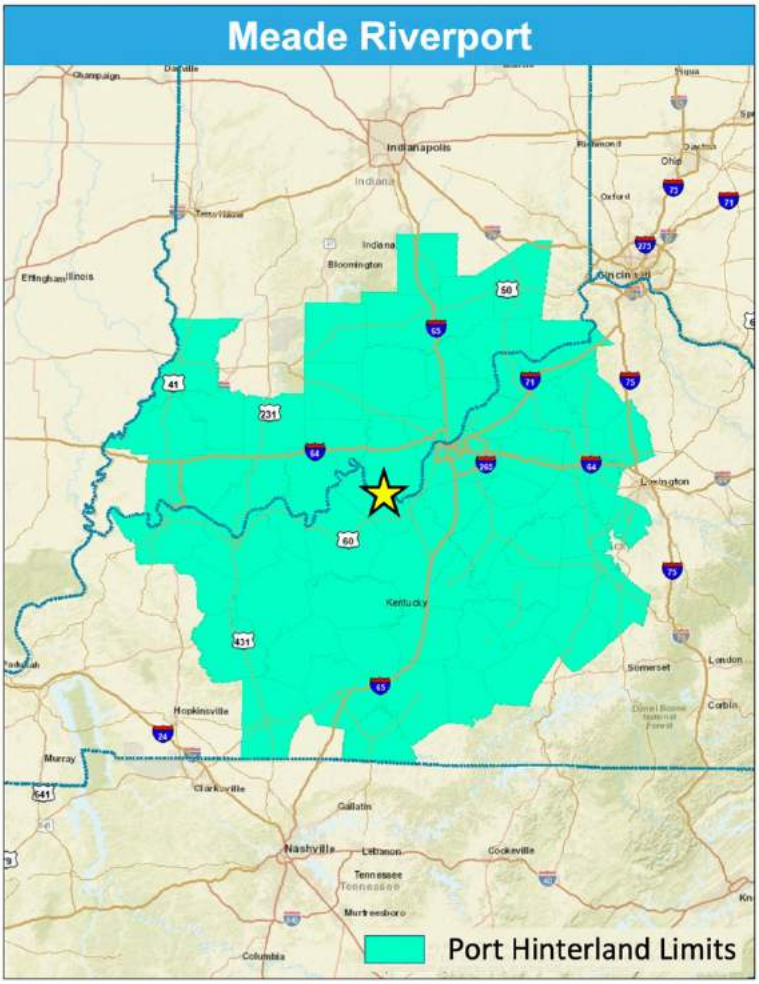

Figure 1-31: Meade County Port Hinterland Area

1.7.3. Northern Kentucky Port Authority

The Northern Kentucky Port Authority was established in 1968 by Boone, Campbell, Gallatin, and Kenton counties, and coordinates with the Central Ohio River Business Association (CORBA) to serve 226.5 miles of commercially navigable waterways of the Ohio River and seven miles of the Licking River (**Figure 1-32**) without any dedicated port infrastructure. The CORBA collaboration was formed in 2012 and involves 15 countries located in Kentucky and Ohio. Kentucky counties include Carroll, Gallatin, Boone, Kenton, Campbell, Pendleton, Bracken, Mason, and Lewis. Counties from Ohio involved include Hamilton, Clermont, Brown, Adams, and part of Scioto County. The Ports of Cincinnati and Northern Kentucky combined comprise the second-largest inland ports in the United States in terms of tonnage.

