The Expansion of the Panama Canal and Its Impact on Virginia

by Sara E. Russell

Introduction
Nearly 100 years ago, the United States completed construction on the Panama Canal, linking the Pacific and Atlantic Oceans and opening connections to nations around the globe. Since that time, 14,000 voyages are made annually through the canal by passenger and cargo ships. However, as ships have grown larger in size, with greater width, length and draft, they have posed a challenge to the canal. The canal's lock system, mechanical devices used to raise or lower ships to different water depths, can accommodate vessels that are no more than 100 feet wide and 1,000 feet long, thus preventing today's larger cargo ships from passing. Therefore, in order for this region to continue to support global trade, particularly cargo exported from the Asian markets to North and South America and Europe, the canal has required an update—a larger set of locks. The U.S. turned control of the canal over to Panama in 1999 and in 2006 Panamanian citizens approved a bond referendum to expand each coast's locks. Once construction is complete in 2015, larger cargo ships will be able to pass through the canal, effectively doubling its capacity.

The canal expansion means that the U.S. Gulf Coast and East Coast ports, including the Port of Virginia at Hampton Roads, will be able to vie for this increased trade and could potentially take away tonnage from the U.S. West Coast. Virginia, with its important and well-placed Port of Virginia at Hampton Roads, stands out among its Gulf and East Coast competitors as a region already well-prepared to handle the cargo, with deep water, state-of-the-art terminals and accessible inland connections. But the state can't merely sit back and wait. The Port of Virginia, in partnership with the state's economic development groups, must proactively work to attract not only the ship lines but also the shippers as customers with a variety of further preparations. After examining the canal's increased capacity and describing current patterns of land and water cargo shipment in the U.S., this article will focus on the new opportunities for various U.S. and Caribbean ports and propose several scenarios for new international and U.S. cargo-transport patterns, with Virginia having the potential to play a leading role in these developments.

The Canal Today
Today's container ships are characterized not only by the forms of cargo they carry but also by the canals they can transit. One defining characteristic of cargo ships is whether they can pass through the Panama Canal. Those that can traverse the existing canal are termed “Panamax-sized” and those that are too large are termed “Post-Panamax-sized.” Panamax-sized vessels carry upwards of 5,000 twenty-foot-equivalent units (TEUs, the
New Infrastructure Development Will Be Needed

In addition to Panama repositioning itself to provide cargo services, the U.S. and Caribbean ports are also focusing on infrastructure development. Today, West Coast ports import 70 percent of the Asian trade and 50 percent of this cargo moves to the Midwest and to the East Coast. However, with the expansion of the Panama Canal, the Gulf and East Coast ports including the Port of Virginia will be able to vie for this trade and could potentially take away tonnage from the West Coast.

When considering expansion plans, the Panama Canal Authority (named in Spanish, La Autoridad del Canal de Panamá or ACP) examined global shipyard order books for ships that would be constructed in the next several years and recognized that the trend was for container ships in the 8,000+ TEU range, but not the incredibly large 13,000+ TEU ships. As such, the new locks will allow for vessels that today are characterized as Post-Panamax. The new locks will allow the canal to double capacity, promoting all water voyages to the U.S. Gulf and East Coasts.

The $5.5 billion expansion will position Panama to accept larger ships and continue that nation’s role in supporting the global economy. Panama is improving many facets of its domestic infrastructure to meet shippers’ demands and provide value-added services. On the Atlantic side of the locks, the Colon Free Zone, the world’s second largest free zone, offers a wide variety of commercial services for shippers including warehousing, packaging, labeling and distribution for $16 billion of cargo activity annually. In a further development this past summer, Damco Panama and Exclusive Brands Logistics Corporation (EBL) formed a logistics and transportation partnership within the region to promote the sale and import/export of textiles and apparel.

