The Future of Southern Ports: Megaships and Megachanges on the Horizon

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The Future of Southern Ports: Megaships and Megachanges on the Horizon

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MEGASHIPS AND PORTS IN THE SOUTHERN LEGISLATIVE CONFERENCE STATES

“For whomsoever commands the sea commands the trade; Whomsoever commands the trade of the world commands the riches of the world, and consequently the world itself.”

Sir Walter Raleigh, The Invention of Ships (early 1600s)

“The giants are coming, and they can carry more than double the maximum number of containers carried on the largest ships in service today. . . [T]hese huge craft with a length of around 1,320 feet and a breadth twice the width of the 106 foot Panama Canal lock system, each will have the capacity to heave 15,000 20-foot containers along the major trade routes by the year 2010.”

The Journal of Commerce

INTRODUCTION

Ports across the United States play a critical role in the nation’s economic life, impacting directly and indirectly at all levels—national, regional, state and local. By facilitating the nation’s water transportation needs and serving as the initial point of contact for waterborne cargo, both domestic and foreign, ports are an integral component of the country’s economic calculations. (In addition to this important commercial role, the nation’s ports play a vital national security role.) According to an October 1998 U.S. Department of Transportation report, the direct, indirect and induced economic impact of the U.S. port industry in a recent, single year was gigantic: 13.1 million jobs, $494 billion in personal income, $1.5 trillion in business sales, $743 billion in contributions to the nation’s gross domestic product (GDP) and almost $200 billion in taxes at all levels.¹

Even in a number of states served by The Council of State Governments’ Southern Legislative Conference (SLC),² the economic impact of the port industry continues to be substantial. In fact, a 1999 resolution passed by the Southern Governors’ Association noted that “61 percent of all U.S. imports and 63 percent of all U.S. exports flow through a port located in a southern state.”³ Some specific examples from SLC states help illustrate the enormity of this economic impact. During fiscal year 1998, the Georgia Port Authority (GPA) reported that the statewide economic impact of all its ports’ activities, including private terminals, totaled an impressive $23 billion in revenue, $1.8 billion in income, $585 million in state and local taxes and 80,100 jobs.⁴ Similarly, the South Carolina State Ports Authority (SPA) noted that in fiscal year 1998, international trade through its port facilities resulted in 83,085 jobs across the state; in fact, the SPA also stated that one out of every 28 jobs in South Carolina is related to trade through its terminals.⁵ A Florida study released in 1994 indicated that the state’s ports and port-dependent businesses—including trade and cruise activity—created
more than 300,000 jobs and resulted in $600 million in state and local tax revenues. Finally, even in a relatively smaller SLC-state port like Gulfport, Mississippi, the economic impact, about $529 million in 1995, remains noteworthy.

While the economic importance of a strong, vibrant port system is not in dispute, the emergence of megaships—ships capable of carrying more than 4,500 20-foot containers, or Twenty-foot Equivalent Units (TEUs)—poses critical choices to policy makers. Specifically, a new generation of megaships more than 1,100 feet long and bearing more than 4,500 containers stands poised to capture a sizable portion of future ocean shipping. Unfortunately, very few ports in the United States are fully equipped to handle these megaships when loaded to capacity. Given the fact that by 2010 analysts expect these megaships to carry up to 40 percent of the world’s container cargo and 33 percent of the container volume moving through U.S. ports, there is an urgent need for policy makers to devise a suitable strategy to deal with this growing trend. While the available research does not indicate the need for a plethora of U.S. ports capable of handling these megaships, shipping analysts envision a hub-and-spoke system, similar to the model used by the airline industry. According to this model, these megaships will connect the “global pivot ports,” such as the super-hubs of Asia and the United States, the cargo contained in these megaships will then be transshipped to medium-sized “regional pivot ports” and, finally transported to destinations by rail and road.

In this era of slashing costs and constantly striving for higher levels of efficiency, the driving force behind the introduction of megaships is lowering operating costs. Given the economies of scale, these megaships will be less expensive, on a per-slot basis, to build and operate. In fact, analysts expect that a reduced number of these megaships will be able to carry more containers with fewer crew members while using less fuel. Consequently, the cost of carrying a container will be lowered, enabling shippers to become more competitive by reducing rates. Since ships only produce revenue when they are at sea, these megaships will increase their market share while simultaneously curtailing the number of port calls.

Upgrading a port to fully handle these megaships promises to be a complex, lengthy and expensive proposition. Not only must the channel and berth depth of a port be a minimum 50 feet, a number of related developments such as bigger and an increased number of container cranes; high-speed truck and rail routes to transport cargo both to and from the megaships; warehouses to store the increased cargo load; and, sophisticated computer systems to efficiently track this cargo, remain a few essential requirements. Regardless of whether a port acquires this elite megaport status, all ports, including those in the SLC region, have to devote resources to improve their capacities to deal with the introduction of these megaships to the oceans.

The objective of this Special Series Report is to assess the relative position of the numerous ports in the SLC and how they might be affected by this growing trend toward megaships. The Report begins by tracing the close link between global economic trends—particularly international trade—and maritime transportation. In developing this section, attention will be paid to waterborne commerce in the United States.
States, in general, and the SLC states, in particular. In addition, this section will refer to
the enormous economic benefits generated by ports in the SLC states. The next section
explores the challenges confronting U.S. ports—specifically the SLC ports—with the
emerging wave of megaships. Some of the issues discussed in this section include the
characteristics of megaships, the rationale for their introduction and structural changes
required for a port to accommodate megaships. The third section refers to the role of
the federal government in port policy and compares ports across the United States,
 focusing on the SLC ports once again, highlighting such criteria as U.S. port rankings,
cargo levels, (both volume and value), and containerized imports and exports. Finally,
the Report provides an SLC state-by-state breakdown of the major issues related to
ports such as overall tonnage, primary cargoes, main channel depth, appointment of key
officials to set port policy, and additional details.8
GLOBAL ECONOMIC TRENDS AND MARITIME TRANSPORTATION

Global economic trends and maritime transportation remain tightly interconnected forces that continually feed off of each other. World trade patterns directly influence the amount of cargo loaded and unloaded at the world’s ports. Hence, a downturn in international trade has an immediate negative impact on activity levels at ports. In this context, it is relevant that experts warn that global economic growth could be stifled in 1999 and perhaps into 2000, wrecked by economic weaknesses in Russia, Asia, Brazil, and some regions of Europe, particularly those countries affected by the conflict in the Balkans. The International Monetary Fund (IMF) predicts “a 2.3 percent global economic growth rate this year [1999], down from 2.5 percent in 1998 and 4.2 percent in 1997.”

Confirming this downward trend in global economic growth is the fact that “the rate of growth in world merchandise exports fell to 3.5 percent last year [1998], only one-third of its 1997 growth rate of 10.5 percent, mainly because of the Asian economic crisis.” The World Trade Organization (WTO) also noted that export growth could slow further in 1999, a hint that seaborne trade could also decelerate. Further reinforcing the link between economic growth and seaborne trade is the 1999 Biennial Report from the International Association of Ports and Harbors, which notes that world seaborne trade slowed down in 1998, growing at only 2.2 percent, its lowest since 1987.

These downturns on the international economic front already are impacting negatively on shipping patterns in the United States, a feature reflected in reports from U.S. ports that ships bringing imports to the United States from East Asia—the largest trade route in the world—are stuffed to capacity. However, ships going back to Asia are half-empty since the economic capacity of these Asian countries to purchase goods...
from the United States has diminished vastly. For instance, while imports from East Asia to ports on the West Coast of the United States stood at about 1.7 million containers in 1997, they leapt to about 2.2 million containers in 1998. On the other hand, exports loaded from ports on the West Coast to Asia dipped from 1.3 million containers in 1997 to 1.1 million containers in 1998. This development is confirmed by the huge upsurge in the nation’s trade deficit: in July 1999, it ballooned to the new monthly high of $25.2 billion. According to reports, the weakened exports to Asia are clearly reflected in the form of empty shipping containers stacked four high on the piers of the adjacent ports of Long Beach and Los Angeles.

Regardless of the expected short-term decline in seaborne traffic due to souring global economic conditions, it is important to note that internationally, there is an inexorable trend toward greater openness and trade liberalization extending to practically every corner of the globe. This trend will result in many new trade gateways, causing dramatic changes in market demand and cargo forecasts. This trend also will produce a huge upsurge in international trade and, consequently, in seaborne traffic. Codifying this liberalization trend are several international agreements such as the Asia-Pacific Economic Cooperation Forum (APEC); the Uruguay Round of Talks of the General Agreement on Trade and Tariffs (GATT), now replaced by the World Trade Organization (WTO); and the North American Free Trade Agreement (NAFTA). The specific thrust of these efforts is freer trade, i.e., enhancing trade opportunities internationally through greater degrees of liberalization, deregulation and lower levels of protectionism. Since the ultimate goal of all these efforts is to expand trade among member nations, it has a direct impact on waterborne commerce. In fact, experts predict that this potential growth explosion in international trade will be transported largely as containerized cargo in the global liner trade, all the more reason for the SLC ports to augment their current capacity levels.

The U.S. harbor system, consisting of 299 “deep-draft” (over 14 foot draft) and 630 “shallow-draft” ports, is expected to handle over two billion tons of cargo this year, a number reached every year since 1994. Approximately two-thirds of the total U.S. waterborne cargo is handled by the deep-draft ports. According to the U.S. Army Corps of Engineers, both foreign and domestic waterborne commerce in the United States has increased significantly in the last few decades. Table 1 provides this information.

<table>
<thead>
<tr>
<th>Year</th>
<th>Foreign Exports</th>
<th>Foreign Imports</th>
<th>Domestic</th>
<th>Total</th>
<th>Total (Foreign and Domestic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>107.2</td>
<td>138.7</td>
<td></td>
<td>245.9</td>
<td>675.7</td>
</tr>
<tr>
<td>1965</td>
<td>157.8</td>
<td>244.7</td>
<td></td>
<td>402.5</td>
<td>752.1</td>
</tr>
<tr>
<td>1975</td>
<td>246.8</td>
<td>432.3</td>
<td></td>
<td>679.1</td>
<td>858.3</td>
</tr>
<tr>
<td>1985</td>
<td>328.0</td>
<td>374.3</td>
<td></td>
<td>702.3</td>
<td>919.8</td>
</tr>
<tr>
<td>1995</td>
<td>430.6</td>
<td>610.2</td>
<td></td>
<td>1,040.8</td>
<td>991.6</td>
</tr>
<tr>
<td>1996</td>
<td>408.9</td>
<td>664.6</td>
<td></td>
<td>1,073.5</td>
<td>998.5</td>
</tr>
<tr>
<td>1997</td>
<td>432.3</td>
<td>788.3</td>
<td></td>
<td>1,220.6</td>
<td>1,112.5</td>
</tr>
</tbody>
</table>

Source: U.S. Army Corps of Engineers
Perhaps the most interesting feature of Table 1 is the growing importance of the foreign component in total U.S. waterborne commerce. From less than 27 percent in 1955, foreign trade rose to 43 percent in 1985 and to 52 percent in 1997, a 93 percent increase between 1955 and 1997. The growing foreign component of U.S. waterborne commerce reflects the changing nature of the U.S. economy, with international trade playing an increasingly significant role. In contrast, domestic waterborne trade, as a proportion of total waterborne commerce, declined from a high of 73 percent in 1955 to 48 percent in 1997, a percentage decline of 34 percent.

More recent statistical information on the level of foreign waterborne cargo, collected by the Maritime Administration and the U.S. Army Corps of Engineers, shows that in the first two months of 1999, total seaborne cargo (exports and imports) amounted to 162,790 metric tons and a value of $92,306 million.16

Any discussion of U.S. waterborne commerce should certainly include reference to America’s major trading partners, i.e., exporters and importers. The Seaports of the Americas: 1999 American Association of Port Authorities (AAPA) Directory contains this information and is represented in Tables 2 and 3.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Exports</th>
<th>Imports</th>
<th>Total</th>
<th>Percent of Total U.S. Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Venezuela</td>
<td>5,264</td>
<td>104,105</td>
<td>109,369</td>
<td>10.5%</td>
</tr>
<tr>
<td>2</td>
<td>Mexico</td>
<td>14,830</td>
<td>82,156</td>
<td>96,986</td>
<td>9.4%</td>
</tr>
<tr>
<td>3</td>
<td>Japan</td>
<td>68,342</td>
<td>11,657</td>
<td>79,999</td>
<td>7.7%</td>
</tr>
<tr>
<td>4</td>
<td>Canada</td>
<td>27,522</td>
<td>48,582</td>
<td>76,104</td>
<td>7.3%</td>
</tr>
<tr>
<td>5</td>
<td>Saudi Arabia</td>
<td>3,472</td>
<td>65,610</td>
<td>69,082</td>
<td>6.7%</td>
</tr>
<tr>
<td>6</td>
<td>Nigeria</td>
<td>1,068</td>
<td>41,498</td>
<td>42,566</td>
<td>4.1%</td>
</tr>
<tr>
<td>7</td>
<td>Brazil</td>
<td>11,673</td>
<td>17,147</td>
<td>28,819</td>
<td>2.8%</td>
</tr>
<tr>
<td>8</td>
<td>United Kingdom</td>
<td>12,581</td>
<td>16,163</td>
<td>28,744</td>
<td>2.8%</td>
</tr>
<tr>
<td>9</td>
<td>China</td>
<td>7,944</td>
<td>19,696</td>
<td>27,640</td>
<td>2.7%</td>
</tr>
<tr>
<td>10</td>
<td>South Korea</td>
<td>23,079</td>
<td>4,309</td>
<td>27,388</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

Total-Top 10 175,775 410,923 586,697 2.2%
Total-All Countries 369,803 667,957 1,037,760

Source: Seaports of the Americas: The 1999 AAPA Directory
Note: Totals columns may vary due to rounding

Table 2 indicates that in terms of seaborne traffic, Venezuela was America’s largest trading partner, accounting for 10.5 percent of all cargo transported by sea. Mexico and Japan, with 9.4 percent and 7.7 percent respectively, occupied the second and third spots in this category. Exports to Japan, transported by sea, ranked first among all U.S. export destinations. Canada and South Korea ranked second and third in this category. On the import front, Venezuela ranked first (mostly crude oil), while Mexico and Saudi Arabia ranked second and third as importers to the United States.
Table 3 demonstrates that in terms of value, the United States’ top trading partner for seaborne traffic was Japan, accounting for more than 18.5 percent of the total value. China, with 9.9 percent, and Germany, with 5.2 percent of the total value ranked second and third in 1997. Japan’s dominance as the United States’ top trading partner—value wise—is further reinforced by the fact that in terms of both seaborne exports and imports, Japan occupies the top position. While South Korea and the United Kingdom placed second and third with respect to seaborne exports, China and Germany placed second and third in terms of seaborne imports.

An interesting analysis of U.S. waterborne foreign commerce involves breaking it down regionally, the South Atlantic vs. the Gulf of Mexico etc. Figure 1 performs this task by total cargo volume (in metric tons) for 1998.
As evident in Figure 1, the South Atlantic and Gulf regions—regions that include a majority of the SLC states—account for a sizable portion of total U.S. waterborne foreign commerce. Specifically, these two regions account for 60 percent of the total U.S. foreign waterborne cargo. In terms of value, the breakdown by region has the South Atlantic and Gulf regions contributing to 33 percent of U.S. waterborne foreign commerce. While this is less than the percentage by volume, it is still significant. Even in 1997, the contribution of these two coastal regions was substantial. For instance, out of a total tonnage of 1,066.8 metric tons (valued at $625.6 billion) in waterborne foreign trade, the South Atlantic and Gulf regions, once again, accounted for about 60 percent, or 632.1 metric tons (value, $211.3 billion).

In addition to the waterborne commerce statistics for the United States as a whole and by coastal region, similar data for the 16 states in the SLC are available. Even though the state-specific data in the U.S. Department of Transportation’s October 1998 report is from 1996, it is still instructive. Table 4 contains this information.
The dominance of the SLC state ports in the overall U.S. waterborne tonnage is clearly evident in Table 4. Specifically, the SLC states accounted for 68 percent of all waterborne tonnage transported in the United States during the review period, with Louisiana, Texas and Florida ranking in the top three in terms of waterborne tonnage in 1996.

As noted above, the economic impact of ports across the country, in general, and the SLC states, in particular, is enormous. An elaboration on that theme is appropriate to report on the economic viability of SLC state ports and related industries. The U.S. Department of Transportation calculates the cumulative economic impact of all U.S. ports by computing the individual economic impacts of the port industry, capital expenditure projects and port users. Using this definition, Table 5 summarizes the total economic impact of port-related activities in 1996, the most recent year for which data is available.
As mentioned previously, the cumulative U.S. port system created an imposing 13.1 million jobs; generated $494.2 billion in income and $1,520.5 billion in sales; contributed $742.9 billion toward the nation’s GDP; and collected $146.4 billion and $53.1 billion in federal and state/local taxes respectively. These cumulative numbers originated in three main categories of the port system: the port industry, capital expenditure projects and port users. In turn, the economic contributions of these three categories included direct, indirect and induced impacts, with the latter two impacts flowing from the multiplier effect of the direct impact spending.

Some background on the three impact categories is helpful at this stage. The port industry includes the actual transshipment process; pilotage and dockage; trade services for freight forwarders, customs and insurance brokers; cargo handling and storage activities; and inland transportation. The public port industry’s capital expenditure program includes the construction and modernization of terminal facilities and channel dredging. Finally, port users are businesses that make substantial use of waterborne commerce for shipping or receiving goods. The economic impact derived from these three categories—direct, indirect and induced—is reflected in Table 5.

The U.S. Department of Transportation also presents data on how the economic impact of ports across the United States is distributed among the different industries. Table 6 contains this information with the percentage breakdown of industries gaining from the movement of waterborne cargo.
Table 6 depicts how the economic impact of U.S. ports is distributed across the economy by industry and which industries gain more than others from the transportation of waterborne cargo. In general, the manufacturing sector remains a clear winner in all four impact categories; services, retail trade, finance, insurance and real estate and wholesale trade are also beneficiaries, though, to a lesser extent.

