

Tennessee Waterway Assessment Study



prepared for

The Nashville District of the U.S. Army Corps of Engineers

and

The Tennessee Department of Transportation

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1.0 INTRODUCTION AND PURPOSE

The State of Tennessee is centrally located on the nation's inland waterway system. With more than 1,062 miles of navigable waterways, Tennessee waterways connect terminals on the Tennessee, Cumberland, and Mississippi Rivers, and their tributaries, with river ports in 21 states and ocean ports in Houston, New Orleans, and Mobile.

The Tennessee Waterway Assessment Study (Study) is intended to provide short and long-range plans of action so that the Cumberland, Mississippi, and Tennessee River Systems and their tributaries will maintain their recognition as part of the national transportation system. The primary objectives are to increase the use of water transportation and improve regional and national economic conditions by increasing utilization of cost-effective, fuel-efficient, environmentally-friendly waterway transportation. To fully address this goal, the Tennessee Department of Transportation (TDOT) entered into an agreement with the U.S. Army Corps of Engineers, Nashville District (COE) to provide an overview of the inland waterways in Tennessee. The COE entered into an agreement with GKY & Associates which subcontracted the work to Hanson Professional Services Inc.

Phase 1 of the Study provides baseline information comprised of the following:

1. An overview of the Inland Waterways in Tennessee, in context of freight transportation.
2. An inventory of existing commercially navigable waterways in Tennessee, facilities and terminals, focusing on general cargo terminals and multimodal freight transportation infrastructure at these river ports.
3. A general assessment of waterborne commodity flows.
4. Identification of stakeholder groups and programs in neighboring states with regards to waterways transportation and port development.
5. Recommendations for Phase II tasks and scope of work.

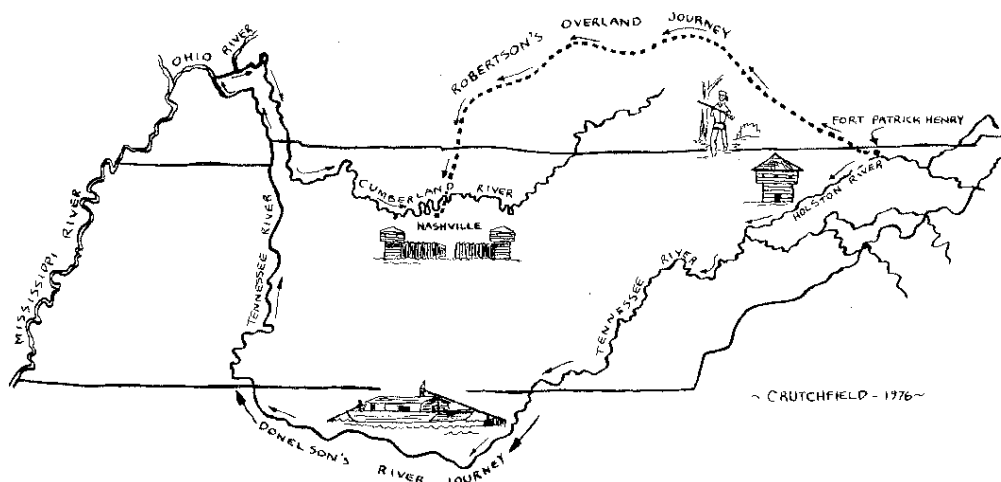
2.0 OVERVIEW OF HISTORIC AND CURRENT INLAND WATERWAY SYSTEM IN TENNESSEE

The Tennessee and Cumberland Rivers were first mapped in 1769. Both rivers had nearly identical characteristics; wild, fluctuating streams; tortuous, boulder-littered channels; broken by serious obstructions to navigation. Together these rivers comprise what has historically been referred to as the Twin Rivers.

2.1 Early Pioneer Settlement

No discussion of early pioneer settlement in Tennessee is complete without mention of the names Robertson and Donelson. James Robertson and Col. John Donelson joined forces in 1779 to settle in Middle Tennessee. The seemingly innocuous plan called for Robertson to lead the men over land to current-day Nashville while the women and children followed by boat, led by Col. Donelson. This expedition marked the first recording of the hazards of the twin rivers.

Donelson's route called for the party's flotilla of boats to sail from Fort Patrick Henry down the Holston River to the Tennessee River, down the Tennessee River to the Ohio River, thence up the Ohio to the Cumberland River and up the Cumberland River.



General route of the Robertson and Donelson parties in 1779-80.

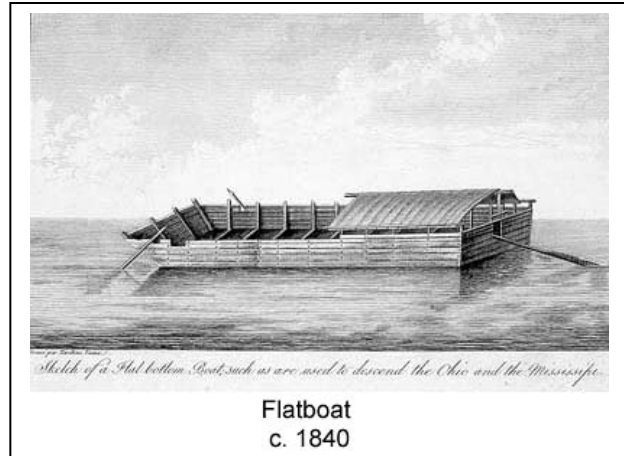
That journey saw obstacles in the forms of impassable shoals, tumultuous eddies, Native American attacks, and smallpox. The first leg of the trip, traversing down the Tennessee, was the most dangerous. That passage took three months and in that time, according to Col. Donelson's journal, 28 members of the party were killed, at least five more injured by Native American attacks, and all were hungry, weak, and tired.

The second phase of the journey was to navigate the Cumberland River from present-day Paducah, KY "upstream against the rising waters of the cantankerous Cumberland in unwieldy craft entirely unsuited for upstream navigation." The flotilla made it thanks to much paddling, poling, and pulling, as well as a make-shift sail. Donelson and his party finally reunited with Robertson and the rest of the men on April 24, 1780. They had departed on December 22, 1779.

New settlement inevitably invites new trade and Robertson's and Donelson's Middle Tennessee settlement was no exception. From Leland Johnson's book *Engineers on the Twin Rivers: A History of the Nashville District United States Army Corps of Engineers*:

... despite the difficulties of navigating the unimproved channel of the Cumberland, Indian resistance to the incursion of the settlers, and heavy duties laid on commerce by the Spanish on the Lower Mississippi, flatboats crammed to the gunwales with the bountiful produce of the Cumberland Valley were soon embarking from the Middle Tennessee settlements on the way to market at New Orleans. In 1785 North Carolina, of which the Tennessee settlements were a part until 1790, established a tobacco inspection program in Davidson County and another at Clarksville in 1789. There was such an extensive trade on the Cumberland by 1797 that Congress established Palmyra, Tennessee, as a port of entry, one of the first on the Transappalachian frontier.

This trade typically moved by flatboats. By definition, a flatboat is a boat with a flat bottom and square ends used to transport freight on inland waterways. The nature of these boats was such that they could float downstream, but not back up. Once a flatboat reached its destination, it was disassembled and its crew had to walk back to the point of origin. For trade between Middle Tennessee

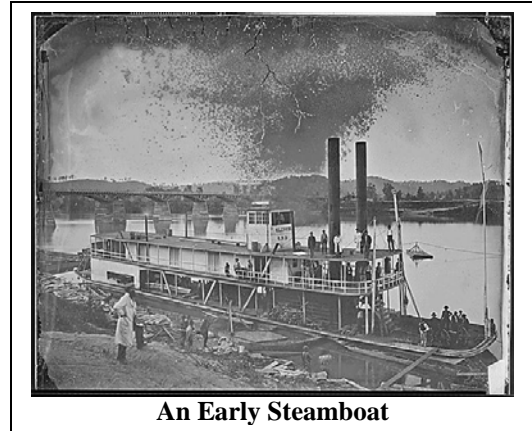


and the area between New Orleans and Natchez, this walk was usually along the Natchez Trace. In the late 1700s and early 1800s, the Natchez Trace was used extensively by Native Americans and early Caucasian explorers as both a trade and transit route.

By the early 1800s, more advanced ships such as steamers were successfully advancing trade on inland waters such as the Hudson and Mississippi Rivers. Would-be traders on the Twin Rivers, however, found themselves facing the same obstacles as Donelson – the waterways were, simply put, difficult to navigate. Perhaps the greatest navigational obstacle that the Tennessee River posed is the rampant, racing waters of Muscle Shoals. In 1836 a canal was built around the Muscle Shoals by the State of Alabama with Federal Aid. The canal was not very successful because ships could not pass during the low waters months. No maintenance was performed on the canal because no funds had been appropriated. In 1838, the canal was abandoned and by the mid-1800's, the railroads began to take traffic away from the rivers.

In 1867, there was a renewed interest in water transportation on the Tennessee River, especially throughout the Shoals area. This time, the reconstruction of the canal to bypass the treacherous navigation in the Shoals area was funded and engineered by the federal government. Using an innovative design, the canal was widened and reconstructed with a series of locks and dams. This design later aided in the planning of the Panama Canal.

In 1890, the first steamboat traveled from St. Louis to Chattanooga through the redesigned canal linking the Shoals area to the ever changing world. The Muscle Shoals Canal was one of the 19th century's amazing accomplishments. The canal increased river transportation, which in turn increased trade, leading the way for the use of inland waterways as a viable alternative for the transportation of goods.



2.2 U.S. Army Corps of Engineers

The beginnings of trade on the Cumberland River had similar tumultuous beginnings as the Tennessee River. From the beginning of commercial navigation until the Civil War, little effort was made to improve these waterways.

In the 1820's, steamboats were carrying tobacco, hemp, and cotton down the Cumberland. The Cumberland, however, was extremely perilous. Impassable at low water levels, steamboat accidents became commonplace.

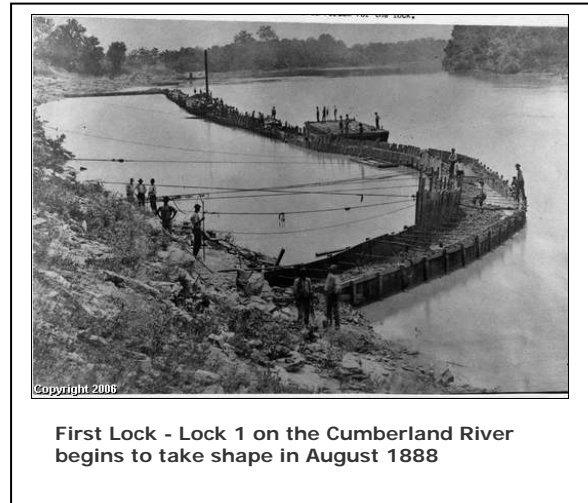
In April of 1824, Congress passed the General Survey Act, charging the U.S. Army Corps of Engineers (COE) to prepare surveys, plans, and estimates to improve channels. Then, in May 1824, the first Rivers and Harbors Act was passed. It provided for the improvement of navigation by removing snags, old sand bars, and timber from the banks. From this date on, the COE was given the mission of keeping the rivers navigable.

2.3 The First Locks and Dams

Canal projects on the Twin Rivers contributed to the renewal of hope and revival of trade and industry in the Tennessee and Cumberland River valleys after the Civil War. Canals, however,

were not the long-term solution to navigational problems. For deep-draft vessels, the construction of locks and dams would be required.

In 1887, plans were prepared for the first lock and dam on the Cumberland River, right across from the Metro Center Levee, creating a pool for Nashville, the busiest harbor on the Cumberland. This ultimately led to the beginnings of the Nashville District Corps of Engineers in 1888. The District's first task was to oversee the construction of a series of locks and dams on the Cumberland River.



Over the next 40 years, fifteen locks and dams were built on the Cumberland River and were kept in service until the modern, multi-purpose dams that are now in operation were constructed.

2.4 Establishing the Tennessee Valley Authority

In 1933, Congress, under the leadership of Franklin D. Roosevelt, passed the Tennessee Valley Authority (TVA) Act. The purpose of the act was to form an agency that would improve the navigability and flood control of the Tennessee River, and provide for affordable power, economic growth and protection of natural resources.

Since TVA's inception, the agency has contributed to the economic development of the Tennessee Valley region. In the 1930's, dams were built to control floods, improve navigation, and generate electricity. During the early 1940's, TVA engaged in one of the largest hydropower construction programs ever undertaken in the United States, building 12 hydroelectric projects and a steam plant.

By the 1950's, TVA had completed a 650-mile navigation channel the length of the Tennessee River and had become the nation's largest electricity supplier.

In the years to follow, TVA continued to lead the way in the energy and environmental areas.

2.5 Managing the Rivers Today

In most of the United States, the COE has responsibility for the operation and maintenance of commercial navigation projects, while the U.S. Coast Guard (USCG) ensures safe transportation on America's waterways and protection of the marine environment. On the State of Tennessee River however, the responsibility for operation and maintenance of the navigable inland waterways is shared between the COE and TVA. This shared responsibility is further described in the following paragraphs.

On the Cumberland and Mississippi Rivers, the COE is responsible for the direction of all water resource activities. This entails the operation and maintenance of 4 navigation lock projects on the Cumberland River. The COE also maintains a commercial navigation channel along 355 miles of the Mississippi River which borders the State of Tennessee. Since there are no locks or dams on the Mississippi River below St. Louis, the COE's responsibility on this portion of the river is primarily river maintenance for navigability.

On the Tennessee River, the COE works in partnership with TVA. TVA owns and manages the overall system which includes nine main and four auxiliary locks. The COE operates the locks, performs maintenance dredging on the main channel, and designs and builds new locks and major rehabilitations. TVA and the COE share responsibility for lock maintenance and lock facility design and construction. The USCG installs and maintains the navigation aids along the commercial channel.

Of the locks and dams managed by the COE and TVA, eight are physically located in the State of Tennessee; three on the Cumberland River and five on the Tennessee River as shown in

Exhibits 2-1 and 2-2. These river dams form a “staircase” of quiet, pooled water and controlled current.

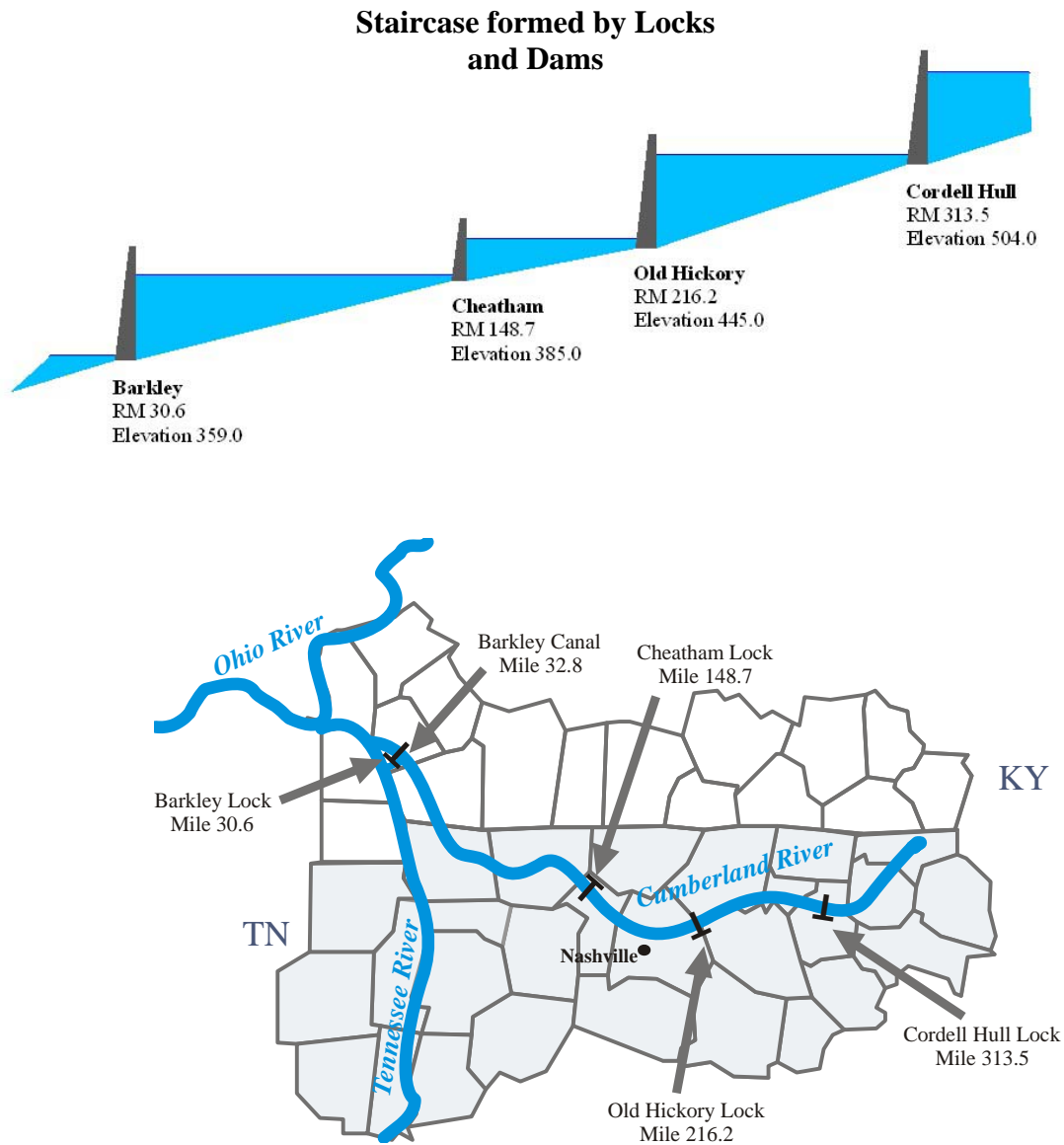


Exhibit 2-1. Locks and Dams on the Cumberland River

Staircase formed by Locks and Dams on the Tennessee River

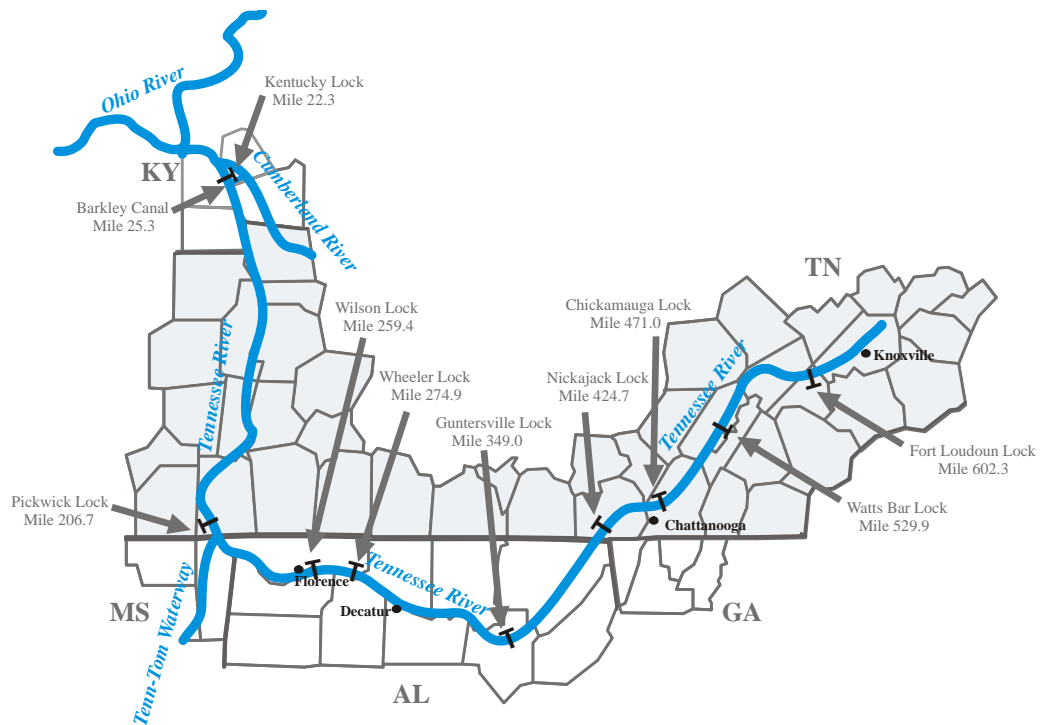
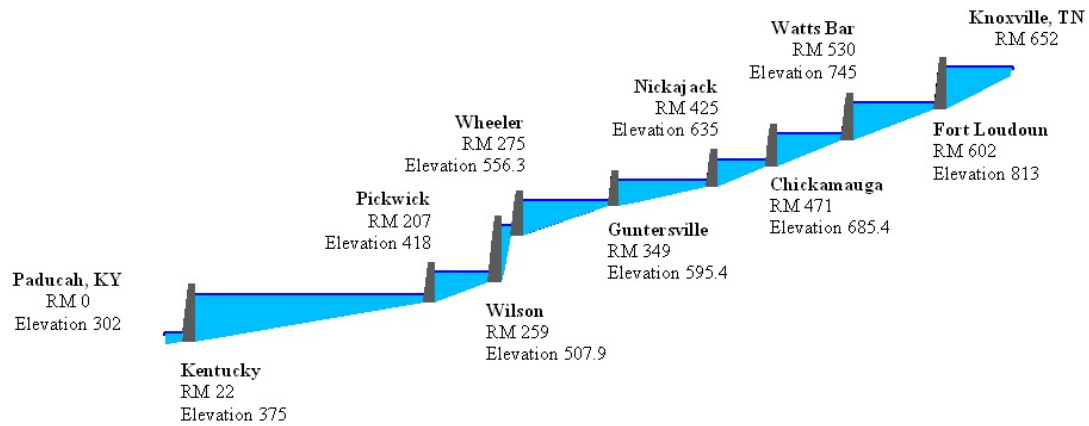


Exhibit 2-2. Locks and Dams on the Tennessee River

2.5.1 Cumberland River Locks and Dams *(Source: U.S. Army Corps Engineers)*

Barkley Lock & Dam - Barkley Lock and Dam is located on the Cumberland River 30.6 miles upstream of the Ohio in Grand Rivers, KY. The lock was opened to navigation in 1964 and has clear chamber dimensions of 800' x 110'. The Cumberland River downstream of Barkley Lock features several sharp turns (or bends) which limit navigation to one tow at a time. This, combined with varying flow levels on the Cumberland, cause the towing industry to favor using Kentucky Lock for loaded barges and Barkley Lock for empty barges.



Cheatham Lock - Cheatham Lock is located near Ashland City, TN at river mile 148.7 on the Cumberland River. The lock is the second lock on the river approximately 40 river miles downstream from Nashville, TN. Construction was started on Cheatham Lock in 1950 and the lock went into temporary operation December 12, 1952. It went into permanent operation on August 7, 1954.



The lock chamber is 800' x 110' and provides a normal lift of 26 feet. Also, the chamber requires 17,115,429 gallons of water and approximately 12 minutes to fill. It takes approximately 15 minutes to empty.

Old Hickory Lock & Dam - Old Hickory Lock and Dam, located on the Cumberland River at mile 216.2 in Sumner and Davidson Counties, Tennessee, is approximately 25 miles upstream from Nashville, Tennessee. The city of Hendersonville is situated on the northern shoreline of the lake and the city of Old Hickory is located on the southern side of the lake, just upstream of the lock and dam. The lake extends 97.3 miles upstream to Cordell Hull Lock and Dam near Carthage, Tennessee. Built in 1954, the lock's dimensions are 400' x 84'.



Cordell Hull Lock & Dam - Built in 1973, Cordell Hull Lock and Dam is located at Cordell Hull Lake on the Cumberland River at river mile 313.5, about 5 miles upstream of the city of Carthage, Tennessee. Built in 1973, the lock dimensions are 400' x 84'. Modern lock facilities are provided for through river traffic from above Nashville to the head of navigation near Celina,



Tennessee. It takes approximately 30 minutes to lock a boat through the 400' x 84' foot lock which contains approximately 17 million gallons of water.

2.5.2 Tennessee River Locks and Dams (*Source U.S. Army Corps Engineers*)

Kentucky Lock - Kentucky Lock is located near Gilbertsville, Kentucky, 22.3 miles from the confluence of the Tennessee and Ohio Rivers. It is 20 miles east of Paducah, Kentucky. The 184-mile reservoir created by Kentucky Dam stretches across parts of Tennessee and Kentucky and is the largest in the Eastern U.S. Built in 1942, the lock dimensions are 600' x 110'.



Ground was broken in October of 1999 on a new 1,200' x 110' lock. Completion of the new lock under realistic funding scenarios may not occur until beyond 2020. The existing lock will continue to be used as an auxiliary.

Pickwick Lock - Pickwick Lock is approximately 12 miles south of Savannah, Tennessee. It is just north of the Mississippi state line.

Located at Tennessee River mile 206.7, it is 52.7 miles below Wilson Lock and 184.7 miles above Kentucky Lock. There are two locks. The main lock is 1,000' x 110'. The auxiliary lock is 600' x 110'. Construction on the first lock was completed in 1937 by TVA. The larger lock was completed and put into operation in 1982.



Wilson Lock – Wilson Lock is located in the northwest corner of Alabama. Located at Tennessee River mile 259.4, the lock is 15 miles below the Wheeler Locks and 52.7 miles above Pickwick Lock.



It is the highest single lift lock east of the Rocky Mountains with a normal lift of between 93 and 100 feet. Originally built in 1927, several improvements were made by TVA in 1959 including completion of the main single-lift lock to replace the old double-lift lockage system. The new lock began operating on November 10, 1959 and is 600' x 110'.

Wheeler Lock – The Wheeler Locks are located about 30 miles from Decatur, Alabama at river mile 274.9. They are 15 miles above the Wilson Locks and 74.1 miles below Guntersville Lock. Built in 1963, the main lock at Wheeler is 600' x 110'. It takes 10 minutes to fill or empty the chamber of its 25 million gallon capacity. The auxiliary lock, built in 1934, is 400' x 60'. Both locks have a maximum lift of 51.5 ft. and an average lift of 45 ft.

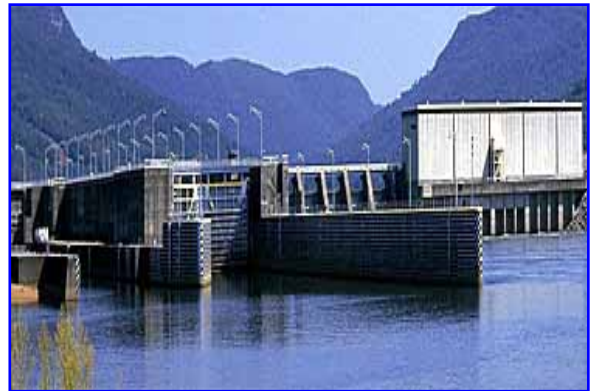


Guntersville Lock – Guntersville Lock is located at Tennessee River mile 349, nine miles downstream from the city of Guntersville, Alabama. It is 75.3 miles downstream from Nickajack Lock and 74.1 miles above the Wheeler Locks.



