“A silent workhorse that supports our great cities, inland waterways transportation is critical to Alabama’s and to the nation’s supply chain. It benefits farmers, shippers, manufacturers, steel producers, coal miners and producers, agribusinesses, towboat operators and just about every American consumer.”

- Tim Parker, Jr., Chair, Parker Towing Company, Inc., Alabama

According to June 2015 statistics released by the U.S. Army Corps of Engineers, 40 of the top 100 U.S. ports (coastal, Great Lakes and inland) in terms of tonnage are located in states belonging to the Southern Office of The Council of State Governments (CSG), the Southern Legislative Conference (SLC). Impressively, seven of the top 10 ports were SLC state ports. The Port of South Louisiana and the Port of Houston rose to the top, ranking first and second, respectively. While the SLC has focused on ports, the economic influence of ports and the potential impact of the expansion of the Panama Canal on ports in the South for more than 15 years, this Regional Resource reviews an important allied field: emerging trends linked to the nation’s, and specifically the region’s, inland ports, waterways and related infrastructure.

A major factor in the United States’ global economic dominance is the presence of a nationwide system of navigable rivers. The founders of the United States quickly realized that an efficient and effective marine transportation system was critical for the nation’s economic success, an attribute that remains valid even in the contemporary context. In 1779, the United States created what is now the U.S. Army Corps of Engineers (Corps) when engineer officers and companies of sappers’ and miners were formed into a corps of engineers. In 1824, the U.S. Congress assigned the Corps its first major public works project, the onerous responsibility of constructing a comprehensive inland waterway system connecting key regions of the United States. Congress also appropriated funds to the Corps for the creation of this navigable inland waterway system, a funding mechanism—with some variations—that prevails to this day. Currently, the Corps shoulders accountability for approximately $232 billion in water resources infrastructure assets, including a network of 11,000 miles of navigable water routes and 207 lock chambers (at 171 sites) on 27 inland rivers and Intracoastal waterway segments. Work by the Corps to ensure that the nation’s harbors are dredged and navigable continues to this day; in March 2015, the Corps announced that 10 harbors on the Mississippi River, all in the SLC region (Arkansas, Kentucky, Missouri and Tennessee), would be dredged of silt and sediment deposits, a process that would ensure the smooth flow of barge traffic and, by extension, commerce.

*Sappers have multiple definitions but, in this instance, it refers to a soldier employed in the construction of fortifications, trenches and tunnels.*
For most of our nation’s history, the fiscal responsibility for the construction and maintenance of the inland waterway system was the sole responsibility of the federal government. In fact, since the Congressional decision to create the Corps, U.S. taxpayers have borne the brunt of the costs associated with constructing, operating and maintaining the infrastructure related to the inland waterway system. In 1978, a major shift occurred with the enactment of the Inland Waterways Revenue Act; this legislation created the Inland Waterways Trust Fund (IWTF) and cleared the way for financing the construction and rehabilitation of the nation’s inland waterways through a modest tax on commercial users of the waterway system. The initial tax was 0.04 cents per gallon, beginning in 1981, on the diesel fuel purchased to operate on the waterway system with increases gradually leading to a tax of 10 cents per gallon by 1985. Additional reforms during the Reagan Administration authorized further tax increases through 1995, when commercial users of the waterways were required to pay a tax of 20 cents per gallon of diesel fuel consumed in inland waterway transportation. In 2014, the tax was further increased to 29 cents per gallon. Table 1 documents the trajectory of the per gallon tax rates levied on these commercial users in the past 25 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Tax</th>
<th>Year</th>
<th>Tax</th>
<th>Year</th>
<th>Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>$0.04</td>
<td>1990</td>
<td>$0.11</td>
<td>1994</td>
<td>$0.19</td>
</tr>
<tr>
<td>1981</td>
<td>$0.06</td>
<td>1991</td>
<td>$0.13</td>
<td>1995</td>
<td>$0.20</td>
</tr>
<tr>
<td>1983</td>
<td>$0.08</td>
<td>1992</td>
<td>$0.15</td>
<td>2014</td>
<td>$0.29</td>
</tr>
<tr>
<td>1985</td>
<td>$0.10</td>
<td>1993</td>
<td>$0.17</td>
<td></td>
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</tr>
</tbody>
</table>


There are two funding sources involved in maintaining, operating and constructing various elements in the nation’s inland waterway system. The first relates to funds deposited in the IWTF from the tax levied on commercial users of the nation’s 27 natural and man-made inland waterways, primarily concentrated in the Eastern half of the United States (see Figure 1). These waterways include a majority of the most influential waterways in the country: the Mississippi, Ohio and Missouri Rivers and the Gulf and Atlantic Intracoastal waterways. Of note, the Ohio and Mississippi River systems carry nearly 90 percent of the total tonnage transported on the nation’s inland waterways.

Revenues collected from the commercial users are deposited in the IWTF and are then deployed to cover 50 percent of the construction costs of new dams, navigation locks and major rehabilitation or maintenance projects, i.e., projects costing over a specific amount ($8 million currently) of existing facilities. The second relates to funds secured from all taxpayers, extracted from the general fund, which covers the remaining 50 percent of the construction costs and 100 percent of the operating costs of these inland waterway assets once they are completed and operational. The tax levied on the commercial users is estimated to generate between $80 million and $85 million in annual contributions to the IWTF. However, operation and maintenance costs levied on the U.S. taxpayer for these assets amount to about $600 million annually. In fiscal year 2014, the IWTF reaped $81.8 million and disbursed $97.9 million for construction projects. (As evident, operations and maintenance costs related to the nation’s inland waterway system involve tens of millions of dollars in extra costs.) Analysts with Taxpayers for Common Sense, a Washington, D.C.-based nonpartisan budget watchdog, have observed that “the nation’s inland waterway system holds the award for the most heavily subsidized form of transportation . . . fully 90 percent of the system’s costs are assumed by taxpayers.”

**Funding Challenges Faced by the IWTF**

As with revenues flowing into the Highway Trust Fund (HTF), the IWTF faces serious shortfalls. Some background on the fiscal pressures facing the HTF is relevant when assessing the position of the IWTF. With regard to the HTF, there are three major factors driving the looming funding gap: 1) the federal gas tax has not been increased since 1993, is not indexed for inflation and has lost considerable purchasing power in the past 22 years; 2) the growing number of hybrid, electric and alternative fuel vehicles that rely less
on gasoline, resulting in reduced levels of overall gasoline purchases and, consequently, lowered revenue inflows; and 3) the reduced number of miles that Americans currently drive due to consumers living closer to their workplaces, keeping driving to a minimum and even foregoing owning a vehicle in certain parts of the country. These three factors acting in concert have severely endangered the financial viability of the HTF, forcing the U.S. Congress to make transfers from the General Fund. With regard to the IWTF, a number of the same factors surface: until 2014, the fuel tax levied on commercial users of the waterways had not been raised since 1995. Consequently, not only had the tax not been raised for nearly two decades, it had lost considerable purchasing power since it was not indexed for inflation. Again, paralleling the HTF’s predicament, defying the estimates of the Corps, the level of commercial freight traffic on the inland waterway system also has been declining during the period leading up to 2014, a development that resulted in lower revenues flowing to the IWTF. As with the HTF, reduced traffic compared to freight traffic estimates resulted in lower fuel tax revenues, a scenario that compounded the fiscal pressures already faced by the IWTF. Finally, the cost-sharing arrangement referred to earlier, where the diesel fuel tax revenues from commercial users are only expected to cover 50 percent of the construction costs of inland waterway projects, with General Fund appropriations covering the remaining 50 percent and 100 percent of operating costs, posed challenges during a time of strained fiscal resources. In fact, expenditures related to the nation’s inland waterways consistently exceeded the revenues generated by the fuel taxes forcing the IWTF to look to Congress for appropriations from the general fund.

In 2014, President Barack Obama signed the Water Resources Reform and Development Act (WRRDA) with overwhelming bipartisan support, the first water resources bill to be signed by a president in 14 years.\(^8\) This $12.3 billion Act includes funding for a surfeit of projects, including the constructions of new dams and locks (such as one near Olmstead, Illinois)\(^9\) and the restoration of barrier islands and other essential projects in Louisiana. One of the many important reforms included in this Act was a .09 cent increase on the tax levied on commercial users of the inland waterway system from 20 cents to 29 cents per gallon of diesel fuel, a move that was supported by the industry.\(^10\) Given that this was the first increase in nearly two decades, analysts noted that these additional revenues would be a significant boost to the funding status of the IWTF. However, the funding allocated to inland waters and navigable rivers continues to be inadequate and below recommended levels. For instance, Scott Stockton, director of Civil Works at the Corps, noted that the 2014 WRRDA was “a good start; but, we need about twice as much to bring the system up to the level of repair it needs.”\(^11\) For fiscal years 2014 and 2015, the Obama Administration sought and secured appropriations for the operation and maintenance of the inland waterways that were considerably higher than in prior years, but still lacking in order to fully ameliorate the nation’s vast needs in this area.

### Products Transported on Inland Waterways

The nation’s inland waterway system plays a critical role in the shipment of freight (primarily agricultural produce), petroleum products, chemicals, and coal to other states and to coastal ports for shipment as exports to foreign countries. These industries rely heavily on the nation’s inland waterways for the transport of their commodities. In fact, these inland water “highways” transport products—both agricultural and industrial—to and from 38 states, alongside moving products to and from coastal ports as exports and imports. In 2013, the most recent year available, 566.7 million tons of waterborne cargo, valued at nearly $216 billion, was transported on our inland waterways, an amount equivalent to approximately 14 percent of all intercity freight that year.\(^12\) Table 2 provides additional details on the commodities transported using inland waterways, coastal and Great Lakes ports in 2013.

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Inland Waterways</th>
<th>Coastal Ports</th>
<th>Great Lakes Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Produce</td>
<td>12%</td>
<td>80%</td>
<td>8%</td>
</tr>
<tr>
<td>Petroleum Products</td>
<td>3%</td>
<td>30%</td>
<td>67%</td>
</tr>
<tr>
<td>Chemicals</td>
<td>1%</td>
<td>5%</td>
<td>94%</td>
</tr>
<tr>
<td>Coal</td>
<td>1%</td>
<td>5%</td>
<td>94%</td>
</tr>
<tr>
<td>Aggregate</td>
<td>1%</td>
<td>5%</td>
<td>94%</td>
</tr>
<tr>
<td>Iron and Steel</td>
<td>1%</td>
<td>5%</td>
<td>94%</td>
</tr>
</tbody>
</table>

While many products are transported by barge, there are certain products that are more suited for this type of transportation method. Some of the products that are optimal for barge transportation along America’s waterways include: coal; chemicals; petroleum; grain; iron and steel; aggregate resources produced from sand and gravel deposits, crushed rock or dredged from the ocean; project cargo, or oversized, heavy, high value pieces of equipment, also referred to as ‘heavy lift’ items, which require disassembly for shipment and reassembly after delivery; and, finally, intermodal containers, usually empty, for stocking and re-shipment by another...
transportation mode. Approximately 60 percent of our nation’s grain exports traverse inland waterways prior to departing for foreign destinations. In addition, more than 22 percent of domestic petroleum and petroleum products, as well as 20 percent of the coal necessary for electricity generation, critical to our nation’s energy infrastructure, also rely on the inland waterway system for transportation.  