While the above section described the economic benefits accruing to the nation as a whole, it is also possible to present information on the tremendous gains accruing to a number of SLC state economies from port-related activities. These gains contribute significantly to the health of these individual SLC state economies.

**Alabama**

Alabama State Docks, the entity responsible for port-related activities in the state, notes that in fiscal year 1997, the economic impact of Alabama’s ports amounted to an impressive $3 billion. This included collecting $467 million in state taxes and providing jobs for 118,000 people across the state. Alabama State Docks, dedicated in 1928, handled 1,250 vessel calls and 36.3 million tons of cargo ranging from iron ore to coal to petroleum to forest products in fiscal year 1997. In fact, Alabama ranks first and second, nationally, for the amount of wood pulp and forest products handled at its ports.

**Florida**

Florida is an SLC state attractive to the shipping industry, given its proximity to key foreign markets and waterways, particularly the burgeoning Latin American region. This has resulted in the state attracting a substantial amount of business to its South Atlantic and Gulf Coast ports. In fact, the Florida Ports Council notes that Florida’s 14 publicly-owned deepwater ports remain the keystones of the state’s fastest growing
industry: international trade. This trade, two-thirds of which flowed through its seaports, reached $64.3 billion in 1997, and is estimated to double by the year 2005 to $130 billion. Florida’s seaports collectively seek to enhance the economic vitality and quality of life in the state by fostering the growth of domestic and waterborne commerce. In fact, the Florida Seaport Transportation and Economic Development Council projected in 1994 that the state’s ports, including trade and cruise activity, and port-dependent businesses generated more than 300,000 jobs and boosted state and local tax revenues by $600 million. It is safe to speculate that this amount has increased considerably in the last five years.

After the Ports of Miami, Everglades (Fort Lauderdale) and Tampa, the Port of Jacksonville ranks fourth among Florida’s ports. Its special niche is in the handling of automobiles, in which it ranks third in the United States. The Jacksonville Port accounts for 12 percent of all vehicles imported for the domestic automobile market in the country. According to the Jacksonville Port Authority (JAXPORT), in 1996, the Port’s maritime economic impact was: 10,906 jobs, $1.07 million in sales, $274 million in wages, $24 million in local taxes and $27 million in state taxes, a total economic impact of $1.4 billion.

Florida’s second ranking port, Port Everglades in the Fort Lauderdale area, has rapidly become one of South Florida’s strongest economic engines, with annual operating revenues of nearly $65 million and total waterborne commerce exceeding 20 million tons in liquid, bulk and containerized cargoes.

**Georgia**

The Georgia Ports Authority (GPA), the public agency charged with developing and operating the state’s coastal and river ports to create greater statewide economic benefits, reported that at the end of fiscal year 1998, cargo handled by GPA facilities surged to record levels for the eleventh year in a row. The record-setting 11.4 million tons of cargo handled in fiscal year 1998—a 5.1 percent increase over the previous fiscal year—reinforced the vibrancy of international trade in the state and throughout the southeastern United States. The end result of the impressive cargo transported through GPA facilities is its statewide economic impact. Specifically, in fiscal year 1998, the GPA and private terminals combined to generate $23 billion in revenue, $1.8 billion in income, $585 million in state and local taxes, and 80,100 jobs throughout the state.

**Louisiana**

In March 1998, Timothy Ryan from the University of New Orleans, published the results of his research on the economic impact of the ports and maritime industry in Louisiana. As Mr. Ryan noted, “the ports of Louisiana and the maritime industry are crucial parts of the Louisiana economy.” The most significant part of the economic impact of the ports is linked to the economic activities of port users—largely importers and exporters—utilizing port facilities. Given Louisiana’s proximity to the Mississippi River and the Gulf of Mexico, numerous manufacturing and warehousing operations are located in the state. As a result, the total economic impact of the Louisiana ports in 1997 was $28.1 billion. This impact included $9.7 billion in direct spending and $18.4 billion in secondary spending. Of this total, ports and related activities generated $4.8 billion in total income for Louisiana residents, and supported, in part, or in whole, 229,871 jobs across the state. In fact, this amounted to approximately one out of every eight jobs in the state, a formidable number indeed.
Of note, Louisiana’s ports contributed 28 percent to the state’s 1997 gross state product (GSP), the total value of goods and services produced in the state. The ports and related activities also produced 5.6 percent of the entire personal income in the state. In 1997, the economic activities of the ports and the maritime industry brought in $395 million in state and local tax revenue. This consisted of $266.2 million in tax revenues for the state and the remaining $128.8 million for local governments. Mr. Ryan estimates that this tax revenue “will recur every year and will increase as the activities of the maritime industry increase.”

Finally, in terms of percentage increases in the economic impact of Louisiana’s ports, Mr. Ryan’s research results are equally impressive. For instance, between 1994 and 1997, total cargo handled by the state’s ports increased by over 22 percent. Similarly, the total economic impact increased from $21.9 billion in 1994 to $28.1 billion in 1997, a percentage increase of more than 28 percent. While employment shot up by almost 29 percent during this period, total tax revenue also expanded by over 27 percent.

**Maryland**

The Maryland Port Administration commissioned a study this year to assess the economic impact of the Port of Baltimore on the state’s economy. The study, considered more detailed than those conducted previously, underscored the fact that the Port’s influence on the state’s economy reaches far and wide. Accordingly, the total number of direct, induced, indirect and related jobs associated with the Port of Baltimore is about 126,700. This amounts to nearly 6 percent of the state’s work force. Specifically, the breakdown was 17,700 direct jobs generated by activities at the Port; 83,100 jobs related to activities at the Port; 11,300 induced jobs supported by the local purchases of goods and services by direct employees; and 14,600 indirect jobs supported by the business purchases of employers who create direct jobs. These jobs range from longshoremen to steamship agents to truck drivers to wait staff.

The largest employer at the Port of Baltimore is Bethlehem Steel in the Sparrow’s Point section of the Port. Since the company imports its raw material through the Port, it is regarded as a business whose 5,400 jobs would not exist without the Port. In addition, trucking companies employ the equivalent of 2,909 full-time workers in Port-related jobs, while there are 1,331 longshoremen jobs. The commodity responsible for the most jobs at the Port is iron ore, used to make steel at Bethlehem Steel. The commodity that creates the second-highest number of jobs is container cargo with 2,601 jobs, followed by sugar and other bulk products, manufactured steel and cars. The study also reported that the average annual salary of workers directly employed by the Port stood at $42,000 last year. This was a marked improvement over the $33,000 average salary workers made in 1992, the last year when a similar economic impact study was done.

Direct Port-related jobs paid $742.8 million in salaries in 1998. Because most of that money is spent in the Maryland economy—the study estimates 85 cents for every dollar—the total “income impact” of the Port was estimated at $1.4 billion. On the tax front, Port activity generated $286.3 million in state and local taxes last year. This figure included income, sales, property and government registration taxes and user fees.
Mississippi

The Mississippi State Port Authority (MSPA) reported that after years of financial losses, its Gulfport facility was finally generating revenue, even after subtracting income from the casinos. (The MSPA leases port-owned land to two casinos.) In addition, the facility’s operational performance has improved sufficiently to realize a significant increase in the number of vessel calls and level of cargo handled. State reviews conducted in 1986 and 1990 found “the port to be in decline, ineffective and dependent on state and local financial help.”

This situation has been transformed in recent years and about 300 vessels call at the Gulfport facility every year. In fact, the MSPA estimated that in 1995 these vessel calls resulted in an economic impact of $529 million. The Port Authority’s executive director notes that “[T]he port is embarking on a five-year, $100 million construction plan that may add another $250 million in annual economic impact to the state.” Finally, the MSPA states that between the casinos and hotels, the privately owned stevedores, the Port staff and others, the Port provides more than 1,000 jobs.

North Carolina

The North Carolina Ports Authority (NCPA) touts the state’s ports (Wilmington and Morehead City) as having a significant impact on the economic vitality of the state. The agency also notes that the state’s ports are entirely self-supporting. In fiscal year 1998, the Port of Wilmington handled a total of 2,157,533 tons of cargo and 105,997 TEUs; the Port of Morehead City handled a total of 2,693,187 cargo tons. According to the NCPA, port operations provided over 80,000 jobs around the state and generated nearly $300 million in tax revenues statewide.

South Carolina

South Carolina is another SLC state with a thriving port-related economy. The South Carolina State Ports Authority (SPA) contributes to the economic development of the state by fostering and stimulating waterborne commerce and the shipment of freight. The SPA estimates that each day an average of six vessels sail into the state’s harbors, carrying more than 32,000 tons of cargo worth more than $75 million. Last year, the SPA’s terminals moved more than 12 million tons of cargo valued at $29 billion. According to the SPA, the Port of Charleston, the state’s main Port, was the nation’s fourth busiest container Port in 1998. In fact, more than 40 steamship lines carry U.S. trade between Charleston and 140 countries around the world.

In fiscal year 1998, international trade through the SPA’s facilities produced 83,085 jobs throughout the state while pumping in $10.7 billion in sales, $2.6 billion in wages and $314 million in taxes into the South Carolina economy. An impressive one-in-28 jobs in the state is related to trade through the SPA’s terminals. Alongside the 700 companies from every county in the state that routinely ship through the SPA’s facilities, there are hundreds of transportation companies that facilitate trade. The businesses include the SPA and its 490 employees; 50 steamship lines; 11 stevedores and hundreds of longshoremen; 131 truck lines; two Class I railroads; two tug companies; 55 customs house brokers and freight forwarders; and hundreds of other firms.

Texas

Among the numerous ports in Texas, the Port of Houston is the most important. In fact, the Port of Houston Authority indicates that it is the world’s eighth largest port and that it ranks first in the United States in foreign waterborne commerce and second in total tonnage. The Houston Ship Channel has been a catalyst for growth in Harris
County since the maiden voyage of a steamship up Buffalo Bayou in 1837. In 1998, the Port moved an estimated 170 million tons of cargo and handled 968,169 TEUs, or container units. Goods moved in foreign trade via the Port amounted to 107.8 million short tons (valued at $36.3 billion) while 7,093 ships called at the Port during 1998.

In 1997, it was estimated that the Port’s public and private marine terminals generated 204,520 jobs in Texas and another 436,500 nationwide. It should also be noted that direct jobs affiliated with Port of Houston activity (those jobs created by the companies providing support services to the cargo handling and vessel-related services of the Port) amounted to 75,487; significantly, 90 percent of these jobs are held by City of Houston and Harris County residents. Furthermore, research shows that the Port’s activity created an additional 129,033 related jobs, i.e., jobs generated locally and throughout the regional economy due to purchases of goods and services by those directly associated with Port activity.

Excluding the value of cargo shipped through the public and private marine terminals on the Houston Ship Channel, more than $7.7 billion in business revenue was created by businesses providing services at the terminals. (This was an increase over the $5.5 billion reported in the 1994 economic impact study.) Finally, research also shows that the Port generated $525 million annually in state and local taxes. The Port of Houston Authority projects that the Port will continue to be an important factor as trade between the Americas expands.

In concluding this section on the economic impact of port and related activities in some of the SLC states, Table 7 encapsulates the information contained in the narrative.

### Economic Impact of Ports in Selected SLC States

<table>
<thead>
<tr>
<th>SLC State/Year</th>
<th>Jobs</th>
<th>Taxes</th>
<th>Sales</th>
<th>Income</th>
<th>Wages</th>
<th>Revenue</th>
<th>Total Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama (1997)</td>
<td>118,000</td>
<td>$467 mill.</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>$3.6 bill.</td>
</tr>
<tr>
<td>Florida (1994)</td>
<td>300,000</td>
<td>$600 mill.</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>$1.4 bill.</td>
</tr>
<tr>
<td>Jacksonville (1996)</td>
<td>10,906</td>
<td>$51 mill.</td>
<td>$1.07 mill.</td>
<td>N/A</td>
<td>N/A</td>
<td>$274 mill.</td>
<td>N/A</td>
</tr>
<tr>
<td>Georgia (1998)</td>
<td>80,100</td>
<td>$585 mill.</td>
<td>N/A</td>
<td>$1.8 bill.</td>
<td>N/A</td>
<td>N/A</td>
<td>$23 bill.</td>
</tr>
<tr>
<td>Mississippi (1995)</td>
<td>1,000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>$529 mill.</td>
</tr>
<tr>
<td>North Carolina (1998)</td>
<td>80,000</td>
<td>$300 mill.</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>South Carolina (1998)</td>
<td>83,085</td>
<td>$314 mill.</td>
<td>$10.7 bill.</td>
<td>N/A</td>
<td>$2.6 bill.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Texas (1997)</td>
<td>641,020</td>
<td>$525 mill.</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>$7.7 bill.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: www.asdd.com (Alabama); www.fsu.edu (Florida) and www.jaxport.com (Jacksonville); www.gaports.com (Georgia); Ryan, Timothy (Louisiana); The Baltimore Sun (Maryland); The Clarion-Ledger (Mississippi); www.ncports.com (North Carolina); www.port-of-charleston.com (South Carolina); www.portofhouston.com (Texas)

a = The economic impact here is for the Port of Baltimore.
b = The economic impact here is for the Port of Gulfport.
c = The economic impact here is for the Port of Houston.
N/A= Information Not Available.
MEGASHIPS AND MEGAPORTS:
AN EMERGING TREND IN SHIPPING

In the long history of merchant shipping, two seminal events loom larger than all others: the introduction of the compound engine in the late 1860s, and about a century later, the widespread adoption of containers. The container, a big steel box of two basic sizes, enables entire ships to be filled up with crates of the same size as opposed to the previously used break bulk approach. Under this former approach, cargo of varying sizes, shapes and designs was stowed in the holds and decks of merchant vessels. While loading and unloading under this method took inordinate periods of time and was labor-intensive, transporting cargo in similar-sized containers not only significantly cuts down on time and labor costs, it significantly reduces the damaged goods quotient. The reduced time devoted to loading and unloading cargo enabled containerships to spend more time traveling between ports, delivering cargo faster and at considerably diminished cost.

Currently, the world’s container fleet consists of three main vessel categories: Feeder (less than 1,000 TEU capacity); Panamax and Sub-Panamax (between 1,000 and 4,000 TEU capacity, capable of transiting the Panama Canal); and Post-Panamax (4,000 + TEU capacity, which exceeds the Panama Canal’s dimensions). As expected, the physical and operational characteristics of these container vessels differ widely as their capacities increase, placing rising demands on navigation channels, port infrastructure and landside access capabilities. Interestingly, the newest generation of megaships, the Regina Maersk, the Hanjin London and the Hyundai Independence, for instance, all are considerably bigger than the largest Post-Panamax vessel from the earlier era. Specifically, the Regina Maersk is 1,043 feet in length while even the largest Post-Panamax vessel from the earlier era averages only 925 feet; in addition, the Regina Maersk can carry up to 6,600 containers while the former Post-Panamax era
vessels carries a little over 4,000 containers. Shipping experts project that the vessels of the future will be even larger, capable of ferrying 15,000 20-foot containers across the oceans.

As noted earlier, a rapidly-liberalized trade environment will bring about a tremendous surge in transportable cargo volumes in the medium-to long-term. Significantly, this cargo growth is expected to be transported largely in containers; even now, an estimated 55 percent of all general cargo is moved in them. Furthermore, shipping experts project that by 2010 some 90 percent of all international liner freight will be shipped in containers. Leaving aside future growth, worldwide container trade is currently growing at an annual rate of 9.5 percent, with U.S. ports recording 6 percent growth rates on the average. Given the fact that a large proportion of these containers will be transported in megaships, the need for ports to be prepared for this development remains critical, especially in the SLC states.

Even though only 1 percent of the world’s containership fleet currently is in the 4,500+ TEU category, i.e., megaship category, 8 percent of the containerships currently on order are ships in that class. Also, experts predict that by 2010, nearly 33 percent of all general cargo traveling through U.S. ports will be on ships built to carry more than 4,500 TEU container units, or megaships. Furthermore, ships in the 6,000 to 9,000 TEU range are expected to grow to about 9.5 percent of the total containerized fleet by 2010. All these factors point to a scenario in which in a few years, an overwhelming share of transportable cargo will be in containers and on megaships.

Use of containers, particularly in Asia, is expanding by as much as 25 percent annually, and this has resulted in the Asian continent producing a majority of the world’s busiest container ports. According to the Containerisation International Yearbook 1998, worldwide container port traffic exceeded the 147 million TEU barrier in 1996, compared with 137 million in 1995. The continuing growth of the regional hub ports, Hong Kong and Singapore—major transshipment points in the East Asian region—proved to be notable once again. In fact, Hong Kong continues to work on a plan to handle 32 million containers per year by 2010, an amount that would far exceed projected volumes for the very largest U.S. port.
In terms of containerization in U.S. waterborne trade, experts anticipate that the fastest growth rates will be seen in shipping patterns with Latin America. The rapid pace of industrial development in Latin America is expected to stoke the demand for manufacturing inputs southbound and finished goods heading north. The expanding world trade scenario has enabled an even greater array of commodities to be transported in containers. For instance, the banana trade from Central and South America—long dominated by bulk shipments on pallets—is quite likely to be shipped in containers given the tremendous improvements in containerized refrigeration technology.27

Another measure indicating the growing importance of container traffic in international seaborne trade revolves around the degree of containerization at the different ports, i.e., the amount of general cargo moved in containers through a specific port. According to the Institute of Shipping Economics and Logistics (ISL), American ports have the highest degree of containerization in the world,28 further evidence that megaships will assume a dominant role in international shipping circles in upcoming years, and that container shipping will become the preferred course of waterborne transportation.