Put into operation in 1965, Guntersville's main lock is 600' x 110'. It takes 10 minutes to fill the chamber to its 22 million gallon capacity and 11 minutes to empty it. The auxiliary lock, built in 1937, is 360' x 60' and holds 7 million gallons of water. Its fill and empty times are both 20 minutes.

Nickajack Lock – Nickajack Lock is located 35 miles west of Chattanooga, Tennessee near the city of Jasper at river mile 424.7. It is 46.3 miles below Chickamauga Lock and 75.3 miles above Guntersville Lock. Construction began on the 600' x 110' Nickajack Auxiliary Lock in March of 1964. TVA completed it for operation in December 1967. The foundation for an 800 ft. long main lock was also laid, but it remains incomplete. This lock will not be completed until the amount of traffic exceeds the capacity of the current auxiliary lock.



Chickamauga Lock & Dam – Chickamauga Lock and Dam is located at mile 471 of the Tennessee River in the port of Chattanooga, Tennessee. TVA built the project in the 1930's. The lock was placed in temporary operation in 1938 and was completed in 1940. The lock chamber measures 360' x 60'. Chickamauga Lock



has a history of problems associated with concrete expansion. A study conducted by the COE recommended the construction of a new 600' x 110' lock chamber. The existing lock requires aggressive maintenance to confront its Alkali Aggregate Reaction (AAR) problem. This expansion of concrete features is causing misalignment of mechanical components and would eventually cause the lock to be closed. Congress has authorized construction of a 600' x 110' replacement lock riverward of the existing structure which will remove four of the existing spillway bays. Project construction began in 2004. The COE currently projects the entire lock project could be completed by 2013, pending congressional funding.

Watts Bar Lock – Watts Bar Lock is located near Decatur, Tennessee at Tennessee River mile 529.9. It is approximately halfway between Chattanooga and Knoxville. The lock is 72.4 miles downstream from Fort Loudoun Lock and 58.9 miles above Chickamauga Lock. Built in 1942, the lock's dimensions are 360' x 60'.



Fort Loudoun Lock – Fort Loudoun Lock is located near Lenoir City, Tennessee, some 55 miles downstream from Knoxville. It is at Tennessee River mile 602.3, some 73.4 miles upstream of Watts Bar Lock. Completed in 1944, the lock's dimensions are 360' x 60'.



2.6 Tennessee Department of Transportation

The Tennessee Department of Transportation (TDOT) was established in 1972 to provide the citizens of Tennessee with an efficient and economical transportation system. It was during this initial formation that the Transportation Act of 1972 was passed by the Tennessee State Legislative establishing the Bureau of Industrial Marine and Watercraft Transportation (Bureau). This formally moved TDOT into the area of water transportation. The Bureau's purpose was to provide a water transportation system which would efficiently serve the movement of goods and people, and provide for the implementation of statewide social, economic, and recreational goals while maintaining the state's ecological and environmental objectives.

In 1987, TDOT reorganized forming the Public Transportation, Waterways and Rail Division. This division was divided into two offices: the Office of Public Transportation and the Office of Rail & Water Transportation.

- **The Office of Public Transportation**

The Office of Public Transportation has responsibility for transit planning, capital and operating assistance to non-urbanized and urbanized areas, elderly and disabled transportation, statewide ridesharing, development of park and ride lots, promotion of efficient transit systems through the coordination of available resources, and research and technical assistance in all aspects of public transportation.

- **The Office of Rail & Water Transportation**

The Office of Rail & Water Transportation oversees short line railroad track and bridge rehabilitation, railroad track and bridge needs assessments, and offers assistance to the inland waterways of Tennessee. In prior years, a number of waterway assessment studies have been conducted by this TDOT division, including such topics as river port development, transportation on the waterways, a feasibility study and master plan,

economic impacts of waterways, development and management of ports, and most recently, a Tennessee Lake and Rivers Resource Booklet.

In the 1990's, the Public Transportation, Waterways and Rail Division created the Office of Rail Safety, which took over the former Public Service Commission's (PSC) railroad regulatory functions, as well as grade crossing safety. This Office was divided into two sections: the Railroad Regulatory Section and the Grade Crossing Safety Section.

- **Railroad Regulatory Section**

The Railroad Regulatory Section partners with the Federal Railroad Administration (FRA) to enforce Federal Railroad Law (CFR Part 49) and oversees railroad safety programs, inspections, new construction, and operating programs & procedures. The Railroad Regulatory Section is a Tennessee Emergency Management Agency (TEMA) responder for railroad emergencies in Tennessee.

- **Grade Crossing Safety Section**

The Grade Crossing Safety Section oversees railroad crossing inventories, closures, signal reviews, standards and related task force and work groups.

The Public Transportation, Waterways and Rail Division is currently undergoing another structural reorganization. In October, 2006, the Grade Crossing Safety Section was relocated to TDOT's Maintenance Division. In July, 2007, the Railroad Regulatory Section will be relocated and become part of TDOT's Chief Engineers staff. The Office of Public Transportation and the Office of Rail & Water Transportation will continue to be a joint division, with the Office of Rail & Water continuing to oversee short line railroads, inland waterways, as well as the newly added functions of freight transportation and the state safety oversight program for fixed rail guide-way

systems. This new division will report directly to the Commissioner of TDOT, but the organizational flow has yet to be completed.

2.7 Transportation Overview

Economic development opportunities are enhanced by connectivity to several modes of transportation. As shown in Exhibit 2.3, the State of Tennessee has a comprehensive intermodal transportation system of inland waterways, interstate highways, and railroads. According to TDOT, the state has nearly 770 miles of shortline railroads and 13,752 miles of state-maintained highways, representing 16 percent of the total highway miles within the state and carrying 72 percent of the traffic. Included in the state highway system are 1,074 miles of interstate highways. Although the interstate system makes up just over one percent of the total highway mileage, it carries one quarter of all the traffic in Tennessee.

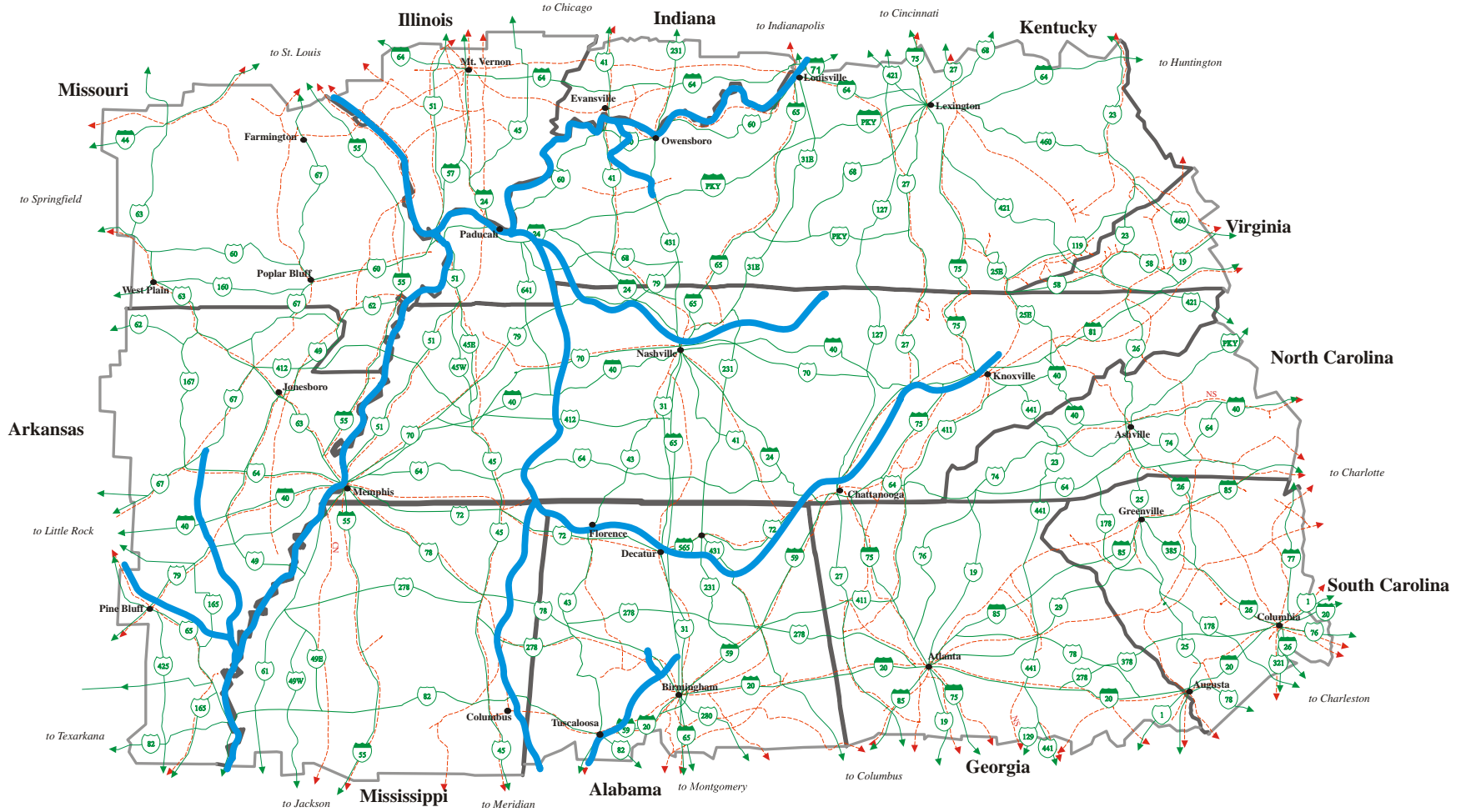


Exhibit 2.3 Transportation Routes – State of Tennessee

3.0 WATERBORNE COMMERCE

Barges continue to be used today for the movement of large quantity bulk commodities and raw materials on the nation's inland waterway system (Exhibit 3.1). According to the COE, nearly 630 million tons or 15% of the nation's freight moved on the inland waterways in 2004 with dominant commodities including coal, petroleum products, raw materials and grain, as shown in Exhibit 3.2.

River transportation produces many benefits. It provides a cost-effective, energy efficient and environmentally sound alternative to land-based transportation modes as shown in Exhibits 3.3 and 3.4. In addition to the distinct advantages in energy savings, barge transportation helps relieve highway congestion and generates far less air and noise pollution, per ton of freight moved, than truck or rail. The movement of commerce on the nation's waterways greatly reduces wear and tear on public highways and bridges. Statistics also show that waterborne transportation significantly reduces the number of traffic accidents and, by extension, the number of traffic fatalities, by reducing the number of vehicles on the highways and at rail crossings.

Over 15% of the nation's freight is moved on inland waterways for less than 2% of the nation's freight movement cost. According to research by the Tennessee Valley Authority, this cargo moves at an average transportation savings of \$10.67 per ton over the cost of shipping by alternative modes. This translates into over \$7 billion annually in transportation savings to the economy of the United States.

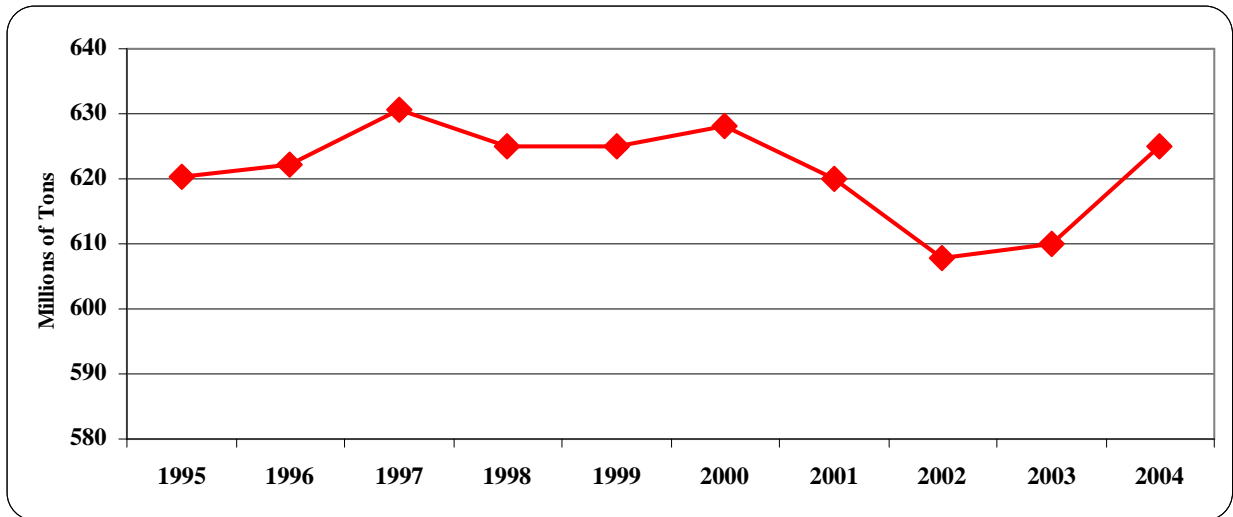
To carry goods and commodities, the inland river transportation system utilizes barges that are linked together to form tows. Each tow is pushed with a towboat. A standard jumbo hopper barge is 195 feet long by 35 feet wide. Each barge carries the equivalent of 15 to 20 rail car loads or 50 to 60 truck loads of material.





Exhibit 3-1. Inland Waterway System

National Inland Waterway System Trends in Commerce



National Inland Waterway System Commerce By Commodity

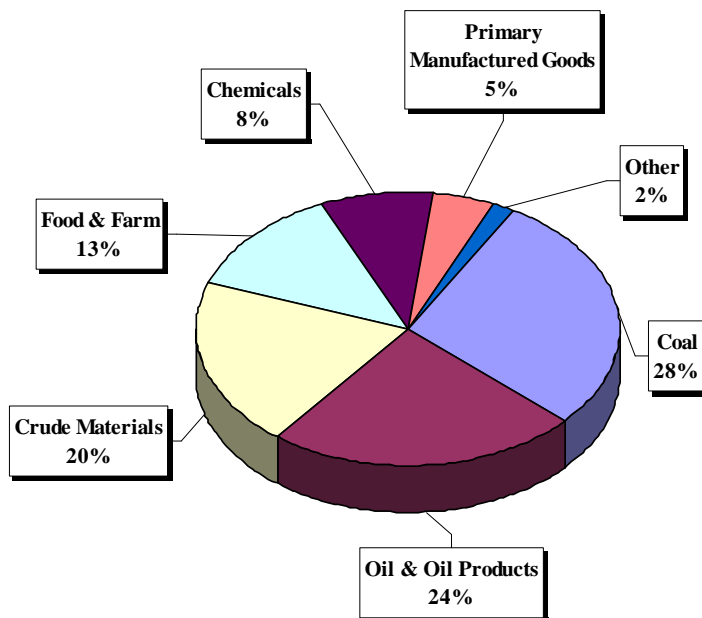







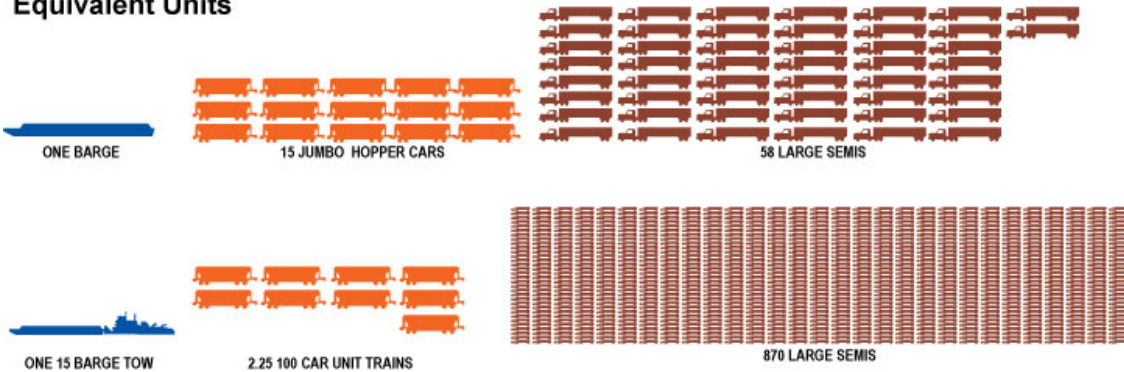
Exhibit 3-2. 2004 National Inland Waterway System – Trends in Commerce

Compare...

Cargo Capacity

				
ONE BARGE	ONE 15 BARGE TOW	JUMBO HOPPER CAR	100 CAR TRAIN UNIT	LARGE SEMI
1,500 TON	22,500 TON	100 TON	10,500 TON	26 TON
52,500 BUSHELS	787,500 BUSHELS	3,500 BUSHELS	350,000 BUSHELS	910 BUSHELS
453,600 GALLONS	6,804,000 GALLONS	30,240 GALLONS	3,024,000 GALLONS	7,865 GALLONS

Equivalent Units



Equivalent Lengths



Source: Iowa Department of Transportation
#HANS 10-0100

Exhibit 3-3. Comparisons of Transportation Modes

FUEL EFFICIENCY

1 gallon of fuel can move
1 ton of cargo...



59 miles by truck



202 miles by train



514 miles
by barge

Exhibit 3-4. Fuel Efficiency by Transportation Mode

Where river transportation exists as a viable alternative, rail freight rates typically must be competitive with waterway shipping rates. Where a river does not exist as an alternative, rail freight rates may rise to be competitive with truck rates. According to the U.S. Army Corps of Engineers (COE) 2004 Civil Works Strategic Plan, the navigation infrastructure of waterborne commerce saves \$7 billion annually in transportation costs by providing a more energy-efficient and environmentally friendly form of conveyance than rail or road transportation modes.

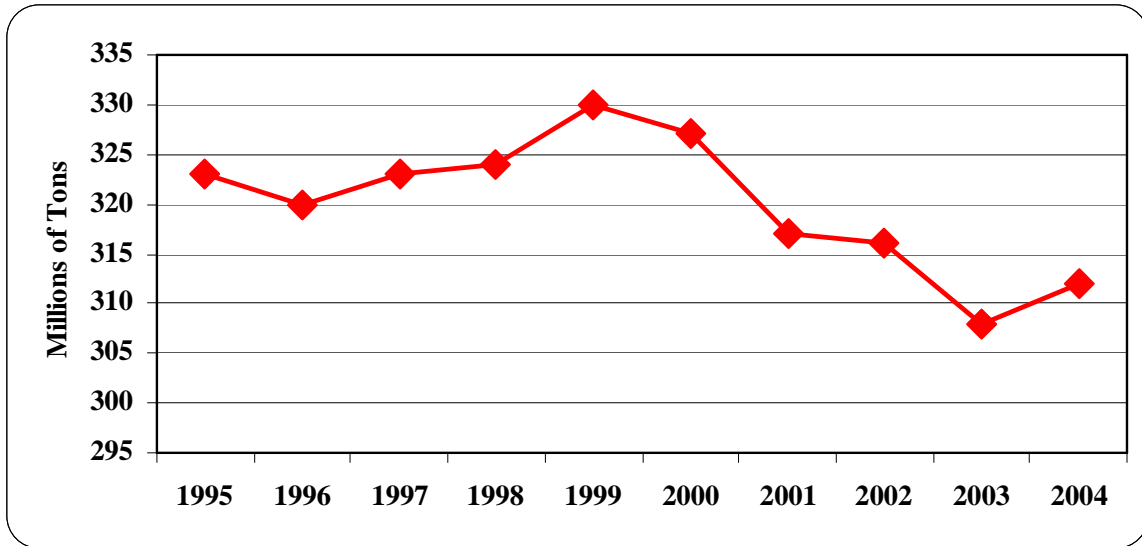
3.1 Waterborne Commodity Movements

Exhibit 3-5 characterizes the total movement of commodities on the Mississippi River. Exhibits 3-6 and 3-7 show the total movement of commodities in 2004 through the State of Tennessee on the Tennessee and Cumberland Rivers, respectively. Exhibit 3-8 shows each commodity as both a percentage of the total tonnage of all commodities and as a percentage of the total value of all commodities.

According to the COE, over 31 million tons of commodities worth over \$4.2 billion moved to, from and within the State of Tennessee in 2004. 3.2 million tons of these commodities were shipped out of the state. A sizeable portion of this outbound tonnage consisted of petroleum and aggregates. 61% of the 25.2 millions tons of commodities shipped to Tennessee was coal, with three Tennessee Valley Authority power plants receiving almost 14.2 million tons for electrical power generation.

Neighboring state Kentucky was Tennessee's top trading partner with over 15.1 million tons moving on barges between the states in 2004 as shown in the table on page 28. Tennessee supplied Kentucky with gasoline and gypsum, while Kentucky supplied most of the coal to Tennessee's power plants.

Mississippi River Trends in Commerce



Mississippi River Commerce by Commodity

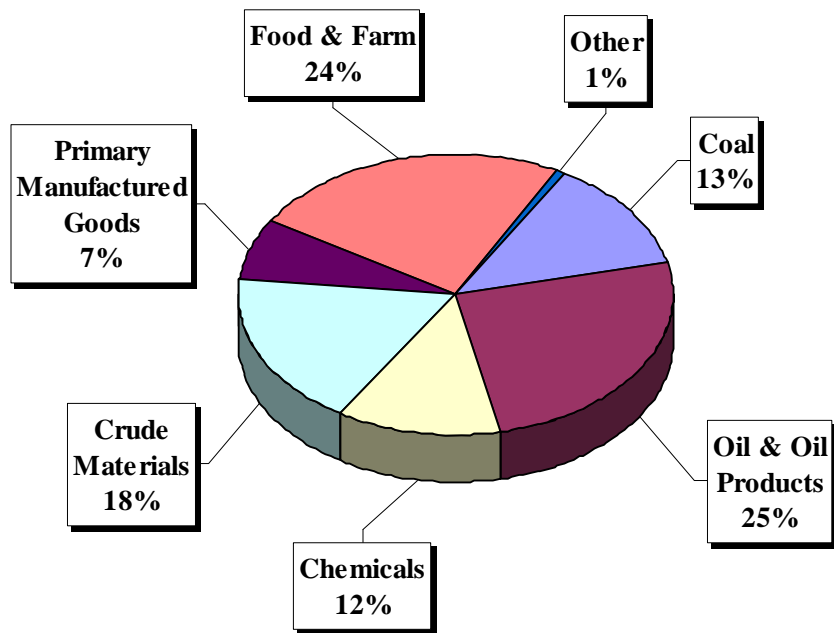
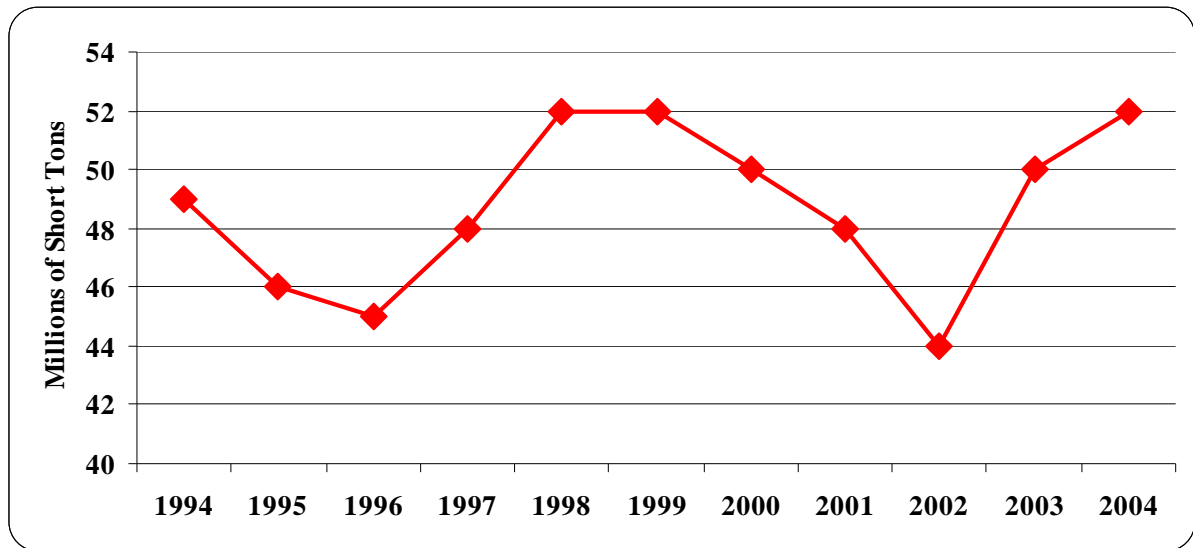


Exhibit 3-5. 2004 Trends in Commerce on the Mississippi River

Tennessee River Trends in Commerce



Tennessee River Commerce by Commodity

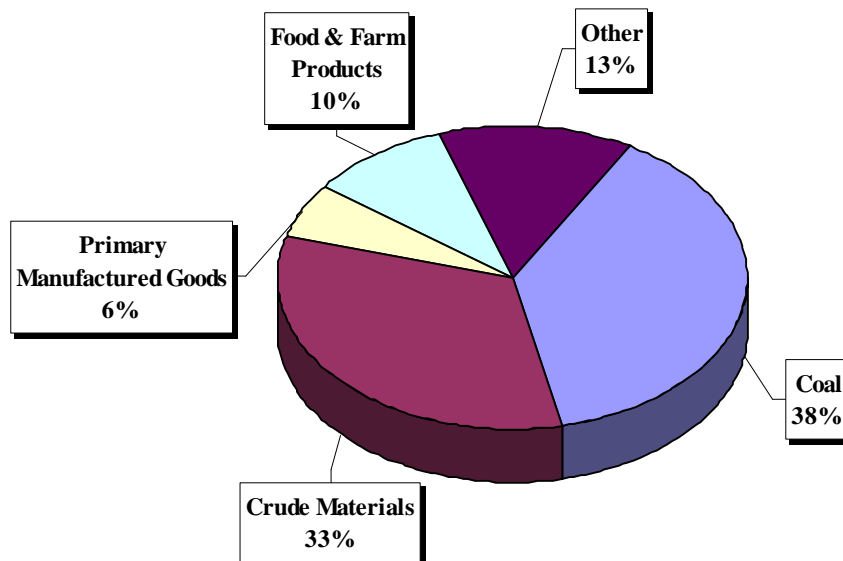
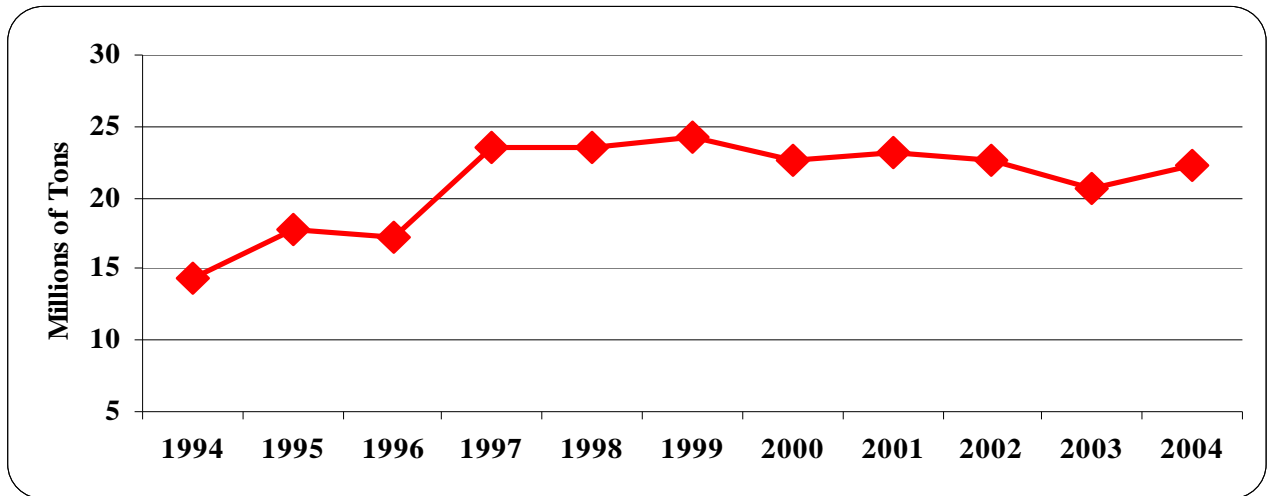


