Mississippi's Unified Long-Range Transportation Infrastructure Plan

Mississippi Department of Transportation

FINAL REPORT

Appendix H: Port and Waterway Needs Assessment

MAY 2011

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1. INTRODUCTION

Mississippi ports are located along the Gulf of Mexico, the Mississippi River, and the Tennessee-Tombigbee Waterway (Tem-Tom). These ports connect the State to the nation's marine network and international trading lanes. By doing so, waterborne transportation is a critical component to Mississippi industries that ship and receive goods in today's global economy.

For these reasons, the analysis of the State's marine facility needs is an important component of MULTIPLAN. The following sections summarize port activity, identify port infrastructure needs, and detail port economic importance. More specifically:

- **Section 1: Introduction** provides an overview of waterborne freight shipment trends, Mississippi public port facilities, improvement needs, and associated economic impacts.
- **Section** 2**: Port Infrastructure, Cargo, and Needs** details the strategic importance of the public ports, including infrastructure and accessibility characteristics, cargo profile, and planned improvements for each Mississippi port.
- **Section** 3**: Mississippi Port Needs** summarizes the planned improvement needs for the public ports and the associated cost estimates.
- **Section 4: Port and Waterway Economic Impacts** presents the methodology and data used to estimate the economic impacts associated with waterborne freight movements at the public ports in Mississippi.

1.1 Cargo and Logistics Trends

A diverse range of freight cargo traverses the coastal and inland ports in Mississippi, with myriad types of commodities originated from and destined to an equally diverse range of locales around the world. As the public ports in Mississippi accommodate such an economically-interconnected trade network, those ports are influenced by changing cargo and logistics trends. Evaluation of strategic transportation investments in ports requires consideration of local, national and global trends. The following discussion identifies such trends likely to affect the Mississippi's public port system.

Panama Canal – In 2014, the expansion of the Panama Canal is expected to be complete, which likely will have the largest impact on both cargo and logistics for Mississippi ports of the anticipated trends. Currently, the Panama Canal is able to accommodate container ships with a maximum capacity of approximately 5,000 twenty-foot-equivalent units (TEUs); whereas, following completion of the expansion, the vessel capacity increases to approximately 12,000 TEUs. Such a per-vessel capacity increase has various ramifications, such as increased draft requirements (i.e., post-Panamax vessels require ~50ft.+ clearance) and potential shifts in logistics and trade networks. An important consequence for Mississippi is the extent to which

the Panama Canal expansion will shift the trade route from West Coast ports to Gulf Coast and Atlantic Coast ports (both in Mississippi and competing ports). The extent to which trade routes will shift is debated, but numerous factors will affect the magnitude, including:

- Global economic health;
- Gulf and Atlantic port capacity to handle increased draft requirements and cargo volume;
- Changes in oil prices (transport fuels);
- West Coast and Mexican port improvements; and,
- Price structure of Panama Canal tolls.

Container Ships – Consequential of the expected Panama Canal expansion and other international trade factors, the average size of container shipping vessels has been increasing. As exhibited in **Table 1-1**, the size of the average container ship more than doubled between 1987 and 2007 and is continuing to increase, growing by over eight percent between 2007 and 2009. As of October 31, 2009, the average size of the 218 ships built in 2009 was 4,125 TEUs.[1]

Table 1-1: Trends in Container Ship Capacity (in TEUs)

Year	1987	1997	2007	2008	2009
TEUs	1,155	1,581	2,417	2,516	2,618

Source: United Nations Conference on Trade and Development

Existing channel and river depth restrictions at the public ports in Mississippi currently hinder large ships (especially post-Panamax) from calling at those locations. However, despite the inability of the ports to accommodate such large ships, the trend toward larger ships will indirectly affect the ports in Mississippi as trade networks shift accordingly.

Caribbean Transshipment - Another evolving trend in global logistics is the use of transshipment facilities in the Caribbean. Facilities are planned for Ponce, Puerto Rico (Port of the Americas), Freeport, Bahamas, and Kingsport, Jamaica. Such transshipment ports would receive large container ships, where containers would be transloaded to smaller vessels for transfer to U.S. ports and thereafter inland distribution. Cuba's future relationship with world trade is unknown, but it is possible that Cuba could emerge as a potential location for a major transshipment facility.

Modal Competition - In addition to improvements planned at coastal ports along the Gulf of Mexico and the Atlantic, significant rail infrastructure investment is ongoing and planned along the U.S. East Coast. Such rail improvements will complement port developments from an intermodal connectivity perspective, and also compete with ports as a possible modal alternative. At this time, three major rail improvement programs are underway in the Eastern United States: the Heartland Corridor, the Crescent Corridor, and the National Gateway. Western rail

[1] United Nations Conference on Trade and Development, *Review of Maritime Transport, 2009*.

improvements are also underway that could pose a competitive challenge, impacting the extent to which the Panama Canal expansion will shift freight from the West Coast to the East Coast.

Shipping Regulations - Domestically, opportunities for containerized traffic are increasing, as a means to avoid or circumvent highway load limits. Existing size and weight regulations and permit processes should be reviewed to determine necessary changes for enhancing freight traffic movements that benefit the economy, while not damaging vital infrastructure. Ports will need to partner with the State to identify container truck routes that meet both the needs of the community and the economy for the efficient movement of freight traffic.

Industry Composition – In the United States, a shift from a manufacturing-oriented to a service-oriented economy continues. Such a shift alters the composition and location of produced goods and services. This alters the transportation needs associated with intermediate inputs to produce affected goods and services, as well as the transportation needs for distributing the final goods and services. Economic restructuring invariably affects the ports that facilitate these transportation needs.

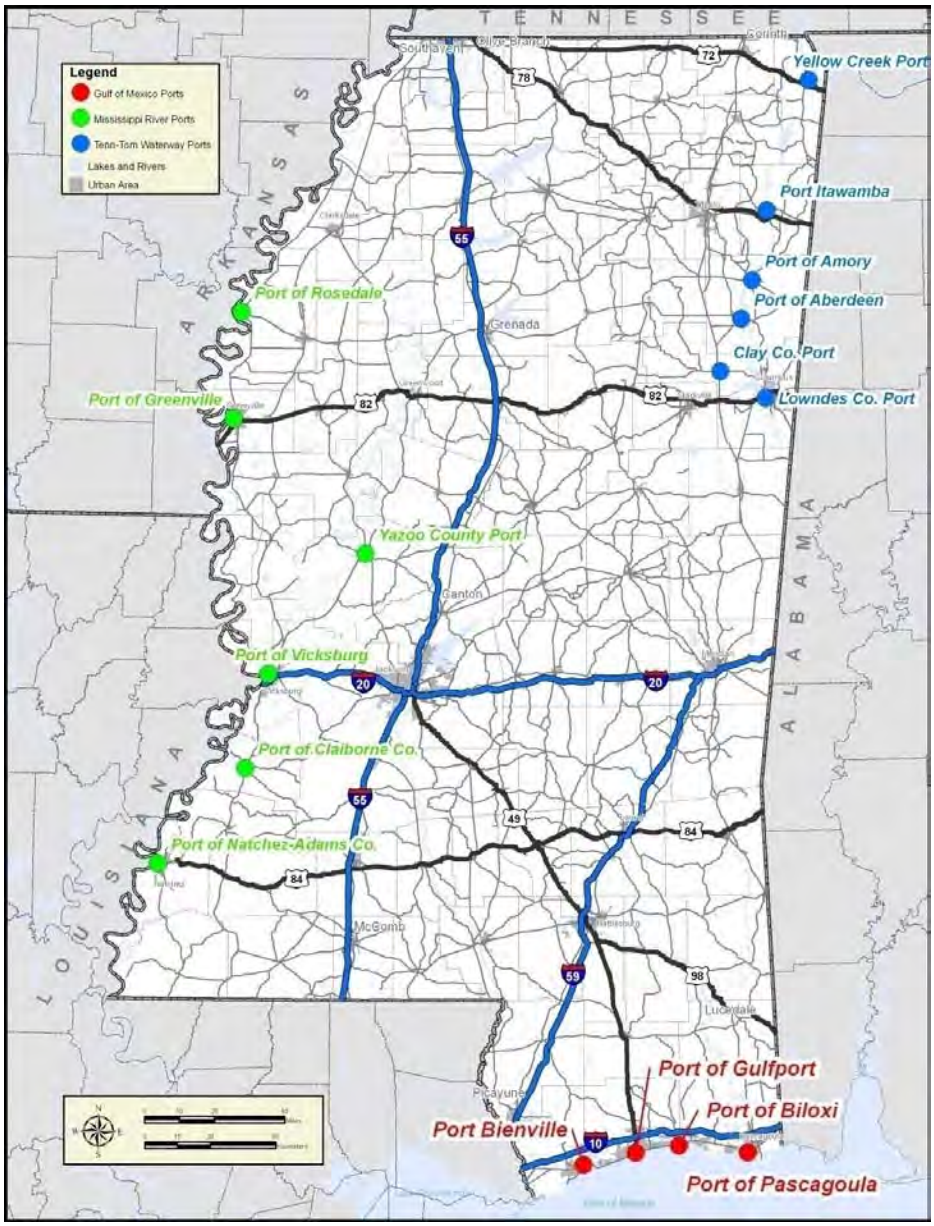
1.2 Mississippi's Public Port Facilities

Mississippi has sixteen public ports located on the Gulf of Mexico, the Mississippi River, and the Tennessee-Tombigbee Waterway. These ports significantly contribute to the local, regional, and national economies by providing employment and income to individuals in the waterborne transportation services industry and by facilitating efficient movements of freight cargo - either intermediate inputs into production processes or goods for final consumption. It is especially the enabling of efficient and cost-effective trade movements that buttress and foster private sector economic productivity. In addition, the ports provide tax revenues to local and state governments and customs fees to the Federal Government.

Ports play a vital role in the logistics network of Mississippi, often providing the lowest-cost option for freight shipping, and facilitating international trade via accessibility to international shipping routes. Gulf Coast ports enable international trade because of immediate access to international maritime routes, while the inland ports on the Mississippi River and the Tennessee-Tombigbee Waterway serve as a feeder network to bring international trade to and from seaports, as well as to facilitate domestic trade.

Port Locations - As exhibited in **Figure 1-1**, four public ports are located on the Gulf of Mexico (Gulfport, Pascagoula, Bienville, and Biloxi), six on the Mississippi River or its tributaries (Rosedale, Yazoo County, Greenville, Vicksburg, Natchez-Adams County, and Claiborne County), and six on the Tennessee-Tombigbee Waterway (Yellow Creek, Itawamba, Aberdeen, Amory, Lowndes County, and Clay County).

Figure 1-1: Mississippi's Ports and Public Water Terminals



Although not in Mississippi, the Port of New Orleans (Louisiana) and the Port of Mobile (Alabama) are important to the State, as they provide deepwater access from the Mississippi River and the Tennessee-Tombigbee Waterway, respectively.

<u>Port Characteristics</u> – Public ports in Mississippi serve various purposes, as a function of location, proximity to industry, and the underlying characteristics of the port, including such facets as footprint (acreage), channel depth, on-site facilities, intermodal accessibility, number and size of berths, etc. **Table 1-2** provides a summary of the public port characteristics in

Mississippi, while **Section** 2 provides further descriptions of such characteristics by individual port.

Table 1-2: Mississippi Ports Summary

Port	Date Placed Under Current Governance	Category of Governance	Acreage	Channel Depth	Square Footage of Warehouse and Dock
Gulf Coast					
Port of Pascagoula	1956	Local	214	38-42 feet	1,996,643
Port of Gulfport	1960	State	184	32-36 feet	8,015,040
Port Bienville	1972	Local	25	12 feet	610,780
Port of Biloxi			2	12 feet	20,000
					Mississippi River
Port of Natchez	1954	Local	25	22 feet	110,000
Port of Claiborne Co.	1991	Local	410	14 feet	66,859
Port of Vicksburg	1960s	Local	11	12 feet	129,000
Yazoo County Port	1964	Local	9	11 feet	15,000
Port of Greenville	1930s	Local	10	9 feet	450,000
Port of Rosedale	1977	Local	75	9 feet	87,000
					Tennessee-Tombigbee
Yellow Creek Port	1972	State	8	9 feet	100,000
Port Itawamba	1975	Local	3	10.5 feet	145,680
Port of Amory	1985	Local	24	9 feet	532,720
Port of Aberdeen	1986	Local	80	9 feet	160,000
Port of Clay County	1984	Local	20	9-12 feet	14,600
Lowndes County Port	1975	Local	19	9 feet	400,000

Source: Mississippi Legislature Joint Committee on Performance Evaluation and Expenditure Review (PEER).

Cargo Movements – Public ports in Mississippi handled approximately 52 million tons of freight in 2008, comprised of 19 million outbound tons and 33 million inbound tons. Cargo data presented is from the Waterborne Commerce Statistics (WCS), published by the United States Army Corps of Engineers (USACE). **Section** 2 provides details of cargo movements (per the WCS dataset) for each public port.

Despite the cargo data availability from the WCS, the economic analysis necessitates origin- and destination-based cargo data[2], and consequently, culled such data from the TRANSEARCH database, produced by IHS/Global Insight. A description and comparison of each freight database is provided within **Section 4.1.2**.

Port Planned Improvements and Needs – As part of the public port assessment, a number of port improvement projects were identified, totaling 86 needs (projects) for 15 of the 16 public ports in Mississippi (no projects were provided by the Port of Biloxi). An estimation of the project costs was conducted based on provided input for thirty of the 86 projects identified. In total, the 86 identified projects would cost an estimated $560 million, or $6.5 million per project, on average.

[2] USACE WCS does not provide data with designations of origins and destinations, only by port handling location

Individual planned improvement needs are identified in the respective individual port subsections within **Section** 2, and **Section** 3 summarizes the project needs by location, port, type, and category. Project types are designed as either pertaining to: 1) Port Facilities; 2) Channel Issues; 3) Rail Access; and, 4) Road Access. Projects are further categorized as: 1) Preservation; 2) Modernization; or, 3) Expansion. Of the projects, Port Facility improvements constitute the largest project type, accounting for approximately 51% of all projects (i.e., 44 of 86) and reflecting the largest relative costs (i.e., 90%).

1.3 Economic Impacts

In addition to the public port infrastructure assessment and identification of potential port improvement needs, an economic impact evaluation of waterborne transportation in Mississippi is presented (see **Section** 4). An economic impact analysis is conducted to present the economic contribution of the public ports to the State, and to provide context for understanding the rationale behind implementing the planned improvement needs.

Economic impacts of Mississippi's public ports reflect the range of impacts directly and tangentially related to waterborne transportation, inclusive of transport-service and trade-user impacts. Transport service impacts represent the economic activity related to the provision of port and waterway operations, while the trade-user impacts relate to the shippers and receivers of waterborne freight cargo. Impacts are estimated and presented by impact activity (i.e., transport service and trade-user), type (i.e., direct, indirect, and induced), and measure (i.e., employment, income, value-added, and output).

Presented in **Section 4.2** are the detailed impact findings. In summary, the public port system in Mississippi, both directly and tangentially, supports almost a $6.5 billion value-added (Gross State Product) contribution to the statewide economy, paying almost $3.5 billion in income to 93,150 employees.

2. PORT INFRASTRUCTURE, CARGO, AND NEEDS

Provided within the subsequent subsections are overview descriptions of the sixteen public ports in Mississippi, presented by clustered geography (i.e., Gulf Coast, Mississippi River, and Tennessee-Tombigbee Waterway). For each public port, a general description is provided summarizing the port location, infrastructure inventory, multimodal accessibility, cargo profile, and any planned improvements.

2.1 Gulf Coast Ports

Along the Gulf of Mexico in Mississippi, there are four public ports, as shown in **Figure 2-1** below. This subsection details the characteristics of those four Gulf Coast Ports**.**

Figure 2-1: Gulf Coast Ports

2.1.1 Port Bienville

Port Bienville is a shallow draft (12 ft.) barge port in southwest Mississippi, located off the Intracoastal Waterway near mile marker 24 on Mullatto Bayou in Hancock County. It primarily serves a market area that includes Harrison and Hancock Counties. In 2008, the market area had a total population of 219,000 residents, with approximately 140,000 employees, and a gross regional product (GRP) of $9.7 billion.

Infrastructure and Accessibility

Port Bienville property encompasses approximately 3,600 acres, including an industrial park containing eighteen industries. It owns the nine-mile long Port Bienville Railroad, which provides connectivity access from the Port Bienville Industrial Park to CSX rail.

Infrastructure characteristics of Port Bienville are summarized in **Table 2-1**.

Cargo Profile

Waterborne Commerce Statistics, compiled and publically-available from the US Army Corps of Engineers (USACE) provides the most reliable source for port cargo data; however, the USACE does not produce cargo data for Port Bienville by commodity. As a proxy in lieu of the unavailable Port Bienville data, data for the East Pearl River waterway segment was assessed. Note that data for the East Pearl River may reflect cargo associated with private terminals along this waterway segment in addition to public port cargo.

Table 2-1: Port Bienville Infrastructure Summary

Category	Description
Acreage	25 acres, 3,600 acre industrial park
Berthing space	8 berths with lengths of 600-1,050 feet
Depth alongside facility	3 berths at 16' and 5 berths at 12 feet
Cranes and other equipment	Two 125-ton cranes
On-site rail infrastructure	Port Bienville Railroad (PBVR) runs between CSX and Port Bienville Industrial Park
Rail connections	1 Spur Track- CSX
Rail service	Commission owns and runs a shortline RR
Highway access	I-10 (9 miles) US Hwy 90 (3 miles)
Logistics facilities (e.g. warehouses, cold storage buildings, etc.)	610,000 sq ft warehouse 30,000 sq ft climate-controlled warehouse (Private) Pipeline for movement of ethyl glycol (400 ft. L x 100 ft. W) Hard surface loading area (6 acres) Container-to-truck facility Direct dump ramp Palletized load handling
Terminal Operator(s) (if different from owner)	Sabic Marine Terminal (liquid bulk styrene and acrylonitrile) Wellman Wharf Liquid Bulk Terminal (Ethylene glycol) PSL Marine Terminal (break-bulk steel for manufacture of steel pipe) Vulcan Materials Marine Terminal (dry bulk) SSA Marine Terminal (dry bulk- largely coal) Port Bienville Public Transfer Dock and Marine Terminal Port Bienville Multi-Use Terminal (formerly Linnea Peninsular)

Source: Interviews with Port personnel and USACE.

As shown in **Figure 2-2**, total tonnage movements along the East Pearl River have decreased over the past five years, from 601,000 tons in 2004 to 465,000 tons in 2008. International textiles completely disappeared in 2006, where the waterway averaged 139,000 tons per year previously. Domestic receipts of hydrocarbon tonnage held steady, as well as nitrogen. Domestic alcohol receipts peaked in 2007 with 121,000 tons, from a low of 67,000 tons following Hurricane Katrina. Domestic receipts of limestone increased significantly from 9,200 tons in 2004 to 74,000 tons in 2008. Domestic coal receipts have steadily increased from 147,000 tons in 2004 to 178,000 tons in 2008.

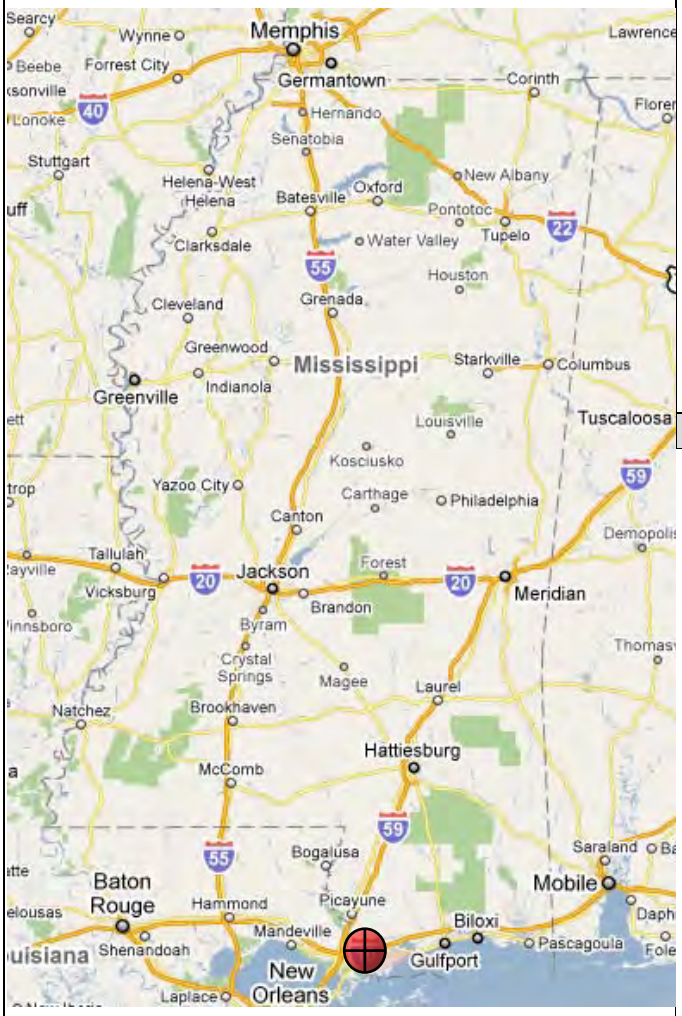
In 2008, the cargo composition for the East Pearl River was mostly coal (38%) and other chemical and related products (44%), with the remaining commodities being soil, sand, gravel, rock, and stone (17%) and non-ferrous ores or scrap (1%).

Planned Improvements

In June 2010, Port Bienville completed a Master Plan Update, identifying near- and long-term priorities. Various potential improvements were suggested, three of which are highlighted below:

Figure 2-2: East Pearl River (Port Bienville Proxy)

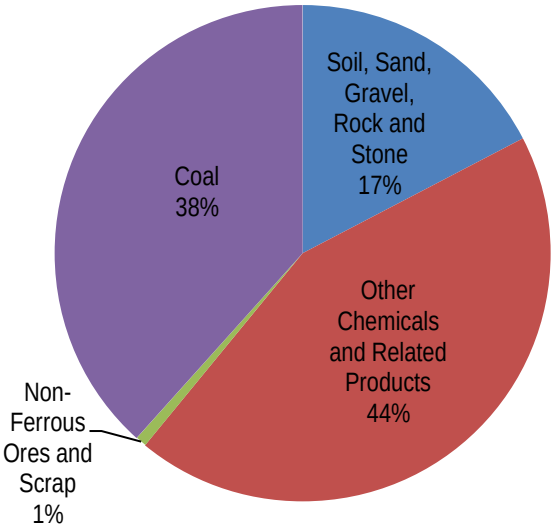
Port Location



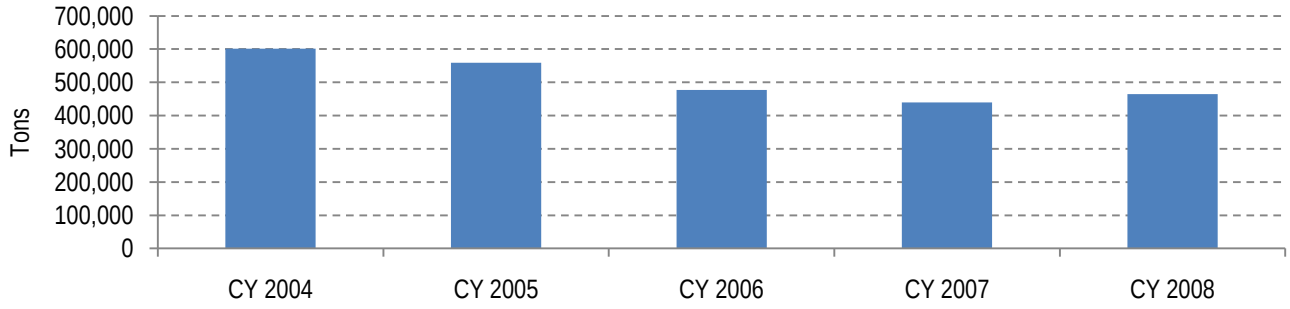
Tons by Direction: 2008

Data Not Available

Tons by Commodity: 2008



Annual Cargo Tons: 2004 to 2008



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics, 2008.

- Channel improvements that would shorten the distance between the Port and deep water, as well as provide access for deeper draft vessels (identified as a near-term need in a Section 905B Reconnaissance Study).
- Development of a new rail connector from Port Bienville Railroad (PBVR) and Norfolk Southern near Picayune, Mississippi, providing a connection to Palmer Crossing and CN. The proposal to connect the rail carrier to Norfolk Southern is under study.
- Replacement of the CSX bridge over the Pearl River at Mile 1.0 near English Lookout. The Pearl River would be the most direct route to the Port from the Gulf Intracoastal Waterway (GIWW), but the narrow passage and location within the river bend makes it impassable for barge traffic.[3] Although the USACE has not maintained the depth at the mouth of the Pearl River, this area falls under USACE jurisdiction. Therefore, the USACE is responsible for maintaining the depth if barge traffic were to resume in that channel. The bridge can only be seen from the water, and the Port Director at Bienville expressed concern about the safety of the bridge itself.