The rapid growth in containerized exports and imports is represented in Table 8, which breaks down U.S. container traffic by major trade routes for the period 1994 through 1999. (1998 and 1999 are forecasts)

<table>
<thead>
<tr>
<th>Year</th>
<th>Trans-Pacific</th>
<th>Trans-Atlantic</th>
<th>Other</th>
<th>Total</th>
<th>Trans-Pacific</th>
<th>Trans-Atlantic</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>3,968,099</td>
<td>1,405,830</td>
<td>1,163,878</td>
<td>6,537,807</td>
<td>2,832,311</td>
<td>1,038,618</td>
<td>1,536,286</td>
<td>5,407,215</td>
</tr>
<tr>
<td>1995</td>
<td>3,988,037</td>
<td>1,444,075</td>
<td>1,280,095</td>
<td>6,712,207</td>
<td>3,122,503</td>
<td>1,200,730</td>
<td>1,847,634</td>
<td>6,170,867</td>
</tr>
<tr>
<td>1996</td>
<td>4,025,189</td>
<td>1,423,329</td>
<td>1,404,065</td>
<td>6,852,583</td>
<td>3,086,668</td>
<td>1,210,139</td>
<td>1,912,281</td>
<td>6,209,088</td>
</tr>
<tr>
<td>1997</td>
<td>4,495,230</td>
<td>1,607,559</td>
<td>1,556,726</td>
<td>7,659,515</td>
<td>3,155,929</td>
<td>1,383,387</td>
<td>2,227,008</td>
<td>6,766,324</td>
</tr>
<tr>
<td>1998</td>
<td>4,941,364</td>
<td>1,745,565</td>
<td>1,734,843</td>
<td>8,421,772</td>
<td>3,137,278</td>
<td>1,515,912</td>
<td>2,473,932</td>
<td>7,127,122</td>
</tr>
<tr>
<td>1999</td>
<td>5,407,616</td>
<td>1,867,301</td>
<td>1,916,058</td>
<td>9,190,975</td>
<td>3,242,885</td>
<td>1,649,907</td>
<td>2,738,538</td>
<td>7,631,330</td>
</tr>
</tbody>
</table>


As indicated in Table 8, there has been a steady increase in both containerized imports and exports in the United States. In the five-year period between 1994 and the forecasted amount in 1999, containerized imports increased by 41 percent (in TEUs); similarly, containerized exports during the same period accelerated by 41 percent TEUs. Even between 1998 and 1999, imports increased by 9.1 percent TEUs and exports by 7.1 percent TEUs. These trends substantiate the growth in containerized goods transported through ports across the United States.

The escalating trend toward containerization is also apparent in a review of imports and exports—in TEUs—for a number of key SLC state ports for the period 1995 to 1999. The potent TEU growth rate in these SLC state ports is ample evidence of the global containerization trend and the onset of megaships. (This data is extracted
from the Summer 1998 issue of *PIERS’ Port Horizons* and includes forecasts for the latter part of 1998 and all of 1999. The forecasts are based on average port market shares in the latest four quarters, projected over trade lane growth.)

Table 9 reinforces the notion that containerized traffic continues to remain pivotal in the operations of ports across the country and for purposes of our review, in the SLC states. Between 1995 and 1999, it is estimated that the SLC state ports, listed in Table 9, accounted for about one-third of all containers transported in the United States. From 32 percent in 1995, the number increased to 33 percent in 1996, 34 percent in 1997, and is expected to remain steady at 35 percent in both 1998 and 1999.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Baltimore, MD</td>
<td>297,125</td>
<td>267,845</td>
<td>253,945</td>
<td>269,144</td>
<td>290,324</td>
</tr>
<tr>
<td>Virginia Ports</td>
<td>650,944</td>
<td>697,734</td>
<td>797,025</td>
<td>858,218</td>
<td>923,273</td>
</tr>
<tr>
<td>Wilmington, NC</td>
<td>76,985</td>
<td>84,744</td>
<td>84,539</td>
<td>86,535</td>
<td>92,792</td>
</tr>
<tr>
<td>Charleston, SC</td>
<td>740,698</td>
<td>786,866</td>
<td>935,357</td>
<td>1,014,137</td>
<td>1,088,510</td>
</tr>
<tr>
<td>Savannah, GA</td>
<td>439,900</td>
<td>452,141</td>
<td>524,718</td>
<td>552,579</td>
<td>593,157</td>
</tr>
<tr>
<td>Jacksonville, FL</td>
<td>175,326</td>
<td>175,890</td>
<td>183,553</td>
<td>201,136</td>
<td>217,297</td>
</tr>
<tr>
<td>Fernandina Beach, FL</td>
<td>18,631</td>
<td>13,658</td>
<td>14,580</td>
<td>16,830</td>
<td>18,196</td>
</tr>
<tr>
<td>Mobile, AL</td>
<td>14,435</td>
<td>16,427</td>
<td>12,604</td>
<td>13,913</td>
<td>14,795</td>
</tr>
<tr>
<td>Gulfport, MS</td>
<td>107,401</td>
<td>106,052</td>
<td>120,760</td>
<td>132,661</td>
<td>148,102</td>
</tr>
<tr>
<td>New Orleans, LA</td>
<td>198,838</td>
<td>196,963</td>
<td>224,200</td>
<td>242,774</td>
<td>266,222</td>
</tr>
<tr>
<td>Lake Charles, LA</td>
<td>18,157</td>
<td>16,824</td>
<td>22,411</td>
<td>27,152</td>
<td>30,508</td>
</tr>
<tr>
<td>Galveston, TX</td>
<td>32,759</td>
<td>6,008</td>
<td>7,151</td>
<td>7,520</td>
<td>8,467</td>
</tr>
<tr>
<td>Freeport, TX</td>
<td>25,880</td>
<td>32,666</td>
<td>29,497</td>
<td>33,418</td>
<td>37,376</td>
</tr>
<tr>
<td>Miami, FL</td>
<td>485,437</td>
<td>494,631</td>
<td>609,458</td>
<td>664,156</td>
<td>723,100</td>
</tr>
<tr>
<td>Port Everglades, FL</td>
<td>378,541</td>
<td>395,819</td>
<td>427,536</td>
<td>463,331</td>
<td>511,090</td>
</tr>
<tr>
<td>West Palm Beach, FL</td>
<td>66,589</td>
<td>74,774</td>
<td>88,665</td>
<td>98,634</td>
<td>107,665</td>
</tr>
<tr>
<td>Houston, TX</td>
<td>452,764</td>
<td>495,771</td>
<td>568,211</td>
<td>624,358</td>
<td>673,539</td>
</tr>
<tr>
<td>Selected SLC Ports</td>
<td>4,180,410</td>
<td>4,314,813</td>
<td>4,904,210</td>
<td>5,306,496</td>
<td>5,744,413</td>
</tr>
<tr>
<td>All Other Ports</td>
<td>8,702,664</td>
<td>8,746,860</td>
<td>9,585,014</td>
<td>10,071,735</td>
<td>10,829,545</td>
</tr>
<tr>
<td>Total U.S. Ports</td>
<td>12,883,074</td>
<td>13,061,673</td>
<td>14,489,224</td>
<td>15,378,231</td>
<td>16,573,958</td>
</tr>
</tbody>
</table>

Source: *PIERS’ Port Horizons, Journal of Commerce,* Summer 1998

- The data is for containerized, commercial cargo only; household goods, bulk, military and government cargoes are excluded.
- The three Virginia ports are Norfolk, Portsmouth and Newport News.
- Table 9 includes cumulative exports and imports to North East Asia, South East Asia, North Europe, Mediterranean, East Europe, Central America, Caribbean, South America, Mid-East, India/Other, Africa and Oceania.

Table 9 reinforces the notion that containerized traffic continues to remain pivotal in the operations of ports across the country and for purposes of our review, in the SLC states. Between 1995 and 1999, it is estimated that the SLC state ports, listed in Table 9, accounted for about one-third of all containers transported in the United States. From 32 percent in 1995, the number increased to 33 percent in 1996, 34 percent in 1997, and is expected to remain steady at 35 percent in both 1998 and 1999.
1999. Of the SLC ports listed, Charleston, South Carolina, is expected to retain its position as the premier mover of containers in 1999, a ranking Charleston attained in the four prior years as well. This statistic confirms Charleston’s national prominence as one of the nation’s top container ports. Some of the other major SLC container ports in 1999 include the Virginia ports, Miami, Houston, Savannah and Port Everglades.

While Table 9 demonstrates the growth in containerized traffic in the SLC state ports, Figure 2 compares growth rates in container traffic for the United States as a whole and the SLC state ports between 1996 and 1999.

As evident in Figure 2, the rate of growth for containerized traffic in the SLC ports exceeded the United States as a whole for the period 1996 to 1999. On the average, container traffic growth reached 8.35 percent per year in the SLC state ports during this period; in the United States it reached 6.55 percent. The highest rate was attained in 1997 when the SLC state ports’ growth stood at 13.7 percent and the U.S. port average was 10.9 percent.

While the orders for megaships gradually increase in response to the preference for containers and other world economic conditions, many shipping carriers are entering into alliances and/or merging with one another to pay for the huge capital expenditures associated with megaships. This trend, replicated in so many other spheres of the international economy from banking (NationsBank and Bank of America) to finance (Solomon Brothers and Smith Barney) to automobiles (Daimler-Mercedes Benz and Chrysler Corporation) to telecommunica-tions (GTE and BellAtlantic) to pharmaceuticals (American Cyanamid and American Home Products) to gasoline (BP, Amoco and ARCO) to aviation (General Dynamics and Gulfstream or Boeing and McDonnell Douglas), to agro-industry (Dupont and Pioneer Hi-Breed) for instance, is certainly evident in the shipping industry too. Shipping alliances, vessel-sharing and other cooperative arrangements continue to flourish as carriers seek to maximize the use of these megaships, consolidate operations and lower operating costs.
By integrating vessel operations, facilities, and equipment to reduce operating costs, consumers and carriers are purportedly rewarded with expanded and improved services; minimal investment costs and risks; and reduced competition among alliance partners and within the trade. Some of the alliances that have occurred in the industry include P&O (U.K.), Nedlloyd (Netherlands), Hapag-Lloyd (Germany), and NYK (Japan); Hyundai (South Korea), MOL (Japan), APL (U.S.), OCCL (China), and Neptune Orient Line (Singapore); K Line (Japan) and Yangming (Taiwan); Hanjin (South Korea), DSR-Senator (Germany), and Cho Yang; and Maersk (Denmark) and Sea-Land (U.S.). These shipping lines cumulatively account for almost the entire container capacity in the world, and the fact that they are entering into cooperative arrangements with each other is indicative of the urgency driving them to enhance profit margins and protect their capital investments while continuing to expand into new markets.

As mentioned, the driving force behind the construction of these megaships is an attempt to reduce shipping costs, i.e., further lower the unit cost of shipping a container. Megaships are costlier to build than their smaller counterparts—an estimated $100 million per ship at least—with actual unit costs varying based on design characteristics and the number of vessels ordered. However, they offer numerous operational advantages such as lower transit costs, reduced transit time and a fewer required vessels. Experts indicate that a fully loaded 6,000-TEU capacity ship costs about 21 percent less to operate per TEU than does a 4,000-TEU capacity ship. The high-speed hull design of these megaships cuts transit time while the faster port turnaround time reduces the number of vessels required to maintain departure schedules. According to the Institute of Shipping Economics and Logistics, ships entering the merchant vessel fleet in the years to come will be largely built in shipping yards overseas, with Japan, South Korea, China, Germany, Italy, Finland and Poland being the primary manufacturers in order of significance.

Since these megaships are extremely capital-intensive, carriers will deploy them in concentrated trade lanes and utilize them over longer routes so as to reduce the number of port calls. However, an important requirement for the success of these megaships involves substantial improvements in the infrastructure of the ports at which they will call. Hence, even though these vessels offer economies of scale at sea, the failure to enhance port facilities could negate the advantages of the economies of scale in port. Therefore, it is vital for port infrastructure to grow in tandem with the onset of megaships so that the inherent economies of scale may be fully captured.
TRANSITIONING TO MEGASHIPS

There are currently very few ports in the United States with the infrastructure capacity to fully handle the megaships being added to the contemporary Post-Panamax fleet. Given the thrust toward these megaships, it is imperative for ports to improve their facilities to share in the projected growth in container traffic. While the rationale for megaships was laid out earlier, it is relevant to consider the basic requirements for a port to accommodate megaships. According to the U.S. Department of Transportation, a single optimal megaship terminal should have, at a minimum, the following physical characteristics:

- 2,500 linear feet of berthing for megaships; this amounts to two 1,250-foot megaship berths;
- 3,000 linear feet of berthing for mixed vessels; this amounts to three 1,000-foot Post-Panamax berths, or a greater quantity for smaller vessels;
- 50-foot water depths in channel and at berths; 800-to-1,000-foot channel widths; 1,430-to-1,650-foot turning basin;
- High rates of berth occupancy (targeted at 50 percent or greater); given two berths, this means that both would be occupied 25 percent of the time, one occupied 50 percent of the time, and both empty 25 percent of the time;
- Three or more large, heavy-lift Beyond Post-Panamax (BPP) cranes per berth; this means that given the berth occupancy targets above, there will be three cranes available per vessel 33 percent of the time and six cranes per vessel 67 percent of the time, for an average of five cranes per vessel; three BPP cranes will provide an adequate vessel turnaround time;
- Stronger wharves to support more and heavier load-bearing cranes, accommodate deeper drafts at berths, permit more yard equipment such as trucks and rail cars;
- Projected annual “throughput” (cargo transported through the gate less possible transshipment) should range from a minimum of 450,000 TEUs per year (3,000 TEUs per acre) to 900,000 TEUs per year (6,000 TEUs per acre);
- Rail connections should be on-dock, or adjacent intermodal railyard, with 2-4 unit train calls per day (40 percent intermodal split);
- Truck traffic on a typical day should accommodate 1,730 to 3,460 trips per day (40 percent split with a rail system) or 2,880 to 5,770 trips per day (with no rail transportation);
- 75 acres of terminal space per megaship berth and 50 acres per standard berth; this translates to 150 acres per 3,000 linear feet of berthing; and
- A gate complex and dockside rail system using the latest available technologies.
At a minimum, these characteristics must be met if ports, across the country and in the SLC states, are to be fully equipped to efficiently handle the onset of megaships. To recoup their capital investment in these megaships, operators must be in a position to minimize the time a ship is in port and maximize the number of trips it makes between ports. The less time spent in port and the significantly higher number of containers carried by a megaship increases the containers moved through a port and on the surface transportation system that serves a particular port. Hence, regardless of whether the freight loaded and unloaded from a megaship is shipped via highway, rail, barge, feeder-ship, or in a combination of these methods, there have to be considerable improvements in these surface transportation methods.

Providing deep access channels (a minimum of 50 feet) is perhaps the most fundamental requirement for a port to be designated a megaship port. Given the fact that deepening navigation channels are largely the responsibility of the federal government, including the cost of deepening and maintaining them, preparing ports across the country for megaships entails a coordinated effort with a number of federal agencies, particularly the U.S. Army Corps of Engineers. According to research, in an attempt to maintain ship channels and make ports more accessible for the newer generation of large vessels, about 400 million cubic yards of sediment must be dredged each year from ports across the country. While the SLC states are fortunate to have several ports with 50-foot channels (Hampton Roads, Virginia and Baltimore, Maryland) and several with 40 to 49-foot channels (Everglades, Miami, Tampa—all in Florida; Savannah, Georgia; Charleston, South Carolina; New Orleans, Louisiana; and Houston, Texas), continuous dredging work is necessary to maintain and increase these depth levels.

In fact, the failure of a port to maintain its navigation channels at a depth to accommodate the current crop of large vessels could cause serious economic losses. There are several cases of port relocation by shipping lines due to the type of draft restrictions referenced. For instance, a few years ago, Sea-Land ended direct calls in New Orleans with its European service in response to draft restrictions in the Mississippi River Gulf Outlet channel that leads to its terminal on France Road. The cargo was handled at the Port of Houston and “feedered” from Houston to New Orleans by barge.

Another requirement for a port to attain megaship-compatible status involves the new generation of wharf cranes. As container ships have become larger and wider, the new generation of wharf cranes has kept pace with this expansion. For instance, Post-Panamax cranes have an outreach of 144 feet and serve vessels with a 106-foot beam across 13 container rows. However, the newer generation of megaships created a need for Beyond Post-Panamax (BPP) cranes that have an outreach of 158 feet across 17 to 18 container rows. It is instructive that in 1995, BPP cranes accounted for only 3 percent of the crane population worldwide; by 1998, they represented 44 percent. In North America, BPP cranes amount to 83 percent of total crane population, a number that confirms the degree of containerization on the continent and the growing trend toward megaships. 
Container storage space is another area where the introduction of megaships has an immediate impact. As expected, a port’s container storage needs grow with an increase in vessel size. This is due to the disconnect between “wharf activity” (rapid, round-the-clock transfers when vessels are at berth) and “gate activity” (more regular, 8-hour-a-day vehicle movements).” Hence, the arrival of megaships, carrying a greater number of containers, lengthens the aforementioned disconnect and the amount of time a container spends stored in the terminal. This triggers the need for greater container storage space. As mentioned, 75 acres per megaship berth remains a satisfactory amount of storage space; a lesser area will create congestion in the storage process.

Transshipment terminals are another design element that assumes greater importance with the onset of megaships. In a megaship environment, ship-to-ship transfers could be a significant portion of port activity with certain ports functioning as feeders to the larger megaports. Hence, even though the megaship-to-feeder ship transfers would diminish the need for additional container storage space, the need for “midstream” terminals with a barge-mounted crane between the two vessels remains essential. The ship-to-ship transfers could also be handled at a completely separate terminal designed for that purpose with reduced storage space, less landside access capacity, and a smaller gate but an efficiently functioning transshipment operation.