Exhibit 3-6. 2004 Trends in Commerce on the Tennessee River

Cumberland River Trends in Commerce



Cumberland River Commerce by Commodity

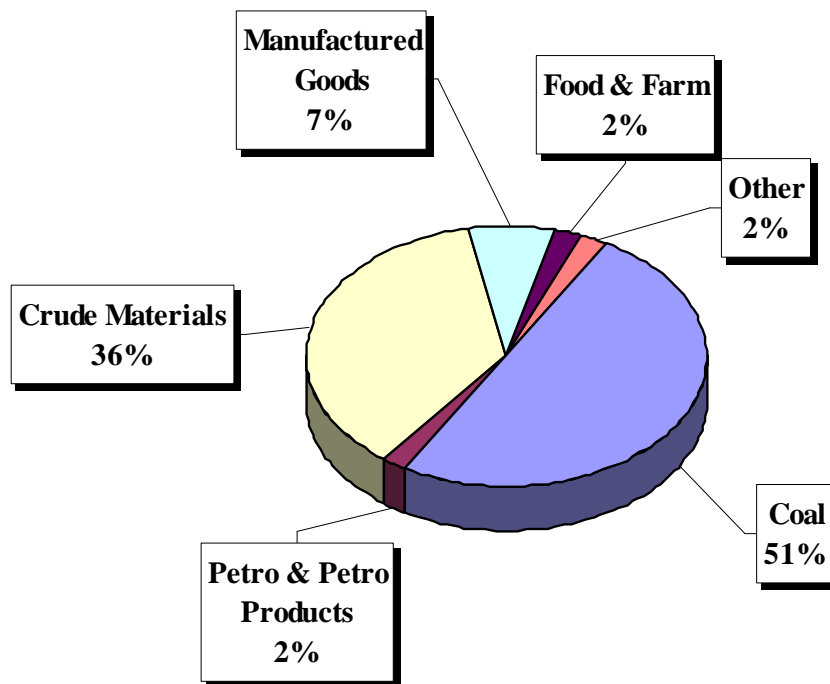


Exhibit 3-7. 2004 Trends in Commerce on the Cumberland River

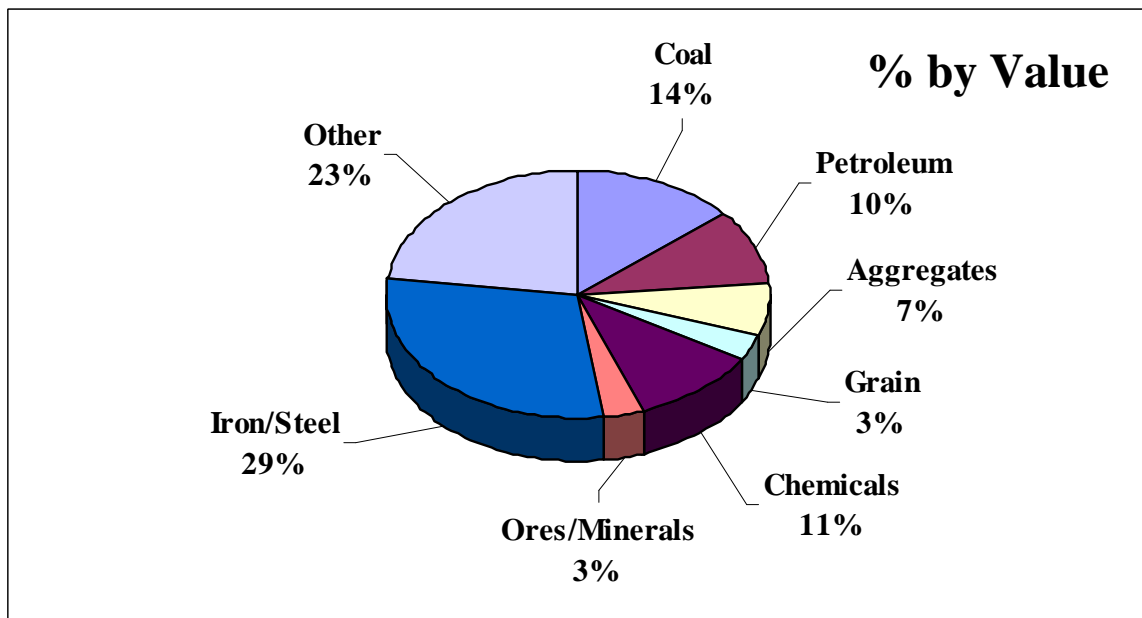
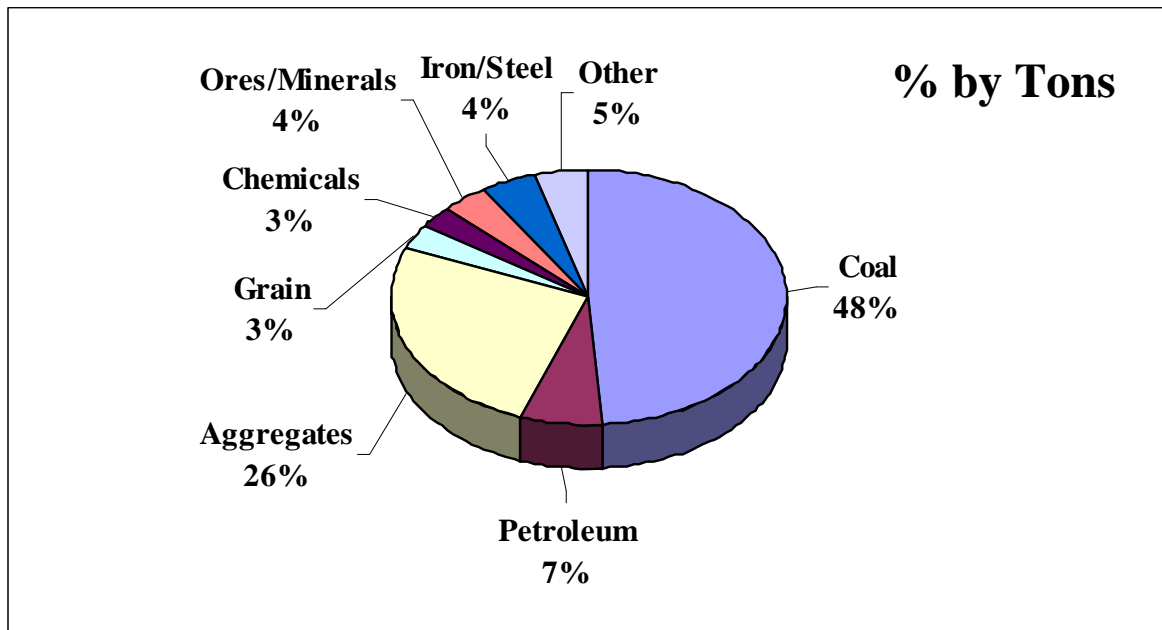


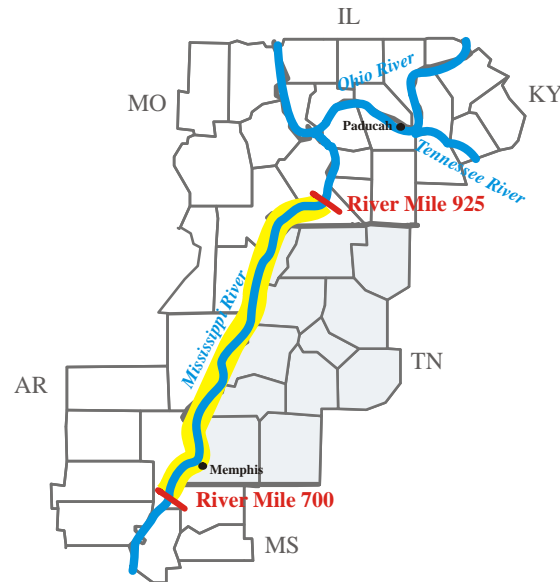
Exhibit 3-8. 2004 Commodities Moved To, From and Within Tennessee

Tennessee 2004 Commodities Shipped by Barge to and from Other States <i>(values in millions of dollars)</i>							
Shipments To	Tons	Value	Top Commodity	Shipments From	Tons	Value	Top Commodity
Kentucky	956,205	\$247	Petroleum	Kentucky	14,351,449	\$820	Coal
Louisiana	488,553	\$84	Grain	Illinois	6,635,234	\$374	Coal
Alabama	461,247	\$297	Iron/Steel	Louisiana	2,341,884	\$725	Ores/Minerals
Arkansas	419,421	\$156	Aggregates	Missouri	463,791	\$24	Others
Indiana	342,995	\$60	Aggregates	Alabama	277,462	\$84	Others
Source: U.S. Army Corps of Engineers Waterborne Commerce Statistics							

Information on commodities moving through a specific waterway segment is useful in characterizing the nature and level of local port activity and commerce. In the United States, locations on rivers are designated by river mile (RM), with mile zero at the mouth or downstream end of all rivers except the Ohio River. (River miles on the Ohio begin at mile zero in Pittsburgh where the confluence of the Monongahela and Allegheny Rivers form the Ohio, and end at mile 981 where the Ohio joins the Mississippi River near Cairo, Illinois.) Reference is made to river miles in the following narratives to define specific river segments for further analysis of cargos and commodities being loaded into barges (outbound) or being offloaded from barges (inbound) in these segments. The river mile segments selected represent that which originates or terminates on pools in the study area.

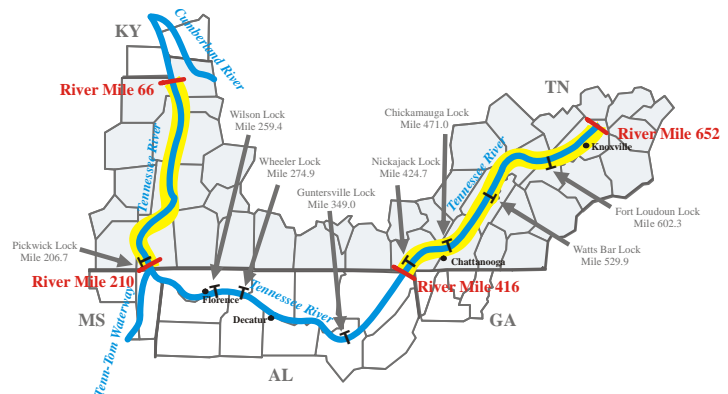
3.1.1 Mississippi River

The Mississippi River borders the western boundary of the State of Tennessee from RM 700 to RM 925. Trends in inbound and outbound cargo movements on this segment of the River are shown in Exhibits 3-9 and 3-10. Inbound metal shipments increased by 23% in the one year period from 2003 to 2004. Some of this increase may be attributable to the expansion of Nucor Steel's Arkansas division, located along the banks of the Mississippi, and increased production at Nucor-Yamato Steel Company. Outbound commodities are varied in nature. Grain and feed are the dominant outbound commodity and is showing a trend for continual growth in shipments.

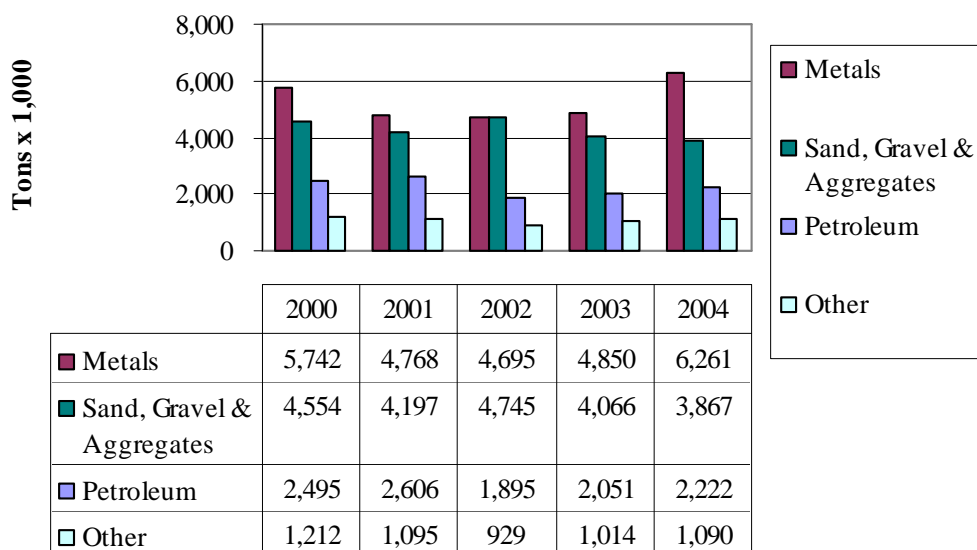


3.1.2 Tennessee River

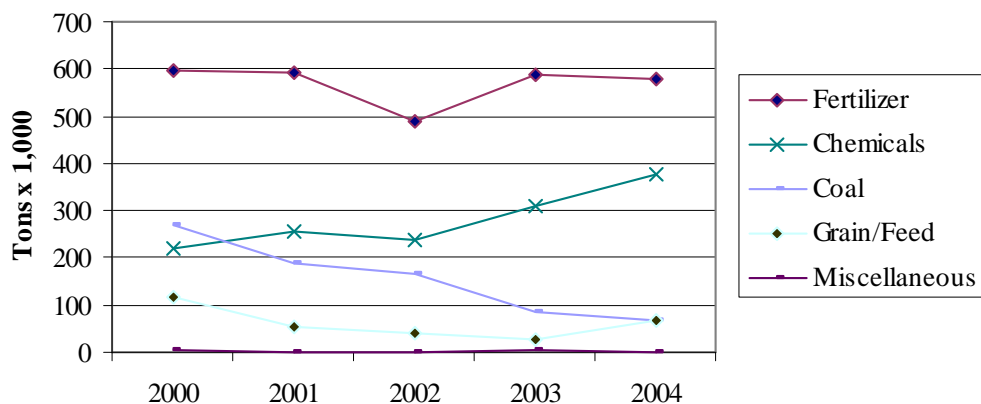
The Tennessee River is formed at the confluence of the Holston and French Broad Rivers on the east side of Knoxville, Tennessee. From Knoxville, it flows southwest through East Tennessee toward Chattanooga before crossing into Alabama. It loops through northern Alabama and eventually forms a small part of the state's border with Mississippi, before returning to Tennessee. At this point, the river flows almost due north into Kentucky and finally empties into the Ohio River near Paducah, KY. Inbound and outbound commodities were analyzed for the segments of the river that fall in the State of Tennessee. This



Inbound Tonnage

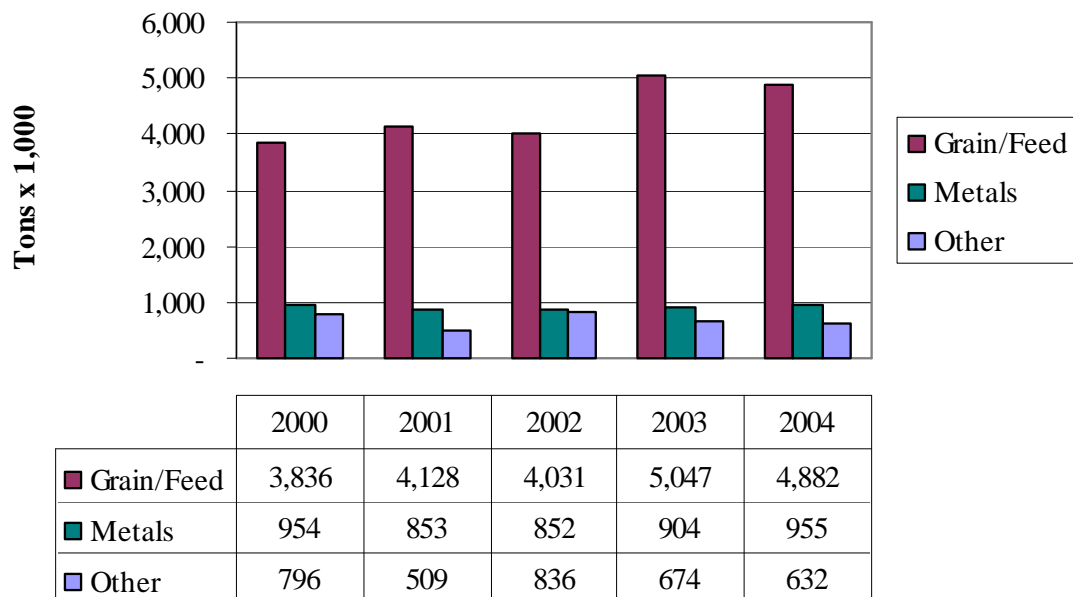


Other Inbound Tonnage Detailed

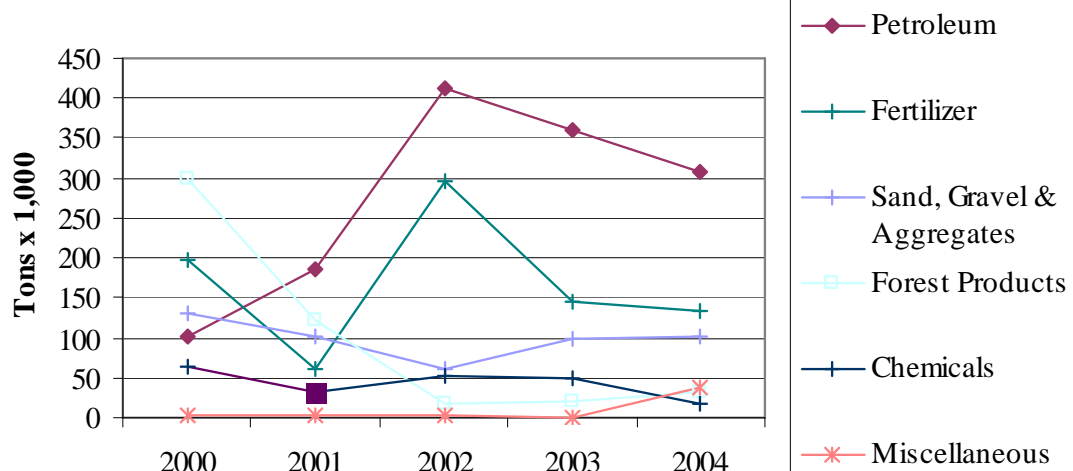


**Exhibit 3-9. 2004 Inbound Tonnage on Mississippi River –
River Miles 700 - 925**

Outbound Tonnage



Other Outbound Tonnage Detailed



**Exhibit 3-10. 2004 Outbound Tonnage on Mississippi River –
River Miles 700 - 925**

encompasses river miles 66-210 on the western portion of the state (West TN River) and river miles 416 to 652 which is the portion of the river that runs from the Nickajack Dam area, close to Chattanooga, to Knoxville (East TN River).

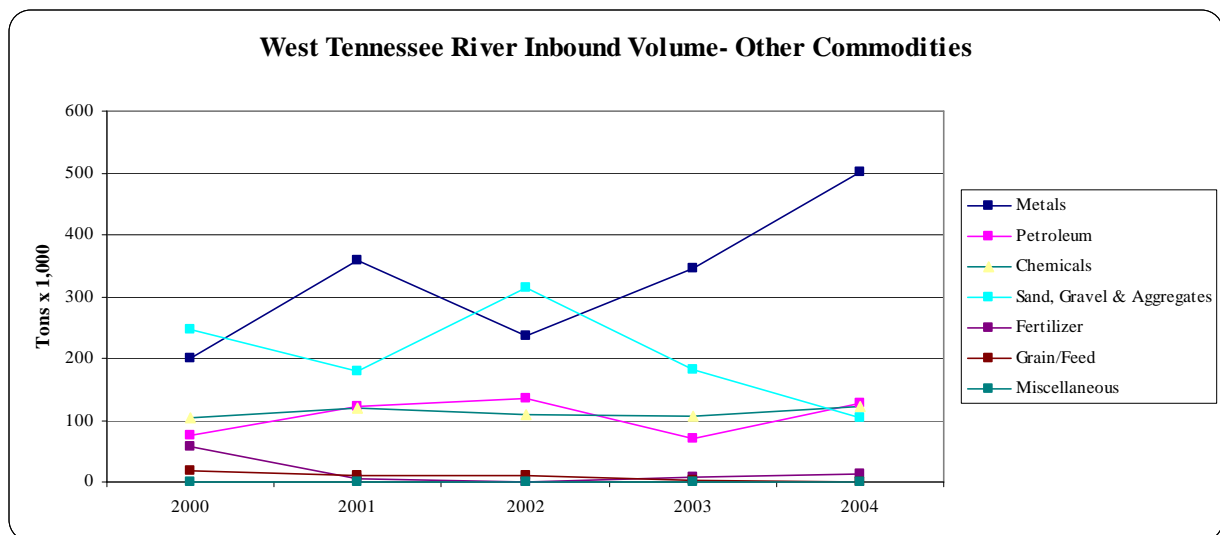
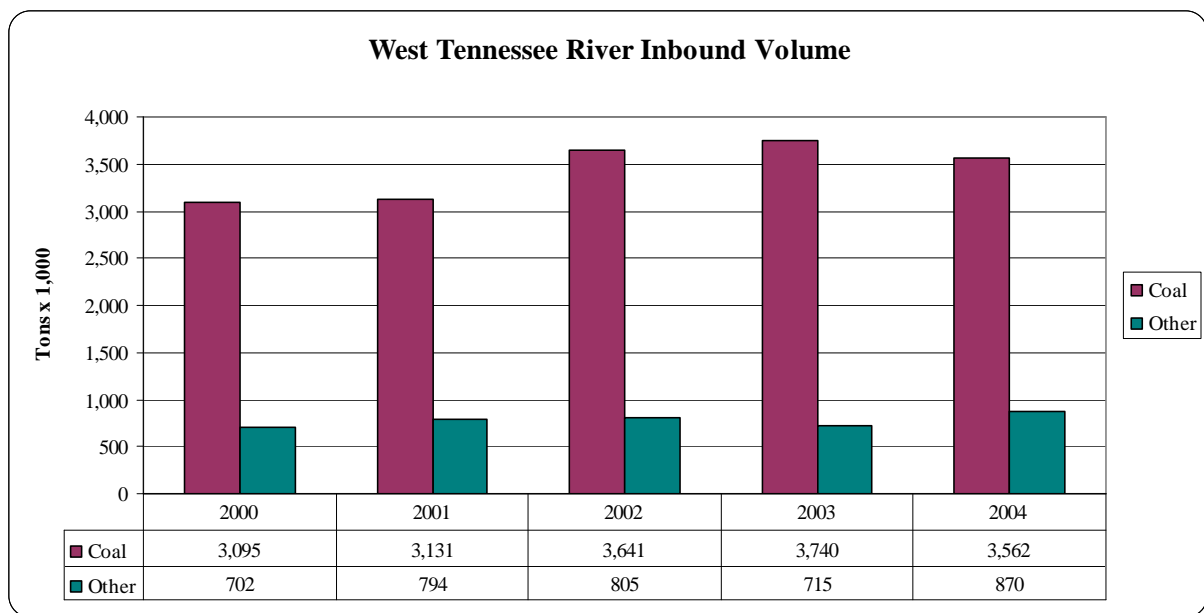
3.1.2.1 West TN River - River Miles 66 - 210

The West Tennessee segment of the River is the busiest section of the Tennessee River. Here Tennessee River traffic is joined by traffic passing through from the Cumberland, Ohio, or upper Mississippi Rivers destined for Alabama waterways or the Gulf of Mexico, or vice versa. A wide variety of waterborne commodities move on this section. Commodities originating or terminating on the lower reach of the Tennessee River include sand and gravel, coal, chemicals, petroleum, and ores and minerals.