As evident in Figure 1, a complex network of inland waterways and inland ports connect to the nation’s coastal ports, a network that permits the free flow of commerce to locations both inside and outside the United States. For example, the Mississippi River links to multiple ports on the Gulf Coast, while the Columbia and Snake Rivers provide crucial links to coastal ports on the Pacific Northwest Coast. According to recent estimates, about 346 million tons of goods were transferred from inland waterways to coastal ports, primarily for export.  

### Benefits of Relying on Inland Waterways for Freight Transportation

Barge transportation has multiple advantages. A typical 15-barge tow* can transport the cargo equivalent of 216 rail cars, or 1,050 semi-trucks, a feature that relieves railroad scheduling pressures and significantly reduces congestion on our crowded highways. According to the American Society of Civil Engineers (ASCE), the nation’s inland waterways and rivers carry the equivalent of about 51 million truck trips each year.  

*In some instances, multiple barges are connected and towed by a tug or tow boat.

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**Table 2**

<table>
<thead>
<tr>
<th>Commodities</th>
<th>Coastal Ports</th>
<th></th>
<th>Great Lakes Ports</th>
<th></th>
<th>Inland Waterways</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tons</td>
<td>Percent</td>
<td>Tons</td>
<td>Percent</td>
<td>Tons</td>
<td>Percent</td>
<td>Tons</td>
<td>Percent</td>
</tr>
<tr>
<td>Coal</td>
<td>4.7</td>
<td>5.1</td>
<td>17.4</td>
<td>5.3</td>
<td>157.6</td>
<td>-6.0</td>
<td>187.8</td>
<td>-5.1</td>
</tr>
<tr>
<td>Coal Coke</td>
<td>**</td>
<td>-100.0</td>
<td>0.1</td>
<td>34.6</td>
<td>4.7</td>
<td>-13.6</td>
<td>5.5</td>
<td>-11.2</td>
</tr>
<tr>
<td>Crude Petroleum</td>
<td>47.4</td>
<td>36.6</td>
<td>**</td>
<td>0</td>
<td>49.4</td>
<td>26.8</td>
<td>102.3</td>
<td>29.9</td>
</tr>
<tr>
<td>Petroleum Products</td>
<td>75.2</td>
<td>-0.2</td>
<td>1.6</td>
<td>-12.8</td>
<td>110.9</td>
<td>-0.2</td>
<td>225.8</td>
<td>-2.8</td>
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<td>Chemical and Related Products</td>
<td>10.6</td>
<td>-4.0</td>
<td>0.1</td>
<td>3.3</td>
<td>50.2</td>
<td>-1.3</td>
<td>70.8</td>
<td>-3.0</td>
</tr>
<tr>
<td>Forest Products, Wood, Chips</td>
<td>**</td>
<td>21.9</td>
<td>**</td>
<td>-53.2</td>
<td>4.3</td>
<td>3.1</td>
<td>5.6</td>
<td>3.9</td>
</tr>
<tr>
<td>Pulp and Waste Paper</td>
<td>**</td>
<td>32.2</td>
<td>**</td>
<td>0</td>
<td>**</td>
<td>38.4</td>
<td>**</td>
<td>45.8</td>
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<tr>
<td>Sand, Gravel and Stone</td>
<td>4.5</td>
<td>32.0</td>
<td>20.4</td>
<td>3.1</td>
<td>60.6</td>
<td>2.0</td>
<td>91.6</td>
<td>2.2</td>
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<tr>
<td>Iron Ore and Scrap</td>
<td>0.4</td>
<td>25.2</td>
<td>40.6</td>
<td>-1.4</td>
<td>9.4</td>
<td>2.8</td>
<td>54.2</td>
<td>-0.2</td>
</tr>
<tr>
<td>Non-ferrous Ores and Scrap</td>
<td>0.3</td>
<td>-19.9</td>
<td>**</td>
<td>0</td>
<td>5.5</td>
<td>-0.7</td>
<td>5.9</td>
<td>-1.6</td>
</tr>
<tr>
<td>Sulphur, Clay and Salt</td>
<td>**</td>
<td>-20.7</td>
<td>0.8</td>
<td>7.6</td>
<td>6.2</td>
<td>6.5</td>
<td>7.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Primary Manufacturing Goods</td>
<td>1.9</td>
<td>-7.7</td>
<td>3.3</td>
<td>1.8</td>
<td>26.4</td>
<td>0.6</td>
<td>32.1</td>
<td>-0.9</td>
</tr>
<tr>
<td>Food and Farm Products</td>
<td>4.5</td>
<td>3.4</td>
<td>0.3</td>
<td>-3.5</td>
<td>70.6</td>
<td>-4.6</td>
<td>75.7</td>
<td>-4.3</td>
</tr>
<tr>
<td>All Manufacturing Equipment</td>
<td>14.3</td>
<td>-5.4</td>
<td>**</td>
<td>**</td>
<td>6.0</td>
<td>-8.1</td>
<td>20.9</td>
<td>-6.2</td>
</tr>
<tr>
<td>Waste, Scrap and Other</td>
<td>**</td>
<td>-24</td>
<td>**</td>
<td>-100.0</td>
<td>1.0</td>
<td>6.5</td>
<td>1.3</td>
<td>2.9</td>
</tr>
<tr>
<td>Total</td>
<td>164.9</td>
<td>8.3</td>
<td>85.4</td>
<td>1.1</td>
<td>566.7</td>
<td>-0.6</td>
<td>891.2</td>
<td>0.1</td>
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</tbody>
</table>

** Denotes tonnage less than 50,000 tons or extreme percent changes.

Another major advantage is the significant cost savings related to barge transportation. It costs approximately 2 cents per ton per mile to transport freight by barge compared to just below 4 cents per ton per mile by rail and slightly less than 18 cents per ton per mile by truck, demonstrating that barge transportation remains the least expensive of the major transportation strategies. An alternate way of reinforcing this point is that by using merely a single gallon of fuel, barges can move one ton of cargo an impressive 576 miles; a rail car can transport the same ton of cargo 413 miles, while a truck can move a ton of cargo 155 miles. Research documents that transporting products on the inland waterway system generates savings in excess of $14 per ton in comparison to other overland modes. Based on these savings, shippers realize approximately $9.2 billion in transportation cost savings annually by relying on barge transportation.

The competitive advantages associated with America’s waterborne transportation network also is evident in the fact that transporting a metric ton of soybeans from Davenport, Iowa, to Shanghai, China, costs $85.19; in contrast, transporting a metric ton of soybeans from North Mata Grosso, Brazil, to Shanghai, China, costs $141.73, a clear indication of the very competitive pricing offered by the United States. However, failure to enhance the infrastructure capacities of the inland waterway system in the United States will result in transportation delays and, along with the plans of nations like Brazil to invest significantly in their own inland waterways, America’s competitive advantage will erode.
Aging Infrastructure and Inland Waterways

The urgent need for a complete overhaul of America’s aging physical infrastructure network is well documented. Once the envy of the world, every element in the American infrastructure system currently requires serious renovation and rehabilitation. From roads and highways, to ports and airports, to bridges and tunnels, to water and sewer systems, to electrical grids and telecommunications, to inland waterways, there is a growing chorus calling for policymakers at every level of government to initiate immediate remedial measures. The failure to grapple with these infrastructure challenges has reduced the nation’s economic competitiveness and created a host of economic inefficiencies: cost overruns, safety concerns, delays in goods and passenger deliveries, traffic congestion, adverse environmental consequences and a diminished standard of living.

The highly valued quadrennial report card on the nation’s infrastructure released by the American Society of Civil Engineers last occurred in 2013; cumulatively, the nation’s vast infrastructure network received a grade of D+, a miniscule improvement from the D received in the 2009 report. A review of the nation’s inland waterways, ports, locks and dam infrastructure also demonstrates major deficiencies, a development borne out in this 2013 ASCE report card. Specifically, the ASCE awarded the nation’s inland waterways a grade of D-, the same grade that was awarded in 2009.

As is the case with many other components of the nation’s infrastructure network, America’s inland waterways also are rapidly aging. In general, engineers project that the viable, economic service life of the various elements included in the nation’s inland waterway and navigation system to be approximately 50 years, and could be expanded to 75 years with a major rehabilitation. However, scrutiny of the inland waterway navigation system reveals that it is considerably older. Figure 2 provides details on the age of the nation’s lock and dam infrastructure, including their distribution by age and the percentage of locks by age. For the 255 locks that are featured here, more than half are older than 50 years, and more than one-third are older than 70 years, a time frame that is considerably older than their expected lifespan of these infrastructure items.

There is a direct correlation between the age and condition of the locks, dams and attendant navigational

**Figure 2** Age of Lock and Dam Infrastructure

![Image of bar chart showing age distribution of locks and dam infrastructure](http://unitedsoybean.org/wp-content/uploads/Americas_Locks_And_Dams.pdf)
infrastructure and transportation delays. One of the major impediments to shipping delivery times relates to delays occurring on the nation’s inland waterway system. For instance, transportation experts note that many of the locks in the system are far too small to accommodate modern barges, the same development that prompted the expansion of the Panama Canal. Another obstacle to the smooth flow of barge traffic is the loss of minimum river navigation depths, again, paralleling the predicament faced at the Panama Canal. Experts also make the point that the poor condition of the locks and dams require frequent closures for emergency and scheduled maintenance work along the inland waterway system, a development that prevents barges from reaching their destinations in a timely manner and forcing them to idle for extended periods of time. Shippers emphasize that the unscheduled delays pose the greatest inconvenience from both an efficiency and cost perspective, a development that increases operating costs and lowers their competitiveness.

According to the 2013 ASCE report card, 90 percent of the locks and dams on the inland waterway system experienced some type of unscheduled delay or service interruption, averaging 52 delays a day. Experts maintain that these delays have increased exponentially since the 1990s, triggered by the lack of capital expenditures and insufficient operational and maintenance funds to ensure the optimal operating potential of the system. The ASCE noted that in 2010, the costs attributed to delays reached $33 billion. By 2020, costs may skyrocket to as high as $49 billion, a projection with serious adverse consequences for manufacturers, shippers and the economy at large.

These delays create the most turbulence in agriculture and concrete industries, sectors that rely heavily on barges to move their goods to market at domestic and international destinations. This was evident in 2014 when highway construction projects in Minnesota dropped behind schedule because holdups in barge travel on the Mississippi River stymied the timely delivery of concrete essential for these highway projects. Similarly, farmers in the Midwest complain that significant bottlenecks at locks on the Mississippi River impede their ability to speedily transport corn and soybean on barges to ports in Mobile, Alabama, and New Orleans, Louisiana, bound for global destinations. Dan Mecklenborg, senior vice president at Ingram, the nation’s largest barge company, which routinely moves coal and grain south on the Mississippi River and concrete and road salt north on the Mississippi River, commented that “The Corps is doing the best it can to ease the congestion, but every additional hour you have to sit at a lock waiting costs money.”