Landside access is another critically important element in the megaship environment; in particular, the rising importance of intermodal rail and the continuing importance of truck access. With certain ports assuming megaport status, transporting containers beyond the customary 400-600 mile radius of the port becomes necessary. Not only is rail transportation cost-competitive vis-a-vis truck transportation, it is also environmentally friendlier and frees up container storage space much sooner. Hence, sound intermodal rail access is a major incentive for shipping lines to call at a port especially if these facilities are on-dock and the rail lines are prepared for double-stack trains. The recent surge in rail mergers across the United States prepares the way for fully-connected transportation systems and links between ocean carriers and rail lines. In fact, this is already apparent with CSX Corp., the railroad behemoth whose predecessor founded the nation’s first railroad in Baltimore, owning the Sea-Land portion of the shipping carrier, Maersk-Sea-Land.

Trucks will continue to carry a bulk of container port traffic, and the megaship scenario will see added growth in this department. Hence, improvements here are essential for the full-impact of megaships. Safer roads, sufficient travel lanes and gate queuing capacity, and clearly-marked signs within the port are some of the more basic requirements with regard to trucks.

The final element necessary to facilitate a smooth transition to the megaship environment involves labor relations within a port. Notwithstanding the tremendous mechanization efforts underway in ports across the United States, labor plays a critical role in a port’s efficient functioning. In this connection, members of the International Longshoremen’s Association loom large. While in a former era, a majority of port workers did little more than heavy lifting (loading and unloading loose cargo on slats by

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**Characteristics of a Megaship Terminal**

- **Size** — 150 acres
- **Berths** — 2 for 1,250 foot megaships and 3 for 1,000 foot mixed vessel sizes
- **Cranes** — 6 to 10 BPP Cranes
- **Water Depth** — 50 foot Channel/Berth
- **Projected Yearly Throughput** — 450,000 TEUs (Minimum); 900,000 TEUs (Maximum)
- **Rail Connections** — On-dock or adjacent intermodal railyard; 2 to 4 unit daily train calls
- **Truck Traffic** — 1,730-3,460 trips/day with 40 percent by rail; 2,880-5,770 trips/day with no rail movements

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hand), dock workers currently operate computerized cranes, forklifts, transfer trucks and other pieces of heavy equipment.34

The importance of a sound working relationship between labor and management in a port was highlighted in the recent battle between the Port Authority of New York/New Jersey and the Maryland Port Administration to lure the giant Maersk/Sea-Land carrier to their respective ports. In an effort to further “sweeten” their offer, dockworkers at the Port of Baltimore offered wage and hour concessions while the port’s pilots—who guide ships up the Chesapeake Bay—offered a 20 percent discount on their charges.35 Similarly, when the Virginia Port Authority (VPA) was still in the running for securing the Maersk/Sea-Land megaships to its facilities, the executive director of the VPA noted that there had not been a local dock strike in Norfolk since 1973 and cited good relations between the International Longshoremen’s Association and waterfront management as an important plus for the VPA.36

At the outset, this Report indicated that ports under equipped, or ill-positioned, to make the transition to accommodate megaships would be designated as feeder-ports in a port system that was rapidly moving towards a hub-and-spoke system akin to that of the airline industry. Given the fact that very few ports in the United States are ready for megaships, coupled with the move toward a hub-and-spoke system, ports—including several in the SLC states—have to make the transition to feeder-port status. It should be noted that the expected growth in container shipping will require ships smaller than the aforementioned megaships; in fact, Panamax container ships in the 2,500 to 3,999 TEU category are expected to secure 36 percent of total transportable cargo.37 Hence, there will be a role for the Panamax vessels and, consequently, these feeder-ports should be prepared for this new role.
CREATING A HUB-AND-SPOKE SYSTEM

All the criteria that would demarcate a port a megaport, or a “load center” port, were enumerated in the previous section, and it is expected that these ports will handle a significant portion of a particular region’s cargo, both in volume and variety. For a port to be a true megaport, it cannot specialize in handling a limited number of cargo types. As noted,

“[A megaport] must be versatile—capable of handling many types of cargo at the same time without congestion, and it must be able to store these cargoes as well as provide efficient transportation services in the land modes and even in the air cargo services. In short, it is a port that handles a large concentration of cargoes because it is able to offer a broad array of efficient services to a wide variety of customers at a lower cost relative to costs at other ports.”  

Hence, a megaport should excel in the entire range of shipping-related services; it is only then that the full extent of the economies of scale available with megaship usage becomes a reality. Ports that provide only one or two aspects of megaships’ needs at a competitive price but fail to provide other aspects—such as an efficient and cost-effective intermodal transportation method—will fail to survive as megaports.

The recent emergence of a hub-and-spoke system in the shipping industry parallels that of the airline industry in the 1970s. (Furthermore, the deregulation occurring in the shipping industry matches the deregulation in the airline industry 25 years or so ago.) Such a system entails that certain ports that are skilled at moving large volumes of cargo will become hub ports for a number of carriers. These ports will accommodate the megaships and will have the appropriate infrastructure and capacity to efficiently handle these megaships. The remaining ports will be transformed into transshipment or feeder-ports. According to Geoff Motte, director of Old Dominion University’s Maritime Ports and Logistics Management Institute,

“Maersk and Sea-Land are leading the way into a new world of waterborne shipping that would resemble the hub-and-spoke system operated by airlines. Rather than calling at five or six ports on a coast, [shipping] lines would call at two or three, serving the other ports and their markets by truck, rail or barge.”

As noted earlier, these smaller, feeder-ports will continue to play a vital role in the industry, not only collecting cargo from the megaships berthed at the megaports but also enabling the smaller Panamax vessels to load and unload cargo. Hence, it is expected that the nation’s ports will split into two camps: a smaller camp consisting of several megaports and a larger number of feeder-ports. The capacity-rich megaports will handle the megaships while the smaller feeder-ports will bring cargo to the megaports from other locations in Panamax vessels.

In the context of the enormous cost and lengthy time period involved in making the transition to effective megaport status, certain industry analysts speculate as to whether certain ports should adopt the more conservative strategy and focus on developing as a feeder-port. In fact, the flurry of activity surrounding a number of ports scrambling to become the home for the megaship Regina Maersk is particularly instructive here. Specifically, five ports, all along the Atlantic coast from Halifax, Nova Scotia to Quonset Point, Rhode Island to New York/New Jersey to Baltimore,
Maryland to Norfolk, Virginia, competed mightily to become the megaship destination for one of the world’s largest shipping lines, the alliance of Maersk/Sea-Land. These different ports promised Maersk/Sea-Land executives that they would initiate major infrastructure development projects to ensure that megaships belonging to the alliance would be able to function to full capacity. After a lengthy and contentious screening process, Maersk/Sea-Land finally selected its current location, the Port of New York/New Jersey, as the “home port” for its megaships.

Some experts proclaim that ports are loath to give up the quest to become a megaport, however remote the possibility, because it means forfeiting billions of dollars in trade, investment and employment that would flow through the port otherwise. According to Alan Meyers, a transportation consultant with the firm VZM/TranSystems, the decision to relinquish megaship business could erode the port’s existing business base, a development with debilitating consequences. As Meyers notes, “[T]he biggest risk is that you lose your business entirely, that somebody takes their business to another port and they are not just taking their 45-foot-deep vessels but all of their ships.”

Notwithstanding these pronouncements, others note that the smaller, feeder-ports will not be completely unprofitable in a hub-and-spoke system but merely assume a different role. In addition to the huge costs associated with making the transition to megaport status, analysts expect that the establishment of a fully-fledged hub-and-spoke port system across the United States will take considerably longer than it took the airline industry. This is because waterborne vessels and port infrastructure are generally more costly and take longer to construct than air transportation facilities. Hence, there will be time for the feeder-ports to expand their capacities.

In terms of forecasting the need for megaship berths in North America, (mostly the United States), analysts have come up with several crude estimates. Accordingly, splitting the shipping routes in North America into three sectors, Atlantic, Pacific and Gulf, leads to the following megaship berth requirements: 12 to 14 megaship berths in the Atlantic comprising seven to eight in the North Atlantic and five to six in the South Atlantic; up to 23 megaship berths in the Pacific including seven in the North Pacific and 16 in the South Pacific; and up to 14 megaship berths in the Gulf. These projections, albeit very tentative, do reinforce the argument that there is a substantial unmet demand for megaship berths across the United States, a scenario policy makers with influence over the nation’s ports must heed.

Some additional details on the potential megaports in the three North American shipping sectors outlined above remain helpful. For instance, in the Atlantic region, there are currently two ports with 50-foot berth capacity (Hampton Roads, Virginia and Baltimore, Maryland) and one with 45-foot berth capacity (Halifax, Nova Scotia). The Port of New York/New Jersey also has plans to advance to 45 feet at Port Newark/Elizabeth along with Charleston, South Carolina and Savannah, Georgia. In the Pacific region, there are a total of eight berths that provide 50-foot water depths at ports in Vancouver, British Columbia (three berths), Seattle and Tacoma, Washington (1 berth each) in the North Pacific region and Long Beach, California (three berths) in the South Pacific.
Pacific region. Plans are underway to increase the number of berths by an additional two, both in Vancouver, for a total of seven megaship berths in the North Pacific region. The Long Beach Container terminal in the South Pacific region is moving speedily towards adding five new megaship berths to its current roster of three. In the Gulf sector, there are currently no 50-foot berths; however, the Port of Houston is dredging its deep ship channel to 45 feet.

In devising plans for the expected hub-and-spoke system in the shipping industry, analysts project several scenarios, once again, divided by the three major shipping regions in North America:

**Atlantic Coast Ports:** Ports along the Atlantic coast currently maintain an extremely versatile global shipping mix. Some of the plausible scenarios include maximum hubbing, where the hub ports would handle most of the potential market split between northern, central and southern hubs along the Atlantic coast. Some potential candidates include Halifax, New York/New Jersey, Hampton Roads, Charleston, Savannah, Jacksonville, Everglades, Miami, San Juan and Freeport. (Seven of these 10 ports lie in SLC states.) In this scenario, these hub ports will grow much faster than the non-hub ports. Moderate hubbing, the intermediate scenario, where projected market growth in cargo volume will be shared between the hub and non-hub, or feeder-ports. Several arguments are extended in favor of this scenario including the fact that Atlantic coast traffic is characterized by a mix of high-traffic and low-traffic service needs with multiple itineraries and ports-of-call. It is expected that a combination of megaships and feeder vessels will work well in this shipping traffic pattern of moderate hubbing. The final scenario, minimum hubbing (considered the least likely) calls for relatively few megaship hubs along the Atlantic coast due to infrastructure constraints.

**Pacific Coast Ports:** This shipping sector of North America encompasses a multitude of trade routes, (more than 150) all among the world’s busiest, and experts anticipate between two and four hub ports in this region. Vancouver (British Columbia); Seattle and Tacoma (Washington); and Oakland and Los Angeles/Long Beach (California) are the potential hub candidates here with a number of the smaller ports in the region serving as feeder-ports.

**Gulf Coast Ports:** The expected explosion in trade between North America and Latin America entails the presence of at least one hub port in this sector. One possible candidate is the Port of Houston. In fact, a study conducted by the Texas Transportation Institute noted that

“[Currently], the Port of Houston has the most modern terminal facility among all Gulf ports, and has a new, more efficient facility already in the planning stages to be constructed in the next few years. It is this port that this study projects to be the leading candidate to operate as the “load center” port for the Gulf of Mexico, handling the majority of containerized cargo in the new evolving hub-and-spoke system.”

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While the development of a hub-and-spoke system in shipping appears very likely, the U.S. Department of Transportation’s Maritime Administration is quick to emphasize that the non-hub ports are not “losers” to the hub ports. As mentioned, these non-hub ports are expected to see a significant growth in their Panamax and Post-Panamax vessel calls while gaining considerable traffic from the feeder-vessels.
associated with the hub ports. Hence, it is critical for these non-hub ports to continue to modernize and expand their infrastructure capacity to fully withstand the expected growth in cargo volumes. Fully developing the ports at the end of the “spokes” remains important for carriers to minimize costs and maximize service and revenue; the “hubs” are not the only ports with huge growth potential.
The federal government continues to be the primary actor in setting port policy across the United States. Given the critical role of waterborne transportation in the commercial and military success of the nation, the role of the federal government goes back to the time of the founding fathers. In fact, the founding fathers “knew that only through active commerce, an extensive navigation system, and a flourishing maritime industry would the new nation survive against foreign powers.” These perspectives resulted in the U.S. Constitution containing the initial statement of federal port policy in Article I, Section 9.

“No preference shall be given by any regulation of commerce on revenue to the ports of one State over those of another; nor shall vessels bound to, or from, one State be obliged to enter, clear, or pay duties in another.”

This provision of the Constitution sought to ensure that port policy across the country remained free from competitive or discriminatory bias in interstate affairs. In addition, it sought to diminish the interstate trade rivalries that prevailed under the Articles of Confederation. The supremacy of the federal government in regulating interstate and foreign commerce was further reinforced and upheld by the United States Supreme Court in the landmark decision, Gibbons vs. Ogden.

Consequently, Congress has authorized and funded activities to ensure the free and efficient navigational access to the nation’s waterways since independence. For instance, in 1789, Congress authorized the first navigation channel improvement project. Then, the General Survey Act of 1824 established the U.S. Army Corps of Engineers, giving it chief responsibility for planning and maintaining the nation’s waterways, roads and railways. To this day, the federal government, through the U.S. Army Corps of Engineers, controls, constructs and maintains all U.S. access and navigational channels.
In this context, it is the Corps of Engineers which plays the dominant role in preparing ports for the onset of megaships since it is the government agency responsible for deepening channels in ports.

The role of the federal government in port policy is particularly important since all ports and channels serve multi-state needs. For instance, the foreign trade activities of a state are supported by a number of ports—both within, and, quite often, outside the state. It is estimated that on average, each state relies on between 13 and 15 ports to handle 95 percent of its exports and imports. Louisiana ports, for example, handle goods from 27 states on their way to foreign destinations. Similarly, imported crude oil refined in New Jersey and Pennsylvania swiftly reaches East Coast consumers from Maine to Florida. This type of efficient goods transfers, facilitated by the nation’s ports, is possible due to the involvement of the federal government acting on the aforementioned Constitutional provision.

Notwithstanding the primary role played by the federal government in port policy across the United States, state and local governments have begun to play increasingly important roles as well. Most state governments have established separate departments to plan and administer the ports within their states. It is also important to note that the federal government is encouraging state and local governments to better coordinate their activities in the transportation sphere, including those in port development.

Information on U.S. port rankings, by total cargo volume, remains very useful in assessing the relative importance of ports. This data show the magnitude of cargo moving through certain ports and as Table 10 indicates, several SLC state port levels remain impressive. The Seaports of the Americas: The 1999 AAPA Directory tabulates this information for 1997, the most recent year available.
Table 10 demonstrates the importance of the SLC state ports in overall U.S. port rankings. Thirteen of the top 20 and seven of the top 10 U.S. ports—by cargo volume—are located in the SLC states, a clear indication of the dominant role SLC state ports play in overall U.S. port calculations. Furthermore, an overwhelming 70 percent of the cargo moved in the top 20 U.S. ports was in the SLC state ports. Non-SLC state ports accounted for the remaining 30 percent. Among the SLC states, Texas and Louisiana accounted for a majority of the cargo volume.

Another interesting measurement perspective involves a ranking of the top 20 U.S. ports by the total dollar value of the cargo (imports and exports). While Table 10 affords comparisons by sheer cargo volume, Table 11 enables comparisons along the lines of which U.S. port moves the most expensive cargo.

<table>
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<tr>
<th>Rank</th>
<th>Port</th>
<th>Foreign Trade</th>
<th>Domestic Trade</th>
<th>Total Trade</th>
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<td>Baton Rouge, LA</td>
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<td>Valdez, AK</td>
<td>3,540,109</td>
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</table>

Source: *Seaports of the Americas: The 1999 AAPA Directory*; Bold indicates an SLC state port.

Note:  
a = Foreign Trade equals imports plus exports.
b = Domestic trade includes cargo handled coastwise, internally (via nation’s inland waterways), and lakewise (between U.S. Great Lakes ports) as well as “local” and “intra-port” shipments.
According to Table 11, even in terms of cargo value transported through American ports, the SLC state ports fare well. Specifically, 11 of the top 20 U.S. ports—in terms of the value of imports—are SLC ports. Similarly, in terms of the value of exports, 13 of the top 20 U.S. ports are SLC state ports. While there are four SLC state ports in the top 10 in terms of import value, there are five SLC ports in the top 10 in terms of export value. Of note, the top American port in terms of export value is the Port of Houston. As a percentage of export value, SLC state ports in the top 20 account for 55 percent of the nation’s total exports and 29 percent of the nation’s imports.

<table>
<thead>
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<th>Rank</th>
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<th>Value</th>
<th>Rank</th>
<th>Port</th>
<th>Value</th>
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<td>Los Angeles, CA</td>
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<td>Norfolk, VA</td>
<td>$14,178</td>
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<tr>
<td>6</td>
<td>Oakland, CA</td>
<td>$15,440</td>
<td>6</td>
<td>Charleston, SC</td>
<td>$11,714</td>
</tr>
<tr>
<td>7</td>
<td>Charleston, SC</td>
<td>$15,168</td>
<td>7</td>
<td>Seattle, WA</td>
<td>$10,305</td>
</tr>
<tr>
<td>8</td>
<td>Tacoma, WA</td>
<td>$15,104</td>
<td>8</td>
<td>Oakland, CA</td>
<td>$9,875</td>
</tr>
<tr>
<td>9</td>
<td>Baltimore, MD</td>
<td>$11,682</td>
<td>9</td>
<td>New Orleans, LA</td>
<td>$9,351</td>
</tr>
<tr>
<td>10</td>
<td>Norfolk, VA</td>
<td>$11,185</td>
<td>10</td>
<td>Miami, FL</td>
<td>$8,456</td>
</tr>
<tr>
<td>11</td>
<td>New Orleans, LA</td>
<td>$8,775</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Savannah, GA</td>
<td>$7,469</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>13</td>
<td>Philadelphia, PA</td>
<td>$7,201</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Miami, FL</td>
<td>$6,490</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Jacksonville, FL</td>
<td>$5,971</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Corpus Christi, TX</td>
<td>$5,725</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Portland, OR</td>
<td>$5,359</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Port Everglades, FL</td>
<td>$4,592</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Boston, MA</td>
<td>$4,230</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>20</td>
<td>Baton Rouge, LA</td>
<td>$4,006</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: *Seaports of the Americas: The 1999 AAPA Directory*; **Bold** indicates an SLC state port
PORTS IN THE SLC STATES

As indicated previously, this Special Series Report compares the relative position of the different ports in the SLC states and determines how they might be affected by the growing trend toward megaships. To achieve this objective, the tight nexus between global economic trends, particularly international trade, and maritime transportation was traced. The challenges that U.S. ports will have to deal with in preparing for the onset of megaships also was assessed. A sketch of the federal government’s role in developing port policy across the country and a comparison of port rankings by cargo volume and value is also included.

