

# PORTMIAMI™

2035 MASTER PLAN  
EXECUTIVE SUMMARY



## EXECUTIVE SUMMARY FOREWORD

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The Port of Miami's mission is to operate and further develop the world's leading cruise port and the largest container port in the State of Florida; to maximize its assets and strengthen its advantage for future growth; promote international trade and commerce as a vital link between North and South America and a growing global trade; support sustainability and operate in an environmentally responsible manner.

At the Port of Miami, with the support of the Mayor and County Commission, we are up for the challenge of the new global trade reality and we are positioning ourselves to compete well into 2035.

The POM 2035 Master Plan is a planning tool used to update the Port of Miami Master Plan Sub element of the County's Comprehensive Development Master Plan (CDMP). This document was prepared simultaneously with the County's Evaluation and Appraisal Report which analyzes if the Port is meeting its goals, policies and objectives.

By incorporating a market analysis for both cruise and cargo and a financial analysis of capital infrastructure, this master plan helps us better understand the direction in which we need to guide the Port. Cruise passenger projections take us from 4.1 million passengers to 5.9 million in 2035. And our cargo projections run from 847,249 TEUs in 2010 to 1.7 – 3.3 million in 2035. Increasing Port business ultimately increases the County's economy.

The 2020 Master Plan presented the need for a tunnel connecting Port traffic directly to the Interstate system and promoted dredging the South Channel to -50'/-52' in order for post-Panamax ships to berth at the Port. These projects are currently underway and their completion should coincide with the completion of the Panama Canal expansion.

The 2035 Master Plan continues to push the envelope and takes us into the future with projects that will help increase both cargo and passenger throughput by adding services, upgrading infrastructure, enhancing efficiency and increasing berthing capacity.

Projects presented in the 2035 Master Plan include a phased implementation plan allowing for development depending on additional changes in the global market. There are three main components to the Ports future progress: Cargo, Cruise and Commercial with an overarching theme of sustainability.

### Sustainability:

The Port of Miami is located within the Biscayne Bay Aquatic Preserve, surrounded by the natural environment including sea grass and marine life, as well as the human environment with commercial and residential uses. Protecting both of these environments for future generations is a major concern in how the Port will grow. The Master Plan dedicates much thought to the surrounding areas and outlines projects that will help preserve it.

- **Shore Power:** Also known as cold ironing; allows ships that berth at the Port to plug-in to the electrical grid and turn off their engines, therefore reducing the emission of carbon dioxide.

- **Electrification of Cranes:** The Port of Miami is in the process of retrofitting all of its existing cranes to run on electricity instead of diesel fuel. This not only reduces carbon dioxide emissions but noise emissions as well.
- **LEED Buildings:** All new buildings constructed on the Port must meet the County's minimum requirement of LEED Certification.
- **Green Energy Initiatives:** There are several projects the Port plans to undertake to save energy. These include installing solar panels port-wide, electric generating wind turbines and water turbines.
- Additional sustainable projects outlined in the following sections include the Port of Miami Tunnel, rail service, consolidation of cargo gates, and a multimodal center. All are projects which will help integrate the Port with the community and reduce congestions and emissions.

### Cargo:

In preparation to compete for cargo for the next 50 years, the Port of Miami is focusing on three major projects: the construction of the Port of Miami Tunnel which will connect Port traffic directly to the interstate system, dredging the main channel to accommodate post-Panamax ships, and the rehabilitation of rail on Port.

- **Dredge:** This Master Plan, as those prior to it, continues to encourage the dredging of the South Channel. Furthermore, this master plan bases all its calculations and market analysis past 2014 solely as if the dredge has occurred, as it obviously notes that, without the dredge, the Port cannot compete for trade.
- **Rail:** Reintroducing rail service at the Port and the development of an on-Port rail yard which will help decrease traffic congestion and reduce emissions.
- **Inland Distribution Center:** The development of an off-Port Inland Distribution Center in the warehousing district to handle increased container traffic.
- **Consolidation of accessory uses:** such as Customs and Border Protection, fumigation yard, sheds, etc., to one area in order to create continuous cargo area for tenants.
- **Cargo Gates:** Consolidation of the individual tenants' cargo gates to the Port's one Security Cargo Gate complex. This project also includes creating a fast-pass lane to increase efficiency and reduce processing time at the gates.
- **Cranes:** Breaks down the purchase of new cranes over the next 25 years, taking the Port to a total of 23 cranes by 2034.

### Cruise:

The cruise industry supports one of the County's biggest economic engines: **tourism**. The Port of Miami, known worldwide as the Cruise Capital of the World, plans to remain number one by competing for the growing cruise industry. To accommodate for this growth in 2035, the Port must begin to invest in new larger terminal complexes and multimodal centers.

- **Berths:** Three new berthing spaces plus the extension of berth 6 to accommodate the new standard of larger cruise ships. This will allow for the berthing of nine of the world's largest class of ships.
- **Cruise Terminals:** The plan outlines several options for two to four new cruise terminals, including introducing the first of its kind twin linear terminals that will offer new efficiencies to cruise lines.

- **Multimodal Center:** A multimodal center allowing for the consolidation of ground transportation, decreasing the sprawled footprint of the Port, therefore allowing for increased efficiency and additional land to be dedicated to cruise or cargo business.

**Commercial:**

The Master Plan aligns the anticipation of an increase in cruise passengers visiting the Port with the need for providing commercial development onsite. This development is the anchor that will connect the Port and the tourism industry that it serves to the community. By working together we will create a unified waterfront global destination.

- **Cruise Ferry:** Design and development of a cruise ferry to service the Caribbean.
- **Marina:** A marina to berth mega yachts.
- **Hotel and commercial:** Development of a hotel, retail, restaurant, and office space to serve cruise passengers, port users, and the community.
- **Trans-shipment:** The creation of a transshipment area with additional cargo berths at the south channel.
- **Utilities:** Increasing capacity of utilities such as electricity, water, sewer, etc.

The capital improvement elements outlined in this master plan total \$2 billion over the next 25 years. The Port, with the goal of creating jobs and building a stronger economy for the community, is aggressively moving forward to implement the projects outlined in this plan, laying the foundation for tomorrow's job and business opportunities.

A handwritten signature in blue ink that reads "Bill Johnson". The signature is written in a cursive style with a large, looping initial "B".

Bill Johnson  
Port Director

## SECTION ESI

### INTRODUCTION

#### ESI.1 HISTORY

Located in the heart of downtown Miami in Biscayne Bay, The Port of Miami is one of the most significant economic generators for South Florida. Through its cargo and cruise activities, the Port has determined that it contributes over \$18 billion annually to the South Florida economy and helps provide direct and indirect employment for over 176,000 individuals. The Port is owned and operated by the Seaport Department of Miami-Dade County.

In 2010 the Port of Miami handled more than 4.1-million cruise passengers and 7.3-million tons of cargo providing a tremendous economic and social benefit to Miami-Dade County and the South Florida community. To meet the challenges of the future in Miami-Dade County and the South Florida region, the Port of Miami will continue its sustainable growth through the development of the cargo, cruise and commercial entities in order to create new jobs in the community. It is timely and relevant for Miami-Dade County to focus attention on this important community asset and plan accordingly for the future.

The Port of Miami is recognized as the "Cruise Capital of the World" – it has retained its status as the number one cruise passenger port in the world for well over four decades accommodating cruise vessels of major cruise lines such as Carnival Corporation, Royal Caribbean Cruises, Ltd. and Norwegian Cruise Line.

As the "Cargo Gateway of the Americas", the Port primarily handles containerized cargo and small amounts of break bulk, vehicles and industrial equipment. The Port of Miami is among an elite group of ports in the world which cater to both cruise ships and containerized cargo.

The port industry is in the middle of competitive changes which require ports to adjust if they are to continue to develop. The Port is geographically positioned for growth opportunities as the Panama Canal expansion project is completed in FY2014/15 allowing for post-Panamax vessels to transit the canal. The Port of Miami will be the closest US Port to the Canal. The Port of Miami is currently moving ahead with deepening the South Channel to -50-ft / -52-ft. to accommodate the new post-Panamax ships – a large container vessel providing for faster routes to Florida and the US East Coast. The development of the tunnel, on-port rail and off-site intermodal yard will accommodate this growth opportunity into the future.

#### ESI.2 BUSINESS APPROACH

This Master Plan is anchored by 5, 15 and 25-year forecasts for cruise and cargo traffic. These forecasts have been assembled through market assessments, the commitments that the Port has in current and planned User Agreements and the Port's recently completed Economic Impact Analysis. These last items are used to assist in the development of a sustainable strategic business plan and a framework for infrastructure planning to meet the projected demands to fulfill the Port's obligation to the community and to be fiscally sound.

The Master Plan also addresses the ancillary supportive tasks required to operate the port, inclusive of berth and mooring assessments, infrastructure improvements and others that are pertinent to the long-term development and success of the Port. The Plan has been prepared and presented so that it can serve several functions:

- Establish short and long-term capital programs;
- Achieve consensus, among the political leadership, on the long-term vision for the Port;
- Provide sound public need and justification to support future environmental permits;
- Allow for the incorporation into the County's Comprehensive Development Plan (CDMP) as its Port of Miami Master Plan sub element; and,
- Provide a potential planning vehicle for use in seeking grants.

#### ESI.3 PLANNING APPROACH

The Master Plan's main focus is to maximize the throughput and optimize its existing "footprint" to obtain sustainable growth. To achieve a plan based on this policy, the Master Plan was crafted in a way that would allow the decision-making logic to support that policy.