According to the ASCE, shipping delays on the inland waterways can be devastating. In recent years, the Ohio and Mississippi Rivers’ systems have experienced the most delays and congestion. If the Mississippi and Illinois Rivers were forced to shut down near St. Louis, the result would be a doubling of truck traffic, five-fold increase in traffic delays and growth in injuries and fatalities on the interstate system from 36 percent to 45 percent. Similarly, in Tennessee, U.S. Senator Lamar Alexander has called for replacing the aging Chickamauga Lock in his state before it fails completely, noting that the “failure of the lock would throw 150,000 trucks onto I-75 and increase the cost of shipping goods to manufacturers all across the state.” Congestion levels on the roads and highways around the major metropolitan areas would rise to even greater levels if barge traffic continues to be hindered in the coming years.

Numerous instances of elements in the inland waterway system crumbling affirm the crisis confronting this aspect of our infrastructure network. For example, in 2011, a 280-foot section of the wall at the Lockport Canal near Chicago collapsed and slid into the Illinois Waterway. Similarly, in 2009, a lock gate fell off its hinges in Ohio, a repair that took five months to complete. Fortunately, for Ohio River shippers, there was an ancillary chamber to that lock that permitted barge traffic to continue during the repairs. Experts note that less than a handful of the 27 locks on the Upper Mississippi River have ancillary chambers, a potentially dire situation if one of those locks had to be temporarily shuttered for repairs. In a similar vein, in South Carolina, the director of the state’s Department of Health and Environmental Control (DEHC) testified before a legislative panel of the General Assembly in November 2015 and noted, “[W]e need to lay eyes on those C1 dams’ every year” given that if the dams were to burst, the damage could cost South Carolinians their lives.

1 C1 dams refer to high-hazard dams, usually found in populated areas, where a failure could lead to the loss of lives.
and the state significant financial expenses. During the major floods that swept across South Carolina in October 2015, seven C1 dams failed in Lexington and Richland Counties; in three of those cases, the failed dam’s inspection was between 8 months and more than two years overdue. The reason for the delay: insufficient staffing given recent budget cutbacks. The DEHC director, whose agency is charged with inspecting and overseeing the condition of 2,370 dams across the state, indicated that the agency’s budget request for the next fiscal year would seek to roughly double the size of its dam-safety staff.

A review of the December 2014 report of the Inland Waterways Users Board documents revealed that, during the 2014 calendar year, 73 lock facilities experienced closures for a total of 2,380 days, more than 52,000 hours, posing additional burdens on shippers, carriers and the federal government. Examples of the 2014 closures include:

» Melvin Price Lock main chamber (mile 200.8, Upper Mississippi River) was unexpectedly closed for 227 days, between late-December 2013 and mid-August 2014;
» Robert C. Byrd Lock main chamber (mile 279.2, Ohio River) experienced two closures totaling 150 days, from May through August of 2014 and from September through November of 2014;
» Dashields Lock main chamber (mile 13.3, Ohio River) and Montgomery Lock main chamber (mile 31.7, Ohio River) were closed for a combined 112 days during 2014; and
» Lock 52 (mile 938.9, Ohio River), the inland waterway system’s busiest lock, experienced 67 days of closure.

The Corps scheduled a number of planned lock closures during 2015; a total of 40 lock closures amounting to 1,433 days, or almost 31,000 hours of lost access to the commercial barges. These closures reinforce the deteriorating condition of many of the locks and dams in the inland waterway system. Tennessee U.S. Senator Lamar Alexander has bemoaned the glacial speed associated with completing the new Chickamauga Lock and Dam near Chattanooga. The original lock, built in 1940, is disintegrating, resulting in significant reductions in barge traffic. A new and bigger lock at Chickamauga is about 20 percent complete after a decade of design and construction work; however, the project has been thwarted for more than three years due to the lack of Congressional funding for this and many other Corps lock and dam projects. Similarly, barge traffic on the Yazoo River in Mississippi—once a thriving conduit for barges ferrying bales and other export commodities between Vicksburg, Mississippi, and New Orleans, Louisiana, has dwindled to a trickle due to Congressional appropriations insufficient to permit critical maintenance necessary to allow the safe and smooth operation of barges. Current annual appropriations to maintain the waterways on the Yazoo River amount to a mere $20,000.

While the costs incurred by shippers and carriers are well known (greater costs due to the delays, lower reliability, and loss of competitiveness in the global marketplace), expenses incurred by the federal government are less well known. The failure to allocate adequate funds for maintenance and operational work leads to lock and dam closures which, in turn, results in unexpected costs to the federal government in emergency repairs to ensure that the impacted facilities are swiftly opened to barge traffic. The Corps’ estimates that at the current level of unscheduled delays, a $13 billion expenditure will be incurred by 2020; if additional postponements or delays were to crop up, the $13 billion estimated figure will inevitably increase. However, current funding levels only will result in an investment of $7 billion by 2020, an expected funding level that underscores the severe underinvestment in this segment of our infrastructure base. A more comprehensive effort to completely overhaul the inland waterway system will require substantially more: the Corps projects a total cost of $125 billion. In October 2015, a report issued by America’s Watershed Initiative further confirmed the research regarding dilapidated inland waterways in America. According to this report, the Mississippi River Basin deserved a grade of D+, with its aging infrastructure topping the list of major concerns. Over a two-year period, the Initiative measured six broad goals — ecosystems; flood control and risk reduction; transportation; water...
supply; economy; and recreation — related to the Mississippi River Basin.

**Inland Ports and Waterways in the SLC States**

An assessment of the status of the inland ports and waterways in the SLC region confirms the importance of these transportation nodes or pathways to the overall performance and vibrancy of the economies in the states. The following sections provide details from the SLC states on this topic. Not only do they serve as crucial domestic and international cargo routes, the inland ports and waterways relieve congestion on the nation’s highways by significantly reducing the movement of cargo by truck. A reduction in the number of trucks on our highways results in environmental benefits and fewer highway-related accidents and fatalities.

While reference to inland ports and waterways usually involves docks, locks and dams along our navigable rivers in the interior of the country, the term inland port also refers to intermodal container transfer facilities with no waterfront access that have sprung up across the United States. These facilities function as logistics hubs that consolidate and containerize cargo for shipment by rail to coastal ports, usually deep-water ports, quite often, several hundred miles away. The cargo usually is brought to inland ports by truck where it is sorted, consolidated and containerized before being loaded mostly onto Class I railroad systems and then shipped to the coastal ports. Since these inland ports are located away from crowded port areas, where space often is scarce, they allow cargo to efficiently be packaged and moved by rail to the ports, thereby relieving pressure in areas around the ports and on their roadways.

According to *Area Development*, the New York-based magazine that provides insights and information to companies considering new facilities and manufacturing locations, 10 inland ports recently have surfaced as national leaders.

The classification of large freight railroad companies in the United States, Mexico, and Canada is based on operating revenue. Railroads are classified as Class I, Class II, or Class III. The exact revenues required to be in each class have varied over time and are continuously adjusted for inflation. In the United States, the Surface Transportation Board defines a Class I railroad as "having annual carrier operating revenues of $250 million or more" after adjusting for inflation.

» Central New York Inland Port in Syracuse, New York, a 115-acre intermodal logistics hub designed to boost the performance of the Port Authority of New York and New Jersey’s facilities.
» Central Florida Intermodal Logistics Center in Winter Haven, Florida, a 318-acre facility with the intermodal terminal has potential to process up to 300,000 containers a year. This inland port has access to 930 acres with the capacity to build up to 79 million square feet of warehouse distribution centers and light industrial facilities.
» INland Logistics Port in Kingsbury, Indiana, a 600-acre intermodal logistics hub that has met railroad giant CSX’s highest set of criteria, including infrastructure and utility availability, environmental reviews, appropriate zoning and entitlement, air quality permitting, rail serviceability, proximity to highways or interstates, and other attributes.
» Cordele Inland Port in Cordele, Georgia, a terminal that transports containerized freight to and from the Georgia Ports Authority in Savannah, Georgia, via rail.
» Rickenbacker Inland Port in Columbus, Ohio, serviced by Norfolk Southern and CSX. Norfolk Southern’s Rickenbacker Intermodal Terminal covers 175 acres and has the capacity to handle more than 400,000 containers annually.
» CSX Northwest Ohio Intermodal Container and Transfer Facility in North Baltimore, Ohio, a $175 million, 500-acre terminal that serves both domestic and international intermodal freight.
» Charlotte Regional Intermodal Facility in Charlotte, North Carolina, a $90 million facility at Charlotte Douglas International Airport.
» Midwest Inland Port in Decatur, Illinois, a multimodal hub with efficient access to three Class I railroads and five major roadways (including four interstates) that connects the Midwest to the East, West, and Gulf Coasts of North America.
» BNSF Intermodal and Logistics Park in Kansas City, Kansas, with an annual capacity of 500,000 container lifts, lying strategically on the transcontinental rail line between Chicago and the Port of Los Angeles and Port of Long Beach.
» Port of Oakland Logistics Hub in Oakland, California, a $1 billion, 360-acre logistics hub under construction at a former U.S. Army base. One of the major advantages of this inland port is that it is located on prime
port property adjacent to the Port of Oakland's container terminals. Once completed, the facility will include a connection to Union Pacific's main rail line and as much as 2 million square feet of logistics space, both features that will considerably boost the facility's transloading and distribution activities for imports and exports.

**Alabama**

There are four major inland navigation systems in the state: Tennessee River, Alabama-Coosa River, Black Warrior River, and Tennessee-Tombigbee River (Tenn-Tom River). A manmade waterway connects the Black Warrior and Tenn-Tom Rivers at Demopolis, Alabama. The Tenn-Tom River also provides an alternate water route to the Gulf Coast and Mobile Bay for nationally critical inland waterway networks such as the Upper Mississippi River and Ohio River. Nearly 1,300 miles of inland waterways effectively connect practically the entire state while the approximately 60-mile length of the Gulf Intracoastal Waterway on Alabama's Southern border provides an important water connection to the states on the Gulf of Mexico, from Florida to Texas. Importantly, Alabama's waterways provide crucial access points to a number of coastal ports in the Gulf of Mexico, including the ports of New Orleans (in Louisiana); Gulfport, Biloxi, Pascagoula (all in Mississippi); Mobile (in Alabama); Pensacola and Panama City (both in Florida). The barges traveling on these waterways transport commodities seamlessly to and from inland ports such as the Paducah-McCracken County Riverport, Kentucky; Itawamba, Mississippi; Guntersville and Dauphin Island, Alabama; and Hailey’s Harbor Intermodal Transportation Terminal, Tennessee, to and from the aforementioned coastal ports on the Gulf of Mexico. Figure 3 provides a graphical representation of a number of the inland river ports and deepwater ports referenced in this section.

