Article, Published Version

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THE NEW PANAMA CANAL: IMPACTS

BY REECE F. SHAW AND JAMES DENTON-BROWN

The new Panama Canal locks are being built to accommodate ships with a total fresh water (TFW) draft of 50 feet, a beam of 160 feet and a length of 1,200 feet. This compares with the current canal limits of about 41 feet draft, 110 feet beam and 1000 feet length. Once opened in 2015, the new canal is expected to have a significant impact on US ports with the primary impact expected to be substantially increased traffic at the US East and Gulf Coast ports and a decrease on the US West Coast ports. *NB: In the following article all dimensions are given in US units wherein 1 foot is equivalent to 0.30 m in SI units*

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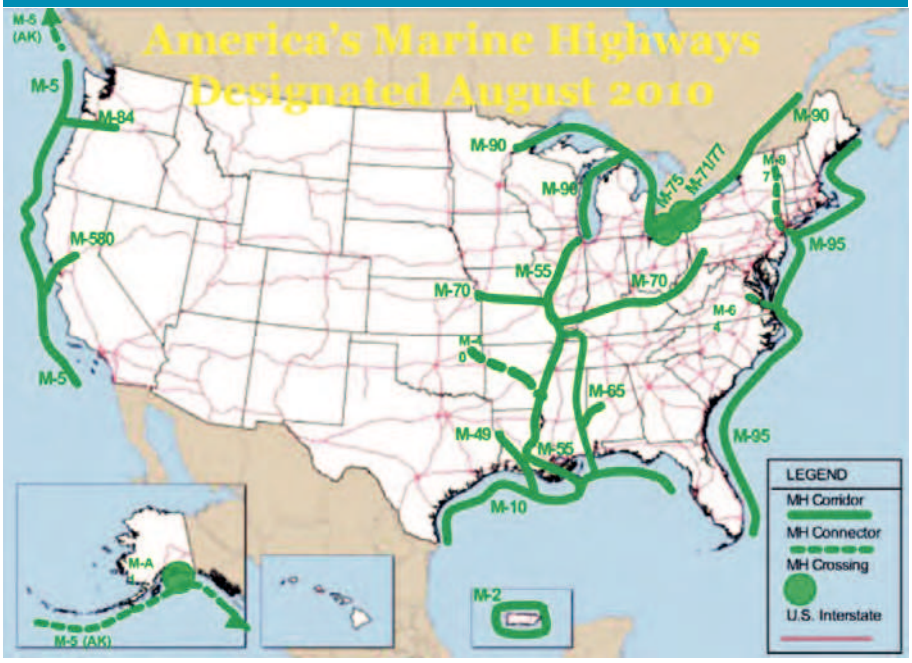
This is due to the fact that the new canal will eliminate the cost advantage that West Coast ports currently have in handling large container ships arriving from Asia whose loads are then moved to the east coast via rail. The much larger ships able to transit through the new canal will shift the cost and time advantage from the West Coast ports to the East Coast ports that are able to handle the larger ships. According to the US Army Corps of Engineers (USACE) Institute of Water Resources there are likely to be two additional impacts:

- To take full advantage of the larger vessels coming through the canal, a large deep water transshipment port located either in the Caribbean or along the US coast is likely to be developed. The largest vessels would unload containers at the transshipment port for reloading on smaller feeder vessels for delivery to other US ports with less draft and capacity.
- On the export side, the ability to employ large deep draft bulk vessels is expected to significantly lower the delivery cost of US agricultural exports to Asia and other foreign markets. This would have a significant impact on the total quantity of US agricultural exports and commodities moving down the Mississippi River for export.

Most existing US East Coast ports are unable to handle the New Panamax ships and have a maximum draft of about 40 feet or less. However, there are exceptions including the ports at Hampton Roads and Norfolk (50 feet) in Virginia, Baltimore (50 feet) and New York (50 feet). In addition to these, Charleston, with a 45 foot channel depth and nearly 5 feet of tide, can accommodate New Panamax vessels at high

Figure 1: Map of Marine Highway Corridors
Source: U.S. Department of Transportation, Maritime Administration



AND OPPORTUNITIES IN THE USA

The Mississippi inland waterway system connects over a dozen Midwestern states with the Gulf of Mexico

Figure 2: Inland waterway map centered on the Mississippi River
Source: PNO Master Plan

tide during a two hour window and Savannah can do so marginally with 48 feet of dredged depth.

