



Implications of the Panama Canal Expansion on the Tampa Bay Region



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This White Paper is one in a series developed as part of the Tampa Bay Regional Goods Movement Study. The purpose of this series of White Papers is to provide background and information for the freight community in the Tampa Bay Region.

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INTRODUCTION

This white paper summarizes the implications of the Panama Canal Expansion on freight activity in the Tampa Bay Region. The expansion of the Canal is a massive undertaking which is anticipated to be completed in 2015. When the project is finished it will substantially change supply chain economics, as much larger vessels will be able to transverse the Canal.

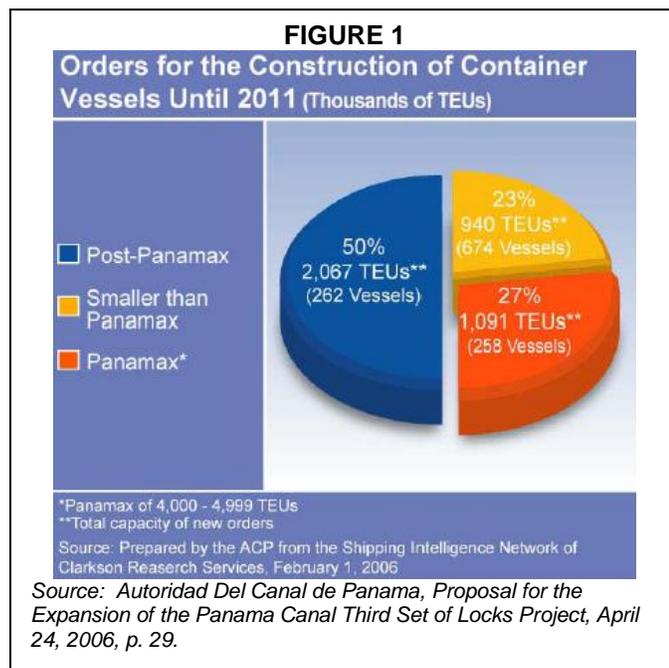
The paper includes discussions of the Panama Canal expansion and “post-Panamax” vessels, implications for the Port of Tampa and Port Manatee, actions by competitor ports, and other potential international opportunities.

OVERVIEW OF THE PANAMA CANAL EXPANSION AND POST PANAMAX VESSELS

Panama Canal

The Panama Canal officially opened in August 1914. The construction effort took 34 years, cost the US and French governments about \$640 million, and involved over 80,000 workers (with 30,000 casualties occurring).¹ The largest currently acceptable vessel size for the Panama Canal is 965 feet in length, 106 feet in width, and 190 feet in height, with a 39 foot, 6 inch draft.² The permissible vessel weight is between 65,000 and 80,000 tons, with cargo generally restricted to about 52,500 tons.³ Ships that meet these specifications are referred to as “Panamax” vessels.

While many vessels in the world’s existing cargo fleet can traverse the Panama Canal, newer construction has tended towards much larger sizes. These larger vessels were designed to efficiently carry the growing amount of international trade, particularly from Asia. The Autoridad Del Canal de Panama (ACP) – the Panama Canal Authority – estimates that 50 percent of the new containership orders are for vessels that are larger than the Panamax dimensions, referred to as “Post-Panamax” (Figure 1), and the average new container vessel can hold more than 12,000 twenty foot containers (TEUs). The emerging