The three main lock and dam systems in Alabama are the Coffeeville, Demopolis, and Wilson systems. In 2013, the first two systems moved an excess of 10 million tons (of which, more than 6 million tons were “downbound” movement), while the Wilson system transported more than 9.3 million tons (6.3 million tons in “upbound” movement). In 2013, more than 69.4 million tons of commodities (primarily coal, petroleum, crude petroleum and iron/steel) were transported to, from and within the state. Of this amount, more than 28.8 million tons of cargo was exported from the state, while 26.7 million tons were received at docks within the state. The remaining nearly 14 million tons travelled within the state. In terms of the composition of the commodities shipped on Alabama's inland waterways, in 2013, approximately 56 percent comprised coal and iron/steel, with crude petroleum, petroleum products and chemicals amounting to about 29 percent of the total cargo moving on the state's river system.

While some transportation professionals note that, generally speaking, the condition of the locks and dams in the state is in better shape than many of the locks and dams in other parts of the country, transportation in the state still is adversely impacted by shaky infrastructure elsewhere. Since the Alabama waterways all are part of an inter-connected national system, a lock failure in the Midwest or a dam break on the Upper Mississippi River can have negative implications for businesses and families in Alabama. These adverse impacts include greater traffic congestion and accidents (cargo would have to be shifted to trucks); delays and higher prices for essential cargoes; reduction in the number of jobs; delays and limited connections to the global marketplace; and a significantly larger carbon footprint given that barges have the lowest emission of noxious fumes into the air when compared with other modes of transportation.

**Arkansas**

More than 18.5 million tons of cargo traversed Arkansas’s inland waterways in 2013. The two primary commodities were grain (more than 6.5 million tons) and iron/steel (more than 4.8 million tons). In terms of grain, Arkansas’s prowess as a major rice-producing state was further demonstrated in 2013, while Nucor Steel’s two facilities near Blytheville ensured the steady movement of iron/steel in the state. Arkansas enjoys a major strategic advantage, bordering more than 300 miles of the Lower Mississippi River, the most crucial

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Transloading refers to the process of transferring a cargo shipment from one mode of transportation to another.

“Downbound and upbound refers to the direction a vessel is moving; for instance, downbound usually refers to movement South and upbound usually refers to movement north.
Figure 3: Inland River Ports and Deepwater Ports

Tenn-Tom Waterway Ports
1. Yellow Creek State Inland Port Authority
2. Port of Itawamba
3. Tom Soya Grain Co.
4. Amory Port
5. Aberdeen Port
6. Clay County Port
7. Tom Soya Grain Co.
8. Lowndes County Port
9. Pickens County Port
10. Aliceville River Terminal
11. Bevill-Hook Port
12. Crossroads of America Port
13. Port of Epes

Tennessee River Ports
14. Paducah/McCracken County Riverport
15. Bailey Port, Inc.
16. Herbert Sangravl, Co., Inc.
17. Hardin County Port Authority
18. Yellow Creek State Inland Port Authority
19. Port of Florence
20. Mallard-Fox Creek River Port
21. Decatur/Morgan County Port Authority
22. Port of Guntersville (ACBL) Bulk Handling Terminal
23. North Alabama Shipping and Mining Co.
24. Alabama State Docks Department
25. Port of Nickajack
26. Mid-South Terminals
27. JIT Chemical Corporation
28. Tellico Public Use Terminal (Little Tennessee River)
29. Burkhart Enterprises

Cumberland River Ports
30. Lyon County Port
31. Hunter Marine Transportation, Inc.
32. Hailey’s Harbor River Transportation Terminal
33. Cherokee Marine Terminal

Legend:
- Private Port
- Public Port
- Deepwater Port
artery in the nation’s inland water system. There is an additional 600 miles of commercially navigable waterways in the state, including the Arkansas, White and Ouachita Rivers. Also important is the McClellan-Kerr Arkansas River Navigation System (MKARNS), the inland waterway system originating at the Tulsa Port of Catoosa and running southeast through Oklahoma and Arkansas to the Mississippi River. There are nine hydropower plants located on the MKARNS with six located in Arkansas.

Arkansas’s three major ports are the Port of Memphis (including terminals on both the Tennessee and Arkansas sides of the Mississippi River), the fourth largest inland port in the nation; Port of Helena Harbor; and the Port of Yellow Bend. Of these, the Port of Memphis is considered the most heavily utilized, as evidenced by the more than 14.2 million tons of cargo moved through the Port in 2013. There are 15 locks and dams in the state, which contribute significantly to water navigation in the state. Of these locks and dams, 13 are situated on the MKARNS and two on the Ouachita River.

In December 2015, the Arkansas Waterways Commission announced that five ports across the state will receive over $450,000 to support capital improvements. The five ports (Crossett; Fort Smith; Helena-West Helena/Phillips County; Little Rock; and Osceola) can deploy these funds to implement capital projects such as construction, improvement, capital facility rehabilitation, expansion and dredging activities.

**Florida**

In 1927, the Florida Legislature established the Florida Inland Navigation District and authorized the purchase of the existing East Coast Canal, which flows from Jacksonville to Miami. This canal had been constructed and maintained by private operators until that time. The federal government also retained an important role after the purchase. The newly purchased public waterway was renamed the Atlantic Intracoastal Waterway in Florida; it currently is 406 miles long and follows numerous coastal rivers, lagoons and meanders past numerous tourism-oriented communities along the state’s Eastern seaboard. Florida statutes require the District to furnish the federal government, the federal sponsor of the waterway, all lands required by them to construct, operate and maintain the Waterway. State statutes also direct the District to carry out necessary maintenance projects on behalf of the federal government, working with other public agencies, if necessary, to ensure the smooth flow of commerce and passenger traffic on the Waterway. In this connection, the District works with the Jacksonville District of the Corps to carry out periodic dredging projects and mitigate the effects caused by shoaling from currents, upland soil erosion and movement of offshore sands through ocean inlets. These dredging projects ensure that authorized vessels can easily navigate this section of the Atlantic Intracoastal Waterway.

The District comprises the 12 counties along the east coast of Florida from Nassau County in the north of the state through Miami-Dade County in the south. The District’s board of commissioners, one each from each of the 12 counties and appointed by the governor, levies a real property tax on all property within the District’s boundaries to generate the funds necessary to fulfill the District’s responsibilities. Maintenance dredging of the Waterway is estimated to cost between $12 million and $16 million annually for the next 50 years; at least 50 percent of this amount is expected to be generated from the aforementioned real property tax on property owners in the 12 coastal counties.

The Waterway’s economic impact is sizeable. A report released by Gulf Engineers and Consultants, a Baton Rouge, Louisiana-based engineering and consulting firm, in December 2011 documented that the navigation channel generated an estimated annual statewide benefit of $11.86 billion in business volume, $3.02 billion in personal income, 66,843 jobs and $540.4 million in tax revenue.

Another important development regarding Florida’s inland ports is the recognition in 2014 by Area Development, the publication covering corporate site selection and relocation trends, that the Central Florida Intermodal Logistics Center in Winter Haven, about an hour’s drive from both Orlando and Tampa, was a national leader. In recent years, as mentioned previously, these inland ports have risen in significance and play a critical role in the logistics and transportation sectors. Since they are almost always located away from crowded port areas, they create space for more buildings in proximity
to intermodal sites, thus relieving pressure in port areas and on nearby roadways. The 318-acre Winter Haven facility, a strategic collaboration between the city of Winter Haven, numerous state and local partners and the rail company CSX, has the capacity to process up to 300,000 containers a year and is designed for scalable expansion as freight volumes continue to grow.

**Georgia**

Georgia has focused intensely on developing a roster of inland ports in an effort to enhance transportation efficiencies and drive economic development in different parts of the state. In July 2015, Georgia Governor Nathan Deal and the Georgia Ports Authority (GPA) announced plans to create Network Georgia, dividing the state into six geographical zones and creating a web of rail connections from sites at these zones, i.e., inland ports, to the state’s impressive triad of ports on the coast: Savannah, Brunswick and Bainbridge. The long-term objective of Network Georgia is to locate these half-dozen truck-train intermodal inland ports in different parts of the state; after trucks deliver containerized cargo to these inland ports, they are then transloaded onto rail cars which then deliver them to the three GPA facilities for shipment across the oceans. A similar pattern would ensue with imports flowing from the GPA ports to the inland ports by rail and then distributed by truck to the appropriate destinations. As noted, the expected benefits are significant: lowered transportation costs for shipping lines, retailers, manufacturers and farmers; speedier deliveries to and from the GPA facilities; expanding the GPA’s market reach into neighboring states; boosting local economies; and reducing truck traffic and diesel emissions across the state. As GPA officials have stressed, a goal of setting up these inland ports across the state is to “create a web of rail connectivity in the Southeast and take advantage of Georgia’s 4,700 miles of railway.”

The Port of Savannah has emerged as one of the nation’s busiest ports in recent years. In 2014, *National Real Estate Investor*, a publication covering commercial real estate trends with a focus on brokerage, construction, development, finance, investment and property expansions rated Savannah the third busiest port in the country. In October 2015, the Port of Savannah’s record volumes made it the only U.S. port to rank among the prestigious *Journal of Commerce’s* listing of the top 10 fastest growing ports in the world. Similarly, the Port of Brunswick has catapulted to the top rung of auto ports in the country and currently is listed as the number one port in the United States for auto imports. In an effort to take advantage of the growth and infrastructure advancements at these facilities, policymakers and officials across the state are committed to channeling cargo from these inland ports to and from the GPA facilities.

In late 2011, Georgia’s first inland port (Cordele Intermodal Services), on 40 acres with an option to expand on 1,200 adjacent acres, opened in Cordele, in the southwestern part of the state. While the Cordele Inland Port is 200 miles away, there is a thrice weekly direct rail service to the facilities on the coast. Even though Governor Deal, GPA and Cordele Intermodal Services (CIS) signed a memorandum of understanding in July 2013, neither the state nor GPA provided any funds for the creation of this inland port, a project executed entirely with private funds. Crisp County, where Cordele is
located, owns the land the inland port lies on, and has leased the land to CIS, which, in turn, built the inland port infrastructure and spurs to the rail line, the Heart of Georgia Railroad, which relies on CSX Transportation and Norfolk Southern for the rail connections. The Cordele Inland Port’s location, a mile from I-75, makes it a prime spot for products from southwest Georgia such as cotton, peanuts, pecans, clay and lumber; however, the goal is to expand the inland port’s reach to beyond southwest Georgia and generate business from Florida’s Panhandle and Southern Alabama. While exports currently comprise 80 percent of the cargo traffic between Cordele and Savannah, in time, officials anticipate that the balance between import and export container traffic for this market will change with a roster of shippers in Albany and Tifton, Georgia; Montgomery and Mobile, Alabama; and Tallahassee, Florida. Although recent statistics from the Cordele Inland Port are not available, reports indicate that container traffic has “surged from 1,500 containers in 2012 to possibly 9,000 in 2015.” In fact, the increase in container traffic from Cordele to Savannah in a scant two years has surprised experts. In July 2013, GPA CEO Curtis J. Foltz indicated, “Cordele has exceeded [his] expectations on the front-end. What it has done certainly speaks to the importance of inland rail.”