For Gulf ports, Gulfport in Mississippi, New Orleans, Mobile and Houston have maximum berth depths of 45 feet or less. None of these ports are currently funded to be deepened to 50 feet.

Ports that are hoping to accommodate New Panamax ships must also consider air draft (the distance from the surface of the water to the highest point on a vessel). The New Panamax ships have an air draft of 201 feet. The eastern seaboard ports of New York and New Jersey are constrained by the Bayonne Bridge which has an air draft 151 feet. The Port of New Orleans is constrained by both channel depth and air draft. The federal channel in the Mississippi River is maintained to a depth of 45 feet up to Baton Rouge and the Crescent City Connection bridge in New Orleans - the farthest downstream bridge on the Mississippi River – has an air draft of 170 feet at low water and 155 feet at high water.

The ports hoping to take advantage of the shift in cargo flows must also consider the movement of goods from the ports to inland destinations. Therefore, landside capacity and good highway connectivity is essential in being able to handle and move the large quantities of containers and bulk products quickly and efficiently to and from onward locations. This is often one of the most serious problems facing existing ports, many of which have highly congested and inefficient inland connections created by dense existing city development surrounding the port.

An Alternative Approach: America's Marine Highways

The federal government has been promoting the rehabilitation and improvement of America's Marine Highways as an alternative to highway congestion on roads and railroads (see Figure 1). These navigable waterways have been designated by the Secretary of Transportation and have demonstrated the ability to provide additional capacity to relieve congested landside routes serving freight and passenger movement.

The program is designed to focus on the integration of Marine Highways into the nation's surface transportation system, providing seamless transition across all modes by leveraging marine services to complement landside surface transportation routes.

Marine Highway Centered on the Mississippi River

The Mississippi inland waterway system shown in Figure 2 is an inland waterway system that connects over a dozen Midwestern states with the Gulf of Mexico. The M-55 Corridor includes the Mississippi and Illinois Rivers from New Orleans via St. Louis to Chicago and on through Louisiana, Mississippi, Arkansas, Tennessee, Missouri, and Illinois. It includes connecting commercial navigation channels, ports, and harbors. It connects to the M-90 corridor at Chicago, the M-40 Connector in AR, crosses the M-70 Corridor at St. Louis, and meets the M-10 Corridor at New Orleans.

At 2,348 miles in length, the Mississippi River is the second longest river in the United States and 92 percent of the nation's agricultural exports are produced in its basin. Sixty percent of all U.S. grain exports move on the Mississippi River and the largest port in the United States (by tonnage) is the Port of South Louisiana which is located on the Mississippi at LaPlace, LA. The Port of New Orleans handled 476,413 containers (TEUs) in 2011, most of which also move inland on truck and rail.

It is extensive but limited to depths of less than 15 feet for the most part. As noted above, the port at New Orleans has a maximum berth depth of less than 45 feet, limiting the containership capacity to less than 5,000 TEUs. Under such circumstances, ports along the Mississippi are primarily handling barges loaded with agricultural commodities, which implies a highly seasonal traffic (end of the summer and fall). The Lower Mississippi ports are dominated by dry bulk trades like coal, grains and ores, along

with a wide variety of other commodities. When viewed from the perspective of the ability of inland waterways to support enhanced export opportunities that a global fleet of larger ocean going vessels represent, those inland waterways that serve a hinterland with desirable export commodities are of particular interest. Logistics/transportation entities at New Orleans have developed new methods of loading commodities to containers that previously only moved in bulk.