New Infrastructure Development Will Be Needed

In addition to Panama repositioning itself to provide cargo services, the U.S. and Caribbean ports are also focusing on infrastructure development. Today, West Coast ports import 70 percent of the Asian trade and 50 percent of this cargo moves to the Midwest and to the East Coast. However, with the expansion of the Panama Canal, the Gulf and East Coast ports including the Port of Virginia will be able to vie for this trade and could potentially take away tonnage from the West Coast. In addition, with this enlarged Panama route available, certain risk management strategies may be adopted by shippers that will expand East Coast and Gulf activity. These include “four-corner” shipping plans, a method of shipping cargo into two ports on separate coasts to reduce the possibility of cargo delays in the event of supply chain disruptions such as labor strikes, weather disturbances, or infrastructure problems. The Panama Canal’s expanded capabilities and multiple ship routings will allow importers and exporters a way to mitigate supply chain disruptions.

Currently, Asian cargo destined for the U.S. East Coast is shipped through the canal on Panamax vessels, sent by land across the country from the West Coast ports, or arrives at East Coast ports via Mediterranean and Suez Canal services. Landbridging is the term used for a process where cargo crosses a body of water, arrives in another nation’s coastal port and is transferred by road or rail to the opposite coast. From this location the cargo can be distributed or can board another ship and travel across another ocean. For example, a container departs the Port of Hong Kong, travels across the Pacific Ocean and arrives at the Port of Los Angeles. At the Port of Los Angeles,
the box is either trucked or railed across the U.S. to the Midwest or the East Coast ports. When the right conditions exist, such as lower trucking and rail costs that occur when fuel costs and traffic congestion are moderate, shippers can save money by landbridging, bypassing the Panama Canal tolls and saving several days of transit time. Prior to the escalation of diesel fuel prices, this strategy was a viable alternative to all-water services for many shippers. Today, with diesel prices and rail infrastructure limitations and bottlenecks, an all-water route is preferable. Therefore, the expansion of the Panama Canal will support such routings.

For regions and ports to handle the expected increase in the number of ships as well as cargo volume, development of seaside, shoreside and landside infrastructures is necessary. Over the past five years, infrastructure development has been occurring throughout the U.S. Gulf and East Coast ports as well as at the Caribbean ports. The Commonwealth of Virginia, with its important and well placed Port of Virginia at Hampton Roads, stands out among its Gulf and East Coast competitors as a port prepared to handle the cargo from the shoreside to the landside, with deep water, state-of-the-art terminals and accessible inland connections.

First, when analyzing seaside infrastructure, it’s imperative that ships are able to safely navigate into ports, load and unload cargo and depart in a timely manner. This requires ship channels to be dredged deeper to accommodate the Post-Panamax ships. Most regions focus on deepening their harbors and quaysides to at least 50 feet to accommodate these ships. The ability to dredge, however, is dependent upon a number of factors, including the seabed content, state and federal environmental regulations, and federal or private funding. Channels leading to terminals within the Port of Virginia as well as the shipping berths there are already dredged to 50 feet (the APM Terminal-Virginia berths are dredged to 55 feet⁴), allowing for Post-Panamax ships to enter, navigate to the quay and berth safely. Furthermore, the U.S. Army Corp of Engineers authorized the area to be dredged to 55 feet, further enhancing the area’s ability to accommodate the larger ships.

Two of the Port of Virginia’s East Coast competitors, the Ports of Charleston and Savannah, currently have 45- and 42-foot drafts, respectively. Studies concerning a 50-foot access to the Port of Charleston are ongoing and even if approved, dredging of the Charleston Harbor is not expected to be completed before 2018 at the earliest. In October 2012, the Savannah Harbor Expansion Project received approval from the U.S. Army Corp of Engineers, which declared that dredging the river to 47 feet was economically viable and met environmental approvals.⁵ Again, the Port of Virginia maintains a competitive advantage with its deep-water access.

A second necessity is that a port’s superstructures be able to service the ships. The berths should be long enough to accommodate the ships and the shoreside gantry cranes must be able to reach across the ship to load and unload the boxes. Norfolk International Terminals (NIT) and the APM Terminals Virginia facility (managed by Virginia International Terminals) are home to the world’s largest cranes. With a 245-foot reach, these cranes can extend across 27 containers on a ship,⁶ allowing for efficient loading and unloading operations.

