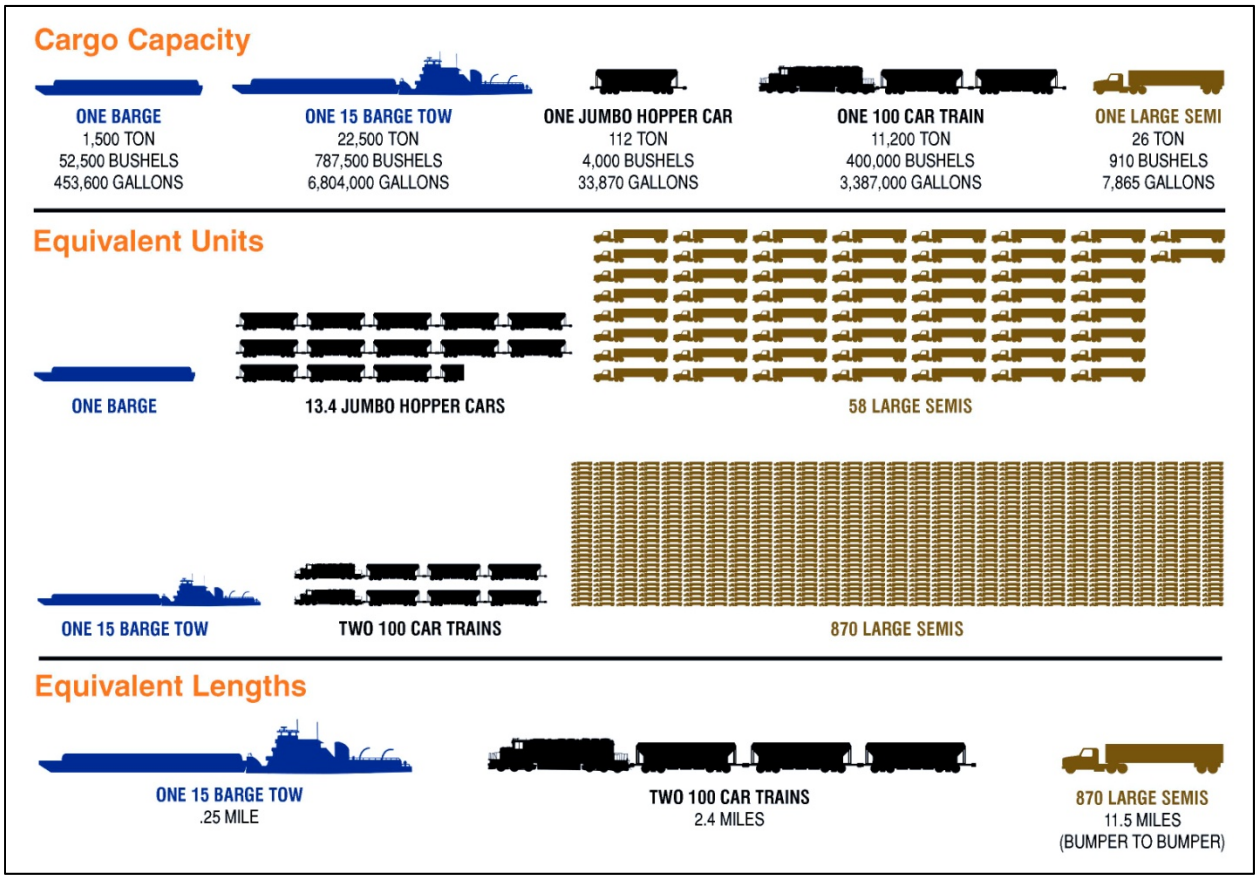
CHAPTER 2: FREIGHT AND INTERMODAL

This chapter defines the Kentucky rail system by describing the major characteristics of each operating freight railroad and details key system-wide trends and conditions. It also depicts major types and quantities of goods shipped from, to, and through Kentucky, including descriptions of some of the multimodal linkages.

Rail transportation is a safe and efficient mode for transporting freight. **Figure 2-1** provides a graphic comparison of cargo carrying capacity by various modes.

All modes have advantages and disadvantages in the movement of freight. The choice between modes is often tied to the location, type of commodity, price of shipment, and connections to other modes. In comparing the cargo capacity of each mode in terms of energy, safety, and environmental impacts, freight rail transportation typically ranks better than trucking but usually does not perform as well as barging.[6]

Figure 2-1: Comparison of Cargo Carrying Capacity by Mode



Source: http://www.iowadot.gov/compare.pdf, 2014

[6] http://www.aclines.com/site/safety-sustain/environmental-benefits-of-barging.html, 2014

2.1 FREIGHT RAILROAD COMPANIES OPERATING IN KENTUCKY AND THE REGION

The connection between Kentucky's rail system and the Eastern and Middle United States' Class I railroad system from the east coast to just west of the Mississippi River is displayed in **Figure 2-2**. The Kentucky rail system, shown in **Figure 2-3**, is comprised of 23 railroads (owning, operating, or having trackage rights), including one port railroad and five museum/tourist railroads, three of which operate on private track. Kentucky railroads range in size from short line railroads to the nation's largest railroads serving the United States, Canada, and Mexico.

Railroads operating within Kentucky through ownership or trackage rights include five Class I railroads, one Class II or regional railroad, thirteen Class III railroads, one passenger railroad, and three tourist railroads. Class I railroads, as defined by the Surface Transportation Board (STB) for 2012, are those with annual gross revenue of $452.7 million or more. Class II railroads, also referred to as regional railroads, are those with annual gross revenue greater than $36.2 million but less than $452.7 million. Class III railroads, also known as short line railroads, are those with annual gross revenue less than $36.2 million. Additional information about class thresholds can be found on the STB website, http://www.stb.dot.gov/.[7]

The railroad infrastructure capacity is maximized by carefully controlled timetables in order to eliminate conflicts in the movement of passenger and freight operations. Track control decisions are handled by arrangement hierarchy ranging from ownership to trackage rights. Track control arrangements provide guidance on which railroad is allowed to operate on a section of track, and the window of time those operations are expected to take place. Below are common examples of track control arrangements in Kentucky:

- A railroad is both owner and operator;
- A railroad operates on a line of track owned by a different railroad company under a lease or contract agreement;
- A railroad operates under a trackage rights agreement; or,
- A railroad is operated by a subsidiary company.

Understanding the context of freight rail transportation terminology is important over the next few sections. Below are definitions of common terms used by railroads regarding business operations:

- Switching – "The process of putting cars in a specific order (as in a classification yard), placing cars for loading or retrieving empties (industrial switching), or the process of

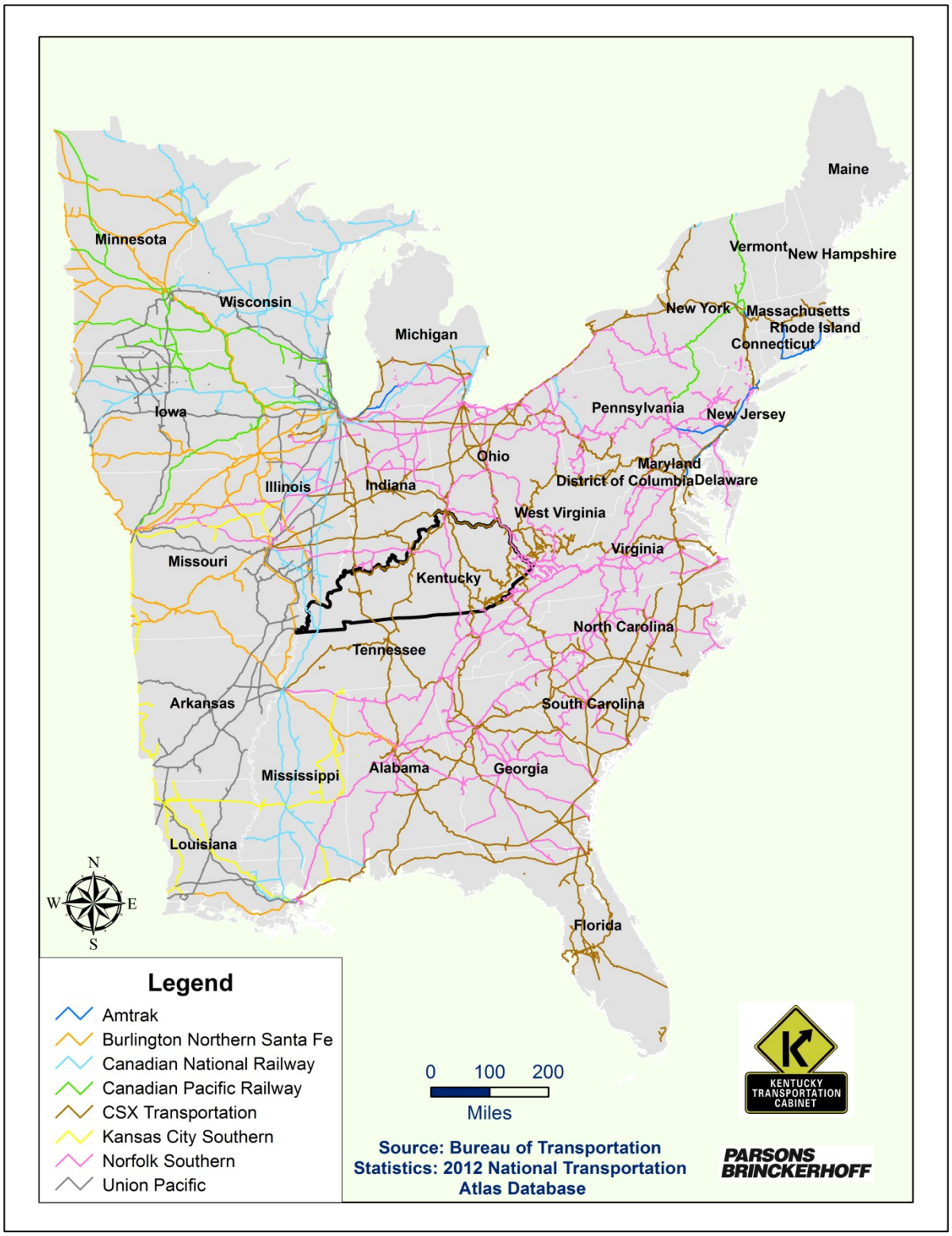
[7] http://www.stb.dot.gov/econdata.nsf/d03c0c2161a050278525720a0044a825/48f3885d7a5b882e852575190052fa79/$FILE/Railroad%20Revenue%20Thresholds%20for%20last%205%20years%20thru%202013.pdf, 2015

adding or removing cars from a train at an intermediate point. OR The movement of cars from one point to another within the limits of an individual plant, industrial area, or a rail yard.";[8]

- Unit Train – "A complete train of one type of freight cars and/or cargo typically with one or more locomotives and an end of train marker device. For example a train made up solely of gondola cars containing coal.";[9]
- Transloading – "Two or more shipments in the same car for different consignees to be stopped en route and transferred to different cars for independent delivery. OR The transfer of lading from one car to another due to a derailment or mechanical failure of the equipment.";[10]

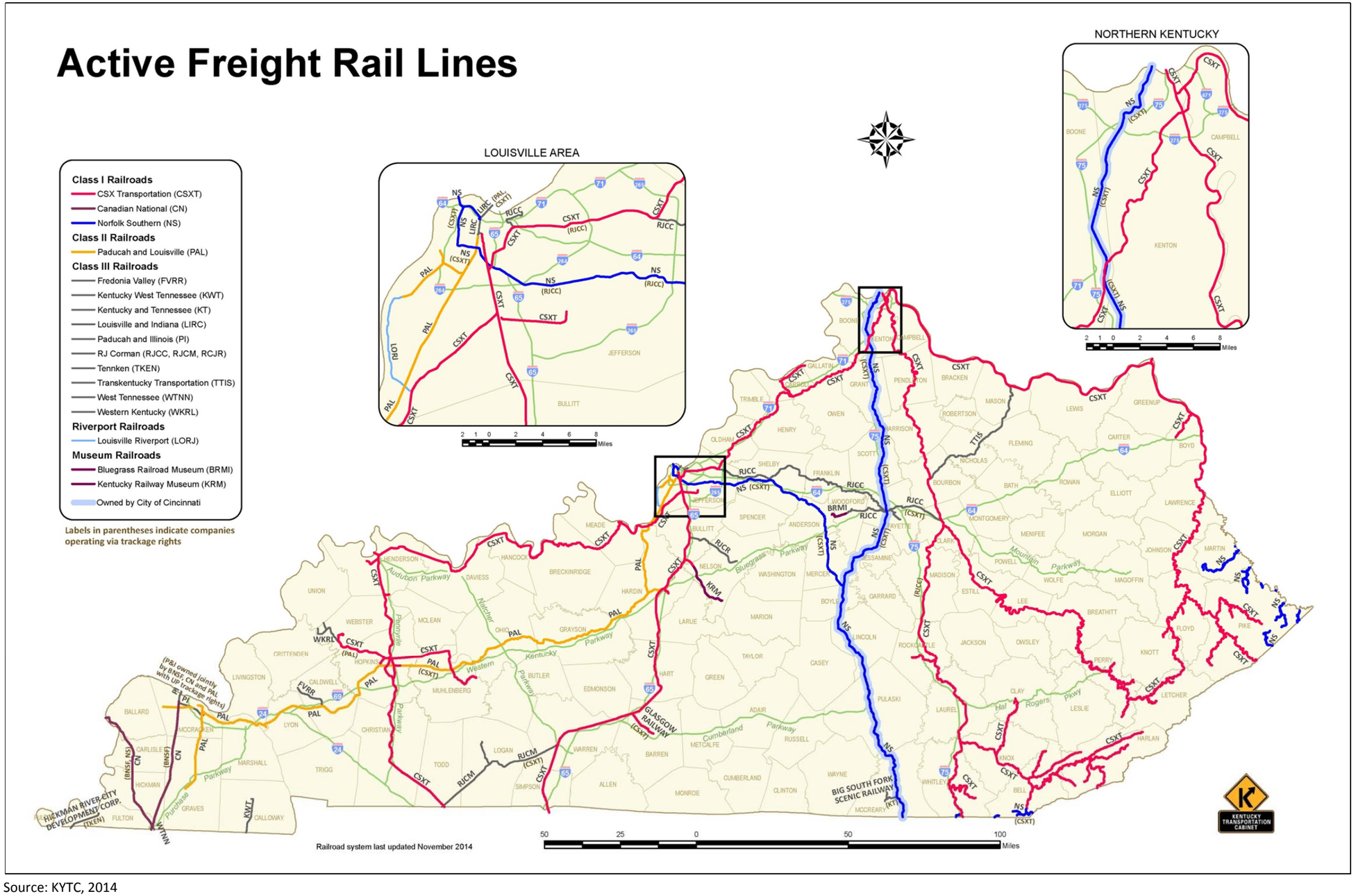
[8] http://www.csx.com/index.cfm/about-csx/company-overview/railroad-dictionary/?i=S, 2014
[9] http://www.csx.com/index.cfm/about-csx/company-overview/railroad-dictionary/?i=U, 2014
[10] http://www.csx.com/index.cfm/about-csx/company-overview/railroad-dictionary/?i=T, 2014