By defining the future cruise and cargo market demand for the Port through the market assessment process, the Plan can define the future physical and operational requirements of the Port for each of these main business units within the physical boundaries of the Port area. In the case of cargo, the Plan also explores the creation of off-port sustainable development to meet future demands and provide for increased market opportunities.

#### ESI.4 DIRECTION

From the outset there were several major policies that provided the directional framework for the study; these include:

- Port of Miami's mission statement and organization;
- The role of the Port of Miami in the community as an economic engine;
- Growth strategies for cruise, cargo and other commercial interests to strengthen and support the County;
- Priorities associated with trade, environment and community leadership; and,
- Successes and limitations of past master planning efforts of the Port of Miami.

During the course of the master planning process, several major strategies were contemplated that provided the overall direction for this report. These major strategies focused on the key components of the Port today (cruise and cargo) while also providing the platform for future commercial development opportunities. Major strategies linked specifically to the study included the following:

- **Cruise**
  - Development of new terminals; and,
  - Updating existing older terminals to meet the needs of larger modern vessels.
- **Cargo**
  - On-port development;
    - Creation of a flexible yard layout;
    - Increasing the dockside capacity;
    - Increase the number and size of cargo berths;
    - Dredging to meet the requirements of the next generation of cargo vessel; and,
    - Include the Tunnel in the development of the long-term port plan layout.
  - Off-port development;
    - Create port rail access to increase market opportunities; and,
    - Create distribution centers for rail and road movements.

- **Financial**
  - Increase revenues of the port;
  - Increase profitability; and,
  - Diversify revenue streams.
- **Management**
  - Manage to maximize profit through the development of business units.

## ESI.5 OUTREACH

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The approach for this plan included extensive outreach to Port users. Stakeholder outreach is an essential component of the Plan to provide the current tenants, facility users and other entities had a role in the assembly and implementation process.

## ESI.6 COMPREHENSIVE PLAN COMPLIANCE

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On July 1, 2011 the House of Representative passed Bill 399(FSTED) SS 311.14.3(a-e) which requires Ports to have a Board approved Strategic Plan which must include 5 components as outlined below:

Each port shall develop a strategic plan with a 10-year horizon. Each plan must include the following:

1. An economic development component that identifies targeted business opportunities for increasing business and attracting new business for which a particular facility has a strategic advantage over its competitors, identifies financial resources and other inducements to encourage growth of existing business and acquisition of new business, and provides a projected schedule for attainment of the plan's goals.
2. An infrastructure development and improvement component that identifies all projected infrastructure improvements within the plan area which require improvement, expansion, or development in order for a port to attain a strategic advantage for competition with national and international competitors.
3. A component that identifies all intermodal transportation facilities, including sea, air, rail, or road facilities, which are available or have potential, with improvements, to be available for necessary national and international commercial linkages and provides a plan for the integration of port, airport, and railroad activities with existing and planned transportation infrastructure.
4. A component that identifies physical, environmental, and regulatory barriers to achievement of the plan's goals and provides recommendations for overcoming those barriers.
5. An intergovernmental coordination component that specifies modes and methods to coordinate plan goals and missions with the missions of the Department of Transportation, other state agencies, and affected local, general-purpose governments.

To the extent feasible, the port strategic plan must be consistent with the local government comprehensive plans of the units of local government in which the port is located.

Additionally, Bill 7207 (Transportation Element of CDMP) – SS 613.3177.6(a)11.(b)2(b) and 3(b) adds the need for plans for ports, but does not address adoption of a master plan. While Bill 7207 (Coastal Management Element of CDMP) – SS 613.3178.2(k) stipulates that "A port master plan shall be prepared by or for each deep-water port for the purposes of coordinating the activities of the port with the plans of the appropriate local government." The plan is to be incorporated into the Transportation Element of the local government's comprehensive plan and be consistent with the goals, objectives,

and policies of that element. Although the Port lies physically within the City of Miami limits, as a facility owned and operated by Miami-Dade County, it falls under the jurisdiction of the County.

An approved master plan must have a 10 year horizon. This plan has a 25 year horizon which is used yearly to update FSTED's Seaport Mission Plan. The Port of Miami Master Plan will need to be updated every 7 years to align with the CDMP.

This Master Plan provides information required for Comprehensive Plan Compliance. It provides discussions on existing and future land uses within the Port; infrastructure needs to support future market conditions, and environmental conditions resulting from any changes to the land uses. These representations are illustrated on aerial maps and other figures within the document.

To guide the Port of Miami through the 2035 Master Plan horizon, this document contains a series of proposed goals, objectives, and policies for implementation to allow for the long-term adoption of the Master Plan for the Port. As part of the 2010 Evaluation and Assessment Report (EAR), the Miami-Dade County Seaport Department and Miami-Dade County Department of Planning & Zoning will coordinate the adoption of the Port of Miami Master Plan sub element within the Comprehensive Development Master Plan.

## SECTION ES2

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### EXISTING CONDITIONS

#### ES2.1 PORT OF MIAMI OVERVIEW

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The Port of Miami is situated on an island with a land mass of 520-acres in central Biscayne Bay. It is bounded to the north by the Main Channel adjacent to MacArthur (I-395) Causeway, to the west by downtown Miami, to the east by Miami Beach and Fisher Island, and to the south by Fisherman's Channel and Biscayne Bay.

Though physically one island, it was created as part of a beneficial reuse plan out of three spoil islands: Dodge, Lummus and Sam's islands. In this 2035 Master Plan, the terminology "on-port" refers to facilities and activities located on these now joined islands (the Port of Miami) and "off-port" refers to locations, facilities or activities elsewhere and outside of the Port of Miami.

The Port of Miami acts as a transient point of entry or departure for cargo, and to meet its objectives, relies on its connections with other intermodal facilities such as the Miami International Airport (MIA), the FEC Hialeah Intermodal Facility, and the West Dade trade-related, freight forwarding and consolidation warehouses. The users of the Port of Miami also rely on the local, regional and inter-regional transportation network components consisting of roads, railway lines and channels to facilitate the efficient movement of goods and passengers including the Fort Lauderdale / Hollywood International Airport for a considerable amount of cruise passenger traffic departing to and from the Port of Miami.

#### ES2.2 PORT OF MIAMI ADMINISTRATION

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The Port of Miami is a non-operating port, owned by Miami-Dade County, Florida, and managed by the Miami-Dade County Seaport Department. A "non-operating" port is one that provides, manages, maintains and leases the facilities for private entities to operate all shipping activities. The Port does not itself provide the services, shipping activities and/or manpower required to load and off-load vessels. The Port is under the leadership of the Port Director which is appointed by the Mayor.

Facilities are either leased or made available to Port users and operators. Tenants include shipping agents, cruise lines, freight forwarders, custom house brokers, stevedores, ship chandlers, federal, state and local agencies, and other port-related firms. The U. S. Coast Guard serves as Captain of the Port in matters relating to safety and inspection. Fire protection and Police services are provided by Miami-Dade County by contractual agreement with the Seaport Department. The Biscayne Bay Pilot's Association is responsible providing piloting services in the harbor.

### ES2.3 LAND USES

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Land uses are established by Miami-Dade County. They are all reflected in the County's Comprehensive Land Use Plan. The entire Port is classified as "Terminal" which allows for a broad range of uses and activities.

### CHANNELS AND TURNING BASINS

Ships approaching from the Atlantic Ocean enter the Port of Miami through Outer Bar Cut and travel northwest to Government Cut and its 1,200-foot radius Fisher Island turning basin.

The Port is scheduled to undergo future deepening from its existing -42-foot depth to between -50 and -52 feet in order to accommodate the next generation of new post-Panamax cargo vessels capable of transiting the Panama Canal once that expansion project is completed in 2014. During the dredge other improvements to the channels will be made including widening the Fisher Island turning basin to 1,500-feet in diameter.

### BERTHING INVENTORY

The Port of Miami accommodates cruise, cargo, military, barge, yacht, and numerous other miscellaneous vessels in support of commercial operations. At present, the Port has more than 28,739 feet of linear berth or buffer surrounding the Port. Approximately 8,474 feet of lineal berthing space are provided for cruise ships and 11,458 lineal feet for container ships. There is still a considerable amount of lineal water's edge of undeveloped berth space along the Main Channel (5,101 feet) from Bay 69 to 98 and additional space along the southwest corner adjacent to the RCCL headquarters building.

### ES2.4 CARGO

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The Port of Miami is a general cargo port with strict limitations on handling certain types of bulk products. Principal cargos passing through the port include fruits and vegetables, apparel and textiles, non-refrigerated food products / groceries, paper, electronic equipment, stone, clay and cement tiles, construction and industrial equipment, trucks, buses, and automobiles. Four types of cargo operations occur at the Port:

- Roll-on / roll-off (Ro / Ro) container operations;
- Lift-on / lift-off (Lo / Lo) container operations;
- Break- bulk cargo operations; and,
- Vehicle exports.

The Port allows container lines and or stevedores to operate at the port. At present there are three major terminal operators at the Port:

- **SEABOARD MARINE** - is an ocean transportation company that provides direct, regular service between the United States and the Caribbean Basin, Central America and South America.
- **SOUTH FLORIDA CONTAINER TERMINAL (SFCT)** is a joint venture terminal operator and stevedoring company between Terminal Link (CMA CGM) and APM Terminals.

- **PORT OF MIAMI TERMINAL OPERATING COMPANY (POMTOC)** has been operating at the Port for more than 10 years.