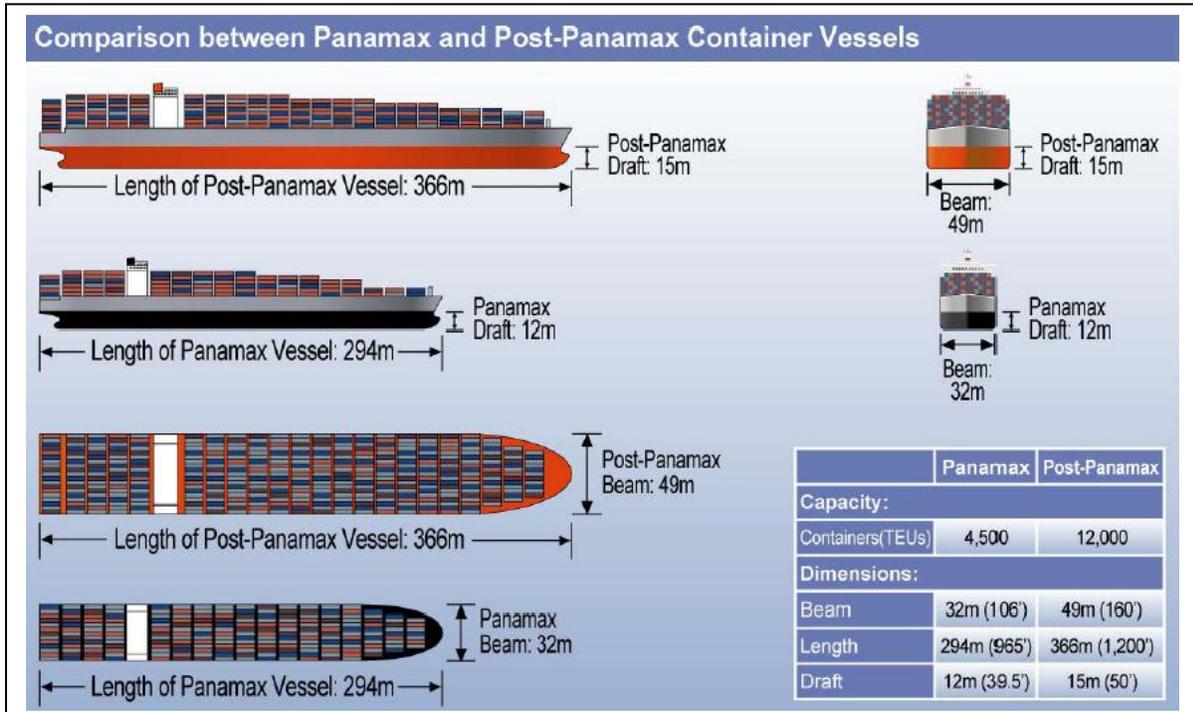
¹ Panama Canal History Museum, <http://www.canalmuseum.com/>

² Autoridad Del Canal de Panama (ACP), *Mr. Notice to Shipping No. N-1-2005*, January 1, 2005, pp.12-14.

³ Lloyds Register, *Infosheet No. 30 – Modern Ship Size Definitions*, February 13, 2004.

class of Post-Panamax vessels can carry nearly three-times the number of containers as a Panamax vessel (**Figure 2**).

FIGURE 2



Source: Autoridad Del Canal de Panama, Proposal for the Expansion of the Panama Canal Third Set of Locks Project, April 24, 2006, p. 45.

As Post-Panamax vessels moved into use during the last two decades of the 20th century, the Canal faced new competition, particularly in the Asia-North American market. The Post-Panamax vessels generally moved between Asia and the West Coast of the US and then moved their cargo shipments inland to other North American destinations through an emerging network of intermodal trains that can hold two stacked containers. In 2006, the ACP estimated that the Panama Canal had a 38 percent share of the Asia – US East Coast trade, compared with the US West Coast port/intermodal doublestack train service having a 61 percent share and the Suez Canal having a one percent share.⁴ It has been estimated that as much as a quarter of the approximately 60 million tons of cargo – nearly 8 million TEU's in 2011 – Los Angeles and neighboring Long Beach handles each year could be diverted to Gulf Coast and East Coast US Ports after the Panama Canal expansion is complete.⁵

Faced with a changing customer profile and loss of revenue, the ACP and the Panama government held a public referendum to add a third set of locks to the Canal that could accommodate Post-Panamax vessels on October 22, 2006. The referendum was overwhelmingly approved and funds were made available to begin construction in December 2006.⁶ The new locks are anticipated to be completed and

⁴ Source: Autoridad Del Canal de Panama, Proposal for the Expansion of the Panama Canal Third Set of Locks Project, April 24, 2006, p. 19.