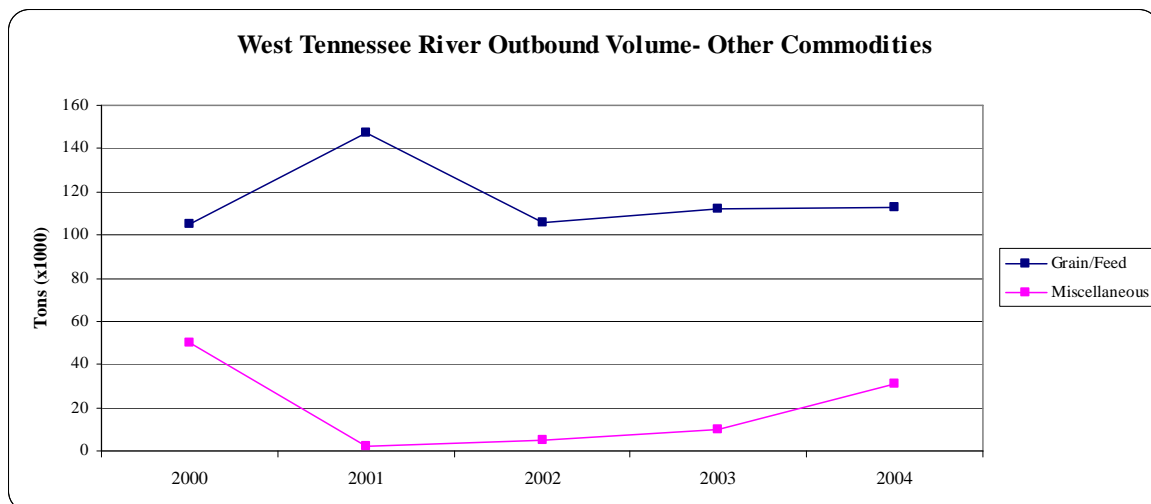
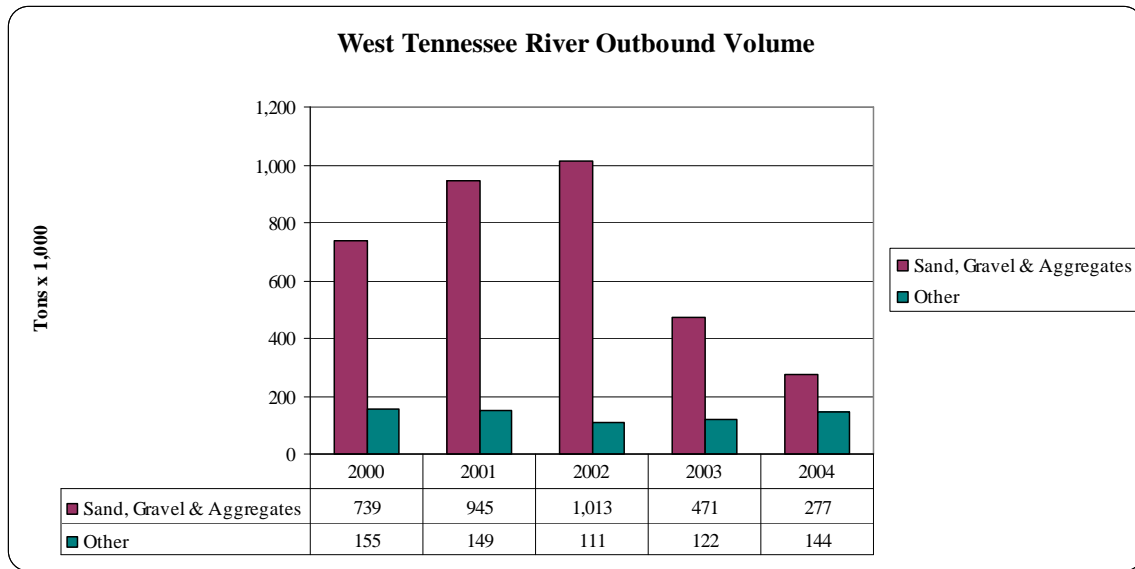
Trends in commerce on this river segment are shown in Exhibits 3-11 and 3-12. Coal is the dominant commodity on this river segment shipped primarily to the power plants. In analyzing the commodity trends for the years 2000-2004, it is worth noting that even though coal is responsible for the primary inbound tonnage, metals have shown a 60% increase in tonnage over this period; 31% of this increase occurring from 2003 to 2004. Overall, inbound tonnage on this river segment has increased by 14% over the five year period analyzed. On the other hand, outbound tonnage has incurred a significant decrease over this same period attributable to the decline in shipments of sand, gravel, and aggregates.

3.1.2.2 East TN River - River Miles 416 - 652

River miles 416 to 652 on the Tennessee River constitute the segment of the river that runs through the eastern half of the state from near Chattanooga to Knoxville. Exhibits 3-13 and 3-14 show trends in commodities on this river segment. Sand, gravel and aggregates are the dominant commodities. Since 2000, overall tonnage has declined on the East Tennessee River. This decline is likely attributable to the structural problems of the Chickamauga Lock. In spite

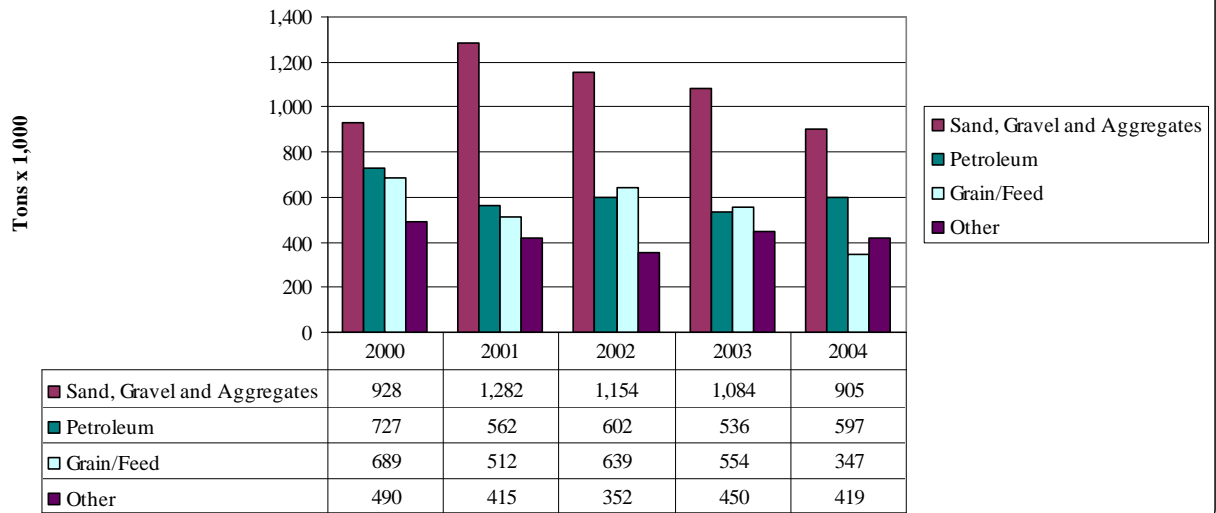


**Exhibit 3-11. 2004 Tennessee West River Inbound Tonnage –
River Miles 66 - 210**

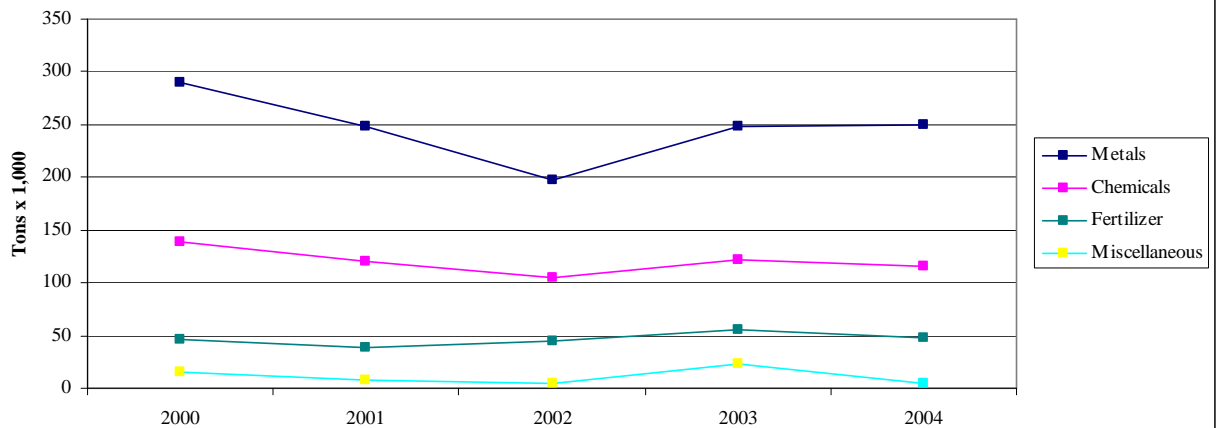


**Exhibit 3-12. 2004 Tennessee West River Outbound Tonnage –
River Miles 66 - 210**

East Tennessee River Inbound Volume

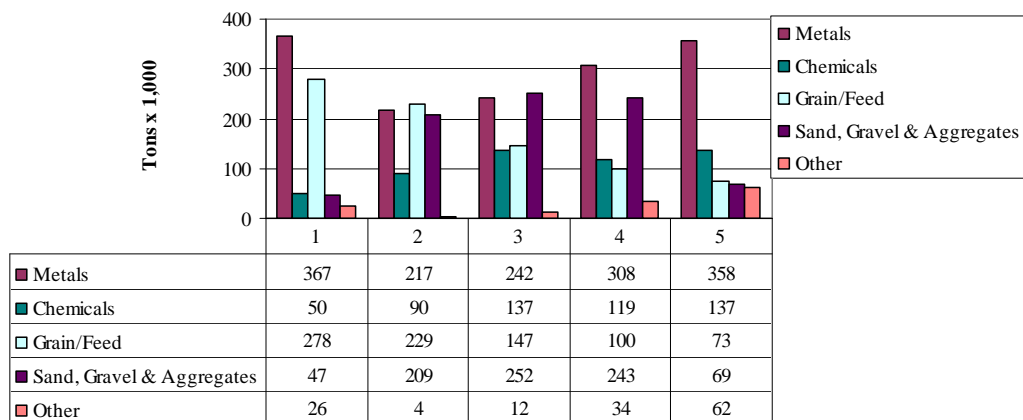


East Tennessee River Inbound Volume- Other Commodities



**Exhibit 3-13. 2004 East Tennessee River Inbound Tonnage –
River Miles 416 - 652**

East Tennessee River Outbound Volume



East Tennessee River Outbound Volume- Other Commodities

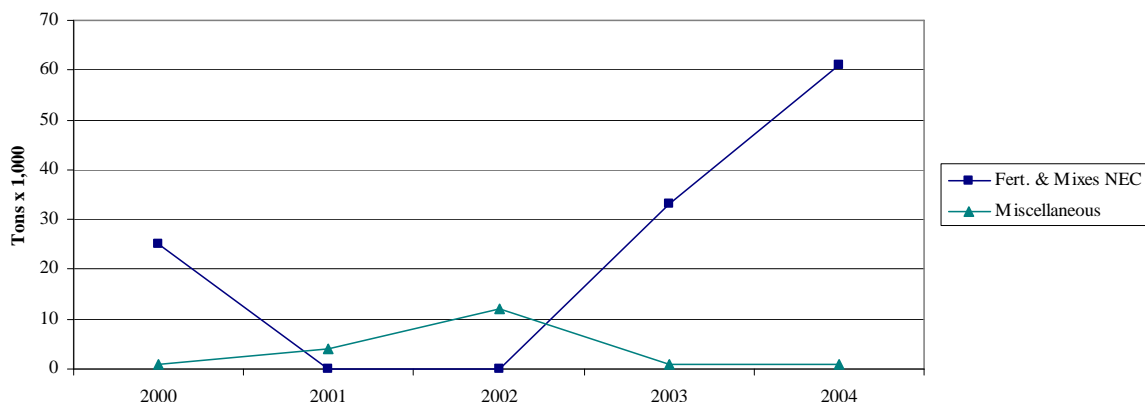
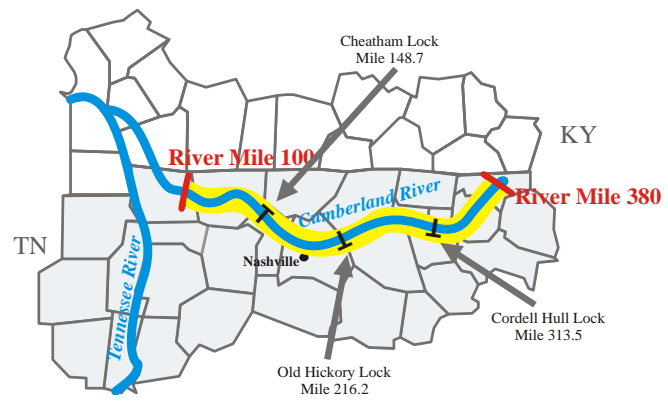


Exhibit 3-14. 2004 Tennessee East River Outbound Tonnage – River Miles 416 - 652

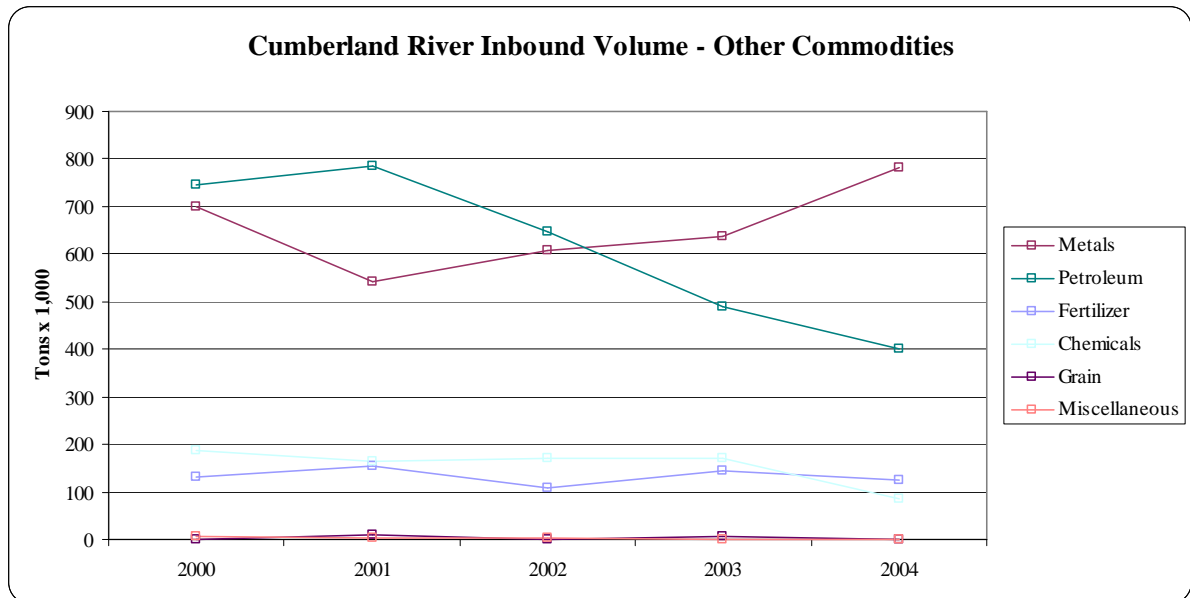
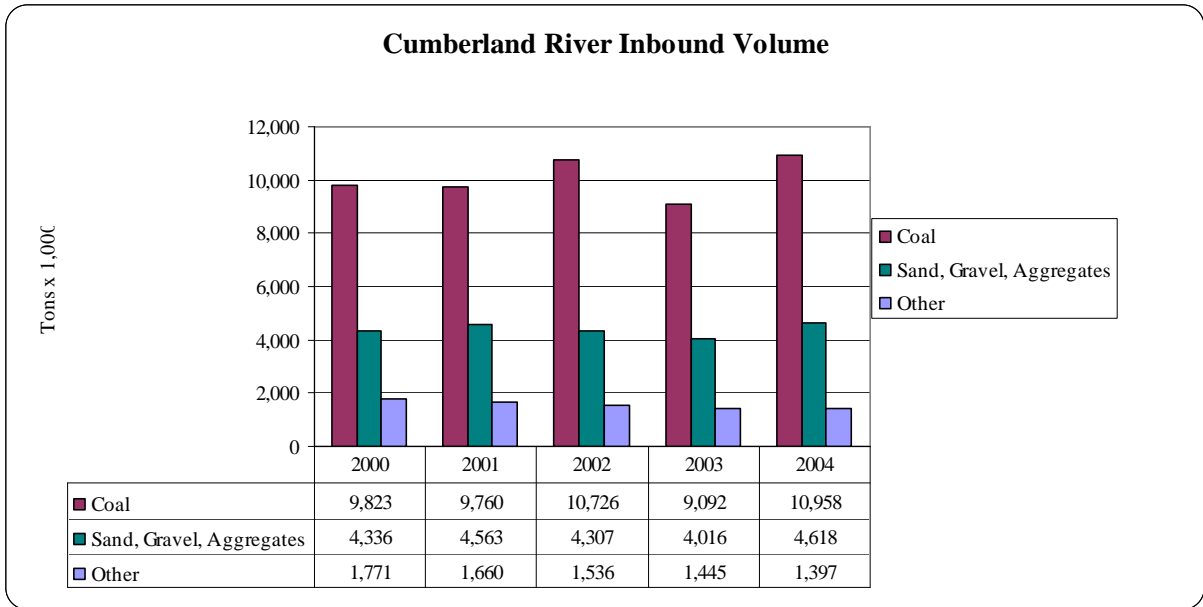
of this decline, there has been a resurgence over the five year period from 2000 to 2004 in the outbound shipments of metals, chemicals, and fertilizer. These three commodity groups constitute a 21% increase in shipments originating from this East Tennessee River segment from 2000 to 2004.

3.1.3 Cumberland River

The Cumberland River flows nearly 700 miles from east to west, through the northern section of Tennessee. It dips down to Nashville, then back northwestward into Kentucky to its mouth on the Ohio River. River miles 100 to 380 were analyzed for inbound and outbound commodity tonnage. These river miles signify the first (RM 100) and last (RM 380) terminal locations in the study area on the Cumberland River. Trends in commerce on these river segments are shown in Exhibits 3-15 and 3-16. During the five year period shown, annual tonnage varied from a low in 2003 of 15.8 million to over 18 million in 2004. Coal is by far the primary commodity moving on this river segment.

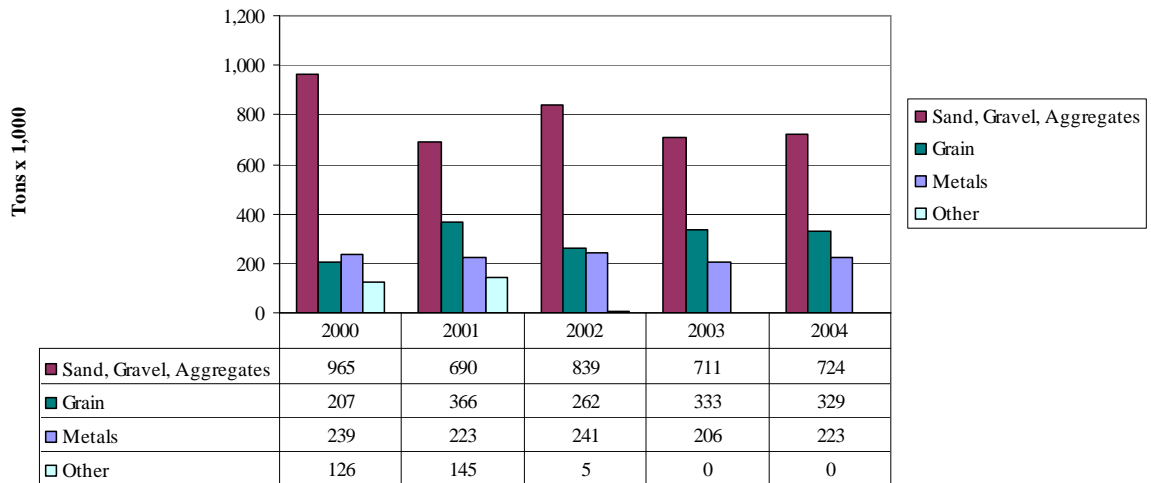


Coal is the dominant inbound commodity unloaded primarily at power plants followed by sand, gravel and aggregates. A closer examination of these two inbound commodities shows a 9% increase over the five year period from 2001 to 2004. Other commodities received in this river segment are diverse in nature as well as tonnage. Outbound shipments primarily consist of sand, gravel, aggregates, grain, and metals. Though outbound tonnage has varied over this same five year period, the period from 2003 to 2004 showed an 8% increase in the outbound shipment of metals as well as a 2% increase in sand, gravel, and aggregates. It is also worth noting that the shipment of metals has increased by 31% since 2001.

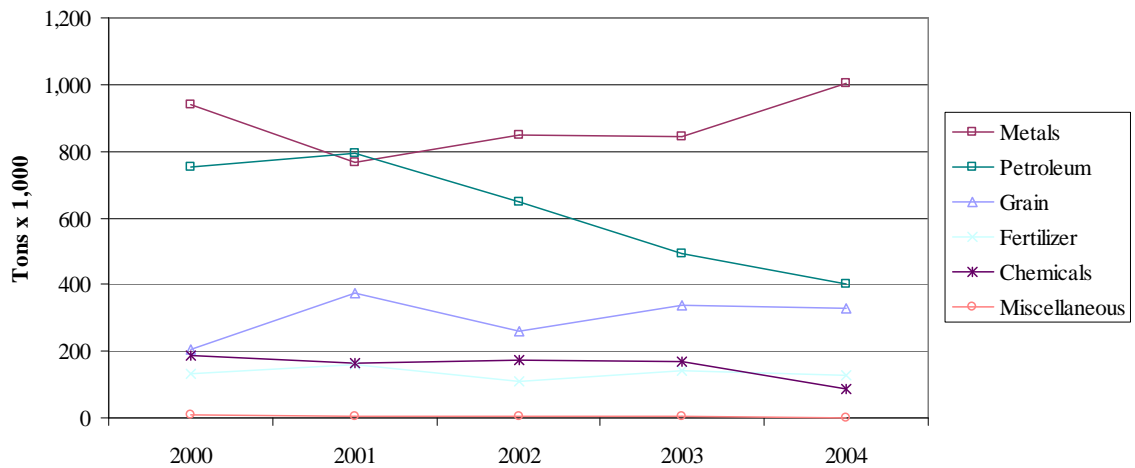


**Exhibit 3-15. 2004 Cumberland River Inbound Tonnage –
River Miles 100 - 380**

Cumberland River Outbound Volume



Cumberland River Outbound Volume - Other Commodities



**Exhibit 3-16. 2004 Cumberland River Outbound Tonnage –
River Miles 100 - 380**

The scope of work for this portion of the Tennessee Waterway Assessment Study does not include a detailed analysis that would indicate reasons for fluctuations in commodity volumes. Such evaluations would require time and budget beyond that available in Phase 1 of this study.

4.0 RIVER TERMINAL INVENTORY

Port development can be an important part of the economic development strategy for a region, providing land which has access to highway, rail and river transportation. By definition, a port is a segment of navigable waterway in which commercial activity takes place. A port encompasses land and facilities along a defined segment of a river, whereas a river terminal is a point at which barges are loaded and/or unloaded. A port complex may include both public and private terminals as well as industrial sites, railroads, warehousing and other infrastructure. In the context of this assessment, ports are important resources for the state and region, as well as their respective local areas.

4.1 Inventory Methodology

The terminal inventory for the Study was conducted to identify the terminals within the borders of Tennessee and any direct competition just over the borders. To accomplish this task, terminal information was compiled from state agencies, associations, federal government, private-sector sources and personal contacts. The raw information was then compared to eliminate duplicates, clarify discrepancies and identify locations where field visits are needed.

Terminals located directly across the Mississippi River from Tennessee were included in the inventory of terminals to properly quantify the number of terminals in the area. Other areas outside of the borders of Tennessee were identified due to the large scale of operations complementing or competing with terminals in Tennessee. These areas are the Hickman-Fulton County Riverport Authority in Hickman, KY, New Madrid County Port Authority in Missouri, Pemiscot County Port Authority in Missouri and the Yellow Creek Inland Port in Iuka, MS. Other terminals and ports were considered to be outside of the Tennessee market area and were not inventoried for this project.

4.2 Terminal Categories

In the context of this Assessment, terminals are categorized by ownership, operation and use. Terminal ownership can be characterized as public or private, as can operation. Terminals can be categorized in terms of use as either special purpose or general purpose. The categories are further explained in the following sections.

4.2.1 River Terminal Ownership

River terminal ownership falls into two broad categories - public and private. Public ownership is where the terminal is owned by a public entity such as a port authority, unit of local government or a state. Private ownership is where a terminal is owned by a private corporation. In the State of Tennessee, there are four publicly owned and eleven privately owned general cargo terminals as shown in the table on page 58.

4.2.2 River Terminal Operation

Public port authorities may develop and construct facilities, retain ownership of the facilities, but contract or lease the facility to a private company which provides day-to-day operations, marketing and management (private operation). In the case of Tennessee, all of the publicly owned terminals are operated by private entities.

When a terminal facility is operated by its owner, control of the strategic direction and pricing of services is retained by the owner. The public entity now has the responsibility for staffing, purchasing and maintaining equipment, marketing and the myriad of other duties associated with operating a river terminal.

4.2.3 River Terminal Use

Special purpose facilities are typically built to be very efficient for moving a specific commodity either inbound or outbound. For example, pneumatic systems, special pipelines, conveyors and special crane systems are often used in single-purpose applications such as loading grain, loading petroleum products, unloading cement, unloading liquid fertilizer or for certain steel or mineral products. Special purpose terminals may have little or no versatility with respect to moving other types of cargoes, but are typically very efficient for their special purpose. These terminals are most often seen at an industry, mine, power plant, or for some other on-site need, and are typically privately owned.

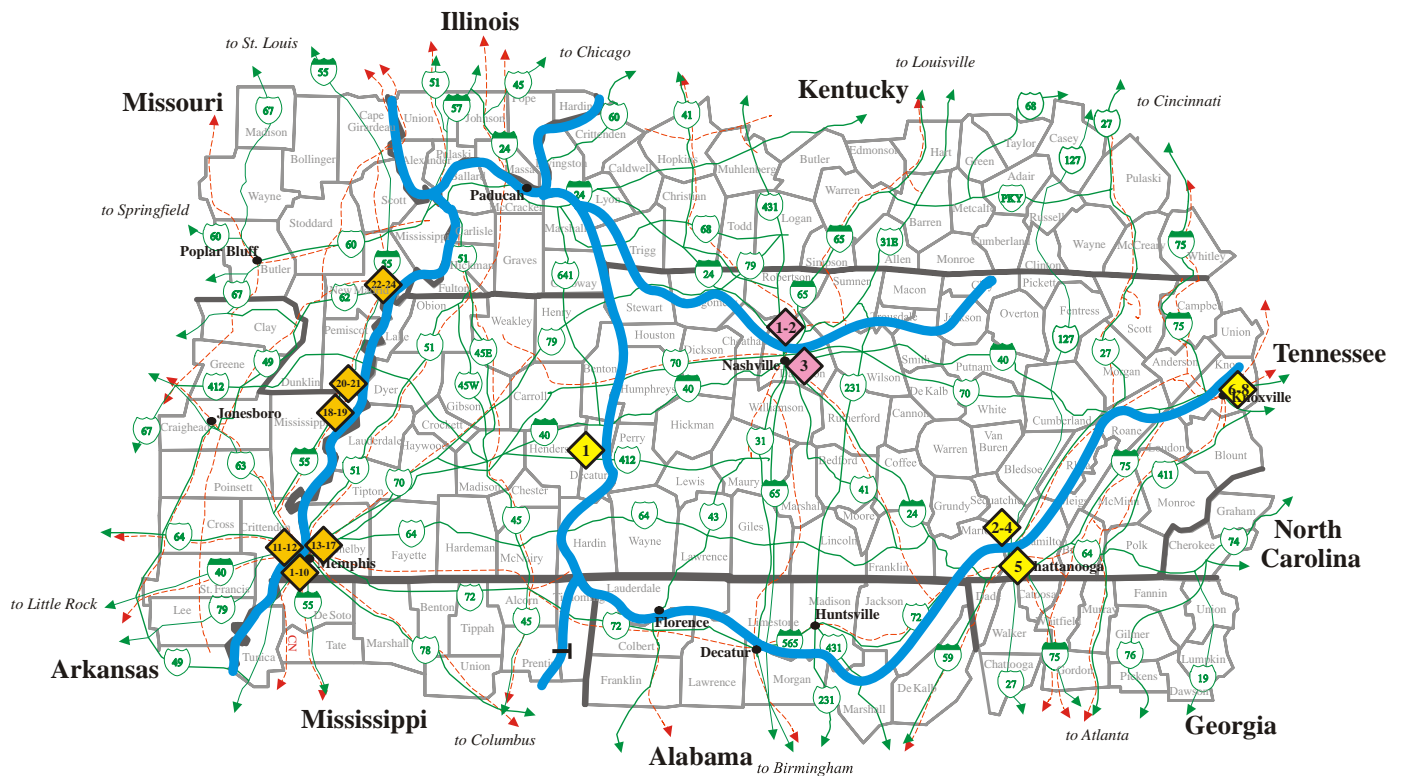
General purpose facilities are usually versatile and can be used for a wide variety of applications such as loading or unloading steel coils, pipe, machinery, forest products, or bulk materials. Equipment may include, for example, a mobile crane which can be rigged with a bucket, spreader bar, hook, clamp, magnet or other cargo handling equipment to move the cargo from the dock into short-term storage. A general purpose terminal is constructed for versatility rather than specialization. Some degree of efficiency may be sacrificed when the general purpose facility is compared to a special purpose terminal built and operated for maximizing single cargo efficiency.