The Port is continuing to implement elements of the 2020 Cargo Master Plan through its Capital Improvements Program. This includes the continued expansion of berths and upland areas to assist in improving functionality and efficiencies of the operators. The main cargo projects to date include dredging deeper in order to meet the future new post-Panamax cargo vessels that can easily reach the Port following the expansion of the Panama Canal, new Tunnel providing for increased ingress and egress capacity for cargo with direct access to the main highway system, rail, cargo gate expansion with new inbound and outbound lanes, software modernization to increase throughput efficiencies, and a possible consolidation of gate functions to expedite processing times, replacing rip-rap with new bulkheads to accommodate additional vessels for cargo operations, stronger storm protection and cargo yard improvements to increase overall efficiencies.

### ES2.5 CRUISE

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The Port of Miami serves as a primary port of embarkation / debarkation (homeport) for the Caribbean region and is mostly used by the top three cruise lines in the world - Carnival Corporation (principal Miami brand – Carnival Cruise Line), Royal Caribbean Cruise Lines (Royal Caribbean International, Celebrity Cruises and Azamara Club Cruises) and Norwegian Cruise Line. Cruise operations occur on the north side of the island. Cruise facilities located in this area includes six cruise terminals with 744,784 square feet of interior operational space, cruise berths, cruise ship loading and support aprons, customs inspection and storage areas, provisioning spaces and parking areas. Additionally, Terminal J is located on the Southwest side of the Port and is able to accommodate cruise vessels up to 800 feet in length based upon current pilot standards. The landside portion of all cruise terminal operations, including parking, comprises approximately 52 acres.

The continued growth in the size of vessels affects the Port's ability to handle the mega-vessel passenger throughput. As discussed, and as shown as a major part of this 2035 Master Plan, some of these facilities will require renovations in the future to accommodate this increased demand.

One of the major issues for the Port of Miami, at present and over the long-term, is the ability to accommodate larger cruise vessels of 1,200 feet in length with larger passenger capacities. The current layout of the terminals does not provide for flexibility to accomplish this. This element is further discussed in the sections that follow.

## SECTION ES3

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## PROPOSED GOALS, OBJECTIVES AND POLICIES

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### ES3.1 CURRENT STATUS

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This Master Plan updates and replaces the Port's 2020 Master Plan previously adopted. This new Master Plan calls for sustainable growth in operations and expansion in cruise and cargo activities through enhancements of existing facilities, the development of a commercial business unit and the creation of a financial model whereby the Port maximizes profitability, prioritizes expenditures, diversifies revenues streams, protects our natural resources and allows for the Port to become self-sustaining.

The Port faces a number of challenges which require looking into the future to determine how to best position itself to meet its mission and role within the community. It must understand the issues and recognize the opportunities and limitations allowed for the creation of a realistic and sustainable Plan that can serve the Port beyond 2035.

Among the critical issues studied and evaluated as part of the Master Plan were the following:

- The location of the Port within the urban core of a major metropolitan area and its role in terms of the types of cargoes that move through it on a daily basis;
- The nature of an island port and its ability to expand (or not) within the Biscayne Bay Aquatic Preserve;
- The economic impact and role of the Port in terms of job creation within Miami-Dade County;
- The role that international trade will have on the future of the South Florida community;
- The realities of the inland transportation of freight from the Port and through the interstate highway system and beyond into the rest of the US hinterland, specifically, the use of rail to service the Port;
- The current economic condition of the Port and its ability to fund future capital programs;
- The Port is committed to achieving a sustainable balance between its customers, operations and development, while continually focused on its environmental responsibilities; and,
- The mobilization and diversification of cruise outside of the U.S. and Miami.

Cargo and cruise capacity throughputs have been consistent over the past few years. Therefore, increasing the level of competition and challenges in the traditional market share of cruise and cargo that the Port of Miami will need to meet over the next 25 years will be essential, not only to keep pace, but to strive to meet the demands of the markets it serves.

Moving forward, the Port will need to expand its physical footprint outside of the Port to remain competitive, diversify its financial capacity through the introduction of a commercial component to its cruise and cargo portfolio that is not tied to tariff income, increase its operational efficiencies in meeting the demands of the Port’s key sectors through the application of technology to increase productivities for port users, and strengthen its marketing efforts to leverage these expansion efforts into additional customer successes.

The main goal for the Port of Miami is as follows:

**THE PORT OF MIAMI SHALL CARRY OUT ITS DAY-TO-DAY OPERATIONS AND ITS LONG-TERM EXPANSION PROGRAM THROUGH COORDINATION WITH FEDERAL, STATE, AND LOCAL AGENCIES IN ORDER TO RETAIN AND EXPAND ITS SHARE OF THE MARKET AS THE TOP-RANKING CRUISE PORT IN THE WORLD AND AS ONE OF THE LEADING CONTAINER PORTS IN THE NATION WHILE CONSIDERING ITS EFFECT ON THE COMMUNITY AND THE ENVIRONMENT.**

## CRUISE AND FERRY

### ES4.1 OVERVIEW

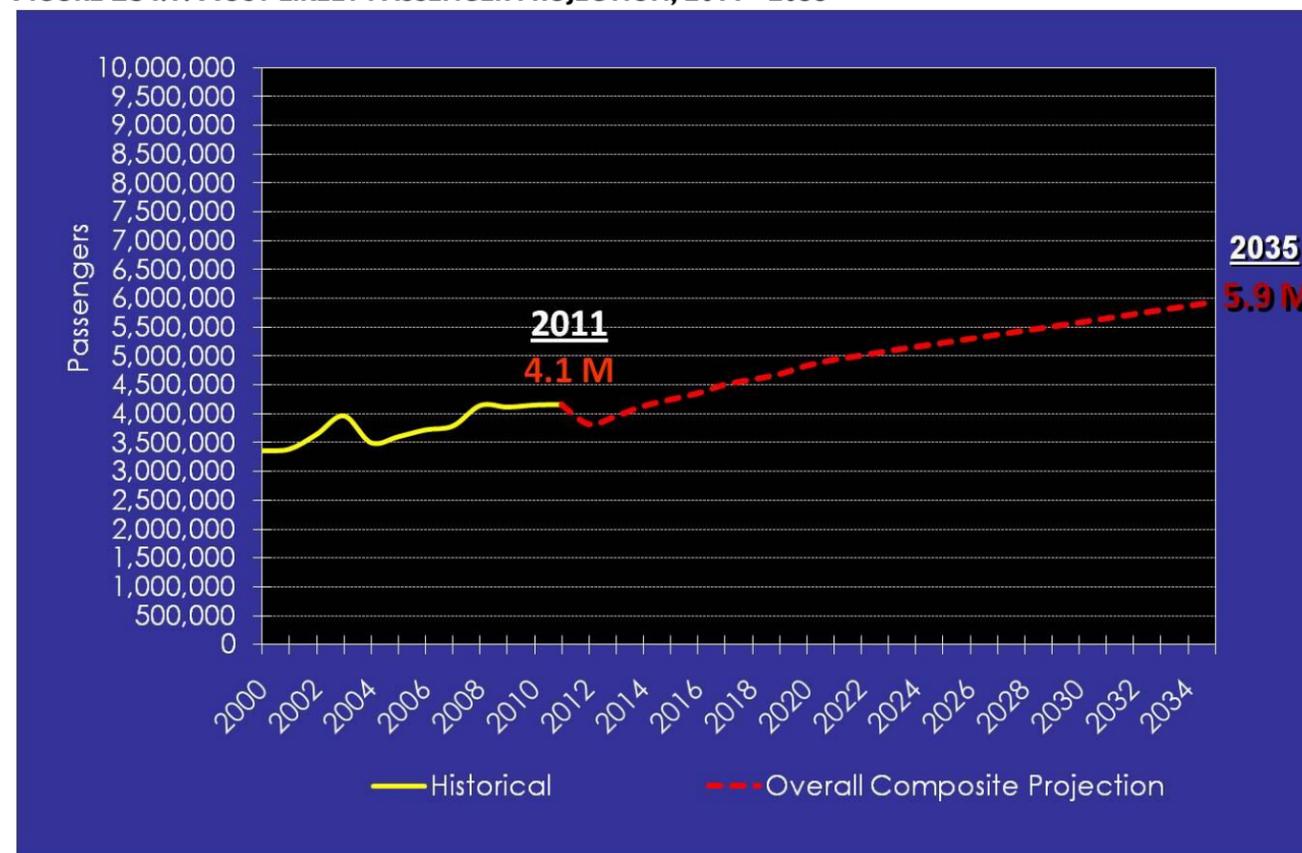
This section discusses the future of cruises at the Port of Miami and the facilities required to meet the needs. These forecasts are used as the baseline for the business plan and physical master plan efforts for the Port to determine future facility demand and financial performance.

The cruise forecasts assess the current industry trends impacting future cruise passenger and vessel throughput for the Port of Miami over the 25-year planning period (2010 - 2035). This assessment of the Port’s main revenue drivers identifies global and regional market trends that impact potential levels of traffic.

### ES4.2 PROJECTION OF CRUISE TRAFFIC

Figure ES4.1 shows the most likely passenger throughput scenario for the Port of Miami with a growth rate of 1.79% per annum.

FIGURE ES4.1: MOST LIKELY PASSENGER PROJECTION, 2011 - 2035



The passengers per sailing ranges from 2,733 to 3,074 based upon the type of vessels that will call at the Port of Miami.

Based upon the most likely revenue passenger projection and the passengers per sailing as illustrated on a per year basis, the overall number of anticipated calls grows from 760 in 2011 to 885 in 2020 and to 966 calls in 2035.