⁵ <http://gcaptain.com/mexicos-900-million-mega-container/>

⁶ Autoridad Del Canal de Panama. <http://www.pancanal.com/eng/expansion/index.html>

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operational in 2015 and will accommodate vessel dimensions of 1,200 feet in length, 160 feet in width and between 150,000 and 170,000 tons, with 50 foot draft.⁷ These vessels can hold 12,000 TEUs. The canal expansion is expected to shorten East and Gulf Coast US-to-Asia voyages from 42 days to 25 days.⁸

Post Panamax Vessels

With the West Coast ports and the US intermodal rail system increasingly congested and costly, it is anticipated that an increasing number of larger vessels will make use of the new Panama Canal locks and directly serve US Gulf and East Coast ports. Even without the Panama Canal expansion, the fact that most new builds are larger vessels translates into the likely scenario that bigger cargo ships will be seeking to call at ports.

Just as the dimensions of the Panama Canal are a consideration in vessel routing, the physical characteristics of Gulf and East Coast ports will be a consideration in selecting the ports of call for the Post-Panamax vessels. The considerations include:

- Waterside – is there sufficient channel depth and “air draft” to accommodate the vessels.
- Terminals – are there sufficient berths, Post-Panamax cranes to work vessels, and landside space for cargo handling.
- Inland Movement – are there sufficient road and rail connections to serve a large market area.

THE PORT OF TAMPA

This section looks at the potential opportunities for the Port of Tampa with the opening of the new Panama Canal.

Port of Tampa Overview

The Port of Tampa is the largest port in Florida in terms of tonnage. It is the gateway for virtually all the petroleum used in central and west Florida, and is the largest fertilizer port in the US and the largest construction material and steel port in Florida. Eight million people live within 100 miles of the Port.

The recent economic recession significantly impacted the activity at the Port of Tampa. In 2012 the Port handled 33.9 million tons of cargo, down from 45.3 million tons in 2007,⁹ with outbound phosphate-based cargoes and inbound petroleum based cargoes being the dominant sources of the Port’s total throughput. General cargo has remained relatively stable. The Tampa Port Authority (TPA) and also private terminals handle cargo movements.

⁷ *Proposal for the Expansion of the Panama Canal Third Set of Locks Project*, *op. cit.*, p. 44.

⁸ <http://www.bloomberg.com/news/2013-09-30/panama-canal-to-cut-u-s-asia-lpg-shipping-costs-as-fleet-grows.html>

⁹ <http://www.tampaport.com/userfiles/files/Total%20Port%20Cargo%20FY06-FY12.pdf>

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Cargo at the Port falls into four categories:

1. Liquid Bulk – In 2012, the Port of Tampa handled 20.8 million tons of liquid bulk, with petroleum products accounting for 15.5 million tons and sulfur accounting for 3.2 million tons.
2. Dry Bulk – In 2012, 11.9 million tons of dry bulk was handled by the Port of Tampa. Dry bulk movements are dominated by phosphate, coal, limestone, and granite.
3. General Cargo (Breakbulk) – General cargo commodities handled by the Port includes steel, scrap metal, automobiles, and containerized cargo. In 2012 the Port handled 1.2 million tons of general cargo, dominated by scrap metal, steel products, and containers.
4. Containerized Cargo – Although the Port of Tampa handles a small percentage of Florida's container cargo, it has seen considerable growth, from 152,000 tons in 2006 to 342,000 tons in 2012. The growth is attributed to the development of a dedicated container facility, retention of Ports America (a major terminal operator) for the facility, the formation of the Executive Shippers Council and the attraction of new container services including direct service from Asia by Zim Integrated Shipping Services. The 2010 TPA Strategic Plan Update indicates that future growth in containerized cargo will depend on its ability to serve three primary markets: its core central/west central Florida market, expanding its market reach within Florida, and expanding its market reach into Latin America, including Cuba.¹⁰

Waterside Considerations for Post-Panamax Vessels at the Port of Tampa

The Port of Tampa currently has the deepest channels of any Florida port, at 43 foot, and an air draft limitation of 175 feet with the Sunshine Skyway Bridge. The Port of Miami is currently deepening its main channel to a depth of 50 feet, which will make it one of the four deepest draft ports on the U.S. Atlantic Coast, along with Norfolk, Baltimore and New York.¹¹ Channel and air draft requirements for Panamax and Post-Panamax vessels are shown in **Figure 3**. While the Port of Tampa appears to have sufficient air draft except for the very largest Post-Panamax vessels, the current channel depths appear insufficient for the larger vessels. The Port of Tampa is evaluating the possibility of deepening the channel to 45 and ultimately 50 feet.