To enhance the transportation advantages of river front industrial sites, a public port authority may market some sites with direct river access for industries which require a private, special purpose terminal as part of their facility, and the port authority may also develop a public general purpose terminal for industries which may want to take advantage of the economics of waterborne transportation, but which do not generate sufficient tonnage to justify construction of their own private terminal.

4.2.3.1 Special Purpose Terminals

Liquid Terminals - Liquids such as fuel, asphalt, other petroleum products, chemicals for industrial processing, and liquid fertilizers commonly move by barge. Most are loaded and unloaded at privately owned special purpose terminals such as those shown in Exhibit 4-1. Liquids are typically offloaded using pumps mounted on the tank barge. Heaters may also be mounted on the barge, or the barge may be rigged to receive steam from a land-based source where heat is required to adjust the viscosity of the material being offloaded. Asphalt, for example, may require heating, especially in cold weather. Liquid storage tanks do not necessarily need to be located directly at the river's edge and, to conserve river frontage for other uses, are often located some distance from the river bank. A liquids dock may be very simple, including adequate barge mooring structures as well as a structure to provide personnel access and hose handling. Hard piping on the barge is connected to hard piping on the land with a specially-fitted, flexible hose.

Grain Terminals - Grain terminals in the market area are shown in Exhibit 4-2. Most are privately owned and operated. Few, mostly in the Memphis area, are owned by a public river port and operated by a private sector firm which leases the facilities from the public entity. The grower will typically take his grain to the point at which he receives the best return, considering the price paid and the cost for delivery to the purchasing facility. Waterborne transportation generally costs less than land-based modes and grain prices at river facilities are often attractive to growers. Facilities for loading grain typically include receiving and storage structures, some form of reclaim equipment or device, and conveyance to the barge. A spout directs grain into the proper area of the barge. Some method for handling barge covers and possibly for moving the barge during loading operations may also be provided. Grain may be unloaded using a variety of devices ranging from special mechanical equipment to a general purpose crane rigged with a clam shell bucket.



Mississippi River Terminals

1. Ergon Terminal
2. Ashland Chemical
3. Brenntag Mid-South
4. Fleischmann's Molasses Terminal
5. Valero Refinery
6. Suburban Propane, W.M. Barr & Co.
7. Valero Memphis Terminals
8. Trumbull Asphalt Co: Marathon
9. Vertex Industries
10. Western Tar Products Corporation
11. Valero West Memphis Terminals
12. Warren Unilube (Coastal), West Memphis Dock
13. Lion Oil Co., Memphis Terminal Dock
14. Exxon Company USA Petroleum Transfer and Storage
15. American Commercial Terminals, Memphis Dock
16. ED&F Man (Westwat Terminals) Molasses – Memphis Terminal
17. Lucy Woodstock Utility Terminal, Memphis Dock
18. Paymaster Oil Mill
19. Continental Oil Co. Terminal
20. AG Distributors, Caruthersville Dock
21. Marine Oil Co.
22. Koch Pavement Solutions, New Madrid Dock
23. River Bend Ag., New Madrid Liquid Fertilizer Dock
24. Sinclair Oil

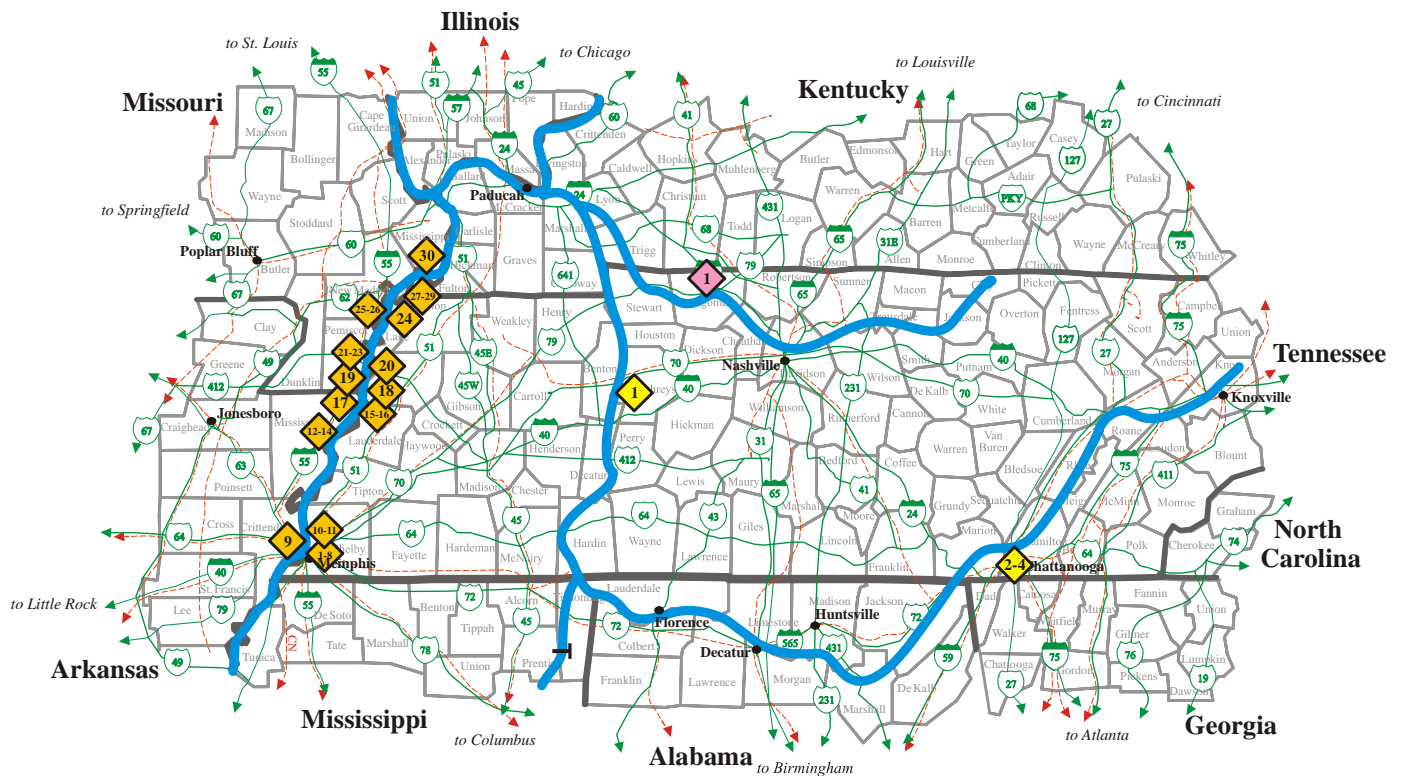
Tennessee River Terminals

1. Koch Materials, Inc. – Asphalt Division
2. Ergon, Inc.
3. Marathon Ashland Petroleum
4. Star Interprises
5. ADM, Chattanooga Oil Refining Dock
6. Marathon-Ashland Petroleum
7. Unocal Corps.
8. Volunteer Asphalt Company

Cumberland River Terminals

1. Southern State Asphalt Company
2. Marathon-Ashland Petroleum, LLC
3. Ergon, Inc.

Exhibit 4-1. Liquid Terminals



Mississippi River Terminals

1. ADM
2. ADM
3. ADM
4. Kinder Morgan
5. Cargill Inc. (Wet Corn Facility)
6. Weiner's Grain
7. Cargill Memphis Soybean Plant Dock
8. Agriliance
9. Kinder Morgan
10. Bunge Corp. Memphis Elevator Dock
11. Cargill (prev. Continental Grain) – Memphis Grain Elevator
12. Bunge Corp., Osceola Riverside Dock
13. Bunge Corp., Osceola Landside Dock
14. Poinsett Rice & Grain
15. Cargill AgHorizons, Hales Point Elevator Dock
16. West Tennessee Terminals
17. Bunge Corp., Huffman Elevator Dock
18. Bunge Corp., Heloise Elevator Dock
19. Consolidated Grain and Barge Co., Cottonwood Pt. Elev. Dock
20. Bunge Corp., Boothspoint Elevator Dock
21. Missouri Grain
22. Bunge Corp., Caruthersville Dock
23. Consolidated Grain and Barge, Caruthersville Dock
24. Cargill AgHorizons, Tiptonville Elevator Dock
25. Bunge Corp., Linda Grain Elevator Dock
26. New Madrid County Port Dock
27. Bunge Corp., Hickman Grain Elevator Dock
28. Fulton County Grain Co.
29. Cargill AgHorizons, Hickman
30. Consolidated Grain and Barge Co., Dorena Elevator Dock

Tennessee River Terminals

1. Cargill Ag Horizons
2. ADM Milling
3. Cargill, Inc.
4. ADM, Chattanooga Oil Refining Dock

Cumberland River Terminals

1. Hopkinsville Elevator Co.

Exhibit 4-2. Grain Terminals

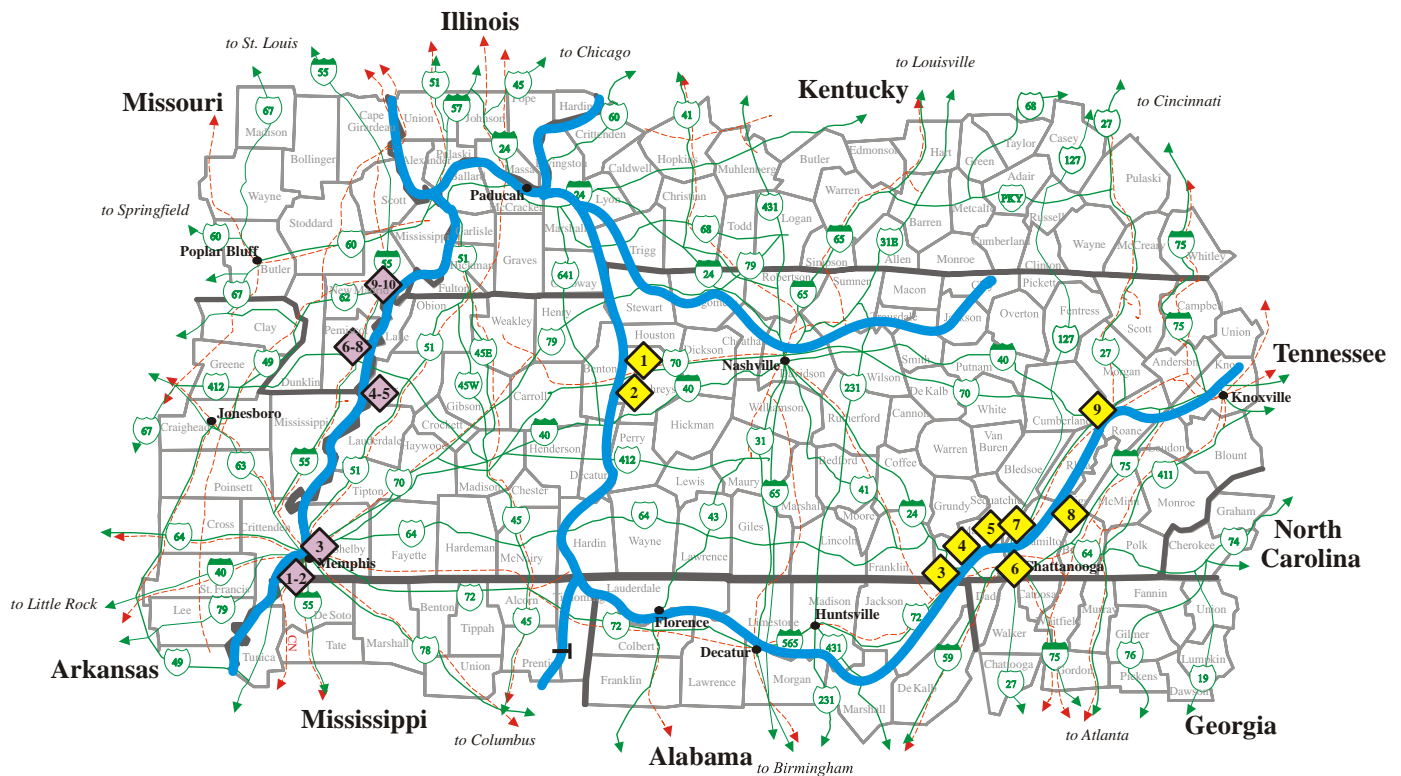
Dry Bulk Terminals - Dry bulk terminals shown in Exhibit 4-3 are involved in shipping or receiving sand, gravel, crushed stone, aggregates and other construction materials. Where aggregate and stone are loaded, a conveyor usually delivers material to the river front where it is channeled through a loading spout or chute into the barge, if the material is of a certain size and the drop is such that it will not damage the barge. Larger stone such as rip-rap may be placed with a crane or other mechanical device or may be dumped directly or via a chute if the drop is not too high.

Sand and Gravel Terminals – Sand and Gravel terminals, listed in Exhibit 4-4, typically receive cargo and store it in the open. The biggest consumer of sand and gravel is the cement industry and many cement manufacturers are located adjacent to sand and gravel terminals to take advantage of the close proximity.

Cement Terminals - Cement is moved in a variety of ways. Pneumatic equipment, mechanical devices or a general purpose crane rigged with a clam shell bucket may be used, but some methods of loading/unloading depend on the type of barge being used to carry the cement. Exhibit 4-5 displays the cement terminals in the study area.

Fertilizer Terminals - Fertilizer terminals were also separated from dry bulk due to their high occurrence on the Mississippi River (Exhibit 4-6). There are terminals that handle fertilizer on the Cumberland and Tennessee Rivers. These were included in the dry bulk or general cargo designations due to the diverse product mix handled.

On-Site Terminals - On-site terminals in the area, shown in Exhibit 4-7, are generally privately owned and located at a power plant or manufacturing plant. These terminals move commodities such as coal, steel and other cargoes used specifically at that site. Types of docks and materials handling equipment vary. At power plants and other locations where coal is unloaded, the equipment used depends on the volume and rate of unloading capability required by the owner. As with grain, equipment can vary from special high-speed mechanical unloading devices to a



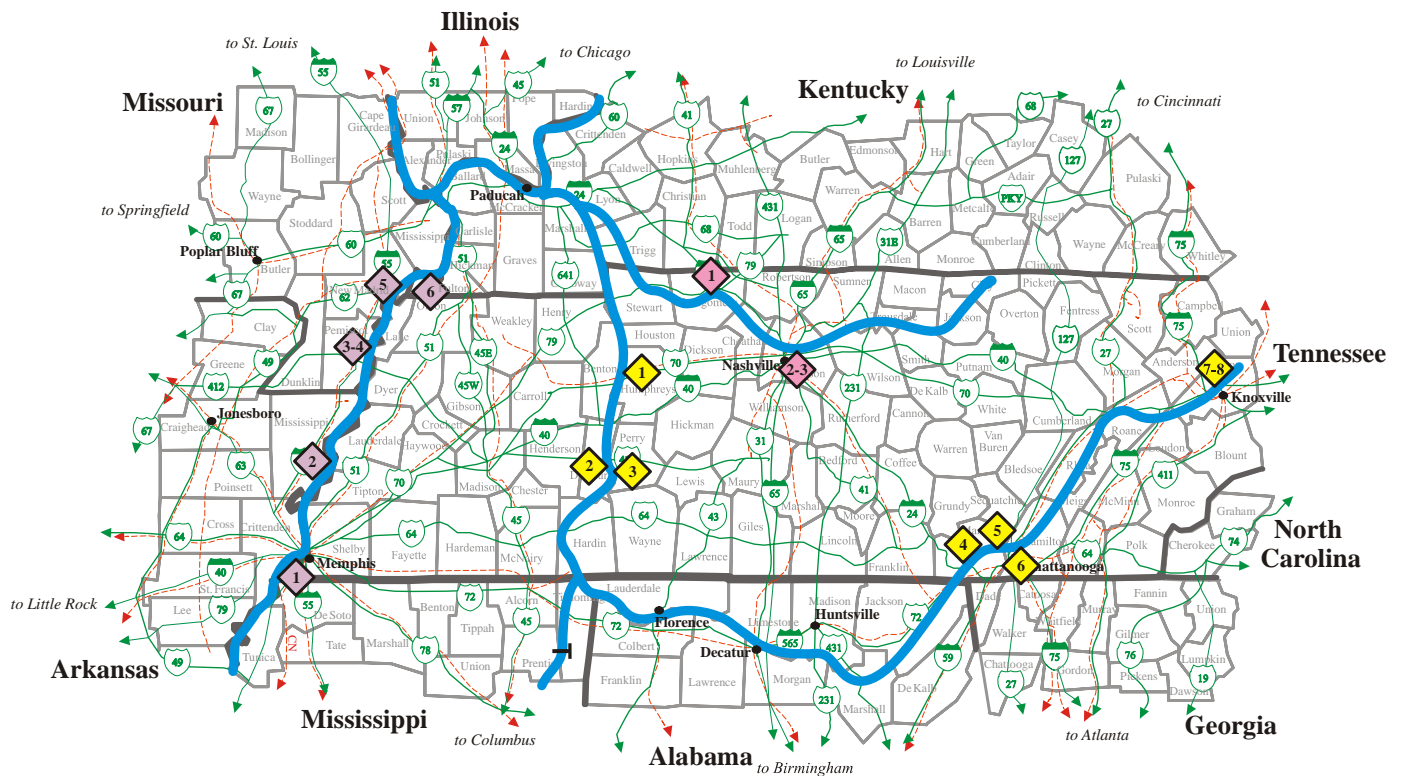
Mississippi River Terminals

1. Koch Materials
2. Drexel Chemicals
3. Perlco
4. West Tennessee Terminals
5. Choctaw Transportation Co., Heloise Dock
6. Caruthersville Marine Service, Dock and Fleet Mooring
7. MFA, Caruthersville Dock
8. Oakley Missouri, Caruthersville Dock
9. New Madrid County Port Dock
10. Cargill AgHorizons, New Madrid Dry Fertilizer Dock

Tennessee River Terminals

1. Kinder Morgan (Hall-Buck Marine)
2. Cargill Ag Horizons
3. Tennessee Consolidated Coal
4. Tennessee Consolidated Coal Company
5. Commercial Metal, Chattanooga Dock
6. Philip Services Corporation
7. American Electrical Inds., Inc.
8. Smoky Mountain Transfer Corporation
9. Philip Services Corporation

Exhibit 4-3. Dry Bulk Terminals



Mississippi River Terminals

1. Martin Marietta Aggregates, Lake Cormorant Dock
2. Arkansas Sand and Gravel
3. Brown Sand and Gravel
4. Taylor Sand and Gravel – Affiliate of Wepfer Marine
5. Taylor Sand and Gravel – Affiliate of Wepfer Marine
6. Lattus Sand & Gravel Co.

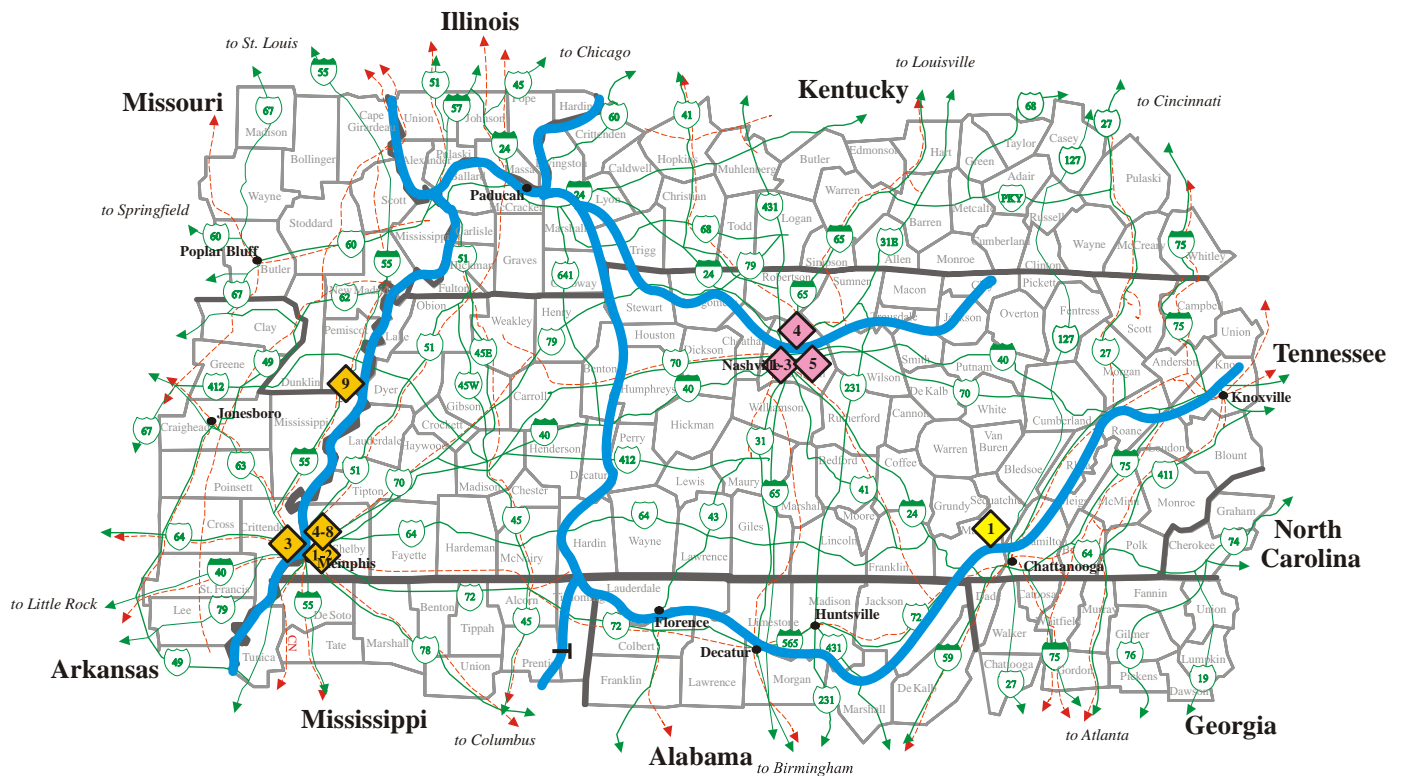
Tennessee River Terminals

1. Herbert Sangravl Co., New Johnsonville Docks
2. Tinker Sand and Gravel, Inc.
3. Teague Brothers Sand and Gravel
4. Signal Mountain Cement Co., Bennett Lake Quarry Dock
5. Signal Mountain Cement Company Plant
6. Vulcan Materials
7. American Limestone Co.
8. Ricker Materials

Cumberland River Terminals

1. Ingram Materials Company
2. Metro Materials
3. Ingram Materials Company

Exhibit 4-4. Sand and Gravel Terminals



Mississippi River Terminals

1. Holman (US) Cement Terminal
2. Buzzi Unicem
3. APAC Tennessee, West Memphis Dock
4. Martin Marietta Aggregates
5. Memphis Cement
6. APAC Tennessee, Memphis Terminal Dock
7. LaFarge Corp. – Bulk Cement Transfer & Storage
8. Buzzi Unichem (prev. Lone Star Industries) – Memphis Terminal Dock
9. River Ready Mix