### ES4.3 CRUISE BERTH DEMAND

#### CRUISE VESSEL GROWTH TRENDS

To forecast the facility requirements to meet the projections, it is important to take into account the anticipated trends in ship construction and deployment. This section illustrates the requirements of the industry relevant to the construction and deployment of cruise vessels in the worldwide cruise market and Caribbean region, in general. A summary of this section is presented below:

- In November 2009, Royal Caribbean International delivered the first new-build of the next generation of cruise vessel – *Oasis of the Seas*. It is approximately 43 percent larger than their other largest vessel delivered in spring 2006 – *Freedom of the Seas* - at 220,000 gross tons (GT). The sister ship - *Allure of the Seas* – was delivered in fall 2010. Also in summer 2010 the 150,000-GT, 325-meter LOA cruise vessel - *Norwegian Epic* - capable of accommodating more than 4,200 passengers and crew began seasonal sailings from the Port of Miami. NCL also ordered two additional vessels for delivery in 2013 and 2014 at 4,000 passengers each. RCCL has also begun a new shipbuilding program named *Project Sunshine* to deliver their next generation vessel.
- As of July 2011, 18 new cruise vessels with a total berth capacity of 56,215 are scheduled for delivery over the next six years (2010 through 2016). A total of 18 vessels have been delivered since December 2010 with a berth capacity of more than 36,000 berths. For comparison purposes, in December 2006, the forward cruise vessel order book contained 29 vessels with a berth capacity of approximately 85,000.
- The evolution of the cruise vessel has been one of the principal mechanisms propelling industry growth. Over the past ten years, the newest and most popular generation of vessels continues to offer greater passenger volumes, beams and lengths to accommodate the area needed for large-scale outside cabin development. These vessels range in length from 965 to 1,300 feet and have an average lower berth passenger complement of between 1,950 and 5,400.

For the Port of Miami to remain competitive in the regional marketplace and be able to fully accommodate the service requirements of the future generation of cruise vessels, current and future berth, terminal facilities and upland support areas will need to accommodate these large cruise vessels. This will include the ability to offer industry operators facilities and venues capable of accommodating a passenger complement upwards of 5,000 to 6,000 passengers per vessel into the mid to long-term. The core market will continue to reflect the predominant brands sailing from the Port of Miami including vessels ranging from 2,000 to 4,200-passengers per vessel.

Design vessel requirements for the Port of Miami homeport operations provide a heavy leaning toward the deployment of larger vessels into the Port and marketplace. Historically, the Port has catered to the mid-size to larger cruise vessels in the North American and, more recently, the worldwide fleet. This trend is likely to continue into the long-term. Albeit, the Port does serve some smaller vessels of the Oceania, Crystal, SeaDream, and World cruise fleets.

Using large vessel design parameters, consideration can be given to each of the primary infrastructure categories required to support the Port of Miami's cruise operations with specific emphasis on the primary infrastructure of entrance channels, turning basins, berths, passenger terminals, ground transportation areas, and other elements.

The Port of Miami presently has demand to serve post-Panamax and super post-Panamax vessels into the long-term. For the Port, the ability to accommodate ships of more than 120,000 to 150,000 GT and approximately 1,200 feet LOA, is a key factor in its ability to serve as a primary regional cruise homeport. The net result of the vessel development trend is that current and future facilities will need to accommodate large cruise vessels for the Port to remain competitive in the cruise marketplace.

#### DESIGN VESSELS

To facilitate the Port of Miami 2035 Master Plan, a recommended series of design vessels for the Port over time is presented. Based upon the plan layout for berthing it is envisioned that, to accommodate all classes of vessels that may utilize the Port, facilities that berth layout design must be in conjunction with the super post-Panamax vessels allowing for a 1,200-foot berth. Upland areas may be developed to provide for a wider range of facilities to then accommodate vessels ranging from post to super post-Panamax.

Table ES4.1 shows the recommended design vessels for the Port of Miami.

Table 4.1: Recommended Design Vessels for Port of Miami		
TYPE	CURRENT	NEW BERTHS
	Design Vessel 2 (post-Panamax)	Design Vessel 3 (super post-Panamax)
Passengers	2,500 to 4,000	4,200 to 5,400
Crew	800 to 1,000	1,000 +
Gross Tons	90,000 to 130,000	140,000 to 225,000
Length Overall (feet)	985 to 1,100	1,100 to 1,300
Beam (feet)	130 to 165	140 to 185
Draft (feet)	28 to 32.8	28 to 32
Air Draft (feet)	Up to 210	210 +

#### TRAFFIC ANALYSIS

Part of the process in identifying long-term berth demand is to develop an understanding of the traffic patterns for the facility. For the Port of Miami a defined seasonal, monthly, and daily traffic pattern emerges through analysis of the historical traffic data. Traffic patterns for the Port of Miami were evaluated based upon an historical assessment. The following elements contributing to Port demand were identified:

- Seasonal and monthly traffic patterns are primarily driven by the winter Caribbean season with a focus on November through April. Redeployment to the Caribbean is shrinking each year as the Mediterranean and other competing destinations worldwide draw away cruise vessels from the Caribbean region;
- The Port of Miami is successful as a key regional homeport providing service to the Caribbean and Bahamas regions as the primary target;
- Over the five year period (2006 – 2011) the months of December, January and March provide the highest volume of cruise calls and passenger traffic with 10.7%, 11.1% and 10.8% respectively; and,

- The peak day for traffic over the period was Sunday. However, in 2009 there was a shift to more capacity sailings on Friday and Monday. That was somewhat offset in 2010.

**MONTHLY TRAFFIC ANALYSIS AND SEASONALITY**

For the Port of Miami the peak monthly traffic occurs in the winter months of November through April each year. During this 6-month period, 61.9% of the annual traffic moves through the Port (10.3% per month). This is in line with the typical Caribbean winter cruise season. Additionally, the Port has maintained a year-round presence in the region from May through October with some 7.9% traffic per month over this period. This pattern will continue into the long-term barring any unforeseen changes in the Caribbean region.

Should Cuba open for North American (US resident) travel and cruise line visits providing additional port options then it is likely this figure will increase to some degree. Seasonal cruise activities can also be attributed to outside influences, primarily Europe, Alaska, and Mediterranean market trends. See Figure 4.5 for the actual numbers of calls on a monthly basis over the 5-fiscal year period. The trend line is indicative of the Ports traffic pattern and used as the long-term baseline for monthly traffic throughput.

Based on the projection assumptions, growth is envisioned to occur in a consistent seasonal pattern for regional traffic on sailings of less than eight days. This is primarily due to the competition from other worldwide summer destinations whereby the revenues will continue to draw traffic out of the regional cruise market catchments over the 25-year planning period. Much of the long-term passenger growth (not cruise call growth) will be a reflection of the increased passenger capacity of the cruise vessels. This will be defined by the type of cruise sailing from the key regional homeports.

**DAILY TRAFFIC ANALYSIS**

From a passenger volume perspective, Saturday and Sunday consistently have shown the highest passenger throughputs.

However, in 2009, there was a considerable increase in the Monday and Friday traffic accompanied by a decrease in weekend cruise calls. This change was due in part to the addition of the *Jewel of the Seas* on Monday/Friday departures; *Norwegian Sky* on Monday/Friday departures; and the switch of the *Carnival Destiny* on Monday/Thursday for the *Carnival Fascination* on Monday/Friday, amongst others. The days from Friday through Monday will continue to be the busiest days for the Port of Miami as they are based upon the vacation patterns of the North American consumer.

If these change, and the European consumer becomes more prevalent in the market, these may be modified slightly into some additional mid-week sailings with a particular emphasis on Thursdays. These patterns are also indicative of a short-cruise duration market with an emphasis on 8-day; 5-, 5-, 4-day; and 3- and 4-day sailings that meet the demands of the North American consumer.

For the Port of Miami, a more consistent traffic pattern is shown with an average of 91.6% of its traffic placed on the peak weekend days (Fri, Sat, Sun, Mon) and the remaining 8.4% on the mid-week days. This is compared to approximately 80% of the traffic on peak weekend days and 20% on mid-week days for Port Everglades over the period. There has been a slight increase in the peak weekend day capacity over the past three years with most of that traffic attributed to larger vessels and the deployment of ships to slots on Monday and Friday.