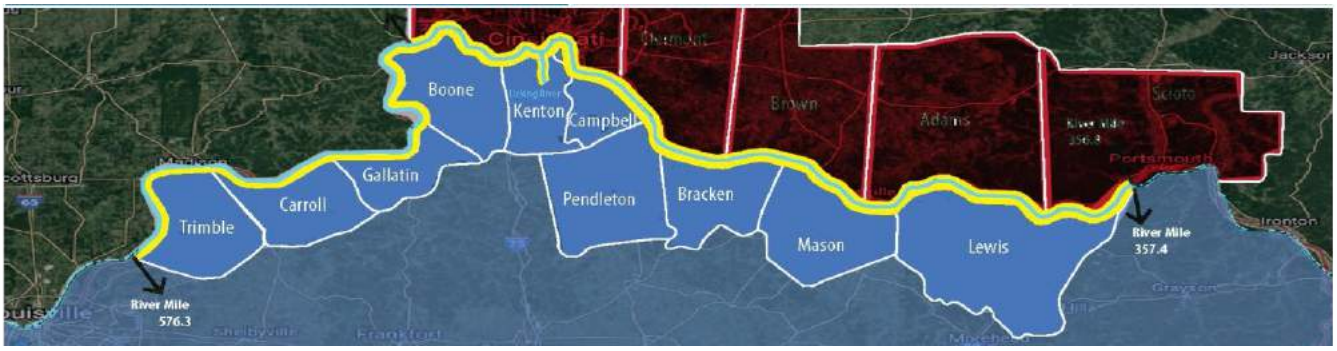

Figure 1-32: Service area for CORBA/Northern Kentucky Port Region

Its hinterland illustrated in **Figure 1-33**, centered in the Northern Kentucky and Cincinnati metropolitan area, covers 61 counties in Kentucky, Ohio, and Indiana. Top commodities already being transported by waterway within the hinterland include coal, nonmetallic minerals, petroleum or coal products, chemicals or allied products, as well as primary metal products. Many top commodities are projected to grow within this market area, including grain, oil kernel, nuts or seeds, primary iron or steel products, industrial organic chemicals, coke, gravel or sand, and fertilizer. And most intriguing in terms of future possibilities, iron and steel products, chemicals, gypsum, and plastics represent potentially divertible commodities that could help offset fossil fuel declines.