The *Strategic Plan Update* also notes that the Port's current channel depth can accommodate:

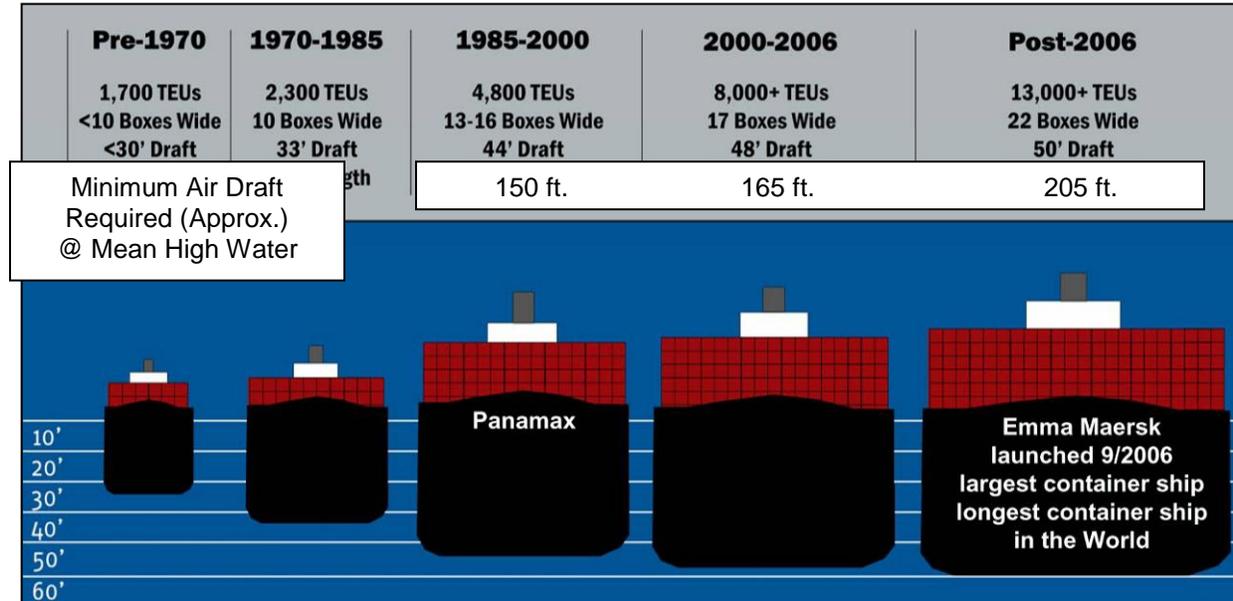
- 80 percent of the world's current tanker fleet
- 86 percent of the world's dry bulk fleet
- 81 percent of the world's container fleet¹²

¹⁰ Tampa Port Authority 2010 Strategic Plan Update, Norbridge/Martin Associates, June 30, 2011.

¹¹ *Ibid.*, p. 16.

¹² *Ibid.*, p. 10.

FIGURE 3: VESSEL CHANNEL DEPTH AND AIR DRAFT REQUIREMENTS



Source: Paul F. Richardson Associates, Inc.

Terminal Considerations and Market Area

Post-Panamax vessels carry as much as three times the amount of containers as a Panamax vessel. The vessels are also wider, ranging from 17-22 containers in width. The current Tampa Port Authority container terminal (**Figure 4**) has 1,800 feet of berth, three container cranes, and 25 acres (which can be expanded to over 100 acres).¹³

FIGURE 4: PORT OF TAMPA CONTAINER TERMINAL



Source: Journal of Commerce Online Related Resources

¹³ The Journal of Commerce Related Resources.
<http://joc.firstlightera.com/EN/Microsites/1/Port-of-Tampa+Container+Terminal/Terminalfacilities>

