

Port of Miami Cargo Gate: using technology to improve throughput and enhance security: Part 1

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Recent technology enhancements at Florida's Port of Miami (POM) have focused on the development and implementation of a new Cargo Gate Complex and Vehicle Processing System. This innovative integration of entrepreneurial business processes with security systems achieves efficiencies in cargo throughput while simultaneously improving access control management. POM is an excellent example of how creative information technology (IT) solutions can help port management merge business and security systems to address the needs of both government security regulations and the cargo container trade.

Prior to 2008, POM, which receives vessel-bound cargo containers primarily by truck, hand-processed gate passes and credentialed individuals accessing the cargo terminals. The port's complex multipurpose uses, geographical limitations, and older gate technology, as well as post-9/11 security requirements, combined to produce significant wait times for trucks staging to enter the restricted cargo areas. The fallout was decreased port revenues, higher operating costs for shippers, cargo terminals, and truckers, as well as increased demands on port security elements implementing stringent terrorism-related threat mitigation strategies. The port's use of a homeland security grant and other government capital development funding, as well as a focused effort to have security, business interests, and IT collaborate on a security/business management solution, resulted in the opening of a new cargo gate complex in 2008, where transactions are managed predominantly via technology-only, unmanned gate pedestals. Innovative IT applications, such as optical character recognition (OCR) software and equipment, have enabled POM to improve the processing of cargo entries and exits, and verify compliance with port security credentialing, business permitting, and accounting requirements. The new technology, combined with port leadership's focus on enterprise security solutions, has enabled POM to adapt its business model to the necessities of port security, and at the same time, respond positively to cargo interests seeking faster gate processing times.

Overview of the Port of Miami

POM is a 528-acre island-seaport situated on commercially developed spoil islands in Biscayne Bay, connected by bridge to the downtown centre of Miami, providing ready deepwater access for maritime interests to the Atlantic Ocean. POM is a multiuse port, nominally marketed as the "cruise capital of the world" due to its historic dominance in the passenger cruise sector, but it is also a significant U.S. cargo container shipping facility. In his 2009 State of the Port message, Port Director Bill Johnson indicated the Port of Miami has an economic impact of over US\$17 billion a year and generates more than 176,000 jobs. In 2008, 4.1 million passengers, and over 7.4 million tonnes of cargo, generated port revenues of US\$101 million. According to information posted on its website, approximately 20 shipping lines use the Port of Miami to call on 100 countries



Figure 1. Container trucks wait their turn to access the Port of Miami's old cargo gate complex.

and 250 ports across the world, serving Asia, the Caribbean, Central America, Europe, the Middle East, North America and South America.

Port Security

In the aftermath of the September 11, 2001 terrorist attacks, the US government enacted the Maritime Transportation Security Act, which established new security requirements for seaports, including enhanced provisions for managing and controlling access to a port's designated restricted cargo and shipside areas. The new security restrictions in essence made seaports a component of the nation's maritime transportation security planning system. Like many ports facing increased security scrutiny, the POM was required to enhance its access controls to mitigate the risk of terrorists encroaching on critical maritime infrastructure. Many of these new restrictions (e.g., credentials, vehicle screening, restricted access to vessel docks and cargo areas) affected the movement of cargo into and out of POM. In addition, Florida has been a leader among US states in developing prescriptive port security standards. Even before 9/11, the state enacted provisions to address the general threat of crime and narcotics trafficking in the state's 14 deepwater seaports. The Florida law requires specific actions by ports concerning access control, personnel, cargo security, parking, fencing, lighting, and a host of other security infrastructure issues. A major aspect of this effort was the requirement that ports develop an access control credential issued pursuant to a fingerprint-based criminal history check. Applicants with specified crimes in their past are prohibited from accessing restricted areas of the seaport.

Cargo processing delays increase

The implementation of stronger security measures impacted cargo throughput efficiencies as POM struggled to redevelop

to meet the needs of both the cruise and cargo industries. In 2006, the daily vehicular traffic volume across the main port bridge amounted to 13,600 vehicles, including 2,050 trucks. POM projections indicated that by the year 2025, daily traffic volume would increase to 24,350 vehicles, 3,600 of those being trucks (Port of Miami, 2007, "Gate Innovations and Technologies for Improving Throughput, Security, and Efficiency." Government Technology Seminar: Beyond Video. Los Angeles, CA). Prior to 2008, the main cargo gate complex consisted of six inbound lanes, and three outbound lanes. Only four of the inbound lanes were capable of processing containerised cargo. Access through the cargo gates, staffed by port security personnel, required the presentation and validation of a POM identification (ID) card; verification of a company's permit to conduct business on the port; the manual data entry of container and chassis numbers; the weighing of the truck, if necessary; the collection of a scale fee in cash; and the production and distribution of a gate pass to the driver. Average processing time was 1.5 minutes. Processing times could be affected by any number of variables, including inaccurate keyboarding, severe weather, scale breakdowns, human resource shortages, and security restrictions which prevented individuals with certain criminal backgrounds from accessing POM restricted areas. The law does allow for restricted area access by non POM-credentialed users to no more than five times in a 90-day period; however, drivers without a Port ID card were required to present themselves at a secondary location to obtain the necessary clearance.

Also complicating cargo gate processing was the nature of the South Florida cargo shipping industry, which predominantly uses trucks to transport cargo containers to and from deepwater ports. Since the majority of container truck traffic occurred on weekdays, traffic congestion was the greatest during the daytime business hours. Truck traffic congestion often occurred during the morning, lunchtime, and evening rush hours as trucks dropping off or picking up containers returned for second and third loads. Also adding to the traffic congestion was the significant volume of cruise-related and other non-cargo vehicular traffic coming to the port on busy cruise days.

POM administration became concerned about the persistent traffic congestion affecting the port's ability to attract new trade and retain its market share. It was not unusual for truck traffic to back up from gate, onto the bridge, and into the downtown Miami streets. The high volume of passenger cruise vehicle and commercial truck traffic created long lines



Figure 2. Inbound container trucks mix with cars as the port's older cargo gate complex works to cope with increased security restrictions and the growing needs of the container shipping industry.

of traffic. The problem was compounded by ongoing capital development and road reconstruction projects associated with re-engineering port roadways to segregate cruise from cargo-related traffic. Because POM management was sensitive to the local community's and the maritime industry's concerns for effecting improvements in cargo processing time, short term and sometimes expensive solutions were implemented, including: new signage; traffic controls to improve truck queuing and staging; posting police and security traffic control officers; assigning a full-time cargo gate manager to maintain oversight and optimise gate processing efforts; and the analysis of gate processing times to establish benchmarks for standards of operations. These short-term efforts however only crystallized the need for completion of the previously planned and funded new cargo gate complex to meet POM's growing cargo and security needs.

End of part 1. Part 2 will feature in edition 44 and will discuss the long-term solution to POM's cargo throughput problem, discussing specific details of the new Cargo Gate Vehicle Processing System as well as the system integration of business and security processes. It will also provide a detailed list of the improved features and advantages of the new cargo gate versus its predecessor.

ABOUT THE AUTHOR



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