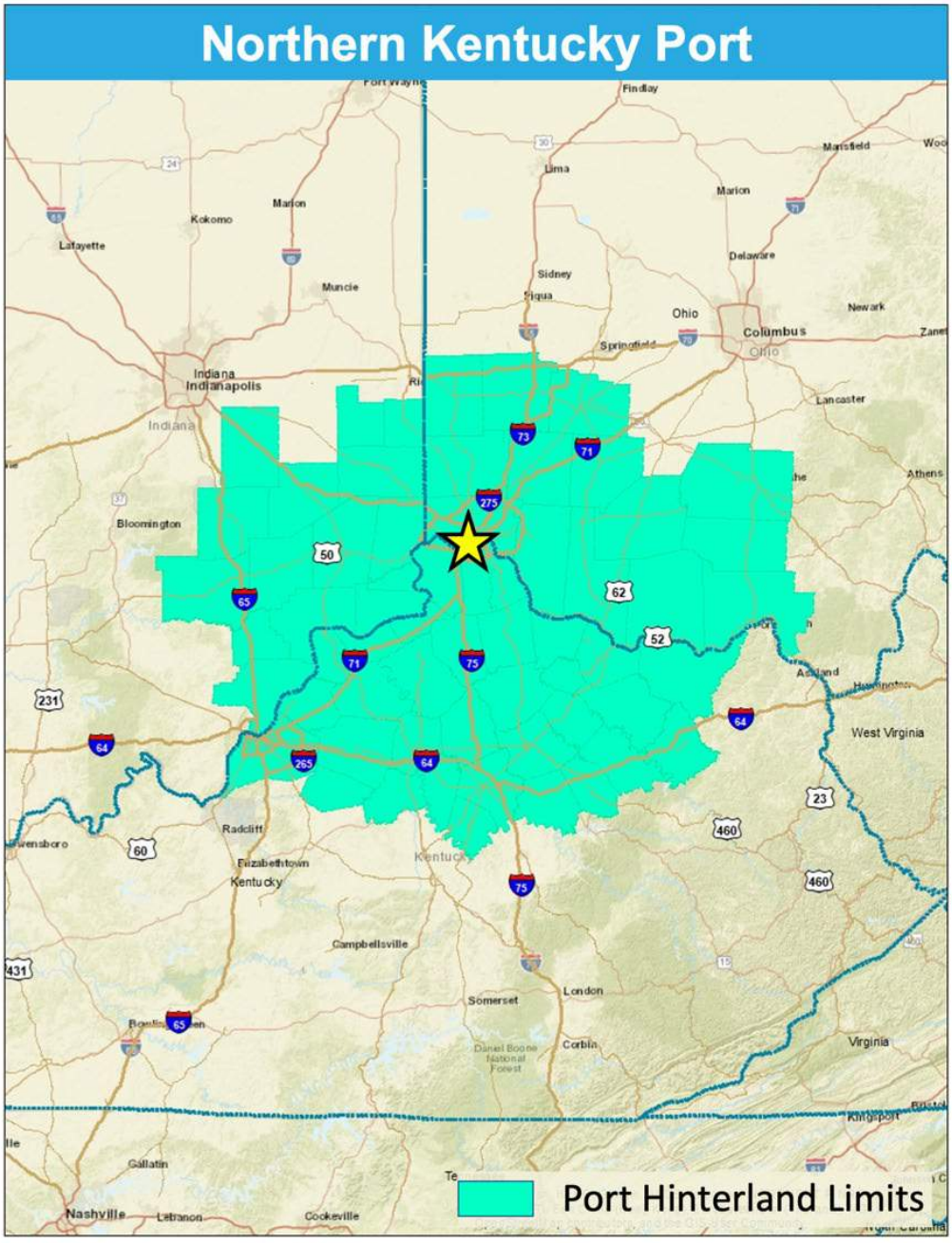

Figure 1-33: Northern Kentucky Port Hinterland Area

1.7.4. Western Kentucky Regional Riverport

The Western Kentucky Regional Riverport Authority (WKRRA) was formed in 2019 as part of a regional effort between Ballard, Carlisle, Hickman, and Fulton counties to establish a port. Its hinterland area, illustrated in **Figure 1-34** covers 50 counties in Kentucky, Illinois, and Missouri.