2.1.2 Port of Gulfport

The Port of Gulfport, located five nautical miles north of the Intracoastal Waterway and twenty miles from open water, has been owned by the State since 1960 and is governed by the Mississippi State Port Authority Board of Commissioners. It has East and West terminals and is in the top thirty U.S. ports handling containerized cargo. In addition to the containerized cargo movements, the Port also accommodates a significant volume of produce, especially green fruit imports; three container vessels from Dole, Chiquita, and Crowley call on Gulfport, offering weekly service to Central America.

Being on the Gulf Coast, the Port is geographically well-positioned to trade with Latin America, as it provides shorter transit times to Latin American markets than most East and Gulf Coast ports, see **Table 2-2** for examples. Moreover, Gulfport also provides a shorter distance to many inland U.S. markets than competing ports in Florida that are closer to Latin America**.** Foreign Trade Zone #92 is located in Harrison County.

Gulfport has an additional geographic advantage in that it is positioned close to international shipping lanes. Carriers can access international waters within an hour of departing from Gulfport, which contrasts with other ports, such as New Orleans, where carriers require significantly longer time to access the harbor from open ocean. For example, the Port of New Orleans is 118 miles from open water, whereas the channel to the Port of Gulfport provides access to deep water at 20 miles.

[3] The alternate route through the Rigolets and Little Lake is longer, includes a difficult turn for barges, requires dredging (at the expense of the Port, since it is not a USACE responsibility), and takes the route through Louisiana waters, complicating permitting processes.

Table 2-2: Distance from Puerto Cortes, Honduras to U.S. Ports

U.S. Port	Distance (in Nautical Miles)	Transit Time (at 14 nauts/hr)
Gulfport, MS	910	2 days, 17 hrs
Houston, TX	1,035	3 days, 2 hrs
Miami, FL	765	2 days, 7 hrs
Charleston, SC	1,188	3 days 13 hrs

Source: Searates.com

Infrastructure and Accessibility

Gulfport sustained severe damage from Hurricane Katrina after which Chiquita temporarily relocated its operations only to return in 2009. **Table 2-3** lists some basic infrastructure characteristics of the Port.

Table 2-3: Port of Gulfport Infrastructure Summary

Category	Description
Acreage	184 acres
Berthing space	Multiple berths ranging from 525 – 750 feet (nearly 6,000 feet total)
Depth alongside facility	Port's North Harbor is 32 feet deep South Harbor and Turning Basin are 36 feet deep
Cranes and other equipment	2 Gantry cranes Mobile cranes Convoyer cranes 2 Container cranes
On-site rail infrastructure	None
Rail connections	CSX, KCS, and CN (through an agreement with KCS)
Rail service	KC S provides switching directly to the terminals Port is also served by CSX Contains a container-to-rail facility KCS provides access to Canadian National and Illinois Central railroads
Highway access	US-90 and US-49 (direct access) 5 miles from I-10
Logistics facilities (e.g. warehouses, cold storage buildings, etc.)	Over 500,000 sq ft of covered storage Open container storage with reefer electrical outlets Bulk material unloading system Dockside and off-dock Storage Open bulk and break-bulk storage Customs secured boundaries with roving patrols Container freight Station. Ro-Ro ramp
Terminal Operator(s) (if different from owner)	Mississippi Power Co., Watson Electric Generating Plant Wharf Gulfport Pilots Association Pier Pan Isles, Ship Island Excursion Pier US Coast Guard, Gulfport Station Pier Dole Fresh Fruit, East Pier Berth No. 1 Gulfport Towing Co. Grand Casino, Commercial Small-Craft Harbor Fuel and Ice Pier Bond Paving Co.

Source: Interviews with Port personnel and USACE.

Landside access to Gulfport is currently somewhat limited. As shown in **Table 2-4,** the Port is served by fewer rail carriers than competing ports, such as New Orleans and Mobile. Gulfport is served by only CSX, KCS, and CN (through a marketing agreement with KCS). By contrast, the Port of Mobile has access to five Class I carriers, and New Orleans to all but one of the Class I railroads operating in the United States. Relatively limited rail accessibility constrains the market reach that could be rail-served from the Port, particularly for low-value commodities that are shipped long distances. Generally, rail shipments are more economical when involving only a single carrier, instead of an "interline" move with multiple Class I rail carriers.

Table 2-4: Rail and Intermodal Connections

Gulfport, MS	New Orleans, LA	Mobile, AL
Rail Connections		
CSX KCS CN (KCS marketing agreement)	CSX NS CN KCS UP BNSF	NS CSX CN KCS BNSF/Alabama & Gulf
Rail Intermodal Connections		
N/A	CSX NS CN (On Dock) BNSF UP	CSX

Gulfport is also limited in rail intermodal accessibility, relative to New Orleans and Mobile, where most of the intermodal rail service provided to those two ports are near dock. Currently, no rail intermodal terminals are located on-site at Gulfport. Comparison of the intermodal facilities and accessibility for Gulfport, New Orleans, and Mobile is provided in **Table 2-5.** Near exclusive reliance on truck intermodal connectivity (without comparable rail intermodal connections) limits the ability of Gulfport to provide container service for distant markets. Generally, container drayage by truck is economical only for nearby markets (e.g., within 300 miles).

Despite the near exclusive reliance on trucking intermodal connectivity, highway access is also a challenge for Gulfport. The nearest limited access, divided highway is I-10; however, trucks entering or leaving the Port of Gulfport can only access I-10 by driving five miles through downtown Gulfport, first on US 90 and then on US 49. Such an indirect route can be highly congested and involves numerous traffic signals. According to interviewed Port officials, U.S. 49

Table 2-5: Gulfport, New Orleans, and Mobile Intermodal Facility Comparison

Parameter	Gulfport, MS	New Orleans, LA	Mobile, AL
Channel Depth (container terminal, ft)	36	45	45
Distance to sea buoy	20	118	30
Access to closest limited access highway	5 miles through downtown Gulfport on U.S. 90/U.S. 49 to I-10	1 mile to Pontchartrain Expressway	Less than 0.5 mile to I-10, less than 1 mile to I-65
Berth length (container terminal) (ft)	Multiple berths 525 - 750 ft	• Napoleon Ave: 2 berths @ 1,000 ft • France Road: 2 berths @ 830 and 700 ft (30 ft depth). • Various other mixed use terminals	2,000 ft
Intermodal capacity (TEU)	Currently 300,000, 1 million after expansion	Napoleon Ave: 594,000	Phase 1: 350,000, Full build out: 800,000
Container cranes-number	2	4 with 2 on order	2, 6 Final build out
Container cranes-type	Mobile harbor cranes	Rubber tire gantry cranes	Rail mounted gantry cranes
Acreage (container terminal)	No separate container terminal, 204 overall	Napoleon Ave: 60	Phase 1:95 Full build out: 135

represents a significant bottleneck during peak periods. Accessibility limitations do not hinder directly competing ports, such as the Port of New Orleans, which maintains a dedicated roadwayrunning along the Mississippi River and is less than a mile from the Pontchartrain Expressway. Roadways connecting the port road and the Pontchartrain Expressway are one-way, increasing their capacity. In addition, the entrance to the Port of Mobile is less than a half-mile from I-10 and less than a mile from I-65. Highway accessibility issues, in combination with an absence of rail intermodal connections, restrict the competitiveness of Gulfport.

Aside from landside intermodal connectivity restrictions, one of the greatest current weaknesses of the Port of Gulfport is the inability to accommodate large ships. Currently, the channel depth of the port is 36 feet, and the turning basin is such that the Port cannot handle ships longer than 950 feet.[4] By contrast, Mobile and New Orleans have channels of 45 feet. Accommodating larger ships will become necessary, as there is a trend within the global container fleet toward larger ships, most of which have drafts in excess of the 36 foot current capacity at Gulfport. Many of the Port of Gulfport's traditional trading partners in Latin America are ports with relatively shallow channels. For example, the Crowley Maritime service visits Puerto Cortes in Honduras, which has a channel of no more than thirty-six feet. So, for these traditional trading markets, the channel depth at Gulfport is not a limitation; however, without an ability to accommodate ships with drafts in excess of 36 feet, which a number of other world ports can handle, the range of services that can be offered by the Port of Gulfport are limited.

[4] After Hurricane Katrina, the port silted to only 32 feet, but has been dredged back to 36 feet post-Katrina.

Cargo Profile

Gulfport has achieved significant success as a niche port, focusing on two primary areas: Chiquita and Dole banana imports from Latin America and Crowley's trailer Gulf/Central America service. Gulfport is the second-highest volume importer of green fruit in the United States, accounting for roughly 75% of national import tonnage. Chiquita signed a new lease in 2008 to lease facilities at the port through 2019, and Dole has also signed a new ten-year contract. Gulfport's other niche service consists of twice-weekly service between Gulfport and Guatemala, Honduras, Nicaragua, El Salvador by Crowley Maritime. Crowley recently signed a new contract with the port.

Latin America Focus – A focus on Latin America and specific commodities establishes an area of specialization, through which the Mississippi State Port Authority and its customers are able to build relationships with Latin American trading partners that can be institutionalized. Logistics channels by which green fruit flows through the Port of Gulfport are well-established, and the Port is known as a portal by which fruit enters the United States. Banana tonnage has held steady since 2003, averaging 657,000 tons per year.

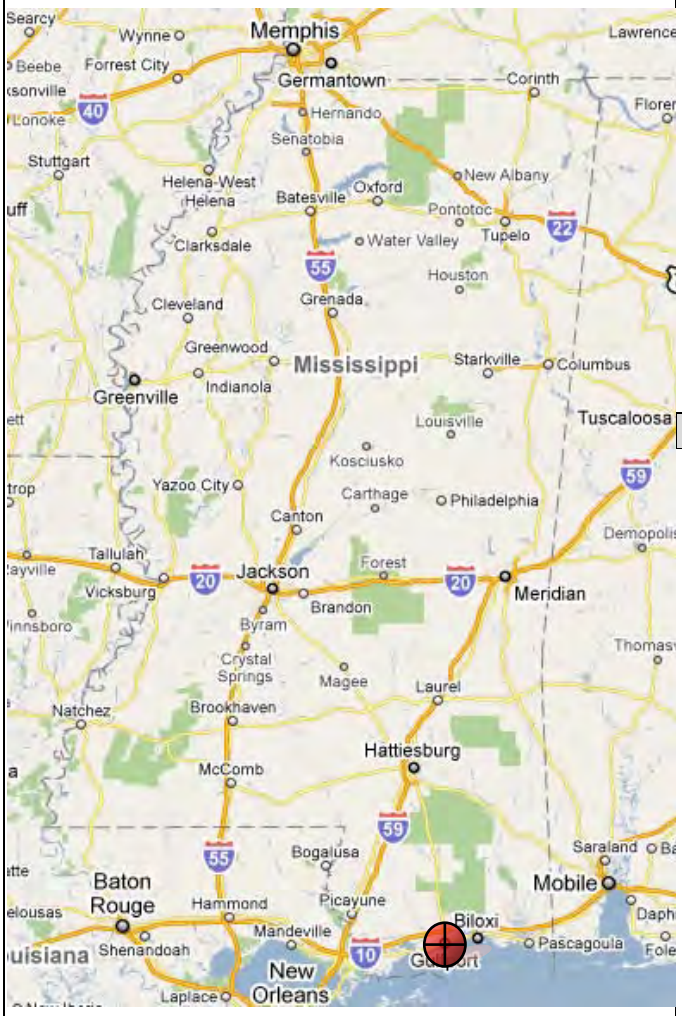
Other Exports – Aside from fruit imports, Gulfport exports commodities including paper, clays, cellulose, fabrics, cloth, yarn, and apparel hardware. Over time, total cargo handled declined following Hurricane Katrina, but has returned to close to pre-Katrina levels by 2008, as shown in **Figure 2-3**. Lumber products have decreased steadily, while fuel oils such as residual oils have risen. Foreign imports of non-ferrous ores took a serious hit from Katrina, but have increased from 271,000 tons in 2003 to 395,000 tons in 2008. Imported limestone started appearing at the Port in 2008 with 67,000 tons.

Summary Tonnage – In 2008, 656,574 tons of freight was shipped from Gulfport. High-volume outbound commodities include manufactured goods, farm products, chemical products, and petroleum products. Gulfport received 1.5 million tons of inbound freight, with the major commodities being farm and food products, crude materials, and manufactured equipment.

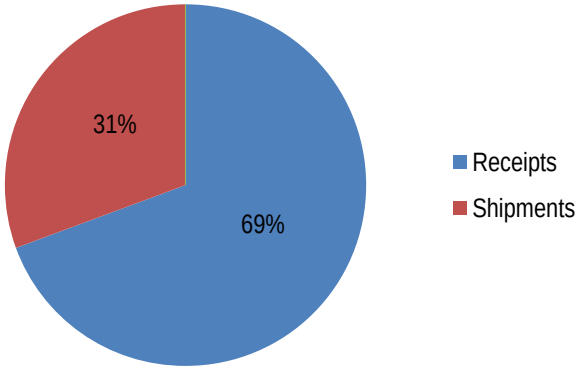
Containers – Gulfport has a growing business in handling intermodal containers. As shown in **Figure 2-4**, in 2008 the Port of Gulfport ranked third amongst container ports on the Gulf of Mexico.

Figure 2-3: Port of Gulfport

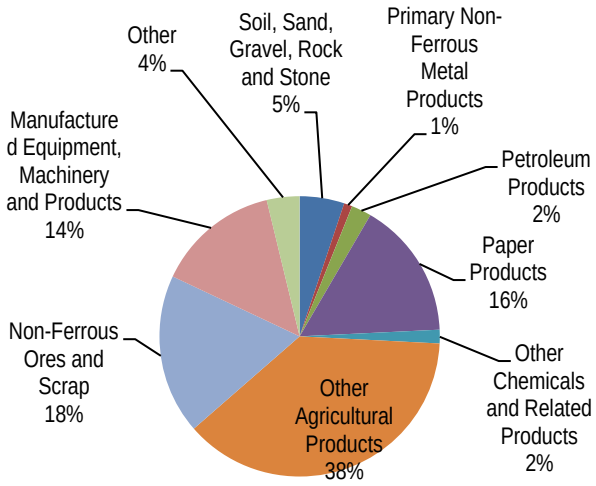
Port Location



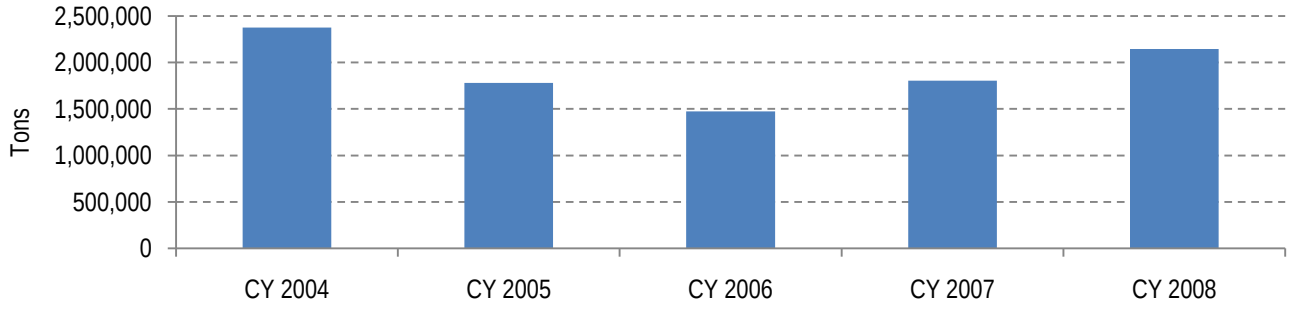
Tons by Direction: 2008



Tons by Commodity: 2008

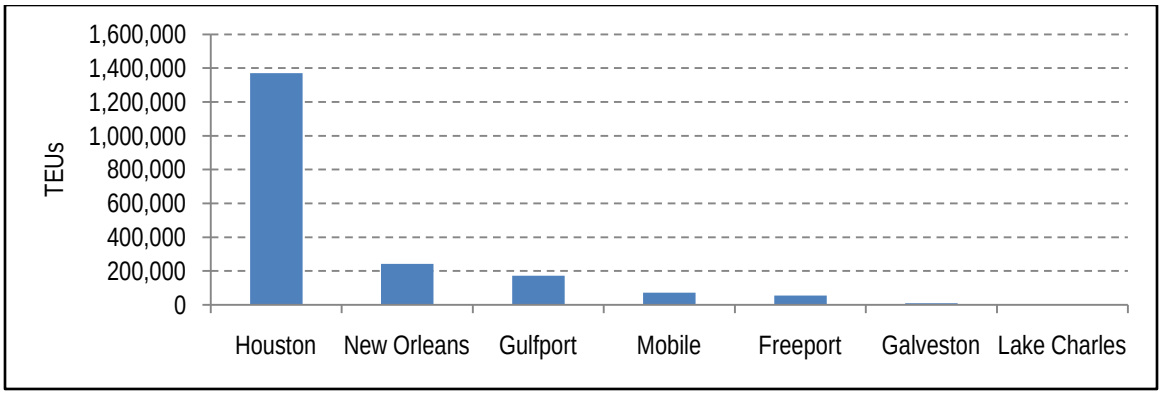


Annual Cargo Tons: 2004 to 2008



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics, 2008.

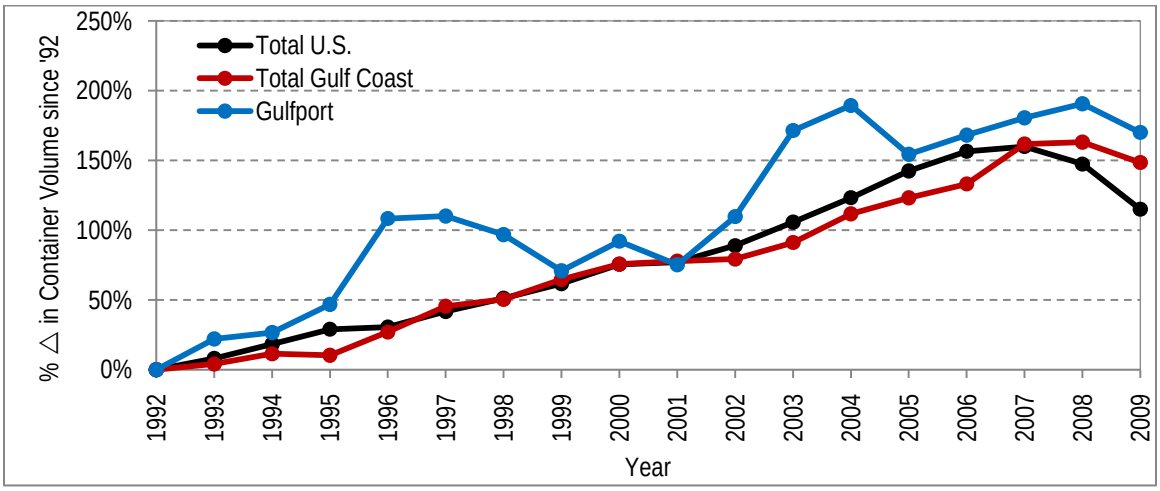
Figure 2-4: TEUs Handled by Deepwater Ports on the Gulf of Mexico: 2008



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics, 2008.

Similar to other ports in the United States, including the Gulf Coast, Gulfport has seen considerable growth in container traffic, increasing 170 percent between 1992 and 2009, with an annual growth rate of over six percent. **Figure 2-5** exhibits the total percentage change in container volume since 1992 for the Port of Gulfport, the Gulf of Mexico ports (collectively), and all United States ports. Gulfport has had more success than some other ports in weathering the recent economic downturn. Container volumes declined between 2007 and 2009; however, the decline was not as sharp as the decline experienced by the Unites States ports collectively.

Figure 2-5: Percent Change in Container Volumes since 1992

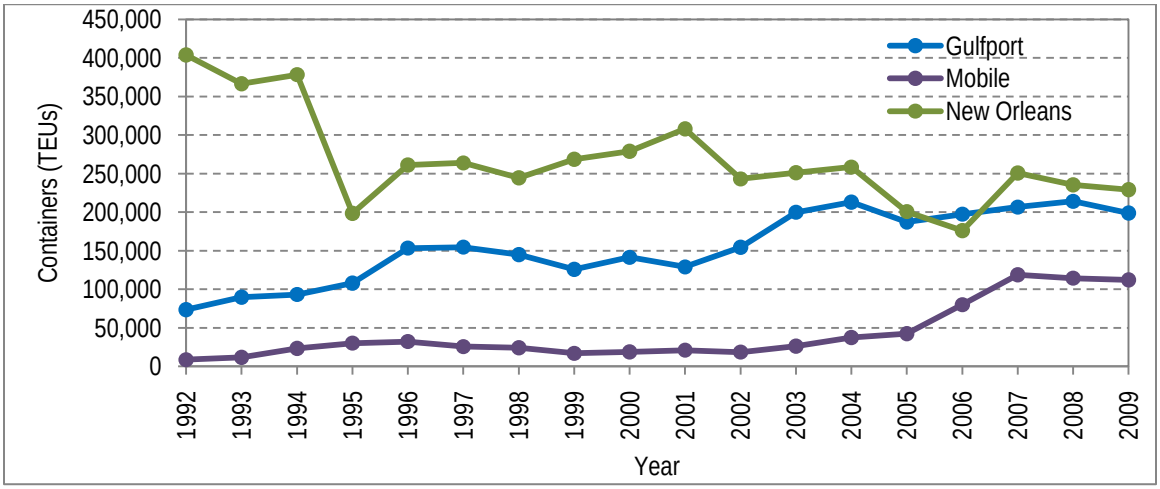


Source: Association of American Port Authorities

Container volumes at Gulfport were higher in 2009 than at the Port of Mobile, as shown in **Figure 2-6**, and close to the volumes at New Orleans. Container volumes at Mobile have increased at a faster rate over the past decade than at Gulfport, while traffic at New Orleans has declined overall. Both New Orleans and Gulfport lost container traffic as a result of Hurricane Katrina, but the declines at Gulfport were not as dramatic. At New Orleans, the Mississippi River

Gulf Outlet (MRGO)[5] and the Inner Harbor Navigation Canal (IHNC) bore the brunt of the hurricane. Hurricane Katrina did an estimated $50 million in damage to the Port of Gulfport. Few structures were left structurally sound and able to be repaired. However, with the Port Restoration program, tenants can have greater confidence in withstanding the next hurricane due to the port being elevated twenty-five feet above sea level.

Figure 2-6: Container Trends at the Ports of Gulfport, New Orleans, and Mobile



Source: Association of American Port Authorities

Planned Improvements

In order to handle more general containerized cargo and to continue to grow and prosper into the future, the projects described below will need to come to fruition. Namely, the Port will need to expand its footprint and streamline operations. The channel will require deepening and widening in order to accommodate larger vessels. Roadway and rail intermodal access will need to be improved. Once these improvements are in place, the Port will be able to leverage its strengths and broaden its cargo mix.

Channel Dredging – Gulfport plans to dredge the channel to a depth of 45 feet. Senator Thad Cochran submitted a request for $10 million as part of the Water Resources Development Act of 2010 to fund a feasibility study to widen and deepen the channel. Currently, the channel is 400 feet wide and 38 feet deep for 8 miles across Ship Island bar and then 300 feet wide and 36 feet deep and 12 miles long through Mississippi sound to the anchor basin at Gulfport, which is 1,120 feet long and 2,640 feet wide. Dredging of the channel to 45 feet would eliminate a major competitive disadvantage; however, the Port would still not be able to accommodate post-Panamax ships requiring a depth of at least 50 feet.

[5] U.S. Army Corps of Engineers has suspended dredging of the MRGO since August 2005

Intermodal Expansion – Gulfport plans massive expansion of intermodal operations; the $570 million planned investment will result in the "Port of the Future" on 220 acres, elevated twenty-five feet above sea level. Construction of the project is expected to start in 2011. Improvements are expected to bring the following benefits:

- Additional tenant space;
- Container capacity expansion from 300,000 to 1 million TEUs; and,
- Elevation increase, removing the existing requirement to evacuate containers within 36 hours in the case of a hurricane.

Highway Accessibility – The Mississippi Department of Transportation (MDOT) has also initiated a project to increase the traffic efficiency between the Port of Gulfport and I-10. Part of this roadway will be elevated, but it will be at ground level where possible, and it is currently designated as State Route 601. It would be designated as I-310 if integrated into the interstate highway system. The alignment would connect with I-10, northwest of the Port at the location of the existing interchange with Canal Road and I-10 Exit 31. As of August 2010, the design and permitting have been completed. The clearing and grubbing contract is in progress. Construction is delayed due to litigation with a developer that owns land on the proposed right-of-way.

Rail Accessibility – The Mississippi State Port Authority (MSPA), in conjunction with KCS, recently received a $20 million grant under the US DOT's TIGER Discretionary Grant Program to upgrade 76.5 miles of KCS's rail line north of Gulfport, as part of a larger rail improvement project whose total cost is $50 million. The rail line would accommodate 49 mph double-stack intermodal trains. Currently, the line is limited to 10 mph and can only accommodate single-stack intermodal cars. Upgrades to the KCS line include new rail and ties, improved and additional siding, installation of new switches and other modernization devices, and replacing, rebuilding, and improving existing road crossings and bridges. The project is intended to help connect the Port of Gulfport to Chicago and Canada as well as to New Orleans and the East Coast. While the improvements to the KCS line to Hattiesburg would improve overall rail access to the Port, this project would benefit Port of Gulfport container operations only if an intermodal terminal were build within the vicinity.