Figure 2-2: Class I Rail System of the Eastern and Middle U.S., 2014



Source: Bureau of Transportation Statistics (BTS): 2012 National Transportation Atlas Database

Figure 2-3: Active Freight Rail Lines of Kentucky



Source: KYTC, 2014

As seen in **Table 2-1**, Kentucky's rail system includes approximately 3,200 route miles. The total extent of routes available for trains to operate is referred to as route miles. Track miles, on the other hand, include the mileage for multiple tracks operating along the route. As an example, for each route mile where there is a double track, there would be two track miles. The five Class I railroads represent approximately 2,300 route miles, or about 73 percent of the Kentucky statewide rail system. These numbers are estimates, since some railroads include siding and auxiliary track mileage in their annual report while others do not.

Table 2-1: Freight Railroad Route Miles Operated in Kentucky (Single Owner)

2013 Mainline Railroad Mileage Reported Owned, Leased or Under Trackage Rights	RR Company Class	Mileage				
		Owned by Self	Owned by Proprietary	Leased	Trackage	Total
Burlington Northern Santa Fe	I	13*	0	0	86*	99
Canadian National (Illinois Central) (Grand Trunk Corp.)	I	86	12*	0	0	98
CSX Transportation	I	1564	64*	11*	46*	1685
Norfolk Southern	I	154	0	212	63*	429
Union Pacific	I	0	0	0	12*	12
Paducah & Louisville	II	265	0	0	15*	280
Carrollton Railroad	III	15*	0	0	0	15
Fredonia Valley Railroad	III	10	0	0	0	10
Kentucky and Tennessee Railway	III	0	0	0	8*	8
KWT Railway (Ky. West Tn.)	III	12	0	0	0	12
Louisville & Indiana Railroad	III	4	0	0	0	4
Paducah & Illinois	III	15*	0	0	0	15
RJ Corman - Bardstown Line	III	20	0	0	0	20
RJ Corman - Central Line	III	114	0	0	0	114
RJ Corman - Memphis Line	III	63	0	0	0	63
TennKen	III	12	0	0	0	12
Transkentucky Transportation	III	50*	0	0	0	50
West Tennessee Railroad	III	1	0	0	0	1
Western KY Railway	III	16	0	0	0	16
Amtrak	Passenger	0	0	0	207*	207
Big South Fork Scenic Railroad	Rec.	12	0	0	0	12
Bluegrass Railroad Museum	Rec.	6	0	0	0	6
Kentucky Railroad Museum	Rec.	23	0	0	0	23
Total		2477	76	223	437	3191

*****Denotes mileage that may be reported by multiple owners or operators of track.

(1) Multiple railroads may own, lease or have trackage rights on sections of track; therefore totals may not accurately represent actual mileage.

(2) Mileage reported consists of mainline railroad track miles as reported annually by Class I railroads to the STB and by Class II and III railroads to the KYTC.

Source: KYTC, 2014

In Kentucky, CSX Transportation (CSXT) is the largest railroad company in terms of mainline route mileage, accounting for 1,685 route miles, or 53 percent of the total route miles. The

second largest railroad by mileage is Norfolk Southern (NS), operating on 429 route miles, or 13 percent of the statewide rail system. The third largest railroad company by mainline route mileage is the Paducah and Louisville Railway, Inc. (PAL), which is Kentucky's only Class II regional railroad. PAL operates 280 route miles of mainline railroad, approximately nine percent of the statewide rail system.

Class II and III railroads provide connections from a local business or industry to the national/regional rail network. Short line railroads combine cars from multiple local facilities to make the Class I railroad stops more efficient. They also break up the train segment brought by the Class I railroad and disburse materials back to local businesses. This is known as making and breaking trains.

Table 2-1 lists route miles owned, leased or with trackage rights by railroad companies, as reported to the KYTC on the annual report. Multiple railroads own, lease, or have trackage rights on the same sections of track, which may lead to a discrepancy when compared to the total number of route miles available in the state. Listed individual totals may not accurately represent actual mileage. Some of the railroads operate through subsidiary railroads. **Section 2.1.1** details each freight railroad currently operating within Kentucky, according to railroad class. Detailed information about railroads in this chapter was compiled from a combination of FRA, STB, KYTC, and the individual railroad websites.

There are also connections to mainline rail and rail yards in nearby states. Information about those connections, while not detailed in this plan, can be found in rail and freight plans of other agencies, including those for the Metropolitan Planning Organizations (MPOs).

2.1.1 Class I Railroads

As detailed earlier, the STB defines the classifications of railroads. The following section describes Class I railroads, which have annual gross revenues of $452.7 million or more.

Burlington Northern and Santa Fe Railway (BNSF) – BNSF operates over 32,500 route miles within the United States and two Canadian provinces. In the United States, it predominantly operates west of the Mississippi River, but it also has short extensions into the southeast region. In Kentucky, BNSF shares ownership of Paducah and Illinois (PI) with Canadian National Railway (CN) and Paducah and Louisville Railway, Inc. (PAL). It also operates over CN track using trackage rights. It generally provides no local switching operations, only pick-up and delivery service. Nationally, commodities hauled by this railroad include agricultural products, consumer products, coal, and industrial products.

Canadian National Railway (CN) – CN's rail network has approximately 20,600 route miles. CN's rail lines span the width of Canada and run north/south generally following the Mississippi River down to the Gulf of Mexico, with connections to all points in North America. In Kentucky,

CN operates along rail lines obtained when CN purchased the Illinois Central Railroad in 1999. CN operates a mainline in Western Kentucky, linking the Port of New Orleans with the upper Midwestern United States. Nationally, CN carries automotive products, coal, forest products, fertilizer, food and beverages, grain and other specialty crops, metals and minerals, and petroleum and other chemicals.

CSX Transportation (CSXT) – CSXT operates approximately 21,000 route miles across 23 states, the District of Columbia, and two Canadian provinces. CSXT serves the major markets in the Eastern United States and is Kentucky's largest railroad by mileage. In Kentucky, it operates on 1,685 miles of track, 93 percent of which is owned by CSXT. Subsidiaries of CSXT in Kentucky are Transkentucky Transportation Railroad, Inc. (TTI) and the Carrollton Railroad. Commodities hauled by CSXT in Kentucky include containerized consumer goods, coal, finished vehicles, semi-finished steel, and auto parts.

Norfolk Southern Railway (NS) – NS operates approximately 20,000 route miles across 22 states and the District of Columbia. In Kentucky, the railroad operates 429 route miles, making it the second largest railroad company within the state. Of those 429 route miles, 212 route miles are owned by the city of Cincinnati, leased to the Cincinnati Southern Railroad, which then leases it to NS. NS primarily operates in the Louisville and Cincinnati markets. It also accesses coal fields in Eastern Kentucky via mainlines from West Virginia. Nationally, commodities hauled by this railroad include coal, chemicals, agricultural products, consumer products, government shipments, metals and construction materials, finished vehicles and automotive parts, paper, clay, and forest products.

Union Pacific Railroad (UP) – UP operates 32,000 route miles in 23 states covering the western two-thirds of the United States and Mexico. UP does not own any track in Kentucky, but has intermodal and other unit trains passing through Kentucky along track owned by NS, CSXT, and PI. Nationally, commodities hauled include chemicals, agricultural products, consumer products, metals and construction materials, automotive parts, paper, clay, and forest products.

2.1.2 Class II Railroads

The following section describes the Class II railroad, which has annual gross revenue greater than $36.2 million but less than $452.7 million, as defined by the STB.

Paducah and Louisville Railway, Inc. (PAL) – PAL was established in 1986 through acquisition of a line owned by the Illinois Central Railroad. PAL is the only Class II railroad within Kentucky, operating on 280 mainline route miles within the state. Branch lines connect the mainline to the cities of Kevil, Mayfield, Elizabethtown, and Cecilia. In Paducah, PAL is part owner of PI and connects to BNSF, CN, and UP, and in Louisville, to NS and CSXT. PAL also connects to CSXT in

Madisonville. PAL's traffic base in Kentucky is diverse, transporting goods to and from chemical plants and other manufacturing companies, coal mines, clay and stone quarries, lumber and propane distributors, farm and mine equipment suppliers, warehouses, transload terminals, bulk terminals, riverports, and Fort Knox.

2.1.3 Class III Railroads

The following section describes Class III railroads which have annual gross revenue less than $36.2 million.

Fredonia Valley Railroad (FVRR) – FVRR is a short line carrier that operates 10 route miles in Western Kentucky. It is owned by Lafarge North America, which owns the rock quarry in Fredonia. This Class III carrier serves a local market between the cities of Princeton and Fredonia, interchanging with PAL in Princeton.

Kentucky and Tennessee Railway (KT) – KT is located in McCreary County, in the southern portion of the state. Although KT transports some freight and does some switching, the line is owned and operated primarily for the benefit of the Big South Fork Scenic Railway, a recreational carrier. Recreational railroads are further described in **Chapter 3**.

Kentucky West Tennessee Railroad (KWT) – KWT is a short line railroad that operates across 12 route miles in Kentucky and Tennessee. It was acquired by Genesee and Wyoming (GNWR) in 2005. KWT interchanges with CSXT in Tennessee. Primary commodities hauled by this railroad include brick, clay, food, and feed products.

Louisville and Indiana Railroad (LIRC) – LIRC operates 113 route miles in Kentucky and Indiana but only four route miles are located in Kentucky. LIRC crosses the Ohio River in Louisville and continues toward Indianapolis, Indiana. It is a division of the Anacostia Rail Holdings. Primary commodities hauled by this railroad include cement, chemicals, food products, grain, lumber, manufactured goods, paper, plastics, scrap, and steel. CSXT has trackage rights on LIRC from Louisville, Kentucky, to Indianapolis.

Paducah and Illinois (PI) – PI is a short line railroad that owns 15 route miles including a vital bridge crossing of the Ohio River between Paducah, Kentucky, and Metropolis, Illinois. The rail line is equally owned by CN, BNSF, and PAL, and UP has trackage rights.

R.J. Corman Railroad Group/Bardstown Line (RJCR) – RJCR consists of approximately 20 route miles within Nelson and Bullitt counties. The railroad extends from a point near the city of Bardstown and travels west to a CSXT line between Louisville and Elizabethtown. Primary commodities hauled by this railroad include plate steel, plastics, lumber, brick, and distiller's grain. RJCR also operates the My Old Kentucky Home Dinner Train along this track, further described in **Chapter 3**.

R.J. Corman Railroad Group/Central Kentucky Lines (RJCC) – RJCC consists of two geographically separate short line railroads that together total 114 route miles. One line is more than 100 route miles in length and runs from the CSXT interchange at HK Tower in Louisville to another CSXT interchange in Winchester. The second line is more than 14 route miles in length, from Versailles to the interchange with NS in Lexington. RJCC also operates the Lexington Dinner Train over this line, further described in **Chapter 3**. Primary commodities hauled by this railroad include peanuts, aluminum ingots, alcohol, paper, plastic, fertilizer, limestone, sand, scrap paper, brick, corn syrup, and oil.

R.J. Corman Railroad Group/Memphis Line (RJCM) – RJCM operates across a total of 100 route miles in Kentucky and Tennessee. The 63 route miles that are located in Kentucky stretch from the Tennessee border to Bowling Green, with a branch line between Russellville and Lewisburg. RJCM connects with CSXT in Bowling Green and Guthrie, Kentucky. Primary commodities hauled by this railroad include aluminum can stock, grain, fertilizer, steel, lumber, paper, chemicals, wallboard, and zinc.

Tennken Railroad (TKEN) – TKEN operates 51 route miles across Kentucky and Tennessee. The 12 route miles within Kentucky are operated under lease with the Hickman River City Development Corporation, which owns the line. It connects the cities of Hickman, Kentucky, and Dyersburg, Tennessee. Primary commodities hauled by this railroad include coiled steel, petroleum coke, electro binder, plastics, synthetic resin, carbon black, fertilizer, and grain.

Transkentucky Transportation Railroad, Inc. (TTI) – TTI operates as a proprietary company of CSXT, owning 50 route miles between the cities of Paris and Maysville, Kentucky, interchanging with CSXT at each end. The primary commodities hauled by this railroad are coal and aluminum.

Western Kentucky Railway (WKRL) – WKRL was purchased by GNWR in 2005 and operates 16 route miles within Kentucky. This railroad operates within Union and Webster counties in the western portion of the state. The primary commodity hauled by this railroad is coal.