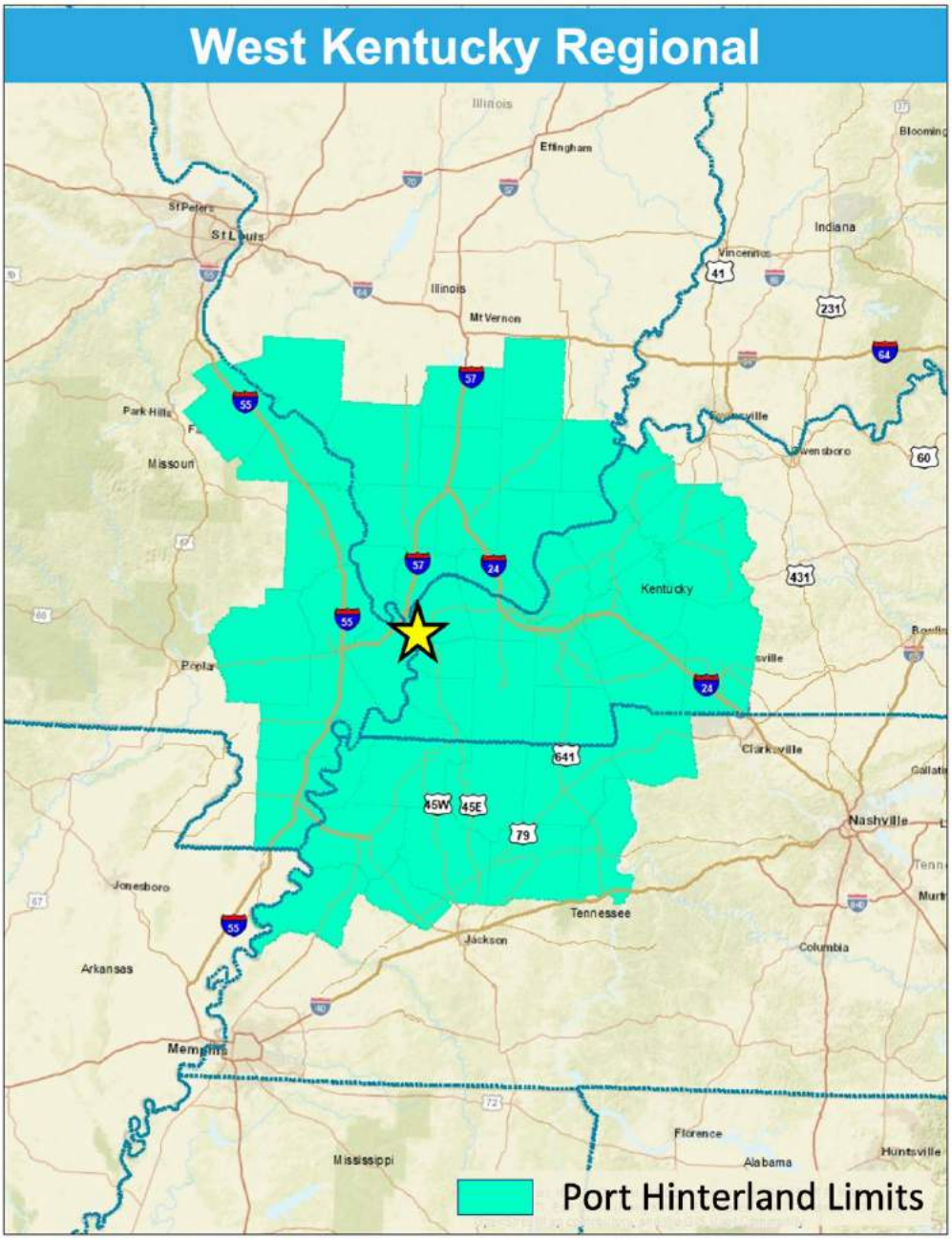

Figure 1-34: Western Kentucky Regional Port Hinterland Area

The proposed development is located on the Mississippi River in Wickliffe and would offer considerable multimodal access via Canadian National (CN) Railroad and three U.S. highways: U.S. 51, U.S. 60, and U.S. 62. These amenities, combined with an existing partnership with Phoenix Paper, give the port a unique advantage. A business survey conducted as part of a March 2021 riverport feasibility study commissioned by the West Kentucky Alliance for a Vibrant Economy (WAVE) indicated that up to six companies are highly motivated to establish or grow operations at the project site over the next two years.[14] The proposed site and surrounding freight connections are illustrated in **Figure 1-35**.