The final section of this Report presents an SLC state-by-state breakdown of some of the major features related to ports. As noted earlier, six of the 16 SLC states—Arkansas, Kentucky, Missouri, Oklahoma, Tennessee and West Virginia—are landlocked and waterborne cargo traffic in these states is limited to inland ports. Cargo volume in these six states is also significantly lower than in the 10 coastal SLC states. Hence, the following state-by-state summaries will only cover these 10 SLC states. Even though an earlier section of this Report did offer some state-specific information as related to the economic impact of the ports in a number of SLC states, the ensuing section will present state-specific information on SLC state ports based on different criteria such as overall tonnage, primary cargoes, main channel depth, appointment of key officials to set port policy and any preparations for megaships.48
Port Activity in Alabama

- Administrative Entity: The Alabama State Docks Department is responsible for all port-related activities in the state. The Port of Mobile is Alabama’s main port.

- Governing Board: The Alabama State Docks Advisory Committee consists of seven members, one nominated from each of the six Congressional Districts in the state by the governor, and the State Docks director; members nominated by the governor are appointed with the advice and consent of the state Senate; compensation: $25/day on official duty.


  - Containerized—156,629
  - Break bulk—4,048,384
  - Liquid bulk—2,148,242
  - Dry bulk—25,154,406

- Primary Cargoes:
  - Inbound—Petroleum; coal; iron ore
  - Outbound—Coal; petroleum; forest products

- Main Channel Depth: 45 feet

- Top Trading Partners: Japan, Venezuela, Canada, United Kingdom and Mexico.

- The Alabama State Docks occupied the following nationwide rankings in 1997: 8th in exports; 16th in imports; 13th in U.S. foreign waterborne commerce; 12th in U.S. cargo tonnage (domestic and foreign); 1st in Gulf Coast forest products; 1st in the nation in wood pulp; and 2nd in the nation in forest products (behind New York’s recycled paper).
Port Activity in Florida

- **Administrative Entity:** There a number of ports in Florida and each has an independent operating authority.

- **Governing Boards:**
  - **Canaveral Port Authority**—Five-member commission; elected; four-year terms; must be qualified elector of district to contest; compensation of $2,400 per year (including the cost of attending meetings).
  - **Dade County Seaport Authority (Port of Miami)**—County commissioners.
  - **Fort Pierce Port and Airport Authority**—Five-member board of commissioners; five county commissioners of St. Lucia County serving ex-officio; compensation of $300 per year in addition to compensation as county commissioners.
  - **Jacksonville Port Authority**—Seven members; four nominated by the governor and appointed with the advice and consent of the state Senate; three appointed by the Mayor of Jacksonville and confirmed by the City Council; four-year terms; no compensation.
  - **Manatee County Port Authority**—County commissioners of Manatee County; no compensation.
  - **Port of Palm Beach District**—Five-member board of commissioners; elected, district-wide; four-year terms; compensation of $2,400 per year.
  - **Panama City Port Authority**—Five commissioners appointed by city commissioners; four-year terms; may not be officers of the city, county or state; no more than two may primarily be engaged in the maritime business; allowance for travel and expenses.
• **Port Everglades**—County commissioners.

• **Pensacola, City Department of Maritime Operations** — City Council.

• **Tampa Port Authority** — Five members; appointed by the governor with the advice and consent of the state Senate; four-year terms; no compensation.

<table>
<thead>
<tr>
<th>Port</th>
<th>Depth (Ft.)</th>
<th>Inbound</th>
<th>Outbound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Canaveral</td>
<td>39</td>
<td>Cement clinkers; newsprint; slate granite; concentrate (drummed); fresh fruits; salt</td>
<td>Mixed fresh citrus; concentrate; frozen products; fresh water; bunkers; used cars</td>
</tr>
<tr>
<td>Miami</td>
<td>42</td>
<td>Fruits; vegetables; stone; clay and cement tiles; textiles; coffee</td>
<td>Textiles; groceries; paper; fruits; vegetables</td>
</tr>
<tr>
<td>Jacksonville</td>
<td>38</td>
<td>Petroleum; coal; coke; gypsum; gasoline/aviation fuel; automobiles; cement; limestone chips; granite; crude minerals; steel wire rods</td>
<td>Containers; phosphoric/sulfuric acids; bulk potassic fertilizer; automobiles; paper/paperboard; beer; ale; grocery products; honey; syrup</td>
</tr>
<tr>
<td>Manatee (Tampa Bay)</td>
<td>40</td>
<td>Bananas; fresh fruits; vegetables; steel; petroleum products; frozen food; cement; frozen concentrate; project cargo; heavy equipment; containerized cargo</td>
<td>Phosphate; general cargo; containerized cargo; vehicles; citrus; pellets; reefer cargo; project cargo; heavy equipment; fresh juices</td>
</tr>
<tr>
<td>Palm Beach</td>
<td>33</td>
<td>Containerized cargo; cement; utility bunkers; aggregates</td>
<td>Containerized cargo; sugar; molasses; break bulk; roll-on/roll-off cargo</td>
</tr>
<tr>
<td>Panama City</td>
<td>32</td>
<td>Steel plate; steel coils; bulk limestone</td>
<td>Forestry products (wood pulp; liner board); steel pipe; bulk clay</td>
</tr>
<tr>
<td>Everglades</td>
<td>47</td>
<td>Gasoline/aviation fuel; cement/clinkers; petroleum/fuel oil; fruit/vegetables; asphalt; coffee; container cargo; gypsum; apparel; beer; ale</td>
<td>General cargo; grocery products; paper; lumber; fabrics; building/construction material; coffee; metal; automobile parts; automobiles</td>
</tr>
<tr>
<td>Pensacola</td>
<td>33</td>
<td>Asphalt; iron castings; bauxite; pumice; perlite; limestone; lumber; steel; sewer parts</td>
<td>Bagged agricultural products; lumber; wood pulp; steel products; frozen food products; lime; industrial equipment pipe; scrap metal; asphalt; sulphur</td>
</tr>
</tbody>
</table>

Source: *Seaports of the Americas: The 1999 AAPA Directory*
Container movements at selected Florida ports, Fiscal Years 1993 through 1998:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Everglades</td>
<td>373,156</td>
<td>701,281</td>
<td>704,390</td>
<td>89%</td>
</tr>
<tr>
<td>Jacksonville</td>
<td>480,616</td>
<td>613,448</td>
<td>753,823</td>
<td>57%</td>
</tr>
<tr>
<td>Miami</td>
<td>650,000</td>
<td>653,217</td>
<td>813,762</td>
<td>25%</td>
</tr>
<tr>
<td>Palm Beach</td>
<td>158,762</td>
<td>174,870</td>
<td>189,804</td>
<td>20%</td>
</tr>
<tr>
<td>Other Ports</td>
<td>33,090</td>
<td>53,103</td>
<td>51,933</td>
<td>57%</td>
</tr>
<tr>
<td>Total</td>
<td>1,695,624</td>
<td>2,195,919</td>
<td>2,513,712</td>
<td>48%</td>
</tr>
</tbody>
</table>

Source: Florida Ports Council
* = Other ports are Canaveral, Fernandina, Manatee, and Tampa

Dollar value of Florida’s waterborne foreign exports and imports by port, 1997 (in current dollars):

<table>
<thead>
<tr>
<th>Port</th>
<th>Exports</th>
<th>Imports</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canaveral</td>
<td>$353,862,368</td>
<td>$519,815,322</td>
<td>$873,677,690</td>
</tr>
<tr>
<td>Everglades</td>
<td>$4,989,777,754</td>
<td>$4,849,634,657</td>
<td>$9,839,412,411</td>
</tr>
<tr>
<td>Fernandina</td>
<td>$284,948,874</td>
<td>$62,515,865</td>
<td>$347,464,739</td>
</tr>
<tr>
<td>Fort Pierce</td>
<td>$19,335,183</td>
<td>$2,590,347</td>
<td>$21,925,530</td>
</tr>
<tr>
<td>Jacksonville</td>
<td>$3,503,765,375</td>
<td>$6,076,619,512</td>
<td>$9,580,384,887</td>
</tr>
<tr>
<td>Key West</td>
<td>$7,387,810</td>
<td>$2,590,347</td>
<td>$9,978,157</td>
</tr>
<tr>
<td>Manatee</td>
<td>$66,348,110</td>
<td>$222,249,562</td>
<td>$288,597,672</td>
</tr>
<tr>
<td>Miami</td>
<td>$8,665,127,088</td>
<td>$6,581,808,571</td>
<td>$15,246,935,659</td>
</tr>
<tr>
<td>Palm Beach</td>
<td>$911,456,214</td>
<td>$597,047,040</td>
<td>$1,508,503,254</td>
</tr>
<tr>
<td>Panama City</td>
<td>$287,796,934</td>
<td>$56,742,855</td>
<td>$344,539,789</td>
</tr>
<tr>
<td>Pensacola</td>
<td>$80,853,137</td>
<td>$4,612,649</td>
<td>$85,465,786</td>
</tr>
<tr>
<td>St. Petersburg</td>
<td>$1,656,739</td>
<td>$443,826</td>
<td>$2,100,565</td>
</tr>
<tr>
<td>Tampa</td>
<td>$2,048,202,288</td>
<td>$712,612,720</td>
<td>$2,760,815,008</td>
</tr>
<tr>
<td>Total</td>
<td>$21,220,517,874</td>
<td>$19,689,283,273</td>
<td>$40,909,801,147</td>
</tr>
</tbody>
</table>

Source: Florida Ports Council
Trends in Florida’s international trade, broken down by airborne and waterborne trade, 1993 through 1998:

![Graph showing trends in Florida's international trade from 1993 to 1998](image)

Source: Florida Ports Council
Port Activity in Georgia

- Administrative Entity: The Georgia Ports Authority (GPA) is responsible for the development, maintenance and operation of the state’s coastal and river ports.

- Governing Board: Seven members; appointed by the governor from the state-at-large; serve four-year terms and elect their own officers; compensation includes $40 per day and expenses, with the chairman being allowed to charge for a maximum of 100 days a year and members for a maximum of 30 days a year.

- Overall annual tonnage at GPA facilities in fiscal year 1998:
  - Containers—5,768,853
  - Bulk—2,458,176
  - Total TEUs—734,866
  - General cargo—3,143,882
  - Total tonnage—11,370,911 short tons
  - Automobile count—166,417

- Primary cargoes at major GPA facilities (Savannah and Brunswick):
  - Savannah:
    - **Inbound**—Iron/steel; wood pulp; foodstuffs; machinery; granite; anhydrous ammonia; vegetable oil
    - **Outbound**—Kaolin clay; linerboard; wood pulp; machinery; granite
  - Brunswick:
    - **Inbound**—Automobiles; gypsum; limestone; perlite
    - **Outbound**—Automobiles; machinery; wood pulp; linerboard; plywood

- Main channel depth: Savannah—42 feet and Brunswick—30 feet

- Future projects at GPA facilities: The GPA has taken numerous steps to enhance infrastructure at its facilities. In Savannah, projects include the development of a seventh container berth, the addition of two Post-Panamax cranes, the expansion of berthing and warehousing space for break bulk cargo, and the deepening of Savannah’s channel from 42 feet to 48 feet to accommodate the expected mega ships. In Brunswick, warehousing has been expanded and enhancements to the agri-bulk facility to accommodate import cargo are being initiated. At the GPA’s inland terminal in Bainbridge, a new dock and radial stacker/conveyor have been added to expand operations.
Special Notes:

- In early August 1999, the U.S. House of Representatives and the U.S. Senate gave final approval to a Conference Committee Report that allows the GPA to move into the next phases of harbor deepening projects at the Ports of Brunswick and Savannah. (The bill, the Water Resources Development Act of 1999, is expected to be signed into law by the president.) This bill qualifies both Georgia ports for federal cost sharing for the feasibility, design and construction phases of deepening their channels. While the Port of Savannah occupies a prominent position among the nation’s top ports, the channel deepening efforts at the Port of Brunswick will open it as a major South Atlantic seaport.

- In March 1999, the “Grand Alliance,” an alliance of several of the world’s leading shipping carriers (Hapag-Lloyd, NYK, OCL and P&O/Nedlloyd) selected the Port of Savannah as its primary U.S. South Atlantic hub. Consequently, ships belonging to the “Grand Alliance” transporting cargo between East Asia and the North American East Coast (via the Suez Canal) and between East Asia and the Pacific and Atlantic Coasts of North America (via the Panama Canal) will use Savannah as its primary hub. With the consolidation of services under the “Grand Alliance,” Savannah emerges as a major destination linking North America with East Asia in container and general cargo services.
Port Activity in Louisiana

- Administrative Entity: Louisiana contains a number of the nation’s most important ports, and they are managed by independent administrative authorities.

- Governing Boards:
  - **Greater Baton Rouge Port Commission**—Nine-member commission with eight members appointed by the governor from lists submitted by the city and various parishes in the district, and one appointed directly by the governor; six-year terms; the commission elects its own officers; no compensation with travel expenses reimbursed.
  - **Lake Charles Harbor and Terminal District**—Five-member board of commissioners appointed from nominations received by nominations council; at least one member each from the Lake Charles Association of Commerce, West Calcasieu Association, Lake Charles Maritime Association and American Rice Growers; six-year terms; no compensation with travel expenses reimbursed.
  - **Louisiana Offshore Terminal Authority**—Nine-member board of commissioners, all appointed by the governor (subject to state Senate confirmation), including two nominees from the state’s three deep-draft ports, one nominee from each of Louisiana’s five Public Service Commission districts and two from the state at-large; six-year terms; no compensation with travel expenses reimbursed.
  - **New Orleans Board of Dock Commissioners**—Seven-member board of commissioners appointed by governor from lists of nominees submitted by various parishes, i.e., Orleans (4), Jefferson (2) and St. Bernard (1); five-year terms; no compensation.
  - **Plaquemines Parish Port, Harbor and Terminal District**—Nine-member board, identical to the Parish Council; no compensation.
  - **St. Bernard Port Harbor and Terminal District**—Five-member board of commissioners appointed by the governor (subject to confirmation by the state Senate); five-year terms; appointments on recommendation of Parish legislative delegation; appointments subject to review every two years; must be U.S. citizens and qualified voters and taxpayers in district; no compensation.
- **South Louisiana Port Commission**—Nine-member commission with one appointment by the governor (four-year term), two appointments each by the parishes of St. Charles, St. John the Baptist and St. James (six-year term) and the director of the Louisiana Department of Public Works and the executive director of the Louisiana Department of Commerce and Industry (terms run concurrently with their tenure in the Departments); all appointees must be U.S. citizens and qualified voters and taxpayers in district; no compensation.