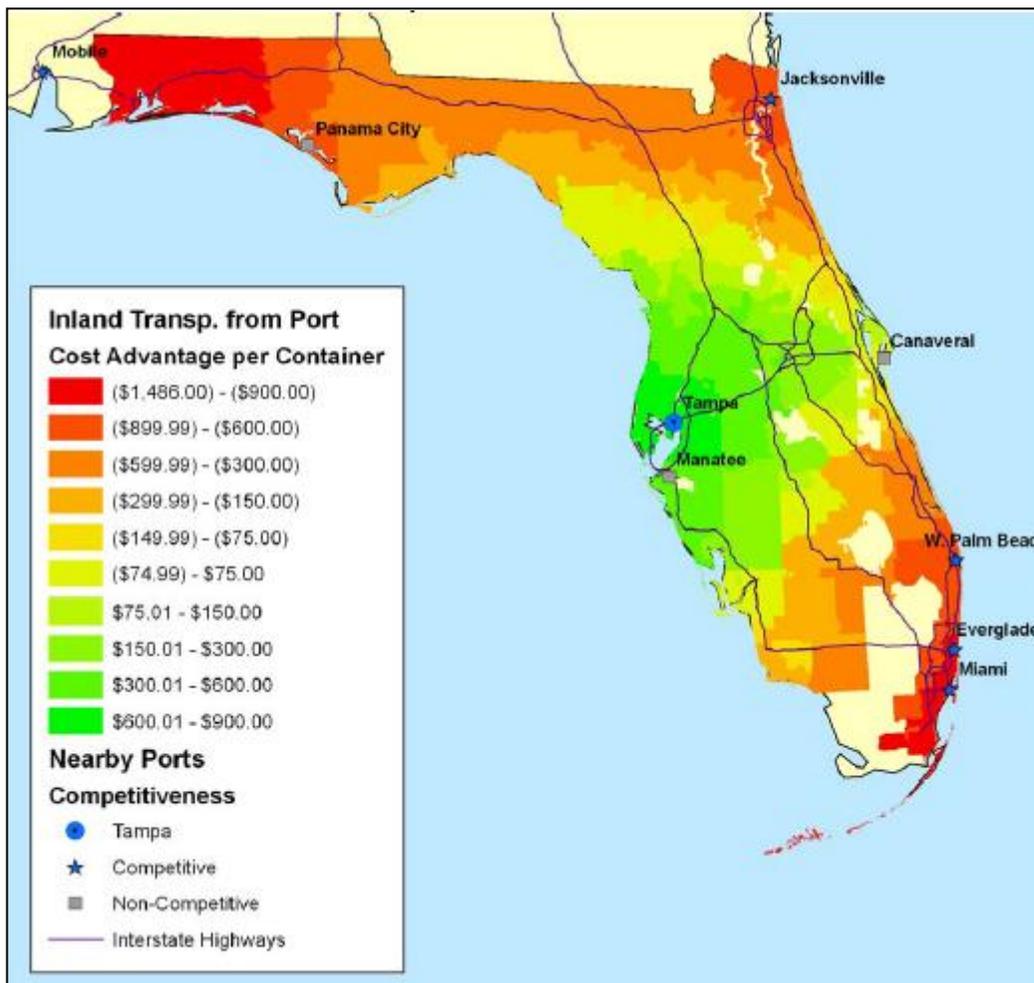
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While three cranes may be sufficient to handle the current container traffic at the Port, a single Post-Panamax vessel may require four-to-five Post-Panamax cranes alone to ensure that cargo is loaded and unloaded expeditiously.

With their larger container capacity, Post-Panamax vessel owners seek to have them call at ports where a sufficient market exists to support the larger cargo volumes. The market generally consists of the local area combined with the hinterland that can be reached cost efficiently via road and intermodal rail.

The TPA's *Master Plan* determined that the Port of Tampa's competitive hinterland consists of 24 counties in West Central Florida (**Figure 5**). The 2010 Strategic Plan Update affirmed that the primary market for the Port for Asian-based trades is the same 24 counties, while for trade to and from the east (Europe, Mediterranean, and India), the primary competitive market is a slightly smaller geographic footprint of 17 counties.

FIGURE 5: PORT OF TAMPA CONTAINER MARKET HINTERLAND



Source: Norbridge, Inc., 2007 Master Plan, February 18, 2008, p. 128.