West Tennessee Railroad (WTNN) – WTNN operates between Corinth, Mississippi, and Fulton, Kentucky. WTNN operates on 230 route miles, but only on one route mile within Kentucky to interchange at the yard in Fulton. The railroad interchanges with CN at Fulton, with CSXT at Humboldt, Tennessee, and with NS and Kansas City Southern (KCS) at Corinth, Mississippi. Primary commodities hauled by this railroad include grain, steel, chemicals, paper, wood, scrap metal, plastics, and other finished goods.

2.1.4 Other Railroads

Other railroads in Kentucky include the Cincinnati Southern Railroad, Glasgow Railway, and Carrollton Railroad. Additionally, there are six public riverports in Kentucky that have rail

service. These riverports are: Greenup-Boyd County Riverport, Henderson County Riverport, Hickman-Fulton County Riverport, Louisville-Jefferson County Riverport (owns track and a locomotive; also provides switching services), Owensboro Riverport (owns track), and Paducah-McCracken County Riverport (owns track).

Cincinnati Southern Railroad – The Cincinnati Southern Railroad is the only interstate railroad owned by a municipality. It runs from Cincinnati, Ohio to Chattanooga, Tennessee. The line is leased in a long term deal to Cincinnati, New Orleans and Texas Pacific Railway (CNO&TP), a wholly-owned subsidiary of Norfolk Southern. Commodities hauled along this railroad include coal, chemicals, agricultural products, consumer products, government shipments, metals and construction materials, finished vehicles and automotive parts, paper, clay, and forest products.

Glasgow Railway – The Glasgow Railway is a privately held short line railroad running from Park City, Kentucky to Glasgow, Kentucky. CSXT operates on this railway. In Kentucky, CSXT hauls containerized consumer goods, coal, finished vehicles, semi-finished steel, and auto parts.

Carrollton Railroad – The Carrollton Railroad is a wholly owned subsidiary of CSXT in Carrollton, Kentucky. In Kentucky, CSXT hauls containerized consumer goods, coal, finished vehicles, semi-finished steel, and auto parts.

Louisville Riverport Railroad – The Louisville Riverport Railroad is associated with the Louisville – Jefferson County Riverport Authority. It has connections to PAL and CSXT, and handles coke, coal, bulk shipments and metals.

2.2 RAILROAD TRACK QUALITY CLASSIFICATION SYSTEM

In the United States, rail speed limit ranges are regulated by the FRA, but many railroads also implement and enforce their own speed limits within those FRA ranges. Speed limits are based on a number of factors, including track conditions, terrain the track follows, the physical condition of a train, the presence of grade crossings, signaling type, and curvature of the track. Speed limits for rail tracks and the trains that run on them are measured in miles per hour (mph). Rail speed limits are broken down by class.

Speed ranges based on rail track quality are established by the FRA, as follows:

- **Class 1**: 10 mph for freight, 15 mph for passenger operations. Many yard, branch line, short line, and industrial spur tracks fall into this category;
- **Class 2**: 25 mph for freight, 30 mph for passenger operations. Branch lines, secondary mainlines, many regional railroads, and some tourist operations are included in this class;
- **Class 3**: 40 mph for freight, 60 mph for passenger operations. This commonly includes regional railroad track and Class I secondary mainline track;

- **Class 4**: 60 mph for freight, 80 mph for passenger operations. This is the most common class for mainline track used in passenger and long-haul freight service;
- **Class 5**: 80 mph for freight, 90 mph for passenger operations. Few freight lines in the United States operate at this speed; and,
- **Excepted track**: In addition to the five numbered classes, the FRA track standards also provide for excepted track, which carries a 10 mph speed limit for freight and cannot be used by occupied passenger trains. The FRA permits excepted track under very narrowly defined conditions.[11]

Most freight lines in Kentucky and in the Eastern United States operate on Class 1 to Class 3 track.

2.3 FREIGHT TRAFFIC ANALYSIS

The Surface Transportation Board (STB), described below, provided Carload Waybill Sample (CWS) data for years 2010 and 2011. The information from the CWS was used to estimate the movement of commodities and traffic densities.

2.3.1 Source of Freight Traffic Information

The STB was established in 1995 as the successor to the Interstate Commerce Commission. Its mission is to "ensure that competitive, efficient, and safe transportation services are provided to meet the needs of shippers, receivers, and consumers."[12] It is organizationally housed within the U.S. Department of Transportation (USDOT), but makes independent rulings regarding certain surface transportation economic regulatory matters. The STB's jurisdiction includes railroad rates and service issues, rail restructuring transactions, labor matters, data collection, abandonments, and operational oversight.[13]

STB maintains the CWS database, a stratified sample of waybills for all national rail traffic submitted by rail carriers terminating 4,500 or more revenue carloads annually. A railroad waybill is a document prepared by the railroads moving a particular shipment, and contains some of the following information: rail car identification, date, location of origin and destination, shipper, route(s), commodity code, weight, shipping charges, and other associated fees. The overall sampling of waybills averages to be less than five percent of terminated carloads. The CWS not only represents a sample of movements by railcar, but also by intermodal container or trailer, referred to as units. Multiple units may be shipped on a single railcar. Although the data originates from a relatively small sample, the CWS is regularly used

[11] 49 CFR 213.9 and 213.4, http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=e2044c8e9c69adf314bc94e472afe9ab&r=PART&n=49y4.1.1.1.8, 2014
[12] STB, http://www.dot.gov, 2014
[13] Ibíd.

for judicial and regulatory purposes, market research and analysis, utilization studies, car cycle analyses, and hazardous material flow and risk assessment.

2.3.2 Commodities and Flows

Kentucky plays an important role in the U.S. rail network, and as such, rail is an important component of Kentucky's economy. Kentucky is centrally located within the eastern and middle U.S. freight network, as shown in **Figure 2-2.** All transportation modes in Kentucky have the ability to reach major consumer markets within relatively short distances, particularly on the east coast and Midwest regions of the U.S. According to 2011 data from the Association of American Railroads (AAR), Kentucky ranked 6th among all states for originated tonnage, 11th for originated carloads/units, 11th for total tons carried, and is the 3rd largest source of coal shipped by rail after Wyoming and West Virginia. Coal is not the only significant commodity carried by rail in Kentucky, however. According to the AAR's 2011 data, Kentucky also ranked 5th nationally for tonnage of originated primary iron (bars, pipe, or sheets of iron) and steel product (steel ingots, plates, bars, pipes, etc.), 8th for terminated metallic ore tons, and 9th for terminated steel product tonnage.

According to the CWS data, the Kentucky rail network carried 255.4 million tons of freight in 2010 and 267.5 million tons of freight in 2011.

2.3.2.1 Profile by Direction and Commodity

The largest share of freight on the Kentucky rail network in 2011 was overhead freight, the phrase for movements that cross through Kentucky, both originating and terminating in other states. Outbound freight, which originates in Kentucky and terminates in another state, was almost double the tonnage of inbound freight, which originates in another state and terminates in Kentucky. Intrastate freight, freight movements that take place solely within Kentucky, comprised the smallest percentage of freight movements in 2011, at less than two percent of carloads/units and less than three percent of tonnage that year. Intermodal freight is freight carried by more than one mode. Most transportation of freight from origin to destination is carried by more than one mode. Rail freight is no exception. Other transportation modes will generally be needed for the first or last segments of freight shipments. **Table 2-2** displays the volume of freight through (Overhead), from (Outbound), to (Inbound), and within (Intrastate) Kentucky.

Table 2-2: Tonnage and Carloads/Units by Movement Type, 2011

Direction	Tons	Percent	Carloads/Units	Percent
Overhead	165,172,308	61.7	3,251,725	74.7
Outbound	65,439,913	24.5	690,064	15.9
Inbound	29,713,888	11.1	340,599	7.8
Intrastate	7,216,502	2.7	69,042	1.6
Total	**267,542,611**	**100.0**	**4,351,430**	**100.0**

Source: STB CWS, 2011

Overhead

Overhead freight, as noted in **Table 2-2**, carried a total of 3.2 million carloads/units and 165 million tons through Kentucky. The top 10 overhead commodities are listed in **Table 2-3**. Coal was the highest percentage commodity shipped through Kentucky by tonnage. However, when measured by carloads/units, consolidated shipments, representing freight of all kinds, was the highest percentage commodity shipped through Kentucky by carloads/units. The commodity listed as freight all kinds is a shipping industry term for pooling various goods and shipping them together at one freight rate.

Table 2-3: Top 10 Overhead Commodities, by Tonnage and Carloads/Units, 2011

Commodity	Tons	Percent	Carloads/Units	Percent
Coal	46,272,343	28	420,869	13
Farm Products	28,341,923	17	289,986	9
Chemicals or Allied Products	16,494,613	10	201,978	6
Food or Kindred Products	15,945,485	10	258,568	8
Freight All Kinds	10,813,896	7	983,656	30
Hazardous Materials	10,801,345	7	174,801	5
Primary Metal Products	8,504,046	5	97,444	3
Pulp, Paper, or Allied Products	6,610,372	4	156,644	5
Transportation Equipment	4,045,854	2	200,628	6
Clay, Concrete, Glass, or Stone Products	3,835,640	2	42,516	1
Top 10 Sub-total	151,665,517	92	2,827,090	87
Grand Total All Commodities	**165,172,308**	**100**	**3,251,725**	**100**

Source: STB CWS, 2011

Outbound from Kentucky

Coal was the commodity with the highest percentage of outbound rail shipments, with more than 56 million tons (86 percent by tons) and nearly 500,000 outbound carloads/units (72 percent by carloads/units) in 2011. The 2011 totals of all outbound commodities were approximately 65 million tons and 690,000 carloads/units. The top 10 outbound commodities in 2011 are listed in **Table 2-4**.

Table 2-4: Top 10 Outbound Commodities, by Tonnage and Carloads/Units, 2011

Commodity	Tons	Percent	Carloads/Units	Percent
Coal	56,318,497	86	496,743	72
Primary Metal Products	2,852,240	4	30,520	4
Transportation Equipment	1,275,054	2	53,506	8
Chemicals or Allied Products	910,488	1	10,240	1
Waste or Scrap Materials	729,704	1	9,484	1
Clay, Concrete, Glass, or Stone Products	549,796	1	5,516	1
Hazardous Materials	528,760	1	11,560	2
Farm Products	522,250	1	4,932	1
Pulp, Paper, or Allied Products	384,200	1	5,520	1
Freight All Kinds	382,400	1	38,240	6
Top 10 Sub-total	64,453,389	98	666,261	97
Total All Commodities	**65,439,913**	**100.0**	**690,064**	**100.0**

Source: STB CWS, 2011

Inbound to Kentucky

Inbound rail freight, originating in other states and terminating in Kentucky, totaled approximately 30 million tons and 340,000 carloads/units in 2011, with coal representing 60 percent of the tonnage and 45 percent of carloads/units. The top 10 inbound commodities are listed in **Table 2-5**.

Table 2-5: Top 10 Inbound Commodities, by Tonnage and Carloads/Units, 2011

Commodity	Tons	Percent	Carloads/Units	Percent
Coal	17,763,751	60	154,700	45
Metallic Ores	2,067,068	7	19,466	6
Chemicals or Allied Products	1,687,292	6	18,360	5
Primary Metal Products	1,395,084	5	16,016	5
Hazardous Materials	1,095,196	4	14,568	4
Waste or Scrap Materials	1,070,404	4	11,676	3
Pulp, Paper, or Allied Products	951,920	3	12,520	4
Food or Kindred Products	847,576	3	10,168	3
Petroleum or Coal Products	517,880	2	6,016	2
Non-metallic Minerals	498,034	2	4,947	1
Top 10 Sub-total	27,894,205	94	268,437	79
Total All Commodities	**29,713,888**	**100.0**	**340,599**	**100.0**

Source: STB CWS, 2011

Intrastate

Intrastate rail shipments in 2011 totaled more than 7.2 million tons and over 69,000 carloads/units. Intrastate rail shipments consisted primarily of coal, with approximately 6.6 million tons and 58,000 carloads/units. Kentucky's intrastate rail tonnage in 2011 was 92 percent coal. Other top commodity types included chemicals or allied products, lumber or

wood products, and transportation products. The top 10 intrastate commodities are listed in **Table 2-6**.