2.1.3 Port of Biloxi

Both the Port of Gulfport and Port of Biloxi are located in Harrison County, Mississippi. Biloxi serves a market area including Harrison and Hancock Counties, while Gulfport serves markets across the State. In 2008, the market area comprising Harrison and Hancock Counties had a total population of 219,000, with approximately 140,000 employees, and a Gross Regional Product (GRP) of $9.7 billion. In 2008, the State had a total population of 2.9 million, with approximately 1.5 million employees, and a Gross State Product of $91 billion.

Cargo Profile

In Biloxi, outbound freight accounted for two percent of the total freight by tonnage in 2008. Ninety-eight percent of that outbound freight was iron and steel scrap (70 thousand tons), and the remaining fraction was machinery. Inbound commodities mainly include coal and limestone.

Coal imports power production in the region, and the ability to ship coal by water not only potentially lowers transportation costs, but also provides flexibility in sourcing coal so that it can be sourced not solely from domestic mines but also from a variety of foreign mines.

Biloxi has regained strength after Katrina and moved approximately 3.5 million tons of cargo in 2008, as shown in **Figure 2-7**. Roughly 77% of that total tonnage was coal and lignite. Limestone receipts have increased, as have iron and scrap metal shipments. Petroleum receipts have plummeted from 304,000 tons in 2003 to 8,000 tons in 2008. Almost all of the cargo moving in and out of the Port of Biloxi in 2008 was domestic cargo.

2.1.4 Port of Pascagoula

The Port of Pascagoula is the largest port in Mississippi by tonnage and is located in Jackson County. Its market area covers the entire state and it serves a variety of industries, most importantly, the petrochemical industry (including the Chevron refinery). For example, 65 percent of the product volume leaving the Chevron refinery is by marine transportation. In addition to the petrochemical industry, the Port also supports, among others, the poultry and forest products industries.

Infrastructure and Accessibility

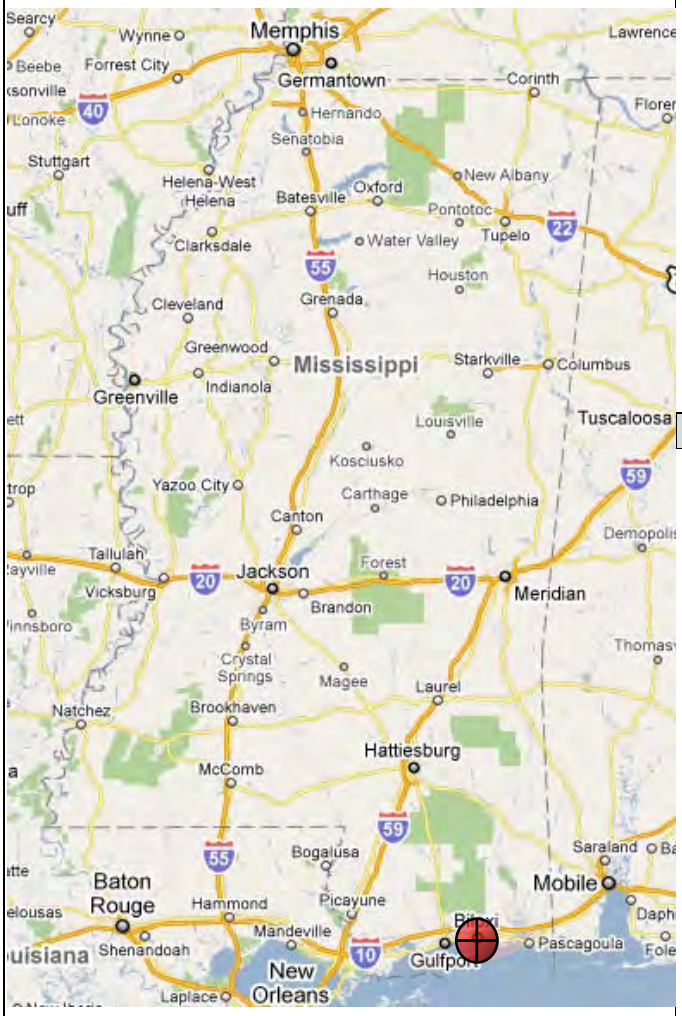
Pascagoula has two primary harbors: Bayou Casotte Harbor[6] (slack water) and the Pascagoula River Harbor, both of which have a turning basin. Pascagoula has three industrial parks: Sunplex Light Industrial Park (47 acres in Ocean Springs), Moss Point Industry and Technology Complex (200 acres of heavy industrial property with barge access via Escapatawpa River that is federally maintained at 12' depth, Mississippi Export RR service to CSX), and Singing River Island (500+ acre island with 75 buildings, occupied by Northrop Grumman Ship System and US Coast Guard Station Pascagoula). Mississippi Coast Foreign Trade Zone #92 is associated with the industrial parks and both harbors.

Access to Class I railroads was identified as the weakest aspect of the Port's landside connectivity. The Port is served by CSX east-west and the Mississippi Export Railway north-south.

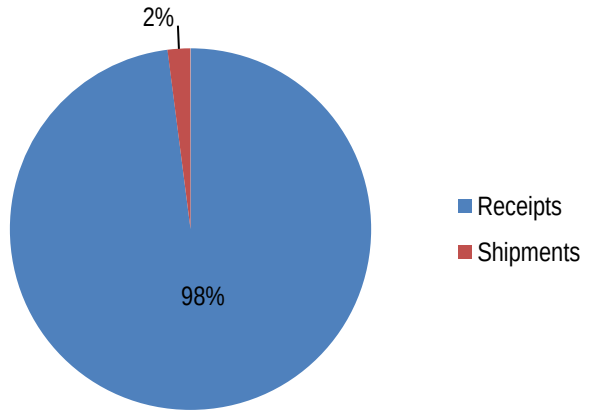
[6] The Bayou Cosette Harbor is equipped with a truck scale.

Figure 2-7: Port of Biloxi

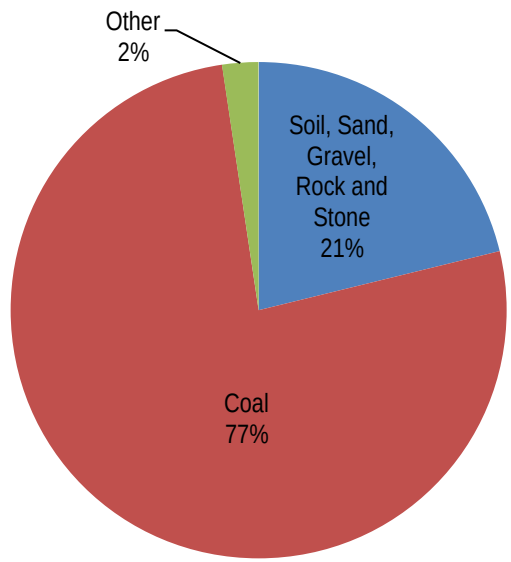
Port Location



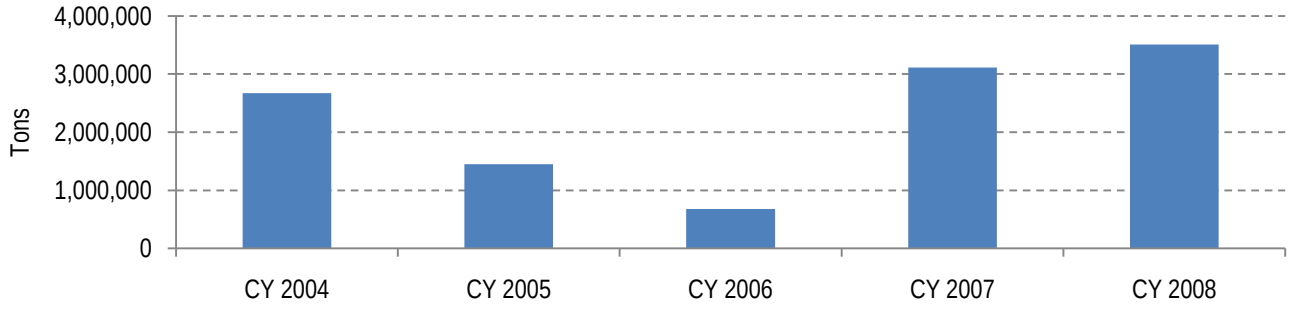
Tons by Direction: 2008



Tons by Commodity: 2008



Annual Cargo Tons: 2004 to 2008



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics. 2008.

Table 2-6 provides a summary of the port's infrastructure.

Table 2-6: Port of Pascagoula Infrastructure Summary

Category	Description
Acreage	Over 300 acres, including industrial parks
Berthing space	10 public berths ranging in length from 500 ft – 825 ft
Depth alongside facility	Bayou Casotte – 42 feet Pascagoula River Harbor – 38 feet
Cranes and other equipment	Two 40-ton gantry cranes
On-site rail infrastructure	2 Track mobiles (transports rail cars)
Rail connections	Short line: Mississippi Export Railroad serves the Port directly and provides a connection to Class I: CSX
Rail service	The Port needs increased access to Class I Railroads
Highway access	Hwy 90 Hwy 63
Logistics facilities (e.g. warehouses, cold storage buildings, etc.)	Not reported
Terminal Operator(s) (if different from owner)	Private terminals located in the Port's two harbors that depend on the deepwater: • Northrop Grumman Shipbuilding (consolidation operations to Pascagoula). • Chevron Pascagoula Refinery • Mississippi Phosphates Corporation • First Chemical Company • Gulf LNG Energy LLC (under construction and on schedule to commence operations in 2011) • VT Halter Marine

Source: Interviews with Port personnel and USACE.

Cargo Profile

Pascagoula, operated by the Jackson County Port Authority, is by far the largest port in Mississippi in total trade tonnage. It ranks in the top 25 U.S. ports in several categories of trade:

- 17th in nation for foreign trade tonnage: 24,137,303 tons
- 17th in nation for imported tonnage: 19,062,768 tons
- 23rd in nation for total trade tonnage: 33,589,817 tons[7]

In 2008, 12.5 million tons of freight was shipped out from the Port of Pascagoula, with the highest volume outbound commodities including petroleum products, chemical products, primary manufacturing products (e.g., paper), food and farm products (e.g., meat), and crude materials (e.g., wood). Also in 2008, the Port of Pascagoula received 21 million tons of inbound

[7] Source: U.S. Army Corps of Engineers, Navigation Data Center, Waterborne Commerce Statistics Center. *Waterborne Commerce of the United States. Calendar Year 2008. Part 5 – National Summaries.* 2008.

freight, with the major commodities being petroleum products, chemical products, and soil, sand, gravel, rock, and stone.

Volumes declined after Hurricane Katrina in 2005 but rebounded quickly in 2006, surpassing pre-Katrina volume levels. Receipts at the Port account for 63% of annual tonnage, while the remaining 37% of total tonnage is shipped out. **Table 2-7** outlines the origins and destinations of several types of cargo that move through the Port. The Port of Pascagoula does not anticipate that cargo volumes will increase at their facilities due to the expansion of the Panama Canal. It is possible that expansion of the Canal may have a negative impact on the Port's cargo volume, if increased tolls at the Canal result in a diversion of non-containerized cargo currently using the Canal to Pacific ports.

Table 2-7: Origin and Destination of Selected Cargoes at the Port of Pascagoula

Product	Origin	Destination	Annual Tonnage
Petroleum Products	Pascagoula	Mexico, India, Spain	10,000,000
Fertilizer	Pascagoula	Venezuela, Pakistan, Mexico, Nigeria, China, India	500,000
Chemicals	Pascagoula	Destination data are not available	2,200,000
Forest Products	Pascagoula, Grenada, MS; Philadelphia, MS, Monticello, MS	Dominican Republic, South America, Central America	400,000
Poultry	South-eastern United States	Russia, Ukraine, Cuba	300,000

Source: Port of Pascagoula. 2010.

Foreign crude petroleum receipts have held steady from 2003 to 2008 with an annual average of 16.4 million tons. Domestic fertilizer shipments have decreased from 265,000 tons in 2003 to 98,000 tons in 2008 while foreign shipments have increased from 249,000 tons in 2003 to 298,000 tons in 2008. Foreign receipts of phosphate rock have held steady, averaging over 1 million tons per year. In 2008, chemicals were down slightly, with the exception of ammonia. There were significant increases in foreign receipts of ammonia, which rose from 168,000 tons in 2003 to 313,000 tons in 2008. Data on the cargo at Pascagoula is illustrated in **Figure 2-8.**

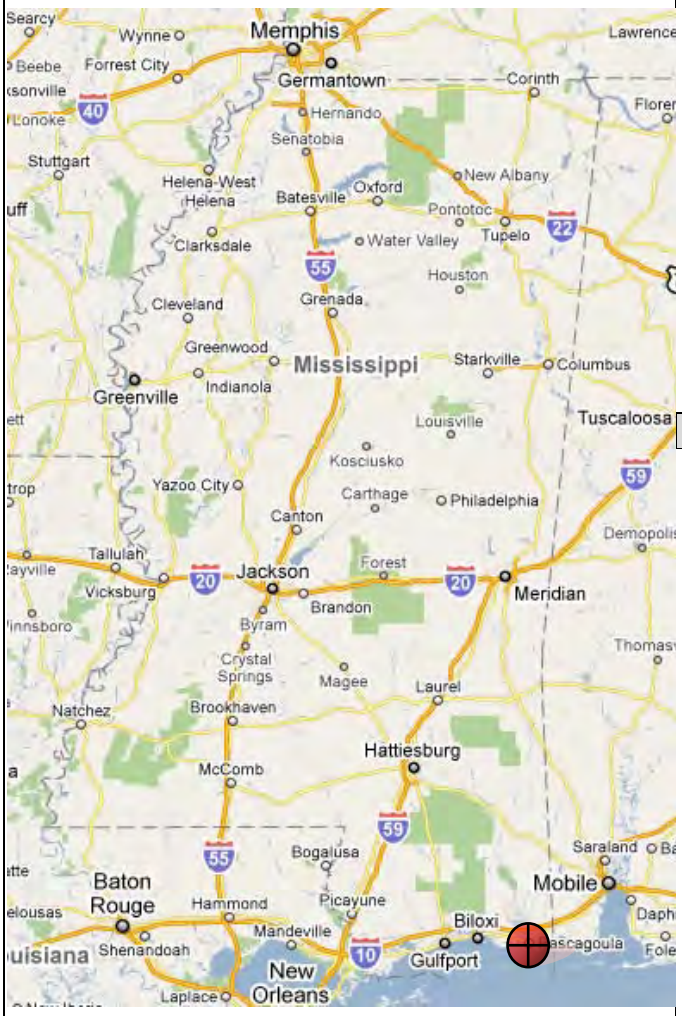
Planned Improvements

Improvements currently underway at the Port of Pascagoula include the following:

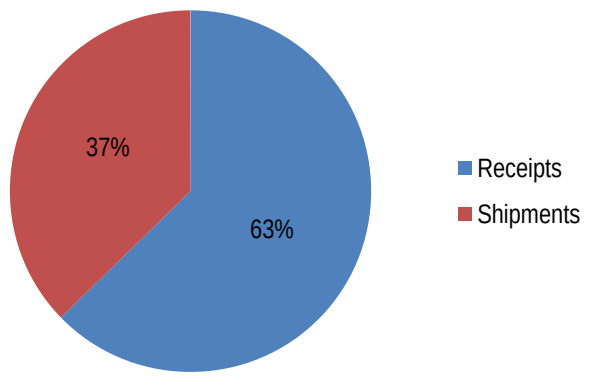
- Modernize the filter components of the industrial water supply system and repair six deteriorated 30-foot filters and two 42-foot filters ($24 million, contract awarded)
- Repair ~600 linear feet of eroded shoreline under the Terminal G extension docks (FEMA to fund through Hurricane Katrina sources)

Figure 2-8: Port of Pascagoula

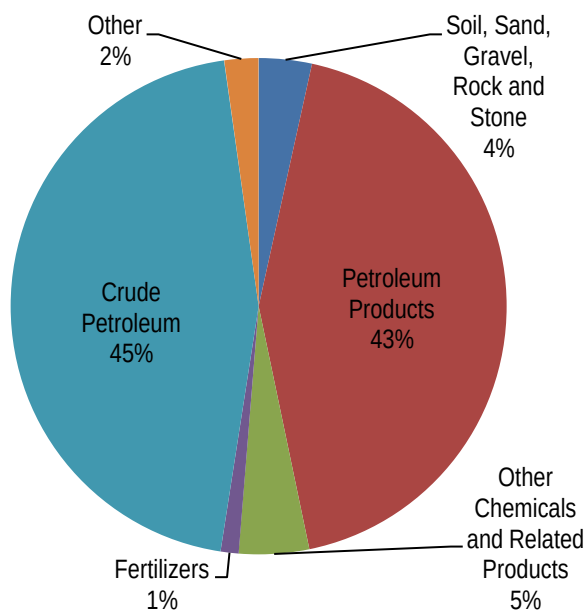
Port Location



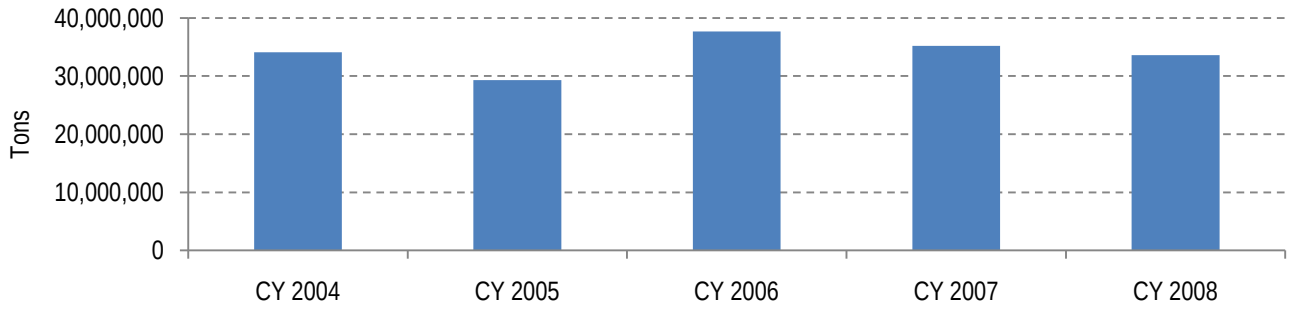
Tons by Direction: 2008



Tons by Commodity: 2008



Annual Cargo Tons: 2004 to 2008



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics, 2008.

The Port of Pascagoula identifies over $48 million in other immediate needs, including:

- Improved gate access;
- Rehabilitation of older public facilities; and,
- Basic infrastructure for South Terminal development.

In the long-term, the Port of Pascagoula intends to develop the South Terminal as a multi-purpose, multi-user marine terminal. Development of the terminal is anticipated to increase cargo volume through the public facilities by approximately 30%.

2.2 Mississippi River Ports

Mississippi has five public ports immediately adjacent to the Mississippi River, and one accessed from the Mississippi River via the Yazoo River. The locations of ports along the Mississippi River are illustrated in **Figure 2-9**.

2.2.1 Port of Rosedale

The Port of Rosedale was legally sanctioned in Section 107 of *The River and Harbor Act of 1960*, as amended (PL86-645), providing for the construction of Rosedale Harbor. It has been operating since 1977. Rosedale is located in northwestern Mississippi in Bolivar County and serves a market area that includes Bolivar, Sunflower, Coahoma, Tunica, and Leflore Counties. In 2008, the market area had a total population of 141,000, approximately 80,000 in employment, and an annual GRP measure of $4.4 billion.

The Port of Rosedale primarily supports local agricultural producers, including outbound shipments of grain and oilseeds and inbound shipments of fertilizer. Also served by the Port of Rosedale is a major grease/lubricator manufacturer and a heavy steel manufacturer. In addition, the Port also facilitates outbound shipments of forest products.

Infrastructure and Accessibility

The location of the Port is unique, as it serves the Arkansas and Mississippi Rivers, with the Mississippi river constantly maintained by the USACE. Rosedale has its own railroad, is governed by its own board, and has five employees. It is the northernmost Mississippi port along the Mississippi River, located at Mile 585. Characteristics of the Port are in **Table 2-8**.

USACE is responsible for dredging alongside the Port of Rosedale; however, dredging funding is not fully guaranteed, and each year, the Port must report to the USACE the need and value for dredging.

Figure 2-9: Ports on the Mississippi River

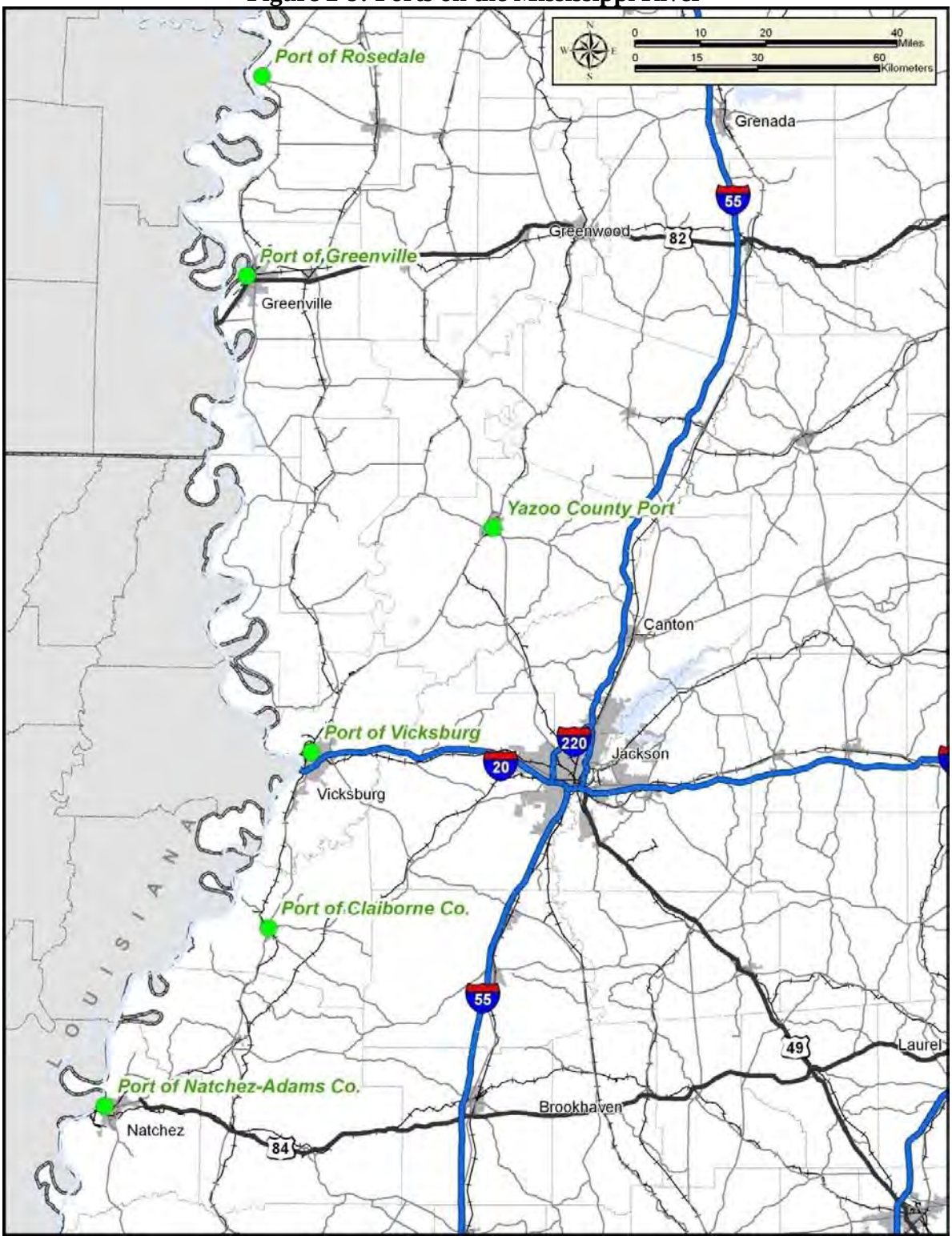


Table 2-8: Port of Rosedale Infrastructure Summary

Category	Description
Acreage	75 Port acres with 250 total acres of industrial park
Berthing space	2 Docks
Depth alongside facility	9-foot depth - Turning basin - max. length 7000 ft. max. width 450 ft.
Cranes and other equipment	2 locomotives 2 spread and 2 deck barges – used as needed 2 conveyor system for dry-bulk load-out 1 conveyor for unloading building 1 load-out conveyor
On-site rail infrastructure	Line connects to Columbus and Greenville short line
Rail connections	Siding at port where loading can take place
Rail service	Not operational
Highway access	Nearest Interstate Highway: I-55 (75 miles) Nearest US Highway: US 61 (20 miles) 15 miles from planned I-69
Logistics facilities (e.g. warehouses, cold storage buildings, etc.)	67,000 sq ft. warehouse 20,000 sq ft climate-controlled warehouse (Private) 1.5-acre hard surface loading area Truck/rail dry-bulk transfer system Public boat ramp located in middle of property 2 truck scales
Terminal Operator(s) (if different from owner)	Jan Tran, Inc., Rosedale Dock and Fleeting Area Jimmy Sanders, Rosedale, Fertilizer Dock. "Liquid Transfer Terminal" Jimmy Sanders, Rosedale, Grain Dock. – Bunge Rosedale-Bolivar County Port Commission, Dry Bulk Unloading Dock. Rosedale-Bolivar County Port Commission, Public Dock. DeBruce Grain Helena Chemical Company

Source: Interviews with Port personnel and USACE.