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Rail freight is an important component of the competitiveness of an area to attract these vessels. In a June 2008 article, *Traffic World* noted:

“... to attract new liner services, the ports of Houston, New Orleans, Mobile, Manatee, Tampa, and others will have to generate demand for intermodal services beyond regional consumer and manufacturing markets, which are better served by trucks. That will depend on intermodal rail connections that link the region with rail hubs and gateways including Memphis, Atlanta, Chicago and Kansas City.”¹⁴

The Tampa Bay Region is served by one national “Class One” railroad – CSX. In contrast, the Florida ports along the East Coast are served by the Florida East Coast Railway, which connects to two Class One railroads – CSX and Norfolk Southern.

However, CSX is developing a 1,250 acre intermodal logistics center (ILC) at Winter Haven, which is envisioned as a major rail-to-truck distribution complex.¹⁵ The ILC will include a truck, rail and warehousing hub for the transfer and storage of containerized consumer goods.¹⁶ The site is adjacent to an existing CSX rail line. At full build-out, the ILC is projected to be comprised of three million square feet of warehouse/distribution center space, 1.5 million square feet of industrial sites, and 0.5 million square feet of office space and generate 8,500 jobs.¹⁷ Combined with access to the Tampa Bay Region, Winter Haven could serve as a distribution point for the larger cargo volumes. The increased cargo volumes provided by the Port could, in turn, provide the critical mass needed for intermodal rail service from Winter Haven to other US destinations.

Another significant public investment that will enhance operation of the Port of Tampa is the Interstate 4-Selmon Expressway connector, and particularly its direct reserved truck lane into the Port of Tampa. This facility will greatly facilitate movement in and out of the Port while minimizing movement through historic Ybor City.

PORT MANATEE

The major portions of this section are derived from the 2009 Revised Port Manatee Master Plan.¹⁸ Port Manatee is described as a niche port that primarily handles proprietary bulk and break-bulk for selected shippers. In addition, the Port is expanding its ability to handle containers. As was the case with most ports, Port Manatee has experienced the impact of the recent recession, though not the extent of many others. Peak tonnage of 9.4 million tons was handled in 2005 and 2006, decreasing to 8.8 million tons in 2008 and returning to 9 million tons in 2012.¹⁹

Liquid bulk cargoes, account for nearly 60 percent of freight tonnage, led by natural gas, fuel, and fruit juices. Dry bulk, comprising cement/aggregates and fertilizers account for 27 percent, with the remaining

¹⁴ David Biederman, “Gulf Ports Seek TEU’s,” *Traffic World*, June 30, 2008.

¹⁵ Billy Townsend, “Rail Yard Could Alter Course of Southeast’s Economy,” *The Tampa Tribune*, April 7, 2007.

¹⁶ http://www.mywinterhaven.com/acm/strategic_initiatives.htm

¹⁷ CSX Real Property, Inc., *Development of an Integrated Logistics Center in Winter Haven, Florida*, January, 2006.

¹⁸ Port Manatee Master Plan, 2009 by PBS&J

¹⁹ Port Manatee 2013 Official Directory

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13 percent from general cargo, notably forest products, fruit, steel, aluminum and construction materials. In 2012 Port Manatee began construction of a 52-acre container terminal. The Port Manatee Master Plan notes that by 2030 it could handle 1 million TEUs. Port Manatee operates its own short-haul railroad, including nearly eight miles of track, and 300-plus rail car capacity, which connects directly to the CSX mainline.

Waterside Considerations for Post-Panamax Vessels at Port Manatee

The current channel depth restrictions are 39 feet in the main channel in Tampa Bay and 37 feet in the approach to Port Manatee. Since Port Manatee is north of the Sunshine Skyway Bridge, similar to the Port of Tampa, it has air draft limitation of 175 feet. The Port Manatee 2009 Master Plan notes that it is not likely they would attract the largest Post-Panamax vessels. There are a number of navigational challenges, including that the approach channel is perpendicular to the main current flow and that the channel is relatively narrow. As a result, entry to the port can only occur at near slack tide, when current is still between incoming and outgoing tides.

Terminal Considerations and Market Area

Port Manatee currently encompasses approximately 1,100 acres of land and includes its own Class III railroad that provides a connection to the CSX Transportation mainline. Port Manatee is planning significant investments in its infrastructure to better serve potential customers. Among the planned capital projects are:

- Expansion of their container transfer yard and purchase of a second mobile crane
- Bulkhead rehabilitation and berth reconstruction
- An intermodal cold storage transfer facility
- Road and rail improvements
- Acquiring land for future expansion

Port Manatee's inland movement is substantially enhanced by the operation of their own railroad connecting to the CSX mainline. The primary market for Port Manatee is the six county area including Manatee, Sarasota, Hillsborough, Polk, Hardee, and Pinellas Counties.