Table 2-6: Top 10 Intrastate Commodities, by Tonnage and Carloads/Units, 2011

Commodity	Tons	Percent	Carloads/Units	Percent
Coal	6,637,557	92.0	58,048	84.1
Chemicals or Allied Products	154,600	2.1	1,640	2.4
Lumber or Wood Products	133,760	1.9	1,760	2.5
Transportation Products	129,265	1.8	3,602	5.2
Pulp, Paper, or Allied Products	44,400	0.6	680	1.0
Waste or Scrap Materials	35,960	0.5	472	0.7
Petroleum or Coal Products	32,080	0.4	440	0.6
Carriers, Returned Empty	19,600	0.3	1,960	2.8
Hazardous Materials	17,200	0.2	320	0.5
Non-metallic Minerals	8,160	0.1	80	0.1
Top 10 Sub-total	7,212,582	99.9	69,002	99.9
Total All Commodities	**7,216,502**	**100.0**	**69,042**	**100.0**

Source: STB CWS, 2011

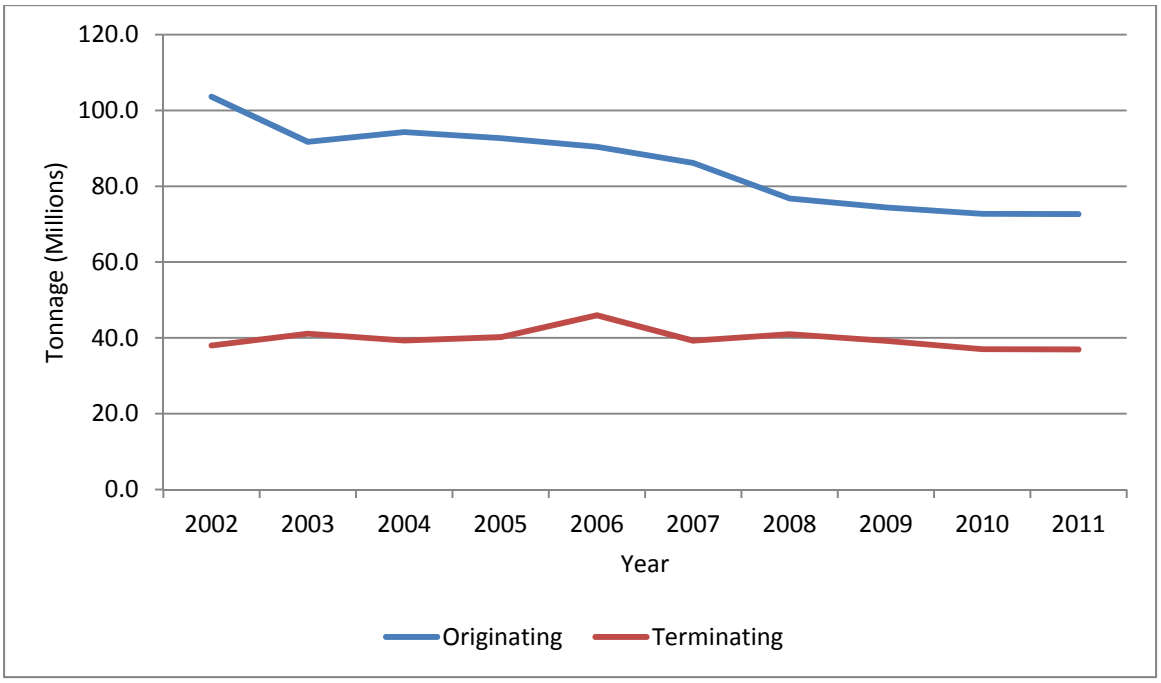
2.3.2.2 Trends in Kentucky Rail Freight

The volume of originating and terminating rail movements in Kentucky declined between 2002 and 2011, according to data from the USDOT's Bureau of Transportation Statistics (BTS). The following is a discussion of recent trends in rail freight in Kentucky, particularly with regards to three important commodities in the state: coal, automotive products, and oil.

Recent Trends

Kentucky's originating rail tonnage dropped from 103 million tons in 2002 to less than 73 million tons in 2011, a decline of about 30 percent. Terminating rail tonnage declined slightly, from 38 million tons in 2002 to 37 million tons in 2011, a decrease of less than three percent. **Figure 2-4** shows rail tonnage originating and terminating in Kentucky from 2002 to 2011. Intrastate movements that both originate and terminate in Kentucky appear in both the originating and the terminating totals.

Figure 2-4: Rail Tonnage Originating and Terminating in Kentucky



Source: BTS, Kentucky State Transportation Profiles Sample, 2014

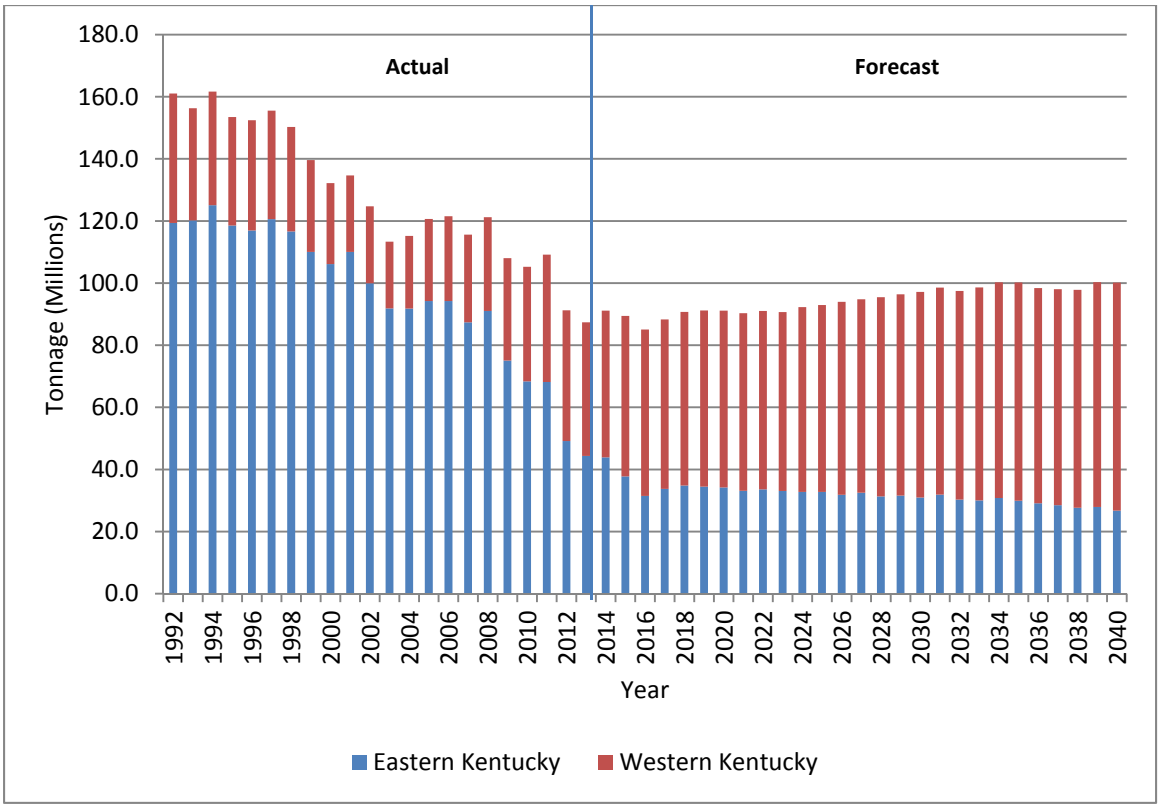
The trends shown in **Figure 2-4** reflect a number of commodity-specific changes, some of which counteract each other. Some commodities, such as chemicals and primary metal products, have mirrored recent changes in the economy, declining during the recession of 2008-2009. Inbound and outbound volumes of these commodities declined after 2006, and bottomed out in 2009, but increased through 2011. Petroleum shipments declined during the time period shown in **Figure 2-4**. For example, in 2005, 11 million tons of petroleum products were shipped to and/or from Kentucky, whereas by 2010, this number had dropped to less than one million tons.

In Kentucky, there are three commodities with market demand that significantly impact rail flows. These are coal, automotive products, and oil. Each of these is profiled in the following sections.

Coal Freight Movements

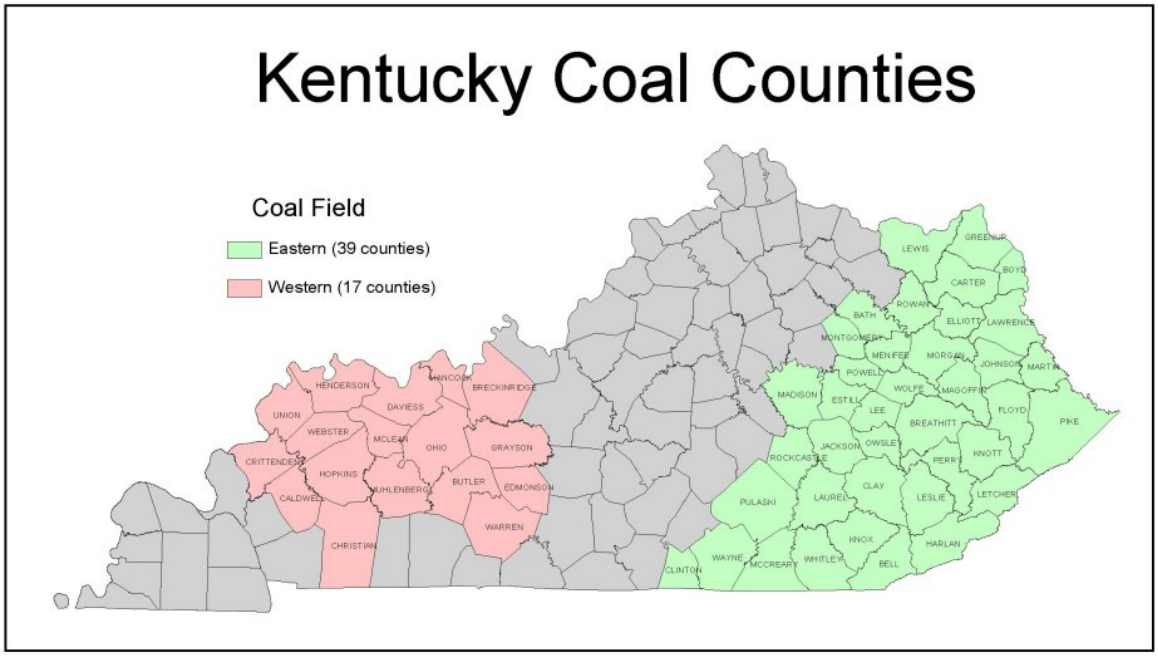
Coal production in Kentucky has decreased since 1992 and is not expected to return to historic levels within the next 25 years. Historic coal production data shown in **Figure 2-5** is from the Kentucky Energy Database, maintained by the Kentucky Energy and Environment Cabinet, while forecasted changes in production are derived from the U.S. Energy Information Administration's (EIA) 2014 Annual Energy Outlook. **Figure 2-6** shows the Kentucky counties in which coal is produced. Eastern Kentucky produced more coal prior to 2012, however it is anticipated that in the future, the majority of coal will come from Western Kentucky. These

Figure 2-5: Kentucky Coal Production by Tons, Historical and Projected, 1992-2040



Source: Kentucky Energy and Environment Cabinet, EIA, 2012

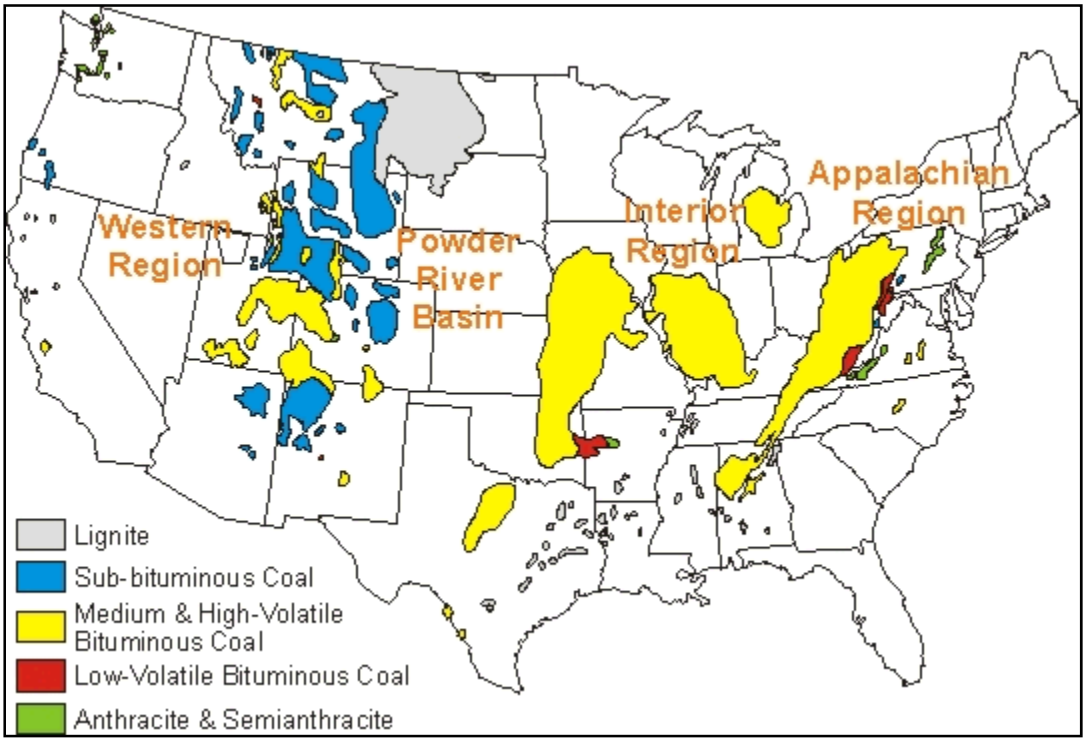
Figure 2-6: Coal Producing Counties in Kentucky, 2014



Source: University of Kentucky, Kentucky Geological Survey, 2014

projections assume that Eastern Kentucky coal production trends will mirror those of the larger Central Appalachian coal production region (Southern West Virginia, Virginia, Eastern Kentucky, and Northern Tennessee). Projections also expect that Western Kentucky coal production trends will increase similar to the Eastern Interior coal production region (Illinois, Indiana, Mississippi, and Western Kentucky). The resulting forecast anticipates major declines in Eastern Kentucky coal, but commensurate increases in Western Kentucky coal production. The EIA's forecasted decline in Eastern Kentucky coal is driven by diminishing coal reserves in Central Appalachia, cheaper coal in other regions, a shift from coal to natural gas, and more restrictive environmental regulations. Eastern Interior coal production is expected to increase due to scrubbers installed at existing coal-fired generating units, which allow them to burn the region's higher-sulfur coals at lower costs. **Figure 2-7** provides a graphic display of U.S. coal production by type.

Figure 2-7: U.S. Coal Production by Type, 2014



Source: http://www.coaleducation.org/lessons/MII/image/us_comparison2.gif, 2014

Approximately 6.6 million tons (27.2 percent) of the 24.4 million tons of coal terminating by rail in Kentucky in 2011 was intrastate, originating in Kentucky. Wyoming originates over 8.1 million tons (33 percent) of the coal terminating by rail in Kentucky. Combined with Colorado at 4.8 million tons (20 percent), the top three states of origin provide over 80 percent of the coal terminating by rail in Kentucky. **Table 2-7** shows the state of origin for coal shipments that terminate in Kentucky. Many of the top terminating locations for coal in Kentucky are loading docks for barges. For example, much of the western coal from Wyoming, Utah, or Colorado terminates at coal barge loading facilities near Paducah.