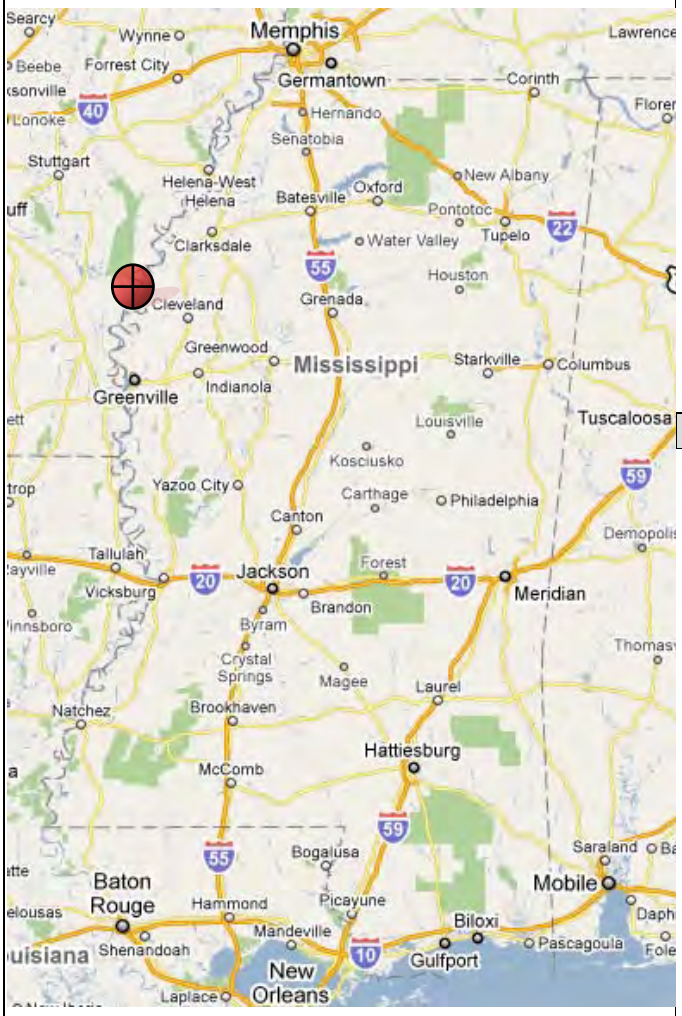
Cargo Profile

The Port of Rosedale is predominately an agricultural commodity port, where 93% of cargo is agriculture-related. Grain and oilseed shipments represent 79% of total tonnage. Domestic receipts of nitrogen fertilizer were up from 77,000 tons in 2003 to 123,000 tons in 2008. Rice shipments rose from 130,000 tons in 2003 to 297,000 tons in 2008, while corn rose slightly and wheat shipments dropped. Soybean shipments fluctuated but returned to their 2003 and 2004 numbers by 2008.

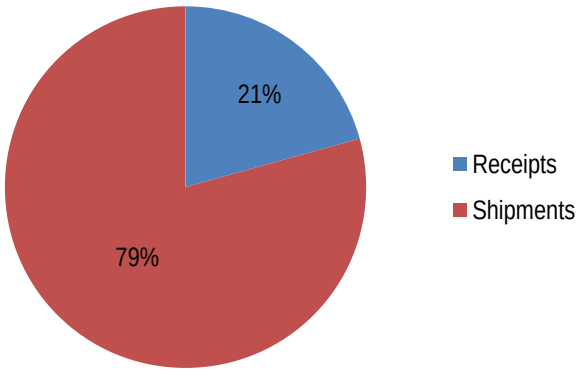
In 2008, 617,000 tons of freight was shipped from the Port of Rosedale and 161,000 tons of inbound freight was shipped out of the Port. The largest volume outbound commodities are food and farm products, including grain and oil seeds, and forest products. In addition to the outbound freight, in 2008 the Port of Rosedale received 147,705 tons of fertilizers, the major inbound commodity. Information on the Port of Rosedale cargo is illustrated in **Figure 2-10**.

Figure 2-10: Port of Rosedale

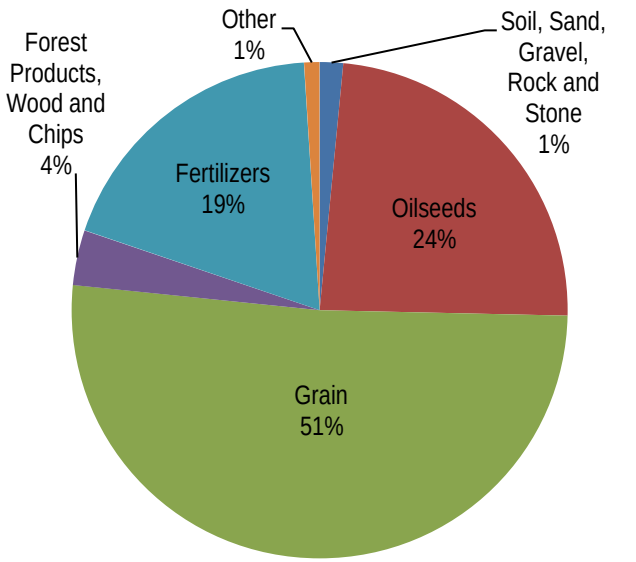
Port Location



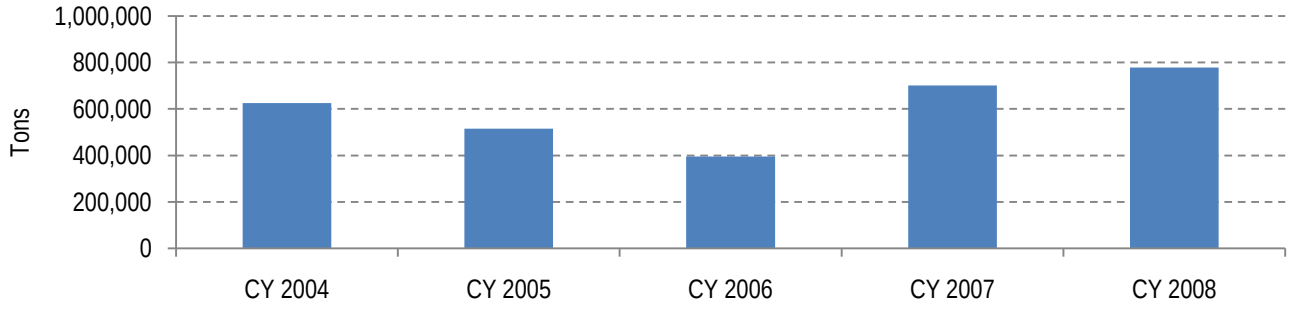
Tons by Direction: 2008



Tons by Commodity: 2008



Annual Cargo Tons: 2004 to 2008



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics, 2008.

Planned Improvements

The road at the Port is concrete and currently in good shape, with upgrades performed in 2010 using Port funds. MDOT's Intermodal Connector Program (ICIP) maintains Port intermodal connector roads and right-of-way; however, this was not funded in 2010. The concrete road through the Port's industrial park was constructed in 1977 and was not designed for the amount of heavy traffic observed in 2010. As such, Port officials indicate a need for road improvement.

Major improvements are needed with regard to rail service. The Great River Railroad (GTR) is owned by the Port. GTR runs from Rosedale southbound to Greenville, where it connects to the Columbus and Greenville Railroad (CAGY). The Port purchased this portion of the old Yazoo and Mississippi Valley Railroad from the Illinois Central Railroad. The GTR segment was embargoed in 2001, but is not considered to be abandoned. Substantial improvements are needed in order for the rail line to become operational again. According to Port representatives, 32.45 miles of track must be totally rebuilt.

2.2.2 Port of Greenville

The Port of Greenville is located in Washington County, Mississippi, and serves a market area that includes Washington, Bolivar, Sunflower, Humphreys, Montgomery, Carroll, and Leflore Counties. In 2008, the market area had a total population of 190,000, employment was approximately 91,000, and GRP was $4.7 billion.

Infrastructure and Accessibility

Greenville is not located on the main channel, but on a slack water harbor with a USACE-maintained depth of nine feet and a turning basin. It has five berthing areas for a combined total of 2,250 feet. Road accessibility could be considered average, with a direct connection to US 82/278 and US 61 within twenty miles of the port; the nearest interstate is I-55 (75 miles).

The port has rail access, but major improvements are needed on 3.2 miles of Port-owned track between the Port facilities and the levy. In 2008, the track was flooded by two feet of water. After the flood waters receded, the first train using the track derailed and it was determined that the foundation was significantly weakened. Since then the ground has stabilized and the segment is currently in use, but the Port had two derailments in a period of 90 days. Average usage of the track is approximately 100 cars per month.

Greenville would like to refurbish this segment of damaged track to reduce liability for movements on this line and prevent further damage that will result from increasing use. A forty-acre site the Port is developing will depend heavily on rail access for grain shipment. It is estimated that the refurbishment will cost approximately $5 million. **Table 2-9** lists some of the characteristics of the Port.

Table 2-9: Port of Greenville Infrastructure Summary

Category	Description
Acreage	2,000 acres, 700 acre industrial park
Berthing space	2,250 feet
Depth alongside facility	9 feet
Cranes and other equipment	3 crawler cranes 100 to 140 tons 4-berth 50-ton covered bridge cranes 2 bulk and rail loading conveyors 5,000-lb. to 52,000-lb. forklifts. Scrap handling magnets
On-site rail infrastructure	Not reported
Rail connections	Not reported
Rail service	Port owns rail between Port facilities and downtown Greenville.
Highway access	Nearest Interstate Highway: I-55 (75 miles) Nearest US Highways– US 82/278, US 61 (20 miles),
Logistics facilities (e.g. warehouses, cold storage buildings, etc.)	450,000 sq ft. warehouse Climate-controlled warehouse, private (21,000 sq ft.) 2 Grain Bins (42,000 Bushels / bin)
Terminal Operator(s) (if different from owner)	APAC-Mississippi, Greenville, Dock Bunge North America, Greenville Harbor Wharf ConAgra International Fertilizer Greenville Wharf Delta Terminal, Dock Dynergy Midstream Services, Greenville Wharf Entergy, Gerald Andrus, Steam Electric Station Wharf Farmers Grain Terminal Greenville, Wharf Greenville Gravel Co. Wharf Greenville Port Commission, Public Terminal Wharf Martin-Marietta Aggregates Greenville, Dock Mississippi Marine Corp., Central Yard Lower, Upper, North and South Wharf Producers Rice Mill, Greenville Wharf Southern States Cooperative, Greenville Wharf Superior Boat Works, Outfitting and Repair Wharf Terral River Service, Greenville, Dock Transmontaigne Product Services, Greenville North Dock and South US Coast Guard, Greenville Landing Waterways Marine of Greenville, Mat Fleet, Valley Fleet Mooring Waterways Marine of Greenville, Warfield Point Wharf

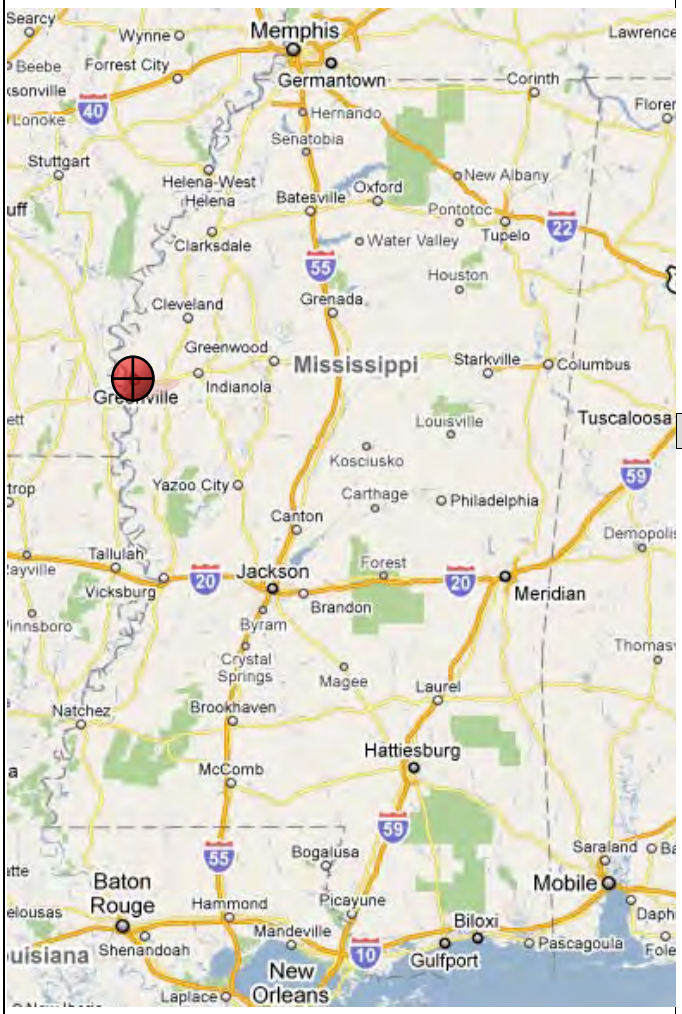
Source: Interviews with Port personnel and USACE.

Cargo Profile

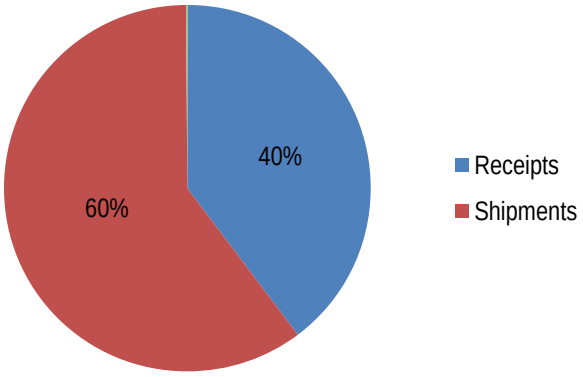
Figure 2-11 indicates that Greenville moved over 3 million tons in 2008, of which 74% was wheat, corn, rice, soybeans, distillate fuel oil, gasoline, and soybeans. Domestic shipments of corn and wheat saw significant increases in tonnage while rice fell. Soybean shipments rose, as did nitrogen fertilizer receipts. Overall, petroleum products were down from 1.2 million tons in 2003 to 605,000 tons in 2008. There was a significant decrease in receipts of residual fuel oils that dropped from levels of 400,000 tons to 7,400 tons in 2008.

Figure 2-11: Port of Greenville

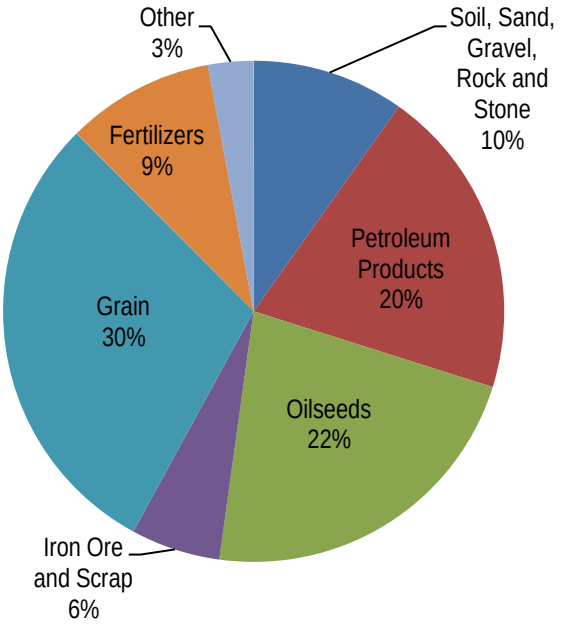
Port Location



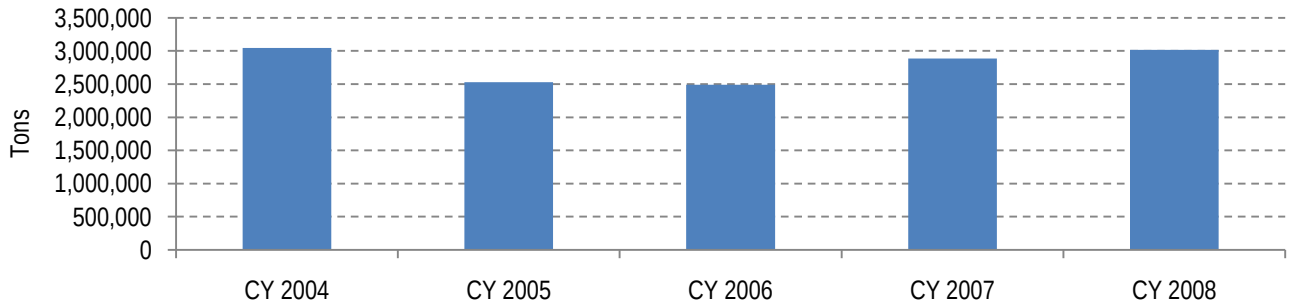
Tons by Direction: 2008



Tons by Commodity: 2008



Annual Cargo Tons: 2004 to 2008



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics, 2008.

In 2008, 1.8 million tons were shipped out of the Port and 1.2 million tons were received. Key outbound commodities include grain, oil seeds, and petroleum products. In addition to the outbound freight, in 2008, the Port received 593,943 tons of petroleum products, 223,067 tons of fertilizers and 296,127 tons of soil, sand, gravel, rock, and stone.

Planned Improvements

Greenville is in the process of replacing capital assets; in 2008, the Port put in a new truck scale, rail crossing, and purchased a new crawler crane. Another rail crossing was added in 2009, and there are plans for more machinery purchases and plans to add a longer side track to hold more rail cars.

2010 Planned Improvements (already funded)

- New 50,000 lb wheel loaders - $185,000
- New 20,000 lb wheel loaders - $85,000
- Track Improvement Switch - $7,800
- Track Expansion - $400,000
- New Sweeper - $20,000
- Port Authority Boat - $52,000
- Port Security System - $34,000

Expansion Program

- Grain Handling System - $1,800,000
- Dock Improvements - $600,000

2011 Planned Improvements

- Equipment - $400,000

2011-2014 Planned Improvements

- Rehabilitation of 3.2 miles of Port-owned track between the Port and the levy- $5,000,000
- Long Range Property Expansion – Development of Phase III 40 acre Property Expansion Plan
- Engineering, Environmental, Construction Estimate - $8,000,000

2.2.3 Port of Claiborne County

Claiborne County has owned the Port since 1991, and the port is managed by the Claiborne County Port Commission, which is comprised of the five county supervisors, five appointed at-large commissioners, and one appointed by the governor. Claiborne County Port is located eight

miles west of Port Gibson, off US 61 at Mississippi River mile marker 404.8 on a slack water harbor with a USACE-maintained depth of 14 feet with a turning basin. **Table 2-10** contains a listing of some of the infrastructure characteristics of the Port.

Table 2-10: Port of Claiborne County Infrastructure Summary

Category	Description
Acreage	10 acres developed, 608 acres undeveloped
Berthing space	Berths (length not available) 1 barge wharf with concrete dock Dolphins (800 feet off of main channel) 1 operating point
Depth alongside facility	14 feet w/ 600ft x 400ft turning basin
Cranes and other equipment	None
On-site rail infrastructure	None
Rail connections	None
Rail service	Nearest Class I railroad is 32 miles away
Highway access	Nearest Interstate – 32 miles Nearest US Highway – 6 miles
Logistics facilities (e.g. warehouses, cold storage etc.)	40,000 sq ft. warehouse (off-site) Approximately 10 acres of open yard storage
Terminal Operator(s)	None

Source: Interviews with Port personnel and USACE.

At the time of this study, the Claiborne County Port was not operating and did not have any tenants (as such, no cargo profiling provided). When active, the Port loaded and unloaded timber for an Alabama-based company. Currently, the Port is in discussions with Entergy about non-exclusive use of Port facilities if Unit 1 at Grand Gulf Nuclear Station is up-rated. In the long-term, the Port aims to serve Entergy's transport needs if a third nuclear reactor is constructed.

Entergy Nuclear is expected to enter into a one-year lease agreement to utilize the Port for the upgrading of its Unit I reactor and has plans to construct a third reactor (Unit III) by 2012. Entergy Nuclear will make the necessary improvements to meet its needs. The Port Commission is working with Entergy to ensure that it is ready should a decision be made to construct Unit III at Grand Gulf Nuclear Station.

Infrastructure and Accessibility

Claiborne County Port has three berthing areas, one barge wharf, three dolphins that are 800 ft off of the main channel, and one operating point. The Port has highway access through close proximity (6 miles) to US 61, and the nearest interstate is 32 miles away. There is no rail access.

Planned Improvements

Currently the Port's greatest challenges are identifying a market niche and obtaining funding for necessary capital improvements. Current needs include:

- 120-ton crane to load/unload cargo;
- 80,000 lb forklift;
- On-site storage;
- Possible extension of three-phase power to Port; and,
- Additional usable land

Together, these improvements are estimated to cost approximately $2.5 million.

2.2.4 Port of Natchez-Adams County

Natchez Port is located in Adams County, Mississippi and on the main channel with a natural depth of fifty feet (no need for dredging) and an unlimited turning basin with the capacity to accommodate a 15,000 ton ship. It serves a market area that includes Adams, Amite, Claiborne, Franklin, Jefferson, Lawrence, Lincoln, Pike, Walthall, and Wilkinson Counties. In 2008, the market area had a total population of 187,000, employment of approximately 77,000, and the GRP was $4.6 billion. It also serves other domestic markets such as Louisiana, Alabama and Texas, plus international markets in Russia.

The Port of Natchez-Adams County supports a variety of industries including agricultural producers and local construction. It provides an inexpensive option for shipping out grain and oilseed, as well as receiving fertilizer and bringing in construction materials.

Infrastructure and Accessibility

Natchez owns twenty-five acres and has a partnership with an adjacent 320-acre industrial park, which is 90% developed. It has six terminals handling a range of cargo including lumber, dry bulk cement, bio diesel, chemicals, and general cargo. Characteristics are listed in **Table 2-11**.

Highway access is very good and improving, with the nearest U.S. highway five miles away (US 61), while Interstate 55 is sixty-five miles away. Natchez also has good rail access with three tracks totaling six miles. There is a side track at the South Dock terminal with the capacity to establish a second side track.

Cargo Profile

Natchez handled half a million tons in 2008, down slightly from a high in 2007, as shown in **Figure 2-12**. Grains, sand and gravel, and oilseeds made up 64% of the cargo that the port handled. Domestic shipments of wheat and corn rose while soybeans dropped. Domestic receipts of limestone, sand and gravel, and cement were all down while aluminum ore receipts rose. Manufactured products made an appearance for the first time in 2006 and have grown from 1,400 tons being shipped out of the port in 2006 to 45,600 tons in 2008.