<table>
<thead>
<tr>
<th>Port</th>
<th>Depth (Fl.)</th>
<th>Inbound</th>
<th>Outbound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baton Rouge</td>
<td>45</td>
<td>Petroleum; molasses; rail; steel coils; chemicals</td>
<td>Grain; forest products; chemicals; coal; coke; petroleum products; pipe; sugar</td>
</tr>
<tr>
<td>Iberia</td>
<td>12-15</td>
<td>Pipe; shell/limestone/barite; steel; oil; gas equipment</td>
<td>Pipe; fabrication/modules; agricultural; oil; gas equipment</td>
</tr>
<tr>
<td>Lafourche</td>
<td>24</td>
<td>Intermodal transfer of personnel; goods and services to and from offshore petroleum facilities</td>
<td>Intermodal transfer of personnel; goods and services to and from offshore petroleum facilities</td>
</tr>
<tr>
<td>Lake Charles</td>
<td>40</td>
<td>Petrochemical; barite; rutile</td>
<td>Petrochemical; rice; bagged goods</td>
</tr>
<tr>
<td>New Orleans</td>
<td>36-45</td>
<td>Steel; rubber; plywood; coffee</td>
<td>Forest products; steel; foodstuff; chemicals</td>
</tr>
<tr>
<td>Plaquemines</td>
<td>55</td>
<td>Coke; carbon black feed stock; crude; fuel oil; gasoline; heating oil; naphtha; natural gas; nickel; cobalt; petroleum products; phosphate; sulphur</td>
<td>Coal; grain-corn; soybean; wheat</td>
</tr>
<tr>
<td>Shreveport</td>
<td>9</td>
<td>Crude oil; steel; aggregate; coal; fertilizer; industrial waste water</td>
<td>Pressure vessels; scrap steel; petroleum; coke</td>
</tr>
<tr>
<td>South Louisiana</td>
<td>45</td>
<td>Crude oil; aluminum ores; petroleum products</td>
<td>Corn; animal feed; oil seeds; wheat; petroleum products; unmilled cereals</td>
</tr>
<tr>
<td>St. Barnard</td>
<td>N/A</td>
<td>Containers; steel; bulk</td>
<td>Containers; steel; bulk</td>
</tr>
</tbody>
</table>

Source: *Seaports of the Americas: The 1999 AAPA Directory*, except information on South Louisiana, which is extracted from the Port of South Louisiana’s website, [www.solarport.com](http://www.solarport.com).
Overall annual tonnage at different Louisiana ports:

- **Baton Rouge** (1997) — 7,820,000 short tons (public facilities only); 84,000,000 short tons (port jurisdiction-U.S. Army Corps of Engineers)
- **Iberia** — 200,000 (break bulk); 500,000 (dry bulk); 150,000 (other)
- **Lafourche** (1997) — 30,000,000
- **Lake Charles** (1997) — 530,000 short tons (Containerized); 800,000 short tons (break bulk); 4,200,000 (dry bulk)
- **Plaquemines** (1995) — 46,695,834 short tons (break bulk)
- **South Louisiana** — 220,000,000 metric tons
- **New Orleans** — 14,090,000 short tons (general cargo) estimated in 1998; 38,037,560 short tons (overall) with 10,285,631 short tons (general cargo) and 264,384 TEUs (containers) in 1997
- **St. Barnard** (1997) — 1,200,000 short tons and 3,900 (containers)
- **Shreveport** — 2,262 (break bulk); 141,582 (liquid bulk);
  (9 months since April 1997) 63,834 (dry bulk) and 1,004 (roll-on/roll-off)

**Millennium Port**: On July 9, 1999, Governor Mike Foster of Louisiana signed into law Senate Bill 863, creating the Louisiana Millennium Port Authority. As laid out in the legislation, the Authority will “promote, plan, finance, develop, construct, control, license, regulate, supervise, operate, manage, maintain and/or modify offshore or onshore terminal facilities to be constructed within the jurisdiction of said authority after July 1, 1999, in order to promote the economic welfare of its citizens.” In this connection, a study ordered by the Port of New Orleans’ Board of Commissioners reported very favorably about the Millennium Port concept, calling it a “a vision unlike anything New Orleans has seen in the past.” According to this study, conducted by VZM TranSystems Corp., the Millennium Port concept is essential to take advantage of the containerized cargo trade between the United States and Latin America. This trade is estimated to skyrocket from 2.5 million TEUs to 16 million TEUs by 2040 with the advent of megaships in the next decade. Hence, the pressure to build “a $1 billion container cargo and multi-modal complex that would help New Orleans become one of the largest volume ports in the world.”
Special Notes:

- The Port of South Louisiana is the largest tonnage port in the United States and the third largest in the world, handling over 200 million tons of cargo transported annually to its 52-mile stretch of the Mississippi River by ship, barge, rail and truck. In fact, over 100,000 barges and half the 7,000 ocean-going ships traveling on the Mississippi River call at the Port every year. The Port of South Louisiana’s 104 miles of deep water frontage makes it one of the largest harbors in the world and ensures its position as the top ranked port in the country in terms of export tonnage and total tonnage. Louisiana’s ports continue to be critical to overall U.S. port calculations since the ports of New Orleans, Baton Rouge, Plaquemines and South Louisiana make up the world’s largest continuous port district and are responsible for transporting one-fifth of all U.S. foreign waterborne commerce.57

- The Port of New Orleans notes its position as a world class rail hub and states with six Class I railroads serving the Port’s terminals. Accordingly, this rail access is easily available on both the Port’s rear and front aprons, sometimes by two lines, and are all connected to national networks through the local New Orleans Public Belt Railroad. The following six key railroads serve the Port: Burlington Northern Santa Fe Corp.; CSX Transportation; Kansas City Southern Railway; Illinois Central Railroad; Norfolk Southern Corporation; and Union Pacific. The recent spate of mergers in the railroad industry, spurred by the desire to take advantage of the economies of scale in transportation, had an impact on the Port of New Orleans with Canadian National’s acquisition of Illinois Central. This merger will facilitate a seamless transportation link between the Atlantic, the Pacific and the Gulf of Mexico building “a T-shaped network with routes extending from Vancouver in the West to the St. Laurence Seaway in the East and in to New Orleans on the Gulf Coast.”58
Port Activity in Maryland

- Administrative Entity: The Maryland Port Administration (MPA) is responsible for operations at the Port of Baltimore, one of the country’s premier ports.

- Governing Body: Seven-member commission with six members appointed by the governor, with the advice and consent of the state Senate, to three-year terms and the state’s secretary of transportation (who also serves as the chairman of the Port Commission); no compensation; several individuals are ineligible for consideration for a position on the commission including all state employees (except the secretary of transportation), members of the General Assembly and representatives or employees of entities “whose principal activities are port-related.”

- Overall Annual Tonnage (1997): 6.1 million tons at MPA facilities including
  - Containerized—4.4 million tons
  - Roll-on/Roll-off (autos)—736,542 tons
  - Break bulk—1.6 million tons
  - Paper/Wood Pulp—418,467 tons

- The Port of Baltimore’s Manifest:
  - Roll-on/Roll-off cargo, including heavy machinery, construction and agricultural equipment, is a growing segment of the Port’s business. In fact, the Port of Baltimore is the number one port in the country for this category of cargo. Table 14 provides data on this category.

<table>
<thead>
<tr>
<th>Year</th>
<th>Import</th>
<th>Export</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>292.5</td>
<td>90.6</td>
<td>383.1</td>
</tr>
<tr>
<td>1995</td>
<td>244.0</td>
<td>137.8</td>
<td>381.8</td>
</tr>
<tr>
<td>1996</td>
<td>220.6</td>
<td>146.2</td>
<td>366.8</td>
</tr>
<tr>
<td>1997</td>
<td>294.7</td>
<td>168.0</td>
<td>462.7</td>
</tr>
<tr>
<td>1998</td>
<td>334.9</td>
<td>172.1</td>
<td>507.0</td>
</tr>
</tbody>
</table>

Source: “Port of Baltimore Charts New Course for Success.” The Washington Times, June 21, 1999, citing the Maryland Port Administration
Primary Cargoes:

- **Inbound**—Steel; automobiles; machinery; rolling stock; ores and metals; manufactured goods
- **Outbound**—Coal; autos; machinery; project cargo; manufactured goods

Main Channel Depth: 50 feet

The Port of Baltimore is one of the nation’s premier ports that imports and exports automobiles. In fact, the Port ranks third in terms of volume behind the ports in New York and Jacksonville. Figure 5 provides data on this trend.

![Automobiles Shipped Through Baltimore](image)

Source: Port of Baltimore Charts New Course for Success.” *The Washington Times*, June 21, 1999, citing the Maryland Port Administration

Additional Details:

- The Port of Baltimore was founded in 1706 to transport farmers’ crops along the Eastern seaboard and handle international trade. The Port continues to play a pivotal role in the economic affairs of the state. Three years ago, MPA officials compiled a strategic plan to boost business in the Port by 2001. Included as goals were a focus on developing niche cargoes such as automobiles (“roll-on/roll-off”), forest products and containers. The Port succeeded in each of these categories, surpassing the 500,000-ton mark in automobile cargo in 1998, a 5.5 percent increase over 1997; a 77 percent
increase in the amount of paper moving through the port in 1998; and an increasing number of containers with the additional vessel calls. (An extra 30,000 containers per year are expected, with several carriers expanding the number of service calls to Baltimore alongside the addition of new carriers.)

• MPA officials also list several advantages at the Port of Baltimore, including its productive labor force, its 50-foot deep channels and its convenient Mid-Atlantic location. In fact, officials indicate that 38 percent of the U.S. market can be reached in a single day from the port. Furthermore, MPA officials note that the presence of two Class 1 rail lines (CSX and Norfolk Southern) at the port vying for business will ensure lower prices and improved service to consumers. In this connection, the MPA recently opened a sales office in Detroit to begin targeting the highly lucrative industrial capabilities of that city. “In essence, [the aim of the new sales office] will be to sell Detroit’s industries [Ford Motor Company, Daimler/Chrysler, General Motors, Detroit Diesel, Meritor] on Baltimore’s enormous capacity to handle intermodal cargo in the form of non-finished products such as engines and axles along with automobiles.”  

In selling the Port’s capacity, the MPA notes that “the rail-transit time to Baltimore and the distances involved are significantly shorter than the transit between Detroit and Norfolk, New York or through the Canadian Gateway.”

Port of Baltimore and Trade with Latin America:
The various nations of South and Central America, from economic giants like Brazil and Chile to smaller countries like Uruguay and Paraguay, have long been cornerstones of the Port’s foreign trade. In 1997, trade with the region accounted for 31 percent of the Port’s total trade. Lumber, sugar, chemicals, farm combines, road building equipment, auto parts, steel, copper, aluminum, iron ore, farm-raised salmon, raisins, bananas dominate the array of products transported to Latin America through the Port.
Port Activity in Mississippi

- **Governing Bodies:**
  - Jackson County Port Authority (Port of Pascagoula): Seven-member commission; two appointed by the governor and five appointed by the County Board of Supervisors; four-year terms; compensation of $10 per meeting.
  - Mississippi State Port Authority at Gulfport: Five-member board; three appointed by the governor, one by the County board of supervisors and one by the governing body of municipality; five-year terms.

- **Overall Annual Tonnage**
  Pascagoula (1997): 28,506,573 short tons
  - Break bulk—520,488
  - Liquid bulk—25,151,397
  - Dry bulk—2,052,477
  - Other—782,241
  
  Gulfport (1997) in short tons:
  - Break bulk—630,000
  - Dry bulk—450,000
  - Containerized—1,080,000

- **Primary Cargoes**
  Pascagoula:
  - **Inbound**—Crude oil; chemicals; phosphate; rock
  - **Outbound**—Forest/paper products; frozen food; petroleum products; fertilizer
Gulfport:

- **Inbound**—Bananas; ilmenite ore; mahogany lumber; pineapples; limestone
- **Outbound**—Chicken (frozen); wood pulp; linerboard; cotton; lumber; steel; cement pipe; apparel and textiles

Main Channel Depth:  
- Pascagoula - 38 feet  
- Gulfport - 36 feet

The Mississippi State Port Authority, which operates the Gulfport facility, records that net income generated by the Port has been on the rise since the early 1990s. Figure 6 depicts this transformation in net income.

![Gulfport Facility Net Income History 1990-1998](image)

Source: “Port Authority Reels in Profits,” *The Mississippi Clarion Ledger*, February 27, 1999

Special Notes:

- In March 1999, Ingalls Shipbuilding of Pascagoula, Mississippi, a subsidiary of Litton Industries, announced that they will build (and that American Classic Voyages, Inc., will operate) two 1,900-passenger vessels that will cost a combined $400 million. The two passenger vessels will be the first built in the United States since 1958. These passenger vessels will be used exclusively in the Hawaiian cruise market by American Classic Voyages. In recent times, nearly all Ingalls Shipbuilding’s contracts have been with the U.S. Navy (submarines and ships) and Ingalls officials commented that the construction of these passenger vessels will reduce the shipyard’s reliance on military...
purchases. The contract calls for building the two passenger vessels by 2003 initially, each weighing 72,000 gross tons and 840 feet in length, and an option for building four additional passenger vessels subsequently. In exchange for agreeing to order these ships, Congress gave American Classic Voyages special rights—contained in a 1997 military appropriations bill—that makes it cumbersome for other companies to join it in the lucrative Hawaiian cruise market.61

- According to the Mayor of Gulfport, Mississippi, the Port, in addition to providing deep-water access to accommodate ships with a 36-foot draft, is the largest banana importing port in the United States as well as the largest exporter of frozen chicken to the former Soviet Union.62 Also, the state department of transportation notes that the Port is used to import other fruits such as pineapples, mangoes, coconuts, and grapes and “about 5,000 trucks a week haul these and other products to the east as far as Atlanta, to the west as far as Dallas and to the north as far as Canada.”63
Port Activity in North Carolina

- Administrative Entity: The North Carolina State Ports Authority is responsible for all operational matters related to the state’s ports.

- Governing Body: Eleven-member board with seven appointed by the governor (for six-year terms), four appointed by the General Assembly (for two-year terms), with the secretary of commerce, or designee, serving as the remaining board member and board secretary; the governor appoints the chairman and the vice-chairman from the 11 members; all appointments are from the state-at-large keeping in mind the state’s agricultural, business and industrial interests; recommended that none of the board members come from a Senate or House district in which a port is located.

Overall Annual Tonnage:

Wilmington (FY 1998): 2,157,533 short tons
- Break bulk—675,283
- Bulk—790,771
- Containerized—691,479

Morehead City (FY 1998): 2,693,187 short tons
- Break bulk—292,989
- Bulk—2,400,198

- Primary Cargoes:

Wilmington:
- **Inbound**—Metal products; tobacco; furniture; furniture parts; chemicals; miscellaneous articles
- **Outbound**—Woodpulp; tobacco; forest products; food; miscellaneous articles

Morehead City:
- **Inbound**—Asphalt; ore; rubber; potash; forest products
- **Outbound**—Phosphate; wood chips; metal products; food

- Main Channel Depth: Wilmington - 40 feet
  Morehead City - 45 feet
Port Activity in South Carolina

- Administrative Entity: Founded in 1942, the South Carolina State Ports Authority (SPA) operates public seaport facilities in Charleston, Georgetown and Port Royal and seeks to contribute to the state’s economic development by fostering and stimulating waterborne commerce and shipment of freight. To achieve this goal, the SPA focuses on developing and operating efficient marine terminals while attracting high-quality steamship services.

- Governing Body: The SPA is governed by a nine-member board appointed by the governor with the advice and consent of the Senate; seven-year terms; there has to be at least one board member from Beaufort, Charleston and Georgetown counties and there has to be at least one member who is not a resident of any of these counties.

- Calendar Year 1998 Volume Statistics at SPA Facilities:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Charleston Container Tons</td>
<td>10,058,428</td>
<td>10,077,510</td>
<td>0%</td>
</tr>
<tr>
<td>Charleston Break bulk Tons</td>
<td>576,874</td>
<td>593,831</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Charleston General Tons</strong></td>
<td>10,635,302</td>
<td>10,671,341</td>
<td>0%</td>
</tr>
<tr>
<td>Georgetown Tons</td>
<td>1,580,058</td>
<td>1,617,131</td>
<td>2%</td>
</tr>
<tr>
<td>Grain Elevator Tons</td>
<td>225,840</td>
<td>71,938</td>
<td>-68%</td>
</tr>
<tr>
<td>Port Royal Tons</td>
<td>117,132</td>
<td>274,083</td>
<td>134%</td>
</tr>
<tr>
<td><strong>Total Other Tons</strong></td>
<td>1,923,030</td>
<td>1,963,152</td>
<td>2%</td>
</tr>
<tr>
<td><strong>TOTAL SPA TONS</strong> (Charleston + Other)</td>
<td>12,558,332</td>
<td>12,634,493</td>
<td>1%</td>
</tr>
<tr>
<td>Total Charleston TEUs</td>
<td>1,217,544</td>
<td>1,277,514</td>
<td>5%</td>
</tr>
<tr>
<td>Charleston Vessels (excl. Barges)</td>
<td>1,795</td>
<td>1,908</td>
<td>6%</td>
</tr>
</tbody>
</table>


- Primary Cargoes:
  - **Inbound**—Consumer goods; iron and steel; chemicals; foodstuffs; textiles; machinery
  - **Outbound**—Chemicals; paper products; woodpulp; foodstuffs; machinery; vehicles; clay
Main Channel Depth: 42 feet mean low water (MLW) at entrance channel; 40 feet MLW at harbor channels, berths and turning basins. (Authorization to 45 feet.)

Tonnage History at South Carolina’s Public Port Facilities

Planning for the Future: The South Carolina State Ports Authority reports that it has a four-pronged strategy to prepare for the onset of the Post-Panamax mega ships:

- Harbor Deepening—The SPA is currently pursuing a $159 million Charleston Harbor Deepening Project, taking the entrance channel to 47 feet at MLW and the inner harbor to 45 feet, also at MLW, by moving some 35 million cubic yards of material. While three contracts worth $100 million have already been awarded, in 1999 the South Carolina General Assembly allocated $40 million in funding towards harbor deepening.

- Global Gateway Terminal at Daniel Island—Approximately three million cubic yards of quality dredged material recovered from the Harbor Deepening Project will be used to develop the SPA’s next container terminal. Daniel Island, located just eight miles from the open ocean, offers convenient access for vessels entering Charleston Harbor and will ultimately provide 12,000 feet of berthing space, associated cargo storage and backup areas and intermodal transport mechanisms.

- Real Time Inventory Management System—SPA’s new Yard Management System (YMS) will further improve Charleston’s productivity by introducing a revolutionary level of real-time container organization. This new system will track containers and cargo and instantly report their status through the use of radio frequency computer interaction. Importers, exporters and other customers will have access to real-time shipment information.

- Near-Term Capital Developments—To enhance the Port’s capabilities until the completion of the Daniel Island expansion, the SPA will contribute more than $200 million into existing

<table>
<thead>
<tr>
<th>Year</th>
<th>Charleston</th>
<th>Georgetown</th>
<th>Royal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>1,825,042</td>
<td>431,621</td>
<td>1,384</td>
<td>2,258,047</td>
</tr>
<tr>
<td>1978</td>
<td>3,024,393</td>
<td>587,120</td>
<td>161,870</td>
<td>3,773,383</td>
</tr>
<tr>
<td>1988</td>
<td>6,073,179</td>
<td>803,184</td>
<td>149,577</td>
<td>7,025,940</td>
</tr>
<tr>
<td>1998</td>
<td>11,049,443</td>
<td>1,507,079</td>
<td>192,040</td>
<td>12,748,562</td>
</tr>
</tbody>
</table>

Source: The SPA website at www.port-of-charleston.com
facilities and new equipment. The goal is to optimize use of the existing terminals through new handling equipment and improved infrastructure.