Table 2-7: State of Origin for Coal Movements Terminating in Kentucky, 2011

State of Origin	Tons	Percent
Wyoming	8,169,608	33.6
Kentucky	6,637,557	27.2
Colorado	4,805,483	19.8
Illinois	2,549,170	10.4
Indiana	1,270,112	5.2
West Virginia	846,984	3.6
Utah	83,256	0.3
Pennsylvania	39,138	0.2
Grand Total	**24,401,308**	**100.0**

Source: STB CWS, 2011

Counties with the highest production are often the counties that originate the most coal by rail, as shown in **Table 2-8**. However, not all rail loading facilities are located in the same county where coal is mined, which may explain instances where originated coal rail tons are higher than total coal production for a given county. This may be due to the fact that some coal could initially be transported into a county by other modes, such as trucks. As shown, the majority of coal is shipped by rail.

Table 2-8: Tons of Coal Originated by Rail and Produced by County, 2011

County	Rail Originated (in millions)	Produced (in millions)
Pike	14	15
Perry	11	13
Union	N/A	12
Harlan	9	10
Hopkins	6	9
Webster	4	6
Ohio	2	6
Muhlenberg	N/A	6
Martin	4	5
Knott	2	5
Letcher	3	5
Floyd	3	3
Henderson	0	2
Magoffin	0	2
Bell	5	1
Breathitt	0	1
Clay	1	0

Source: STB CWS, 2011

Automotive Freight Movements

The Kentucky rail network is necessary for the automotive industry, especially for auto plants and parts manufacturing facilities. In 2013, about 1.2 million light vehicles were produced in Kentucky, which is one in every 10 light vehicles produced in the United States. General Motors, Ford, and Toyota each have assembly plants in Kentucky. As mentioned previously, Kentucky is a major recipient of steel products, some used by the automotive industry.

In 2011, the Kentucky rail network handled more than 5.3 million tons and over 252,000 carloads/units of freight related to finished vehicles, as well as vehicle parts. Most of this was overhead freight for Kentucky, although about 23 percent originated in the state. **Table 2-9** shows total automotive tonnage, including finished vehicles and parts, by movement type in Kentucky.

Table 2-9: Automotive Tonnage by Movement Type, 2011

Direction	Tons	Percent	Carloads/Units	Percent
Overhead	3,727,400	70.2	188,880	74.9
Outbound	1,222,520	23.0	51,400	20.4
Inbound	247,040	4.7	9,200	3.6
Intrastate	112,120	2.1	2,840	1.1
Total	**5,309,080**	**100.0**	**252,320**	**100.0**

Source: STB CWS, 2011

In Kentucky, finished automobiles and trucks account for more than 75 percent of all automotive commodities shipped by rail inbound, outbound, overhead, and intrastate. These are typically shipped in multilevel flat cars in unit train quantities.

Based on STB CWS data, intermodal units play a minor role in shipping commodities categorized as automotive parts, accounting for only 1.4 percent of automotive commodity shipments that originate, terminate, or are shipped within Kentucky. However, intermodal shipments typically are categorized as Miscellaneous Mixed Shipments, so automotive parts may comprise a larger portion of intermodal freight inbound, outbound, or intrastate than the CWS indicates. **Tables 2-10** and **2-11** list automotive tonnage in Kentucky respectively by commodity type and rail equipment type.

Table 2-10: Automotive Tonnage and Carloads/Units Shipped Inbound, Outbound, Overhead, or Intrastate, by Commodity Type, 2011

Commodities	Tons	Percent	Carloads/Units	Percent
Passenger Vehicles	41,280	65.1	944,720	59.7
Trucks	11,640	18.3	266,800	16.9
Vehicle Parts	5,160	8.1	241,120	15.2
Vehicle Frames	3,160	5.0	107,040	6.8
Vehicle Engines	2,200	3.5	22,000	1.4
Total	**1,581,680**	**100.0**	**63,440**	**100.0**

Source: STB CWS, 2011

Table 2-11: Automotive Tonnage and Carloads/Units Shipped Inbound, Outbound, Overhead, or Intrastate, by Rail Equipment Type, 2011

Equipment Type	Tons	Percent	Carloads/Units	Percent
Multilevel Flat	1,211,520	76.6	52,920	83.4
All Other Flat Cars	191,440	12.1	5,160	8.1
Equipped Box	156,320	9.9	3,120	4.9
Intermodal Container	22,400	1.4	2,240	3.5
Total	**1,581,680**	**100.0**	**63,440**	**100.0**

Source: STB CWS, 2011

Kentucky automotive freight rail traffic (including automotive parts and finished automobiles) originates from Christian, Hardin, Jefferson, Scott, and Shelby counties. The largest origin of automotive freight rail traffic is from Jefferson County (Louisville), where the Ford Motor Company has located two manufacturing plants. One Ford plant is located near the Louisville International Airport and produces automobiles and small sport utility vehicles (SUVs). The other Ford plant is located along I-265 to the east of downtown and produces light and heavy duty trucks. Over half of the Kentucky tonnage of automotive freight rail traffic originates from Jefferson County. Scott County (Georgetown) is the second largest originator of automotive freight rail traffic. The Toyota Motor Manufacturing Kentucky (TMMK) plant in Georgetown

produces automobiles and vehicle engines, along with other parts. Shelby County (Shelbyville) is the third largest originator of automotive freight rail traffic with the Martinrea body stamping plant and the Norfolk Southern automotive distribution center rail yard. Next is Hardin County (Radcliff and Elizabethtown), with the Akebona Brake Corporation as the primary manufacturer. Finally, Christian County (Hopkinsville) is the location of several manufacturers including Denso Air Systems and Grupo Antolin North America.

Oil Freight Movements

Petroleum shipments to and from Kentucky declined sharply between 2005 and 2011, a decrease of about 11 million tons. However, petroleum shipments are expected to increase, particularly for crude oil. Technological improvements in oil and gas extraction, including hydraulic fracturing in nearby states, have made large deposits of oil and gas in non-permeable shale rock recoverable. As a result of these developments, domestic crude oil production has grown dramatically. In 2008, production had declined to only about five million barrels per day. However, by the summer of 2013, production had increased to 7.5 million barrels per day.

Crude oil is of little use until it is refined. Most refineries are concentrated in areas where crude oil was traditionally extracted, namely Texas and Oklahoma, or areas along the coasts that could easily be accessed by tanker ships. Much of the recent increase in oil production has occurred in places that traditionally produced minimal oil, such as the northern plains. Therefore, oil must now be shipped from areas of historically minimal production to areas with refinery capacity. **Figure 2-8** depicts refinery locations and capacities across the country. Also symbolized in that figure is the Petroleum Administration for Defense District's (PADDs) geographic aggregation of states to facilitate analysis of patterns of petroleum product movements throughout the nation.

There are two oil refineries located in Kentucky, including one large refinery in Catlettsburg, and a smaller refinery located in Somerset. The refinery in Somerset reopened in 2013 after being closed for several years. These refineries could see increased rail traffic due to growing demand for refined petroleum products and the proximity of the plants to Class I rail lines.

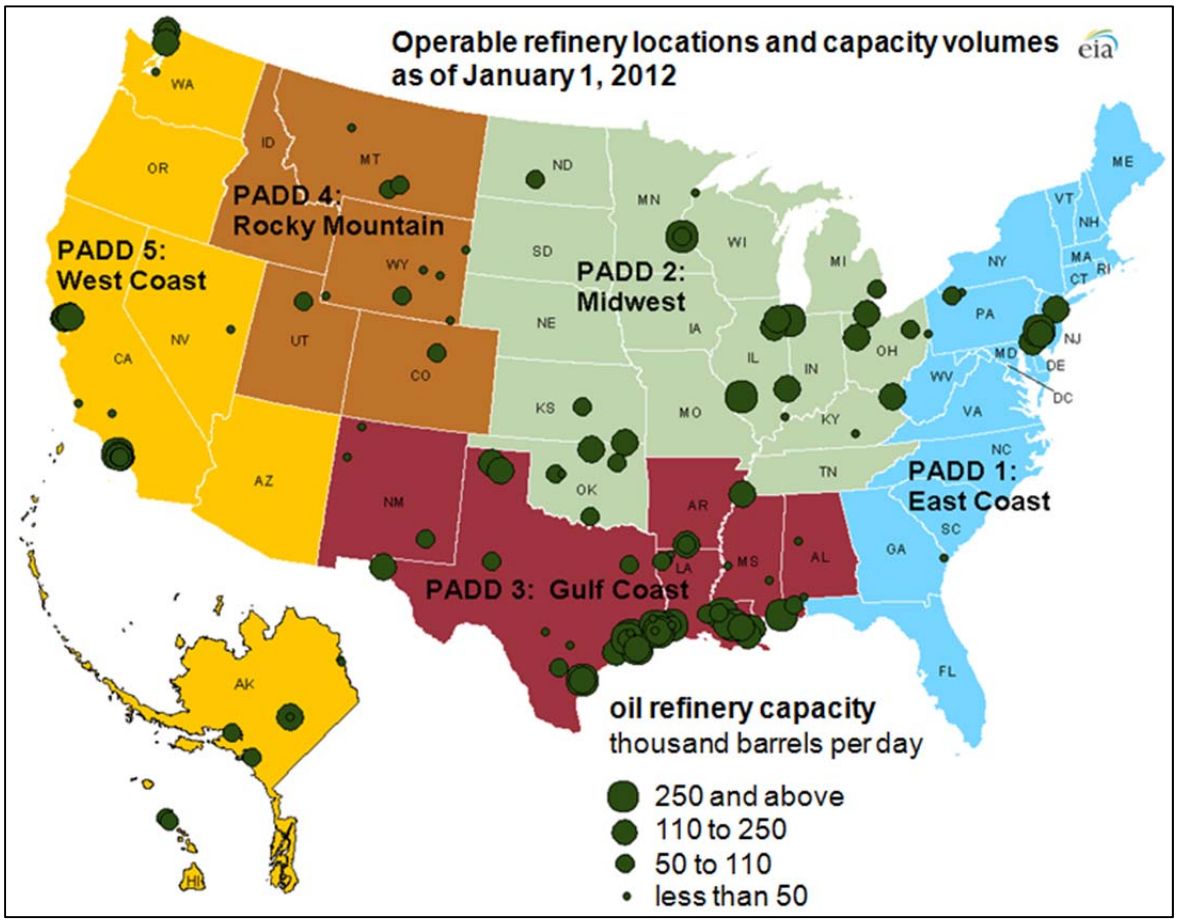
Until recently, oil was shipped primarily by pipeline, but railroads have captured a significant share of the new crude oil domestic transportation. Rail's current prominence as a transportation option for crude oil is due to several trends, including a lack of pipeline capacity at remote production areas and the lower initial capital cost of using rail compared to building new pipelines. Additionally, the scalability of rail transport and rail's flexibility in serving multiple locations are responsible for the mode's rise in transporting oil. However, oil transportation by rail is more expensive than pipeline transportation, so it is possible that once new pipeline capacity is built, rail's role in crude oil shipping may decline. Furthermore, high profile derailments have raised safety concerns over the large quantities of oil that now move

by rail. Despite these moderating influences, crude oil shipments by rail are expected to increase in the short-term.

In May 2014, the FRA issued emergency action rules requiring notification of larger shipments and strongly recommended the use of safer railroad cars for the shipment of oil.[14] This was largely due to several high-profile incidents involving the transport of oil by rail. It is anticipated that more regulations from the FRA may be pending.

According to the AAR, Class I railroads originated nearly 9,500 carloads of crude oil in 2008. By 2012, crude oil shipments had risen significantly to 234,000 carloads, and almost doubled by 2013 to originate approximately 400,000 carloads of crude oil on Class I railroads.

Figure 2-8: U.S. Refinery Locations and Capacity



Source: U.S. Energy Information Administration, 2012

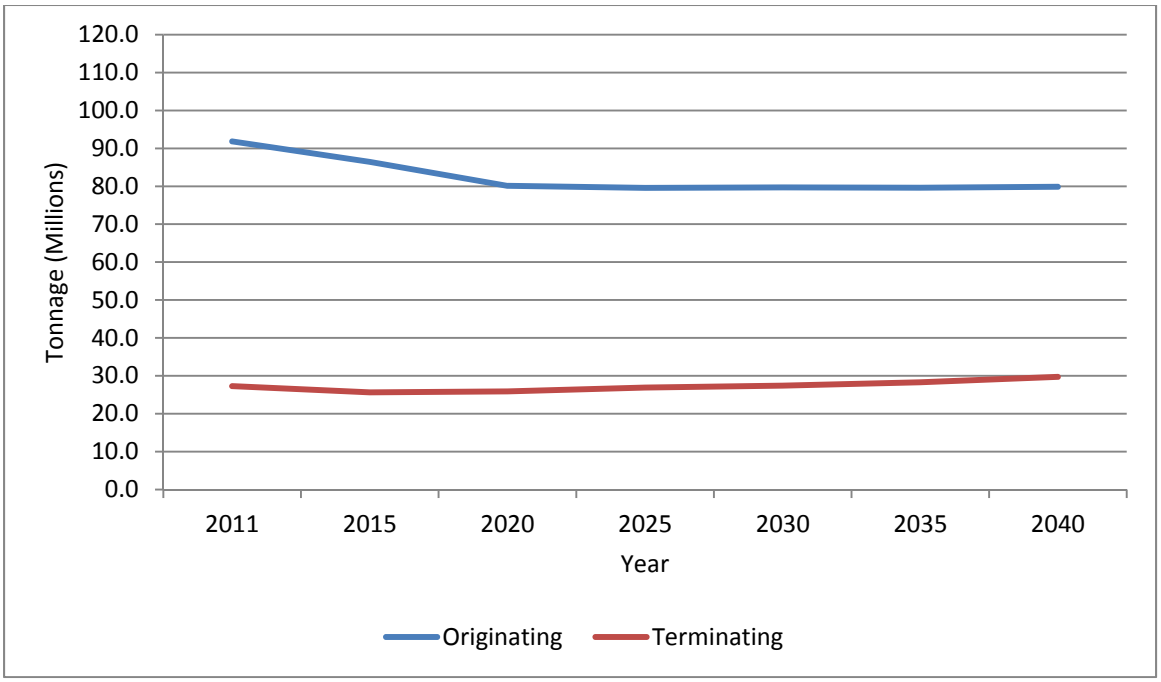
2.3.2.3 Forecasted Trends

While the CWS database provides data on past rail shipments, it is not used for predictions of future rail shipments. Forecasts are completed using the Federal Highway Administration's

[14] http://www.fra.dot.gov/eLib/details/L05223, 2014

(FHWA's) Freight Analysis Framework (FAF) – Version 3.4 freight flow database. As shown in **Figure 2-9**, for Kentucky inbound and outbound rail traffic, the FAF predicts Kentucky originating rail freight to decline through 2020, a trend driven by expected declines in coal tonnage. If future increases in Western Kentucky coal counteract expected declines in Eastern Kentucky coal as indicated in **Figure 2-6**, these declines may be lower than the FAF forecast that appears in **Figure 2-9**. In Kentucky, terminating inbound rail movements are expected to increase slightly from 27 million tons in 2011 to 30 million tons in 2040. Originating outbound rail movements are expected to decline from just over 90 million tons in 2011 to 80 million tons in 2040. This also takes into account potential increases in auto related and oil shipments.

