



sink OR SWIM

Fifth District coastal ports must continue to expand to remain competitive

BY CHARLES GERENA

A few autumns ago, a single barge sailed the Intracoastal Waterway along the Carolina shore. Sitting atop the vessel, like massive stallions of metal and rivets, were two cranes that traveled more than 160 miles from Charleston, S.C., to Wilmington, N.C.

This voyage signaled progress for both ports. After making their grand entrance in Wilmington in October 2003, the cranes helped boost the capacity of the city's port. One of the beasts, a gantry crane that can carry up to 150 tons, replaced a 25-ton crane that had been in service for almost half a century. For Charleston's port, the sale of the older cranes was part of an effort to handle more cargo from bigger ships.

New York, California, Texas, and

Louisiana have the busiest ports, but the Fifth District is no slouch with four major coastal facilities. Three of them — the Port of Charleston, the Port of Baltimore, and the Port of Virginia in the Hampton Roads region — were among the nation's 30 busiest in 2002, the latest year available for aggregate data. Looking at foreign trade alone, these ports currently rank in the top 10 in terms of dollar value of goods, and the top 25 in metric tons moved and container volume. The Port of Wilmington is among the 25 busiest container facilities.

A state chartered, functionally independent authority controls the land and facilities at each port. Charleston's and Wilmington's maritime facilities must be financially self-sufficient, though they occasionally

receive government funding for capital projects. The Port of Baltimore and the Port of Virginia receive regular appropriations as part of their states' transportation departments.

In sum, these semi-private enterprises play a pivotal role in global commerce. Without them, retailers couldn't sell merchandise from all over the world at the low prices that consumers demand. Think of how public airports enable the airline industry to function by providing the shared infrastructure that carriers couldn't afford to own and operate individually.

At one time the physical limitations of ports dictated the size of cargo ships. Today, the relationship is reversed. Shippers push for bigger vessels to realize economies of scale and to cut costs for customers. As a result,

PHOTOGRAPHY: BILL MCALLISTER

public ports have boosted their capacity and capability to remain competitive. From 1998 to 2002, they devoted nearly \$7 billion to capital improvements, or about one-quarter of total investments made over the last 75 years.

At some ports, maritime trade is changing faster than they can adapt. In the Fifth District, ports have been adding cranes, deepening and widening waterways, and investing in other improvements to keep pace. The Port of Virginia and the Port of Charleston appear to be in the best competitive position to accommodate the biggest vessels, while the Port of Wilmington has the advantage over its larger East Coast competitors in terms of excess capacity.

But the future holds additional challenges for Fifth District ports to expand and adapt. Those that cannot

overcome constraints on waterway capacity, road and rail infrastructure issues, or land availability problems due to waterfront redevelopment, will be out of luck. “If you aren’t able to meet the needs of the shipping community, you run the risk of ships being attracted to another port,” says Kathleen Broadwater, deputy executive director at the Maryland Port Administration, which operates Baltimore’s port.

In the competitive world of global trade, such shifts in cargo flow are routine. For individual ports, however, lost business could translate into decreased economic activity on the local and regional level. Fewer people are involved in water transportation of freight — 37,400 in 2002 versus 47,400 in 1992 — but they make a comparatively good living. For example, a stevedore who loads and unloads ships earns an estimated \$16.95 an hour compared to \$15.03 for the average blue-collar worker. The businesses drawn to a port, from fuel suppliers to distribution centers, generate additional employment and spending.

Bigger, Faster, Better

It takes a small army of stevedores, crane operators, and other unionized workers to run a maritime facility — Baltimore’s port-related employment approaches 16,000 people. Historically, these workers have loaded bundles of cargo from ships, separated them into smaller shipments, and loaded them by hand and forklift into trucks and trains.

“There is a lot of inefficiency because of the restrictions on what tasks they can perform. They also earn higher wages,” says Wayne Talley, an economist at Old Dominion University who heads the school’s International Maritime, Ports, and Logistics Management Institute.

In order to minimize labor costs, shippers have moved from break-bulk to container shipping since the 1960s, transforming a labor-intensive endeavor into a more capital-intensive activity. Enormous cranes now scoop up standardized boxes stuffed with

goods and transfer them from ship to land with ease and efficiency.