Intermodal Transportation Projects

Once the cargo arrives, it must move from port premises to local, regional or national customers via truck, barge or rail. These modes must consider the impact of larger cargo volumes as well. It’s evident that much of our nation’s interstate highway system cannot realistically handle increased traffic volume; therefore, an emphasis on alternative...
modes of transportation for much of this cargo is a priority. Once again, service providers within Virginia and surrounding areas are positioned to offer alternate methods of transport because completed infrastructure projects, ranging from updated rail connections to barge services, are now readily available to the port’s customers.

The Port of Virginia is serviced by two Class I railroads, Norfolk Southern and CSX. Over the past decade, both organizations have spent considerable amounts of money to update rail infrastructure along the Eastern Seaboard. One important rail project completed to improve intermodal transportation in the region was Norfolk Southern’s Heartland Corridor project. The $320 million project,\(^7\) completed in 2010, raised the height of 28 bridges and eliminated overhead obstructions along the rail route from Hampton Roads to Columbus, Ohio, allowing for the passage of double-stacked container trains.

Not only did the project double freight capacity along this rail line linking to Chicago, the nation’s busiest rail interchange, but it also shortened transit distance by 250 miles. It now takes the same amount of time for cargo to transit from the Hampton Roads area to Chicago as it does for cargo departing the terminals at the Ports of New York and New Jersey, thus improving the competitive position of the Port of Virginia and improving services for its customers located throughout the Midwest and the West.

A second project, CSX’s $842 million National Gateway Project, focused on improving rail access along the East Coast and into the Midwest markets (see Figure 2). This project includes upgrading rail corridors throughout several states including Virginia, allowing for the passage of double-stack cargo trains. Both projects can significantly improve the Port of Virginia’s ability to attract discretionary cargo that is not destined for the Mid-Atlantic but needs to go to the Midwest or West.

Another established option for shippers utilizing the Port of Virginia is the James River Barge Service’s 64 Express. This weekly container service between the terminals in Hampton Roads and the Port of Richmond allows shippers’ cargoes to bypass congested Interstate 64 between the metro regions and to move in a more environmentally-friendly manner. Since beginning operations at the end of 2008, the container-on-barge tonnage has increased. From January to August 2012, the service moved 5,978 containers, a 105 percent increase from the same period in 2011.\(^8\) Because barging is a slower alternative to rail and trucking operations, it is infrequently used for the transportation of time-sensitive or perishable cargo.

An important benefit is that barge operations significantly lower amounts of greenhouse gases (hydro carbons, carbon dioxide, and nitrogen oxides), sulphur or particulate matter as compared...
to road and rail transportation (see Table 1). As shippers and shippers’ customers become more concerned with their “carbon footprint,” sustainable business operations, and the impact that their supply chains have on the environment, barging must be examined as an alternative to road and rail transportation.

**Build It, But Will They Come?**

As evidenced, the Commonwealth of Virginia’s infrastructure is prepared to accommodate the Post-Panamax ships and the expected increases in cargo tonnage with the Panama Canal expansion, but the state can’t merely sit back and wait for cargo. The Virginia Port, in partnership with the state’s economic development groups, must proactively work to attract the shippers. This can be accomplished in several ways, for example, through tax incentives for investments in manufacturing facilities and distribution centers and by establishing foreign trade zones.

In 2011, the Virginia General Assembly passed several port-related tax incentive plans. The first tax credit, the Barge and Rail Tax Credit, offers shippers a $25 per TEU incentive to move containers by barge or rail rather than by trucks on Virginia’s highways. By utilizing alternative intermodal transportation options, shippers lessen the amount of traffic on roadways and interstates as well as provide an environmental benefit to the region. Another credit, the International Trade Facility Tax Credit, allows taxpayers a credit for either capital investment in an international trade facility or increasing jobs related to an international trade facility. A third measure, the Port Volume Increase Tax Credit, allows taxpayers to claim it if they qualify as a manufacturing facility or if they increase port cargo volume at Virginia’s port facilities by 5 percent above base-year port cargo volume. The overriding goal of the measures is to encourage organizations to utilize the Port of Virginia for their international transportation needs. In addition, the incentives promote the commonwealth as an attractive location for firms looking to establish or relocate manufacturing facilities or distribution operations related to international trade. More than thirty retailers operate import warehouses or distribution centers in Virginia, including Target Stores, The Home Depot, and CVS (see Figure 4).