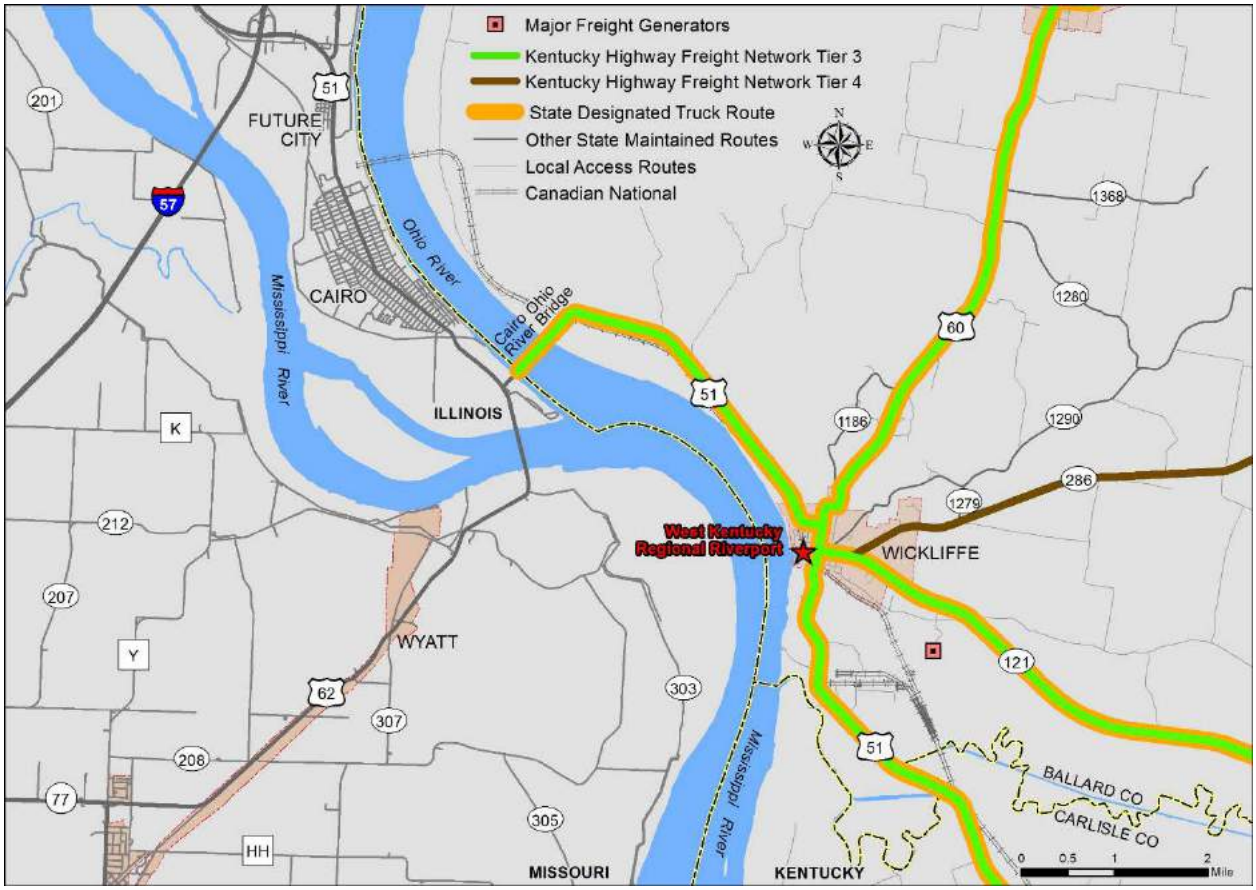

Figure 1-35: Western Kentucky Riverport Freight Infrastructure in the Vicinity

Top commodities that are already being transported by water within the hinterland include coal, nonmetallic minerals, agricultural production/livestock, chemicals or allied products, and petroleum or coal products. Many top commodities are projected to grow within this market area, including mixed consumer products, grain, waste or scrap, and plastic/synthetic fibers.

[14] Commonwealth Economics, "West Kentucky Regional Riverport Project Feasibility Analysis," March 2021.

1.8 UNDERSTANDING CURRENT OPPORTUNITIES

The history and status of Kentucky's waterborne economy as documented above clearly demonstrate that public riverports have an impactful, resilient presence in Kentucky's economy. Based on this contribution, riverports and their stakeholders have a strong business case to safeguard and take actions to lead this economic contribution moving forward. For over 200 years, waterborne commerce in Kentucky demonstrated the ability to evolve with changing national and global markets, technology, workforce, and physical conditions. Now, the ongoing conversation between Kentucky public port leaders distills to three main topics:

- **Collaboration |** To be competitive, individual ports should collaborate system wide.
- **Innovation |** Each port represents a potential catalyst to promote innovation at the local level.
- **Investment |** Additional funding is critical to continue serving the Commonwealth.

These themes resonated throughout the study analyses, at each one-on-one coordination meeting and at all the virtual summits. Each theme is explored further in subsequent chapters.

INCREASED COLLABORATION

The summits held in 2020 and 2021 initiated dialogue about new collaborative approaches for riverports to successfully secure federal funding by pooling their resources to apply for grants. Healthy competition in the riverport industry can be fostered between individual riverports while also making them more competitive with private ports and public port systems in other states.

Nearby riverports often compete for commodities, trading partners, and funding, but a collaborative partnership can promote a stronger, integrated market position. The 2020-2021 dialogue reveals interest among stakeholders to promote a collective business and economic position: to speak with one, louder voice about economic, physical, and policy change affecting the Kentucky riverport system. Overall, engaged stakeholders are willing to collaborate to enhance the resilience of Kentucky's overall waterborne economic position against growing challenges posed by technology shifts, changing markets, global trade, and climate change.

An innovative strategy for Kentucky's riverports is to empower their surrounding communities to build "homegrown" markets through business attraction, retention, creation, and expansion. Consistent discussions consider partnerships with client businesses, community organizations, and local high schools and colleges to invest in job training programs that provide a pathway to employment, particularly for youth in low-income households. Today's leaders are interested in incentives to promote equipping students for real-world career paths in the industry—with the long-term potential to lift at-risk teens (and often their descendants and communities) out of poverty. Not only do such programs provide a living for individuals and an increase in qualified labor for businesses, but eventually, they have the potential to reduce government spending on poverty relief.

New human capital eventually helps attract new businesses to Kentucky, further contributing to the rich tapestry of interdependent relationships that promote the economic development of surrounding communities and for Kentucky as a whole. **Chapter 5** focuses on economic development strategies.

