

Select U.S. Ports Prepare For Panama Canal Expansion

Port of Miami



Grace Wang

*Associate Professor, Maritime Administration
Texas A&M University at Galveston
Galveston, Texas*

Anthony M. Pagano

*Director, Center for Supply
Chain Management and Logistics
University of Illinois at Chicago
Chicago, Illinois*

“It’s a game changer, but I also think that not every port inside the U.S. needs to go to 50 feet.”

– Bill Johnson, CEO and port director, Port of Miami¹

Port of Miami

Located in southeast Florida, the Port of Miami (also known as PortMiami) resides on Dodge Island, a 520-acre island in central Biscayne Bay just east of the city of Miami. The port is adjoined with two other nearby islands, Lummus and Sam’s. It has a channel depth of 42 feet, which is currently being dredged to about 50 to 52 feet, with a completion date scheduled for mid-2015.²

Location, Size and Terminals

The Port of Miami features 128 cargo berths (berths 60–188; see Figure 3) and three major terminal operators, Seaboard Marine, South Florida Container Terminal and Port of Miami Terminal Operating Company.³ The port also has seven cruise terminals, which take up 64 berths. According to Cruise Market Watch, Miami was the busiest cruise port in the world in 2013.⁴

Operating Status

Performance for the years 2009–2012 has been moderate. Operating revenue for 2012 decreased by \$5.6 million from 2011. The decline can be attributed to a decrease in revenues from cruise-related activity, cargo activity, crane user fees, parking, rentals and ground transportation.⁵ According to the Port of Miami’s financial report for 2012, “the economic upturn contributed to an increase of approximately 0.2 percent, when measured in TEUs. This increase, as well as tariff adjustments, caused the port’s cargo related revenue to increase by 11 percent from fiscal year 2011.”⁶ Tourism has almost made a full

recovery, compared to the number of tourists traveling to the city of Miami before the recession.⁷ This part of the market is essential to the port because of its positioning in the cruise industry. However, the increase in tourism did not translate to more cruise passengers in 2012, when the port saw slightly fewer cruise passengers than it did in 2011.

By streamlining processes and moving cargo more efficiently, the port has reduced operating expenses year after year since 2009. This, coupled with the completion of major projects, specifically the tunnel project in mid-2014 and the rail restoration project, will enable the port to continue moving more cargo efficiently. This, in turn, will allow the port’s operating revenue to increase while at the same time lowering operating expenses. However, the forecast is still moderate until the deep dredge project is complete. At that time, larger ships carrying more cargo will be able to call on the port, which will increase throughput.

Cargo

According to the Port of Miami’s website, over half of its cargo business is derived from trade with Latin America and the Caribbean.⁸ Principal inbound and outbound cargo for the port include fruits and vegetables, apparel and textiles, non-refrigerated food products, paper, electronic equipment, stone, clay, cement tiles, construction/industrial equipment, trucks, buses and automobiles. Accordingly, the main operations of the port include roll-on/roll-off (Ro/Ro), container, break bulk (odd-shaped) cargo and vehicle exports.

Figure 1

Operating Status

Year	Operating Revenue (in thousands of dollars)	Operating Expenses (in thousands of dollars)	Operating Income (in thousands of dollars)
2013 (Estimate)*	\$105,878	\$59,027	\$48,118
2012	103,577	59,550	44,027
2011	109,146	65,836	43,310
2010	104,084	66,335	37,749
2009	100,057	68,998	31,058
2008	94,697	61,578	33,118
2007	84,568	64,020	20,547
2006	82,114	77,342	4,772
2005	80,360	53,180	27,180
2004	78,624	49,011	29,613
2003	83,153	65,044	18,108
Average Growth Rate (2003 to 2012)	2.22%	-0.88%	9.29%

*Estimates are based on authors' calculations, using the average growth rate.