Other ports are also taking action. As early as 1994, the state of Georgia passed a Business Expansion and Support Act (BEST). A Port Activity Job Tax and Investment Tax Credit included in the legislation provides incentives to establish or expand operations related to the marine terminals of the Georgia Ports Authority. These early plans encouraged firms such as Whirlpool, Target, IKEA, Heineken and Oneida to locate facilities in Georgia. In 2007 these facilities operated more than 3 million square feet of warehousing and transported 100,000 TEUs annually. Today, the top 15 distribution centers manage more than 15 million square feet of warehousing space. As the fourth largest container port in the United States, the Georgia Ports Authority proactively promotes the benefits of the state and its port system.

Although importers and Asian cargo are the primary focus for the canal expansion, exporters and their cargos should also be a consideration. In 2010, during his State of the Union Address, President Obama launched the National Export Initiative, a plan focused on doubling U.S. exports by 2015. Goals included modernizing export controls, improving accessibility to capital and financing via the U.S. Export-Import Bank, and emphasizing export promotion. Both the U.S. and state economies will benefit from the increased amount of exports through job creation and manufacturing operations, and the carriers will also have cargo for their return trips, making the backhauls profitable.

All ports throughout the United States are working to upgrade and expand their facilities, attract shippers to their regions, and establish memorandums of understanding (MOUs) not only with the Panama Canal but also steamship

Table 1: Modal Comparison of Emissions, 2005

<table>
<thead>
<tr>
<th>Mode</th>
<th>Hydrocarbon (HC)</th>
<th>Carbon Monoxide (CO)</th>
<th>Nitrogen Oxides (NOx)</th>
<th>Particulate Matter (PM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inland barge towing</td>
<td>0.01737</td>
<td>0.04621</td>
<td>0.46907</td>
<td>0.01164</td>
</tr>
<tr>
<td>Eastern railroad</td>
<td>0.02419</td>
<td>0.06434</td>
<td>0.65312</td>
<td>0.01624</td>
</tr>
<tr>
<td>Western railroad</td>
<td>0.02423</td>
<td>0.06445</td>
<td>0.65423</td>
<td>0.01621</td>
</tr>
<tr>
<td>Truck</td>
<td>0.02000</td>
<td>0.13600</td>
<td>0.73200</td>
<td>0.01800</td>
</tr>
</tbody>
</table>

The MOUs state that the firms will attempt to work with one another, support shippers, and drive cargo into their facilities.

Which ports will dominate and how will the global trade patterns shift? Before tackling that question, it is important to note the current rankings of North America ports (see Table 2).

Table 2: North American Port Rankings as Measured by TEUs, 2010 and 2011

<table>
<thead>
<tr>
<th>Rank in 2011</th>
<th>Port</th>
<th>TEUs 2010</th>
<th>TEUs 2011</th>
<th>Change Amount</th>
<th>Change Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Los Angeles, CA</td>
<td>7,831,902</td>
<td>7,940,511</td>
<td>108,609</td>
<td>1.39</td>
</tr>
<tr>
<td>2</td>
<td>Long Beach, CA</td>
<td>6,263,499</td>
<td>6,061,091</td>
<td>-202,408</td>
<td>-3.23</td>
</tr>
<tr>
<td>3</td>
<td>New York/New Jersey</td>
<td>5,292,025</td>
<td>5,503,485</td>
<td>211,460</td>
<td>4.00</td>
</tr>
<tr>
<td>4</td>
<td>Savannah, GA</td>
<td>2,825,179</td>
<td>2,944,678</td>
<td>119,499</td>
<td>4.23</td>
</tr>
<tr>
<td>5</td>
<td>Metro Vancouver, CAN</td>
<td>2,514,309</td>
<td>2,507,032</td>
<td>-7,277</td>
<td>-0.29</td>
</tr>
<tr>
<td>6</td>
<td>Oakland, CA</td>
<td>2,330,214</td>
<td>2,342,504</td>
<td>12,290</td>
<td>0.53</td>
</tr>
<tr>
<td>7</td>
<td>Seattle, WA</td>
<td>2,133,548</td>
<td>2,033,535</td>
<td>-100,013</td>
<td>-4.69</td>
</tr>
<tr>
<td>8</td>
<td>Hampton Roads, VA</td>
<td>1,895,017</td>
<td>1,918,029</td>
<td>23,012</td>
<td>1.21</td>
</tr>
<tr>
<td>9</td>
<td>Houston, TX</td>
<td>1,817,169</td>
<td>1,866,450</td>
<td>49,281</td>
<td>2.71</td>
</tr>
<tr>
<td>10</td>
<td>Manzanillo, MEX</td>
<td>1,511,378</td>
<td>1,762,508</td>
<td>251,130</td>
<td>16.62</td>
</tr>
</tbody>
</table>