It is vital to invest in safeguarding Kentucky's ability to move goods by water. The benefits, supply chains, and industries discussed above rely on a vibrant, multimodal freight network—including Kentucky's public riverports. In turn, many of the operating riverports rely on aging infrastructure and are dependent on limited, competitive funding streams to maintain critical assets in a functional state of good repair.

The existing value of Kentucky's riverports to local, state, national, and international economies is already quite extensive. The question remains where that value can be increased, expanded, and in other ways enhanced.

- What kinds of investments need to be made?
- Where will those investments provide the greatest return on investment to the overall system?
- What paradigm shifts need to occur in the ways that stakeholders conceptualize the riverports?
- How do ports fit into the larger structure of Kentucky's economy and transportation system as a whole?

BULK COMMODITY TYPES

Major commodities include iron ore, coal (coking coal and steam coke) and grain, which account for more than 65% of dry bulk.

Minor commodities include fertilizers, steel, other agricultural products, cement, and petroleum coke (pet coke), which account for the remaining 35% of dry bulk.

1.8.1. Market Conditions—Demand from China

No conversation about current opportunities is complete without acknowledging ongoing trade demands in Asian markets—China in particular. Economic growth in China means sustained demand for goods including energy (major bulk) and agricultural (minor bulk) products.

According to IHS Markit, "Capacity in the dry bulk fleet is projected to rise 2.0% in 2021 and just 0.8% in 2022, compared with 3.2% last year and 4.1% in 2019."[15] As shown in **Figure 1-36**, predictions estimate that "the global dry bulk trade will increase by 3.2% in 2021, mainly driven by coal (4.4%) and minor bulk trade (8.0%)."[16] It is expected to continue growing by 5.8% in 2022 and 2.7% in 2023 supported by industrial materials and agricultural goods in the current post-pandemic economic recovery. Growth of the dry bulk fleet is expected to remain 2-3% over the next three years, supporting the dry bulk market in Kentucky.

[15] https://www.marinelink.com/news/fewer-shipbuilding-orders-supports-dry-487272
[16] https://ihsmarkit.com/Info/0821/freight-rate-forecast-dry-bulk-market-briefing-2021-en.html