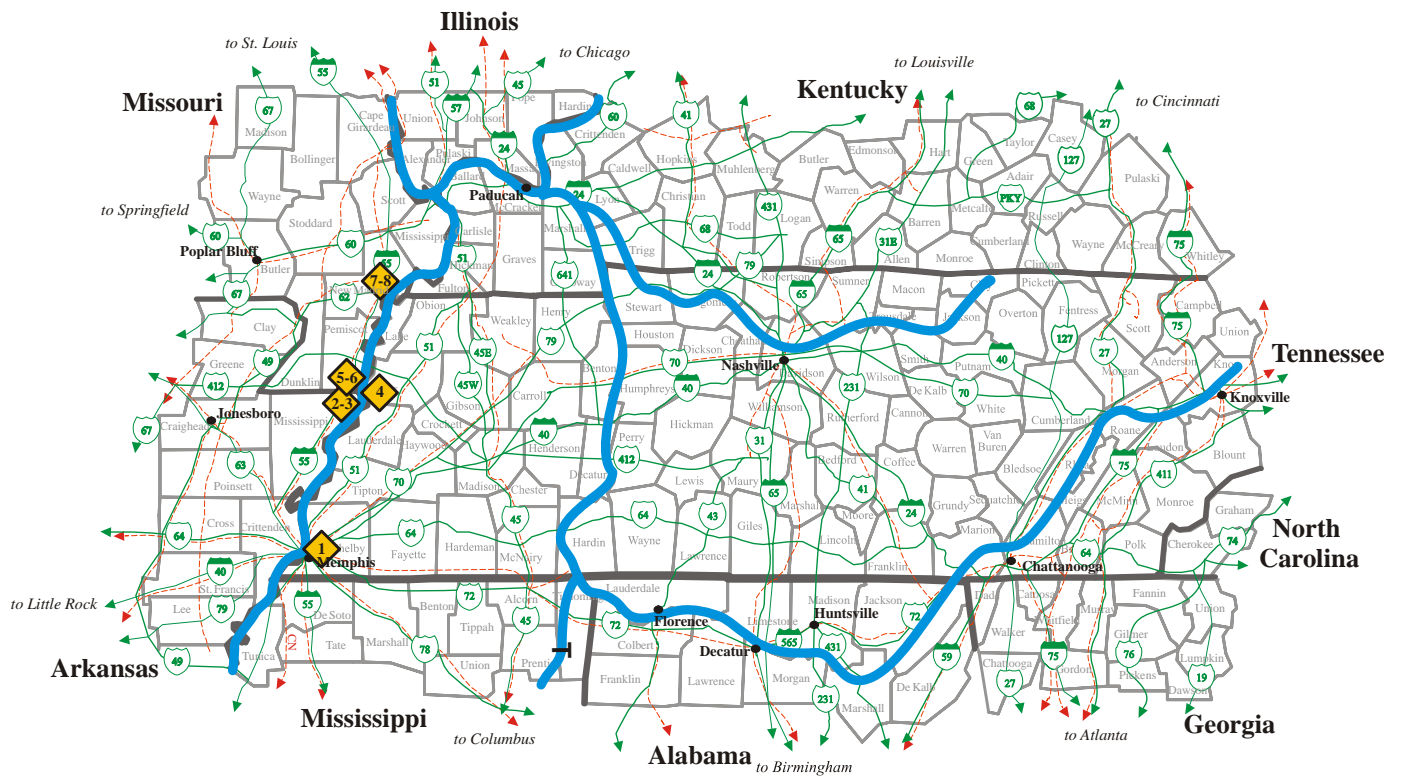
Tennessee River Terminals

1. Cemex, Inc.

Cumberland River Terminals

1. Lafarge
2. Lone Star Industries, Inc.
3. Signal Mountain Cement Company
4. Southdown, Inc.
5. Holnam, Inc.

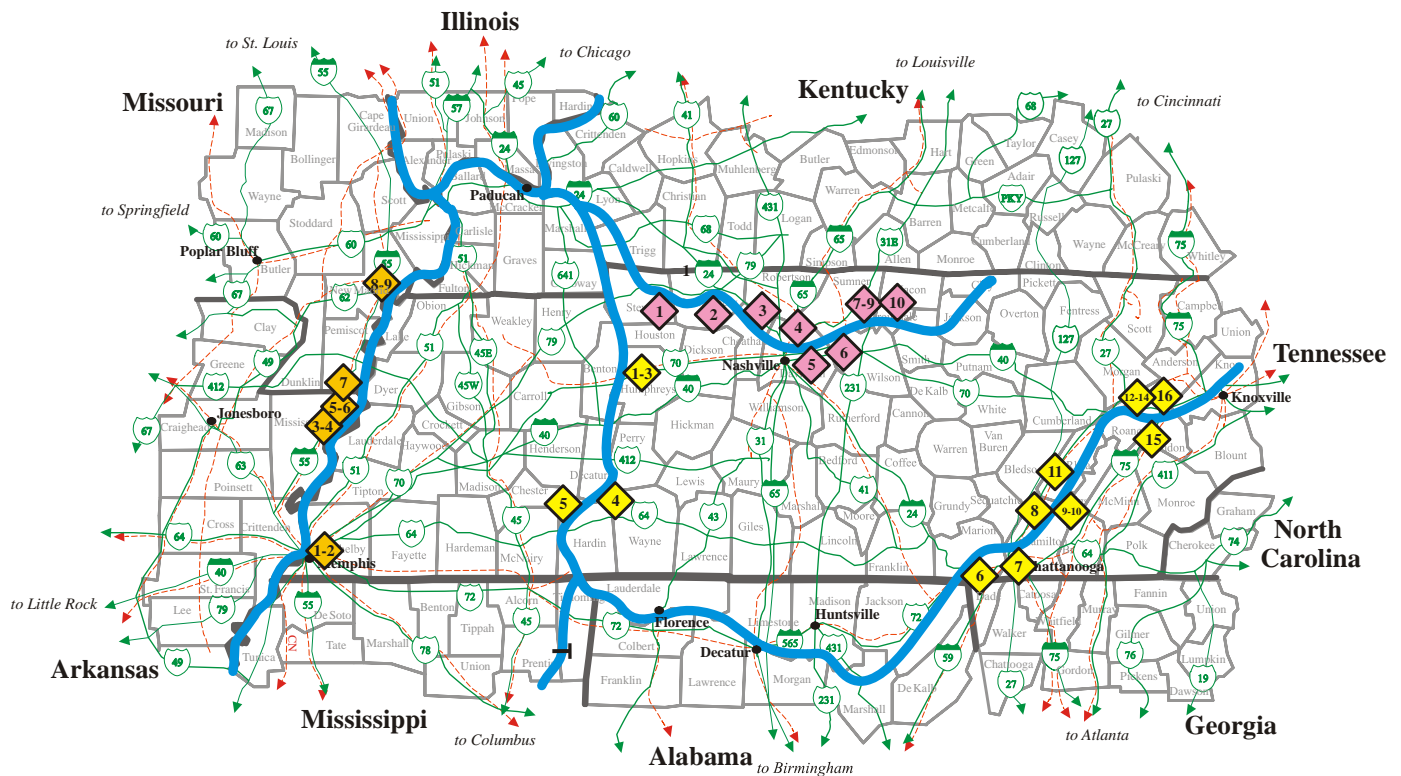
Exhibit 4-5. Cement Terminals



Mississippi River Terminals

1. Helm Fertilizer Terminal, Memphis Dry Fertilizer Dock
2. Blythville River and Rail Terminal – Bunge Corp., Barfield Terminal Dock
3. Terra Industries, Blytheville Plant Dock
4. West Tennessee Terminals
5. AG Distributors, Caruthersville Dock
6. MFA Caruthersville Dock
7. River Bend Ag, New Madrid Liquid Fertilizer Dock
8. Cargill AgHorizons, New Madrid Dry Fertilizer Dock

Exhibit 4-6. Fertilizer Terminals



Mississippi River Terminals

1. Metal Prep
2. TVA TH Allen Electric Generation Plant
3. Nucor-Yamato Steel Corp., Blytheville Dock
4. Marine Terminals of Arkansas, Barfield Dock and Fleet Mooring
5. Marine Terminals of Arkansas, Hickman Docks
6. Nucor Steel, Blytheville Dock
7. Trinity Marine Products, Caruthersville Shipyard Dock
8. Noranda Aluminum, New Madrid Dock
9. City of New Madrid Power Plant

Tennessee River Terminals

1. Scepter, Inc.
2. El Dupont Denemours & Co.
3. TVA, Johnsonville Steam Plant, Fuel Oil Dock
4. Vulcan Materials Co. – Clifton
5. International Paper Company
6. Serodino, Inc. – Shipyard Pier
7. Alston ABB Combustion Engineering, Inc.
8. TVA Sequoyah Nuclear Plant
9. Olin Corp. – Charleston Plant
10. Southern Ionics, Inc.
11. TVA Watts Bar Fossil Plant
12. TVA Bull Run Fossil Plant
13. TVA Kingston Fossil Plant
14. Tennessee Valley Port Authority, Watts Bar, Steam Plant Dock
15. McKinnon Bridge Co., Loudon Wharf
16. AE Stanley Manufacturing, Inc.

Cumberland River Terminals

1. TVA Cumberland Fossil Plant
2. Zinifex – Clarksville, Inc.
3. Nashville Bridge Company
4. Philip Metals, Inc.
5. Mid-South Wire Company
6. El DuPont Denemours & Company, Inc.
7. Garrott Brothers, Inc.
8. TVA Gallatin Fossil Plant
9. TVA Gallatin Fossil Plant
10. TVA Hartsville Plant Site

Exhibit 4-7. On Site Terminals

general purpose crane rigged with a clam shell bucket. Most power plants and other high volume users will have a dedicated special purpose dock with staging area for a number of barges, barge haul equipment and an unloading device like a bucket wheel or other high-speed machine to deliver the coal to an inbound conveyor.

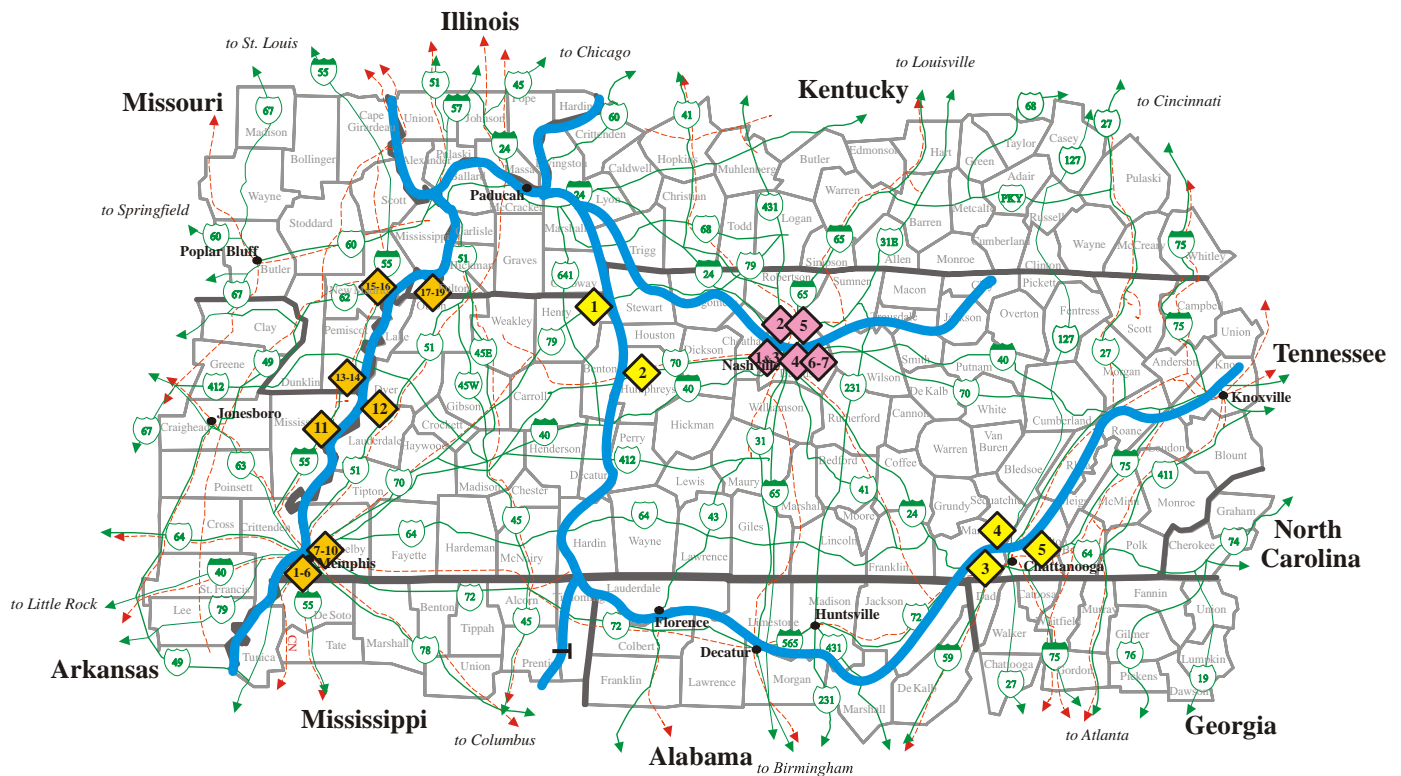
Navigation/Marine Service Terminals - Navigation/marine services category includes facilities which are not necessarily “terminals” that handle cargo, but rather includes facilities whose core purpose is to provide services to the marine industry. These facilities are shown in Exhibit 4-8 and include fleeting and mooring service providers, government agencies such as the United States Coast Guard and Corps of Engineers, and fueling/grocery service for towboats.

Other Terminals – Other terminals are those that have a use that is not directly classified above. Exhibit 4-9 displays the other terminals which are used for miscellaneous purposes. Of interest, is that the Cates Casting Field, listed on the Mississippi River in Northwest Tennessee, is the location of a new public port facility (Cates Landing Terminal) expected to open in late 2007/early 2008.

Inactive Terminals - Inactive terminals are those used that are not regularly operated. Exhibit 4-10 shows these terminals.

4.2.3.2 General Purpose Terminals

Public port authorities often construct a general purpose river terminal to enhance the overall economic development competitiveness of an area by providing capability to load and/or unload a wide variety of materials and commodities. Some general purpose terminals are constructed, owned and operated by private companies to provide services to the general public. General purpose terminals are shown in Exhibit 4-11, including those in adjoining states which serve markets in Tennessee.



Mississippi River Terminals

1. Barnhart Crane & Rigging Co.
2. Great Lakes Dredging
3. Wepfer Marine
4. Pine Bluff Sand and Gravel
5. Wepfer Marine
6. Wepfer Marine
7. Patton Tully Trans. Co. Mooring
8. Waxler Towing Co. (Economy Boat Store)
9. American Commercial Terminals, Memphis Dock
10. Vulcan Material (Barge Fleeting)
11. Poinsett Rice & Grain
12. West Tennessee Terminals
13. Tri-State Marine Service, Dock and Fleet Mooring
14. Caruthersville Marine Service, Dock and Fleet Mooring
15. St. Jude and New Madrid Harbor Service, Lower Fleet Moorings
16. St. Jude and New Madrid Harbor Service, New Madrid Fleet Moorings
17. Wepfer Marine, Hickman Dock and Fleet Mooring
18. Hickman Harbor Service
19. U.S. Coast Guard, Depot Hickman Moorings

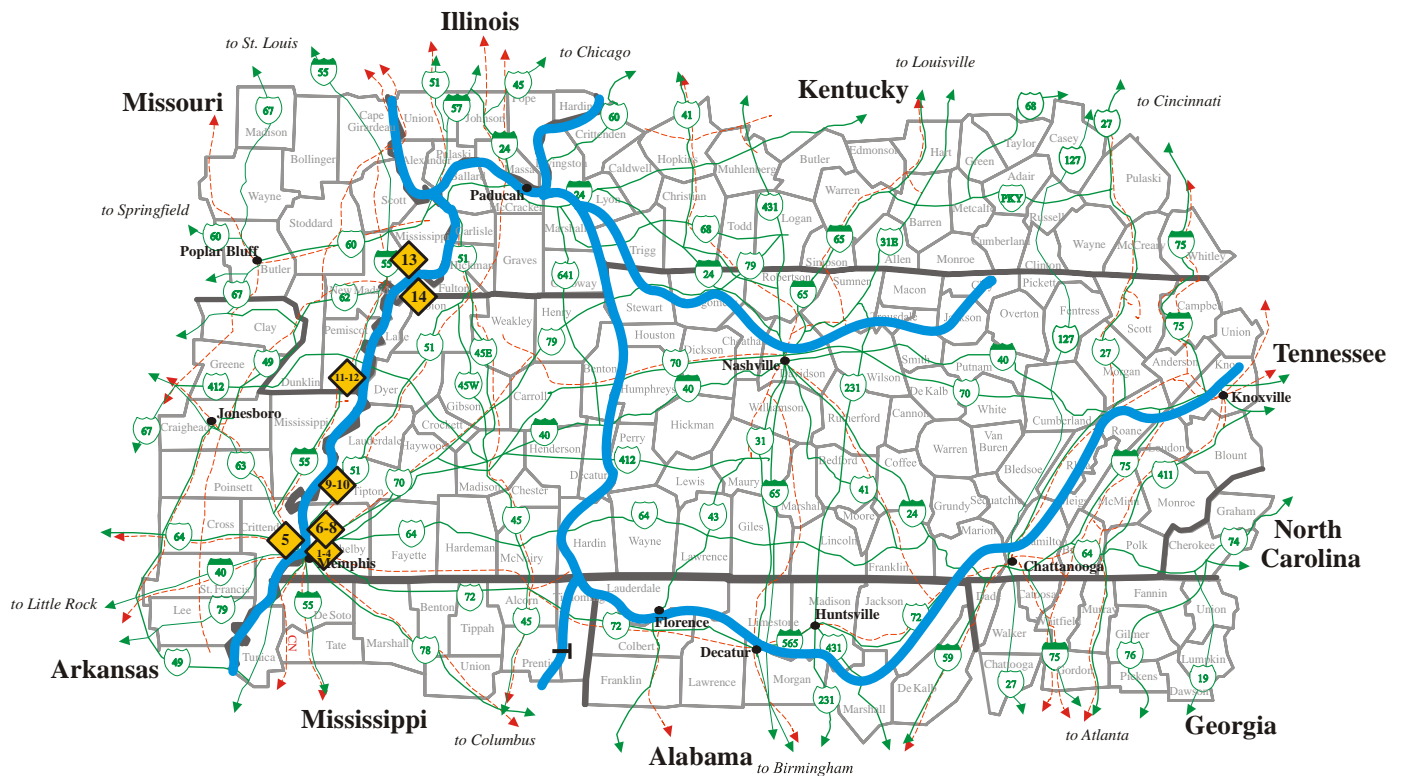
Tennessee River Terminals

1. US Coast Guard Pier
2. New Johnsonville Marine Service
3. Serodino, Inc. – Shipyard Pier
4. Southern Electric Fleeting Co., Chattanooga Mooring
5. US Coast Guard Pier

Cumberland River Terminals

1. Ingram Materials Co. – Fleeting
2. Cherokee Marine Terminal – Fleeting
3. Ingram Materials Co. – Fleeting
4. Ingram Materials Co. – Fleeting
5. Nashville Bridge Co.
6. Ingram Materials Co. – Fleeting
7. US Army Corps of Engineers

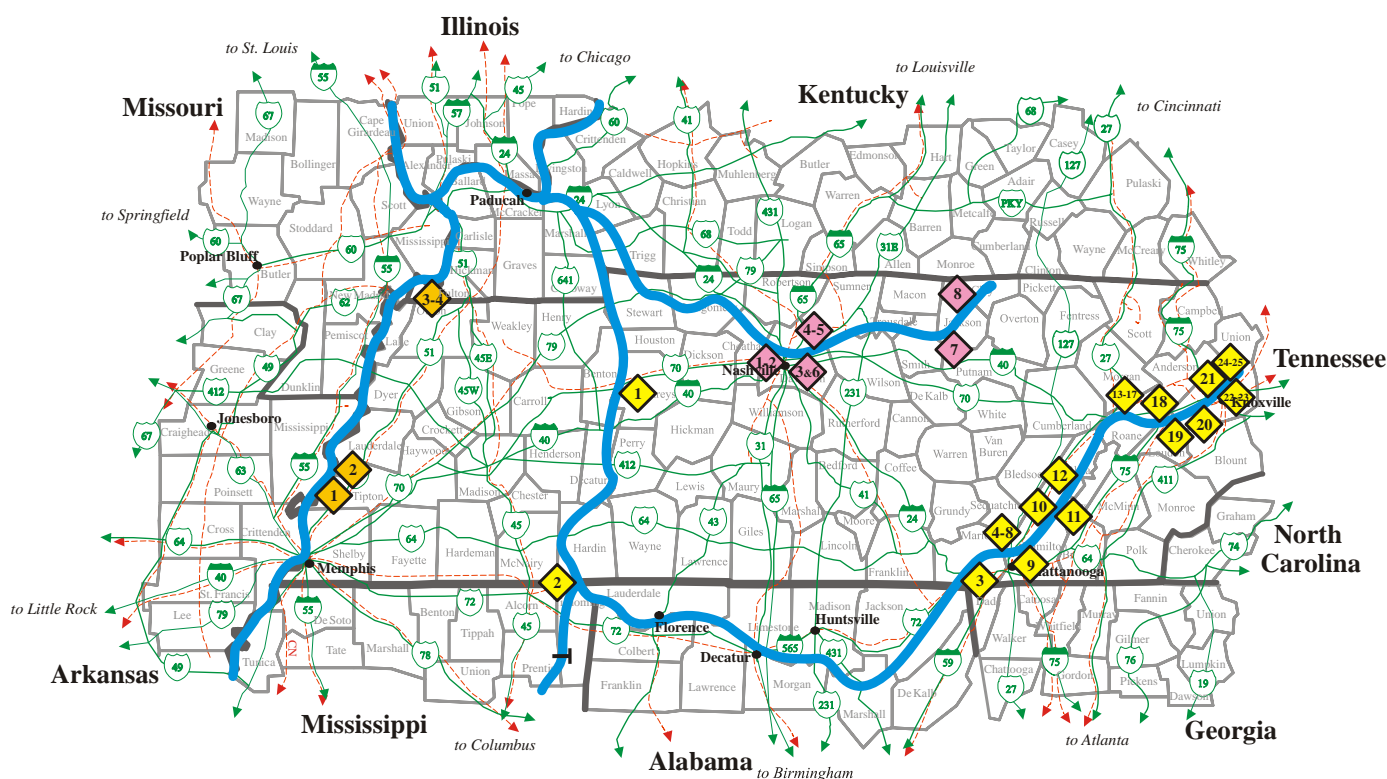
Exhibit 4-8. Navigation/Marine Service Terminals



Mississippi River Terminals

1. Rivergate Industrial Port
2. T&B Trucking
3. Barnhart Crane and Rigging
4. USACE Ensley Engineer Yard Wharf
5. Truman Arnold Companies/West Memphis Dock
6. Luhr Brothers
7. Patton-Tully Transportation Co.
8. USCG Lower Mississippi River
9. US Army Corps of Engineers, Richardson Casting Field Landing
10. McAlister Construction Co.
11. James Marine Equipment
12. Caruthersville Casting Field
13. Ralph Anderson Lumber co.
14. Cates Casting Field

Exhibit 4-9. Other Terminals



Mississippi River Terminals

1. Cargill AgHorizons, Richardson Landing Dock
2. Continental Grain Co., Golddust Elevator Dock
3. Fred Stokes Oil Co.
4. Triple L. Marine Service, Hickman Dock

Cumberland River Terminals

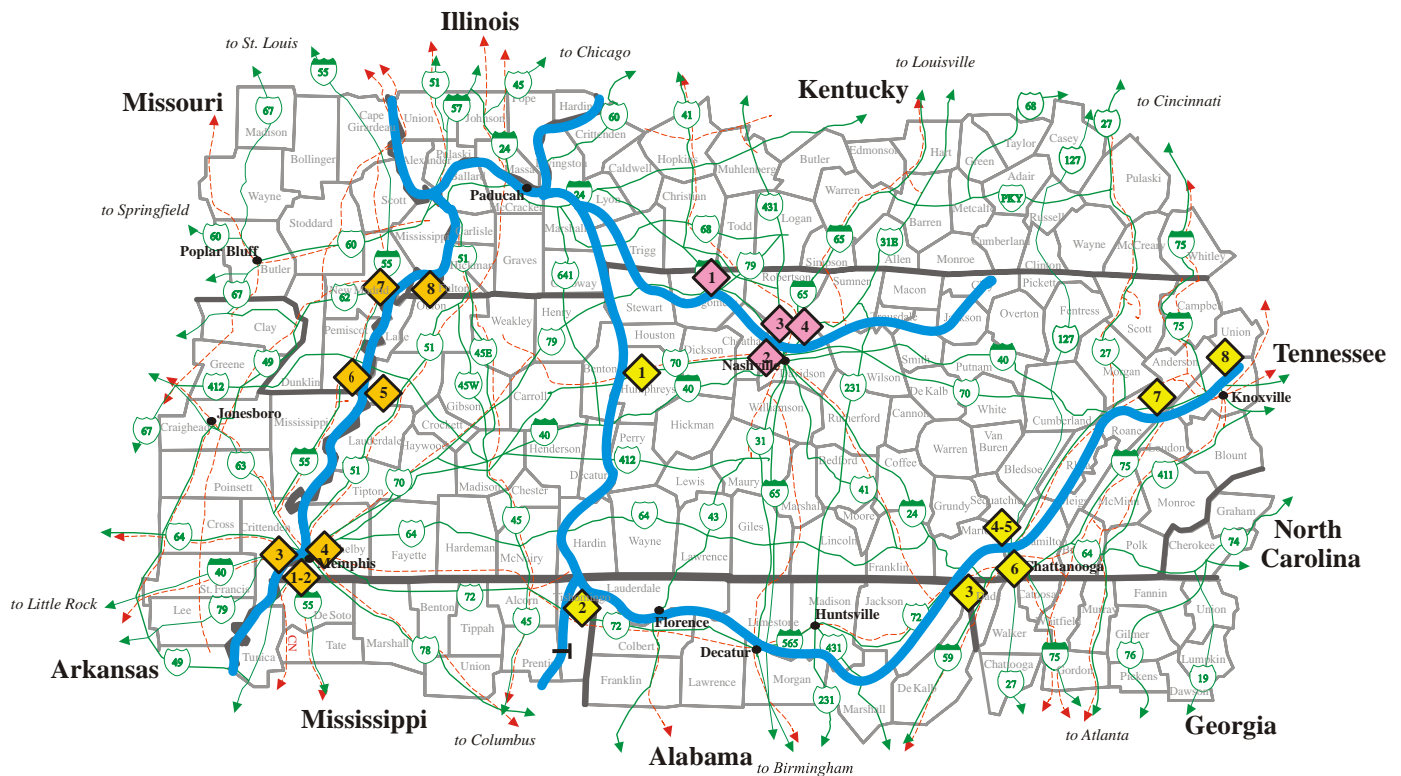
1. Shell Oil Company, Inc.
2. Exxon Co.
3. Lion Oil Company
4. Cities Serv. Oil Co.
5. NAMOLCO
6. Triangle Refineries
7. Gainsboro Port Authority
8. Celina Port Authority

Tennessee River Terminals

- | | |
|---|--|
| 1. Vanguard Services, Inc., Div. of Al Johnson Construction Co. | 13. Bowater, Calhoun Woodlands Operations |
| 2. Hardin County Port – Packaging Corp. of America | 14. Clinch River Corporation |
| 3. TVA Raccoon Mountain Pumped Storage Plant | 15. Eagles Bend Manf. Co. |
| 4. Luria Brothers & Co. | 16. Harbert International, Inc. – Harriman Coal |
| 5. BP – Amoco Oil Company | 17. US Dept. of Energy |
| 6. Rock-Tenn Company – Mill Division | 18. APAC of Tennessee, Harrison Div. |
| 7. Concrete Service Company | 19. Tellico Reservoir Dev. Agency |
| 8. Vulcan Materials Co., Chattanooga Batch Plant Dock | 20. TVA Singleton Dock |
| 9. Volunteer Army Ammunition Plant | 21. Signal Mountain Cement Co. |
| 10. Bowater, Calhoun Woodlands Operations | 22. Star Enterprise Co. |
| 11. Bowater, Southern Division – Fuel Oil | 23. RL Conley and Company |
| 12. Bowater, Calhoun Woodlands Operations | 24. White Lily Foods (not owned by them anymore) |
| | 25. Regal Corp., Knoxville Terminal Wharf |

Exhibit 4-10. Inactive Terminals

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Mississippi River Terminals

1. Kinder Morgan Bulk Terminals
2. Lash Intermodal Terminal Company
3. Kinder Morgan Bulk Terminals
4. Fullen Dock and Warehouse, Memphis Wharves
5. West Tennessee Terminals
6. Pemiscot County Port Authority
7. St. Jude Industrial Park, Barge Dock
8. Hickman-Fulton County Riverport Authority

Tennessee River Terminals

1. Herbert Sangravl Co., New Johnsonville Docks
2. Yellow Creek State Inland Port Authority
3. Port of Nickajack, Inc.
4. Mid South Terminals, Div. of Serodino, Inc.
5. JIT Terminals
6. Centre South Riverport
7. Fort Loudon Terminal
8. Burkhart Enterprises, Inc.