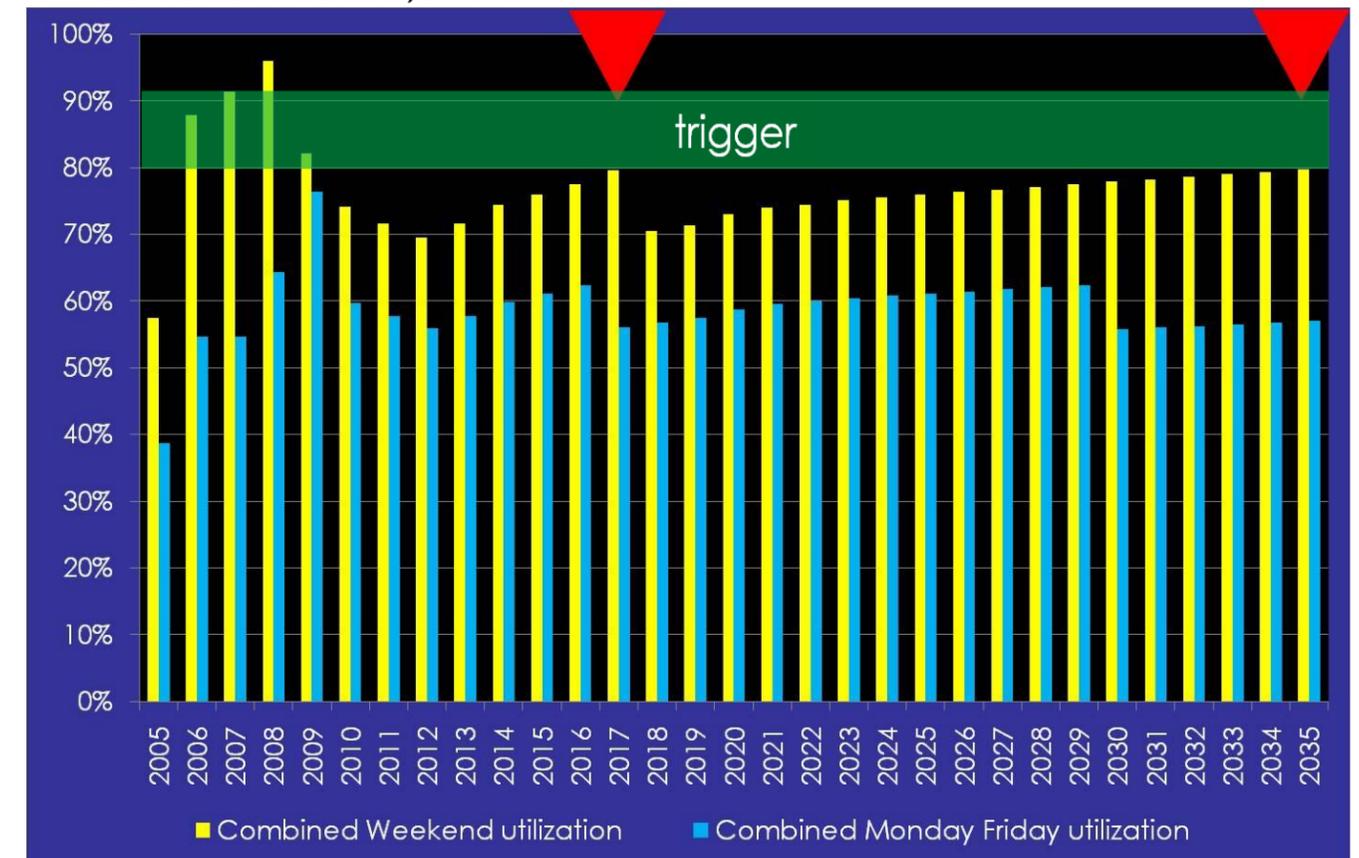
For cruise ports, the consistency of cruise traffic calling on a year-round basis is a positive attribute. This consistency allows the Port to manage the cruise facilities through revenue planning, personnel scheduling, and other defined areas of operations. If cruise traffic is inconsistent on an annual basis, it poses challenges in terms of apportioning reserves to maintenance during low cruise traffic periods and places more demands on other aspects of the cruise operation.

**FACILITY DEMAND**

For the purposes of this master planning study, we believe the majority of the berths should be able to accommodate the future design vessels of 1,100 feet LOA (berth size 1,260 feet). With this size berth, the facility can also accommodate vessels of less than these dimensions. Thus, the berth demand and projected requirements are based upon this berth length.

Figure ES4.2 illustrates the anticipated demand for berths in the upcoming years based upon the triggers. As shown there is a total demand for up to 9 berths during the projection period with an extension of berth 6 and a seventh now; an 8<sup>th</sup> berth in 2017; and, a 9<sup>th</sup> berth in approximately 2035. As presented in the Master Plan, vessels of more than 900-ft. would berth along the North Channel due to pilotage concerns with moving larger cruise vessels along the South Channel. The Southern Terminal “J” would act as the overflow facility until 8 to 9 berths are built along the North Channel.

**FIGURE ES4.2: BERTH DEMAND, 2009 - 2035**



**ES4.4 FERRY**

North American operators have had success in understanding how to market and develop cruise products that appeal to the tastes of many diverse consumer groups. These operators suggest there are still opportunities within the Caribbean cruising region; as such, this region will be one of the many focuses of their development in the mid- to long-term. For instance, the development of Cuba, offering a series of cruise ports and the continued development of new destinations throughout the region, will bolster mid- to long-term interest in the region by cruise lines, and more importantly, by consumers. Cruise line deployments will also continue to be based upon outside influences directly related to other potential markets in Europe and Asia as these begin to open and develop.

It is not believed, based upon cruise line interviews, that the introduction of Cuba at any point will have a dramatic effect on increased capacity from the South Florida market. However, this will assist the region in maintaining its dominance. Additionally, there are likely limited opportunities for passenger ferry service as the airline industry will capture much of the market to the dispersed cities of Cuba. There is an opportunity in the short-term for ferry Ro-Pax services and Ro-Ro services to move people, vehicles and construction supplies to the island community.

The development of shorter patterns sailings from South Florida on 3- to 5-day patterns to take advantage of the proximity of key Cuban ports may increase passenger throughput to some degree with the opening of Cuba to cruise tourism. However, many experts agree that the development of the infrastructure to support cruise tourism operations as seen in other Caribbean islands may take up to 2 to 3 years to develop once Cuba is open. This time period should also allow adequate development time for any U.S. ports to transition infrastructure, if necessary, to support new cruise operations.

From a competitive homeport standpoint, in the long-term Havana, Cuba may compete for international (particularly European) homeport traffic as the airline industry deploys to the island with direct flights. However, the major portion of the cruise consumer market will be North American and is much more likely to use Cuba as a port-of-call rather than a homeport operation.

#### **ES4.5 CRUISE LAYOUT ALTERNATIVES**

Historically, the Port of Miami has grown its cruise facilities organically as the need has arisen. This means that, as cruise vessel volumes (numbers of total vessels needing to be accommodated) as well as the vessel size (increases in vessel length, tonnage and passenger capacity) have increased, the Port has created the upland cruise terminal, ground transportation areas, and parking to accommodate the need. In many instances the Port had to respond to customer needs within months and resorted to building a terminal at a location that might not be the best from a planning perspective, but rather it was the only practical solution at the time. While this mode of growth appears to be appropriate from a financial perspective whereby the Port does not overly extend itself, this method does not work for long-term planning. What has occurred at the Port is that facilities built in the mid-1990's to serve that generation of cruise vessels are now out of place, creating conditions that impact operations and service for the Port and cruise line users.

The Port already has a major investment in the four westernmost terminals (F, G, D, and E) as well as Terminals B and C where an additional \$21 million was recently spent to accommodate the *Norwegian Epic*. The next question will arise when additional terminals are needed to the east. Therefore, for planning purposes, it is important to layout the optimum berth configuration and then decides upon the most appropriate location.

Flexibility is inherent in this plan, thus the final decision of when and where to place the terminal can and should be made at the time that the need arises, however this will allow the Port to proceed with items that are very long-term in nature such as the environmental permitting and financial planning.

#### **BERTH CONFIGURATION**

Based upon the cruise market assessment and berth demand analysis, there is a demand for up to 9 berths of 1,200-ft. over the projection period of 2035. As such an extension of berth 6 and a 7<sup>th</sup> berth is required now, followed by an 8<sup>th</sup> berth in 2020 and a 9<sup>th</sup> berth in approximately 2032. All of this cruise development would occur along the North Channel. This area would be separated from cargo operations to provide a passenger-friendly and sustainable cruise operations zone. In the short to mid-term, all cruise vessels over some 900-ft. would berth along the North Channel. Terminal "J" on the South Channel would continue to be used for smaller vessels until at least 8 berths are built. Cargo would utilize the South Channel only.

In order to accommodate the requirements for up to 9 – 1,200-ft. berths along the North Channel of the Port an analysis was done as to the most viable approach to add these berths to the channel.

To allow for the extension of berth 6 and add three more berths along the channel, the option was chosen to cut into the island based upon cost, marine elements and environmental balance.

Approximately 12.1-acres of cargo area would be needed in order to develop this new cruise berth area and uplands support areas. A 9<sup>th</sup> berth would require an additional approximate 6 acres of cargo space. To fully implement the plan additional cargo area of more than the acreage needed for the berths would be required for the terminals and upland support areas.

#### **CRUISE TERMINAL LAYOUT**

The Port has a fixed amount of land that can be used in various ways including cruise, cargo and commercial. From a cruise perspective, future development of upland facilities should maintain maximum flexibility and return on investment. However, from the Port's perspective, the allocation of land is a more complex evaluation which weighs the available solutions' impact on each user, the environment and the overall needs of the community.

The traditional approach of terminal development at the Port has been to build almost independent terminals for each ship. This now requires extensive infrastructure and the need for multiple Customs, Immigration, and security stations. As part of this plan, other options were considered to this approach. The concept of the sustainable development of twin or mega-terminals that can be positioned to service multiple vessels can align with different berth configurations, can be accessed via walkways, can be adjacent to Ground Transportation Area (GTA) and parking facilities, and can provide for mixed operations (such as security, Customs & Border Protection) to save on costs and perhaps even combining baggage and check-in long-term into the formula may apply.

#### **RECOMMENDATION**

Alternatives were evaluated through a process that looked at cost, implementation, areas impacted, and the theoretical **internal rate of return (IRR)** which compares the revenue generated per square foot of land for each competing land uses. Alternative A2 is preferred in the short-term for development at a total cost of approximately \$241-million.

Providing for a continued linear berth pattern that works along the edge of the Main Channel and minimizes the impacts to the cargo yards adjacent to the cruise facilities will assist the Port in achieving its long-term goals. Based upon the recommended option A2, a mid-term and long-term master plan layout for the cruise terminal facilities has been developed as illustrated in Figure ES4.3 and the long-term Figure ES4.4, respectively. Based upon feedback from the cruise line users, the separation of cruise tourism and cargo activities is a positive impact on the Port.