COMPETITORS FOR PANAMA CANAL TRAFFIC

This section places the Tampa Bay Region within the context of other Gulf and Florida ports seeking to capture the new traffic through the Panama Canal. The competition can be viewed at two levels:

1. The competition for the large Post-Panamax vessels is expected to begin to transverse the Canal in 2015 and provide all-water connections to Gulf and East Coast ports.
2. The competition for Panama Canal traffic destined to or originating in the Florida market.

Competition for Post-Panamax Vessels

The larger Post-Panamax vessels are likely to call on “gateway” ports – major hubs that serve large portion of the North American market. These ports have channel depths of at least 45 feet, multiple container terminals with numerous Post-Panamax cranes, several hundred acres of space, and inland road and rail connections to the rest of North America. East coast ports preparing for Panama Canal expansion with new super Post-Panamax cranes include Baltimore, Savannah and Miami. Similarly, Houston on the Gulf Coast is deepening its channels to 45 feet, has 13 container cranes, and 230 acres of marshalling area.

Although they will be unable to compete with these gateway ports for the very largest Post-Panamax vessels, the Ports of Tampa and Manatee can nonetheless expect considerable growth due to the increased movement of goods through the Panama Canal.

Competition for the Florida Market

The TPA’s *Strategic Plan* classified Tampa as a “regional” port, which is defined as a port that serves a more narrowly defined market than a gateway port. Within the context of being considered a regional port, the competition is for the Florida market.

The *Strategic Plan* identified the major cargo and passenger businesses served by the Florida ports (**Table 1**). The assessment found that the Tampa Bay Region competes with the Ports of Miami, Everglades, Palm Beach and Jacksonville for containerized cargo. Tampa Bay also competes with other Florida ports for petroleum product movements.

TABLE 1: CARGO AND PASSENGER MARKETS SERVED BY FLORIDA PORTS IN 2007					
	Containers	Breakbulk	Dry Bulk	Liquid Bulk	Cruise
Port of Miami	Florida				World's Largest
Port Everglades	Florida	Steel (Florida)	Cement (South Florida)	Petroleum Products (South Florida)	World's 3 rd Largest
Port of Palm Beach	Florida and Southeast ¹			Petroleum Products (Local Utility)	
Port Canaveral			Cement and Aggregates (Space Coast)	Petroleum Products (Space Coast and Local Utilities)	World's 2 nd Largest
JAXPORT	Southeast Including Florida ²	Vehicles; Southeast		Petroleum Products (North and Central Florida)	Niche Port of Call
Port of Tampa	Emerging; West and Central Florida	Steel (Florida); Reefer (Florida)	Cement, Aggregates and Fertilizers (Central Florida)	Petroleum Products (Central and West Florida Fertilizer)	Gateway to West and Central Caribbean
Port Manatee	Modest, but expanding capacity	Forest Products (Florida); Reefer (Florida)	Cement, Aggregates, Fertilizers	Natural gas, fuel, and fruit juices	None at this time.

¹ Palm Beach serves as a regional gateway for Tropical Shipping, a niche container shipping line primarily serving the Caribbean and Central America.

² A majority of Jacksonville's containerized traffic moves between Puerto Rico and U.S. eastern and Midwest markets. Jacksonville also serves as a regional gateway for the Latin American trades.

Sources: Norbridge, Inc.; Port Manatee 2009 Master Plan

The Port of Tampa had been the only Gulf port in Florida that handles containers. However, Port Manatee has recently attracted container-on-barge service from Texas and modest container shipments from Honduras. Currently the Port of Tampa handles nearly ten times the number of container TEUs, but Port Manatee is making significant investment in cranes and storage facilities to better serve containers. Both the Port of Tampa and Port Manatee are positioned to attract additional containerized trade as the Panama Canal expands.