According to Talley, cargo that used to take a week to unload can be moved in less than 24 hours if it’s stored in containers, resulting in substantial reductions in inventories. Container shipping also has resulted in less theft, since boxes are sealed until they arrive at a consignee, and less damage to cargo in transit.

As competition in global trade has intensified, container shippers have strived to transport more boxes per voyage and, thus, decrease per-unit transportation costs. This has meant employing vessels that are longer, wider, and deeper than ever before.

The largest ships, called “post-Panamax” since they exceed the dimensions of the Panama Canal locks, typically measure 1,100 feet in length and 136 feet in width, draw a maximum of 46 feet of water, and hold 5,000 to 8,000 TEUs. (ATEU, or “20-foot equivalent unit,” is equal to one container measuring 20 feet long, 8 feet wide, and 8 feet deep.) That’s a big difference from the earliest container ships that carried less than 1,000 TEUs. At the same time, other shippers have demanded bigger vessels to transport other types of cargo, from supertankers that carry enough oil to power a small city to bulk carriers that transport tons of grain, coal, and other materials.

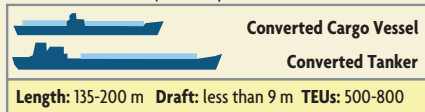
Talley offers one example of how ports have reconfigured themselves to service these vessels. A ship used to dock at a terminal perpendicular to a finger pier. Many ports have knocked down those piers so that container ships can dock parallel to a terminal and be offloaded by cranes.

Ports also have enlarged their waterways, built longer docks, and purchased taller cranes. For example, the Port of Virginia is adding eight new cranes to its main terminal in Norfolk that stand higher and reach out farther into the water than any other crane, enabling the terminal to service the next generation of container ships. More than \$45 million was spent on the cranes and millions more

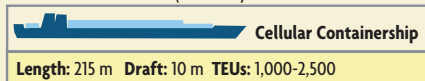
Five Generations of Containerships

The capacity of containerships has increased tenfold in the last 50 years, driven by demands of shippers to minimize per-unit transportation costs. Ports have been forced to keep up.

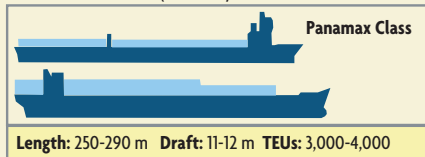
FIRST GENERATION (1956-1970)



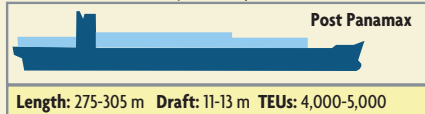
SECOND GENERATION (1970-1980)



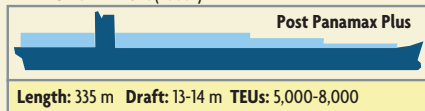
THIRD GENERATION (1980-1988)



FOURTH GENERATION (1988-2000)



FIFTH GENERATION (2000+)



SOURCE: Jean-Paul Rodrigue, et al. Transport Geography on the Web. Hofstra University, Department of Economics & Geography, 2004

to strengthen wharves to support the cranes.

While size matters, ports have had to work smarter too. For instance, the Port of Charleston has been implementing a yard management system that allows for more accurate tracking of containers. These and other operational upgrades have enabled the port to handle a near doubling of its cargo volume in the last 10 years without developing any new terminals.

With global trade accelerating in recent years, port officials anticipate further growth in the movement of containerized cargo, as well as break-bulk shipments, bulk commodities, and other goods. Much of this growth is expected to continue coming from trade with Asian countries, especially imports.

Officials in the Fifth District think their facilities will continue to attract a significant share of global cargo flow. Economic trends support their optimism. For one thing, distribution facilities are opening closer to population centers on the East Coast, many of which are near ports.

"Within the last five years, Virginia has attracted a significant number of major distribution centers," says J. Robert Bray, executive director of the Virginia Port Authority. These centers, opened by mass retailers like Home Depot, Target, Wal-Mart and Family Dollar, import large amounts of merchandise, so they have "demanded increased shipping service [and] caused ships to offload much more cargo than they did in the past."