Within the overall cruise zone of the Port, it is envisioned in the mid to long-term that a centralized multi-modal center could be developed to serve as a transportation hub for the Port, provide additional commercial (hotel, retail, entertainment) and allow for the opportunity to serve as a link to the Miami International Airport. The multi-modal center would also provide green spaces for activities such as tennis, jogging, swimming, and other outdoor activities that could accommodate port staff, crew, and other community activities. This site would primarily serve the cruise terminals from CB 1 to CB 4 with additional parking and support services.

The sustainable development in this central area of the Port can be done in conjunction with the development of the intermodal center. As shown, this area encompasses new buildings adjacent to the existing Port of Miami offices and Miami World Trade Center as well as development within the proposed multi-modal center and a replacement park on the roof.

A multi-modal center is approximately 230,000-SF per floor and a total of 3 to 7 stories. This dimension provides numerous internal uses and a rooftop green space. Uses may include parking, GTA, hotel, retail, entertainment, and others as required to support cruise functional operations and Port-specific needs. A second multi-modal center made up of

parking, ground transportation area for bus, taxis, and private cars, potential baggage drop off, and other operational support elements would also be established to serve cruise terminals CB 5 to CB 8 (CB 9 long-term).

Additionally, to allow for financially viable cruise facilities growth of the Port, the next generation terminal complex at the Port would provide for the consolidation of services allowing for better management of operations and security (entryways to the terminal complex may be a shared security zone) where passengers would then move to individual halls from a series of main entryways and corridors for check-in processing.

#### **FUTURE CRUISE OPERATIONS**

With the development of the 2035 Port Master Plan there are significant operational issues related to the planned development approach that must be resolved through further review and specific master planning of the multi-modal centers, terminals, walkways, berths, and roadway systems servicing the cruise area. There are substantial operational challenges with the development of a terminal complex that may provide for up to five individual terminal spaces to service berths CB 5 through CB 9.

Cruise line users will need to be involved in the planning process to ensure that the adopted development pattern is consistent with how future cruise operations can be effectively and efficiently managed. Specific items of concern are the movement of baggage to and from cruise vessels berthed at a distance from the cruise terminal structure (such as CB 7 through CB 9). Alternative methods of moving baggage utilizing improved logistics and technologies will need to be explored. The current method of transporting baggage via forklift and cages to the individual vessels at this distance will certainly multiply substantially the total labor and equipment required. Thus, movement via green trolley trains or, more likely, via a beltway system linked to dispatch baggage from and to the terminals to each individual vessel would be used. This baggage system would be built as part of the walkway system that would provide access to the cruise vessel gangway systems for passengers moving to and from the cruise terminals.

The walkways, which may range from approximately 1,200 to 4,000-feet, would be equipped with an interior clearance space allowing for two-way travelators (moving walkways), shell door / gangway accessibility, movement via walking (if desired) and for trolley carts to provide transportation for disabled passengers along this core. The space would be air-conditioned and planning of the space should also consider the distance and time passengers will be in the space. Provisioning the individual vessels must also be considered. Pre-clearance of goods and service vehicles by CBP, stage areas for trucks, apron access, and an apron area wide enough to allow for these operations to function efficiently will need to be considered when master planning these sites.

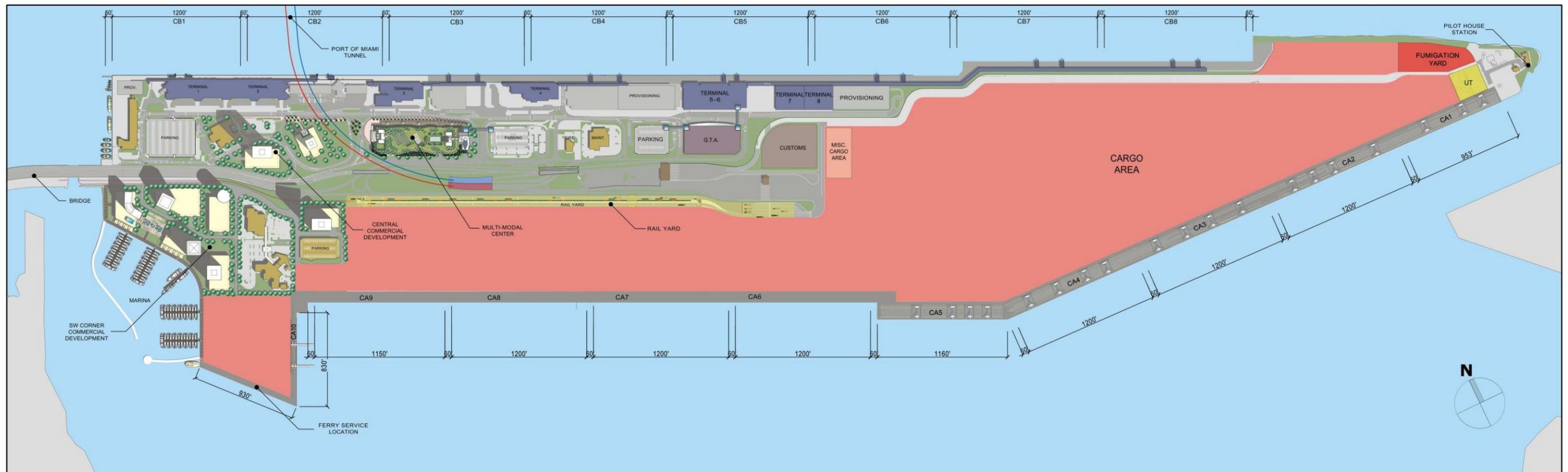
The use of a terminal complex, instead of the traditional approach of one berth/one terminal, saves substantial real estate utilization at the Port and lessens the overall impact on cargo operations. However, this is a “visionary” master plan for the next 25-years and is meant to be utilized as a baseline for growth and improvement at the Port of Miami. Specific development will need to be driven by User need with a clear focus on operational costs, passenger services, and cost of the facilities. This set of factors may, over time, provide for a modified master plan development.

Working with the cruise line users and involving them in the decision-making process will not only improve the operational successes of the master plan development but also allow for enhanced relationship development between the Port and cruise line users. It is imperative that the Port continue to work with its cruise line partners as this master plan development moves forward through the sustainable planning of individual berth and terminal projects as well as upland support areas.

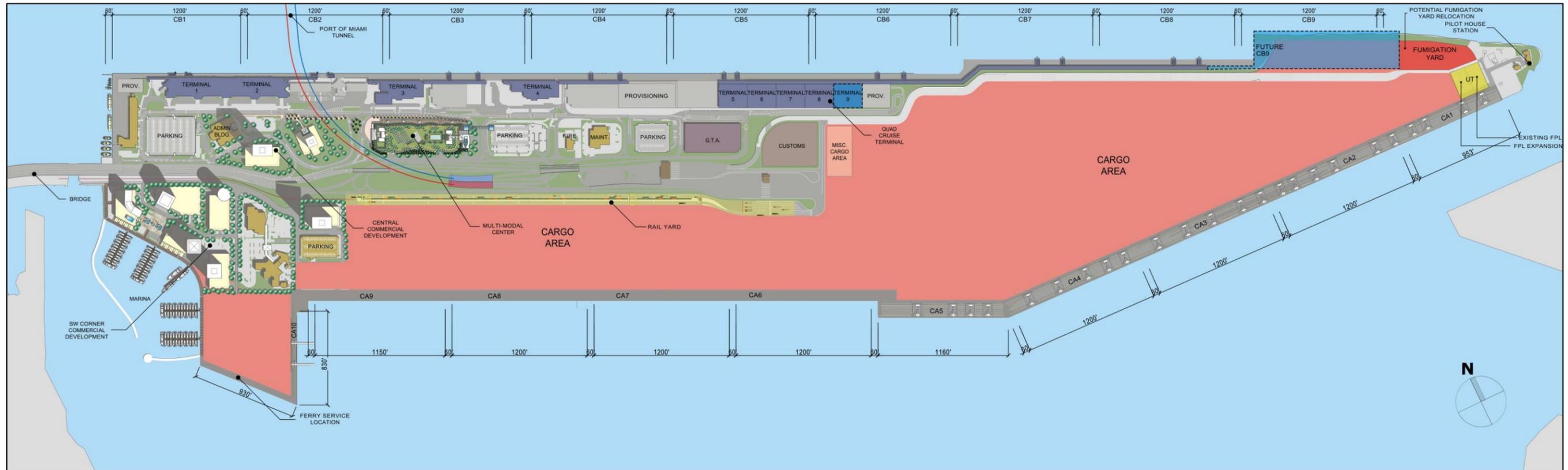
Additionally, it is noted within the mid and long-term master plan that Terminal “J”, the small ship cruise terminal facility located on the southwest corner, would be demolished to provide for new cargo capacity and be replaced through the addition of a new berth and green terminal on the North Channel in coordination with future need overall. The decision on when to do this will not be necessary at this time as it is based upon the Port’s business plan.

The southwest corner of the Port would also provide a future development area for mixed-use cargo, Ro/Ro and Ro-Pax ferry operations as may be dictated by future opportunities in the Caribbean, specifically Cuba.

FIGURE ES4.3: MID-TERM PREFERRED CRUISE PLAN ALTERNATIVE



**FIGURE ES4.4: LONG-TERM PREFERRED CRUISE PLAN ALTERNATIVE**



## SECTION ES5

### CARGO

#### ES5.1 OVERVIEW

This section provides a summary of the projected containerized cargo throughput through 2035.

These forecasts are used as the baseline for the business plan and physical master plan efforts for the Port to determine future annual throughput capacities and facility demand.

The Port of Miami handles over seven million tons of waterborne containerized cargo annually. From 2000 through 2005, the Port's tonnage increased steadily, growing at an average rate of about 4% per annum.