The success of the Cordele Inland Port prompted Georgia officials to support the creation of the state’s second inland port for ocean trade in Chatsworth in northwest Georgia. In July 2015, Governor Deal and GPA officials announced the planned development of the Appalachian Regional Port, in Chatsworth, a facility on 42 acres adjacent to I-75, that will be operated by the GPA. While the facility is scheduled to open in 2018, it is expected to handle 50,000 containers annually with Class I railroad service provided by CSX Transportation. These containers will be transported to the Port of Savannah. Unlike the inland port in Cordele, the state has invested $10 million in the Chatsworth inland port, with an additional $7.5 million provided by the GPA. Importantly, experts estimate that the proposed Chatsworth inland port will relieve congestion by taking at least 40,000 trucks off the state’s highways. In the future, the GPAs plans for a network of inland ports across the state include locations on I-85, north of Atlanta; along I-95, near the South Carolina and Florida borders; Augusta; and Macon.

Kentucky

With the exception of Alaska, Kentucky has the distinction of possessing the most miles of marine highway in all the United States. Among the major rivers flowing through the commonwealth are the Kentucky, Tennessee, Cumberland, Green and Licking Rivers. In addition, Kentucky borders three of the most commercially navigable rivers in the country: the Ohio (Northern border with Ohio), Mississippi (Western border) and Big Sandy Rivers (Eastern border). Furthermore, the two largest manmade lakes east of the Mississippi River also are located in the commonwealth: Kentucky and Cumberland Lakes.

This extensive array of marine highways ensures that more than 102.7 million tons of cargo (primarily coal, aggregates and petroleum) traveled in and out of Kentucky in 2013. Coal comprised 51 percent of this tonnage, followed by aggregates at 25 percent and petroleum at 8 percent. Cumulatively, the value of this impressive amount of cargo totaled more than $11.1 billion in 2013. Of the total tonnage transported on Kentucky’s rivers during the review period, 53.2 million tons were shipped out of the state. Given Kentucky’s prowess as a coal-producing state, 26.4 million tons of the 53.2 million total tons of cargo involved coal. Of note, Marathon Petroleum Corporation’s Catlettsburg location on the Big Sandy River is the largest refinery in the state and shipped nearly 8.2 million tons in 2013, a value of $7.6 billion, the top ranking item that moved on Kentucky’s rivers in terms of value.

The 70-year old (and cracked) Kentucky Lock and Dam, near Paducah, Kentucky, exemplifies the woeful condition of the locks and dams across the United States. Barges streaming down the Tennessee River hit a serious choke point at this location and often have to linger for hours to travel through it because the locks often are shut down for maintenance and repairs. Moreover, due to its age, it is increasingly difficult to accommodate the newer and often larger barges. Consequently, operators have to split the barges into sections and then

‡‡ Observers confirm that large cracks are clearly visible on the walls of the Kentucky lock.
slide them through the lock, a requirement that causes further delays. (Splitting barges into sections for this reason also occurs at other locks across the country.) As noted earlier, these delays cost a great deal and diminish the efficiencies related to bringing goods to market in a timely manner. The Kentucky Lock and Dam is a major thruway for products from nearly two dozen states and just in the last decade, the average delay has expanded to nearly seven hours, from less than four hours in 2004. Even though there are plans to construct a new replacement lock, it will not be functional until 2023, possibly even later, if there are additional delays related to securing federal funding.

As in a number of other states, the five major inland ports in Kentucky are not necessarily location specific but a collection of smaller ports, in some instances, recognized by the state as a single port. These major ports are Huntington-Tristate (the largest port on the state's inland waterway system); Louisville; Elvis Stahr Harbor; Cincinnati, Ohio (this port includes both banks of the Ohio River), and Mount Vernon (a port whose terminals are primarily located on the Indiana side of the Ohio River). Kentucky has a total of 232 manufacturing facilities, terminals and docks that are deployed in moving cargo on its waterways. While Kentucky shipped goods to 15 other states, the commonwealth received cargo from 17 states. There are 14 navigation locks and dams in Kentucky. Ten of the 14 are active projects on the Ohio River. Of the remaining four, there is an additional lock and dam each on the Tennessee and Cumberland Rivers and two on the Green River.

**Louisiana**

One of the earliest projects undertaken by the Corps involved improving access in and out of the Baton Rouge area, a notorious chokepoint on the Mississippi River when traveling to and from the Gulf of Mexico. In 1824, under the statutory guidance of the General Survey Act of 1824, the Corps was directed to enhance navigational access on the Ohio and Mississippi Rivers. Even as far back as nearly 200 years, American policymakers realized the importance of Louisiana ports to the nation’s strategic imperatives.

Louisiana’s ports are among the most critical in the United States, a fact borne out by the tremendous cargo volumes that transit through the state’s ports each year. Louisiana’s three primary waterways — Mississippi River, Lake Charles Waterway and the Gulf Intracoastal Waterway (GIWW) — handled more than 503.5 million tons of cargo in 2013. The Mississippi River, the fourth longest river in the world, is the most travelled waterway in the state and handled 437.5 million tons of cargo in 2013. The Mississippi River flows almost the entire length of the state’s Eastern border before bisecting the state around Simmesport and Lettsworth and then flowing into the Gulf of Mexico. A majority of the cargo that shipped was destined to three ports: South Louisiana, New Orleans and Baton Rouge.

Cargo traveling through the state is broken up into inland traffic and coastal traffic. Inland traffic refers to vessels transiting through the state’s ports, coastal waterways and inland rivers with a draft of less than 14 feet; coastal traffic refers to vessels transiting through the state’s ports, coastal waterways and inland rivers with a draft of more than 14 feet.

Louisiana’s coastal traffic, 263.7 million tons of cargo in 2013, is dominated by petroleum products (31 percent of total cargo), grains (23 percent) and crude petroleum (16 percent). As with the inland rivers, the state’s ports are

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§§In this instance, shallow draft tonnage refers to cargo moved on inland waterways that are considered shallow.
a main export transit point for coal and grain produced in many other states along with petroleum products, both produced in Louisiana and outside the state. The state’s major ports (South Louisiana, New Orleans and Baton Rouge) handle nearly 70 percent of the nation’s grain exports, a clear indication of the importance of these ports to the nation’s economic calculations.

The state’s three major ports handled a total of 379 million tons of cargo in 2013. The Port of South Louisiana, the largest tonnage port in the United States and largest tonnage port in the Western Hemisphere, stretches 54 miles along the Mississippi River. The Port of New Orleans is the top importer for steel and natural rubber in the country, while the Port of Baton Rouge, the fourth largest inland port in the United States, is located where the Mississippi River officially intersects with the GIWW. Louisiana has 18 navigation locks and three control structures with most of the locks supporting the GIWW system, which flows for 1,300 miles from Brownsville, Texas, to Port St. Joe, Florida.

With the completion of the Panama Canal expansion project in 2016, in May 2015, the Corps announced that it was drafting an environmental impact statement to gauge the effects of deepening the Mississippi River’s shipping channel from 45 feet to 50 feet between the Gulf of Mexico and Baton Rouge. Shipping officials across the state, particularly those affiliated with the Port of New Orleans, have emphasized the importance of deepening the Mississippi River to accommodate the larger vessels expected to call on the East Coast in the wake of the Panama Canal expansion project.

**Missouri**

Missouri’s location in the center of the country has prompted an impressive array of rail, river, truck and air transportation options fueling the state’s ability to move both raw materials and finished products throughout the country (and overseas) efficiently and effectively. Not only do segments of both the Upper and Lower Mississippi River flow through the state, an important section of the Missouri River also runs through the state, further accentuating Missouri’s ability to leverage its natural geographic assets to its advantage.

In 2013, more than 40.9 million tons of cargo travelled along the Mississippi and Missouri Rivers in the state. The value of the cargo on the Mississippi River alone amounted to $8.6 billion in the review period. A bulk of this cargo (32.4 percent) involved aggregates, i.e., limestone from Missouri’s quarries and sand and gravel extracted or dredged from rivers in the state. Coal (18.5 percent) was the next most important commodity to be transported through the state. Even though Missouri is not a major coal-producing locale, the state relies on coal-fired power plants for a bulk of its electricity generation. Importantly, Missouri shipped out more than five times the amount of cargo the state received.

Missouri has 200 manufacturing facilities, terminals and docks that shipped and/or received cargo in 2013. Louisiana ranked high among the states receiving cargo from Missouri during the review period. Coal was a major commodity, traveling from Montana and Wyoming by rail to Missouri, by barge to Louisiana and then to other destinations, both foreign and domestic (Florida, for instance). Similarly, grain from a number of Midwestern states made its way to Missouri to be transported by barge to Louisiana for milling and final shipment to overseas destinations. Approximately 6 million tons of Midwestern grain was loaded in Missouri for waterborne transportation in 2013.

The state’s three major ports are the Port of St. Louis, the second largest inland port in the country, running 70 miles on both sides of the Mississippi River with 130 facilities; Caruthersville Harbor, the 13th largest inland port in the United States with a total port tonnage of 2.6 million in 2013; and New Madrid Harbor, which moved 1.5 million tons of cargo during the review period, mostly fertilizer and grain. Missouri has seven navigation systems along the Mississippi River. A bulk of the cargo traveling through these navigation systems headed south, mostly grains produced in Illinois, Iowa, Wisconsin, Missouri and Minnesota, destined for Louisiana. Coal was another commodity shipped to Louisiana from the three major ports in Missouri.

The Port of Kansas City (Port KC’s Woodswether Terminal) reopened in August 2015, a project that had been in the works for seven years. Kansas City’s ability to now include waterborne commerce (moving cargo by barge) as a transportation option complemented the air, rail and truck options already in place. The reopening of Port KC, which also generated additional
jobs, and the benefits associated with reducing truck-related traffic (according to the president and CEO of Port KC, “each barge is equivalent to 87 truck-loads of cargo”) were positive outcomes of the project. Port KC officials expect to receive between eight and 10 barges every month. Plans currently are in place to connect Port KC to rail lines, a move that would further enhance the location’s transportation capacities.

In September 2015, the Interim Committee on the Development of Improvement of Missouri Ports of the General Assembly held a hearing to outline specific strategies to leverage the ports as a priority in future policymaking. While members of the Committee are interested in converting their status from an Interim Committee to a Special Committee, Representative Becky Ruth, chair, emphasized, “[H]ow important ports are in our state, what a great economic development tool that we have at our disposal and the amount of dollars they can bring in revenue to our state.”