Source: Port of Miami website; dataset compiled by authors

The port operates a state-of-the-art fumigation system able to quarantine 70 containers daily. This is an important procedure for the port, because a large portion of its imported cargo is perishable goods. However, the port is not limited to the short voyage from South America for its fruits and vegetables. Longer voyages carrying this cargo use refrigerated containers. The port can accommodate up to 1,000 refrigerated containers at a time.

Facilities: Cargo Terminals

The Port of Miami has a unique terminal layout because of its location on Dodge Island. Berths and terminals are contiguous along the edge of the island. For this reason, berth number ranges are stated rather than individual terminal names. Berths 00 to 59 and 189 to 194 are cruise terminals; berths 60 to 71 and 83 to 188 handle Ro/Ro cargo; berths 99 to 182 are cargo terminals, including container terminals; and berths 195 to 219 handle miscellaneous cargo.

Figure 2

Cargo Summary

Year	Container Volume (in thousands of TEUs)	Outbound Tonnage (in thousands of tons)	Inbound Tonnage (in thousands of tons)	Total Tonnage (in thousands of tons)
2014 (Estimate)*	892	4,089	3,819	7,908
2013	901	4,000	3,961	7,980
2012	909	4,222	3,886	8,108
2011	907	4,376	3,846	8,282
2010	847	3,865	3,524	7,389
2009	807	3,500	3,331	6,831
2008	828	3,655	3,775	7,430
2007	885	3,462	4,373	7,835
2006	977	3,352	5,302	8,654
Average Growth Rate (2006 to 2013)	-1.01%	2.23%	-3.58%	-1.01%

*Estimates are based on authors' calculation, using the average growth rate.
Source: Port of Miami website; dataset compiled by authors

Figure 3

Facilities: Terminals

Terminal	Existing Channel Depth (in feet)	Existing Berth Length (in linear feet)
Berths 00–59	36	7,126
Berths 60–62	35	299
Berths 63–68	35	699
Berths 69–71	35	285
Berths 72–98	35	3,345
Berths 99–140	42	4,951
Berths 141–149	42	1,150
Berths 150–182	28	3,919
Berths 183–188	30	651
Berths 189–194	30	850
Berths 195–208	30	1,443
Berths 209–212	N/A	310
Berths 214–219	28	739

Source: Port of Miami website; dataset compiled by authors

Currently the port is working to have the main channels dredged to about 50 to 52 feet. Cargo and container terminals are perfectly situated at the furthest southeast side of Dodge Island. This allows the larger ships with the deepest drafts to load and unload cargo without having to traverse the narrower and more shallow segments of the port. There are still 5,101 feet of available berth space that can be used for development between bays 69 and 98.

Facilities: Cranes

In August 1999, the Port of Miami established Port of Miami Crane Management Inc. (PMCM), a nonprofit corporation, to handle the maintenance of port cranes. The port owns 13 ship-to-shore container handling gantry (quay) cranes. PMCM owns some of the largest cranes in the world. According to PMCM, “these Super Post-Panamax cranes [11-12 in Figure 5] that were delivered in January 2005 are among the largest quay cranes in operation in the world as they were designed to work a 22 container wide vessel at Port of Miami cargo terminal;” and “they were designed to have the capacity to work on any container vessel existing and on the engineers’ drawing boards.”⁹ The port has made a significant financial commitment to being prepared for the expansion of the Panama Canal through its purchase and installation of these Super Post-Panamax cranes. All necessary cranes have been ordered and installation is complete.