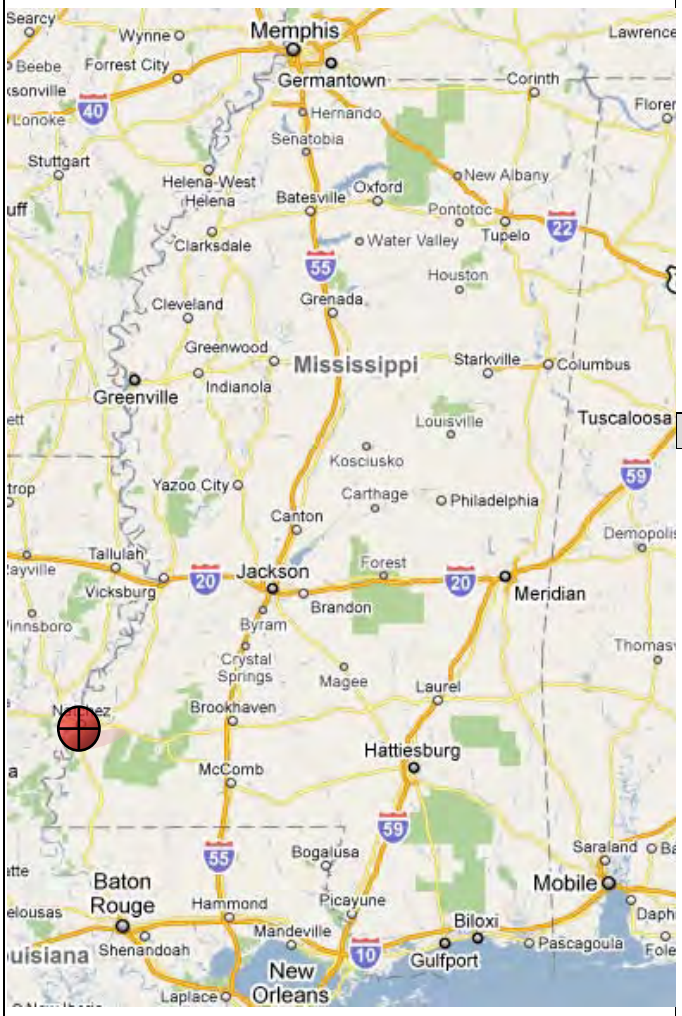
Table 2-11: Port of Natchez-Adams County Infrastructure Summary

Category	Description
Acreage	25 acres at Port, 320 acre industrial park (90% developed) 100 additional acres
Berthing space	3 Docks at 800 ft berths
Depth alongside facility	9 – 22 foot mean depth, 50-foot natural depth (natural deep water harbor), unlimited turning basin
Cranes and other equipment	Pedestal Cranes (300-, 125- & 100-ton capacities) Clamshell buckets Mobile Grain Conveyor Ro-Ro Ramp Forklifts ranging from 4,500 lbs. to 15,500 lbs. capacity 45,000 ton lift is available 41507M Trackmobile is available
On-site rail infrastructure	Class I RR Carrier; 3 T Spur racks totaling 6 miles of length: East – West Track North – South Storage Track Extension of E/W track in the North Track Rail Siding Service onsite at South Dock
Rail connections	Time Reliability: Good Cost (rates): Fair Loss and Damage: Good Equipment Availability: Good Service Flexibility: Good
Rail service	A&K - NVTR
Highway access	Nearest Interstate Highway: I-55 (65 miles) Nearest US Highway: US 61 (5 miles) Intermodal connection route to SE – River Terminal Road to Providence Road to Louisiana
Logistics facilities (e.g. warehouses, cold storage buildings, etc.)	100,000 sq ft Warehouse 400,000 sq ft climate-controlled Warehouse (Private) 4.5 acres of open yard pit storage Truck scale Port leases 7 rail cars serving a port client Stock pile surface loading area - 3 acres Waterborne freight transload – Barge–to-Barge and Barge-to-Ship 5 pipeline connections (four 12”, one 6”) Largest vessel accommodated: 5000 - 15000 Ton Ship
Terminal Operator(s) (if different from owner)	Natchez-Adams County Port Commission (South Dock), General Cargo Natchez-Adams County Port Commission (Liquid Transfer Terminal), Liquid Products US Coast Guard (Natchez Landing) Natchez-Adams County Port Commission (North Dock), Bulk Loading Buzzi Unicem J.M. Jones Lumber Company, Landing

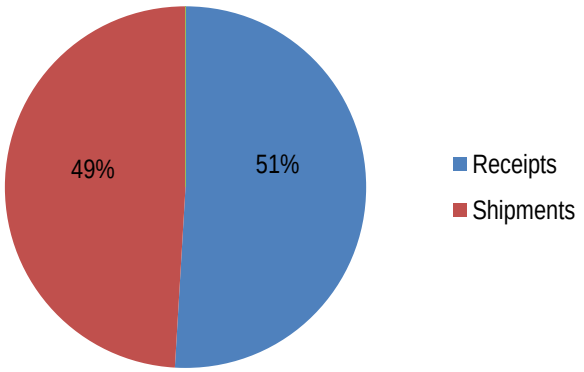
Source: Interviews with Port personnel and USACE.

Figure 2-12: Port of Natchez-Adams County

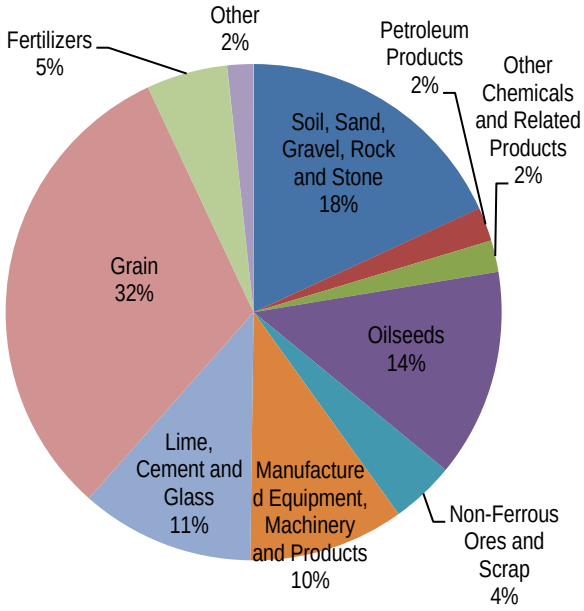
Port Location



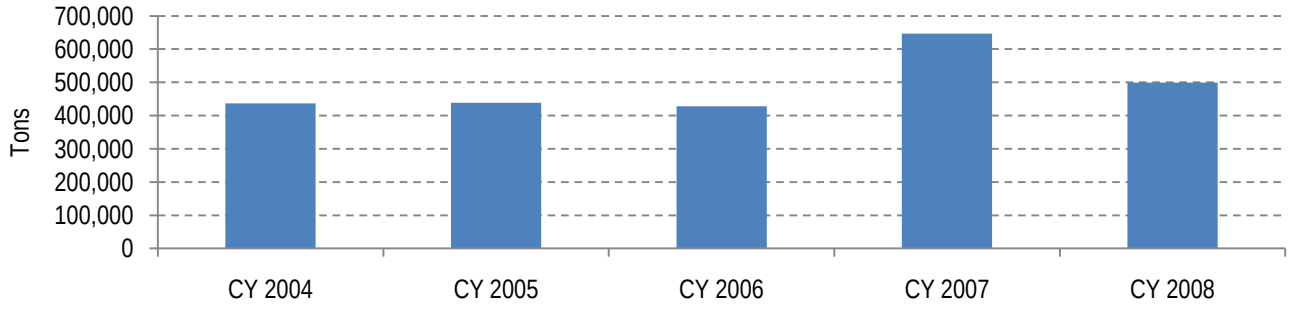
Tons by Direction: 2008



Tons by Commodity: 2008



Annual Cargo Tons: 2004 to 2008



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics, 2008.

In 2008, 244,945 tons of freight was shipped out of Natchez Port and 254,225 tons were received in the Port. Key outbound commodities include food and farm products, including grain and oil seeds, and manufactured equipment. In 2008, inbound freight included 111,166 tons of crude materials, 58,255 tons of manufactured products, 33,550 tons of farm products and 36,654 tons of chemical products.

Planned Improvements

In 2008, a survey was performed for the Mississippi State Goods Movement and Trade Assessment Study. Responses included the following needs and issues for Natchez Port:

- Demand for the Port's services.
- Financial backing for growth of the Port.
- Acquire land; specifically, 100 acres from a former golf course that are available.
- A portion of the Port property is on a flood plain. The flood zone along the front portion of the Port provides an impediment to continuous operation.
- The Port plans to capitalize on its deepwater assets to attract container ships.
- The Port of Natchez is prevented from taking full advantage of its natural depth because of the low height (112 feet) of the Mississippi River Bridge. Additionally, the Port of Baton Rouge disallows ocean-going vessels, thereby removing the operational efficiencies that carriers could achieve by calling on both inland ports.

As noted earlier, the 320-acre industrial park is 90% developed, leaving the Port with no availability of protected and developable parcels greater than nine acres to respond to economic development activity. In the immediate future, the Port plans to address repairs and improvements to the liquid loading dock and property acquisition.

- Repair and improve liquid loading dock ($1,000,000)
- Repair and improve the Port's south general cargo dock ($296,700)
- Expand to 4th Dock due to possible new client ($2,500,000)
- Property Acquisition ($10,000,000)
- Install Vapor Recovery System for new liquid dock due to possible new client ($1,500,000)

In the long-term, the Port plans to address the following challenges:

- Continued property acquisition for industrial development
- Develop rail access to south side of port
- Completion of the bulk cargo handling dock, including paving the road access, extending the rail and completing the covered conveyor system
- Improve US 190 bridge (Huey P. Long Bridge) in Baton Rouge to allow larger oceangoing barges to reach Natchez

- Rail extension and maintenance program on the south terminal
- Rebuilding a bridge along the major access
- Plans for a 100,000 sq ft building

Bridge improvements at the US 190 crossing of the Mississippi River would bring more international and domestic trade to southwestern Mississippi. Larger vessels would increase the import/export capacity of the Port and take advantage of the naturally deep channel. Without the bridge improvements, the Port will not be able to take advantage of the expansion of the Panama Canal because the larger ships will not be able to move north past this point.

2.2.5 Port of Vicksburg

The Port of Vicksburg is located in Warren County, Mississippi and is part of Foreign Trade Zone #158, which also includes the airport in Jackson, Mississippi. It serves a market area that includes Warren, Hinds, and Claiborne Counties. In 2008, the market area had a total population of 307,000, employment of approximately 223,000, and GRP measuring $14.6 billion.

Vicksburg supports a variety of industries including agriculture and oil and gas distribution. Twenty-one businesses and industries operate at the Port and employ over 4,000 employees.

Infrastructure and Accessibility

Characteristics of the Port are listed in **Table 2-12.**

Cargo Profile

Vicksburg was 85th in the U.S. in 2008 in terms of total tonnage handled, with a cargo volume of 3.5 million tons, as shown in **Figure 2-13**, and total cargo is down from a high of 4.1 million tons in 2006. Total petroleum products are down from a high of 2.5 million tons in 2004 to 2.2 million tons in 2008, including gasoline and distillate fuel oils receipts and shipments of lube oil, asphalt, and tar. Total food and farm products went down from 260,000 tons in 2003 to 131,000 tons in 2008, but nitrogen fertilizer was up slightly. Lime shipments were down as were wood receipts. Pig iron and iron and steel pipe appeared in 2007 and rose dramatically, but the figures matched the same numbers in the Yazoo River/Vicksburg Harbor Channel data set. Non-ferrous ores and scrap dropped from a high of 70,000 annual tons in 2006 to zero in 2008.

In 2008, 632,873 tons of freight were shipped out of the Port of Vicksburg and 2.8 million tons were received into the port. Key outbound commodities include petroleum products, grain and oilseeds, and chemical products. In 2008, the Port of Vicksburg received 1.6 million tons of petroleum products, 100,701 tons of chemical products, 587,064 tons of crude materials, 432,888 tons of manufactured goods, and 75,000 tons of farm products.

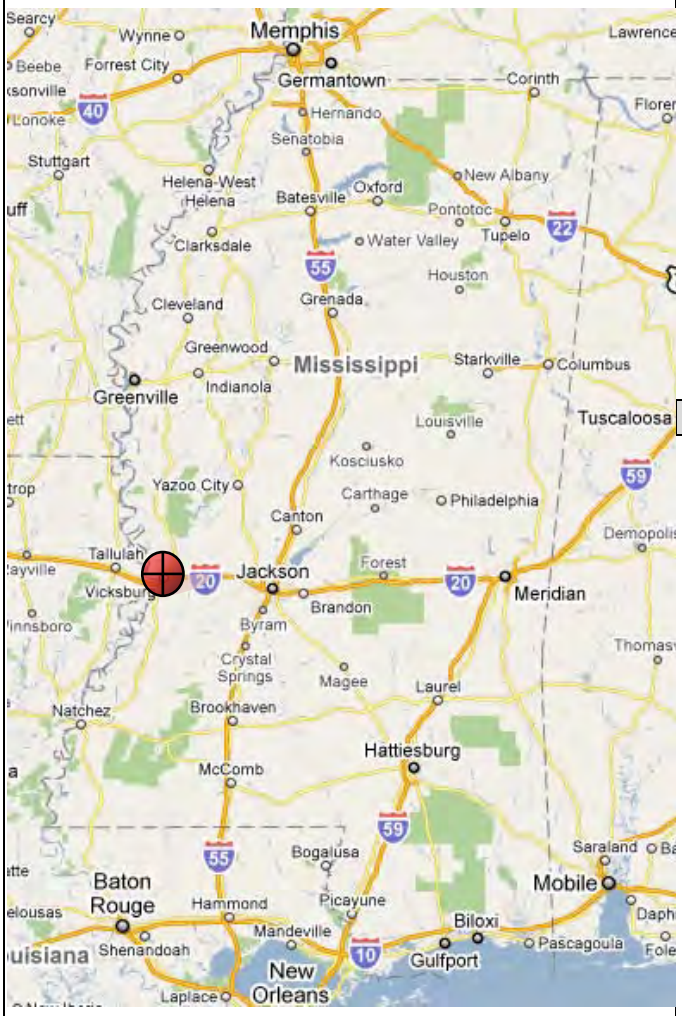
Table 2-12: Port of Vicksburg Infrastructure Summary

Category	Description
Acreage	11 acres (300-acre industrial park)
Berthing space	800 feet
Depth alongside facility	12 feet
Cranes and other equipment	125-ton crane Rail and road look through facility Overhead crane, two 15-ton lifts
On-site rail infrastructure	Class I RR Carrier 3 RR Spurs (3 miles total length)
Rail connections	Class I Rail service: Kansas City Southern Railway. The KCS Mid-South rail line serves the Port by connecting with the railroad's main line from Meridian, Mississippi to Shreveport, LA and is the only rail crossing of the Mississippi River between Memphis, TN and Baton Rouge, LA. KCS Mid-South connects with the Canadian National mainline at Jackson, MS and with the Union Pacific at Tallulah, LA. There is a rail loop on-site that allows for intermodal transfer of cargo throughout the facility with direct access to loading docks for transshipping between barge, truck, and rail (*MS Statewide Goods Movement and Trade Assessment*, 2008)
Rail service	Kansas City Southern Railway
Highway access	Nearest Interstate Highway: I-20 (6 miles) Nearest US Highway: US 61 (Direct Access)
Logistics facilities (e.g. warehouses, cold storage buildings, etc.)	130,000 sq ft warehouse Climate-controlled, 500,000 sq ft. warehouse (Private) 7 port employees and 650 for all tenants Open bulk and hard surface loading area (4 acres) Direct dump ramp Direct barge loading Port is located on a 4800-foot channel to MS River Palletized load handling
Terminal Operator(s) (if different from owner)	Baxter Wilson, Steam Electric Station Wharf Ergon Marine and Industrial Supplies Wharf Miller Materials, Wharf Southland Oil Co., Vicksburg Terminal Wharf Anderson-Tully Lumber Co. Dock Bunge North America, Vicksburg, River Elevator Wharf Vicksburg City, Wharf ConAgra International Fertilizer Co., Wharf Shell Lubricants/Pennzoil-Quaker State, Vicksburg Wharf Magnolia Marine Transport Co., Dock Holcim, Vicksburg Terminal Dock US Coast Guard, Vicksburg, Moorings Big River, Ship Builders Dock Port of Vicksburg Terminal, Wharf and Dock Falco Lime Vicksburg Harbor, Dock Citgo Petroleum Corp., Vicksburg Dock Bunge North America, Vicksburg Harbor, Wharf

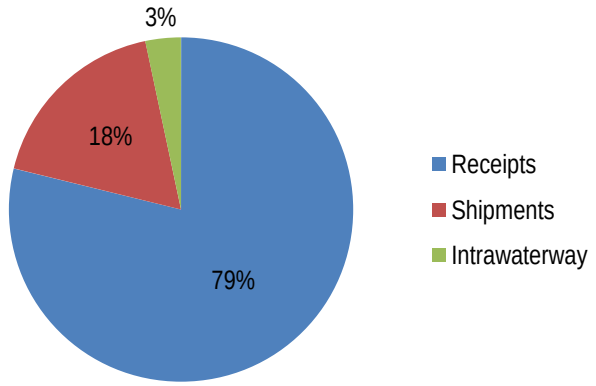
Source: Interviews with Port personnel and USACE.

Figure 2-13: Port of Vicksburg

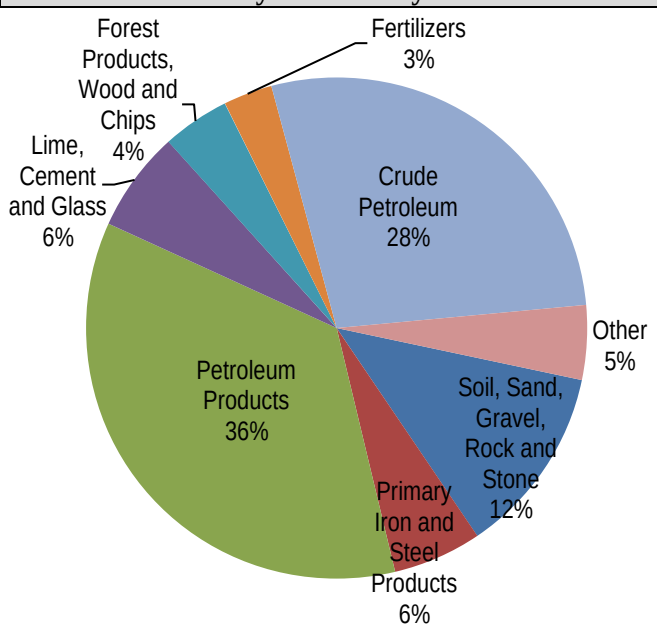
Port Location



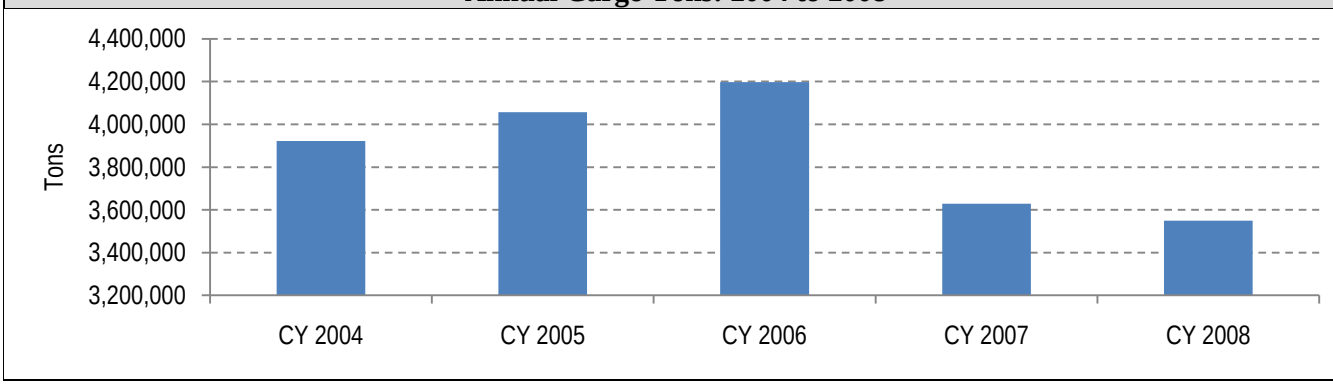
Tons by Direction: 2008



Tons by Commodity: 2008



Annual Cargo Tons: 2004 to 2008



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics, 2008.

2.2.6 Port of Yazoo County

Yazoo County Port is located in Yazoo County, Mississippi. It serves a market area that includes Issaquena, Sharkey, Yazoo, and Warren Counties. In 2008, the market area had a total population of 84,000, employment of approximately 44,000, and GRP was $2.5 billion. Yazoo County Port supports a variety of industries, including construction, agriculture, and metal fabrication. Since the Port is east of the Mississippi River it also offers service to industries along the Yazoo River and connects them with the Delta Region to the south.

Infrastructure and Accessibility

Yazoo has a 220-acre industrial park and owns 8.5 on-site acres at the Port, but has no access to a foreign trade zone. Also, there is a 27-acre area on the terminal and a 56-acre area a half-mile from the terminal that can also be developed. It has three terminals that handle fertilizers and grain commodities. Characteristics of the Port are listed in **Table 2-13**.

Table 2-13: Yazoo County Port Infrastructure Summary

Category	Description
Acreage	One 27-acre area on the terminal and one 56-acre area one-half mile from the terminal. There are an additional 220 acres within 1 mile of the Port
Berthing space	2 Docks
Depth alongside facility	11-foot, but is at the mercy of high and low water conditions
Cranes and other equipment	T-Dock with 125-ton crane MANITOWOC 3900 crane
On-site rail infrastructure	Class I RR Carrier Several Spurs with Sidings onsite
Rail connections	Class I connection
Rail service	Canadian National
Highway access	US 49 West MS Highways 3 and 16 SR-149
Logistics facilities (e.g. warehouses, cold storage buildings, etc.)	15,000 sq ft warehouse One 8-inch pipeline servicing private storage facilities 7 port employees and 650 for all tenants Open bulk Port is run at a high-threat security level Truck scale
Terminal Operator(s) (if different from owner)	Bunge North America, Yazoo City, Grain Elevator Dock Yazoo County Port Commission, Bulk Material Dock, Liquid Dock

Source: Interviews with Port personnel and USACE.

Yazoo County Port is located on the main channel of the Yazoo River with a maintained depth of 11 feet. However, as the river depth fluctuates greatly, the channel is not categorized as navigable by the USACE and the Port must therefore maintain dredging. Low water conditions in the past have prevented barges from loading. In addition to the depth issues, the Port also has problems with maintenance of the river banks around the Port.

Road accessibility is poor, and sometimes the port entrance road becomes so congested with trucks that the road becomes one lane and the Port experiences congestion delays. Currently, the Port is served by US 49, MS 3, and MS 16, and the newly constructed SR-149. Rail access is available through the Canadian National Railroad, which provides Class I service, and through several side tracks to multiple companies.

Cargo Profile

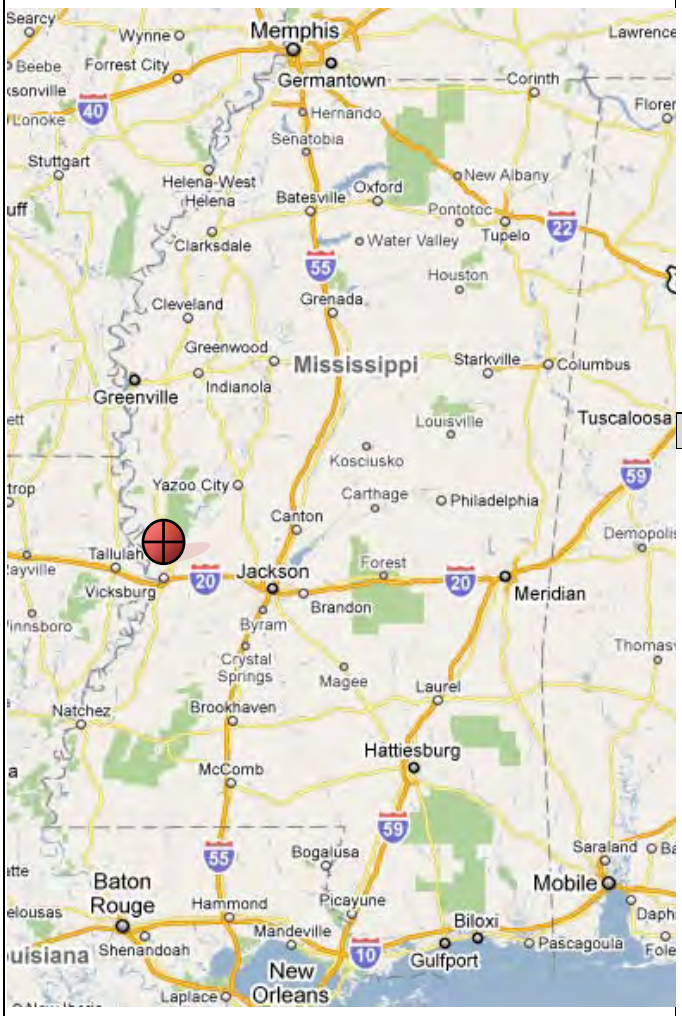
There are two data sets for Yazoo; the first pertains to the lower portion and mouth of the Yazoo River, where it joins the Mississippi River, the second pertains to the remaining upper portion. In the first set, data includes cargo shipped over the last 9.3 miles of the Yazoo; but, the majority of cargo traffic takes place over the last 2.5 miles from the Vicksburg Harbor Channel.

Figure 2-14 illustrates the cargo handled on the lower 9.3 miles of the Yazoo River. Receipts represented 92% of all cargo handled in 2008. Since 2004, the total amount of cargo handled has dropped by 846,000 tons. The Vicksburg Harbor Channel appears to be shifting from handling agriculture-based commodities to more industrial-based, steel manufactured products. Grain, oilseeds, and nitrogen fertilizer cargo have dropped significantly with corn and soybeans showing combined drops of 100,000 annual tons since 2004. Petroleum receipts saw a 135,000 ton drop over the same period. Pig iron and steel pipe cargo made a sudden appearance in 2007 and have increased significantly. Petroleum coke receipts have grown from 1,200 tons in 2004 to 69,000 tons in 2008. Lime receipts are down and non-ferrous ore receipts were nil in 2008, having peaked at 70,000 tons in 2006.

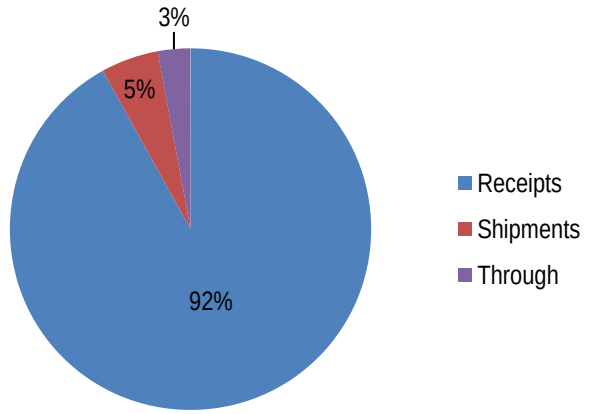
Figure 2-15 represents data on the Yazoo River from the Old River (9.3 miles) to the Yalobusha River. After 9.3 miles, the channel depth levels out around 4 feet and total cargo shipped downstream is entirely related to rainfall amounts and timing around harvest time. The upper Yazoo only sees receipts of fertilizers and shipments of corn, wheat, and soybeans. Total tonnage for this segment dropped from 531,000 tons in 2004 to 37,000 tons in 2008.