**Mississippi**

Mississippi gets its name from the Native American Ojibwe-Chippewa word *misi-zibi*, which means “great river or gathering place.” The eponymous river flowing along the state’s Western border is the fourth longest and 10th largest in the world. There are three crucial navigable, inland waterways in Mississippi: Mississippi River, Tenn-Tom Waterway and Yazoo River. These waterways provide crucial links to the Ohio and Tennessee Rivers and locations beyond.

In 2013, nearly 50 million tons of cargo moved to, from and within Mississippi. While crude petroleum (31 percent), petroleum products (29 percent) and grains (10 percent) were the three major commodities, the primary commodity on the Mississippi River’s waterways was grain (26 percent), followed by petroleum products (18 percent) and aggregates (16 percent). As is the case of several other states, grains traversing through the Mississippi River system flowed mostly to Louisiana for milling before being launched to other destinations, including foreign ports, from the major ports in Louisiana.

Mississippi’s coastal traffic was dominated by petroleum products refined from crude petroleum. The state’s three major oil refineries on the Gulf Coast cumulatively account for about 2 percent of total U.S. refining capacity, a level that ranks the state 13th in petroleum production. The largest of these refineries, located in Pascagoula, is operated by Chevron Corporation and after processing crude oil imported from South and Central America, supplies fuel to the Southern parts of the United States.

In terms of terminals and docks, there are 157 in the state that shipped and received cargo in 2013 servicing a range of manufacturing facilities. The bulk of this cargo, mostly grain, was shipped to Louisiana (in excess of 6.1 million tons); approximately 2.7 million tons in 2013, mostly petroleum also were sent to Louisiana. Shipments to Florida and Texas also were important, again mostly petroleum products, with Mississippi’s refineries servicing the high demand for gasoline and aviation fuel, particularly in Florida.

There are eight navigation locks and dams in Mississippi, all located on the Tenn-Tom River. (See Figure 2 for a graphical representation.) Vessels using these locks and dams in Mississippi are mostly headed to the coastal Port of Mobile, Alabama, and then to overseas destinations or inbound from international destinations to other locations on the Tenn-Tom or Ohio Rivers. Another important waterway in the state is the Bayou Casotte Waterway, a system that moves the most of tonnage in the state, 32 million in 2013. This system primarily services the Gulfport-Biloxi-Pascagoula metropolitan area.

Mississippi’s three major inland ports are located in Pascagoula, Greenville and Vicksburg. The Port of Pascagoula is a critical contributor to the state’s economy and the location for the state’s largest employer, Ingalls Shipbuilding, a division of Huntington Ingalls Industries. In 2011, a $1.1 billion liquefied natural gas terminal opened at the Port enabling the facility to be ranked the 10th largest oil refining operation, in terms of capacity, in the United States. The Port of Greenville’s specialty involves dry bulk commodities such as liquid fertilizer and grain; in 2013, the Port shipped and received more than 3.4 million tons, making it the 10th busiest of all inland ports in the United States. Finally, the Port of Vicksburg focuses on barge traffic transporting cotton, steel coils, aluminum and crude oil. Shipments transiting the Port enabled it to rank as the 14th largest in terms of tonnage (2.3 million tons) in 2013.
Barge traffic along the Yazoo River transporting export commodities such as grain, cotton and fertilizer between Vicksburg and New Orleans has declined in recent years. Lack of regular maintenance on the waterways and frequently low water on the Yazoo River have resulted in reduced barge traffic on the River, and then only during high water periods. Obstructions and unmaintained navigation channels have made traversing the Yazoo River a major challenge. The declining volume of goods moving on the Yazoo River has resulted in federal officials providing ever declining funds for maintenance; given that maintenance funds to the Corps are allocated based on total tonnage, the reduced tonnage, because of the unmaintained navigation channels, reduces the funding provided, a vicious loop that only contributes to the decline in tonnage. There has not been any maintenance on the Yazoo River’s navigational channels since 2009, when limited funds were appropriated under the American Recovery and Reinvestment Act (ARRA).

North Carolina

Like several other SLC states, North Carolina has focused on expanding its transportation capacities through an inland port, Charlotte Regional Intermodal Facility, which opened in 2014. Although the placement of this inland port between two runways at Charlotte Douglas International Airport created the impression that it would primarily involve cargo to be shipped by air, this is not the case. The new 170-acre site, with a current capacity of 140,000 containers per year and the potential to expand to 200,000 containers, relies on Norfolk Southern’s rail lines to move containers to and from seaports such as Charleston, South Carolina; Savannah, Georgia; Miami, Florida; and several other locations. In promoting the use of this facility, Senior Vice President Jeff Heller of Norfolk Southern noted, “We can move 300 containers on one train, which is the equivalent of 300 trucks on the highway. Companies moving domestically have moved historically all by truck, but they are under pressure now to convert some of that freight to intermodal.” Most freight moving through the Charlotte inland port travels to domestic locations. The site has more than 15 million square feet available for development.

The genesis of this inland port project dates back a decade and a half when it was proposed as part of the airport’s strategic development plan. By the mid-2000s, the push for a larger inland port gathered momentum among transportation planners in Charlotte, particularly at Norfolk Southern, which was running out of space at their 40-acre location in Uptown Charlotte. In March 2012, Norfolk Southern and the city of Charlotte signed a lease agreement for the railroad company to begin construction immediately at the more spacious airport location. This state-of-the-art rail and truck inland port, opening about two years later and providing a national and international freight link for the city and the region, is managed by Norfolk Southern.

While a majority of the total cost (about $96 million) was borne by the railroad company (approximately $74 million), the remainder was provided by the federal and state governments. The North Carolina Department of Transportation completed construction on ramps connecting the facility to I-485. The facility also is conveniently located near I-77 and I-85, providing easy access to trucks moving containers in and out of the location. Projections for the inland port’s economic impact over a 20-year timespan remain impressive: $300 million locally, alongside 7,000 direct and indirect jobs spurring $7.6 billion in regional economic development. In fact, commercial real estate giants such as CBRE Group noted that the presence of the inland port quickly generated steady business from freight services companies seeking proximity to the facility. As with many other projects in the SLC region designed to enhance transportation capacities, the expected completion of the Panama Canal expansion project in 2016 is a major motivating factor for the construction of this inland port.

Oklahoma

The McClellan-Kerr Arkansas River Navigation System (MKARNS), referenced in the Arkansas section, includes important segments in Oklahoma along the Arkansas, Poteau and Verdigris Rivers. Upper segments of the MKARNS lie in Oklahoma, and the state’s five locks and dams (two in the Verdigris River and three in the Verdigris Rivers Arkansas River) provide critical waterway passageways to, from and across the state. The MKARNS is a vital link connecting Oklahoma’s inland ports with the Ohio and Mississippi Rivers, the ports along the Lower Mississippi River and, eventually, many international destinations through the Gulf of
Mexico. A number of commodities exported by Oklahoma, such as grains, and commodities imported into Oklahoma, such as chemical fertilizers, travel to and from these Lower Mississippi River ports, especially the ports in Louisiana.

In 2013, nearly 6.8 million tons of cargo worth $3.4 billion moved to, from, and within Oklahoma. In terms of the volume, the state exported more than 3.8 million tons and imported more than 2.9 million tons; while grains (1.7 million tons) were the primary export product, chemicals (1.6 million tons) constituted the primary import product. These commodities were transported from 25 different manufacturing facilities, terminals and docks scattered across the state. The MKARNS, a 445-mile long, 18 lock and dam system, is an integral part of Oklahoma's water navigation system that is shared with Arkansas. All waterways in Oklahoma are components of the MKARNS. Of these MKARNS waterways in the state, the Verdigris River component is the most influential and accounting for approximately 79 percent of the commodities moved by water in Oklahoma.

The two major ports in Oklahoma are the Port of Catoosa and the Port of Muscogee. The Port of Catoosa, a short distance away from Tulsa, is one of the largest and most inland river ports in the country; in 2013, the Port moved 2.7 million tons of cargo. The Port of Muscogee is situated on the Arkansas River and transported about 793,000 tons of cargo in 2013.

**South Carolina**

One of the most successful inland ports in the SLC region does not rely on water to move cargo: South Carolina’s inland port facility at Greer. When this $50 million facility, owned and operated by the South Carolina State Ports Authority (SPA), opened in 2013, it was projected to handle 40,000 containers per year for the first several years. By fiscal year 2015, the second year of operation, the inland port significantly exceeded projections and handled 58,407 containers (65 percent more than was expected). For the current fiscal year, 2016, the inland port is on track to move 70,000 containers and is likely to reach 100,000 containers by 2018. Because of this unexpected growth spurt, in August 2015, the SPA initiated emergency measures and secured additional cranes for the Greer facility to move the additional cargo. Specifically, the SPA moved two rubber-tyred gantry cranes from the Wando Welch Terminal at the Port of Charleston to the inland port, boosting the number of cranes to five. In fact, the success of

Rubber-tyred gantry cranes are mobile gantry cranes used in intermodal operations to ground or stack containers. These cranes typically straddle multiple lanes, with one lane reserved for container transfers.
the Greer facility—exceeding capacity expectations for its first five years of operation in just two years—has prompted the SPA to consider expanding the location to move cargo between the coast (primarily the Port of Charleston) and intermodal hubs hundreds of miles away. The president and CEO of the SPA, Jim Newsome, commented that not only is “the inland port a key strategic advantage for South Carolina,” inland ports are “the next trend in East Coast distribution” operations. Consequently, the SPA is considering opening other inland port sites, potentially along the north-south I-85 corridor, one of the busiest and most lucrative regions of the state from a transportation perspective.

Among the companies that rely heavily on the Greer site: German auto manufacturer BMW, whose only North American manufacturing facility also is located in Greer. An estimated 50 percent of the business that flows through the Greer site is related to the operations of BMW. In fact, BMW sends 800 vehicles a day to the Port of Charleston for export through the Greer plant. Upon their arrival at the Greer inland port, they are loaded onto Norfolk Southern trains and transported to the Columbus Street Terminal at the Port of Charleston for destinations across the globe.

Several other developments could spur further expansion of the Greer facility. A 1.1-million-square-foot Dollar Tree regional distribution center currently is under construction in nearby Cherokee County. A Rite-Aid distribution center also is scheduled to open in the vicinity next year. In fact, the SPA's Newsome noted that the Greer “inland port is firing on all cylinders. It was a major factor in bringing the Dollar Tree distribution facility to South Carolina's Upstate,” the first such operation in that part of the state. Growth at the nearby Michelin tire manufacturing plant, along with the activities at the impressive roster of tire manufacturers operating in South Carolina, could provide further impetus for expansion at the Greer facility.