POTENTIAL IMPACTS OF OFFSHORE SUPERPORTS

As noted above, the Port of Tampa and Port Manatee can significantly benefit from the Panama Canal project, in spite of having some limitations to handle the very largest Post-Panamax vessels. Both ports may be able to further capitalize on opportunities provided by offshore superports, at which transshipment of cargo from the largest Post-Panamax vessels to more modest vessels would occur. This operating model would involve large vessels transferring cargo to a number of smaller vessels, which in turn could distribute freight to other ports on the Gulf and East Coasts.

The creation of global superports is a major development in the movement and distribution of worldwide freight. Internationally, superport development is proceeding at a number of centers on the east coast of

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Canada, Shanghai, Hong-Kong, Rotterdam, Brazil, Mexico and others. Of particular interest to opportunities for the Ports of Tampa and Manatee will be the development of major superports in the Caribbean region. Existing major Caribbean ports include Kingston, Jamaica; Freeport, Bahamas; Port of Spain, Trinidad and Tobago; Caucedo, Dominican Republic; Colon, Panama; and Colombia.²⁰ The Ports of Kingston and Freeport have pursued larger ships but are already at capacity. So instead, the Ports are using a “hub-spoke” system where large ships transfer their containers to smaller ships with less draft.²¹

It is anticipated that the Ports of Kingston, Freeport, and Colon will likely emerge as transshipment centers. In 2011, Kingston Port announced plans to double its capacity to 4 million TEUs and develop port-centric logistics zones. With the exception of Kingston and Freeport, it is thought to be unlikely that other Caribbean ports will become large transshipment hubs unless clearly supported by a global terminal operator.²² There is also a new transshipment hub in Ponce, Puerto Rico, the Port of the Americas, which is the first East Coast offshore transshipment facility under a US flag. It can handle as many as four Panamax-size vessels.

If relations between US and Cuba improve, Cuba has the potential to become a major transshipment hub in the Caribbean. (Under US law, any ship that called on a Cuban port is prohibited from entering a US port for 180 days with limited exceptions covering foodstuffs and humanitarian goods). As part of first-special development zone, Cuba is planning a new container-handling port in Mariel Bay.²³

The provisions of the Merchant Marine Act of 1920, also known as the Jones Act, requires that all goods transported by water between U.S. ports must be carried in ships constructed in the U.S., owned by U.S. citizens, and crewed by U.S. citizens and permanent residents. This Act effectively precludes the U.S. from serving this role of global transshipment.

OTHER INTERNATIONAL OPPORTUNITIES

The Panama Canal offers the Tampa Bay Region an improved route to connect with the important Asian market. At the same time, services that connect Tampa Bay with its existing markets in Central America and the Caribbean can be expanded and new connections to the South American markets can be explored. For example, in August 2008, the Peruvian Amazon Line began calling on the Port of Tampa.²⁴ Shipments to Tampa include forest products from Peru and fertilizer from Mexico. Shipments from Tampa include yachts and machinery destined to Brazil.

CONCLUSIONS

International trade – both import and export – can be an economic stimulus for an area. The Panama Canal expansion will enhance the connectivity of the Tampa Bay Region to Asian markets and also markets on the west coast of South America. The Canal expansion will also create opportunities for larger vessels to call on the Port of Tampa and Port Manatee. While it may be difficult for the largest Post-Panamax vessels to call, it is likely that both ports will see larger vessels if they demonstrate an ability to

²⁰ <http://www.landmarine.org/cm/index.php/back-issues/issue-16/91-expansion-of-panama-canal-and-challenges-for-caribbean-ports.html>

²¹ <http://fitsnews.com/wp-content/uploads/2013/04/Mitchell-Impact-of-the-Expansion-of-the-Panama-Canal-FINAL-with-Chapters.pdf>

²² http://people.hofstra.edu/jean-paul_rodrigue/downloads/Panama%20Canal%20Study%202011%20Final.pdf

²³ <http://www.businessmonitor.com/news-and-views/new-port-to-compete-for-caribbean-transshipment-0>

²⁴ “New South American breakbulk service calls Tampa,” *Journal of Commerce Online*, August 5, 2008.

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accommodate the vessels and prove they can serve the broader Florida market. In order to attract the larger vessels, both ports need to deepen their channels, add terminal capacity and leverage their rail and highway connections, actions which they are seriously exploring.