Figure 4

Cargo Lines Served

American President Lines Ltd. (APL)	Mitsui Osaka Shosen Kaisha Lines (MOL)
China Shipping Container Lines	Nipon Yusen Kabushiki Kaisha (NYK Line)
CMA CGM Group	Orient Overseas Container Line (OOCL)
Compania Sud Americana de Vapores CCSAV	Seaboard Marine
Ecuadorian Line	United Arab Shipping Company (UASC)
EvergreenMarine	US Lines
Hanjin Shipping	Wilhelmsen
Hapag-Lloyd America	Yang Ming
Hyundai Merchant Marine	Zim Integrated Shipping Services
Maersk Line	

Source: Port of Miami website

Figure 5

Type and Number of Cranes

Type	Number	Tons/Description
Cranes 4–6		
Kocks 50LT	3	70 tons max under cargo beam; ABB DCS600 retrofitted drives with AC410 Advant Controller with CMS 7
Cranes 7–10		
ZPMC 50LT Cranes	4	50 long tons; all have been converted from diesel-generated power to electrical power that works on 13.2 KV from underground electrical pits
Cranes 11–12		
ZPMC 65LT	2	75 long tons max under cargo beam; Super Post-Panamax cranes; ABB DCS600 Multidrive System, AC410 Advant Controller with CMS 7; Flender gearboxes, Bubenzer brakes, ZPMC 20/40/45/2-20 65LT Twin-Lift Spreaders and run on 13.2 KVAC shore power
Cranes 13–16		
ZPMC 65LT	4	100 long tons max under cargo beam; Super Post-Panamax crane; ABB ACS800 Multidrive System, AC800M Controller with CMS 7; ZPMC gearboxes, Bubenzer brakes, ZPMC 20/40/45/2-20 65LT Twin-Lift Separating Spreaders and run on 13.2 KVAC shore power

Sources: Port of Miami website; dataset compiled by authors

Facilities: Passenger Terminals

Known as the “Cruise Capital of the World,” the port moves millions of passengers each year and relies heavily on these passengers to return year after year. Currently, 30 cruise ships and 13 different cruise lines operate from the port, headed to the Bahamas, the Caribbean and Mexico. According to the port website, 2013 was the busiest year for cruise traffic in the port’s history, with 4,030,356 multiday passengers and 48,173 single-day passengers.¹⁰ Coupled with the increase in cruise passengers is an increase in the number of cruise lines sailing out of Miami. According to the port director, “the 2013 cruise season was one of Port of Miami’s best with the addition of two new cruise brands — Regent Seven Seas Cruises and Disney Cruise Line — and the arrival of three new build ships [new ships] including the Carnival Breeze, Celebrity Reflection and the Oceania Riviera.”¹¹

Passenger traffic is forecasted to increase to just shy of 5 million for 2014.¹² Another promising sign for 2014 is the arrival of MSC Cruises' MSC Divina and Norwegian Cruise Line's newest ship, Norwegian Getaway. Cruise lines served are AIDA Cruises, Azamara Cruises, Carnival Cruise Lines, Celebrity Cruises, Costa Cruises, Crystal Cruises, Disney Cruise Line, MSC Cruises (USA), Norwegian Cruise Line, Oceania Cruises, Regent Seven Seas Cruises, Resorts World Bimini and Royal Caribbean International.

Foreign Trade Zone

The Port of Miami's Foreign Trade Zone No. 281 is considered a "General Purpose Trade Zone" established under the Alternative Site Framework (ASF). According to Miller & Company P.C., "one of the benefits of the ASF is that companies may be added in just thirty (30) days. This ASF option does not require a Grantee to locate other zone status property to remove or transfer to the proposed new site as with a traditional boundary modification."¹³ This makes FTZ No. 281 more competitive. Existing customers and new customers can obtain a FTZ site in a relatively short amount of time compared to other sites without ASF status. The FTZ offers all forms of transportation necessary for multimodal distribution; located within it are Miami International Airport, Opa-locka Airport, railroad service and major highway access.¹⁴