**Tennessee**

The origins of the name Tennessee can be traced back to the Overhill Cherokee town of Tanase (in contemporary Monroe County, Tennessee) and the Tanase River (the Little Tennessee) in the Southeastern segment of the state. While Tennessee borders 165 miles of the Mississippi River, the state also envelopes 600 miles of the Ohio River Basin, including its two major waterways, the Tennessee and the Cumberland Rivers. Furthermore, the Tenn-Tom River connects river traffic on the state's Eastern half, including traffic flowing on the Ohio River, conveniently to the deep water ports located along the Gulf of Mexico. Finally, important tributaries of the Tennessee River (such as the Hiwassee, Clinch, Emory, Holston and French Broad and Little Pigeon Rivers) promote the smooth movement of commerce to both urban and rural centers across Tennessee. Products from Tennessee have two potential routes to these deepwater ports: from Western Tennessee, products may travel south on the Mississippi River to the Port of New Orleans; from Eastern Tennessee, cargo may travel south to the Port of Mobile using the Tenn-Tom and Black Warrior waterways. The reverse route is an option for items imported to Tennessee from overseas destinations.

In 2013, 35.4 million tons of cargo, valued at $8 billion, moved to, from and within the state. A major share of this cargo involved coal (39 percent), followed by aggregates (20 percent) and grains (14 percent). Even though Tennessee is not as dependent on electricity generated by coal-fired power plants as many other states in the region — the state secures power from a blend of other sources, including hydro and nuclear — coal from Kentucky is the primary contributor to the state's cargo flows through the state. Petroleum shipments through the state also are significant. In fact, petroleum products rank fourth in terms of tonnage, but first in terms of value during the review period. Docks in Tennessee exported more than 7 million tons of cargo and imported more than 26 million tons of cargo, with a smaller amount moving within the state. A bulk of the shipments out of Tennessee was to Louisiana, over 5 million tons in 2013 (four-fifths of these shipments involved grains), primarily to the Port of New Orleans. Navigating the Tenn-Tom Waterway, cargo shipments from Tennessee (mostly iron and steel products) also made their way to the deepwater Port of Mobile, Alabama.

Tennessee operates several of the nation's busiest inland ports. Ranked high on this list is the Port of Memphis, the fourth largest inland port in the United States, moving 14.2 million tons of cargo in 2013. The more than three dozen terminal facilities operating under the aegis of the Port of Memphis move an assortment
of commodities including petroleum, tar, asphalt, cement, steel, coal, salt, fertilizer, rock, gravel and grains. The Port of Chattanooga, the nation’s 12th largest inland port, is the second busiest port in the state, moving 2.6 million tons in 2013. Finally, the Port of Nashville (ranked 15th nationally), which includes 13 miles of the Cumberland River, primarily moves sand, gravel, asphalt, iron and steel.

Nine locks and dam systems provide navigational assistance in Tennessee. Five of these are on the Tennessee River, three on the Cumberland River and one on the Clinch River. Of these, the busiest system is the Pickwick Landing Lock and Dam (over 12 million tons) servicing the Western Tennessee portion of the Tennessee River as it flows from Alabama and Mississippi. Cheatham Lock and Dam, servicing the Cumberland River, was the second busiest system during the review period, with more than 9 million tons of cargo. Relatively, in August 2015, U.S. Senator Lamar Alexander expressed dissatisfaction with the Corps’ failure to replace the Chickamauga Lock in a timely manner. The lock, seven miles upstream of Chattanooga, built in 1940, is owned by the Tennessee Valley Authority and operated by the Corps. In recent years, existing barge traffic has declined because the Lock is not as reliable as it once was and is smaller than other locks downstream of the Tennessee River. Senator Alexander has called for replacing the Lock before it fails completely, adding that “failure of the lock would throw 150,000 trucks onto I-75 and increase the cost of shipping goods to manufacturers all across the state.” Shippers already are pursuing alternate methods, such as rail, because of the uncertainty related to the Chickamauga Lock.

Texas

Texas’ dominance as the top energy producing state in the nation influences its waterways and navigational developments. The state’s record as both the highest consumer and producer of energy in the country requires extremely efficient transportation capabilities. The state’s water resources play a critical role in facilitating these efficiencies. One of the nation’s most important waterways, the Gulf Intercoastal Waterway (GIWW) flows along the state’s Southern border, and the GIWW’s numerous channels, bayous and outlets ensures an array of connecting waterways to promote the movement of commodities. The GIWW and its numerous connecting links boost the state’s industrial and manufacturing sectors by transporting products to, from and within the state. These waterways also provide an important connection to transporting products to and from overseas destinations using the state’s deep-water ports.

In 2013, more than 492.8 million tons of cargo, primarily petroleum products and crude petroleum, were transported to, from and within Texas on the GIWW and numerous connected waterways. Approximately 45 percent of this cargo related to imports, 39 percent related to exports, and the remaining cargo moved within the state. Given Texas’ location on the Gulf of Mexico, the state’s coastal ports also play a pivotal role in these cargo shipments. Coastal traffic mostly involves crude petroleum, petroleum products and chemicals, cumulatively a total of 83 percent of total coastal traffic cargo. As mentioned, the state’s coastal ports offered shippers convenient access to a number of international markets for both exports and imports. In terms of inland traffic, in 2013, more than 110 million tons of cargo traveled on Texas’ rivers. Once again, the dominant commodities were petroleum products (52 percent), chemicals (23 percent) and crude petroleum (17 percent), comprising more than 92 percent of the state’s inland traffic total.

Given the state’s sheer size and economic complexity, Texas operated 442 manufacturing facilities, terminals and docks that transported cargo in the review period. These facilities shipped products to 23 states (Louisiana received the most Texas products) and received products from 27 states. As mentioned, the state’s major ports, particularly the deep-water ports, play a critical role in not only the state’s economic vitality but also the entire nation’s economic performance. The Port of Houston, one of the nation’s most important, is 50 miles inland and occupies 25 miles along the San Jacinto River and Galveston Bay. More than 229 million tons of cargo moved through the Port in 2013. Given the surging trade volumes, the Port’s channel was recently deepened to 45 feet to accommodate larger vessels. The Port of Beaumont, the state’s second busiest port, moved more than 94 million tons of cargo; the Sabine-Neches Ship Channel at the Port is slated to be deepened to 45 feet. The Port of Corpus Christi, the state’s third busiest port and the fourth largest U.S. coastal port, handled more than 76 million tons of cargo, primarily crude
petroleum and petroleum products, in 2013. In terms of locks and dams, the Corps manages four systems in Texas, all located along the GIWW.

**Virginia**

Ports have been located and played a dominant role in Virginia since the first English settlers arrived on the coast in 1604. Coastal deep-water ports, navigable rivers and waterways play a critical role in Virginia’s economic trajectory. In this regard, the Virginia Ports Authority’s (VPA) has an inventory of impressive assets: Norfolk International Terminals (NIT), located in the Hampton Roads Harbor, is the largest terminal with a channel depth of over 50 feet; Newport News Marine Terminal (NNMT) is the main break-bulk and roll-on/roll-off facility; and Portsmouth Marine Terminal (PMT), also in the Hampton Roads area, has the capacity to handle containers, break-bulk, and roll-on/roll-off cargo and provide rail access by CSX directly and Norfolk Southern via the Norfolk Portsmouth Beltline Railway. In addition, there are two inland ports that play an influential role in the commonwealth’s transportation calculations, a role that is forecasted to grow significantly more important in the coming years.

The inland port at Front Royal (Warren County) is one of those facilities. In fact, this facility was the Southeast’s first inland port, built nearly three decades ago, to compete more directly with the Port of Baltimore for manufacturers, retailers and markets across the Mid-Atlantic and Midwest. An intermodal container transfer facility, where freight containers are transferred between trucks and trains, extends across 161 acres of land at a location that is a mere 60 miles west of Washington, D.C. This inland port’s location and ensuing operations bring the VPA’s coastal assets (NIT and NNMT) much closer to the cargo radiating from the Washington, D.C. and Baltimore Metropolitan Regions through convenient rail links. Norfolk Southern’s rail operations at the Front Royal inland port also provides handy access to cargo being shipped to and from Western Pennsylvania and the New York/New Jersey region. Propelled by the increasing capacities of the Front Royal inland port, dozens of companies, including The Home Depot, Kohl’s, Rite Aid and Red Bull have established new distribution centers in the immediate vicinity. According to reports, the companies, jobs and investments associated with these corporate operations are substantial: 39 major customers, 8,000 new jobs and $748 million in investment inflows. The inland ports at locations away from the water, such as the ones in Front Royal, Virginia; Greer, South Carolina; and Cordele, Georgia, are routinely cited as examples of facilities that boost the logistics and transportation operations in these states.

The Port of Richmond, a facility owned by the city of Richmond but leased to the VPA, is about 100 miles from the deepwater ports in the Hampton Roads area. The facility has more than 300,000 square feet of warehouse space, a 1,570-foot long wharf available for berthing, capacity to handle containers, temperature-controlled containers, break-bulk, bulk, and neo-bulk cargo. There currently is a weekly container-on-barge service from Hampton Roads to Richmond, along the James River, providing a maritime alternative to transporting goods by truck on I-64, a service that reduces truck traffic on local roads and highways.

For a number of years, the VPA had a lease agreement with the city of Richmond to operate and administer the Port. This lease was up for renewal in 2015 and, after reviewing lease applications from two other entities, the city decided to renew the lease with the VPA by granting a 40-year lease extension in September 2015. Under the new lease, the VPA assumes responsibility

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Neo-bulk goods are prepackaged, counted as they are loaded and unloaded; in contrast, bulk cargo goods are not counted individually, not stored in containers and transferred as units at a port. Examples of neo-bulk cargo goods include heavy machinery, lumber, bundled steel, scrap iron, bananas, waste paper and cars.
for all operating expenses, capital requirements, environmental tasks and workforce development. After years of regular losses, for the fiscal year that ended on June 30, 2015, the Port of Richmond generated a profit of $14 million, a significant accomplishment.

Inspired by the success of the inland port at Front Royal, and in an effort to replicate that success at the Port of Richmond, VPA and city officials are collaboratively working on projects to enhance the operations of the Port of Richmond. The Port, which is within a day’s drive of half the U.S. population, offers less congestion than the VPA facilities in the Hampton Roads region and has the potential to provide convenient access to the Hampton Road facilities, particularly by barge.

Currently, about $18 million in capital improvements by the VPA – from roadways to dredging to a new crane – are in progress. Additionally, the city has invested $13.5 million in renovating buildings in the immediate vicinity of the Port to locate more than 250 municipal employees. In fact, John Reinhart, VPA CEO, after his agency secured the lease extension, commented that “[T]hat’s a good model (referring to the inland port at Front Royal) for us to bring here as we try to reinvent the Port of Richmond. We see this as the time to invest and double down on the Port of Richmond.”