At the same time, there has been mounting interest in East Coast ports as congestion at their West Coast counterparts has led to higher costs and headaches for shippers sending goods to and from Asia. Last October, dozens of ships reportedly waited at the Port of Long Beach to dock and unload consumer products bound for retailers stocking up for the 2004 holiday season. On top of that, the price of cross-country rail and truck transportation has been rising, adding to the expense of mov-

ing goods from the West to Eastern and Midwestern markets.

The last straw was a labor dispute that eventually shut down 29 West Coast ports in the fall of 2002. Asian shippers and producers had to reevaluate their distribution routes to keep their freight flowing. In the process, they found a viable alternative. Instead of sailing directly across the Pacific Ocean to West Coast ports, smaller ships could go around North America via the Panama Canal to reach East Coast ports. "Once shippers began that process, producers rearranged their just-in-time inventory to accommodate the additional time that the cargo spent on water," Bray says.

In the future, it may be more common for larger post-Panamax ships to bypass the West Coast and take the long way around to the East Coast, primarily by going through the Middle East via the Suez Canal and then crossing the Atlantic Ocean. However, this will happen only if it also proves to be economically viable for shippers.

The East Coast has some excess port capacity to handle any redirected cargo volume, according to Hofstra University geographer Jean-Paul Rodrigue. Most of the slack is at smaller facilities like the Port of Wilmington.

"We are seeing a tremendous amount of congestion starting to occur at competing ports north and south of us," says Thomas Eagar, CEO of the North Carolina State Ports Authority. "That's bad news for them, but good news for us. We are in the midst of serious discussions with two or three major container lines looking to divert [cargo] or bring new services to the Port of Wilmington."

Reality Check

But how much additional cargo volume can Fifth District ports realistically capture in the near term? Even if more shippers utilize the wider and deeper Suez Canal and other longer routes to the East Coast, many of their vessels wouldn't be able to fit into most ports once they arrive. At present, the Port of Virginia is the

only Fifth District facility that's big enough for the biggest ships of the present and the future.

Additionally, container ships stop in fewer places. "They want a port which can unload their containers very quickly. Today's ship spends most of its time moving; in the past, a ship spent most of its time in port," says Rodrigue. This could mean more business for larger ports, while the smaller ones will become merely feeders.

Ports could specialize in handling non-containerized goods. For example, Baltimore has become the largest hub for "roll-on/roll-off cargo" such as automobiles and farming equipment, and the vessels that carry them aren't as big as container ships. Nevertheless, every Fifth District port will want to grab its share of container shipping since it accounts for 90 percent of the value of non-bulk goods transported globally. That will require an acceleration of capital investments.

First, there is the task of deepening and widening waterways even further. Since channels are federal property, the Army Corps of Engineers performs routine dredging that clears channels of silt and other debris, while federal funding covers part of the cost of enlarging channels. Ports pay the remainder of that tab, plus they are responsible for deepening the access channels that lead to individual terminals and the berths where ships dock.

Some ports in the Fifth District are further along than other facilities. The Port of Virginia and the Port of Baltimore currently have 50-foot-deep main channels, while the Port of Charleston has an entrance channel measuring 47 feet deep and an inner harbor of 45 feet following the completion of a \$150 million deepening project in 2004. The Port of Wilmington also finished dredging its navigation channel to 42 feet last year.

So what if the Charleston port's channels are shallower than Virginia or Baltimore? "It makes a heck of a difference," says Bray of the Virginia Port Authority. "Some of the larger ships that Maersk and other shippers

have will draw a little more than 47 feet of water when fully loaded.” Channels need to be at least 50 feet deep to provide a margin for error when water levels in harbors change.

For now, the Virginia and Baltimore ports are ahead on this count. The Charleston port’s harbor could be deepened, but officials are holding off on doing it due to the cost, according to spokesman Byron Miller of the South Carolina State Ports Authority. Any dredging that goes beyond 45 feet lowers the federal share of project funding to 50 percent. Instead, the port will continue investing in its existing terminals and build a new span across its main shipping channel to accommodate taller ships.