Figure 2-9: Projected Rail Tonnage Inbound and Outbound in Kentucky, 2011–2040



Source: FAF, 2013

2.3.2.4 Geography of Kentucky Rail Freight Flows

Top Domestic Trading Partners

According to the STB, the states generating the greatest inbound rail tonnage to Kentucky in 2011 were Wyoming, Colorado, Illinois, Ohio, and Indiana. The primary commodity shipped from these states was coal. Ohio was the exception, with the primary commodity of metallic ores. The largest outbound rail tonnage from Kentucky was shipped to Georgia, South Carolina, Virginia, North Carolina, and Florida.

Table 2-12 shows that Wyoming, as the top state of origin for rail movements terminating in Kentucky, accounted for almost 8.2 million tons (27 percent) and over 69,000 carloads/units (20 percent) in 2011. Colorado followed, originating 4.8 million tons (16 percent) and nearly 43,000

carloads/units (13 percent) that year. Illinois contributed almost 4.1 million tons (14 percent) and nearly 56,000 carloads/units (16 percent).

Table 2-12: Kentucky Inbound Tonnage and Carloads/Units, by State, 2011

State	Tons	Percent	Carloads/Units	Percent
Wyoming	8,177,408	27.5	69,634	20.4
Colorado	4,805,483	16.2	42,882	12.6
Illinois	4,085,294	13.7	55,788	16.4
Ohio	3,005,236	10.1	30,210	8.9
Indiana	1,794,960	6.0	18,248	5.4
West Virginia	977,175	3.3	9,205	2.7
Kentucky	780,618	2.6	8,919	2.6
Texas	540,920	1.8	6,520	1.9
New Jersey	519,360	1.7	5,868	1.7
Georgia	511,244	1.7	6,416	1.9
Top 10 Sub-total	25,197,698	84.8	253,420	74.4
Total All States	**29,713,888**	**100.0**	**340,599**	**100.0**

Source: STB CWS, 2011

States receiving the most rail shipments in 2011 from Kentucky, by volume, were Georgia with 11.1 million tons (17 percent) and more than 107,000 carloads/units (15 percent), South Carolina with 10.3 million tons (16 percent) and nearly 92,000 carloads/units (13 percent), and Virginia with nearly 8.5 million tons (13 percent) and 98,000 carloads/units (14 percent). Coal was the primary commodity shipped to most of the states. **Table 2-13** shows the top ten states receiving shipments from Kentucky in 2011.

Table 2-13: Kentucky Outbound Tonnage and Carloads/Units, by State, 2011

State	Tons	Percent	Carloads/Units	Percent
Georgia	11,109,628	17.0	107,745	15.6
South Carolina	10,338,508	15.8	91,860	13.3
Virginia	8,460,385	12.9	98,131	14.2
North Carolina	8,336,576	12.7	74,248	10.8
Florida	7,886,329	12.1	75,381	10.9
Ohio	5,424,123	8.3	56,927	8.2
Alabama	2,617,359	4.0	23,880	3.5
Tennessee	2,414,251	3.7	25,072	3.6
Michigan	2,280,634	3.5	20,630	3.0
West Virginia	1,244,807	1.9	11,683	1.7
Top 10 Sub-total	60,112,600	91.9	585,557	84.9
Total All States	**65,439,913**	**100.0**	**690,064**	**100.0**

Source: STB CWS, 2011

Counties with the Highest Shipment Volumes

A shown in **Table 2-14**, nearly 80 percent of inbound rail tonnage and 77 percent of carloads/units were bound for destinations in only five counties in Kentucky. These counties, in order of tonnage received, were Marshall, Livingston, McCracken, Boyd, and Jefferson. Tonnage terminating in these counties ranged from Marshall County with 7.2 million tons (24 percent) and almost 63,000 carloads/units (18 percent) to Jefferson County with 3.2 million tons (11 percent) and nearly 77,000 carloads/units (23 percent) in 2011. Marshall and Livingston counties are home to major coal river terminals. McCracken and Jefferson counties are home to coal-fired electric power generators. Boyd County is a steel producing area with a major refinery in Catlettsburg, receiving metallic ores, and is also home to major river coal terminals.

Table 2-14: Kentucky Inbound Rail Tonnage and Carloads/Units, by County of Destination, 2011

County	Tons	Percent	Carloads/Units	Percent
Marshall County	7,239,438	24.4	62,915	18.5
Livingston County	5,105,761	17.2	44,885	13.2
McCracken County	4,518,201	15.2	40,590	11.9
Boyd County	3,442,462	11.6	35,490	10.4
Jefferson County	3,225,781	10.9	76,945	22.6
Lawrence County	739,344	2.5	6,400	1.9
Carroll County	387,336	1.3	4,264	1.3
Daviess County	352,156	1.2	4,584	1.3
Henderson County	335,532	1.1	3,492	1.0
Boone County	331,760	1.1	4,480	1.3
Top 10 Sub-total	25,677,771	86.4	284,045	83.4
Total All Counties	**29,713,888**	**100.0**	**340,599**	**100.0**

Source: STB CWS, 2011

Kentucky's top 10 counties for outbound rail movements in 2011, shown in **Table 2-15**, are all coal-producing counties. The majority of tonnage originates in three counties with Pike County originating 14.3 million tons (22 percent) and nearly 130,000 carloads/units (19 percent), Perry County with 10.2 million tons (16 percent) and over 88,000 carloads/units (13 percent), and Harlan County with 8.6 million tons (13 percent) and 74,000 carloads/units (11 percent). These top three counties of origin accounted for over 50 percent of Kentucky's outbound tonnage and over 42 percent of Kentucky's outbound carloads/units.

Table 2-15: Kentucky Outbound Rail Tonnage and Carloads/Units, by County of Origin, 2011

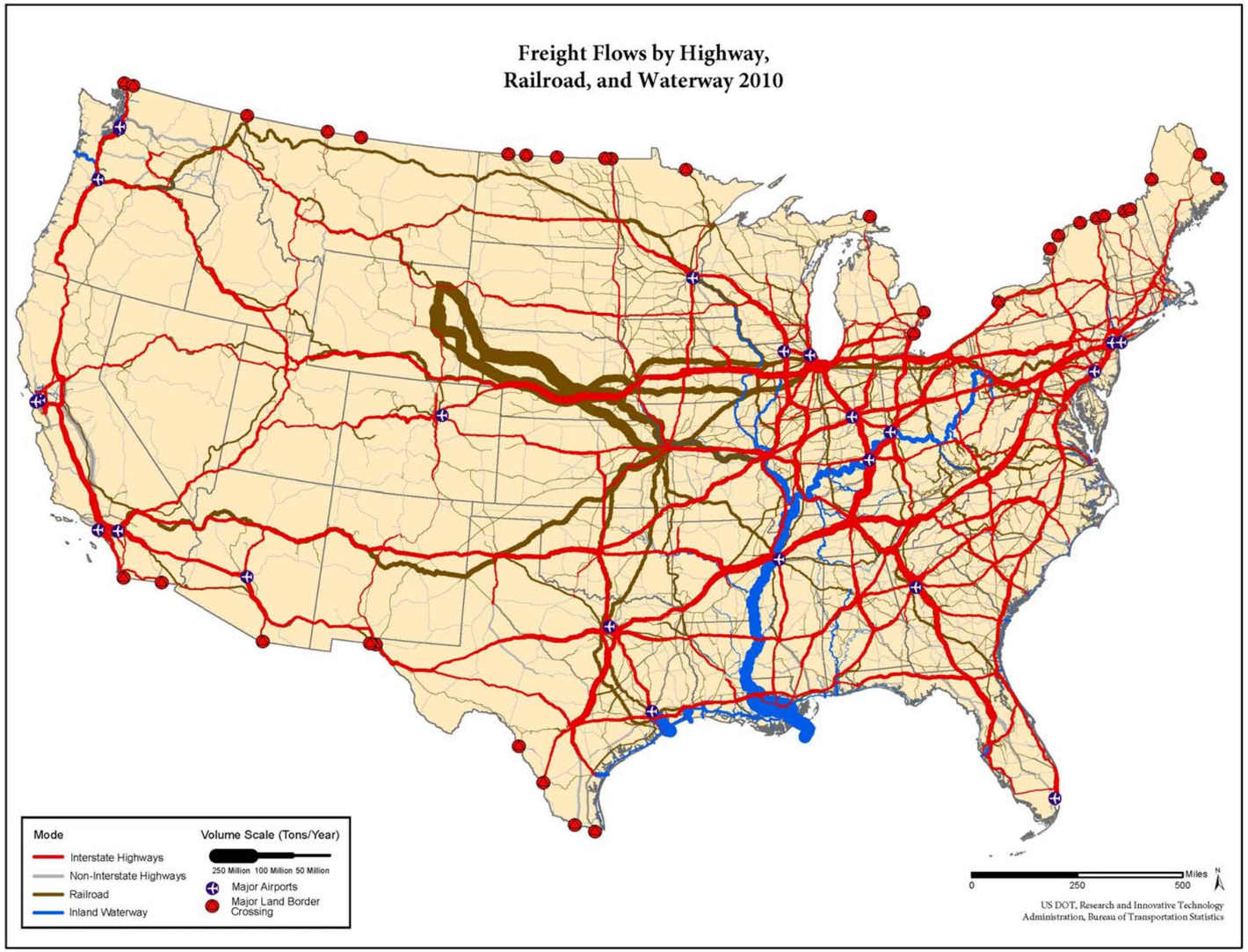
State	Tons	Percent	Carloads/Units	Percent
Pike County	14,346,132	21.9	129,992	18.8
Perry County	10,187,280	15.6	88,519	12.8
Harlan County	8,561,083	13.1	74,356	10.8
Bell County	4,518,083	6.9	40,574	5.9
Martin County	4,065,624	6.2	35,721	5.2
Hopkins County	2,987,102	4.6	25,290	3.7
Webster County	2,794,315	4.3	23,578	3.4
Boyd County	2,704,298	4.1	29,244	4.2
Letcher County	2,513,726	3.8	22,319	3.2
Floyd County	2,466,265	3.8	21,586	3.2
Top 10 Sub-total	55,144,378	84.3	491,109	71.2
Total All Counties	**65,439,913**	**100.0**	**690,064**	**100.0**

Source: STB CWS, 2011

2.3.3 Role of Kentucky's Freight Network within the Region and Nation

Kentucky's rail lines are a key component of the national rail network, particularly for rail flows that connect the Midwest and Great Lakes regions to the Southeast. **Figure 2-10** depicts the national freight flows throughout the United States via other modes and linkages to rail.

Figure 2-10: National Freight Flows Map



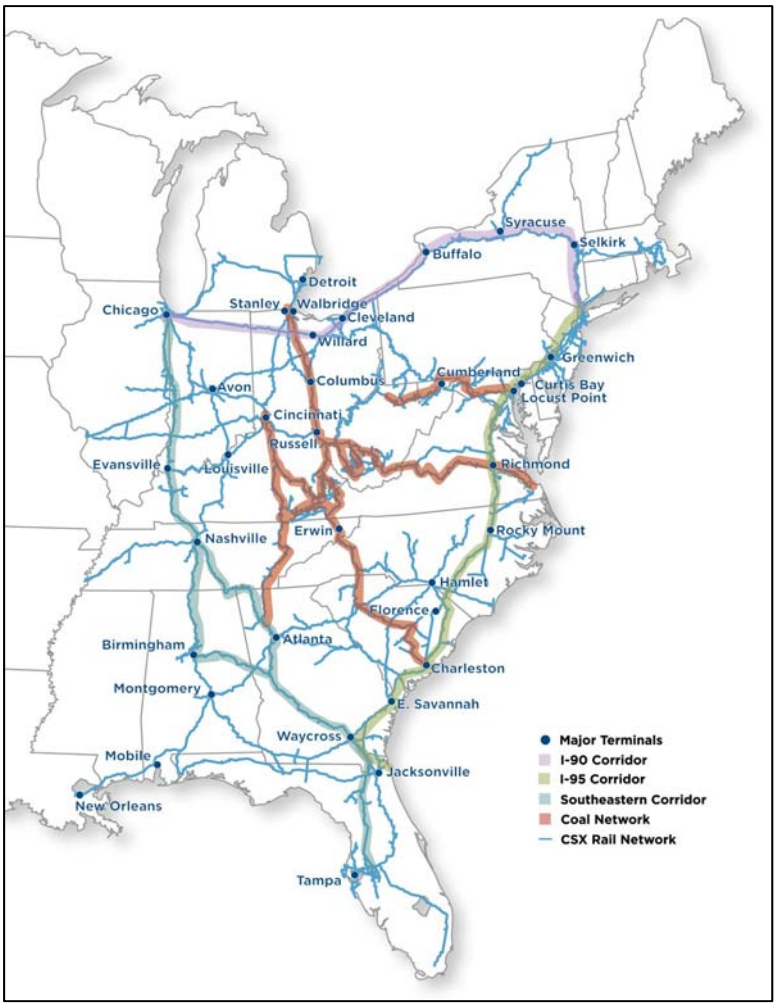
Sources:
U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration (RITA), Bureau of Transportation Statistics (BTS), Transportation Statistics Annual Report 2012
Air —U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division, USA Trade Online
Land —BTS TransBorder Freight Data
Water — U.S. Army Corps of Engineers, Navigation Data Center, personal communication, as cited in BTS' National Transportation Statistics, Table 1-51, retrieved from http://www.bts.gov/publications/national_transportation_statistics/, October 2012.