Container Tonnage History at the Port of Charleston, one of the nation’s top container ports, for fiscal years 1968 through 1998 (in container tons):

![Container Tonnage History, Charleston](image)

Source: The SPA website at [www.port-of-charleston.com](http://www.port-of-charleston.com)

Conversion of the Charleston Navy Base: The 1993 announcement that the Charleston Navy Base would close was met with great trepidation about the loss of economic activity. However, in what has been described as “a model for the country in base reuse,” community leaders have managed to regain the 25,000 jobs lost when the base closed. The companies that began operations at the former base perform a range of activities from repairing ships to preparing small boats for overseas shipment.
Port Activity in Texas

- Administrative Entity: Texas has a great number of major ports, and they are operated by independent administrative authorities.
- Governing Bodies:

  - **Port of Beaumont Navigation District**—Governed by a five-member board of commissioners that is elected for two-year terms; residents and qualified voters are eligible for election; the president, vice president and secretary/treasurer are elected and compensated in the following manner: all commissioners are paid travel expenses while the president is paid $150 per month and other commissioners $125 per month.

  - **Brazos River Harbor Navigation District (Port of Freeport)**—Six-member board of commissioners who are all elected for six-year terms and provided $200 per month as compensation.

  - **Brownsville Navigation District**—Three-member board of commissioners who are elected for two-year terms; no compensation.

  - **Calhoun County Navigation District**—Six-member board of commissioners who are elected and provided $75 per meeting as compensation.

  - **Port of Corpus Christi Authority**—Five-member board of commissioners who are appointed to six-year terms; no compensation.

  - **Port of Galveston**—Seven-member board of trustees appointed by the City Council, including one ex-officio member of the City Council, appointed for three-year terms and provided $10 per month as compensation; appointees should have been residents of Galveston for at least one year in the preceding appointment period.

  - **Port of Houston Authority**—Five-member board with the city and county each appointing two members and the remaining member being appointed jointly by both the city and county.

  - **Orange County Navigation Port District**—Five-member board of commissioners elected to four-year terms; compensation includes $10 per day served to a maximum of $600 per year, excluding mileage allowance.

  - **Port Arthur Navigation District of Jefferson County**—Five-member board of commissioners who are elected to serve two-year terms; all commissioners are paid travel expenses while the president is paid $75 per meeting and the other commissioners $50 per month.
- **Port Isabel-San Benito Navigation District**—Three-member board of commissioners who are elected to six-year terms; compensation involves a flat rate per month regardless of number of meetings attended.

### Main Channel Depth and Primary Cargoes, Texas

<table>
<thead>
<tr>
<th>Port</th>
<th>Depth (Ft.)</th>
<th>Primary Cargoes</th>
<th>Outbound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthur</td>
<td>40</td>
<td>Iron and steel products; forest products</td>
<td>Forest products; iron and steel products</td>
</tr>
<tr>
<td>Beaumont</td>
<td>40</td>
<td>Aggregate; military cargoes; iron and steel products</td>
<td>Forest products; iron and steel; military cargoes; bulk grain</td>
</tr>
<tr>
<td>Brownsville</td>
<td>42</td>
<td>Steel coils and plates; limestone; magnesite; sunflower seed oil; pig iron; lubricants</td>
<td>Iron and steel coils, billets and plate; soybean oil; sunflower seed oil; celestite; steel products</td>
</tr>
<tr>
<td>Freeport</td>
<td>45</td>
<td>Bananas; miscellaneous fruit; project cargo</td>
<td>Rice; chemicals; general cargo</td>
</tr>
<tr>
<td>Galveston</td>
<td>40</td>
<td>Bulk sugar; containers; bananas; plywood</td>
<td>Bulk grain; containers; sack/bagged goods; cotton</td>
</tr>
<tr>
<td>Houston</td>
<td>36-40</td>
<td>Petroleum products; crude fertilizers and crude minerals; steel; organic chemicals</td>
<td>Petroleum products; organic chemicals; grains; plastics</td>
</tr>
<tr>
<td>Orange</td>
<td>30</td>
<td>Not Available</td>
<td>Lentils; corn soya blend; flour; beans; bulgur; plywood</td>
</tr>
<tr>
<td>Lavaca/Point Comfort</td>
<td>36</td>
<td>Liquid bulk petro-chemicals; dry bulk commodities</td>
<td>Refined petro-chemicals; break-bulk chemical materials</td>
</tr>
</tbody>
</table>

Source: *Seaports of the Americas: The 1999 AAPA Directory*

a = 45 foot depth being constructed at the Port of Houston
Overall annual tonnage at different Texas ports:

- **Arthur** (1998) — 923,021 short tons (break bulk)
- **Beaumont** (1996) — 2,743,761 total tons consisting of 640,269 (break bulk) and 2,103,492 (dry bulk)
- **Brownsville** (1996) — 1,028,165 metric tons (liquid bulk) and 1,100,189 metric tons (dry bulk)
- **Corpus Christi** (1998) — 89,528,133 short tons consisting of 136,780 (break bulk); 1,463,127 (bulk grain); 2,001,658 (chemicals); 7,867,258 (dry bulk); 53,649 (liquid bulk); 78,005,661 (petroleum)
- **Freeport** (1998) — 931,168 tons including 516,082 (containerized); 72,718 (break bulk) and 342,368 (dry bulk)
- **Galveston** (1997) — 6,080,568 short tons including 94,327 (containerized); 332,214 (break bulk); 4,974,187 (dry bulk) and 679,840 (liquid bulk)
- **Houston** (1998) — 170.0 million short tons in total tonnage handled; 968,169 TEUs or 20-foot container units handled (this is a total of 8.1 million short tons)

Special Note: The Port of Houston, the world’s eighth largest port, is a 25-mile long complex of diversified public and private facilities several hours sailing time from the Gulf of Mexico. The Port of Houston Authority, which owns and operates the public facilities along the Houston Ship Channel, notes that the Port ranks first in the United States in foreign waterborne commerce and second in total tonnage. The Port’s top five trading partners in 1998—in terms of tonnage—were Mexico, Venezuela, Algeria, Iraq and Saudi Arabia.

In terms of preparing for the onset of megaships, an extensive research study conducted by the Texas Transportation Institute at Texas A&M University noted that the “Port of Houston is the most likely candidate to capture the role of load center containership megaport for the Gulf.” In fact, the study indicates that the Port’s management has initiated various measures to improve their facilities to prepare for container growth in the 21st century.
Port Activity in Virginia

- Administrative Entity: There are three main entities governing shipping activities in the commonwealth including the Chesapeake Port Authority, the Richmond Port Commission and the Virginia Port Authority. In this connection, the Virginia Port Authority (VPA) is the state’s leading agency for international transportation and maritime commerce, charged with operating and marketing the marine terminal facilities through which the shipping takes place.

- Governing Boards:
  - **Chesapeake Port Authority**—Five-member board, the members of which receive compensation for expenses only.
  - **Richmond Port Commission**—Thirteen commissioners appointed by the City Council to three-year terms; the commissioners must include the city manager and persons experienced in maritime commerce, freight transportation, finance, sales and marketing, engineering, a member of the City Council, two other persons and four port users, who serve as non-voting members; compensated at the rate of $50 per day.
  - **Virginia Port Authority**—Eleven-member board of commissioners, appointed by the governor and confirmed by the General Assembly; the commissioners should include the broadest possible representation of the state; no more than three commissioners should represent Chesapeake, Hampton, Newport News, Portsmouth or Norfolk.

- Special Note: As mentioned earlier, the VPA oversees the state’s major cargo operations with terminals at Norfolk, Portsmouth, Newport News and Virginia Inland Port in Front Royal. The VPA states that it has the best natural deepwater harbor on the U.S. East Coast with 50-foot unobstructed channels providing easy access and maneuvering room for the largest container vessels. VPA ports are located some 18 miles from the open sea on a year-round, ice-free harbor. In the realm of intermodal transportation, the VPA notes that it has the largest intermodal facility on the U.S. East Coast offering six direct-service
trains to 28 major cities each day and more than 50 motor-carrier companies providing full freight-handling and load-consolidation services. In fact, the VPA states that its intermodal transportation system extends easy access to two-thirds of the U.S. population.

- **Main Channel Depth at VPA:** 50 foot outbound channel.

- **Primary Cargoes at VPA:**
  - **Inbound**—Tobacco (manufactured and non-manufactured); auto engines and parts; natural rubber; paper and paperboard; construction and building equipment; alcoholic beverages; metal manufactures; cocoa beans; machinery parts; manufactured or processed food.
  - **Outbound**—Logs and lumber; paper and paperboard; wood up; tobacco (manufactured and non-manufactured); auto parts; alcoholic beverages; poultry (fresh and frozen); pet and animal feeds; staple fibers and fabrics; alcohol and alcohol derivatives.

- **VPA Historical General Cargo Tonnage (1991 to 1999)**

<table>
<thead>
<tr>
<th>Year</th>
<th>1991</th>
<th>1993</th>
<th>1995</th>
<th>1997</th>
<th>1998</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEUs</td>
<td>7,344,551</td>
<td>6,871,356</td>
<td>9,086,218</td>
<td>10,748,833</td>
<td>11,169,644</td>
<td>4,877,782</td>
</tr>
</tbody>
</table>

* = 1999 figures are for the period January through May, 1999

Source: Virginia Port Authority, Market Analysis, June 24, 1999

- **VPA Historical TEUs, 1991 through 1998:**

Source: Virginia Port Authority, Market Analysis, June 24, 1999
With the impressive growth in international trade and maritime commerce out of the VPA facilities at Hampton Roads, millions of dollars continue to pump into the state’s coffers. Consequently, local government officials in the cities (Portsmouth, Norfolk and Newport News) playing host to these lucrative ports have been pressing the state to compensate them in greater amounts citing the steady growth in the asset values of these port facilities and their acreage. In fact, lobbying from local officials resulted in a budget amendment of about $5.5 million for the above-mentioned three cities in both chambers of the General Assembly. (In 1999, the three cities received less than $600,000 combined.) Even though the measure failed in both chambers in the 1999 session, state lawmakers requested the Joint Legislative Audit and Review Commission, the General Assembly’s independent watchdog agency, study the impact of the state-owned ports on the cities to determine if they are being fairly compensated.
CONCLUSION

Ports across the United States contribute immensely to the economic health of the nation. Not only do they serve a vital commercial role, generating millions of jobs, billions of dollars in personal income, taxes and business sales, and contributing handsomely towards GDP, ports also perform a valuable military role. In this connection, a number of the nation’s most important seaports such as Baltimore, Norfolk, Hampton Roads, Charleston, Savannah, Jacksonville, Miami, New Orleans, South Louisiana and Houston, are located in the SLC states. Even here, the economic impact of port-related activity is impressive. With regard to the dominance of the SLC ports in overall U.S. waterborne tonnage, about 68 percent of all waterborne tonnage transported across the United States in 1996 involved ports in the SLC states. In terms of exports and imports, the SLC state ports play a very significant role as well, further underscoring the importance of SLC ports in the functioning of the national economy.

A major contributory factor to a flourishing port system is international trade. An expanding international trade environment generally results in a bustle of activity at ports across the globe. Even though turmoil in the global economy in the last two years has caused some short-term declines in shipping activity in the United States, the past 30 years have seen a tremendous increase both in the level of international trade and foreign waterborne commerce. From about 35 percent in 1965 to 43 percent in 1985 to 52 percent in 1997, there has been a steady growth in the foreign component of waterborne commerce. Experts also anticipate that trade between the United States and other regions of the world—particularly Latin America and East Asia—will continue to grow at impressive rates. In this regard, the proliferation of trade agreements and the general acceptance of free trade as the preferred economic philosophy indicate that there will be an upsurge in shipping activity. Hence, it is crucial that SLC state ports stand poised to take advantage of this international trend.
Alongside this surge in international trade and activity at ports across the globe in the last three decades, the use of containers to transport all types of cargo has also surfaced as a radically different transportation technique in shipping. Containerized shipping is not only the fastest growing technique for transporting all sorts of cargo but it is also considered the most efficient and cost effective method. This surge towards containerization has resulted in tremendous improvements in intermodal transportation methods with rail, truck and barge movements gaining significantly. A corollary of this rapid drift towards containers has been the need for ever larger vessels to take advantage of the economies of scale available in cargo transportation. This has resulted in numerous alliances, mergers, and vessel-sharing arrangements among carriers and shipping lines, often crossing national boundaries in their quest to lower operating costs and enhance profit margins. In certain instances, these alliances and mergers have spilled across modes of transportation too, with shipping carriers joining forces with railroad operations, a scenario that poses interesting conundrums to regulators here in the United States.

The notion that substantial cost savings might be realized by increasing vessel size is practically a given in contemporary shipping circles. Megaships, or ships capable of carrying in excess of 4,500 20-foot containers, or TEUs, will soon become more widespread. In fact, the first megaship with the capacity to carry 6000+ TEUs, the Regina Maersk, has already called on several SLC state ports, including Baltimore, Norfolk and Charleston. Furthermore, orders for megaships with similar, and even greater, load-bearing capacities, have stepped up in recent years and this class of vessel is expected to dominate shipping well into the next century.

Given the enormous size of these megaships, the constraints and challenges—both logistical and infrastructural—remain extraordinary for the ports at which these megaships will call. At this time, very few ports in the United States are fully equipped to handle these megaships when they are loaded to capacity. Given the fact that analysts expect these megaships to carry up to 40 percent of the world’s container cargo and 33 percent of the container volume moving through the United States by 2010, policy makers across the country, and particularly in the SLC states, are well served to develop an appropriate strategy to address this phenomenon.

It is generally acknowledged in shipping circles that the less time a vessel spends in port, the greater the amount of revenue that may be extracted from transporting cargo. Hence, there is a great push towards minimizing the time ships spend loading and/or unloading cargo. This phenomenon, in conjunction with the huge capital costs of megaships, will result in fewer port calls by megaships, which will stop only at ports that can move cargo in and out in an expeditious manner. Upgrading a port to fully handle these megaships promises to be a complex, lengthy and expensive proposition. Not only must the channel and berth depth of a port be a minimum of 50 feet, a number of related developments—such as bigger and more container cranes, high-speed truck and rail routes to transport cargo both to and from the megaships, warehouses to store the increased cargo load, and sophisticated computer systems to efficiently track this cargo—remain a few essential requirements. Regardless of whether a port acquires this elite megaport status, all ports, including those in the SLC region, have to devote resources to improve their capacities to deal with the introduction of these megaships to the oceans.
elite megaport status, all ports, including those in the SLC region, have to devote resources to improve their capacities to deal with the introduction of these megaships to the oceans.

Another emerging trend forecasted with the development of megaships involves a *hub-and-spoke* system, similar to the model used by the airline industry. According to this model, these megaships will connect the “global pivot ports,” (such as the super-hubs of Asia and the United States) cargo will then be transshipped to medium-sized “regional pivot ports,” and finally transported to their ultimate destinations by rail and road. Therefore, shipping experts do not envisage the need for a number of U.S. ports capable of handling these megaships, but only for a select number that will play the role of “global pivot ports.”

In closing, given the expected growth potential in international trade and the swift movement towards containers, the onset of megaships as the vessel of choice in the shipping industry is assured. Certain SLC states have anticipated this development and have begun preparations to enhance their capabilities to efficiently accommodate these megaships. In this connection, the ports in Baltimore, Norfolk, Charleston, Savannah, New Orleans and Houston have initiated programs to brace themselves for the wave of megaships that will surely be coming their way. Nevertheless, it is important for policy makers to continue to monitor these development efforts and ensure that they continue on pace. It is also important that these capacity enhancements include the smaller “pivot ports” given the fact that they remain critical elements in the incipient *hub-and-spoke* system. The slew of ports in the SLC states occupies an extremely important position in the nation’s economic measurements, a trend clearly demonstrated in the proportion of U.S. exports and imports flowing through the SLC ports. Hence, it is vital that the SLC state ports maintain and strive to expand this role as the trade gateway to the United States.
APPENDIX I
INLAND PORTS IN THE SLC STATES

America’s inland waterways and ports remain a crucial component of the nation’s transportation infrastructure and generally function away from the gaze of the public and media. Yet, inland ports handle a tremendous amount of cargo with the Lower Mississippi River inland ports, for instance, handling more tonnage than any other port complex in the world, even more than such world leaders as the ports in Rotterdam, Hong Kong and Singapore.\(^6\) As noted earlier, while the focus of this Report was the coastal ports, it is important to acknowledge the economic contribution made by the nation’s inland ports and waterways. Specifically, the U.S. Marine Administration records that the nation’s inland water transportation industries provided more than 75,000 jobs and contributed almost $450 million in federal and state payroll taxes.

The inland waterway system comprises navigable rivers and waterways and the inland ports that facilitate trade on them. These inland ports, terminals and waterways contain several characteristics that distinguish them from the more publicized coastal seaports. While their water depths are generally shallower—about 14 feet or less—they are less concentrated geographically and provide a greater number of access points to the waterways. Private ownership of inland waterway facilities is also more prevalent in comparison to the ownership of coastal facilities.\(^7\) The U.S. inland waterway system includes a network of commercially viable channels, 635 shallow-draft ports and 300 deep-draft ports. The fact that the inland water transportation system moves 60 percent of the nation’s grain exports, 24 percent of all chemical and petroleum movements and 20 percent of domestic coal shipments reinforces its overall importance to the economy.
The U.S. Maritime Administration’s October 1998 report to Congress includes statistics on inland ports as well, and the information on the SLC states is presented in Table 21.