Perhaps Charleston shouldn’t trouble itself. Having deep channels doesn’t do much good if a port’s

berths are shallower. The Port of Virginia’s Norfolk terminal has 50-foot berths, but the Portsmouth and Newport News terminals have berths that are only 45 feet deep and 42 feet deep, respectively. Bray says there isn’t a need to excavate at these terminals, but another deepwater facility is planned across from the Norfolk terminal at Craney Island, an area created with dredge material.

At the Port of Baltimore, an estimated 40 percent of its berths are too shallow. Some of them are being deepened, says Kathleen Broadwater at the Maryland Port Administration, but others will have to wait until the port’s older terminals are rebuilt so that dredging to 50 feet doesn’t undermine any structures. Such rebuilding projects are pending funding from the state legislature. Meanwhile, the Port of

Charleston recently dredged all of the berths at one terminal to 45 feet and three berths at its main Columbus Street terminal to 52 feet, putting it ahead of its Fifth District competitors.

In addition to making more room in its waterways for container ships and other large vessels, ports will need more dry land as operational improvements at existing terminals prove insufficient to deal with rising cargo volume. Land also has to be available nearby for additional warehousing and distribution centers.

Some ports have land inventoried for future expansion, but it can take a while to develop it. The construction of a new terminal for the Port of Charleston at a former naval base will take up to five years once the permit is approved.

Moreover, the land may never be fully exploited if there are insufficient

Cruisers and Containers

Containers aren’t the only things that Fifth District ports handle. Cruise ship passengers have joined the flow of goods at terminals in Baltimore, Norfolk, and Charleston in the last few years, generating new business and tourism-related dollars that have prompted some cities to make additional investments in their cruise facilities.

Traditionally, south Florida and New York have been the most popular departure points for cruisers. In 2003, their ports handled about 5.1 million of the 7.1 million passengers who set sail from the United States. But several factors have created opportunities for other ports to attract some of this passenger flow.

According to Brian Major, spokesman for the Cruise Lines International Association, more ships are sailing — the worldwide fleet has grown by two-thirds in the last five years alone — and cruise operators are looking for more options to offer to repeat customers. Both trends have fueled the need for additional departure points.

At the same time, cruise operators have moved their home-ports closer to coastal cities, explains Major. “With the reluctance to travel far away and to fly, [they believed] people would appreciate having a ship close to a large, regional population center that is within driving distance.”

Finally, cruise operators have more flexibility in where they choose to operate. Ships are much faster, enabling them to embark from ports farther away from their destination and make additional stops during their journeys without losing time.

Fifth District ports have managed to attract their share of cruise ship calls. In 2003, 31 ships departed from Baltimore, another 31 from Norfolk, and 17 from Charleston, and all three ports experienced growth in departures for 2004. No cruise

ships leave from the Port of Wilmington regularly, but they do stop there occasionally as they travel along the East Coast.

This volume is relatively small compared to the hundreds of cargo ships that call at ports every day, but they are still a significant source of revenue. “Port service providers at each of the embarkation ports and ports-of-call in the United States provide a broad range of services, including tugboat and piloting services, stevedores, passenger reception services, warehousing and other material handling services,” noted an August 2004 economic impact study commissioned by the International Council of Cruise Lines (ICCL). “During 2003, the cruise industry spent \$1.6 billion on such port services.”

Additionally, the passengers and crew on cruise ships spend their money in nearby communities. The ICCL study found that about a third of cruisers stay one or more nights at a port city and spend an average of \$195 per visit. Those who arrive the day of the cruise dole out an average of \$17 per visit while ship personnel spend \$29 per visit. (As a side note, the big-spending overnight passengers are smaller in number: 2.3 million compared to 4.8 million day-of-arrival passengers and 4.4 million crew members.)

Going forward, waterway capacity for cruise ships shouldn’t be a problem. Most ports can handle the largest vessels. However, terminal capacity could be an issue if Fifth District ports continue attracting the attention of cruise operators. So, city officials in Norfolk plan to build a new \$36 million cruise ship terminal to replace a temporary facility next to the Nauticus science center, while Maryland will invest \$3 million to \$4 million to renovate a cargo terminal in Baltimore to exclusively serve cruise lines. Charleston already has a cruise ship terminal in its downtown historic district.