The containerized cargo activity handled at the Port is handled by three individual terminals occupying approximately 268 acres: Seaboard Marine, South Florida Container Terminal/Terminal Link (formerly APM Terminals), and Port of Miami Terminal Operating Company, LLC (POMTOC).

Latin American cargoes have typically accounted for about 45-50% of the Port of Miami's total tonnage. Northern European cargoes have remained relatively constant at about 10-15% of the total, while Asian cargoes have increased from 15% in 2003 to nearly 30% in 2008. Conversely, Mediterranean, Middle East, and African cargoes share have been declining to less than 10%. It is anticipated that, as more direct, all-water services call the Port, the share of Asian cargoes will continue to grow.

Historically, growth at South Florida ports – Miami and Port Everglades – has averaged a modest 1.2% annually over the past ten years; however the 20-year containerized growth for these ports has been 5.4%. Specifically, since 1991, the Port of Miami has averaged 3.9% per annum.

Based on data from Moody's economy.com, US real Gross Domestic Product is likely to grow between 2-4 % annually over next 5 years. Based on the 1.5X future growth rate, this equates to a 3% to 6% baseline growth rate in TEUS at US ports. Some ports will experience greater growth as a result of shifting trade patterns while other ports are likely to grow at lower rates. Similarly, Florida GDP is expected to remain between 2% and 4% through 2020.

It is anticipated that, over time, more Asian service will be introduced on all-water Suez and Panama Canal routings however, the Port of Miami will still remain heavily vested in an export market that serves Latin American and Caribbean countries with consumer goods and supplies that replenish the cruise and tourism industries. Historical and projected near-term growth was also examined in terms of gross domestic product (GDP) in the Latin American and Caribbean countries. According to the International Monetary Fund (IMF)'s World Economic Outlook (April 2011) the Latin American and Caribbean region's GDP has experienced average annual growth rate of 3.4% over the past ten years. GDP growth rates for 2011 through 2016 are expected to average 4.1%.

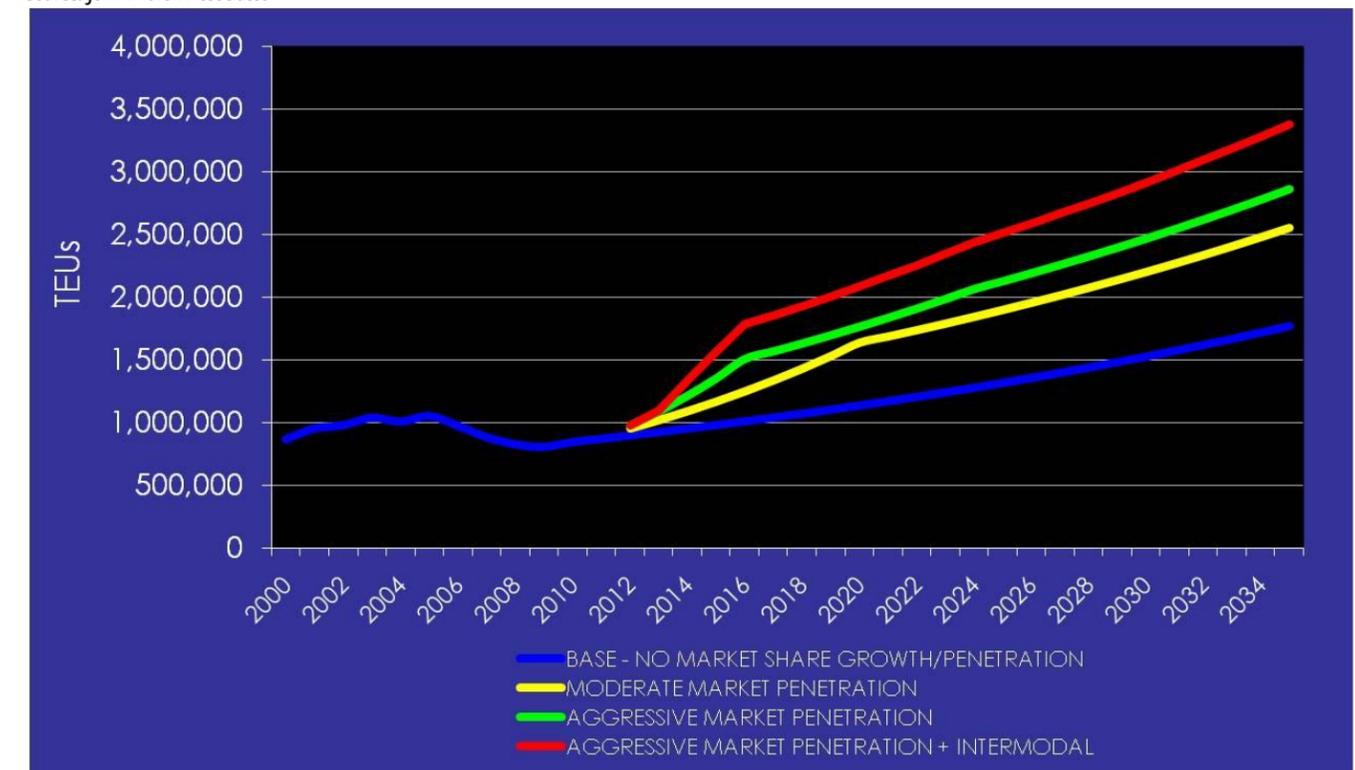
Based on the estimated FY 2010 containerized volume handled at the Port of Miami, interviews of Port terminal operators and carriers and future growth factors, a range of containerized forecasts were developed:

- Low scenario container forecast, with no new market penetration, assumes a 3% growth of FY2010 base cargo.
- The moderate growth penetration scenario incorporates the estimated 500,000 potential TEU market that the Port of Miami can capture; 50% of the local truck hinterland market and 25% of the Central Florida market by 2020, with a 3% growth thereafter.
- The aggressive market penetration scenario assumes the same 500,000 potential TEU market is captured by 2016, with a 4.5% growth through 2025 and 3% thereafter.
- The aggressive market penetration plus intermodal scenario assumes the same rate of capture of the local truck hinterland and Central Florida market as described in the aggressive scenario as well as an 18% intermodal share, assuming the Port deepens the channel to -50', allowing for the ability to market to global carriers and handle a fully-laden first-inbound call.

By 2035, the unconstrained container throughput at Port of Miami is projected to range between 1.77 million and 3.38 million TEUs. The long-term growth rates of these scenarios range between 3% and 5.8%. The low/base, moderate, aggressive and aggressive plus intermodal container forecasts are graphically depicted in Figure ES5.1.

**FIGURE ES5.1: PORT OF MIAMI LOW AND HIGH UNCONSTRAINED CONTAINER FORECASTS**

Source: John Martin Associates



#### ES5.2 ON-PORT CARGO FACILITY DEMAND

In terms of current terminal capacity, the 828,349 TEUs handled over 268 terminal acres at the Port of Miami yielded about 3,200 TEUs per acre. This figure incorporates total gross acreage for all three cargo terminals. This TEU per acre

figure is fairly consistent with the East Coast average of 3,257 TEU per acre. Other Florida ports of Port Everglades and JAXPORT reflect similar densities under current configurations.

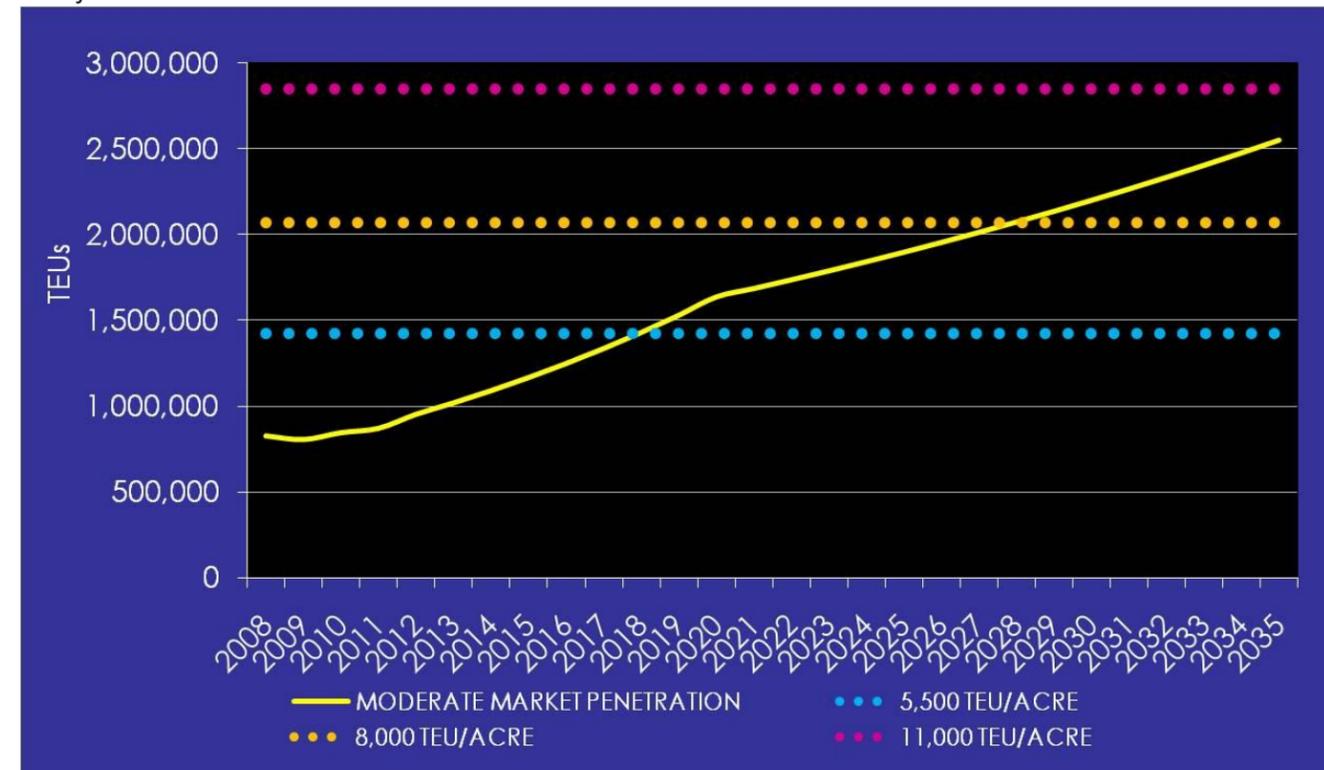
### FUTURE ON-PORT CARGO TERMINAL CAPACITY

Based on the mid potential cargo projection scenario, the Port of Miami will be required to handle nearly 2.7 million TEUs in 2035. Using the current configuration of approximately 268 acres of gross cargo terminal area, this equates to about 10,350 TEUs per acre. Industry studies indicate that terminal density can increase to 11,000 TEU's / acre and eventually to 15,000 TEU's / acre without full terminal automation. However, to reach this level of densification, significant amounts of investment, including rail mounted gantry cranes (RMG) and other technology to minimize dwell times, will be required.