Cumberland River Terminals

1. Winn Materials
2. Hunter Marine Transport, Inc.
3. Hailey's Harbor River Transportation Terminal
4. Cherokee Marine Terminals

Exhibit 4-11. General Purpose Terminals

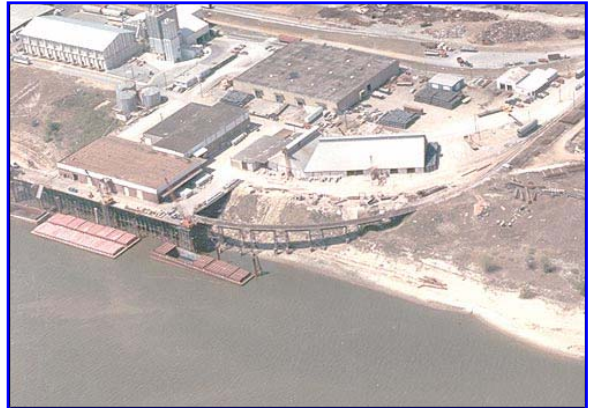
A general purpose terminal provides access to barge transportation for shippers who need to take advantage of low-cost barge rates, but do not have sufficient annual tonnage to justify construction of their own facility. In Tennessee, there are 15 general purpose terminals as shown in the table below. Four are located on the Mississippi River, another four terminals on the Cumberland River and seven on the Tennessee River. Recent news has also indicated that preliminary work on the Port of Cates Landing in Tiptonville, TN, is scheduled to begin around April of 2007.

There are four publicly owned general cargo terminals in Tennessee. The four publicly owned terminals are leased to and operated by private sector entities. The Memphis County Port Commission owns two terminals in Memphis operated by Kinder Morgan and Lash Intermodal. The Nickajack Port Authority owns the Port of Nickajack in South Pittsburg, TN and is operated by Parker Towing. The Hamilton County Port Authority owns the Centre South Riverport Wharf in Chattanooga which is also operated by Parker Towing. All others are privately owned and there are no publicly operated terminals in Tennessee.

General Cargo Terminals in the Study Area

River	Mile	L/R	Terminal	Location	Public Ownership	Private Ownership	Public Operation	Private Operation
Mississippi	725.0	L	Kinder Morgan Bulk Terminals	Memphis, TN	X			X
Mississippi	725.0	L	Lash Intermodal Terminal Company	Memphis, TN	X			X
Mississippi	740.3	L	Fullen Dock and Warehouse, Memphis Wharfs.	Memphis, TN		X		X
Mississippi	818.5	L	West Tennessee Terminals	Halls, TN		X		X
Cumberland	123.9	R	Winn Materials	Clarksville, TN		X		X
Cumberland	175.5	L	Hunter Marine Transport, Inc.	Nashville, TN		X		X
Cumberland	180.1	R	Hailey's Harbor River Transportation Terminal	Nashville, TN		X		X
Cumberland	189.9	R	Cherokee Marine Terminals	Nashville, TN		X		X
Tennessee	100.4	R	Herbert Sangravl Co., New Johnsonville Docks.	New Johnsonville, TN		X		X
Tennessee	423.7	L	Port of Nickajack, Inc.	South Pittsburg, TN	X			X
Tennessee	456.2	R	Mid South Terminals, Div of Serodino, Inc.	Chattanooga, TN		X		X
Tennessee	463.8	R	JIT Terminals	Chattanooga, TN		X		X
Tennessee	466.5	L	Centre South Riverport	Chattanooga, TN	X			X
Tennessee	600.2	R	Fort Loudon Terminal	Lenoir City, TN		X		X
Tennessee	652.2	R	Burkhart Enterprises, Inc	Knoxville, TN		X		X

Kinder Morgan Bulk Terminals on President's Island in the Port of Memphis is located at RM 725.0 on the Lower Mississippi River. The terminal includes two docks, has 168,000 sq. ft. of warehouse capacity and handles dry bulk, break-bulk, liquids and special cargo. The terminal offers access to interstate highways within one mile proximity and an on-site rail connection to the Union Pacific (UP), Canadian National (CN), Burlington Northern (BN), CSX Transportation (CSX) and Norfolk Southern (NS).



Lash Intermodal Terminal Company is located at RM 725.0 on the Lower Mississippi River, also on the President's Island portion of the Port of Memphis. The terminal includes one dock, has 287,000 sq. ft. of warehouse space and handles general cargo. The terminal offers access to highways within one mile proximity and an on-site rail connection to the UP, CN, BN, CSX and NS. The interesting feature that Lash Intermodal



provides is handling LASH (acronym for lighter aboard ship) barges which are landed on pedestals inside a warehouse for loading and unloading. LASH barges have dimensions of 61.5' x 31.0'.

Fullen Dock and Warehouse is located at RM 740.3 on the Lower Mississippi River. This privately-owned terminal includes six docks, over 500,000 sq. ft. of covered storage, 750,000 sq. ft. of paved storage, and handles containers, steel, aggregates and general cargo. It also has highway access (Hwy 78) to Interstates 40 and 55 as well as rail access to the CSX, BN, UP and NS.



West Tennessee Terminals is located at RM 818.5 on the Lower Mississippi River. The terminal includes a floating dock and handles dry-bulk, fertilizer, aluminum, steel, scrap and grain. The terminal is in close proximity to Hwy 88 and does not have a rail connection.



Winn Materials is located at RM 123.9 on the Cumberland River. The terminal includes a sheet pile dock structure and handles primarily limestone products and sand. I-24 is within 7 miles of the facility. There is no rail connection.



Hunter Marine Transport is located at RM 175.5 on the Cumberland River. This private, general purpose terminal includes two docks, 100,000 sq. ft. of covered storage and handles steel, dry bulk, coke, sand, salt, stone coal, fertilizer and general cargo. I-40 is less than three miles south; Hwy. 155 is less than 2 miles east of the terminal and the terminal offers a connection to the CSX.



Hailey's Harbor is located at RM 180.1 on the Cumberland River. The terminal includes one dock, a small slack water harbor and handles steel, scrap, coal, salt, dry bulk and general commodities. Hwy. 155, or Briley Parkway, is less than one mile away and provides connection to interstates within 10 miles. Nashville and Western provides rail service.



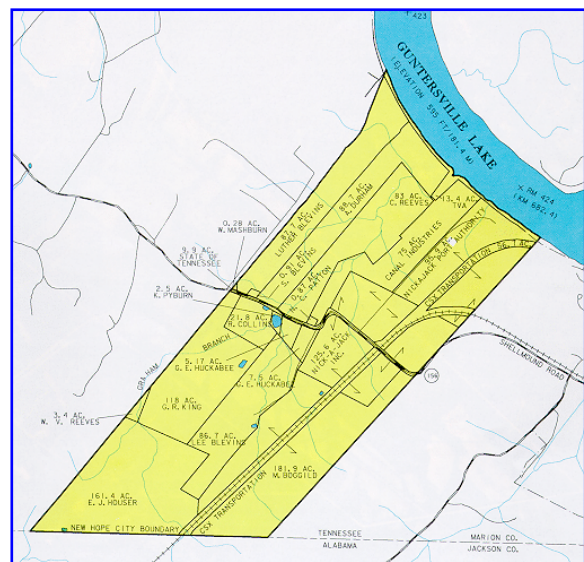
Cherokee Marine Terminals is located at RM 189.9 on the Cumberland River. The terminal includes three docks, 160,000 sq. ft. of warehouse space and handles steel, heavy lift cargo and general cargo. I-24 is adjacent to the facility and CSX is on-site.



Herbert Sangravl Co., New Johnsonville Docks is located at RM 100.4 of the Tennessee River. The terminal includes a sheet pile dock structure and offers paved storage and primarily handles aggregates, steel, coke, livillite, coal, ore, sand and aluminum. I-40 access is less than 10 miles away; US-70 is 5 miles away and CSX is on-site.



The **Port of Nickajack** is located at RM 423.7 of the Tennessee River. The terminal includes one dock, ground storage and handles pig iron, forest products, aggregates and coal. State Highway 156 is adjacent and rail service is not available on-site.



Mid-South Terminals is located at RM 456.2 on the Tennessee River. The terminal operates using mooring dolphins and cells. Typical commodities handled are iron, steel, coal, coke, grain and aggregates. Rail is on-site and US-27 provides access to I-24.



JIT Terminals is located at RM 463.8 on the Tennessee River. The terminal operates via mooring structures along the waterway and utilizes a 155,000 sq. ft. building. Steel, chemicals and propane are the primary commodities handled. Rail is on-site and Highway 27 connects with I-24 in the near vicinity.



Centre South Riverport is located at RM 466.5 on the Tennessee River. Part of a 300 acre multi-modal industrial park, the terminal operates using a sheet pile dock, mooring structures and open storage. Typical commodities handled are steel, dry bulk and break-bulk. Hwy 58 and I-24 are nearby. NS rail service is on-site.



Fort Loudon Terminal is located at RM 600.2 on the Tennessee River. The terminal handles general cargo and operates two storage buildings totaling 75,000 sq. ft. Rail service is on-site and both I-40 and I-75 are within three miles of the site.



Burkhart Enterprises is located at RM 652.2 on the Tennessee River. The terminal has two docks and over 24,000 sq. ft. of warehouse storage. Highway 168 connects the port to I-40 and I-70 and rail is on-site.



5.0 PUBLIC AND STAKEHOLDER OUTREACH

In order to provide the State of Tennessee with short and long-range plans of action so that the rivers of Tennessee maintain their recognition as part of the national transportation system, it is useful to have an understanding of the roles of stakeholders and what other neighboring states are doing to increase the use of water transportation and improve regional and national economic conditions.

5.1 Identification of Stakeholder Groups

Three general stakeholder groups that have an inherent interest in the promotion of waterborne commerce were identified. Interaction with these groups will be recommended for Phase II of this study.

General Purpose Terminals - General purpose terminals generate significant local and regional economic growth, including job creation. They serve existing business users, may provide services to attract new industry and create and expand opportunities for port services.

Shippers and Carriers - This stakeholder group includes major shippers with potential to use waterborne transportation. These shippers own and move the cargo. For example, shippers may include owners of steel, cement and chemical companies. Carriers include the barge lines. They play an integral role in providing valuable input on future transportation needs.

Government - This group includes local, state, and federal government agencies as well as development districts, economic development entities, and metropolitan planning organizations (MPOs) located along Tennessee's waterways. This group has an intrinsic stake in the impact of waterborne commerce on bringing jobs and additional tax base into their area.

5.2 Programs in Neighboring States

A survey of state-level programs was conducted to determine what programs and assistance is provided by those states to support ports and waterways. The following is a description of several state programs that have been proactive in formulating action plans and legislative initiatives to provide such support as well as a description of Tennessee's current program. Each state surveyed was unique in their approach to support ports and waterways. A summary of this information is provided on page 72.

Alabama

The Alabama State Legislature created a state-owned deepwater port in Mobile as early as 1923. A subsequent law passed in 1953 led to as many as 14 inland ports that were authorized and built by the state. Four of these facilities were later transferred to local port authorities. For the others, the state leases the port's facilities to a company or companies for actual operation. Some of the inland ports have not been that successful because their locations were dictated more by political influence at that time than by market needs or economic justification.

In 2000, an Alabama State Port Authority was created replacing the existing Alabama State Docks Department that had jurisdiction over the deepwater port facilities in Mobile and the State-owned inland docks. The Authority is governed by a board of directors, consisting of eight appointed members by the Governor to staggered terms. The executive director serves at the pleasure of the Authority and not to the sitting governor. The port authority is also independent of the State's Transportation Department (ALDOT).

ALDOT currently has no vested authorities or functions for water transportation. However, legislation has been introduced during the 2007 session of the Legislature to authorize water transportation as a modal function of ALDOT; establish a grant program to assist public ports with its capital needs; and, to create a ports and waterways advisory board, comprised of waterway interests, to advise policy makers within DOT and state government on matters of

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importance to this mode. These legislative initiatives have broad political support and are expected to be enacted.

Kentucky

The General Assembly passed legislation in 1964 to permit local governments to establish riverport authorities. Currently, there are eleven public riverport authorities of which seven have port operations while the other four are in the developmental stages. The seven older ports benefited from a grant and loan program that was enacted in 1966 and administered by the Kentucky Port and River Development Commission that was part of the Cabinet for Economic Development. The Commission was abolished in 1992 by the General Assembly and the state funding was discontinued. In 1998, state oversight for riverports was transferred to the Transportation Cabinet and is currently assigned to its Planning Division.

The Transportation Cabinet has commissioned a study of the state's riverports and to formulate recommendations for a statewide riverport improvement program; a marketing strategy or plan for the ports; and development of a state program that will address the governance, marketing and funding needs of the Kentucky ports. This study is a form of technical assistance by the state and is scheduled for completion in the summer of 2007 in time to draft bills for consideration by the 2008 session of the General Assembly.

Louisiana

Louisiana has more miles of navigable waterways than any of the other continental states. It is served by 6 deepwater ports, 8 coastal ports, 13 inland riverports, and 11 developing ports for a total of 38 public port authorities.

The state provides \$20 million annually to its ports for funding and financing needed improvements. The grant program, called the "Ports Priority Program," was started in 1989 and requires a 10 percent local match. Funding for the program comes from fees and taxes paid by the maritime related transportation industry but with the majority (\$15 million) coming from the

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Transportation Trust Fund (gas tax revenues). The state had to pass a constitutional amendment to permit such use of road tax revenues. Many state constitutions only allow gas taxes to be spent on highway and bridge projects.

To establish the relative priorities of the grant applications, a benefit-to-cost analysis is conducted that compares the project's total investment costs to the economic benefits accruing to the state from that investment, such as the reduction in cargo handling and shipping costs, jobs created, increases in personal income, and other direct and indirect economic impacts. Priorities are also influenced by technical feasibility of the proposed improvement, its environmental impacts and the quality of the port's management. The applications are reviewed, evaluated, and prioritized within the Department of Transportation and Development.

The state has authorized a Waterways Infrastructure Bank that would provide financing and capital for port development activities needed to "retain and increase commerce on Louisiana's waterway." The bank has yet to be funded. A program to help ports market their facilities is also authorized but not yet funded.

The state port association has commissioned a study that has identified a need for 104 projects to be constructed during the next five years with a combined cost of nearly \$850 million. The ports group advocates an increase in state funding to \$40 million annually to help meet these needs.

Minnesota

Minnesota is served by two waterway systems, the Mississippi River and the Great Lakes/St. Lawrence Seaway. It has five ports on the Mississippi River that shipped nearly 12 million tons in 2005. The four ports on Lake Superior recorded a total of nearly 66 million tons of commerce that year, over one-half of which were associated with Minnesota's taconite industry.

The Ports and Waterways Section of the Minnesota Department of Transportation administers a Port Development Assistance Program. This revolving loan program began in 1996 and has

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received a total of \$14.5 million in appropriations along with the revenues generated from repayment of loans. The maximum state match is 80 percent and is intended to modernize the physical infrastructure of its nine ports. Most of the funding is allocated to facility repair.

The MNDOT has gained a national reputation during the past 25 years for its research and studies concerning water transportation. Two such studies conducted were (1) *Monetary Cost of a Modal Shift - 1997*, which compares the fuel cost efficiency of the water mode to land modes and the air emission results of burning additional fuel to move the same product tonnage; and (2) *Environmental Impacts of a Modal Shift - 1991*, which examined the type and extent of environmental impacts associated with the shift of the cargo from the water to either the rail or highway modes. This work has not only helped develop and maintain a comprehensive water transportation plan for the state, but some conclusions of its studies and research, such as that concerning user fees, environmental impacts and cost of modal shifts, have been of much importance to the waterway industry and to transportation policy makers.

Mississippi

Mississippi has 16 public ports, two of which are state-owned and operated. Its Ports and Waterways Division is part of the Office of Intermodal Planning within the state's transportation department. In 2000, MDOT completed a comprehensive study of the state's ports, including an assessment of each port's infrastructure needs to accommodate current as well as anticipated commerce. This study provided timely information that led to enactment of a grant program by the Legislature to help finance these needs.

The Multi-Modal Transportation Improvement Fund apportions a set percentage of the annual appropriations to each of five modes. The percentage designated for ports is 38 percent. The legislature appropriated \$10 million to the fund in 2007 from state fuel taxes resulting in \$3.8 million for port improvements. A Port Multi-Modal Fund Committee reviews applications and makes recommendations to the MDOT for approval. Seven of the ten members of the committee are port directors. The grant is most unique since it does not require any matching funds from the

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port. Higher priority is given to those applications that plan to use the state grant funds to help leverage other financing for the port's proposed improvement. The grant funds cannot be spent for administrative or operational expenses.

The state's economic development agency also administers a marketing assistance program available to the public ports. The state will contribute 50 percent of the costs for advertising, preparation of brochures, websites, and other marketing projects. Since enactment of the program, new investment near ports includes steel, automotive, ethanol, chemicals and other industries which use waterborne transportation.

Missouri

Unlike most states, Missouri funds two grant programs for its 14 public port authorities. These ports handle about 2.4 million tons of commerce annually at an estimated worth of \$4.1 billion. One of the grant programs provides about \$450,000 annually to assist the ports with administrative expenses, such as marketing and strategic planning. The grant was initially funded from general revenues, but more recently from sales taxes collected on vehicles. The program does not require a match.

Its other grant program is called the Port Capital Improvement Program. It assists ports with capital improvements and requires a 20 percent match from the local port authority. The program is funded at about \$1 million annually that is appropriated from the State Transportation Fund. In addition, the state provides two public ferryboat operations on the Mississippi River and a grant of \$75,000 to each ferry service every year to support those operations. The Multimodal Operations Division of the Missouri Department of Transportation administers the three grant programs.

Tennessee

In 1987, the Waterways and Rail Division was established within TDOT. Tennessee currently has no grant or loan programs to assist ports. TDOT uses less than \$100,000 of fuel taxes to

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fund port feasibility studies, waterway-related investigations and annual contributions to the Tenn-Tom Waterway Development Authority.

West Virginia

The West Virginia Public Port Authority is part of the state's Department of Transportation. It is governed by an 11-member board and has many responsibilities resembling an economic development agency. The Authority's Board of Directors is comprised of the Transportation Secretary and 10 individuals divided between congressional districts who are appointed by the governor. The Authority's role is multi-modal. Its charter defines a port or public port to include river ports, airports, rail, wayports, terminals, and other similar facilities for rail, water, highway, or air transportation. The Board hires and retains an Executive Director to run its day-to-day business.

While it has the power to acquire, lease, construct, own, and maintain ports, the Authority does not presently control or operate any such facilities. Its empowerments are far reaching, including the right of eminent domain and the issuance of public port revenue bonds to finance port projects. It has also cooperated with federal agencies, universities, and others to conduct studies and research to help promote water transportation in its state. Local port districts are chartered under the control of the Authority.

A notable achievement by the Authority was establishing a statistical port that encompasses 199 miles of the Ohio, Kanawha, and Big Sandy Rivers and comprised of river terminals within three states. The so-called Port of Huntington-Tristate Port ships nearly 80 million tons of commerce each year, making it the 7th largest water port in the United States.

Summary of State-Level Programs

State	Governance	State Assistance to Ports
Alabama	Independent state port authority with pending DOT connection	2007 legislation pending to establish grant program to assist public ports with capital needs and create ports and waterway advisory board
Kentucky	KYDOT planning division	Study of state's riverports in progress with outcome anticipated to generate state-level program to assist ports
Louisiana	Intermodal Division of Dept. of Transportation and Development	\$20m annually from gas tax revenues in state funding and financing for needed improvements
Minnesota	MNDOT	Revolving loan program established which has received \$14.5m in appropriations along with revenues generated from loan repayments since 1996. Maximum state match of 80% intended to modernize physical port infrastructure.
Mississippi	MDOT Intermodal planning office & marketing under economic development	State appropriations of \$3.8m for ports from fuel taxes. State's economic development agency administers marketing assistance whereby state contributes 50% of costs for advertising, brochures, websites, and other marketing projects.
Missouri	MODOT	2 grant programs: (1) \$450,000 annually from vehicles sales tax to assist ports with administration expenses such as marketing and strategic planning; (2) \$1m annually from State Transportation Fund to assist ports with capital improvements
Tennessee	TDOT	Less than \$100k from fuel tax to fund port feasibility studies, waterway-related investigations and annual dues to the Tenn-Tom Waterway Development Authority.
West Virginia	Public Port Authority under WVDOT	Issuance of public port revenue bonds to finance port projects.

6.0 SUMMARY AND CONCLUSIONS

Tennessee's growing population and economy has placed heavy demands on the state's transportation system. Intensifying roadway congestion and increasing transportation-related pollution are by-products of a growing economy. Transportation planning with emphasis on freight mobility will be critical to addressing these issues. Many states have already recognized the importance of the inland waterway system and have programs to champion the development of ports and waterways. Other states are conducting extensive studies in order to implement their own state level programs. Whether currently in place or in the development process, what these states have in common is the recognition that port and waterway development will benefit their economy through attraction of new industries, high paying jobs, and enhancement of the tax base resulting from these new industries, strengthening their current economic position.

With its central location and extensive navigable river system, Tennessee is in a position to take a leadership role in facilitating waterborne commerce. DOT agencies have the role of facilitating a more efficient transportation system that enables economic growth and development. Waterborne commerce can alleviate some of the ever increasing congestion issues the transportation infrastructure is facing, as well as enhance the economic development potential of the state.

Appendix

Inventory of General Purpose River Terminals in Tennessee

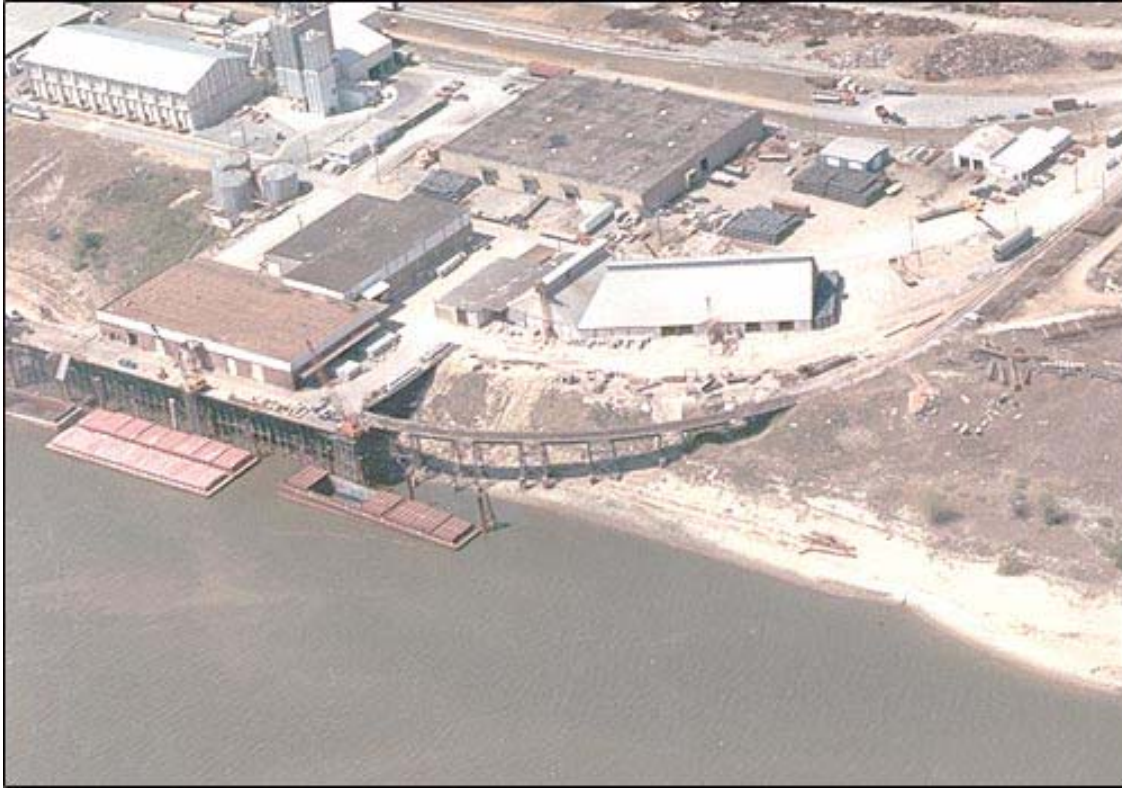
General Purpose River Terminals in Tennessee *

River	Mile	L/R	Name of Terminal	General Location	Page #
Mississippi	725.0	L	Kinder Morgan Terminals	Memphis, TN	A-2
Mississippi	725.0	L	Lash Intermodal Terminal Company (LITCO)	Memphis, TN	A-4
Mississippi	740.3	L	Fullen Dock and Warehouse, Memphis Wharves	Memphis, TN	A-6
Mississippi	818.5	L	West Tennessee Terminals, LLC	Halls, TN	A-8
Cumberland	123.9	R	Winn Materials	Clarksville, TN	A-10
Cumberland	175.5	L	Hunter Marine Transport, Inc.	Nashville, TN	A-12
Cumberland	180.1	R	Hailey's Harbor River Transportation Terminal	Nashville, TN	A-14
Cumberland	189.9	R	Cherokee Marine Terminals	Nashville, TN	A-16
Tennessee	100.4	R	Herbert Sangravl Co., New Johnsonville Docks	New Johnsonville, TN	A-18
Tennessee	423.7	L	Port of Nickajack, Inc.	South Pittsburg, TN	A-20
Tennessee	456.2	R	Mid South Terminals, Div. of Serodino, Inc.	Chattanooga, TN	A-22
Tennessee	463.8	R	JIT Terminals	Chattanooga, TN	A-24
Tennessee	466.5	L	Centre South Riverport	Chattanooga, TN	A-26
Tennessee	600.2	R	Fort Loudon Terminal	Lenoir City, TN	A-28
Tennessee	652.2	R	Burkhart Enterprises, Inc.	Knoxville, TN	A-30