— CHARLES GERENA

roads and rail lines to transport the additional cargo volume. Charleston's proposed expansion on Daniel Island was scratched partly due to concerns about nearby road capacity, while a proposed third bridge-tunnel system in Hampton Roads is critically important for the Port of Virginia's future terminal on Craney Island because it will help relieve local traffic jams.

"More and more folks want to live closer to the water," says Miller. "That's putting additional pressure on road infrastructure. As the [coastal] population continues to grow, perhaps even faster than the trade grows in port cities," governments will have to respond.

Cargo Or Condos?

Coastal development has also made it difficult for ports to expand. "Most of our major commercial ports are located in highly developed, urban areas, and as a result face real constraints on how much land is available for use as marine terminals," said Christopher Koch, president of the World Shipping Council, in May 2001 testimony to a House of Representatives subcommittee.

Homes and businesses surround the terminals of the Port of Virginia, but there is still some room for projects such as the planned expansion of a paper distribution facility near the Newport News terminal. Development is occurring along Wilmington's waterfront, but mostly in the northern half where older maritime facilities are being converted into condominiums, offices, and marinas. The southern waterfront where the port resides has remained mostly commercial. As for Baltimore and Charleston, residential, office, and tourism-driven retail development encroach on maritime activities, making port expansion very difficult.

Every Fifth District port competes for land with the private sector to some degree. Waterfronts contain underutilized or abandoned industrial property, but they also offer great views that residents and office workers value. "The most desirable land is always coastland, so [ports] have a lot of competition with real estate development," Rodrigue says. "People prefer to see condos rather than a port terminal."

Port authorities have the power of eminent domain, thanks to state legislation, but they rarely use it. Taking private property for public use usually requires lengthy court proceedings that often become mired in legal disputes. Additionally, this power isn't unlimited.

Rather than public ports bidding against private developers, some port advocates suggest using restrictive zoning to preserve waterfront property for future port expansions. In September, Baltimore officials created a "maritime industrial overlay district" that prohibits nonmaritime development along a large stretch of harbor for the next 10 years.

But what if ports don't need the land and other industrial users aren't demanding it due to consolidations and market shifts in the manufacturing sector? The rezoned property would simply sit unused.

Such a scenario would probably be hard for local governments to swallow. Since their interest is in encouraging economic growth, they provide incentives like tax breaks and clean-up assistance to support waterfront redevelopment. "I have heard of horror stories where real estate projects aimed at closing almost the entire port because building condos and commercial real estate would gener-

Where Ports Stand

U.S. Waterborne Foreign Trade, Total

(Thou. of Metric Tons)

Port	2003	Rank Among Top 25
Baltimore	22,443	18
Norfolk	22,011	19
Charleston	17,245	22

U.S. Waterborne Foreign Trade, Total

(Mil. of Dollars)

Port	2003	Rank Among Top 25
Charleston	39,375	5
Norfolk*	29,486	6
Baltimore	25,956	8

U.S. Waterborne Foreign Trade, Containerized

Cargo

(Thou. of TEUs)

Port	2003	Rank Among Top 25
Charleston	1,250	4
Norfolk*	1,093	6
Baltimore	307	13
Wilmington	72	25

NOTE: *Excludes trade at Newport News and Portsmouth terminals at the Port of Virginia

SOURCE: U.S. Maritime Administration

ate more taxes," Rodrigue says.

Instead of government arbitrating development, as Baltimore did, developers argue that buyers and sellers should determine the highest and best use of waterfront property. Anyone who is willing to put their money on the table should be allowed to redevelop a site, especially someone who wants to convert underutilized industrial space into housing or office space that is in demand.

Regardless of how these issues will be resolved, Fifth District ports are acutely aware of the competition they face. The next generation of larger container ships will be sailing the oceans in coming decades, and will require ports to get bigger and smarter to handle the growing volume of containers, or else develop other customer bases. **RF**

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