Pedro Bay every day delivering cargo to the central U.S. and Midwest in five to six days. Barring any intermodal congestion or labor disruptions, it is realistic to assume that the West Coast ports, with their established deep water and port superstructures, will continue to service a large percentage of Asian cargo imports.

The remaining cargo could be handled in one of three ways. First, a Caribbean hub and spoke operation could be established serving a greater role in cargo transshipments. Second, a U.S. East Coast port could strategically position itself as a major hub facility. Third, several East Coast and Gulf ports could receive small increases in Asian cargo.

Already, the Caribbean ports of Freeport in the Bahamas, Kingston in Jamaica, and Caucedo in the Dominican Republic handle transshipment lines. The MOUs state that the firms will attempt to work with one another, support shippers, and drive cargo into their facilities.

Before tackling that question, it is important to note the current rankings of North America ports (see Table 2). How will these ports deal with the change? That is literally a billion dollar question. Several possibilities exist. First, West Coast ports will continue to receive the bulk of the trade simply because of their population centers and existing infrastructure. The Ports of Los Angeles and Long Beach serve an immediate population of 20 million people. The Port of Los Angeles has a 500-mile trucking radius to 15 percent of the nation’s population, and more than 100 trains depart the San Pedro Bay every day delivering cargo to the central U.S. and Midwest in five to six days. Barring any intermodal congestion or labor disruptions, it is realistic to assume that the West Coast ports, with their established deep water and port superstructures, will continue to service a large percentage of Asian cargo imports.
cargo that is delivered to other Caribbean islands and North and South America. Benefits abound in the Caribbean, including low-cost labor, deep water, and low real estate costs, thus positioning the region as an attractive location for port investment and development. In the summer of 2011, the French shipping line, CMA CGM, signed a MOU to lease the Kingston Container Terminal and committed $100 million for investment, establishing its Caribbean transshipment location. Ultimately, one of these islands could position itself as a logistical load center, receiving the larger Post-Panamax traffic and then distributing cargo via smaller feeder ships to North and South American markets. However, some importers may balk at the cost of their cargo being handled twice—both at the Caribbean facility and then again at a U.S. or South American port. This scenario, although a possibility, would most likely add to the cost of handling the goods.

Other scenarios involve U.S. Gulf Coast and East Coast facilities. The first scenario is that an East Coast or Gulf Coast port could become a load center, act as a hub for Asian-bound exports and distribute imports via feeder services to surrounding coastal and inland facilities. This option would necessitate the expansion as well as development of other ports’ infrastructures on that coast. When needed, Virginia does have room for expansion, with the Craney Island Eastward Expansion, which would become the fifth marine terminal within the Port of Virginia.

Given that an East Coast or Gulf Coast load center option limits the competitiveness of the non-load center ports and would require many of these facilities to become secondary ports, a more realistic option is that several key ports with well-developed infrastructures and quality services will receive smaller portions of the expected increased tonnage.

In the second half of 2012, cargo volumes at the Port of Virginia rebounded close to the pre-recessionary cargo levels of 2007 and early 2008 (see Figure 5). The looming September 30th deadline for the International Longshoreman Association’s (ILA) contract discussions spurred many shippers to expedite shipments into the East Coast ports to avoid supply chain disruptions in the event of a labor strike. More recently, in the wake of Hurricane Sandy the port absorbed diverted cargo from the Port of New York and New Jersey, which suspended operations.