Figure 2-14: Yazoo River (Mississippi River to Old River)

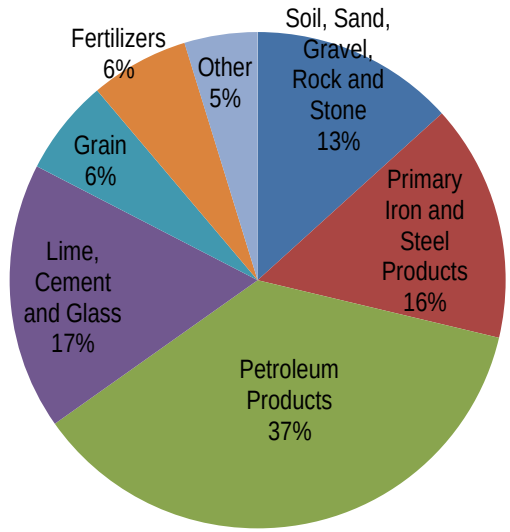
Port Location



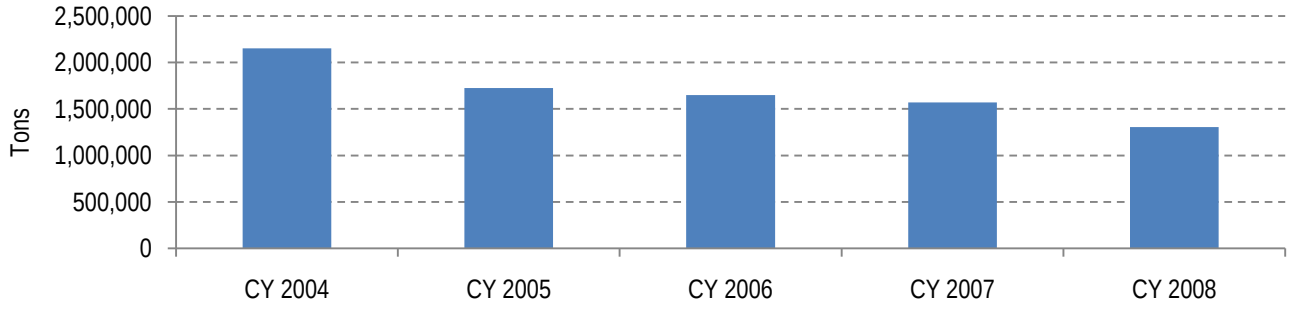
Tons by Direction: 2008



Tons by Commodity: 2008



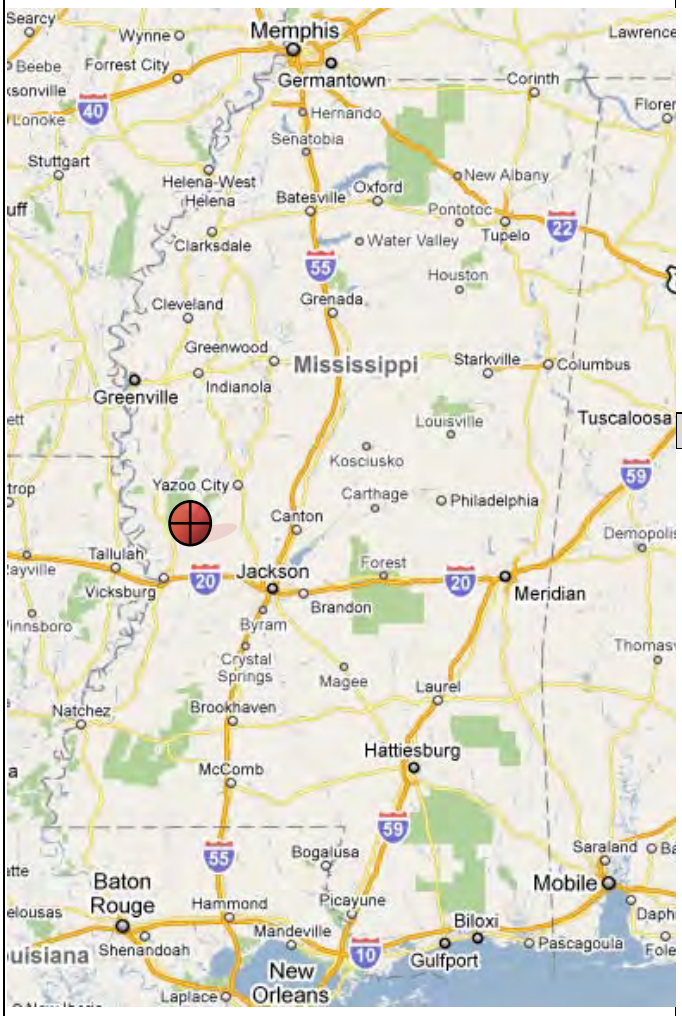
Annual Cargo Tons: 2004 to 2008



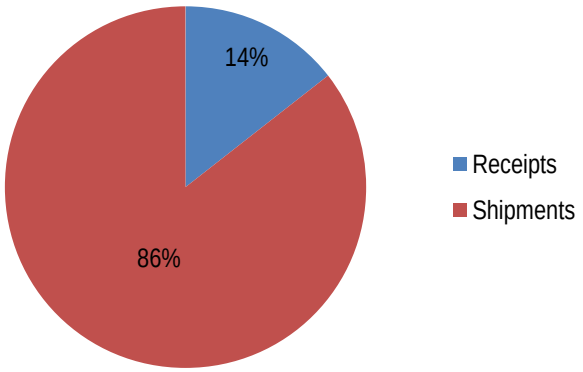
Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics, 2008.

Figure 2-15: Yazoo River (Old River to Yalobusha River)

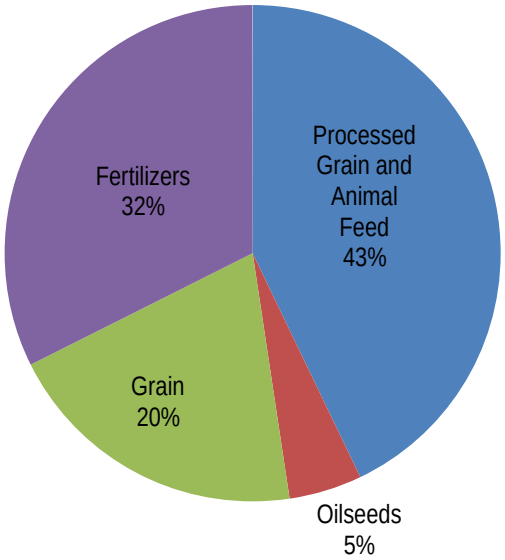
Port Location



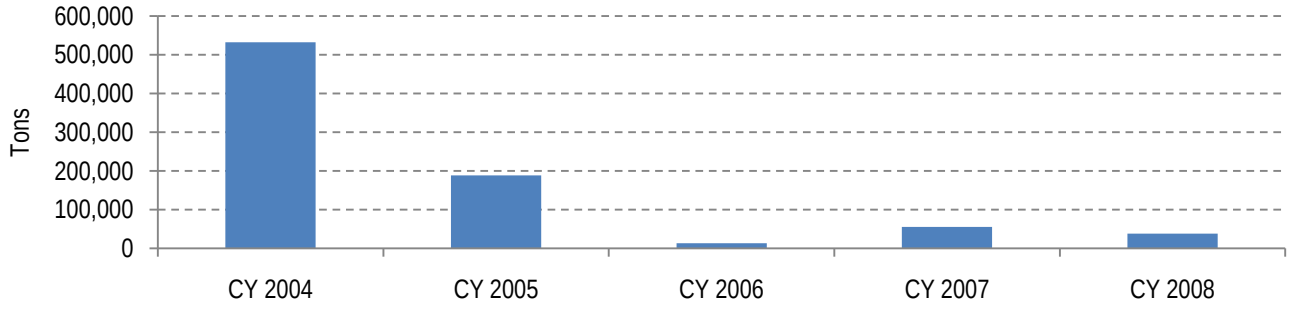
Tons by Direction: 2008



Tons by Commodity: 2008



Annual Cargo Tons: 2004 to 2008



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics, 2008.

Planned Improvements

Yazoo County Port suffered a direct hit from a tornado in 1980 and ripple effects from a tornado that hit the surrounding area in the spring of 2010. Destruction from such tornadoes, in combination with other factors, results in challenges that need to be addressed if the Port is to remain effective and competitive. Some of the rail spurs that were built in the 1960s need to be upgraded to Class I standards. Improved maintenance is also an issue. Water level fluctuations and non-designation of the Yazoo River as a navigable waterway have left annual dredging and maintenance uncertain. Roads need new overlays in multiple spots and railroad crossings need improvements.

The Port plans to make the following improvements:

- New overlays for port roads
- Yazoo River to be designated navigable by the USACE
- Railroad operator to improve cooperation with Port
- Improved road capacity entering the Port
- Railroad crossings ($300,000)
- Property acquisition of 4,000 acres for a new port (possible)

2.3 Tennessee-Tombigbee Waterway Ports

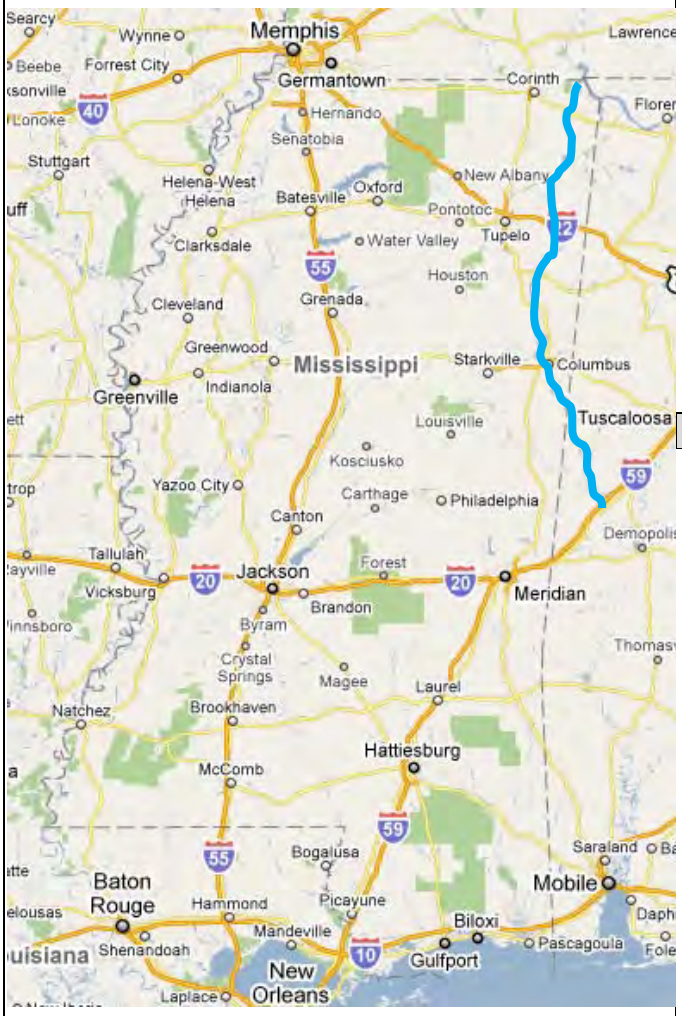
The Tennessee–Tombigbee Waterway system is an important inland water corridor for the tri-state region of Mississippi, Alabama, and Tennessee. Currently, six ports are located along the Tenn–Tom Waterway in Mississippi, including: Yellow Creek State Inland Port, Port Itawamba, City of Aberdeen Port, Port of Amory, Port of Clay County, and Lowndes County Port. These ports support a market area in Mississippi that includes thirteen counties in the northeast part of the State. A single cargo profile for the entire Tenn-Tom is provided, rather than for each port, because USACE does not maintain data for individual ports along the Tenn-Tom. A different USACE source was used that provided a profile of cargo carried by segment of waterway. Information about cargo by ports is based on interviews.

2.3.1 Cargo Profile Summary

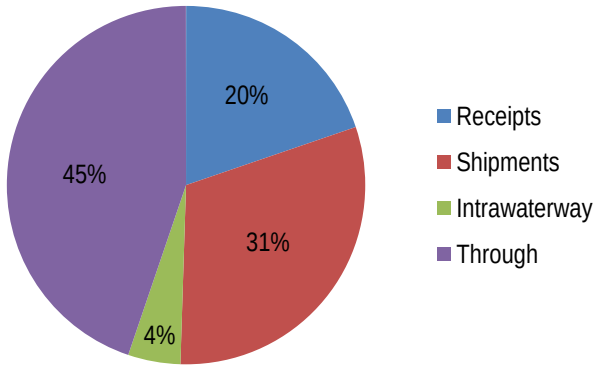
The Tenn-Tom carried 6.5 million tons in 2008, as shown in **Figure 2-16**, of which roughly half (3.2 million tons) were inter-waterway or through movements, and 3.3 million tons were handled at the Ports. Three quarters of the freight was coal, wood products, crude materials, and petroleum. Forty-five percent of the cargo was traveling through the Waterway to either the Ohio River or the Port of Mobile, most of which was crude materials or coal and petroleum-based products. Wood products dominated the Mississippi region of the Tenn-Tom, destined for European paper and wood pellet markets.

Figure 2-16: Tennessee-Tombigbee Waterway

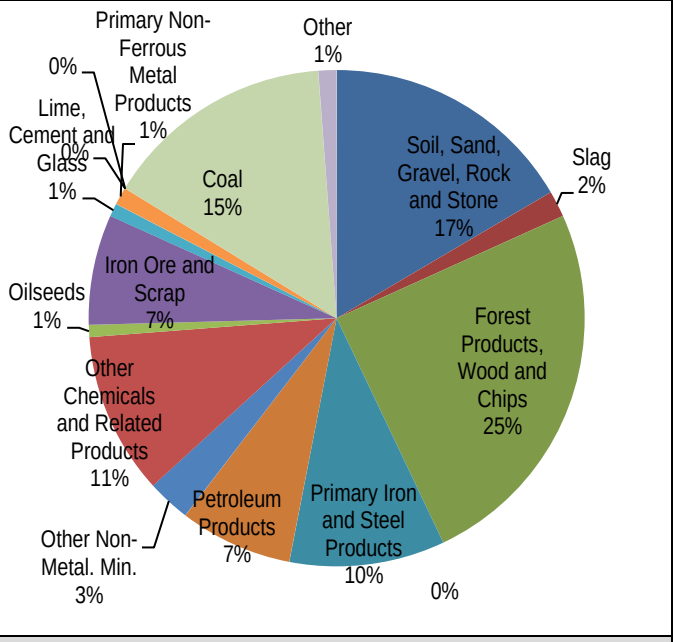
Port Location



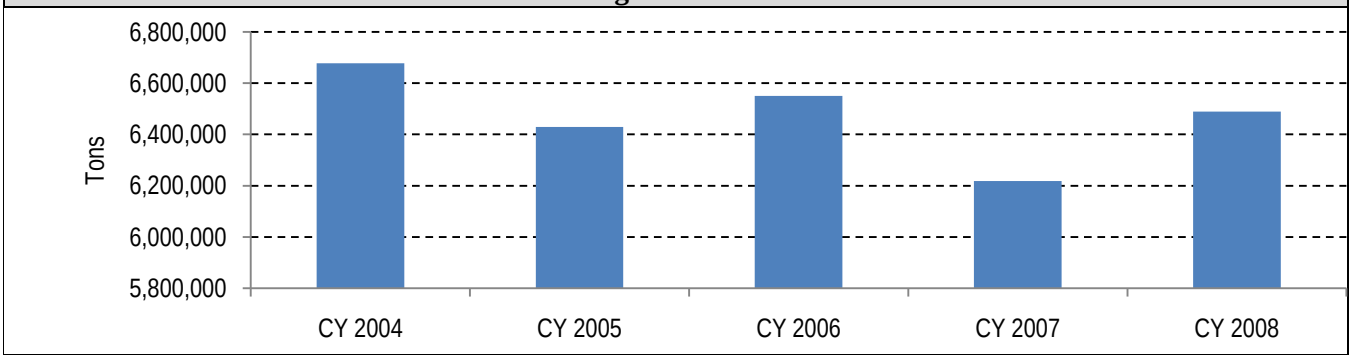
Tons by Direction: 2008



Tons by Commodity: 2008



Annual Cargo Tons: 2004 to 2008



Source: USACE, Waterborne Commerce in the United States, 2008.

From 2004 to 2008, total chemical and related products (predominately hydrocarbons and nitrogen) have declined significantly from 1.4 million tons in 2004 to 690,000 tons in 2008; however, those are entirely through shipments and do not impact the local economy of Northeastern Mississippi. Forest and wood products held steady with an average of 1.5 million tons of wood chips exported per year. The decline in chemicals was offset by an increase in iron and steel. Iron ore increased from 3,200 tons in 2004 to 216,000 tons in 2008 while steel scrap increased from 165,000 in 2004 to 250,000 in 2008. Pig iron increased as well from 61,000 tons in 2004 to 241,000 tons in 2008 along with fabricated steel products that increased from 32,000 tons to 171,000 tons.

In 2008, users of the Tenn–Tom Waterway System, including the ports that are located in Tennessee and Alabama, as well as Mississippi, shipped approximately 2 million tons of freight and received around 1.3 million tons of inbound freight. Outbound commodities include wood chips, manufactured goods, petroleum products and iron ore and scrap. In 2008, the Tenn–Tom Waterway shipped out 1.5 million tons of wood chips, which accounted for seventy-five percent of the total outbound freight.

2.3.2 Cargo Profile by Tennessee-Tombigbee Port

Overall, the USACE tracks cargo moving through locks along the Tennessee-Tombigbee Waterway. However, since the data is for segments along the Waterway and does not differentiate between cargo originating from or destined for the ports, cargo data was gathered from the ports directly. Moreover, ports collect data from the private terminals that lease space and some of that data was unavailable due to confidentiality and disclosure issues. Consequently, the commodity numbers for the Tenn-Tom Waterway Ports should be evaluated as anecdotal information and not as a purely empirical and exhaustive dataset. According to the six ports along the Mississippi segment of the Tenn-Tom Waterway, they handled 2.8 million tons[8] of cargo through their 23 terminals located on port properties.

Port of Aberdeen

The Port of Aberdeen primarily serves five counties in Mississippi: Lee, Itawamba, Monroe, Chickasaw, and Clay, as well as counties in Alabama. It serves the nearby cosmetic industry with clay imported from Greece and provides petroleum for distribution to the local markets from the Gulf Coast. Aberdeen once received substantial grain shipments, but those shipments have shifted to the Amory Port. Two grain terminals are located at this Port, but because of the business lost to the Amory Port, cargo numbers are very low and will not be published because of confidentiality.

[8] Versus the estimated 3.3 million derived from the Waterborne Commerce Statistic data. Differences reflect different reporting methods, which may include private terminals in the WCS estimates.

Top commodities and annual tonnage[9] through the Port in 2008:

- Clay – 12,000 tons
- Diesel fuel - unknown

Port of Amory

The Port of Amory serves primarily Monroe and Lowndes County in Mississippi. It averages one outgoing barge per week of wood pellets destined for Germany for the European subsidized energy market. Ore is imported from various countries, petcoke is imported from Illinois and Louisiana, and calcined sand is imported from Texas.

Top commodities and annual tonnage[10] through the Port in 2008:

- Rock salt – 175,000 tons
- Soybeans – 75,000 tons
- Wood pellets – 53,000 tons
- Ore – 243,000 tons
- Petcoke – 88,000 tons
- Calcined sand – 13,000 tons

Clay County Port

Clay County Port serves the local soybean market and imports rock salt from Louisiana. Locally, it serves the Mississippi counties of Monroe, Clay, Oktibbeha, Lowndes, Webster, Lee, Chickasaw, and Noxubee.

Based upon discussions with Port officials, the top commodities and annual tonnage[11] through the Port in 2008 were:

- Rock salt – 175,000 tons
- Soybeans – 75,000 tons

Columbus- Lowndes County Port

Lowndes County Port serves several markets. Locally, it serves the Mississippi counties of Monroe, Clay, Oktibbeha, Lowndes, Winston, and Noxubee and the Alabama counties of Lamar and Pickens, as well as the Gulf Coast. Main commodities include raw steel, steel coil, wood chips, liquid caustic soda, and limestone. Raw steel materials are shipped and received from both domestic and international markets that range from Kentucky (limestone) to Texas (caustic soda) to Brazil (pig iron). Severstal Steel, located in nearby Columbus, MS, is currently the lone

[9] Estimates based on phone interview with Port Director, Mayor Jim Ballard.
[10] Estimates based on interview with Port Director, Mayor Howard Boozer.

[11] Estimates based on a phone interview with Tom Soya Manager, Perry Lucas.

processor of steel, bringing in pig iron and scrap steel to produce steel coils. Wood chips are shipped to Pennington, Alabama for the manufacturing of tissue paper and cardboard for paper plates and other similar products.

Top commodities and annual tonnage[12] through the Port in 2008:

- Steel – 490,000 tons
- Wood chips – 250,000 tons
- Wood bark – unknown
- Caustic Soda – 40,000 tons
- Aggregates – 80,000 tons
- Coal – 20,000 tons
- Alumina tri-hydrate – 15,000 tons

Locally, Lowndes County Port is focusing on expanding its wood market into the wood pellet industry to serve the European energy market. The Port also hopes to grow the steel industry around the TVA mega-site tenant, Severstal, which recently announced that two steel processing companies (Mississippi Steel Processing and New Process Steel) will be locating next to Severstal to provide value-added services of leveling, slitting, storing, logistics, and fabricating. Construction of these two new plants will be completed in the first quarter of 2011. In addition, the local economic development organization is cultivating the aerospace industry around a couple of key tenants and relationships with surrounding research universities. When the Panama Canal is renovated, the Port anticipates increased tonnage along the Tennessee-Tombigbee Waterway.

Port Itawamba

Port Itawamba serves both domestic and international markets (in Mississippi, the counties of Itawamba, Lee, Monroe, Pontotoc, Tishomingo and Prentiss, and parts of northwest Alabama) with the shipment of wood chips, bark, steel scrap, steel coils, and fabricated steel. In 2008, the Port handled an estimated 550,000 tons of cargo. Steel fabrications, such as scrubbers for coal-fired power plants, are shipped all over the U.S. and steel coil (35% of total annual cargo) comes from all over the world (including African nations, Turkey, and China) for the local furniture manufacturing industry. In preparation for the nearby Toyota manufacturing plant that will build the popular Corolla model, the Port advocates upgrading the Mississippian Railway short line to full capacity heavy rail (286,000 lbs), providing a better linkage to the BNSF main line. If this improvement can be made, the Port anticipates an additional 10,000 to 12,000 TEUs per year.

Top commodities and annual tonnage[13] through the Port in 2008:

[12] Estimates based on phone interview with Port Director, John Hardy.

- Wood bark & chips – 234,000 tons
- Steel coils – 234,000 tons
- Steel fabrications – 78,000 tons

Port Itawamba's primary competition is with rail shipments out of the Port of Los Angeles. The Port recently spearheaded the creation of GROWPORTS, a regional inland port consortium, to market the region and develop container-on-barge facilities and capacity along the Tennessee-Tombigbee Waterway in anticipation of the opening of the renovated Panama Canal. Last month, the Port of Mobile signed an agreement with Panama. Tenn-Tom is currently working on an added agreement between the GROWPORTS region and Panama.

Yellow Creek Port

Yellow Creek Port handled 700,000 annual tons of domestic steel with steel fabrication, coils, pipe, and piling in 2008. Yellow Creek also received shipments of asphalt, but data were not provided for this terminal.

Top commodities and annual tonnage[14] through the port in 2008:

- Steel fabrications – 300,000 tons
- Steel coils & rods – 300,000 tons
- Steel pipe – 50,000 tons
- Steel piling – 50,000 tons

Outbound barge traffic of processed steel has been increasing significantly over the past years to the point where the Port is developing an additional 8.9 acres to stage inbound and outbound shipments.

3. MISSISSIPPI PORT NEEDS

After interviews with the various ports in Mississippi, a number of needs and planned improvements were identified. This section summarizes those port needs by project type: Channel Issues, Port Facilities, Rail Access, and Road Access, as well as by project category: Preservation, Modernization, and, Expansion.

3.1 Individual Port Needs and Costs

A total of 89 needs (projects) were identified for 15 of the 16 public ports in Mississippi (no improvements projects were provided by the Port of Biloxi). Needs are summarized in **Table 3-1** by the four improvement types and detailed within **Table 3-2**. Of these improvement projects, 14

[13] Estimates based on phone interview with Port Director, Greg Deakle.
[14] Estimates based on phone interview with Port Director, Eugene Bishop

are for Gulf Coast ports (16%), 47 for Mississippi River ports (53%), and 28 for the Tenn-Tom Waterway ports (31%). Over half (53%) of the projects concern port facilities (47 projects), 37 percent improve accessibility, split between road (14 projects) and rail (19 projects), and 10 percent address with channel issues (9 projects).