<table>
<thead>
<tr>
<th>State</th>
<th>Number of Terminals</th>
<th>General Cargo</th>
<th>Dry Bulk Cargo</th>
<th>Liquid Bulk Cargo</th>
<th>Multi-Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>137</td>
<td>8</td>
<td>78</td>
<td>36</td>
<td>15</td>
</tr>
<tr>
<td>Arkansas</td>
<td>84</td>
<td>2</td>
<td>50</td>
<td>13</td>
<td>19</td>
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<tr>
<td>Kentucky</td>
<td>175</td>
<td>3</td>
<td>110</td>
<td>48</td>
<td>14</td>
</tr>
<tr>
<td>Louisiana</td>
<td>66</td>
<td>1</td>
<td>22</td>
<td>34</td>
<td>9</td>
</tr>
<tr>
<td>Mississippi</td>
<td>69</td>
<td>1</td>
<td>29</td>
<td>23</td>
<td>16</td>
</tr>
<tr>
<td>Missouri</td>
<td>133</td>
<td>2</td>
<td>87</td>
<td>32</td>
<td>12</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>27</td>
<td>3</td>
<td>14</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Tennessee</td>
<td>129</td>
<td>6</td>
<td>76</td>
<td>35</td>
<td>12</td>
</tr>
<tr>
<td>West Virginia</td>
<td>149</td>
<td>9</td>
<td>100</td>
<td>37</td>
<td>3</td>
</tr>
<tr>
<td>SLC Mississippi</td>
<td>969</td>
<td>35</td>
<td>566</td>
<td>264</td>
<td>104</td>
</tr>
<tr>
<td>Mississippi System Sub-total</td>
<td>1,748</td>
<td>61</td>
<td>1,023</td>
<td>477</td>
<td>187</td>
</tr>
<tr>
<td>Columbia/Snake Sub-system</td>
<td>64</td>
<td>9</td>
<td>45</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Total U.S.</td>
<td>1,812</td>
<td>70</td>
<td>1,068</td>
<td>484</td>
<td>190</td>
</tr>
</tbody>
</table>

Source: U.S. Department of Transportation

Table 21 provides a breakdown of the inland/riverport terminals in the SLC states and the cumulative numbers for the Mississippi and Columbia/Snake Rivers. As shown in the Table, dry bulk facilities account for the majority of the terminals (58 percent) with liquid bulk (27 percent) and multi-purpose terminals (11 percent) ranking second and third, respectively, in the SLC states. As mentioned previously, the Mississippi River system, which includes a number of the SLC states, accounts for a huge number of cargo movements every year. It is estimated that more than 300 million tons of cargo is shipped down the Mississippi River every year. As noted by the president and CEO of the Board of Commissioners of the Port of New Orleans, “[Y]ou can’t overstate the importance of the Mississippi River to the Port of New Orleans and the inland transportation system.” Most commercial freight on the Mississippi River and the inland waterway system travels on barges pushed by tugboats. More than half the states in the United States are tied to navigable waterways of the Mississippi, and the vast network of businesses bordering these inland waterways ship and receive goods with a value in excess of $100 billion.
The following section highlights some additional details on inland port activity in the several SLC states.

- **Inland Port Activity in Louisiana**—The focal point of the 14,500-mile network of inland waterways that flow into the Mississippi River is the Port of New Orleans. The Port has been working steadily to position itself as the leading port in trade with Latin America and considers the surrounding inland waterway system as a major component of this effort. In fact, the Millennium Port strategy referred to earlier seeks to tie the state’s inland waterways to the Port’s future plans by developing a multipurpose intermodal super terminal at or near the mouth of the Mississippi River. This super-terminal will facilitate the intermodal transportation, by rail or truck, of cargo transported by barge.

- **Inland Port Activity in Oklahoma**—Traffic at Tulsa’s Port of Catoosa has been increasing steadily over the last several years. In 1998, 2.4 million tons of cargo moved through the inland port on 1,423 barges; an increase from the 1.5 million tons that moved through the Port in 1995. In fact, Port officials note that in the last three decades, the Port has handled 41 million tons of cargo. It should be noted that the Port of Catoosa operates at the headwaters of the McClellan-Kerr Arkansas River Navigation System, the 445-mile waterway linking Oklahoma and the surrounding five-state area with the Port of New Orleans via the inland waterway system.

Despite the impressive tonnage moving through the Port in recent years, drought conditions have caused problems for barge traffic, with water in the Mississippi River falling so low that barges were forced to unload their cargo onto trucks. Specifically, low water and sediment build-up on the Mississippi combine to hamper barge traffic; typically barges need nine-foot drafts to navigate up and down rivers. This has prompted the Congress to fund projects to facilitate year-round navigation all the way up the Mississippi River to Catoosa, and the related construction is expected to be completed by 2003. (It is estimated that 4,000 Oklahomans rely on jobs related to the Port, generating $85 million in combined income.)

The director of the Port of Catoosa recently stressed its connections to Latin America, noting that “we can ship all over the globe without touching land. Oklahoma has eight separate inland ports.” He also noted that barges from Catoosa travel as far away as Uruguay.

- **Inland Port Activity in Tennessee**—The Port of Memphis serves as a prime load center and intermodal distribution complex at the gateway to the Midwest and beyond. In fact, the Port is currently working on a proposal for an intermodal super terminal that would expand the operations considerably. In 1997, Memphis handled 19 million tons of cargo and is a major shipping point on the Mississippi River.

- **Inland Port Activity in West Virginia**—According to the U.S. Army Corps of Engineers, barge traffic along the Kanawha River is at an all-time high, with the river functioning “as an important link in the regional economic and transportation system.” While coal is the main commodity shipped on the
Kanawha, chemicals and oil are shipped on the river as well. In addition, manufacturers ship in raw materials and ship out finished products, creating jobs at shipping companies, chemical plants, and other factories. In 1996, nearly 25 million tons of materials were shipped on the Kanawha, in comparison to 18.2 million tons in 1986. Across the state, about 25.4 million tons of coal were shipped by river barges in 1997, with about 15 percent of the coal produced in the state being transported by barge. The state has also received approval from the Army Corps of Engineers to construct an inland port at the Morgantown Industrial Research Park, which will make the site eligible for millions of dollars in federal funds.
ENDNOTES


2 The 16 states in the Southern Legislative Conference (SLC) are Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia.


7 “Port Authority Reels in Profits,” *The Clarion-Ledger*, Jackson, Mississippi, February 27, 1999.

8 It should be noted that six of the 16 SLC states (Arkansas, Kentucky, Missouri, Oklahoma, Tennessee and West Virginia) do not have a coastline. Consequently, waterborne commerce in these six states is limited to inland ports and related facilities. In addition, cargo traffic and related economic activity in the inland port states are significantly lower than in the coastal SLC states. Hence, a dominant section of this Report will focus on the 10 SLC states with coastlines. However, since the inland port activity in the six land-locked SLC states do play an important economic role, Appendix I provides a short review of recent inland port activity in these six states. Furthermore, this Appendix provides limited information on the inland port activity in some SLC coastal states.


The Association of American Ports Authorities’ (AAPA) definitions of the following measuring terms:

• **Metric Ton** = Measure of weight equal to 1,000 kilograms, or approximately 2,200 pounds. Symbol is “t”; also, referred to in some countries as “tonne.”

• **Short Ton** = Measure of weight equal to 1,000 pounds, commonly called a “ton.”

• **Long Ton** = Measure of weight equal to 2,240 pounds, or 20 long hundred weights. Also known as a “gross ton.”


Ibid.

“What If Port Disappeared?,” The Baltimore Sun, June 6, 1999. (Study compiled for the Maryland Ports Administration)

“Port Authority Reels in Profits.”

The two basic sizes are: a smaller one of 20 x 8 x 8, measured in the previously mentioned TEUs, or Twenty-foot Equivalent Units, and a larger one of 40 x 8 x 8, measured in FEUs, Forty-foot Equivalent Units.

The ensuing section draws on The Impact of Changes in Ship Design on Transportation and Infrastructure Operations, U.S. Department of Transportation, February 1998; Megaports and Load Centers of the Future with the Port of Houston as the Baseline Port, Texas Transportation Institute, Texas A&M University System, September 1997; Containerisation International Yearbook, 1998; ISL Shipping Statistics and Market Review, Institute of Shipping Economics and Logistics (ISL).


An illustration from the Maryland Port Authority is particularly instructive in showing how fewer vessels do not necessarily mean a reduction in cargo transported through the port. Specifically, in 1989 about 2,500 vessels called at the Port of Baltimore with just under 300,000 short tons in roll-on, roll-off cargo. However, in 1997, even though only 1,832 vessels called at the Port, they transported 462,738 short tons in roll-on, roll-off cargo. Despite a 27 percent reduction in the number of vessel calls, there was a 54 percent increase in cargo transported. This was possible because of the introduction of megaships to the industry. See “Last Call for Port Director,” The Baltimore Sun, July 26, 1998.


Texas Transportation Institute, p. 57.


37 Texas Transportation Institute, p. 131.

38 Ibid., p. 132.


41 Texas Transportation Institute, page vii.

42 Ibid., p. 133.


45 In Gibbons vs. Ogden (53, U.S. at 457, 13 L. Ed. at 1064), the Supreme Court held the Federal government to be supreme in the regulation of commerce including the “navigation, connected with commerce with foreign states, or among several states.”

46 Godwin.

47 Texas Transportation Institute, p. 107.

48 Information for the ensuing state sections was obtained from two AAPA sources, unless specified otherwise: Seaports of the Americas: The 1999 AAPA Directory and “U.S. Public Seaport Agency Governing Boards.”

49 Here are definitions for these types of cargo and examples:

- Containers—Refers to cargo packed in big, steel boxes, i.e., containers
- Break bulk—General cargo loaded package by package such as items in bales, on crates and pallets, unitized or not, but not in containers
- Dry bulk—Dry cargo such as iron ore, grain, coal, fertilizer etc. that is unpackaged and loaded in free flowing streams directly into vessel holds
- Liquid bulk—Liquid cargo such as petroleum, liquid natural gas, wine etc. that is unpackaged, i.e., not in drums, but loaded in free flowing streams directly into the tanks of a tanker or crude oil carrier

50 Alabama State Docks Department, from Internet site www.asdd.com.

51 Ibid.


53 “Grand Announcement by Grand Alliance,” AnchorAge. (Georgia Ports Authority), First Quarter 1999, Volume 39, No. 1.

54 Millennium Port Authority, Act 1225, July 9, 1999.

55 “Millennium Port Concept Will Capture Market Share,” The Port Record, March/April 1999.

56 Ibid.

57 Port of South Louisiana, from the Internet site www.solarport.com.

58 “Millennium Port Concept Will Capture Market Share.”


60 Ibid.

62 Mayor Bob Short, “Welcome to the Crossroads of the New South,” from Internet site www.ci.gulfport.ms.us.

63 “Port Authority Reels in Profits.”


67 Texas Transportation Institute, page 197.


71 “The Inland Waterway System.”


73 Ibid.

74 “The Inland Waterway System.”

## Contact Addresses for Selected SLC Ports

(Extracted from *Seaports of the Americas: The 1999 AAPA Directory*)

### Alabama
Alabama State Docks Department  
P.O. Box 1588  
Mobile, AL 36633  
Telephone: 334/441-7100

Port of Palm Beach  
P.O. Box 9935  
Riviera Beach, FL 33419  
Telephone: 561/842-4201

### Arkansas
Little Rock Port Authority  
7500 Lindsey Road  
Little Rock, AR 72206  
Telephone: 501/490-1468

Panama City Port Authority  
5321 W. Highway 98  
Panama City, FL 32401  
Telephone: 850/763-8471

### Florida
Canaveral Port Authority  
P.O. Box 267  
Cape Canaveral, FL 32920  
Telephone: 407/783-7831

Port Authority of Port St. Joe  
P.O. Box 280  
Port St. Joe, FL 32456  
Telephone: 904/227-1111

Canaveral Port Authority  
P.O. Box 267  
Cape Canaveral, FL 32920  
Telephone: 407/783-7831

Key West Port and Transit Authority  
P.O. Box 1078  
Key West, FL 33041  
Telephone: 305/292-8161

Port Authority of Port St. Joe  
P.O. Box 280  
Port St. Joe, FL 32456  
Telephone: 904/227-1111

Port of Everglades  
1850 Eller Drive  
Fort Lauderdale, FL 33316  
Telephone: 954/523-3404

Port of Iberia District  
P.O. Box 9986  
New Iberia, LA 70562  
Telephone: 318/364-1065

Port of Miami  
1015 North America Way  
Miami, FL 33132  
Telephone: 305/371-7678

St. Lucie County Port and Airport Authority  
2300 Virginia Avenue  
Fort Pierce, FL 34982  
Telephone: 407/461-7899

Nassau County Ocean Highway and Port Authority  
P.O. Box 2  
Fernandina Beach, FL 32034  
Telephone: 904/261-0098

Panama City Port Authority  
5321 W. Highway 98  
Panama City, FL 32401  
Telephone: 850/763-8471

Port of Iberia District  
P.O. Box 9986  
New Iberia, LA 70562  
Telephone: 318/364-1065

Port of Palm Beach  
P.O. Box 9935  
Riviera Beach, FL 33419  
Telephone: 561/842-4201

Port of St. Petersburg  
107 8th Avenue, S.E.  
St. Petersburg, FL 33701  
Telephone: 813/893-7053

Tampa Port Authority  
P.O. Box 2192  
Tampa, FL 33601  
Telephone: 813/272-0555

### Georgia
Georgia Ports Authority  
P.O. Box 2406  
Savannah, GA 31402  
Telephone: 912/964-3811

### Louisiana
Greater Baton Rouge Port Commission  
P.O. Box 380  
Port Allen, LA 70767  
Telephone: 504/342-1660

Port of Iberia District  
P.O. Box 9986  
New Iberia, LA 70562  
Telephone: 318/364-1065
The Future of Southern Ports

Greater LaFourche Port Commission
P.O. Drawer 490
Galliano, LA 70354
Telephone: 504/632-6701

Lake Charles Harbor and Terminal District
P.O. Box 3753
Lake Charles, LA 70602
Telephone: 318/439-3661

Madison Parish Port Commission
Route 1, Box 351
Sondheimer, LA 71276-9206
Telephone: 318/574-2181

Port of New Orleans
P.O. Box 60046
New Orleans, LA 70160-0046
Telephone: 504/522-2551

Plaquemines Port, Harbor and Terminal District
124 Edna LaFrance Road
Braithwaite, LA 70040-9715
Telephone: 504/682-0081

Port of Shreveport/Bossier
P.O. Box 52071
Shreveport, LA 71135-2071
Telephone: 318/861-4981

Port of South Louisiana
P.O. Box 909
LaPlace, LA 70069-0909
Telephone: 504/652-9278

St. Bernard Port, Harbor and Terminal District
P.O. Box 1331
Chalmette, LA 70044-1331
Telephone: 504/277-8418

Port of West St. Mary Harbor and Terminal District
P.O. Drawer 601, St. Mary Parish
Franklin, LA 70538
Telephone: 318/828-3410

Maryland
Maryland Port Administration
The World Trade Center, 401 E. Pratt Street
Baltimore, MD 21202
Telephone: 410/385-4700

Mississippi
Mississippi State Port Authority at Gulfport
One Hancock Plaza, Suite 1401, P.O. Box 40
Gulfport, MS 39502
Telephone: 228/865-4300

Port of Pascagoula—Jackson County Port Authority
P.O. Box 70
Pascagoula, MS 39568-0070
Telephone: 228/762-4041

Missouri
Southeast Missouri Regional Port Authority
2110 Main Street
Scott City, MO 63780
Telephone: 314/264-4045

City of St. Louis Port Authority
1015 Locust Street
St. Louis, MO 63101-1323
Telephone: 314/622-3400

North Carolina
North Carolina State Ports Authority
2202 Burnett Boulevard, P.O. Box 9002
Wilmington, NC 28402
Telephone: 910/343-6242

South Carolina
South Carolina State Ports Authority
P.O. Box 22287
Charleston, SC 29413-2287
Telephone: 843/723-8651

Tennessee
Port of Memphis
1115 Riverside Boulevard
Memphis, TN 38106-2504
Telephone: 901/948-4422

Texas
Port of Beaumont Navigation District
P.O. Drawer 2297
Beaumont, TX 77704
Telephone: 409/835-3995

Port of Brownsville-Brownsville Navigation District
1000 Foust Road
Brownsville, TX 78521
Telephone: 956/831-4592
Port of Corpus Christi Authority
P.O. Box 1541
Corpus Christi, TX 78403
Telephone: 512/882-5633

Port of Freeport—Brazos River Harbor Navigation District
P.O. Box 615, 1001 Pine Street
Freeport, TX 77542-0615
Telephone: 409/233-2667

Port of Galveston
P.O. Box 328, 123 Rosenberg, 8th Floor
Galveston, TX 77553
Telephone: 409/765-9321

Port of Harlingen Authority
P.O. Box 2646
Harlingen, TX 78551-2646
Telephone: 512/423-0283

Port of Houston Authority
P.O. Box 2562
Houston, TX 77252-2562
Telephone: 713/670-2400

Matagorda County Navigation District
—Port of Palacios
1407 Main Street, P.O. Box 551
Palacios, TX 77465
Telephone: 512/972-5556

Port of Orange—Texas
P.O. Box 2410
Orange, TX 77631-2410
Telephone: 409/883-4363

Port of Port Arthur Navigation District
P.O. Box 1428
Port Arthur, TX 77641
Telephone: 409/983-2011

Port Isabel-San Benito Navigation District
P.O. Box 218
Port Isabel, TX 78578
Telephone: 512/943-7826

Port of Port Lavaca/Port Comfort
P.O. Box 397
Point Comfort, TX 77978
Telephone: 512/987-2813

Port of Texas City—Texas
C/o Texas City Terminal Railway Corporation,
P.O. Box 591
Texas City, TX 77592
Telephone: 409/945-4461

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Virginia

Chesapeake Port Authority
860 Greenbriar Circle, Tower 1, Suite 304
Chesapeake, VA 23320
Telephone: 804/523-1100

City of Newport News—Department of Planning and Development
2400 Washington Avenue, City Hall
Newport News, VA 23607
Telephone: 757926-8428

Port of Richmond
5000 Deepwater Terminal Road
Richmond, VA 23234
Telephone: 804/646-2020

Virginia Port Authority
600 World Trade Center
Norfolk, VA 23510
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