2.3.3.1 Kentucky in the CSXT Freight Network

The CSXT Coal Network serves the eastern portion of Kentucky. One line runs south from Cincinnati, Ohio, into Kentucky, and splits at Winchester, with one line extending toward Atlanta, Georgia, and another toward Charleston, South Carolina. Another portion of the CSXT Coal Network has a northern terminus near Toledo, Ohio, and then runs through Columbus, Ohio, through the Eastern Kentucky region, splitting at Catlettsburg with one line extending to Hampton Roads, Virginia, and another extending toward Charleston, South Carolina.

Western Kentucky is crossed by CSXT's Southeastern Corridor, running between Evansville, Indiana, and Nashville, Tennessee. This corridor connects CSXT's western gateways with the Southeast, hauling mostly intermodal shipments (containers on flat car and trailers on flat car, or COFC and TOFC respectively; see **Section 2.4.1.1**), automotive, general merchandise, and coal. **Figure 2-11** shows the CSXT freight network.

Figure 2-11: CSXT Network Map



Source: CSXT, 2013

2.3.3.2 Kentucky in the NS Freight Network

The Norfolk Southern line owned by the Cincinnati Southern Railroad runs south from Cincinnati, Ohio, through Lexington, Kentucky, toward Chattanooga, Tennessee. This important line is the primary conduit for agricultural and manufacturing shipments between the carrier's western gateways, the Great Lakes region, and the Southeast. **Figure 2-12** shows how Kentucky's NS rail system connects to the East Coast and larger NS network.

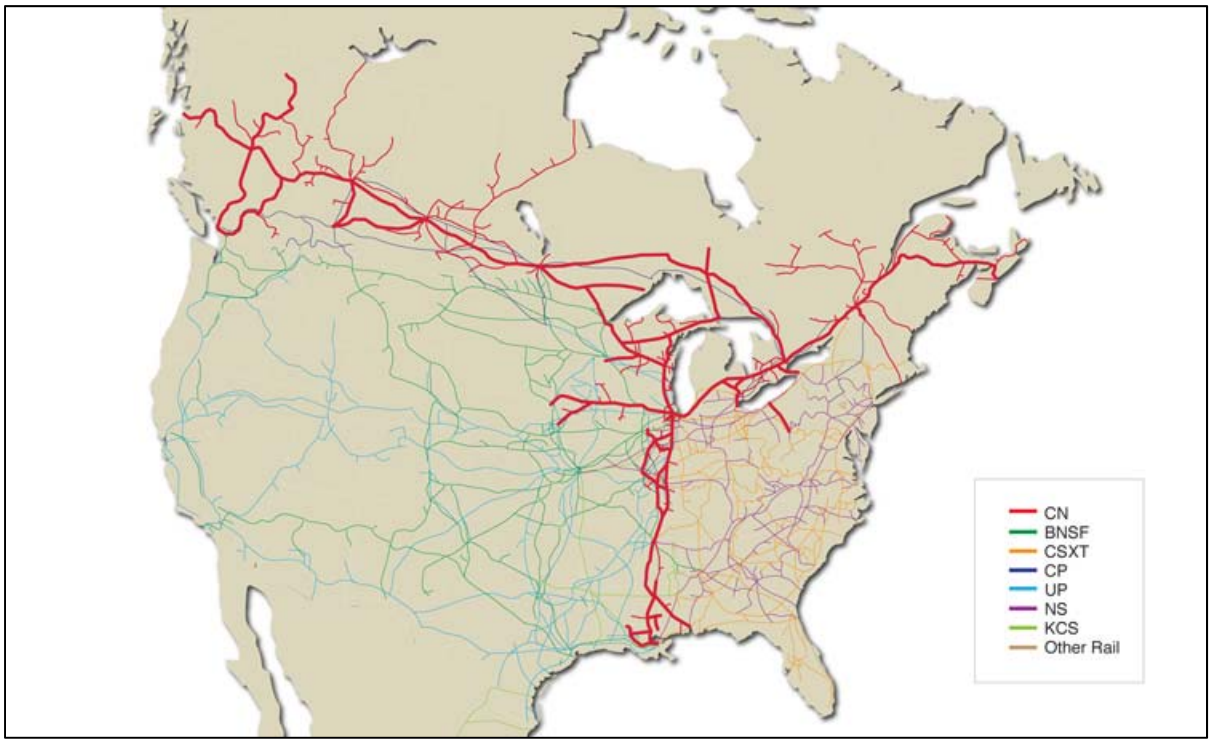
Figure 2-12: NS Network Map

Source: http://www.atlantarails.com/uploads/1/0/3/5/10352997/2723854_orig.gif?251, 2014

2.3.3.3 Kentucky in CN Freight Network

The CN has a line in western Kentucky near Fulton primarily connecting the Chicago, Illinois area with the Port of New Orleans along the old Illinois Central Line. In Kentucky, the CN carries coal and consumer goods. The NS also uses the line through a trackage rights agreement. A map of the CN network is shown in **Figure 2-13**.

Figure 2-13: CN Network Map



Source: CN, 2014

2.3.3.4 Kentucky in the PAL Freight Network

PAL connects the Kentucky rail network to other parts of the Western U.S., with connections to BNSF, CN, CP, and CSXT. Its network carries a variety of commodities and products including coal, clay, stone, lumber, farm and mine equipment, and is bounded by Paducah on the western end and Louisville on the eastern end. A map of the PAL network is shown in **Figure 2-14.**

Figure 2-14: PAL Network Map

Source: PAL, 2014

2.4 INTERMODAL FREIGHT TRAFFIC ANALYSIS

Many companies have direct rail access, but others are not located on a rail line or spur. Those who have rail access may not have direct access to other transportation options. Companies, therefore, rely on intermodal connections between Kentucky's rail, highway, air, pipeline, and waterway modes to deliver their products. Furthermore, intermodal transportation can serve a consolidation function. For example, trucks may make relatively short trips to bring goods (as in the case of containerized freight) to a rail intermodal center, so that efficient unit train rail connections can provide long distance service between intermodal hubs.

Freight is generally classified in categories including bulk, intermodal, and break bulk. Bulk describes goods that must be loaded individually or in large quantities, such as oil or grain. Break bulk cargo is transported in smaller containers such as bags, boxes, crates, drums, barrels or on pallets.

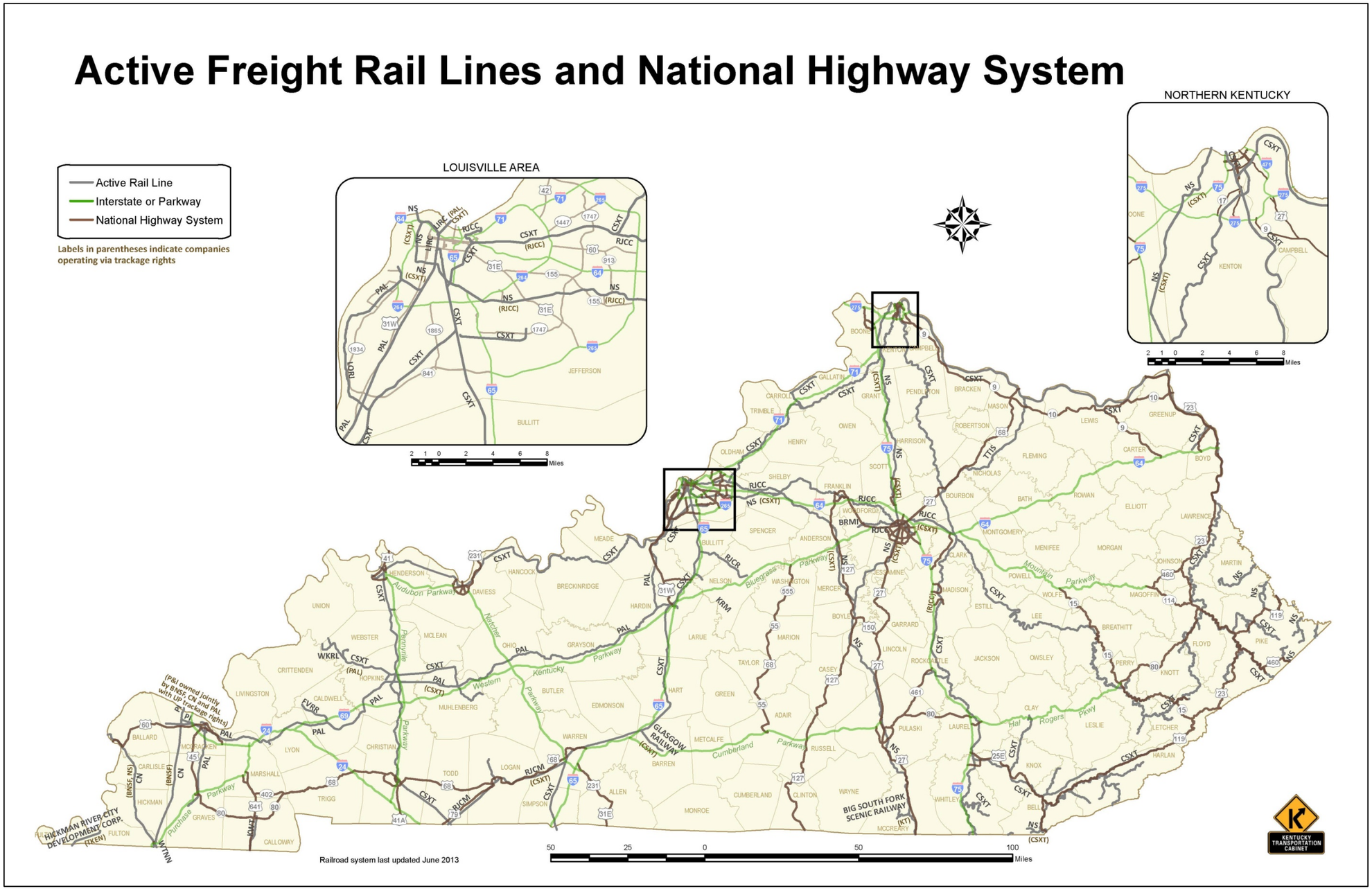
Typically within the railroad industry, intermodal is defined as cargo carried inside containers or trailers and often by different modes. Containers can be transferred between truck, rail, or marine modes, while trailers (sometimes referred to as piggyback) can be transferred between truck and rail. Rail intermodal shipments are carried either by trailer on flatcar (TOFC) or container on flatcar (COFC) shipments.

Facilities for transferring bulk freight or break bulk freight between truck and rail are often referred to as transload facilities. These can have a broad range of facility designs. Examples of transload facilities can include rail-served warehouses, open areas where dimensional freight (such as lumber or steel) is moved between truck and rail, or open areas where dry or wet bulk materials, such as coal, sand, or cement are transferred.

2.4.1 Rail to Truck or Truck to Rail

The truck mode serves the majority of the first and last miles of all freight shipments. **Figure 2-15** shows Kentucky's freight rail network's connections to the truck mode via the interstates, parkways, and the National Highway System (NHS).

Figure 2-15: Kentucky's Freight Rail Lines and National Highway System



Source: KYTC, 2014

2.4.1.1 Trailer on Flat Car (TOFC)/Container on Flat Car (COFC)

Kentucky's rail network is an important component of the national intermodal rail network. Four intermodal terminals are located in Kentucky. These terminals are transfer points between truck and rail modes. NS operates three terminals, two in Louisville and one in Georgetown. CSXT opened a terminal in Louisville in 2012. **Table 2-16** lists intermodal facilities in Kentucky.

Table 2-16: Intermodal Facilities in Kentucky

Facility Name	Address	Serving RR
CSXT Louisville	8021 National Turnpike Road, Louisville, KY 40214	CSXT
NS Georgetown	601 Cherry Blossom Way, Georgetown, KY 40324	NS
NS Louisville – Appliance Park	4000 Buechel Bank Road Louisville, KY 40225	NS
NS Louisville - Buechel	4705 Jennings Lane Louisville KY 40218	NS

Source: NS and CSXT, 2014

According to the STB CWS, the vast majority (about 94 percent) of the intermodal units handled in Kentucky were overhead, or passing through the state, with non-Kentucky origins and terminations. Of the remaining six percent, three percent originated in Kentucky and three percent terminated in Kentucky. Empty containers traveled within the state (intrastate) while being relocated from one intermodal terminal to another, increasing overall freight costs. **Table 2-17** lists intermodal units hauled in Kentucky in 2011 by movement type.