** This appendix includes only those General Purpose River Terminals that are located within the State of Tennessee.*

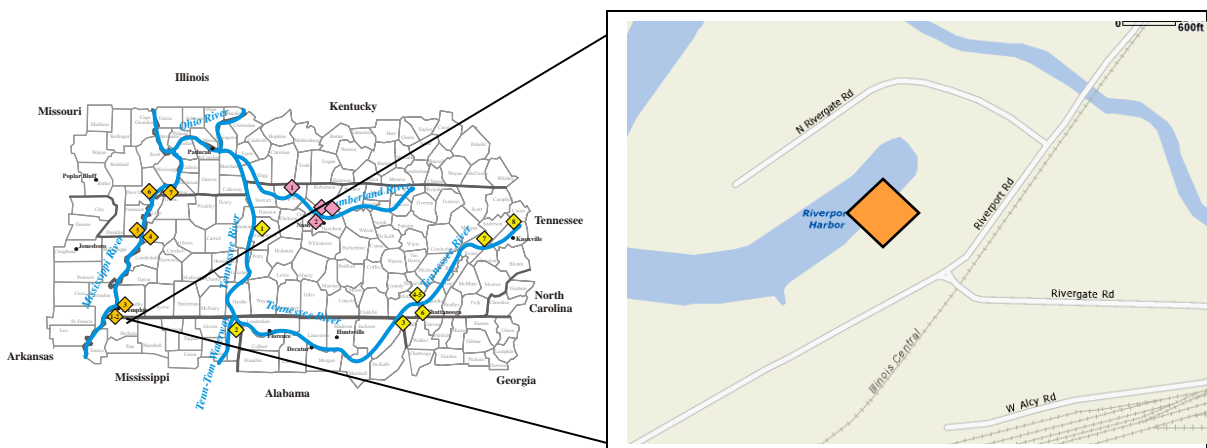
Port Name	Kinder Morgan Terminals
Location	
City	Memphis
County	
State	Tennessee
River	Mississippi River
River Mile	725.0
Dist. To Hwy.	I-55 < 1 mile
Dist. To Rail	Onsite, CN, UP, BN, CSX, NS
Site	
Acres Developed	35
Acres Owned	35
Topography	Flat
Facilities	
Docks	2 docks, 5 barge capacity
Buildings	168,000 sq. ft. capacity
Equipment	(6) Flat Railcars; (1) Truck Scale; (2) Locomotives; (4) Boom Cranes; (5) Overhead Cranes; Front End Loaders; Bobcat
Services Offered	Truck/Barge/Rail
Business	Wire rod, tin plates, steel, caustic soda, zinc, various grains and fertilizers, ferro alloys and furaldehyde
Contact	
Terminal Owner	The Memphis and Shelby County Port Commission
Terminal Operator	Kinder Morgan

KINDER MORGAN BULK TERMINALS



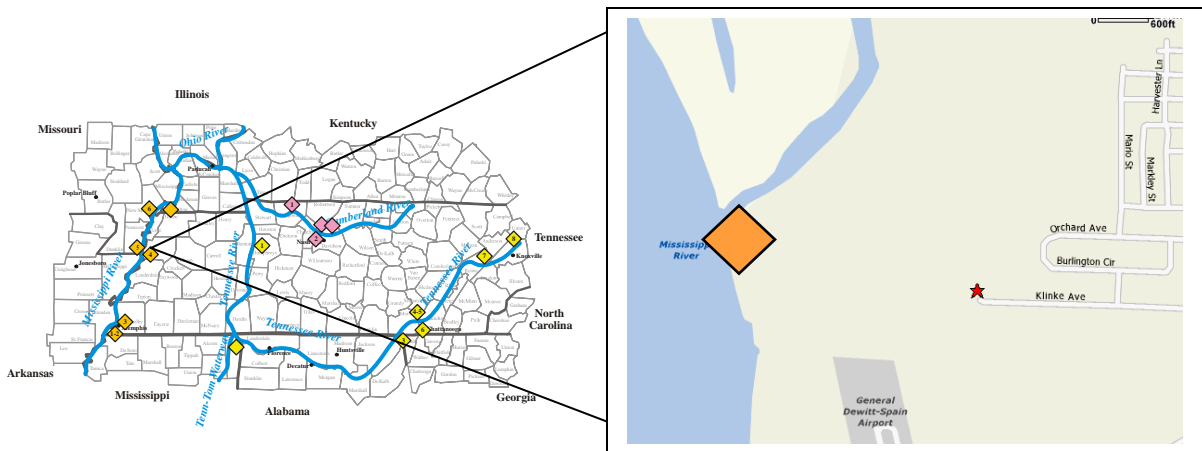
Port Name	Lash Intermodal Terminal Company (LITCO)
Location	
City	Memphis
County	Shelby
State	Tennessee
River	Mississippi River
River Mile	725.0
Dist. to Hwy.	I-55 < 1 mile
Dist. to Rail	On site, CN, BN
Site	
Acres Developed	12
Acres Owned	12
Topography	Flat
Facilities	
Docks	1 dock
Buildings	287,000 sq. ft.
Equipment	25 ton crane
Services Offered	Truck/Barge/Rail
Business	General cargo on lash barges
Contact	
Terminal Owner	The Memphis and Shelby County Port Commission
Terminal Operator	Cooper T Smith

LASH INTERMODAL TERMINAL COMPANY (LITCO)



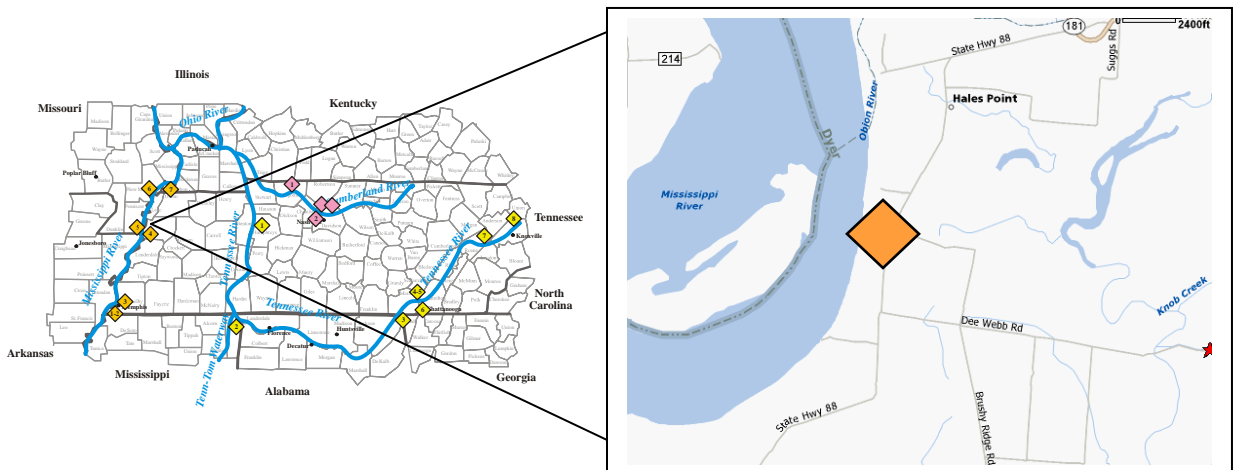
Port Name	Fullen Dock and Warehouse, Memphis Wharves
Location	
City	Memphis
County	Shelby
State	Tennessee
River	Mississippi River
River Mile	740.3
Dist. To Hwy.	Near I-40 and I-55 < 20 miles
Dist. To Rail	CSX, BN, UP, NS
Site	
Acres Developed	
Acres Owned	640
Topography	Flat
Facilities	
Docks	6 docks
Buildings	+500,000 sq. ft. of covered; 750,000 sq. ft. paved
Equipment	Cranes to 100 tons, buckets to 7 yards
Services Offered	Truck/Rail/Barge
Business	Containers on barge, steel, aggregates, general cargo
Contact	
Terminal Owner/Operator	Fullen Dock & Warehouse, Inc.

FULLEN DOCK AND WAREHOUSE, MEMPHIS WHARVES



Port Name	West Tennessee Terminals, LLC
Location	
City	Halls
County	Lauderdale
State	TN
River	Mississippi River
River Mile	818.5
Dist. To Hwy.	Hwy. 88 < 1 mile
Dist. To Rail	None
Site	
Acres Developed	25
Acres Owned	25
Topography	flat
Facilities	
Docks	300 ft.
Buildings	
Equipment	Hydraulic excavator and material handler
Services Offered	Truck/Barge
Business	Dry bulk, fertilizer, aluminum, steel, scrap, grain
Contact	
Terminal Owner	Cargill
Terminal Operator	West Tennessee Terminals, LLC

WEST TENNESSEE TERMINALS, LLC



Port Name	Winn Materials
Location	
City	Clarksville
County	Montgomery
State	Tennessee
River	Cumberland River
River Mile	123.9
Dist. To Hwy.	I-24 < 7 miles
Dist. To Rail	none
Site	
Acres Developed	
Acres Owned	
Topography	Flat
Facilities	
Docks	Mooring structures
Buildings	
Equipment	
Services Offered	Truck/barge
Business	Limestone products, sand, general cargo
Contact	
Terminal Owner/Operator	Winn Materials

WINN MATERIALS



Port Name	Hunter Marine Transport, Inc.
Location	
City	Nashville
County	Davidson
State	Tennessee
River	Cumberland River
River Mile	175.5
Dist. To Hwy.	I-40 < 3 miles; Hwy. 155 < 2 miles
Dist. To Rail	CSX connection
Site	
Acres Developed	22
Acres Owned	32
Topography	Flat
Facilities	
Docks	2 docks
Buildings	100,000 sq. ft.
Equipment	Cranes, conveyors
Services Offered	Barge, Truck, Rail
Business	Steel, dry bulk, coke, sand, salt, stone, equipment, coal, fertilizer
Contact	
Terminal Owner/Operator	Hunter Marine Transport, Inc

HUNTER MARINE TRANSPORT, INC.



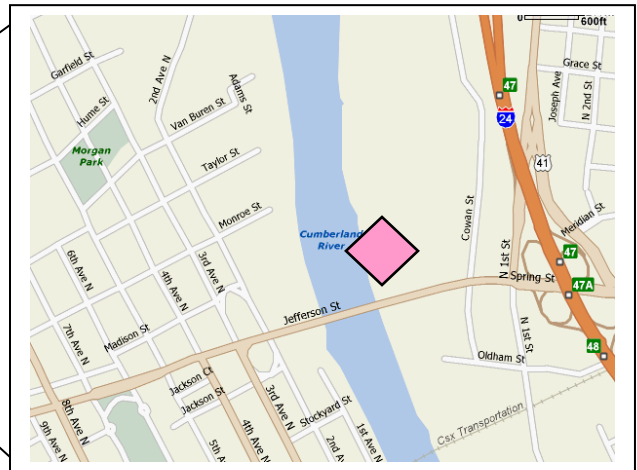
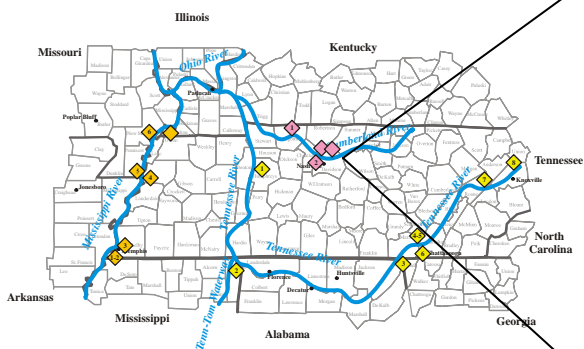
Port Name	Hailey's Harbor River Transportation Terminal
Location	
City	Nashville
County	Davidson
State	Tennessee
River	Cumberland River
River Mile	180.1
Dist. To Hwy.	Hwy. 155 < 1 mile; I-40 < 8 miles; I-24 < 10 miles
Dist. To Rail	Nashville and Western on-site
Site	
Acres Developed	34
Acres Owned	34
Topography	flat
Facilities	
Docks	1
Buildings	Open
Equipment	Cranes, conveyors, material handlers
Services Offered	Truck, Rail, Barge
Business	Steel, scrap, coal, salt, dry bulk, general commodities
Contact	
Terminal Owner/Operator	Hailey's Harbor Intermodal River Terminal

HAILEY'S HARBOR RIVER TRANSPORTION TERMINAL



Port Name	Cherokee Marine Terminals
Location	
City	Nashville
County	Davidson
State	Tennessee
River	Cumberland River
River Mile	189.9
Dist. To Hwy.	I-24 adjacent
Dist. To Rail	CSX
Site	
Acres Developed	29
Acres Owned	29
Topography	flat
Facilities	
Docks	3
Buildings	160,000 sq. ft.
Equipment	Cranes
Services Offered	Barge, Truck, Rail
Business	Steel, heavy lifts, general cargo
Contact	
Terminal Owner/Operator	Cherokee Marine Terminal

CHEROKEE MARINE TERMINALS



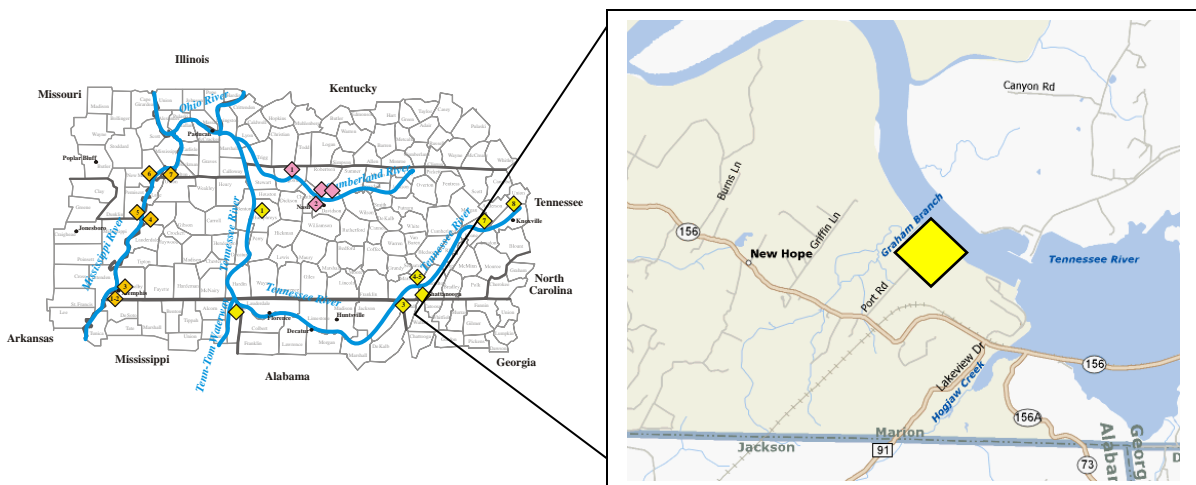
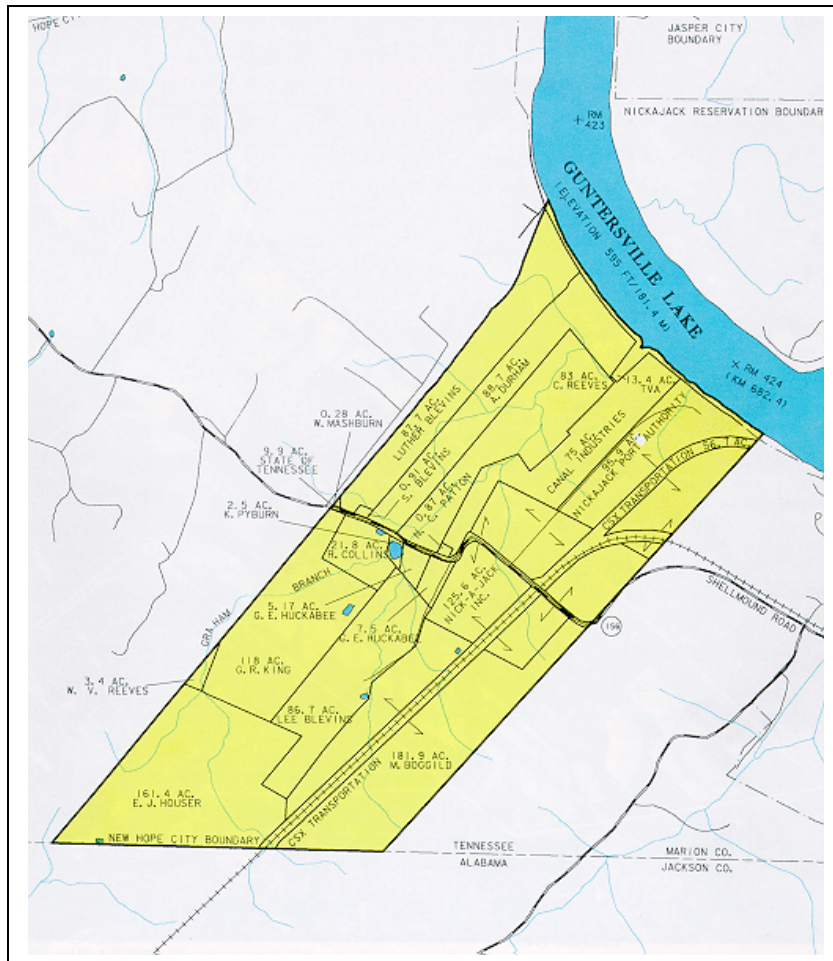
Port Name	Herbert Sangravl Co., New Johnsonville Docks
Location	
City	New Johnsonville
County	Humphreys
State	Tennessee
River	Tennessee River
River Mile	100.4
Dist. to Hwy.	I-40 - 10 mi.; US-70 - 5 mi.
Dist. to Rail	Rail on site
Site	
Acres Developed	15
Acres Owned	15
Topography	Flat
Facilities	
Docks	Mooring cells
Buildings	None
Equipment	(1) 150 ton crane; (1) floating crane; 4-yard clam bucket; 200 tph conveyor
Services Offered	Truck/ground/rail/barge service
Business	Aggregates, steel, coke, livilite, coal, ore, sand, aluminum
Contact	
Terminal Owner	Ingram Materials
Terminal Operator	Sangravl Company

HERBERT SANGRAVL CO., NEW JOHNSONVILLE DOCKS



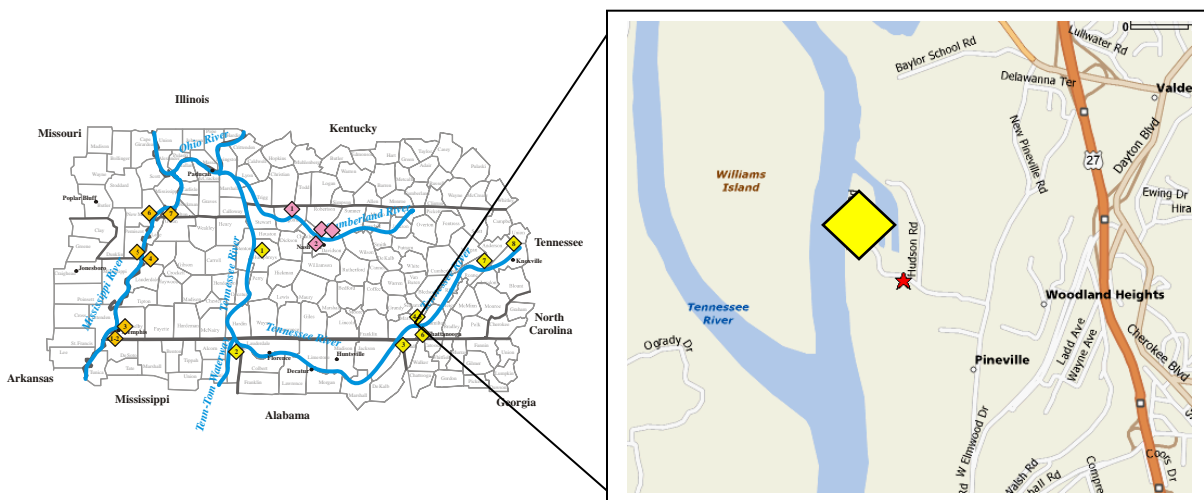
Port Name	Port of Nickajack, Inc.
Location	
City	South Pittsburg
County	Marion
State	Tennessee
River	Tennessee River
River Mile	423.7
Dist. to Hwy.	ST-156 adjacent
Dist. to Rail	No rail on site
Site	
Acres Developed	3
Acres Owned	8
Topography	Flat
Facilities	
Docks	800 ft. river frontage with 40 ft. crane cell and (3) 20 ft. mooring cells; capacity is one working with 4 fleeted
Buildings	No storage buildings
Equipment	Crane with 40,000 lb. capacity at 40 ft.; 5 cy. clam bucket; 82" magnet
Services Offered	Transload from barge to truck and to ground storage
Business	Pig iron, steel, forest products, aggregates, coal
Contact	
Terminal Owner	Nickajack Port Authority
Terminal Operator	Parker Towing Company

PORT OF NICKAJACK, INC.



Port Name	Mid South Terminals, Division of Serodino, Inc.
Location	
City	Chattanooga
County	Hamilton
State	Tennessee
River	Tennessee River
River Mile	456.2
Dist. To Hwy.	I-24 via US 27
Dist. To Rail	Rail on site
Site	
Acres Developed	Three sites – (2) 1.5 acre and (1) 15 acre site at 456.5 that is inactive at this time
Acres Owned	18
Topography	Flat
Facilities	
Docks	1,600 ft. river frontage with many dolphins and cells along the main channel of the river as well as the barge slip area
Buildings	None
Equipment	(2) 70 ton cranes on 25 ft. cells; (2) 100 ton cranes - American 999C crawler; Manitowoc 4000 crawler
Services Offered	Barge to truck/ground/rail/liquid storage Truck/ground/rail/liquid to barge
Business	Iron, steel, coal, coke, grain and aggregates
Contact	
Terminal Owner/Operator	Serodino, Inc.

MID-SOUTH TERMINALS, DIVISION OF SERODINO, INC.



Port Name	JIT Terminals
Location	
City	Chattanooga
County	
State	Tennessee
River	Tennessee River
River Mile	463.8
Dist. To Hwy.	Hwy. 27 adjacent, I-24 < 3miles
Dist. To Rail	Connection to NS
Site	
Acres Developed	30
Acres Owned	30
Topography	Flat
Facilities	
Docks	Mooring structures
Buildings	155,000 sq. ft.
Equipment	70 ton crane
Services Offered	Truck/Barge/Rail
Business	Steel, liquids & general cargo
Contact	
Terminal Owner/Operator	JIT Terminals, Inc

JIT TERMINALS



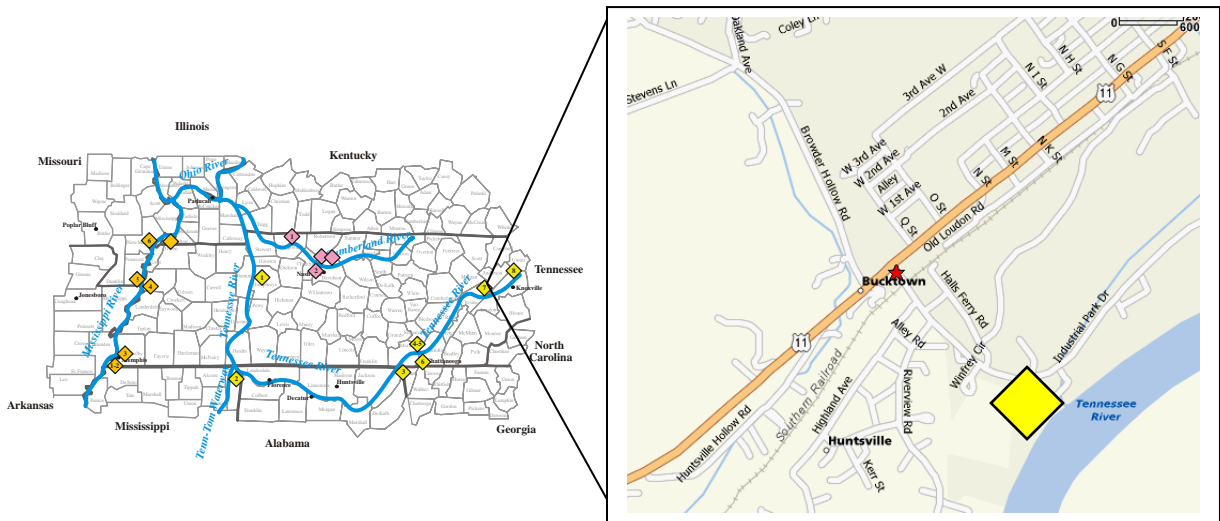
Port Name	Centre South Riverport
Location	
City	Chattanooga
County	
State	Tennessee
River	Tennessee River
River Mile	466.5
Dist. To Hwy.	Hwy. 58 adjacent, I-24 < 10miles
Dist. To Rail	Connection to NS
Site	
Acres Developed	15
Acres Owned	15
Topography	Flat
Facilities	
Docks	Mooring Structures
Buildings	Open
Equipment	150 ton crane
Services Offered	Truck/Barge/Rail
Business	Steel, bulk and break-bulk
Contact	
Terminal Owner	Hamilton County
Terminal Operator	Parker Towing

CENTRE SOUTH RIVERPORT



Port Name	Fort Loudon Terminal
Location	
City	Lenoir City
County	Loudon
State	Tennessee
River	Tennessee River
River Mile	600.2
Dist. To Hwy.	I-40 and I-75 are within 3 miles
Dist. To Rail	Rail on site
Site	
Acres Developed	11
Acres Owned	22
Topography	80% flat; 20% slightly sloped
Facilities	
Docks	Extensive river frontage
Buildings	(2) storage buildings – 25,000 sq. ft. and 50,000 sq. ft.; 1 acre storage pad
Equipment	(1) 30 ton crane; (4) other cranes; (2) truck scales
Services Offered	Truck/ground/rail service
Business	Iron, salt, forest products, alloys, fertilizers, sand, chemicals, steel, coal, coke, grain and aggregates
Contact	
Terminal Owner/Operator	Tennessee Farmers Cooperative

FORT LOUDON TERMINAL



Port Name	Burkhart Enterprises, Inc.
Location	
City	Knoxville
County	Knox
State	Tennessee
River	Tennessee River
River Mile	652.2
Dist. To Hwy.	I-40 and I-75 are accessible via ST-168
Dist. To Rail	Rail on site
Site	
Acres Developed	60
Acres Owned	100
Topography	Flat
Facilities	
Docks	Nearly one mile of riverfront, 2 docks – 60 ft. concrete, 40 ft. gravel
Buildings	24,000 sq. ft. warehouse; 5,000 sq. ft. bulk storage
Equipment	(1) 100 ton crane; (1) 85 ton crane; (2) truck scales
Services Offered	Truck/ground/rail/barge service
Business	Iron, salt, sand, steel, coal, coke and gravel
Contact	
Terminal Owner/Operator	Burkhart Enterprises

BURKHART ENTERPRISES