**West Virginia**

There are five commercially navigable river systems in West Virginia: Ohio, Monongahela, Little Kanawha, Kanawha and Big Sandy River. Given the presence of these river systems in the state, the history and progress of West Virginia’s economy has been intricately linked to the development of these systems. From the construction of canals (dating back to George Washington’s Potowmack Company, established in 1785), to the development of locks and dams, to expanding barge traffic linking the state and beyond, the state’s focus on developing its water resources has assisted in West Virginia’s economic growth. As the second highest coal-producing state in the country, West Virginia relies on barges to transport coal to locations both inside and outside the state. In fact, 30 percent of the coal produced in the state is transported by barge or a combination of barge and rail and/or truck. Most of these coal shipments are directed to Ohio, Kentucky, Pennsylvania and Indiana.

In 2013, West Virginia’s waterway systems moved more than 62 million tons of commodities (primarily coal and petroleum) — priced at $10.7 billion — by barge to destinations to and from West Virginia. Docks in the state shipped out about 35.8 million tons or approximately 57 percent of total tonnage moved in that year. Relying on the five major river systems in the state, commodities moving in and out of West Virginia connected to the Mississippi River and then, in and out of the Gulf of Mexico, mainly through the Port of New Orleans. Many of the coal-fired power plants across West Virginia (such as the ones sitting on the Kanawha River near Charleston, the two plants on the Upper Monongahela River and those on the West Virginia side of the Ohio River) rely heavily on these river systems to obtain their supply of coal, mainly by barge. Numerous docks on these different river systems provide convenient access to supplies of coal to power these plants; the electricity generated at these plants is either used in West Virginia or exported to other states.

The Port of Huntington Tri-State, a port system shared by Ohio, West Virginia and Kentucky, is the most important in the state. In 2013, the Port moved 46.8 tons of cargo. There are 13 navigation locks and dams in West Virginia and seven of these are located on the Ohio River. In addition, the Kanawha and Monongahela River each maintain an additional three navigation and lock systems. West Virginia’s access to the Ohio River, the largest tributary of the Mississippi River by water volume, is crucial because of the subsequent access to the Gulf of Mexico through the Port of New Orleans.

**Conclusion**

The presence of myriad rivers and navigable waterways remains a major factor behind the rise of the United States as a global economic super power over the past two centuries. In 1824, the U.S. Congress tasked and provided funds for the U.S. Army Corps of Engineers to create a navigable inland waterway system to connect far-flung states across the nation and link the nation with distant lands across the globe. This bold move resulted in the economic footprint of the United States expanding exponentially. In the ensuing decades, the nation’s inland ports and waterway system have played a critical role in the shipment of freight, primarily agricultural produce, petroleum products, chemicals and coal, to other states and to coastal ports, for shipment
as exports to foreign countries. These industries rely heavily on the nation’s inland waterways for the transport of their commodities.

While funds for this important responsibility were appropriated from the general fund for nearly 200 years, beginning in 1978, a portion of the expenses related to operating our inland waterways was generated from a tax levied on commercial users of the waterway system and channeled to the Inland Waterways Trust Fund (IWTF). Nevertheless, the funds generated from this revenue source are insufficient to cover all capital and operating expenses and, the U.S. taxpayer, through allocations from the general fund, continues to fund a bulk of the expenditures, including the construction costs of new dams, navigation locks and major rehabilitation or maintenance projects, although insufficient to maintain a sound infrastructure.

Deploying the nation’s inland ports and waterways to facilitate the movement of commerce produces an array of positive effects. One such benefit involves relieving railroad scheduling pressures and significantly reducing congestion on our nation’s crowded highways, given that a typical 15-barge tow can transport the cargo equivalent of 216 rail cars or 1,050 semi-trucks. Another benefit relates to the savings generated since cargo transportation by barge costs approximately 2 cents per ton per mile compared to just below 4 cents per ton per mile by rail, and slightly less than 18 cents per ton per by truck. Transporting cargo that is vital to the economic vitality of every state and, by extension, the United States, is another positive effect. The sheer economic and strategic importance of the inland waterway system is reinforced by the fact that more than 22 percent of domestic petroleum and petroleum products, about 20 percent of the coal necessary for electricity generation in the United States and approximately 60 percent of the nation’s grain exports rely heavily on inland waterways for transportation.

Additionally, the economic activity triggered by inland ports and waterways produces tremendous direct, indirect and induced economic benefits. For example, in Alabama, 80,100 jobs, a $9.8 billion contribution to the state’s economy, direct and indirect jobs in 40 of the state’s 67 counties and $500 million in tax revenues, are the result of operations at the state’s inland ports and waterways. Connecting distant places in America to the global marketplace, with inland ports and waterways serving as a conduit to deepwater ports on the nation’s coasts, is another major benefit. Lowering the amount of noxious fumes emitted into the air, given that transportation by barge produces the lowest carbon footprint compared to other modes of transportation, also are enormously significant additional positive results. Finally, protecting communities from accidents and fatalities on the nation’s highways and railway crossings associated with moving cargo by truck and rail is another critical benefit that cannot be overemphasized.

However, as with the revenue pressures sweeping over the Highway Trust Fund, the IWTF also faces significant funding gaps. Some of these pressures include no increase in the tax on commercial users for nearly 20 years (until 2014 when the tax was raised, the last time it had been raised was 1995); erosion in the purchasing power of the revenues flowing into the IWTF; decline in revenues due to a drop in commercial freight traffic usage; reductions in appropriations from the general fund during a time of strained fiscal resources; and sustained calls for cutbacks in government spending. Cumulatively, these factors have resulted in the serious degradation and disrepair of not only the nation’s inland waterways, ports, locks and dam infrastructure, but also every other element in America’s physical infrastructure network. Once the envy of the world, many facets of the vast American infrastructure network currently requires some investment in renovation and restoration. A variety of organizations from the American Society of Civil Engineers to the U.S. Chamber of Commerce to America’s Watershed Initiative have reported extensively on the nation’s crumbling infrastructure and the urgent need to devote additional resources to replace, repair and rehabilitate all aspects of our infrastructure network.

As is the case with many other components of the nation’s infrastructure network, the nation’s inland waterways are aging rapidly too. Engineers generally forecast that the viable, economic service life of the various elements included in the nation’s inland waterway and navigation system is around 50 years; these engineers also maintain that this service life could be expanded to 75 years with a major overhaul. However, scrutiny of
the nation’s inland waterway navigation system reveals that it is considerably older. For the 255 locks that are under review, more than half are older than 50 years and more than one-third are older than 70 years, a timeframe that is considerably older than the expected lifespan of these infrastructure items. Given that there is a direct correlation between the age and condition of the locks, dams and attendant navigational infrastructure and transportation delays, in recent years there have been inordinate shipping delivery time delays. The poor condition of the locks and dams resulted in frequent closures for emergency and scheduled maintenance work along the nation’s inland waterways, a development that prevents barges from reaching their destinations in a timely manner and forcing them to idle for extended periods. A staggering statistic included in the 2013 ASCE report card was that 90 percent of the locks and dams on the nation’s inland waterway system experienced some type of unscheduled delay or service interruption, averaging 52 delays per day. The scenario in 2015 demonstrates little improvement. While the expenditures flowing to the shippers and carriers are well known, i.e., greater costs due to the delays, lower reliability, loss of competitiveness in the global marketplace, a lesser known fact involves the costs borne by the federal government. The unexpected expenses thrust upon the federal government for these emergency repairs given the pressure to open the locks to barge traffic in an expeditious manner.

Even in an era of dwindling federal appropriations for these infrastructure projects, states have not remained sedentary but, instead, have devised a range of alternate strategies to move cargo from point to point, efficiently and effectively. These strategies include preparations for the expansion of the Panama Canal with essential infrastructure enhancements and the establishment of inland ports. A number of SLC states have set up inland ports, i.e., logistics hubs that consolidate and containerize cargo for shipment by rail to coastal ports, usually deepwater ports, several hundred miles away. The cargo usually is brought to these inland ports by truck, where they are sorted, consolidated and containerized and transported to coastal ports by rail. The inland ports in Cordele, Georgia; Greer, South Carolina; Winter Haven, Florida; Front Royal, Virginia; and Charlotte, North Carolina, all have gained regional and national recognition as fine examples of well-organized transportation hubs.

While the nation’s infrastructure network, including its inland ports and waterways, strain under the constraints of age, decay and lack of funding, there has been some movement in the last two years at the federal level to redirect resources to recondition and restore the different elements in the system. Even in light of this recent development, the cumulative effect of inaction at the federal level has forced states to forge ahead on their own, devising their own financial solutions to their transportation challenges and funding infrastructure upgrades to heighten efficiencies in the transportation sector. States continue to recognize that a well-run transportation system, undergirded by sound infrastructure, is critical to the economic progress of the United States and the nation’s ability to compete effectively in the global marketplace.
Endnotes


3) “Mississippi River Harbors to be Dredged in Arkansas, 3 Other States,” Arkansas Business, March 24, 2015.


7) “Inland Waterways Trust Fund: Fact Sheet . . .


10) “Inland Waterways Users Board . . .

11) “Barges Sit for Hours . . .


13) Ibid.


18) Ibid.

19) “Navigable Waterways . . .


24) “Barges Sit for Hours Behind Locks . . .

25) Ibid.

26) “Navigable Waterways . . .


30) “Inland Waterways Users Board . . .

31) “Lamar Alexander Backs Completion of Chickamauga Lock . . .


36) Unless otherwise indicated, information on the inland ports and waterways in the SLC states are extracted from Waterway System: An Inland Marine Highway for Freight, http://waterwayscouncil.org/waterways-system/. The most recent information available on this topic involves 2013 data; 2014 data will not be released until spring 2016.
38) “Inland Waterways Integral to Alabama’s Economy, Quality of Life,” www.al.com, April 6, 2015.
42) Ibid.
45) Information related to Georgia’s inland ports, unless otherwise specified, are extracted from “GPA Aiming for New Inland Ports,” Business Savannah, July 8, 2015; “Georgia to Develop 2nd Inland Port for Ocean Trade; July 29, 2015; and, “The Ins and Outs of Georgia’s Inland Ports,” The Atlanta Journal Constitution, September 6, 2015.
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This report was prepared by Sujit CanagaRetna, Fiscal Policy Manager for the Economic Development, Transportation & Cultural Affairs Committee of the Southern Legislative Conference (SLC) of The Council of State Governments (CSG), under the chairmanship of Senator Jeff Mullis of Georgia. This report reflects the body of policy research made available to appointed and elected officials by the Southern Office.

The Southern Office of The Council of State Governments, located in Atlanta, Georgia, fosters and encourages intergovernmental cooperation among its 15 member states. In large measure, this is achieved through the ongoing work of the standing committees of its Southern Legislative Conference. Through member outreach in state capitols, policy research, international member delegations, staff exchange programs, meetings and fly-ins, staff support state policymakers and legislative staff in their work to build a stronger region.

Founded in 1947, the SLC is a member-driven organization and the largest of four regional legislative groups operating under CSG and comprises the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia.

The SLC’s six standing committees provide a forum which allows policymakers to share knowledge in their area of expertise with colleagues from across the South. By working together within the SLC and participating on its committees, Southern state legislative leaders are able to speak in a distinctive, unified voice while addressing issues that affect their states and the entire region.