Transportation and Access

The Port of Miami is significantly improving its ability to more efficiently move cargo in and out of the port by building a tunnel that will connect the port to Interstate 395 via Watson Island. Currently, according to the PortMiami Tunnel Project, "nearly 16,000 vehicles travel to and from the Port of Miami through downtown streets each weekday. Truck traffic makes up 28 percent (or 4,480) of this number."¹⁵ Improvements to the existing railroad tracks (the Intermodal/Freight Rail Restoration Project) will, according to the port, "...re-connect the port with the national rail systems (CSX and Norfolk Southern) and expedite the movement of goods throughout Florida and into the continental U.S. New rail service to Port of Miami, with expanded connections throughout North America, augment the port's efforts to become a major global logistics hub allowing containerized cargo to reach 70 percent of the American population in 1-4 days."¹⁶

Employment

The Port of Miami supports 207,000 jobs, both directly and indirectly. This number is expected to increase by 33,000 new jobs due to projected increases in cargo throughput. The port's economic impact includes \$27 billion in annual tax revenue to local and state governments. This is projected to increase to \$34 billion annually with the increase in cargo throughput.¹⁷

Figure 6

Cruise Ship Terminals Passengers Served

Year	Number of Passengers (in thousands)
2013	4,078
2012	3,774
2011	4,018
2010	4,145
Average Growth Rate (2011 to 2012)	-12.1%
Average Growth Rate (2010 to 2011)	-3.1%

Sources: Port of Miami website; dataset compiled by authors

Current and Future Port Projects

The Port of Miami has been very aggressively preparing for the expanded Panama Canal. With the tunnel project complete, dredging is the only project left to be completed. The tunnel project was a decade in the making and will greatly reduce the amount of traffic created at the port. This, coupled with the rail restorations, will allow the port to efficiently move larger amounts of cargo faster. Deep channels are required for the larger Post-Panamax ships; the port has already started dredging in preparation.

Figure 7

Improvement Projects

Project	Completion Date (Estimated)	Estimated Investment (in millions of dollars)	Description
Tunnel Project	Completed	\$915.0	The new port tunnel will improve access to and from the Port of Miami, serving as a dedicated road directly linking port facilities with the National Highway System. In addition to providing quicker access for port-bound trucks and automobiles, the port tunnel is designed to reduce traffic congestion on downtown Miami streets.
Deep Dredge	Mid-2015	\$150.0	The port's deep dredge project will deepen the port's existing channel from its current 42-ft. depth to +/- 50-52 ft. in preparation for Post-Panamax ships.
Intermodal/ Freight Rail Restoration		\$ 49.3	Previously decommissioned tracks will be restored to link the port and the Hialeah Rail Yard, providing direct cargo access to the national rail system. The on-dock intermodal rail service will provide shippers the convenience of port-to-door service.
New Super Post-Panamax Cranes	Summer 2013	\$ 42.0	Four Super Post-Panamax cranes with the capacity to handle the new generation of large container cargo vessels have been installed.
Bulkhead Strengthening	Winter 2013	\$ 65.0	Bulkheads and seawall along Wharves I-VII have been improved through a comprehensive strengthening program. This program included a variety of improvements to each wharf, including new bollards, fenders and water stations. Wharves originally designed for channel water depths ranging from 42-46 ft. have been deepened for improved wharf access, allowing improved cargo movement and stacking efficiencies needed for projected increases in containerized trade.

Source: Port of Miami website; dataset compiled by authors

Outlook

Similar improvements are being made at Port Everglades and the Port of Miami. The intermodal rail restoration and roadway tunnel projects link port facilities with Florida's interstate highways and other major arteries. Those landside improvements facilitate the growth of the maritime supply chain and reduce possible traffic congestion. The Port of Miami's unique terminal layout, which allows the larger ships with the deepest drafts to load and unload cargo without having to traverse the more narrow and shallow parts of the port, gives it a competitive advantage. Given the stable growth of the cruise business and cargo transport, the port is expected to remain a major economic force in the area.

However, it is critical to ensure that landside improvements, such as intermodal system, and waterside improvements, like dredging and deepening the Main Ship Channel, will deliver on time to accommodate Super Post-Panamax ships. Any delay in delivering the planned improvements or lack of budget to maintain the progress of the current investment will threaten the competitiveness of the port.

Endnotes

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