Table 3-1: Number of Port Needs by Type

Port	Improvement Type				Total
	Channel Issues	Port Facilities	Rail Access	Road Access	
Gulf Coast Ports					
Port of Pascagoula	0	4	0	0	4
Port of Gulfport	2	1	2	1	6
Port Bienville	2	1	1	0	4
Port of Biloxi [(1)]	0	0	0	0	0
Subtotal	**4**	**6**	**3**	**1**	**14**
Mississippi River Ports					
Port of Natchez	1	8	2	1	12
Port of Claiborne Co.	0	1	0	0	1
Port of Vicksburg	0	3	2	2	7
Yazoo County Port	1	1	2	1	5
Port of Greenville	0	9	2	0	11
Port of Rosedale	1	4	1	5	11
Subtotal	**3**	**26**	**9**	**9**	**47**
Tennessee-Tombigbee Waterway Ports					
Yellow Creek Port	0	3	2	1	6
Port Itawamba	0	4	1	0	5
Port of Amory	0	3	2	2	7
Port of Aberdeen	0	3	1	1	5
Port of Clay County	1	0	0	0	1
Lowndes County Port	1	2	1	0	4
Subtotal	**2**	**15**	**7**	**4**	**28**
Total	**9**	**47**	**19**	**14**	**89**

Notes: [(1)] No information received from the Port of Biloxi.

Table 3-2: Listing of Port Needs

Ref. #	Project Type	Cat. [(1)]	Identified Need	Cost Estimate [(2)]
Gulf Coast Ports				
Bienville				
1	Channel Issues	P	CSX Rail Bridge Replacement (CSX bridge over the Pearl River near English Lookout, Mile 1.0 of the Pearl River)	N/A
2	Channel Issues	P	Navigation Channel Improvements: Reconnaissance Study, Feasibility Study, and EIS.	N/A
3	Port Facilities	E	Develop barge fleeting area at Port Bienville. Estimated cost range $180,000 to $240,000.	$210,000
4	Rail Access	M	Development of a new rail connector from Port Bienville Railroad (PBVR) and Norfolk Southern near Picayune, Mississippi, providing a connection to Palmer Crossing and CN. The proposal to connect the rail carrier to Norfolk Southern is under study.	N/A

Ref. #	Project Type	Cat. (1)	Identified Need	Cost Estimate (2)
Gulfport				
5	Channel Issues	P	Ensure the navigable waterway channels provide sufficient depths to allow for waterborne transportation to and from ports	N/A
6	Channel Issues	P	Increase drayage operation	N/A
7	Port Facilities	E	Gulfport plans massive expansion of intermodal operations; the $570 million planned investment will result in the "Port of the Future" on 220 acres, elevated twenty-five feet above sea level.	$570,000,000 (3)
8	Rail Access	M	Improve rail line between Gulfport and Hattiesburg. The cost of this project minus the $20,000,000 TIGER Grant (i.e. $30,000,000) is included in the Mississippi 2035 Rail Plan.	$50,000,000(3)
9	Rail Access	M	Develop rail access directly into port facility	N/A
10	Road Access	M	Create a new corridor to I-10 for port traffic (MS 601, Canal Road)	$300,000,000(3)
Pascagoula				
11	Port Facilities	M	Basic infrastructure for South Terminal development including: Dock improvements, ground improvements, power and lighting, bulkhead extension, rail rehab and dredging.	$27,000,000
12	Port Facilities	M	Improve gate access	$2,500,000
13	Port Facilities	M	Improve gate access	$4,000,000
14	Port Facilities	M	Rehabilitation of older public facilities: Demolish 175 sq ft warehouse and rehab and extend the dock area at Terminals E and F in Bayou Casotte	$15,000,000
Gulf Coast Ports Subtotal for projects with cost estimates				**$968,710,000**
Mississippi River Ports				
Claiborne				
15	Port Facilities	M	120 ton crane to load/unload cargo; 80,000 lb forklift; On-site storage; Possible extension of three-phase power to Port; Additional usable land	$2,500,000
Greenville				
16	Port Facilities	M	Grain Handling System	$1,800,000
17	Port Facilities	M	Dock Improvements	$600,000
18	Port Facilities	M	New 50,000 lb wheel loaders	$185,000
19	Port Facilities	M	New 20,000 lb wheel loaders	$85,000
20	Port Facilities	M	Port Security System	$34,000
21	Port Facilities	E	Development of Phase III 40 acre Property Expansion Plan, Engineering, Environmental, Construction Estimate	$8,000,000
22	Port Facilities	M	New Sweeper	$20,000
23	Port Facilities	M	Equipment	$400,000
24	Port Facilities	M	Port Authority Boat	$52,000
25	Rail Access	M	The Port plans to add a longer side track to hold more rail cars, a track mobile and track improvement switch.	$407,800
26	Rail Access	M	Rehabilitation of 3.2 miles of Port-owned track between the Port and the levy.	$5,000,000
Natchez				
27	Channel Issues	M	The Port requested a long term project to either raise the Mississippi River Bridge or installation of a drawbridge.	N/A
28	Port Facilities	P	Repair and improve liquid loading dock	$1,000,000

Ref. #	Project Type	Cat. (1)	Identified Need	Cost Estimate (2)
29	Port Facilities	E	Expand 4th dock including liquid terminal for possible new client	$2,500,000
30	Port Facilities	M	Complete the covered conveyor system.	N/A
31	Port Facilities	M	Complete the bulk cargo handling dock	N/A
32	Port Facilities	M	Complete conveyor system for the bulk cargo handling dock	N/A
33	Port Facilities	M	Build a 100,000 sq ft storage facility	N/A
34	Port Facilities	M	Install Vapor Recovery System	$1,500,000
35	Port Facilities	M	Acquire additional 100 acres of land adjacent to the existing industrial park	$10,000,000
36	Rail Access	M	Extend rail to the bulk cargo handling dock	N/A
37	Rail Access	M	Build a rail extension to the Port's "South Dock"	N/A
38	Road Access	P	Pave road to bulk handling cargo dock	N/A
Rosedale				
39	Channel Issues	P	The Port of Rosedale requests the USACE expand its maintenance of the Arkansas River.	N/A
40	Port Facilities	E	Develop a container-on-barge facility.	N/A
41	Port Facilities	P	Repair and resurface pile coating at main dock – currently being done - over 50% complete	N/A
42	Port Facilities	E	Build a thirty-eight-acre hydraulic-fill site with a seven-acre berm and build a facility costing in excess of $100,000,000	$100,000,000(3)
43	Port Facilities	M	Possibly build rice mill at the port.	N/A
44	Rail Access	P	Repair 32.45 miles of GTR railroad. All ties and ballasts need to be replaced as well as possible widening in certain locations. The railroad has been inactive for the past 10 years.	N/A
45	Road Access	M	ICIP approved footage does not include the entire port road – Must include the entire length of the port road to be included in funding.	N/A
46	Road Access	P	Resurface and widen one mile of existing access road – industrial road	N/A
47	Road Access	P	Rehabilitate access road that will link the Port and the new industrial park.	N/A
48	Road Access	P	Roads in the Port are good due to Port maintaining with Port funds. Since the MDOT Intermodal Connector program was not funded in 2010, the Port used operation funds to upgrade its concrete road.	N/A
49	Road Access	P	Road through industrial park was constructed of concrete 33 years ago and was not designed for amount of heavy traffic in 2010. Needs to be improved.	N/A
Vicksburg				
50	Port Facilities	P	Upgrade and rehabilitate bridge crane infrastructure and replace 15-ton crane -	$12,400,000
51	Port Facilities	E	Build a new 300-400 acre slack water port facility south of the I-20 Mississippi River Bridge	N/A
52	Port Facilities	E	Construct a container-on-barge facility.	N/A
53	Rail Access	M	Construct a short-line railroad track between Yazoo City and Vicksburg Ports.	N/A
54	Rail Access	M	Vicksburg is in the process of upgrading the 900 feet of existing rail road tracks	$50,000

Ref. #	Project Type	Cat. (1)	Identified Need	Cost Estimate (2)
55	Road Access	M	Replace the existing 400-foot long, two-lane bridge access to the port with a modern four-lane bridge	$7,000,000
56	Road Access	M	Construct a new roadway bypass extending from Highway 61 Bypass to Washington St., eliminating 12 miles of road from the Port to the highway. The EA has been completed	N/A
Yazoo				
57	Port Facilities	E	Acquire 4000 acres to facilitate new client and new port facility	N/A
58	Rail Access	P	Provide new overlays for railroad crossings	$300,000
59	Rail Access	M	Rebuild spurs to Class 1 Standards	N/A
60	Road Access	P	Maintain and resurface local roads, as well as improving road capacity entering the Port	N/A
61	Channel Issues	P	Port of Yazoo requests the USACE designate the Yazoo River as a navigable waterway (or at least the portion that affects the port).	N/A
Mississippi River Ports Subtotal for projects with cost estimates				**$153,833,800**
Tennessee-Tombigbee Waterway Ports				
Aberdeen				
62	Port Facilities	M	Build a 100,000 sq ft open pad for economic development.	$200,000
63	Port Facilities	E	220 acre inbound/outbound container on barge (COB) site. They plan to target the grain industry and its many byproducts and increase the lumber industry.	N/A
64	Port Facilities	P	Repair 500 sq yards of the 10 inch thick wharf dock.	$50,000
65	Rail Access	M	Construct approximately 15,150 linear feet of rail to connect Aberdeen Port to the Kansas City Southern Railway. The project will also include six turn-outs and facility improvements to assist in the loading and unloading of containers. The Port plans to increase rail capability to over 45 cars with the addition of a new rail spur.	$5,200,000
66	Road Access	P	Repair one mile of access road with an addition of 1,000 ft. of paved shoulder	$1,500,000
Amory				
67	Port Facilities	E	Construct loaded barge fleeting area at minimum 75ft x 1,100 ft	N/A
68	Rail Access	M	Extend rail spur south to US 278 bridge	N/A
69	Rail Access	M	Upgrade twelve rail bridges located between Amory, Mississippi, and Columbus, Mississippi operated by Burlington Northern Santa Fe Railway. (Amory Subdivision). Proposed rail upgrades would increase the load-carrying capability to 286,000 pounds.	$4,500,000
70	Road Access	P	Overlay north portion of Waterway Drive. Cost estimate includes paving of shoulders for parking.	$500,000
71	Road Access	M	Widen US 278 to 4 lanes from canal to US 45 (6-miles)	N/A
72	Port Facilities	E	Construct a new barge docking notch	N/A
73	Port Facilities	E	Extend the present dock at Amory Port one barge length to the north and install a heavy-duty winch system	N/A
Clay County				
74	Channel Issues	P	Regular dredging maintenance	N/A
Itawamba				
75	Port Facilities	E	Construction of a new container-on-barge facility and notch development	N/A

Ref. #	Project Type	Cat. (1)	Identified Need	Cost Estimate (2)
76	Port Facilities	M	Improvements to the 60 ton bridge crane	$200,000
77	Port Facilities	M	Purchase a new automated spreader bar	$200,000
78	Port Facilities	M	Construct a truck fleeting/marshalling area	$800,000
79	Rail Access	M	Rehabilitate the Mississippian Railway: 23 miles of industrial rail line from Fulton, Mississippi, to Amory, Mississippi. The Mississippian Railway provides a vital intermodal link between the Port Itawamba inland slip, the Burlington Northern Santa Fe Railway, and U.S. 78. Upgrade the line to 286,000-pound capacity.	$10,400,000
Lowndes				
80	Channel Issues	P	Dredging at Dock #1 ($25,000) – already budgeted and planned.	$25,000
81	Port Facilities	P	Rehab 68,000 sq ft warehouse roof ($100,000) – already budgeted and set to begin	$100,000
82	Port Facilities	E	Expand port land reserve and extend infrastructure – long range	N/A
83	Rail Access	M	Engineering/environmental planning & acquisition for west bank rail spur ($300,000) – without rail access, Lowndes cannot expand their economy. Project is currently in the budget.	$300,000
Yellow Creek				
84	Rail Access	P	Rehabilitate the 10-mile industrial spur track that connects Yellow Creek State Inland Port to the national rail system, replacing damaged ties along the rail spur and bringing the spur into compliance with all federal and American Railway Engineers and Maintenance-of-Way Association (AREMA) standards.	$2,000,000
85	Rail Access	M	Construct a 3-mile rail spur from the Norfolk Southern main line to the container-on-barge distribution port terminal at the Northeast Mississippi Waterway Industrial Park and Barge Terminal.	$4.100,000
86	Road Access	M	1-mile access intermodal road	$500,000
87	Port Facilities	M	Dock and storage area improvements that would provide 8.9 acres of additional lay-down area.	N/A
88	Port Facilities	M	Construction of a marshalling yard and infrastructure improvements that would serve the existing container-on-barge distribution port terminal at the Northeast Mississippi Waterway Industrial Park and Barge Terminal.	N/A
89	Port Facilities	M	Gantry at new barge terminal.	N/A
Tennessee-Tombigbee Waterway Ports Subtotal for projects with cost estimates				**$30,575,000**

Notes:
(1) Project Category: P = Preservation, M = Modernization, and E = Expansion
(2) N/A - Not Available. No cost estimate was provided.
(3) Due to the high cost of these projects they were excluded when estimating costs for projects that lack cost estimates.

3.2 Summary Port Needs

These needs are summarized by project type and category.

Needs by Project Type – Of the 89 projects identified, cost estimates were provided for 45 projects (51%). Excluding the costs of four projects that exceed $50 million each, the total cost

for the remaining 44 projects amounts to $133 million, as shown by project type in **Table 3-3**. Assuming that the average cost estimates by project type are representative of the remaining projects of that type, the total cost for 85 identified port needs is estimated at approximately $247 million. With the four projects exceeding $50 million, the total port needs are estimated to amount to $1,267 million.

Table 3-3: Cost Estimates by Type (in millions)

Parameter	Project Type				Total
	Channel Issues	Port Facilities	Rail Access	Road Access	
Gulf Coast Ports					
No. of Projects	4	6	3	1	14
Projects with Costs < $50 m	0	5	0	0	5
Cost Estimate	N/A	$48.71	N/A	N/A	$48.71
Mississippi River Ports					
No. of Projects	3	26	9	9	47
Projects with Costs < $50 m	0	15	4	1	20
Cost Estimate	N/A	$41.08	$5.76	$7.00	$53.83
Tennessee-Tombigbee Waterway Ports					
No. of Projects	2	15	7	4	28
Projects with Costs < $50 m	1	6	6	3	16
Cost Estimate	$0.03	$1.55	$26.50	$2.50	$30.58
All Mississippi Ports					
No. of Projects	9	47	19	14	89
Projects with Costs < $50 m	1	26	10	4	41
Cost Estimate	$0.03	$91.34	$32.26	$9.50	$133.127
Estimated cost of 85 Projects	**$0.23**	**$158.08**	**$56.06**	**$30.88**	**$247.25**
Projects exceeding $50 million each					
Port of Gulfport Expansion of Intermodal Operations		$570.00			$570.00
Improve rail line between Gulfport and Hattiesburg			$50.00		$50.00
Create a new corridor to I-10 for port traffic (MS 601, Canal Road)				$300.00	$300.00
Rosedale: Build 38-acre hydraulic-fill site with a 7-acre berm and facility		$100.00			$100.00
Total cost of 89 Projects	**$0.23**	**$828.08**	**$108.06**	**$330.88**	**$1,267.25**

Needs by Category – To facilitate comparison with other modal transportation needs, projects are categorized into these three categories:

Needs Category	**Port and Waterway Needs**
Preservation:	Maintenance and repair
Modernization:	Upgrading of existing port facilities, improvements to road and rail access, including expansion of access facilities, and expansion of infrastructure for economic development
Expansion:	New or expanded port infrastructure

Port needs by category are summarized in **Table 3-4.** Due to the lack of costs for many projects the total estimated cost by project category assumes the total for all port needs, excluding the cost of four projects that exceed $50 million each, is approximately $247 million as discussed above.

Table 3-4: Port Needs by Category (in millions)

Parameter	Project Category			Total
	Preservation	Modernization	Expansion	
Gulf Coast Ports				
No. of Projects	4	8	2	14
Projects with Costs < $50 m	0	4	1	5
Cost Estimate	N/A	$48.50	$0.21	$48.71
Mississippi River Ports				
No. of Projects	13	27	7	47
Projects with Costs < $50 m	3	15	2	20
Cost Estimate	$13.70	$29.63	$10.50	$53.83
Tennessee-Tombigbee Waterway Ports				
No. of Projects	7	15	6	28
Projects with Costs < $50 m	6	10	0	16
Cost Estimate	$4.18	$26.40	N/A	$30.58
All Mississippi Ports				
No. of Projects	24	50	15	89
Projects with Costs < $50 m	9	29	3	41
Cost Estimate	$17.88	$104.53	$10.71	$133.12
Percent of Total Costs	13%	79%	8%	100%
Estimated cost of 85 Projects	**$33.20**	**$194.15**	**$19.89**	**$247.25**
Projects exceeding $50 million each				
Port of Gulfport Expansion of Intermodal Operations			$570.00	$570.00
Improve rail line between Gulfport and Hattiesburg		$50.00		$50.00
Create a new corridor to I-10 for port traffic (MS 601, Canal Road)			$300.00	$300.00
Rosedale: Build 38-acre hydraulic-fill site with a 7-acre berm and facility			$100.00	$100.00
Total cost of 89 Projects	**$33.20**	**$244.15**	**$989.89**	**$1,267.25**

4. PORT AND WATERWAY ECONOMIC IMPACTS

The estimated economic impacts of waterborne freight activity in Mississippi address both waterborne transport service impacts as well as impacts to industries within the State that use ports and waterways to trade goods. TRANSEARCH-derived, port-specific inbound, outbound, and intrastate commodity flow volumes and values are applied in conjunction with the IMPLAN

economic model to determine how such commodity movements generate *direct* economic impacts in Mississippi. Further, the *indirect* impacts associated with suppliers, and the *induced* impacts associated with the re-spending of income, are also quantified. Combined, the *direct*, *indirect*, and *induced* impacts comprise the *total* economic impacts. Such impacts are measured in terms of employment, income, value-added (i.e., Gross State Product), and output. The following sections outline the methodology adopted, relevant commodity flow data, and resulting impact estimates.

4.1 Approach, Terminology, and Data

The economic impact estimation approach follows accepted industry impact analyses by identifying and categorizing the range of impacts directly and tangentially related to waterborne freight transportation. The following subsection outlines this methodology, the data sources, and the economic model used.

4.1.1 Impact Approach and Terminology

Economic impacts of port and waterway freight transport are categorized into two broad impact ***activities***: *transport-service* and *trade-users* impacts. For each broad *activity*, three impact ***types*** are quantified: *direct*, *indirect*, and *induced* impacts. And for each impact *type*, four impact ***measures*** are derived: *jobs*, *income*, *value-added*, and *output*. These impact activities, types, and measures are defined below.

Impact Activities – The economic impacts of port and waterway freight activity in Mississippi are categorized into port and waterway *transport-service* impacts that would most-assuredly be lost in the absence of waterborne activity, and *trade-user* impacts that pertain to industries using waterborne transport as one of several available modes to transport freight.

- *Transport-Service Impacts* – Economic impacts associated with the provision of port and waterway operations (i.e., the waterborne transport industry) include a wide range of primarily on-terminal activity, but also may include off-terminal support operations associated with administrative functions. Such activity includes port cargo handling services and operations at four Gulf ports, five River ports, and six ports on the Tennessee-Tombigbee Waterway (Tenn-Tom).
- *Trade-User Impacts* – Economic impacts associated with shippers/receivers using the port and waterway network for the movement of goods (e.g., intermediate and final goods), excepting the waterborne transport industry itself. Port and waterway users have several options available to transport freight and could possibly substitute other modal transport (truck and/or rail) if waterborne services became unavailable.[15] However, the choice to use ports to ship/receive freight over other modes indicates cost and/or

[15] Further, the substitutability factor if port and waterway transport became unavailable also affects the import and/or export of goods and material, which might result in the use of local products instead of out-of-state products.

logistical advantages, and as such, removal of such advantages would negatively affect port users.

Impact Types – The *Transport-Service* and *Trade-User* activity impacts each consist of three impact types (and a combined total):

- *Direct* – Impacts from the provision of waterborne transport (i.e., "*transport-services*"), as well from the firms/industries that use ports and waterways to ship and receive goods (i.e., "*trade-users*").
- *Indirect* – Impacts associated with the suppliers that provide intermediate goods and services to the *directly* impacted industries.
- *Induced* – Impacts associated with the re-spending of earned income from both the *direct* and *indirect* industries in the study area.
- *Total* – Aggregated *direct*, *indirect*, and *induced* impact types.

Impact Measures – Each impact *type* is *measured* in terms of four economic metrics:

- *Jobs/Employment* – Employment, as measured in terms of full-time-equivalent (FTE) job-years.
- *Income* – The wage/salary earnings paid to the associated jobs.
- *Value-added* – The net additional economic activity (i.e., total output less gross intermediate inputs), synonymous with GRP (gross regional product) or GSP (Gross State Product). Includes employee and proprietor income, other income types, taxes, etc., required in the production of final goods and services.
- *Output* – The total sales value associated with all levels of economic activity (comprised of gross intermediate inputs *and* value added, combined).

4.1.2 Data Sources and Models

Reflective of agriculture, mining, manufacturing, and other production sectors, *Trade-User* impacts are typically much greater than those related to *Transport-Service.* Generating solid, comprehensive *Trade-User* impact estimates requires converting commodity movement data into *direct* industry output estimates. To do so, the WATERBORNE COMMERCE STATISTICS (WCS) OF THE UNITED STATES was reviewed, and the TRANSEARCH commodity movement data and the IMPLAN model are used.

Waterborne Commerce Statistics – Published by the U.S. Army Corps of Engineers (USACE), the WATERBORNE COMMERCE STATISTICS OF THE UNITED STATES compiles and provides most domestic traffic movement data for waterborne vessel operators of record. [16,17] While the WCS

[16] Excludes: 1.) cargo on general ferries; 2.) coal and petroleum loaded from shore facilities directly into vessels for fuel use; 3.) military cargo moved in Department of Defense vessels; and, 4.) cargo weighing less than 100 tons moved on government equipment.

provides a centralized source for actual tonnage movements associated with Mississippi's ports, the WCS data is limited in applicability for economic impact analyses because it does not differentiate between in- and out-of-state origins and/or destinations. For example, manufactured goods could arrive at Mississippi coastal ports that are then forwarded on to Alabama or Tennessee, which are captured within the WCS freight flows for MS. Applying such out-of-state destined port data from the WCS in the estimation of *Trade-User* impacts would overstate the associated economic impact of ports to Mississippi (where, instead those impacts should be attributed to AL or TN). Because the terminus coverage of freight movements within the WCS data for MS are not strictly constrained to just Mississippi[18], the WCS was reviewed only for context, but ultimately not applied to the derivation of the *trade-user* impacts.

TRANSEARCH – The TRANSEARCH® commodity database (Source: IHS/Global Insight, Inc.) is the primary source for estimating the *trade-user* economic impacts associated with waterborne traffic movements. TRANSEARCH waterborne data is partially derived from the WCS, so in theory, it captures the same data. However, both a geographic-coverage and timing rectification is required to enable a comparison between the two datasets. Based on USACE data, the release of domestic TRANSEARCH waterborne data has historically lagged by six months. Conversely, the prompt availability of current data on U.S.-foreign waterborne trade (reported through the U.S. Census and Customs and Border Protection) provide current input to TRANSEARCH.

TRANSEARCH vs. WATERBORNE COMMERCE STATISTICS: TRANSEARCH data is preferable to WCS data for *trade-user* impact estimates for two reasons. First, TRANSEARCH provides commodity values (WCS does not) in addition to tonnage flows. Such commodity values are essential in estimating the industry output and associated economic impacts. Second, as addressed above, TRANSEARCH identifies the economically-applicable Mississippi-terminus movements versus those WCS port tonnage movements that simply pass through Mississippi ports (e.g., inclusive of outbound movements originating, or inbound movements terminating, outside of Mississippi). Since the TRANSEARCH data loses some of its waterborne movement clarity at a sub-State geographic level, only the Statewide data is used to estimate the State's total port-related *Trade-User* impacts. Specifically, data applied in the economic analysis include 2006 tons and value, by commodity type and directional movement (inbound, outbound, and intrastate), categorized by Standard Transportation Commodity Classification (STCC) code level.

IMPLAN – The IMPLAN® v3 model, produced by the Minnesota IMPLAN Group, Inc., is an economic modeling, input-output based, social account matrix software used to estimate the economic impacts to a defined geography (i.e., the State of Mississippi) ensuing from expenditures in an industry or group of industries (or, commodity, or group of commodities).[19] A social account matrix reflects the economic interrelationships between the various industries (and commodities), households, and governments in an economy and measures the economic

[17] Foreign statistics are compiled and available from the U.S. Census Bureau and U.S. Customs
[18] The economically-inapplicable data is not easily sequestered and removed from the overall MS-applicable data
[19] Note that all impacts presented pertain only to one-year static impacts for year 2006 flows (in year 2008 values), and does not provide any dynamic or feedback changes.

interdependency of each industry on others through impact multipliers. Impact multipliers are developed within IMPLAN from regional purchase coefficients, production functions, and socioeconomic data for each of the economic impact variables and are geographically-specific. IMPLAN data and industry-accounts closely follow the conventions used in the "Input-Output Study of the U.S. Economy" by the Bureau of Economic Analysis.