Table 2-17: Intermodal Units by Movement Type, 2011

Direction	Units	Percent
Overhead	1,608,760	93.6
Outbound	56,560	3.3
Inbound	51,832	3.0
Intrastate	1,960	0.1
Total	**1,719,112**	**100**

Source: STB CWS, 2011

In Kentucky, many railroads carry intermodal freight. CSXT's Southeastern Corridor, crossing through Western Kentucky between Evansville, Indiana and Nashville, Tennessee, is by far their highest volume intermodal corridor in the state. Within the NS network, the most heavily used line in Kentucky begins in Cincinnati, Ohio, passes through Georgetown, Kentucky, and then extends southward toward Atlanta, Georgia.

Intermodal trains allow greater efficiency when the containers are double-stacked. Double-stacked trains allow railroads to ship more containers per train due to the increased capacity. The cost per container then declines with the resulting economies of scale. However, in Kentucky, some corridors are restricted by vertical clearances. Double-stacked trains require about 21 feet of vertical clearance from the top of the rails, much taller than the maximum height of any railcars in service at the time when many rail lines were built, resulting in some corridors being unable to accommodate double-stacked cars. The CSXT coal routes south of Cincinnati, Ohio handle intermodal trains but are unable to accommodate double-stack trains due to overhead height restrictions of tunnels and other infrastructure. Specifically, the line that crosses Kentucky between Cincinnati, Ohio and Knoxville, Tennessee is limited to 18 feet above the rails, which precludes some types of shipments and most double-stacked trains.

2.4.2 Non-Containerized Truck/Rail and Rail/Truck Facilities

Additional non-containerized rail to truck transfer facilities are listed in **Table 2-18**, including automotive distribution facilities, grain elevators, and transload facilities. Finished vehicles may be loaded onto trains at the automotive assembly plants within the state. Automotive distribution facilities are locations where rail shipments of vehicles are unloaded from trains and either delivered locally by truck or accumulated into unit trains for long-distance shipment. Not included in **Table 2-18** are dozens of rail-served warehouses within Kentucky, which also facilitate the transfer of freight between truck and rail.

Table 2-18: Non-Containerized Truck/Rail and Rail/Truck Facilities in Kentucky, 2014

Facility Name	City	Serving RR	Facility Type
NS Shelbyville Automotive Distribution	Shelbyville	NS	Automotive Distribution
Total Distribution Services Automotive	Louisville	CSXT	Automotive Distribution
Bluegrass Grain Company	Lexington	CSXT	Grain Elevator
Christian County Grain	Pembroke	NS	Grain Elevator
Henderson County Riverport	Henderson	CSXT	Grain Elevator / Transload
Hickman-Fulton County Riverport	Hickman	TKEN	Grain Elevator / Transload
Hopkinsville Elevator Company	Guthrie	CSXT, RJCM	Grain Elevator
Hopkinsville Elevator Company	Hopkinsville	CSXT	Grain Elevator
Hopkinsville Milling Company	Hopkinsville	CSXT	Grain Elevator
Mayfield Grain Company	Mayfield	PAL	Grain Elevator
Maysville-Mason County Riverport	Maysville	TTIS	Transload
Owensboro Riverport	Owensboro	CSXT	Grain Elevator / Transload
Paducah-McCracken County Riverport	Paducah	CSXT, PAL	Grain Elevator / Transload
Pilgrim's Pride	Mayfield	PAL	Grain Elevator
MARTTS - Mid America Truck Transfer System	Louisville	PAL	Transload
NS Independent Bulk Transfer Terminal	Louisville	NS	Transload
R&L Transport	Leitchfield	PAL	Transload
Thoroughbred Bulk Terminal	Louisville	NS	Transload
Thoroughbred Bulk Terminal	Somerset	NS	Transload
TRANSFLO	Louisville	CSXT	Transload
TTI Railroad	Paris	TTIS	Transload

Source: KYTC and riverport websites (Henderson County, Hickman-Fulton, Maysville-Mason County, Owensboro, Paducah-McCracken County), 2014

2.4.3 Rail/Barge Facilities

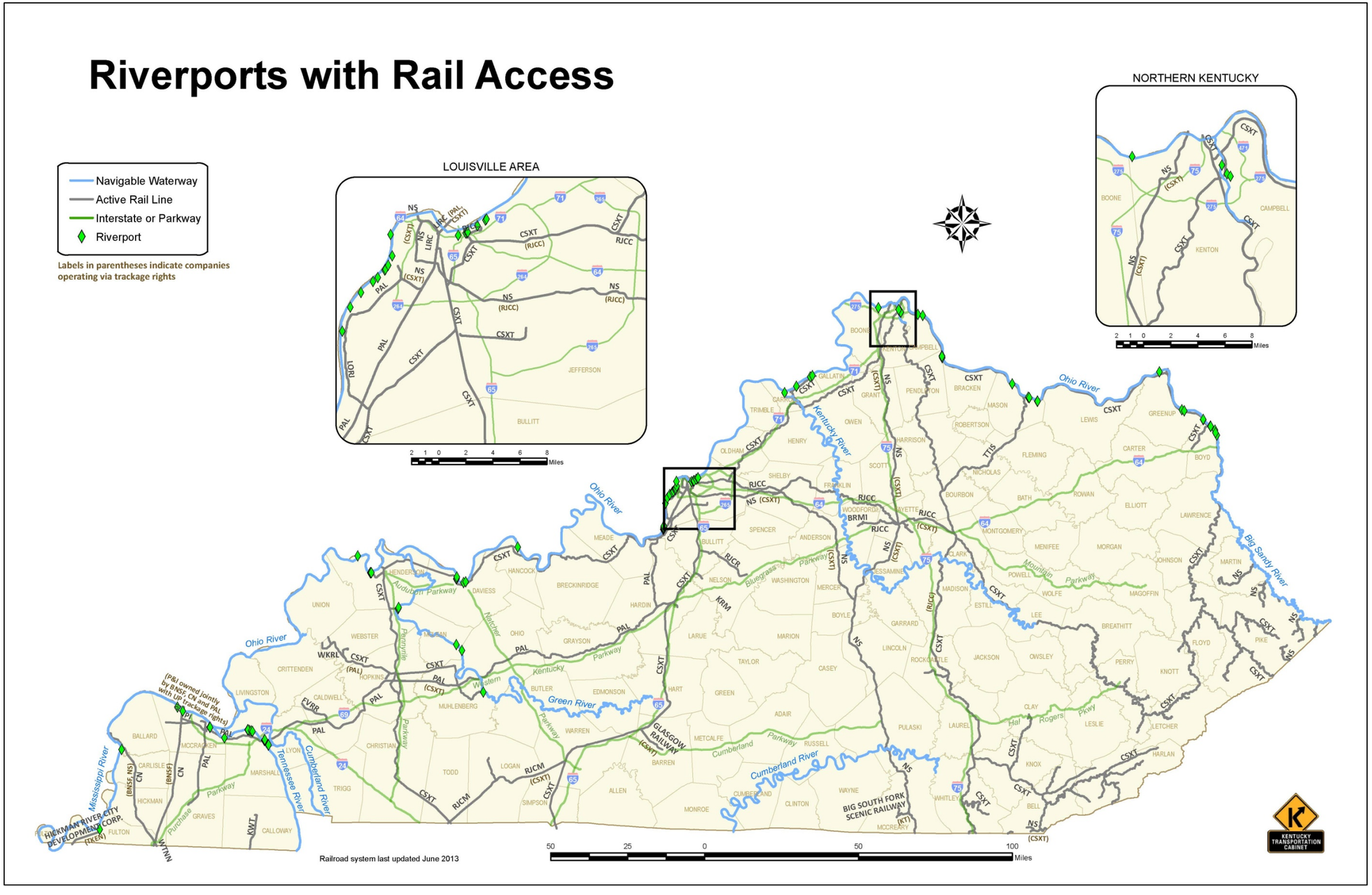
Kentucky is served by more than 1,980 miles of navigable waterways.[15] According to data from the U.S. Army Corps of Engineers (USACE), Kentucky riverports handled about 95 million tons of freight in 2012, making Kentucky the seventh largest state for total waterborne commerce in the nation based on tonnage. Kentucky ranks behind only Louisiana, Texas, California, New Jersey, Washington, and Illinois in waterborne freight tonnage. The majority of waterborne freight is energy-related, including coal and petroleum products. Other waterborne freight commodities include sand, gravel, metals/metallic ores, and agricultural products. Most riverport terminals in Kentucky are privately owned, including some of the highest volume coal terminals. The state's publicly owned terminals include seven active public riverports and five developing public riverports. The Ohio River is the largest component of the nine river waterway system, with 665 miles along the northern border of Kentucky.

[15] KYTC, 2014

Rail is a vital part of the operations of many of Kentucky's riverports. The 2014 USACE Port Facility Spreadsheet[16] lists 83 rail-accessed riverport terminals in the state, as depicted in **Figure 2-16.**

[16] USACE Navigation Data Center, http://www.navigationdatacenter.us/ports/ports.asp, 2014

Figure 2-16: Rail-Served Riverport Facilities



Source: KYTC, 2014

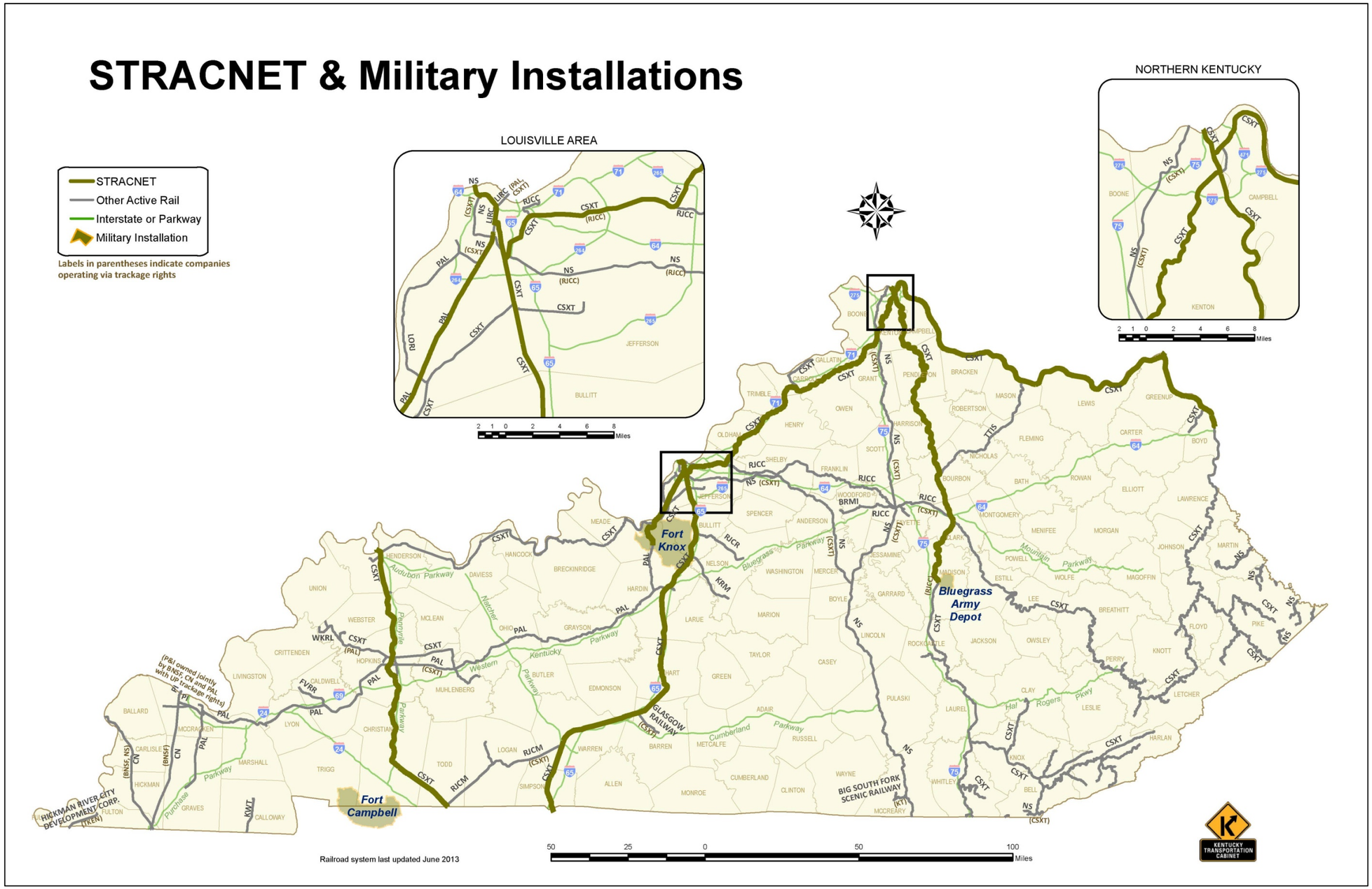
2.5 STRATEGIC RAIL CORRIDOR NETWORK

The United States Department of Defense (DoD) has designated the Strategic Rail Corridor Network (STRACNET), a network of 30,000 miles of rail corridors that are considered important to national defense. The STRACNET was developed through analysis of mobilization needs, deployment needs, and peacetime traffic. The FRA designated a rail mainline to satisfy each STRACNET corridor. Also designated are connector rail lines to provide links between the STRACNET and military installations or activities that require rail service.

STRACNET lines are required to be maintained to at least FRA Track Class 2 Standards, with a minimum speed of 25 mph for freight. The low density lines connecting STRACNET routes to military installations are to be maintained to at least FRA Track Class 1 Standards with a minimum speed of 10 mph for freight. STRACNET lines must be able to accommodate railcars that are 12 feet wide and 16.92 feet tall.

STRACNET main lines pass through Kentucky, and connectors provide rail access to Fort Knox, Fort Campbell, and the Blue Grass Army Depot. **Figure 2-17** shows the state's STRACNET lines and military installations in Kentucky.

Figure 2-17: STRACNET and Military Installations in Kentucky



Source: KYTC, 2014