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Logistics: Shipping on the Panama Canal

BY LILIANA RIVERA AND YOSSI SHEFFI

The Panama Canal Expansion Program (PCEP), launched in September 2007 and scheduled for completion in 2014, is expected by its proponents to have the greatest impact on global shipping of any project underway today. Once completed, the \$5.5 billion project will roughly triple the size of vessels that can pass through the Canal, from the current maximum of 4,400 20-foot equivalent units (TEU) to 12,600 TEU.

In a December 2010 article, *The New York Times* echoed the general consensus that the project will lead to “the biggest shift in the freight business since the 1950s, when sea-faring ships began carrying goods in uniform metal containers.”

Nevertheless, at the midpoint of the project’s timeline, there are important questions about what has been achieved to date, and in particular, about how effectively ports outside Panama will be able to handle the larger ships and the associated increased volume of traffic.

For the Autoridad del Canal de Panamá (ACP), the good news is that 19 percent of the work was completed by the end of 2010. Expansion is focused on four primary areas: the construction of new locks on the Pacific and Atlantic sides; excavation of new locks for the channel’s northern access; improvements to existing navigational channels; and improvements to the Canal’s water supply and draft dependability.

Phases one and two of the excavation of the Pacific Access Channel are complete. These first steps—clearing land, including a former munitions range—were necessary for further expansion and the relocation of roads. Initial work also focused on preparing for construction of the third set of locks. This will be led by the Grupo Unidos por el Canal (GUPC)—a conglomerate including Spain’s Sacyr Vallehermoso, Italy’s Impregilo, Belgium’s dredging and marine engineering company Jan de Nul, and Panama’s largest construction company Constructora Urbana SA (CUSA).

Phases three and four are ongoing. They involve further land-clearing and excavation activities, including the excavation for lock chambers, lock heads and water control mechanisms. Additionally, the dredging of the Pacific and Atlantic entrance navigational channels is moving forward, as is the work in Gatun Lake and the Culebra Cut, an artificial valley that cuts through the continental divide in Panama.

To complete the configuration of the locks’ hydraulic system, GUPC contracted Compagnie Nationale du Rhône to build a model of the locks in Lyon, France, that tests competing engineering designs. Project managers chose rolling floodgates successfully used in Europe, especially in Belgium, appropriate to the size of the future locks. The first floodgate design is almost finished and its construction should start in 2011.

A strike, along with heavy rains that battered Panama in 2010, caused the canal’s first closure in over 20 years. Nevertheless, the ACP reports that the expansion is on schedule. In 2011, the contractor for phase four of the excavation of the Pacific Access Channel is expected to start construction of the Borinquen 1E dam, the first to be built in the canal area in the last 75 years. In addition, 2011 should witness the pouring of concrete for the new set of locks on the Pacific and Atlantic sides.

Beyond Panama

The PCEP will affect freight shipments throughout the Americas, opening opportunities for new transportation routes, distribution patterns and logistics hubs formation. Today, the fastest and preferred way to send cargo from China to the eastern U.S.—Shanghai to New York in 19–22 days—is by a combination of ship and rail. Avoiding rail and using the Panama Canal, the same cargo arrives in 25–26 days; the Suez Canal route takes 27–28 days. This is the reason that 75 percent of Asian imports use the West Coast route (with Los Angeles/Long Beach ports accounting for 43 percent of this volume) and only 19 percent use the Panama Canal. With the expansion, larger Post-Panamax ships (so-called because they will be larger than the Canal’s current 4,500 TEU limit) will be able to sail directly to the eastern U.S., lowering shipping costs. But the ship-rail combination will still be quicker.

Traffic diversion estimates vary widely. Most observers put the maritime traffic gains through the expanded canal at between 20 and 35 percent of the current West Coast freight.



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Naturally, this will also depend on the toll levied by the ACP. Currently the ACP charges each ship \$72 per unit of container- capacity; so a 4,500 TEU vessel pays \$324,000 to use the canal, whether loaded or empty. Given its past practice, the ACP likely will continue to segment the market and charge fees based on a user's ability to pay. This maximizes traffic and revenues.

To capture some of the new traffic, projects to deepen harbors and expand rail and capacity handling are underway in almost all large ports on the U.S. East Coast and along the Gulf of Mexico. For example, the Port of Norfolk, Virginia, which is 50 feet deep and currently the only port on the eastern U.S. coast that can handle the Post-Panamax ships, is focused on maintaining unrestricted navigation in the port to allow easier access for these vessels.

The Port of Charleston, South Carolina, is investing in maintaining its current depth through a continuous dredging program, while also deepening the harbor further. At the Port of New York/New Jersey, work is underway to increase deepwater capacity; plans are also underway to raise the roadbed of the Bayonne Bridge to allow for passage of Post-Panamax ships. The Port of Tampa has an ongoing terminal expansion to quadruple its size. The Port of Miami is establishing an intermodal container rail service and expanding supporting rail and bridge infrastructure. Savannah Harbor is being dredged.

In addition, the Gulf of Mexico ports in Gulfport, Mississippi, and Mobile, Alabama, along with the Tennessee-Tombigbee Waterway have signed memoranda of understanding with the ACP to encourage increased traffic in the Gulf. Other ports striking agreements with the authority include Houston, Boston, Miami, New Orleans, Charleston, and Tampa.

These massive investments in port infrastructure may be a case of too much investment chasing too little freight. The highest estimates of increased Post-Panamax ship traffic have failed to take into account several factors.

First among them, the competitive response of the existing players. Some of the West Coast ports including Los Angeles, Long Beach, Oakland, Portland, Seattle, and Tacoma have banded together with the western railroads, chiefly Burlington Northern Santa Fe (BNSF) and Union Pacific (UP), to form the U.S. West Coast Collaboration (USWCC) with the purpose of guaranteeing competitive cost and service options for West Coast ports.

Second, as some traffic starts to be diverted through the canal and as port congestion decreases, the efficiency of the West Coast ports will improve. This improved service will attract shipping carriers and ocean liners to the ship-rail operation, thereby dampening the long-term increase in canal traffic.

Additionally, while the ACP and the Panamanian government have said that a principal reason for the expansion program is to increase the rate of transshipments and related logistics operations in Panama, such an increase may not necessarily take place. Many other ports in the Caribbean (including Cuba, should U.S. relations improve) stand ready to unload Post-Panamax vessels and transfer their cargo to smaller boats that can navigate any East Coast port.

And finally, increased focus on the environment and carbon pricing in the future may favor the West Coast route. The reason: CO2 emissions per TEU for a large Panamax vessel going through a West Coast port and using the rail for inland distribution are, on average, only two-thirds of the emissions involved in a trip through the Panama Canal to an East Coast port.

In essence, while the Panama Canal Expansion Project seeks to maintain the dominance of the Panama Canal as the preferred method for shipping goods, the canal's continued importance is not guaranteed. That means authorities must design a strategy that creates incentives and offers competitive prices to attract the level of shipping business that will justify the enormous expense and effort of this project. Such a strategy will involve increased cooperation between the canal, Atlantic Coast port operators, East Coast railroads, and local as well as state governments along the Atlantic Coast.

It is therefore difficult to predict the consequences of the Panama Canal enlargement. The project will certainly lead to increased competition between ports and carriers and, in this, the shippers will be the clear winners. Atlantic Coast ports may experience some growth in traffic, but it may be less than what is suggested by the optimistic forecasts that are the basis for investments in these ports.

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