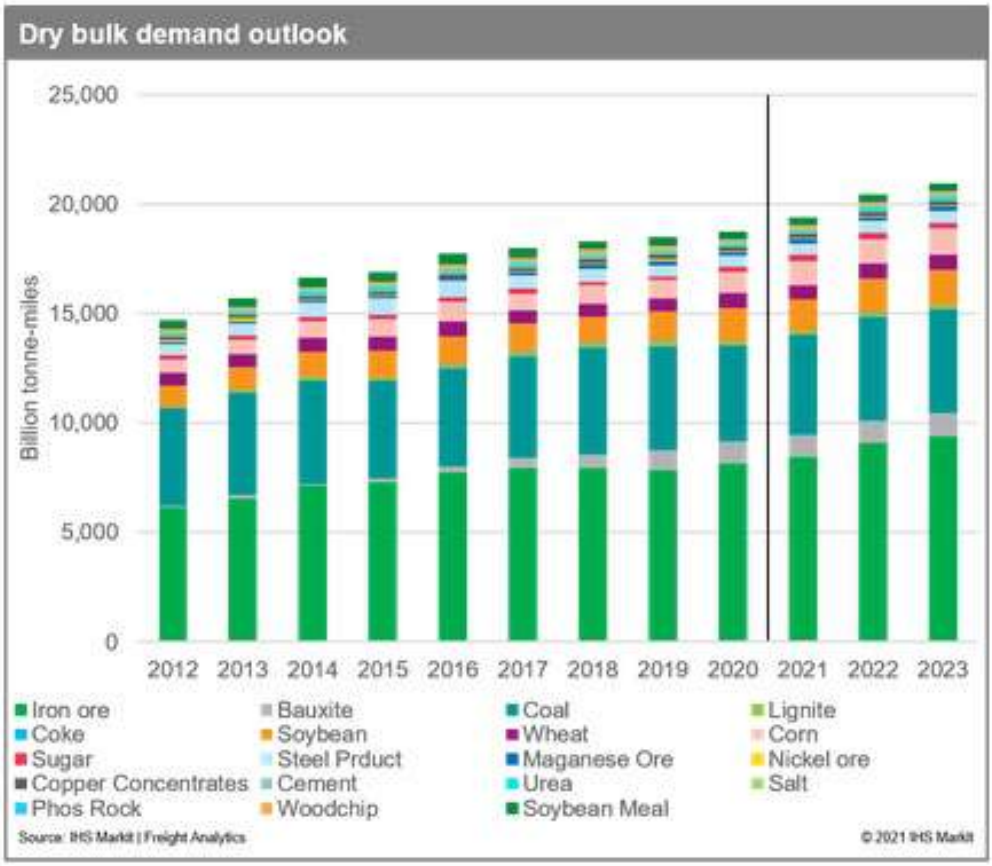

Figure 1-36: Industry Dry Bulk Demand Outlook

Soybean trade growth will likely continue from 2022 to 2023. China's meat consumption will also increase due to continued urbanization. Corn trade will also expectedly increase between 2021 and 2023 due to China's economic growth. Thermal coal demand is expected to remain strong in the near future due to energy demand and high gas prices, but it will eventually decline with new priorities in energy production. This means Kentucky riverports that handle coal or petroleum coke, known as "pet coke," should look to new commodities that can be handled by their existing equipment and new directions of investment to remain viable. This includes storage, equipment, and information technology. Minor bulk trade is set to be the best performing in 2021 with 8% growth.

FACTORS AFFECTING COAL DEMAND

"Environmental policies that favor renewables and gas over thermal coal and favor scrap over coking coal and iron ore will lead to more widely available coal demand to be down. Metallurgical coal trade will recover from its 2020 levels and grow in 2021 and 2022 by 5-7% every year but annual growth will start to slow once it becomes near its 2019 level."

Source: "Dry bulk Market: Vaccine, a double-edged sword," April 9, 2021. Available at https://www.hellenicshippingnews.com/dry-bulk-market-vaccine-a-double-edged-sword/

1.9 FROM CURRENT POSITION TO FUTURE CHOICES

Based on Kentucky's current waterborne commerce market base, national position, and overall industry utilization, the Commonwealth can make strategic choices about the role public riverports will play in its future. Some key considerations informing the interpretation of future trends in subsequent chapters include:

- **Preserve Capacity:** It is vital to invest in safeguarding Kentucky's ability to move goods by water. During 1997-2017, Kentucky riverports provided $43 billion in benefits for Kentucky with $74 billion for the U.S.
- **Explore Growing Asian Agriculture and Food Markets:** Given the downward trend in coal and the shift away from fossil fuels, which have constituted a large share of the commodities transported through Kentucky's riverport system, it is vital that the riverports both invest and proactively market their bulk-shipping capability to capture growing international agricultural markets. The inland river system is critical to the trade of agricultural products between the U.S. and Asia, which is expected to continue to be a growth market. Grain and other agricultural products can help make up for declining coal shipments, serving as a low-cost way for farmers to access international markets.
- **Shift to Manufacturing Supply Chains:** As markets such as coal, gas, and minerals serving long-standing energy and mining supply chains have declined, smaller but rapidly growing supply chain opportunities for waterborne commerce have begun to open in areas of manufactured goods—notably plastics, rubber, textiles, and machinery. Kentucky has also done better than the nation in sustaining its waterborne commerce share in grains and alcohol movement. However, a port system that competes for commodities like plastic, rubber, and machinery (which are more modally diverse than coal and nonmetallic minerals) can require new technical and marketing capabilities.
- **Seek Collective Market and Investment Perspectives:** While each of Kentucky's riverports has its own business situation, a competitive analysis of Kentucky's waterborne economy finds that the riverports share a common market position with respect to commodities, trading partners, and investment needs. Consequently, this report emphasizes ways that individual port-level investments, state funding programs, and strategies can fit into innovative collective programs or collaboratives to achieve an improved market position for the changing riverport economy.
- **Define New Needs, Investments, and Strategies**: A pivot in the capacity, marketing, and local market development for Kentucky riverports is supported by observations that can readily be made in existing commodity markets and economic relationships as demonstrated in the 2017 FAF and the 2018 TRANSEARCH data. Subsequent chapters explore and recommend specific statewide and port-specific strategies appropriate to this economic position.