Deep-water Gulf Coast Transshipment Hub Options

There are basically three Gulf transhipment hub options which would support the U.S bound vessels transiting the New Panama Canal:

- **Existing Gulf Coast Ports.** We have already seen that the Gulf Coast ports of Gulfport, New Orleans, Mobile and Houston have maximum berth depths of 45 feet or less and are unlikely to be deepened to 50 feet. Hence, this option does not address the potential of the large vessel Transshipment Hub.
- **Competing hubs within the Caribbean.** Several transshipment hubs exist and have been proposed both in the Caribbean and along the Gulf Coast. Of the major competing hubs within the Caribbean, only Freeport in the Bahamas (dredged depth of 51 feet), the in process container ports in Colon Panama (dredged depth of 52 feet) and Moín Costa Rica (approach channel dredged to 62 feet) can accommodate the New Panamax vessels. While these ports can function as oceanic transhipment hubs, they cannot serve the needs of U.S. river cabotage which is dominated by non-oceangoing river barges.
- **Deep Water Gulf Coast Ports.** A floating offshore trans-shipment port complex located about 20 miles off the U.S. coasts has been proposed by Lawrence Livermore National Laboratory (LLNL), in its security research project called Portunus (see Figure 3). If such a complex were to be situated along the approach to the Mississippi River, it could serve as both an oceanic transhipment hub as well as a hub serving large river barges. This terminal would have no draft restrictions but would be orders of magnitude more expensive than a conventional landside port.

An Alternative Concept

A fourth option has been recently proposed at the mouth of the Mississippi River, called the Louisiana International Gulf Transfer Terminal (LIGTT). This port is envisioned to be a trans-shipment port providing a logistics "hub-and-spoke" system for containerized cargo located on 250 acres at River Mile 0 of the Mississippi River. The site would provide for water depths of 75 feet on the Gulf of Mexico side. With no road or rail access, the terminal will rely on state of the art efficient intermodal logistics to decrease costs and speed up throughput.

Although the project is still in the concept stage, it is drawing interest and support and would be able to capture the opportunity provided by the new Canal at a location best able to handle the large deep water ships while simultaneously delivering products to and from the Mississippi River Marine Highway system.

Figure 3: The off-shore port concept would allow cargo to be inspected far away from cities to increase homeland security
Source: LLNL Community New July 2, 2010, VOl. 3, NO. 26, Illustration by Mark McDaniel/LLNL

Conclusion

Clearly a New Panamax container and commodity transhipment logistics hub port focused on serving the U.S. Gulf Coast and providing major port transhipment gateway services to North America is needed. Intermodal bound containers and bulk cargo shipped through such a hub would be received from various sized international transshipment vessels afloat after passage via the new expanded Panama Canal, from ports across the Atlantic Ocean, or from ports throughout the Western Hemisphere. The LIGTT appears to be the most viable option identified to date.

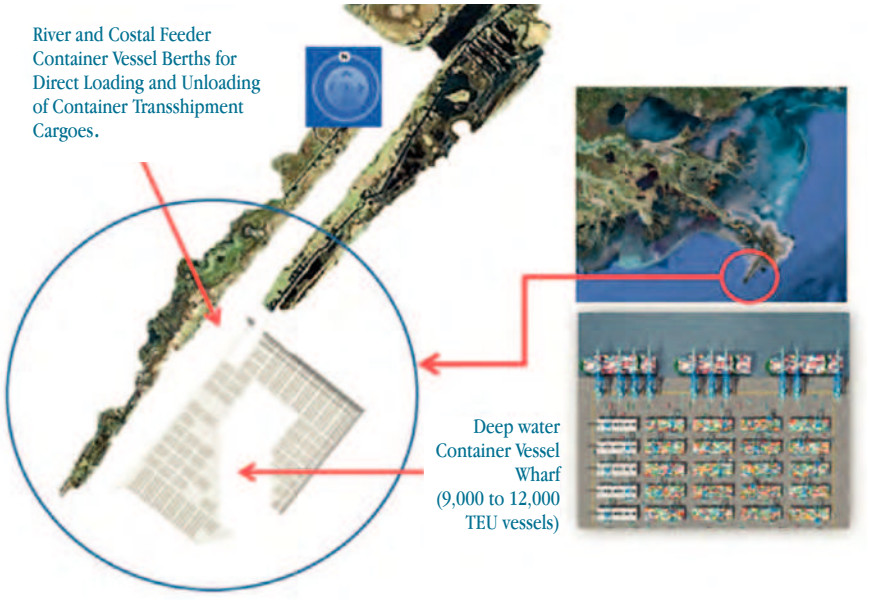


Figure 4: The LIGTT deep water transshipment hub concept - located at the mouth of the Mississippi inland waterway system
Source: Louisiana International Gulf Transfer Terminal Authority Website, http://www.ligtt.com/index.html