Additionally, IMPLAN provides commodity-to-industry production and absorption matrices that enable the quantification, for example, of how inbound grain is used across industries in production processes (i.e., poultry farms, bakeries, and other food processing industries) to create consumable final goods and services. Further, the Consultant has developed algorithms to translate TRANSEARCH commodity (STCC) data into IMPLAN. Such data and translation processes are used to estimate the *trade-user* impacts associated with directional commodity movements.

4.1.3 Port Tonnage and Value

Analyzed economic impacts associated with Mississippi waterborne tonnage flows and activity account for the movements at fifteen ports, which include the four major Gulf ports, the five major River ports, and the six Tennessee-Tombigbee ports, as listed in **Table 4-1**.

Table 4-1: Ports Included in Economic Impact Analysis

Gulf Port	River Ports (1)	Tenn-Tom ports
Bienville	Greenville	Aberdeen
Biloxi	Natchez	Amory
Gulfport	Rosedale	Clay County
Pascagoula	Vicksburg	Columbus-Lowndes Co.
	Yazoo	Itawamba
		Yellow Creek Itawamba

Note: (1) As noted in Section 2.2.3 the Port of Claiborne County was not operational at the time of this study and so could not be included in the Economic Impact Analysis.

Total Port Tonnage Movements – According to the WCS, these fifteen ports accommodated 50.6 million tons in 2008. By direction, 64% (32.3 million tons) were inbound receipts, 36% (18.2 million tons) were outbound shipments, and a remaining small percentage: 0.2% (0.1 million tons) were intra-port transfers. By port location, the Gulf ports accommodated the greatest relative volumes, with 78% (39.7 million tons) of the total volume, followed by the River ports with 16% (7.9 million tons), and Tenn-Tom ports with 6% (3.1 million tons). Two-thirds of the State's total waterborne tonnage (66%, or 33.6 million tons) is accommodated by Pascagoula. Pascagoula tonnage is dominated by petroleum products, which comprises 89% (29.8 million tons) of the tonnage; in fact, Pascagoula's petroleum products (both inbound and outbound)

comprise 59% of total statewide port tonnage movements. These total port tonnage movements, by port location and direction, are presented in **Table 4-2**.

Table 4-2: Total Mississippi Port Tonnage (2008)

Port	Receipts	Shipments	Intra-port	Total
Gulf Ports				
Bienville	464,000	0	0	464,000
Biloxi	3,437,200	71,200	0	3,508,400
Gulfport	1,486,400	656,600	0	2,143,000
Pascagoula	21,060,900	12,527,600	1,300	33,589,800
Subtotal	26,448,500	13,255,400	1,300	39,705,200
River Ports				
Greenville	1,198,600	1,816,200	3,200	3,018,000
Natchez	254,200	244,900	0	499,100
Rosedale	161,000	617,500	0	778,500
Vicksburg	2,798,400	632,900	118,400	3,549,700
Yazoo	12,000	25,000	0	37,000
Subtotal	4,424,200	3,336,500	121,600	7,882,300
Tenn-Tom Ports				
Aberdeen	12,000	0	0	12,000
Amory	519,000	128,000	0	647,000
Clay County	175,000	75,000	0	250,000
Columbus-Lowndes Co.	115,000	780,000	0	895,000
Itawamba	234,000	312,000	0	546,000
Yellow Creek	400,000	300,000	0	700,000
Subtotal[1]	1,455,000	1,595,000	0	3,050,000
Total	**32,327,700**	**18,186,900**	**122,900**	**50,637,500**

Source: Waterborne Commerce Statistics, U.S. Army Corps of Engineer
1Note, estimates for Tenn-Tom Ports based on WCS data, which exclude intra-port tonnage

Net Mississippi Port Tonnage Movements – Approximately 60% of the total 50.6 million tons accommodated by Mississippi ports originate or terminate out-of-state. This estimate is based on a comparison between the WCS 2008 data and the TRANSEARCH 2006 data.[20] This comparison, shown in **Table 4-3**, compares the TRANSEARCH net tonnage estimates for Mississippi (excluding outbound movements originating, or inbound movements terminating, out-of-state, i.e., the *through* movements) are compared with the WCS total tonnage movements (implicitly inclusive of *through* movements). While 58% of the total WCS outbound shipments appear to originate in Mississippi, only 25% of the WCS inbound port tonnage terminates in Mississippi.

[20] At the time the project was undertaken, 2006 was the most recent year of available TRANSEARCH data. Conversely, while back years of WCS data are readily available for the Gulf and River ports, year 2006 data for all the Tenn-Tom ports were not. Based on comparison of the WCS years 2006 and 2008 data for the Gulf and River ports, it appears that total port tonnage fell 0.5%. As such, the available WCS data does not suggest a notable change for the entire state, although notable change was identified for some individual ports such as Biloxi's inbound movements between the comparison years.

Table 4-3: Net versus Total Mississippi Port Tonnage

Direction	Net Tonnage (TRANSEARCH)[1]	Total Tonnage (WCS)[2]				TRANSEARCH as % of WCS
		Gulf Coast	River	Ten-Tom	Total	
Outbound (Shipments)	10,533,000	13,255,000	3,336,000	1,595,000	18,187,000	58%
Inbound (Receipts)	8,160,000	26,449,000	4,424,000	1,455,000	32,328,000	25%
Intrastate (Intra-port)	413,000	1,000	122,000	0	123,000	336%
Total	19,107,000	39,705,192	7,882,000	3,050,000	50,637,000	38%

[1] *TRANSEARCH 2006 database – Net Mississippi tonnage, excludes through movements*
[2] *USACE reported total WCS freight movements in 2008 through Mississippi ports, includes through movements*

Detailed inbound and outbound commodity movements and values associated with these net TRANSEARCH-reported movements are used in conjunction with the IMPLAN data to estimate the *Trade-User* impacts. Note, that while the waterborne *through* movements accommodated at Mississippi ports and waterways do not translate into *trade-user* impacts for MS (because those impacts would be attributable to the commodity originating and terminating locations beyond MS), the on-port impacts associated with handling the *through* cargo is quantified as part of the *Transport-Service* impacts.

Port tonnage volumes and corresponding commodity values by direction used in the economic analysis are based on the TRANSEARCH Statewide tonnage and value data. The following TRANSEARCH data details the consolidated commodity flows for inbound, outbound, and intrastate freight movements. For purposes of the economic analysis, three adjustments are made:

1. Commodity flow data is analyzed from a detailed perspective (versus the consolidated) to facilitate translation between the TRANSEARCH commodity categories to those of IMPLAN;
2. Intrastate movements were combined with outbound movements, since both reflect industry production within Mississippi; and,
3. The year 2006 price levels provided by TRANSEARCH were inflated to year 2008 price levels to facilitate the 2008-based IMPLAN model (inflated via the U.S. Bureau of Labor Statistics Producer's Price Index, by commodity).

While the detailed commodity freight flows are evaluated in the economic impact calculations, the consolidated movement flows and values are summarized below to provide an order-of-magnitude understanding and to illustrate key concepts.

Inbound Commodities – *Petroleum or Coal Products* dominates in terms of inbound consolidated tonnage (6.2 million, at 58.6% of total) and value ($4.7 billion, at 68.5% of total) in 2006, see **Table 4-4**. The average value per ton of major consolidated commodities indicates a relatively low measure of under $1,000 per ton. As is typical of waterborne freight movements, only the very low tonnage commodities, including *Fish and Marine Products* as well as *Other*, have greater average values per ton, surpassing $2,600. Inbound tonnage totals 10.5 million tons valued at $6.9 billion.

Table 4-4: Inbound Waterborne Freight Volume and Value by Major Commodity

Consolidate Commodity	Volume[1]		Value[2]		Avg Value ($/ton)
	Tonnage	Percent	$ (million)	Percent	
Petroleum or Coal Products	6,171,121	58.6%	$4,712	68.5%	$764
Farm Products	1,663,714	15.8%	$457	6.6%	$275
Waste or Scrap Materials	1,308,826	12.4%	$599	8.7%	$458
Chemicals or Allied Products	788,157	7.5%	$632	9.2%	$802
Food or Kindred Products	398,838	3.8%	$214	3.1%	$536
Lumber or Wood Products	133,488	1.3%	$99	1.4%	$741
Fish and Marine Products	60,200	0.6%	$159	2.3%	$2,644
Other	8,752	0.1%	$27	0.4%	$3,122
Total	10,533,096	100.0%	$6,900	100.0%	$655

[1]*Year 2006 volume*
[2]*Inflated to year 2008 dollars (from given 2006 values)*

Outbound/Intrastate Commodities – Review of the consolidated outbound/intrastate waterborne traffic flows indicate that *Petroleum or Coal Products* also leads in both terms of tonnage (2.5 million, at 29.2% of total), while *Petroleum* leads in terms of value ($1.9 billion, at 36.8% of total), see **Table 4-5**. Average values per ton range significantly from $26 for *Non-Metallic Minerals* to $2,676 for *Other* products (which include miscellaneous shipments and fabricated metal products). Combined, outbound/intrastate tonnage totals 8.6 million tons valued at $4.8 billion.

Table 4-5: Outbound/Intrastate Waterborne Freight Volume and Value by Major Commodity

Commodity	Volume[1]		Value[2]		Avg Value ($/ton)
	Tonnage	Percent	$ (million)	Percent	
Petroleum or Coal Products	2,504,787	29.2%	$1,502	29.7%	$466
Waste or Scrap Materials	1,942,702	22.7%	$515	12.5%	$251
Nonmetallic Minerals	1,869,641	21.8%	$54	1.3%	$26
Petroleum (unprocessed)	1,126,870	13.1%	$1,859	36.8%	$1,282
Chemicals or Allied Products	793,307	9.3%	$463	9.9%	$489
Coal (unprocessed)	126,064	1.5%	$5	0.1%	$31
Farm Products	72,098	0.8%	$18	0.3%	$181
Other	138,173	1.6%	$368	9.4%	$2,676
Total	8,573,642	100.0%	$4,784	100.0%	$458

[1]*Year 2006 volume*
[2]*Inflated to year 2008 dollars (from given 2006 values)*

4.2 Impact Findings

Port and waterway activity in Mississippi impacts an estimated 93,150 *total* jobs across the State. A vast majority of these *total* employment impacts arise from port users who trade goods via the waterway system, with the balance attributable to waterborne transport services. In terms of jobs, *trade-user* related employment impacts total 90,200 jobs (96.8% of *total* jobs), versus 2,950 (3.2%) port transport-service related jobs. These summary port-operation and port-user impacts

include the *direct* impact of goods and services provided, the *indirect* impact associated with suppliers, and the *induced* impacts associated with income re-spending.

The ensuing discussion details the composition of the employment impact estimates, as well as the other impact *measures* (e.g., output, value-added, and income). The impact *types* (e.g., direct, indirect, and induced) and *measures* are first presented for port *Transport-Services*, and then for *Trade-Users*. The total impacts are then summarized for both port *activities* by impact *measure* and *type*.

4.2.1 Waterborne Transport-Service Impacts

The *direct* impact of Mississippi port and waterway operations totals 830 jobs[21]. The *indirect* and *induced* (i.e., the multiplier) effect associated with port operations yield an additional 2,120 jobs (1,320 and 800, respectively) throughout the State. Combined, an estimated 2,950 people owe their jobs, directly or tangentially to the physical movement of freight by water. This excludes the *trade-user* impacts associated with the shippers/consignees that ship/receive goods, as quantified in the following subsection.

Direct Waterborne Transport-Service Impacts – The *direct* output impacts related to port services total $440 million, of which $65 million is paid in income to the 830 people *directly* employed in the port and waterway industry, as shown in **Table 4-6**. These impacts typically occur at ports, with the vast majority of direct jobs resulting from freight service.

Table 4-6: Port Transport-Service Impacts

Impact Type	Output[1]	Value Added[1,2]	Labor Income[1]	Employment[3]
Direct	$440	$128	$65	830
Indirect	$142	$83	$57	1,320
Induced	$79	$45	$24	800
Total	$661	$256	$146	2,950

Source: Wilbur Smith Associates
[1] Millions of 2008 dollars
[2] Comparable with Gross State Product (GSP)
[3] In FTE job-years

Total Port Transport-Service Impacts – The *indirect* output impacts associated with the supply of products and services to port transport providers total $142 million, of which $57 million is paid in income to 1,320 *indirect* jobs. The re-spending of *direct* income ($65 million) and *indirect* income ($57 million) generates an additional $79 million in *induced* output impacts, of which $24 million is paid to an additional 800 jobs.

[21] Source; IMPLAN baseline data, confirmed with data from the U.S. Bureau of Economic Analysis

Combined, a *total* of 2,950 jobs are related directly or tangentially (indirect and induced) to the provision of port and waterway transport in Mississippi. These employees earn a total of $146 million. Total output related to such port transport services totals $661 million.

4.2.2 Waterborne Trade-User Impacts

In addition to the port-operation (transport-service) impacts detailed above, many consignees and shippers in the State rely heavily on the port service to receive and/or ship freight. In doing so, they generate significant impacts as well. While these firms/industries are not entirely dependent on port freight shipments, it is hard to envision their continued operation levels without such access. In fact, port/waterway access is often instrumental in major manufacturing business location decisions.

If the Gulf, River, and Tenn-Tom ports did not accommodate demand, consignees and shippers could use other modes (i.e., truck, rail, air, etc.) to transport freight. However, the use of other modes would likely entail higher transport costs (due to longer transport distances, price, logistics, etc.), and could increase overall demand (and resulting handling costs) for all users of other modes (both the diverted waterborne users as well as current users). The long-term result would be a migration of industry away from Mississippi to other locations with relatively better port accessibility (and relatively better transport competitiveness).

The following analysis identifies the economic impacts associated with firms in Mississippi that rely on port transport. To estimate such impacts associated with port tonnage movements requires an understanding of how the various inbound and outbound commodities are used or produced by various industries to generate output, income, and employment. To do so, the IMPLAN commodity-to-industry matrices were applied to estimate *direct* impact measures. *Indirect* and *induced* multipliers were then applied to the *direct* impact estimates to derive *total* economic impacts.

Trade-User Impacts – The *direct* output of port users in Mississippi totals $13.3 billion, of which $2.0 billion is paid in the form of income to 50,830 *direct* jobs. Indirect impacts associated with suppliers account for another $3.5 billion in annual output, of which $740 million is paid in income to 20,170 jobs. The re-spending of direct and indirect income ($2.8 billion) generates additional *induced* impacts of $2.3 billion in output, of which $555 million is paid in income to 19,200 jobs.

As shown in **Table 4-7,** a *total* of 90,200 jobs in Mississippi can be traced to the firms that ship and/or receive freight via ports in Mississippi. Of these *total* jobs, approximately 16% (14,540 jobs) are attributable to freight originating in Mississippi (including intrastate movements) and 84% (75,660 jobs) are attributable to inbound freight terminating in Mississippi. These impact estimates are based on the freight volumes and values originally presented (Table 4-4 and Table

4-5). The significant impact variance between the directional movements reflects differences in tonnage volume, commodity types and industry uses.

Table 4-7: Port Trade-User Impacts

Measure and Type	Outbound /Intrastate[4]	Inbound[4]	Trade-User Total[4]
Output[1]			
Direct	$4,630	$8,638	$13,268
Indirect	$867	$2,665	$3,532
Induced	$640	$1,686	$2,326
Total	$6,137	$12,989	$19,126
Value Added[1,2]			
Direct	$1,422	$2,404	$3,826
Indirect	$345	$940	$1,285
Induced	$316	$774	$1,090
Total	$2,083	$4,118	$6,201
Labor Income[1]			
Direct	$562	$1,470	$2,032
Indirect	$195	$545	$740
Induced	$160	$395	$555
Total	$917	$2,410	$3,327
Employment[3]			
Direct	5,100	45,730	50,830
Indirect	4,150	16,020	20,170
Induced	5,290	13,910	19,200
Total	14,540	75,660	90,200

Source: Wilbur Smith Associates
[1] Millions of 2008 dollars
[2] Comparable with Gross State Product (GSP)
[3] In FTE job-years
[4] Overlap impacts associated with cargo that potentially moves in and out by port is subtracted-out.

Outbound/Intrastate Trade-User Impacts – 8.6 million tons of freight originating in Mississippi is either shipped via ports out-of-state (8.2 million tons) or internally (0.4 million tons). Combined, waterborne freight originating in Mississippi is valued at $4.8 billion (see Table 4-5), and generates an estimated $4.6 billion in *direct* output in Mississippi.[22] This *direct* output, tabulated by industry, was applied to IMPLAN multipliers to estimate the associated *indirect* and *induced* impacts associated with Mississippi goods and materials transported by water. As also shown in Table 4-7, the *total* impact associated with such movements measures $6.1 billion in output, of which $917 million is paid in income to 14,540 jobs Statewide.

[22] Note that some scrap and other materials are secondary products of low value that are not directly related to output, which is why the *direct* output is slightly less than the tonnage value.

Inbound Trade-User Impacts – The 10.5 million tons of freight originating beyond Mississippi that terminates in the State, valued at $6.9 billion (see Table 4-4), are used by Mississippi industries to generate $8.6 billion in *direct* output. This output is comprised of *final demand* and *industry demand*, where:

- *Final Demand* – 23% ($1.6 billion) of inbound freight value is estimated to comprise finished goods bound for final demand markets (e.g., households, governments, etc.) and distributed via wholesale or retail outlets, or through direct sales (which has no associated impacts). The sales of those $1.6 billion of port inbound merchandise generates an estimated $0.4 billion in *direct* wholesale/retail output in Mississippi (see **Table 4-8**).

- *Intermediate Demand* – 77% ($5.3 billion) of inbound freight value is used/absorbed by Mississippi industries in their production processes. These commodities are allocated to the major industry users based on relative absorption patterns. Output impacts are then estimated based on each industry's average value-added contribution to intermediate inputs to produce final goods and services. The exercise generates a *direct* industry output estimate of $8.2 billion. (see Table 4-8)

Table 4-8: Inbound Port Trade-User Value and Direct Output (in billions)

Demand Type	Freight Value	Direct Output
Final	$1.6	$0.4
Industry	$5.3	$8.2
Total	$6.9[1]	$8.6[2]

[1]*See Table 4-4 (Inbound Total Value)*
[2]*See Table 4-7 (Inbound Direct Output)*

Of the estimated $8.6 billion in *direct* output, $1.5 billion is paid in income to 45,730 jobs (see Table 4-7). Combined with indirect and induced effects, the impact associated with inbound trade-users *total* $13.0 billion in output of which $2.4 billion is paid in income to 75,660 jobs.

Trade-User Impact Overlap – Two notable impact *overlap* issues arose in the estimation process: *intra-modal* overlap and *inter-modal* overlap. First, *intra-modal* overlap occurs when supplies, such as seed and fertilizer, are imported by a grain producer via water. The *trade-user* impacts quantified allocate a share of the inbound seed and fertilizer commodities to the grain industry and then estimate the industry-associated output. The *intra-modal* overlap potential arises when grain is then transported by water out of the State, since impacts are also estimated for outbound waterborne movements. So in effect, the output associated with the grain industry would be counted twice: once associated with the inbound movement of seed and fertilizer, and second with the outbound movement of grain. To avoid double-counting impacts, such potential

overlaps were identified and subtracted-out of the analysis to ensure conservative estimates.[23] The *intra-modal potential overlap* subtracted from the impact findings comprise between 3% and 11% of the total reported waterborne impacts, depending on the *impact measure* and *type*.

Similar in principle to the first, the second potential overlap issue concerns rail impacts, which are also estimated as part of the Mississippi MULTIPLAN. If an inbound waterborne commodity is used in the production of an outbound rail commodity (or vice-versa), then the same convention is required when evaluating the combined impacts associated with rail and port movements. Specifically, the potential overlap is subtracted-out to ensure no double-counting.

For the purposes of this Port and Waterway Chapter, the *intra-modal* potential overlap impacts are subtracted-out of the presented results (similarly, the *intra-modal* impacts are subtracted out of the rail impacts analysis). However, the *inter-modal* potential overlap impacts are NOT addressed here, as it would understate the *trade-user* impacts associated with modal movements. However, in the Plan Summary, the total port/waterway and rail impacts are presented jointly, both exclusive and inclusive of the *inter-modal* overlap.

4.2.3 Total Port Activity Impacts

Port service is essential to Mississippi's economy. While the basic provision of port service generates a modest 830 *direct* jobs (2,950 including multiplier effects), port trade-users in the State generate 50,830 *direct* jobs. Combining the *total* port trade-users job impacts of 90,200 (inclusive of the multiplier impacts) with port transport-services jobs yields a *total* port-related employment impact of 93,150 jobs, with $3.5 billion paid in income, and output of $19.8 billion. The impact summaries by type, measure, and category are summarized in **Table 4-9**.

[23] While the TRANSEARCH data and IMPLAN model provide comprehensive analysis potential, they cannot be used to specifically track how such inbound port commodities result in corresponding outbound port commodities. Therefore, to avoid double-counting, an estimate is made of the *potential overlap* by identifying the minimum output between the modal directions. For example, if grain industry output associated with inbound seed and fertilizer totals $100 million and the grain industry output shipped outbound by port totals $60 million, the maximum potential overlap would be the minimum between the two movements (e.g., $60 million), because all of the port outbound grain-related impacts *could* have been produced with the port inbound commodity inputs.
So, instead of estimating a total direct impact of $160 million (aggregating the separately-calculated inbound- and outbound-related impacts), the $60 million in *potential overlap* is subtracted-out of the analysis, resulting in a conservative trade-user impact estimate of $100 million between the two directional movements.
However, it is doubtful that the overlap would be 100%. Specifically pertaining to the example, it is doubtful that the $60 million in port grain output could be entirely traced to the same $100 million of inbound port seed and fertilizer.

Table 4-9: Total Port Activity Impacts

Measure and Type	Transport-Service	Trade-User[4]	Total
Output[1]			
Direct	$440	$13,268	$13,708
Indirect	$142	$3,532	$3,674
Induced	$79	$2,326	$2,405
Total	$661	$19,126	$19,787
Value Added[1,2]			
Direct	$128	$3,826	$3,954
Indirect	$83	$1,285	$1,368
Induced	$45	$1,090	$1,135
Total	$256	$6,201	$6,457
Labor Income[1]			
Direct	$65	$2,032	$2,097
Indirect	$57	$740	$797
Induced	$24	$555	$579
Total	$146	$3,327	$3,473
Employment[3]			
Direct	830	50,830	51,660
Indirect	1,320	20,170	21,490
Induced	800	19,200	20,000
Total	2,950	90,200	93,150

Source: Wilbur Smith Associates
[1] Millions of 2008 dollars
[2] Comparable with Gross State Product (GSP)
[3] In FTE job-years
[4] Includes both inbound and outbound/intrastate related impacts. Overlap impacts associated with cargo that potentially moves in and out by port is subtracted-out.

These port-related impacts are also compared with State total employment, income, and gross state product (GSP) in **Table 4-10**. In summary:

- 93,150 jobs directly or tangentially affected by ports represent 6.1% of the 1.5 million jobs statewide (in 2008).
- $3.5 billion earned by these employees represents 6.0% of Mississippi's total income (in 2008).
- And, the combined value-added impact, $6.5 billion, associated with the port operations and port users represents 7.1% of GSP.

Table 4-10: Relative Port Activity Impacts

	Transport Service	Trade-User	Total
Value Added as % of State GDP[1]			
Direct	0.14%	4.2%	4.4%
Indirect	0.09%	1.4%	1.5%
Induced	0.05%	1.2%	1.3%
Total	0.28%	6.8%	7.1%
Labor Income as % of State Income[2]			
Direct	0.11%	3.5%	3.6%
Indirect	0.10%	1.3%	1.4%
Induced	0.04%	1.0%	1.0%
Total	0.25%	5.7%	6.0%
Employment as % of State Employment[3]			
Direct	0.05%	3.3%	3.4%
Indirect	0.09%	1.3%	1.4%
Induced	0.05%	1.3%	1.3%
Total	0.19%	5.9%	6.1%

Based on IMPLAN data for GDP, Labor Income and Employment
[1] Compared to total Mississippi GSP of $90.6 billion
[2] Compared to total Mississippi income of $58.1 billion
[3] Compared to total Mississippi employment of 1.53 million

Conclusion – The economic analysis clearly demonstrates that port activities and services provide a vital role in Mississippi's economy. The associated employment, income, value added, and output impacts span all industries, and reach every region of the State:

- The impact of port transport goes far beyond the 830 directly employed in the provision of port transport. When the trade-user impact activities and the indirect/induced effects are included, port-related employment in Mississippi totals **93,150 jobs**. These jobs represent 6.1% of the 1.5 million jobs statewide.
- The $3.5 billion earned by these employees represents **6.0% of Mississippi's total income.**
- The combined value-added impact, **$6.5 billion**, associated with the port operations and port users represents **7.1% of the State's gross state product (GSP).**

While it would be erroneous to conclude that all of these impacts are entirely and solely dependent on waterborne transport, the findings do suggest that port service facilitates business for a wide range of economic activities throughout the State. Specifically, these impacts highlight the magnitude of port use by manufacturers across the State, as well as dealers, retailers, and others who transport materials, component parts, and products.

Increasingly, the globalization of trade and manufacturing require dependable and efficient access to transport. Significantly cheaper than highway (on a ton-mile basis), waterborne transport provided by the various ports and waterways provides cost and/or logistical advantages to Mississippi's firms that enable the State to compete efficiently in the global market place.

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