**Summary and Conclusion**

The expansion of the Panama Canal to handle much larger vessels moving cargo between the Atlantic and Pacific oceans by 2015 opens the way for ports in the Caribbean and the U.S. Gulf
Coast and East Coast to compete for significantly increased trade, especially from Asia, and could potentially take away tonnage from the U.S. West Coast. Virginia, with its important and well placed Port of Virginia at Hampton Roads, stands out among all as being already well prepared to handle more cargo and is set to play a leading role in new international trade developments.

A central issue concerning current port operation in Hampton Roads is the consideration of privatization bids. In May 2012, APM Terminals North America, a division of the A.P. Moller - Maersk Group, submitted an unsolicited bid to resume control of the APM Virginia Facility and assume operating control of the current Virginia International Terminals (VIT) - operated port facilities in Hampton Roads, including the inland port in Front Royal, VA. Subsequently, RREEF (Deutsche Bank) has submitted a proposal. The Virginia Office of Transportation Public-Private Partnerships office and the Virginia Port Authority Board of Directors are now reviewing the bids and a decision should be made in 2013 as to whether the terminals will be privatized or whether VIT will remain the region's terminal operator.

The port, currently eighth in the nation in annual tonnage passing through, has deep water, state-of-the-art terminals, room for expansion and good inland connections for shipping as far as the Midwest and even beyond. Virginia's freight rail system is especially well prepared and the state has good interstate highway connections. However, the Port of Virginia, in partnership with economic development groups, must proactively work to attract ships and shippers that will begin moving through the Panama Canal two years from now. Economic incentives for increased warehousing, manufacturing and logistical services should be offered.

Given that if one port such as Virginia’s became the leading load center for new shipping patterns, forcing other highly attractive ports to become secondary sites, a more likely scenario is that several key ports with well-developed infrastructures and services will together receive smaller portions of increased tonnage in varying shares. Yet, it is realistic to assume that because the magnificent deep water Port of Virginia can clearly handle significant cargo volume increases, the impact of the Panama Canal expansion on the state could mean considerable economic growth, through shipping, manufacturing, distribution, and infrastructure development with corollary job creation. As a result of far-sighted infrastructure projects in place and under way both seaside and landside in Virginia, the state is poised and prepared for higher volumes of cargo when the larger vessels begin moving through the Panama Canal in 2015.

**ABOUT THE AUTHOR**

Sara Russell is a lecturer in the Maritime and Supply Chain Management Program at Old Dominion University (ODU) in Norfolk, Virginia. Ms. Russell created and implemented the course curriculum designed to provide students with an integrated working knowledge of maritime operations and supply chain management. In addition, she has published a chapter entitled, “Port Safety and Workers” in the edited text, *Maritime Safety, Security and Piracy*, and she has also published in the edited text, *Transportation Dictionary*. Outside the classroom, Ms. Russell is the faculty advisor for the Old Dominion Student Propeller Club and serves as President for the Hampton Road’s Chapter of the Organization for Women in International Trade. Prior to joining ODU, Ms. Russell’s career included positions in various fields including transportation and logistics, port operations and customs brokerage. She holds an MBA from ODU in business administration with concentrations in maritime, ports and logistics management and international business and a BS degree in business administration from the University of Delaware.

**Endnotes**

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5 *Journal of Commerce,* “*Savannah River Dredging Gets Green Flag.*” (October 30, 2012).
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12 Georgia Ports Authority, “*Retail Import Distribution Centers In the Savannah Area.*” [http://www.gaports.com/SalesandMarketing/EconomicIndustrialDevelopment/RetailImportDistributionCenters.aspx](http://www.gaports.com/SalesandMarketing/EconomicIndustrialDevelopment/RetailImportDistributionCenters.aspx)
In Memoriam

William H. Wood

1943 - 2012

Editor of the Virginia News Letter, 1996 to 2007

and

Founding Director of the Sorenson Institute for Political Leadership at the University of Virginia

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