Figure ES5.2 illustrates the thresholds of capacity under various densification scenarios. This analysis suggests that, under the medium projection scenario, Port of Miami will approach densification of 8,000 TEU per acre in 2028. Assuming an 11,000 TEU per acre densification, the Port will not reach capacity in the planning period under the medium growth scenario.

**FIGURE ES5.2: TEU PER ACRE PROJECTED CAPACITY THRESHOLDS**

Source: John Martin Associates



Given these scenarios, the Port's terminals will need to densify in order to meet future long-term demand. This can be accomplished by:

- Reducing on-dock dwell times;
- Moving toward RTG and RMG operations;
- Improving gate efficiencies; and,
- Managing off-dock overflow yards, if necessary.

The levels of investment required to achieve this level of densification could result in higher operating costs per unit. It is imperative that there is a balance of maintaining reasonable cost per unit while gaining terminal efficiencies.

### FUTURE BERTH CAPACITY

In addition to the landside constraints, future berth capacity must be taken into consideration. The average TEU per ship call has increased from about 350 to 510 since 2000. The average number of TEUs per call will most likely continue to increase. As larger vessel deployments occur on direct all-water routings, these vessels will discharge and load more units per call to ensure economies of scale of these larger ships. Currently the top 10 global carriers' fleets average about 3,600 TEU capacity per vessel. The order book for these same carriers reflects an increase in average vessel capacity to nearly 8,000 TEU per ship.

Based on industry standards, it is estimated that berth capacity can handle between 400,000 and 500,000 TEUs annually. The berth capacity analysis is based on 10,000 LF of berth – 6,700 of container crane and 3,300 of mobile crane berth operations. Assuming an average of 1,100 LF per berth, the analysis generates the need for 9 berths.

### ES5.4 OFF-PORT CARGO FACILITY DEMAND

#### OFF-PORT DISTRIBUTION CENTER OPPORTUNITY

The potential for the Port of Miami to compete for distribution centers (DCs) to serve the Florida wholesale and retail markets is assessed in this section. This is due to the anticipated growth in Asian imports to the East Coast ports from increases in all-water direct services via the Panama and Suez Canals, and the accompanying growth in distribution centers near East Coast ports.

The Port of Miami finds itself in a unique situation by virtue of the fact that there is a significant parcel of land adjacent to the Hialeah intermodal yard that may be available for DC operations. The Flagler Property is approximately 400 acres and can be used for both intermodal and distribution opportunities. The following analysis focuses on this potential opportunity.

The Distribution Center (DC) and warehousing market in Florida has historically served not only retail and wholesale industries that serve the key consumption markets throughout the State with import and domestic shipments, but also the freight consolidators primarily located in South Florida and Jacksonville to serve the export Caribbean Island and Latin American trade as well as supply cruise vessels calling the Florida ports. The majority of DC growth in Florida has occurred in three regions:

- **MIAMI-DADE/BROWARD COUNTIES:** Serves the South Florida retail and wholesale markets; food wholesalers near the Port of Palm Beach, Port of Miami, and Port Everglades infrastructure serve cruise and island export markets; consolidators focus on near-airport facilities to also serve the air cargo market at Miami International Airport (MIA). There are also major highway and rail corridors linking the major cores of these areas.
- **I-4 CORRIDOR (TAMPA-LAKELAND-ORLANDO):** Serve growing population and tourism in Central Florida. Also ability to serve South Florida retail and wholesale markets; excellent highway and rail access from hinterland.
- **GREATER JACKSONVILLE AREA:** Increasing market share; ability to serve into North/Central Florida as well as westbound; inexpensive land, low congestion; excellent highway and rail access that can also access South Florida; high interest by Asian steamship lines to develop container terminals in JAXPORT.

Historically, the South Florida markets of Palm Beach, Broward, and Miami-Dade Counties have been significantly more expensive in terms of lease rates and operating costs than Central and Northern Florida. Miami-Dade County's current

industrial gross (IG) asking rate is \$7.48 per square foot. Industrial gross differs from triple net (NNN) leases in that in a NNN agreement, the lease pays for rent and absorbs the costs of utilities, building insurance, and taxes. In an industrial gross arrangement, these costs are included in the rent. The differential from NNN to industrial gross is about \$1.50 per square foot. Current NNN asking lease rates in Palm Beach and Broward Counties are \$ 6.71 and \$7.37, respectively. In contrast, NNN rates in Central Florida market of Tampa and Orlando range from \$5.27 to \$5.66 per foot. Furthermore, the Jacksonville area boasts a NNN asking rate of \$3.86 per square foot.

**PORT OF MIAMI DISTRIBUTION CENTER SITE ANALYSIS**

The Port of Miami can compete with the Central and Northern Florida locations to serve the Florida consumption market with DC operations in Hialeah or Medley. The Flagler Property, which provides significant industrial acreage and intermodal access, exists and is available for development. The size of the parcel, coupled with the fact that smaller to mid-size DCs are becoming the trend, allows the site to pose as a potential multi-tenant complex. It is recommended that the Port continue to work in conjunction with Flagler and other involved parties including the Florida East Coast Railroad (FEC) to market this site to carriers, developers, and DC operators (shippers/consignees).

**ES5.5 CARGO LAYOUT ALTERNATIVES**

The options for providing for the cargo needs at the Port are affected by the cargo projections, input from the current leaseholders of the cargo terminals, and the longevity of the leases that the Port has over the current Port lands.

Since the cruise plan calls for the extension of cruise berths along the north shore of the container yard, the main component of the plan is to reroute the main access road to all of the container terminals on Lummus Island from that location. The plan proposes a new cargo access roadway allowing for the expansion of the cruise berths CB 7 to CB 9, and the access to each yard, fumigation yard, pilot station, and the utilities zone at the far eastern end of the Port.

To provide the Port and Users with future sustainable yard flexibility, the approach to flow cargo traffic from the main gate complexes to the north along the cargo/cruise boundary and into the cargo yards has been taken. The specific gates for each yard, configuration and acreage of each, layout of support facilities, and containers is then only dictated by the available space within the yard and not affected by outside issues. As noted in the cruise section above, the addition of the new cruise berths on the North Channel impacts the cargo yard acreage in that area. Access to the Seaboard cargo yard will continue to be organized in a similar fashion as today following the implementation of their master plan and gate complex.

**ADDITIONAL LAND**

Based on the analysis shown in the previous section, the plan will be to optimize the use of the current land within the port for cargo operations. As such, in a range from 2027 to 2029 more space will be required. It is possible that some of this need may be offset by increases in overall yard efficiencies and new technologies related to the improved handling and movement of boxes to and from the Port and yards.

Impacts on Port of Miami cargo operations will be seen in two specific upcoming projects: The Port of Miami tunnel project which has started construction as of May 2010 and is scheduled for completion in 2014, and the new deep dredge project on the South Channel that will allow for 50+ feet of draft for larger cargo vessels to enter and use the Port of Miami facilities. These projects together will assist in positioning the Port for the widening of the Panama Canal and the opportunity to service these large vessels capable of transiting from the Pacific to Atlantic once the canal project is completed in 2014. The development of these projects will serve as a new opportunity for the Port to expand its cargo operations to the outlying regions of the southern U.S.

Additionally, planning and design enhancements to the Port security cargo gate complex have also started and will provide for further efficiencies to cargo movements. Although this was not a key part of the master plan project, it is evident that

this is a key barrier to the cargo yard efficiencies. The operations of each cargo operator are different and it is not an easy task to facilitate changes that impact each user. However, improvements to allow for faster movement in and out, box scanning capabilities, pre-clearance of trucks, and other related gate issues should be further explored as part of the overall tunnel and master plan.

See Figure ES5.3 for the TEU's per acre forecast for the Port of Miami.

**FIGURE ES5.3: TEU'S PER ACRE FORECAST**

Source: John Martin Associates and B&A



**ES5.6 CARGO LAYOUT**

Most of the cargo operations are consolidated in Lummus Island and the south side of Dodge Island. However, transit shed B is an isolated building still handling cargo while adjacent to cruise terminals. This creates operational issues and does not allow for efficient use of space; customs is in a tight space for access.

The recommended cargo master plan layout provides for consolidation of cargo yards and supporting functions and the ability for future expansion to coincide with projected TEU throughput demand and reconfiguration of the cruise area. In doing so, a separation of cruise and cargo will occur.

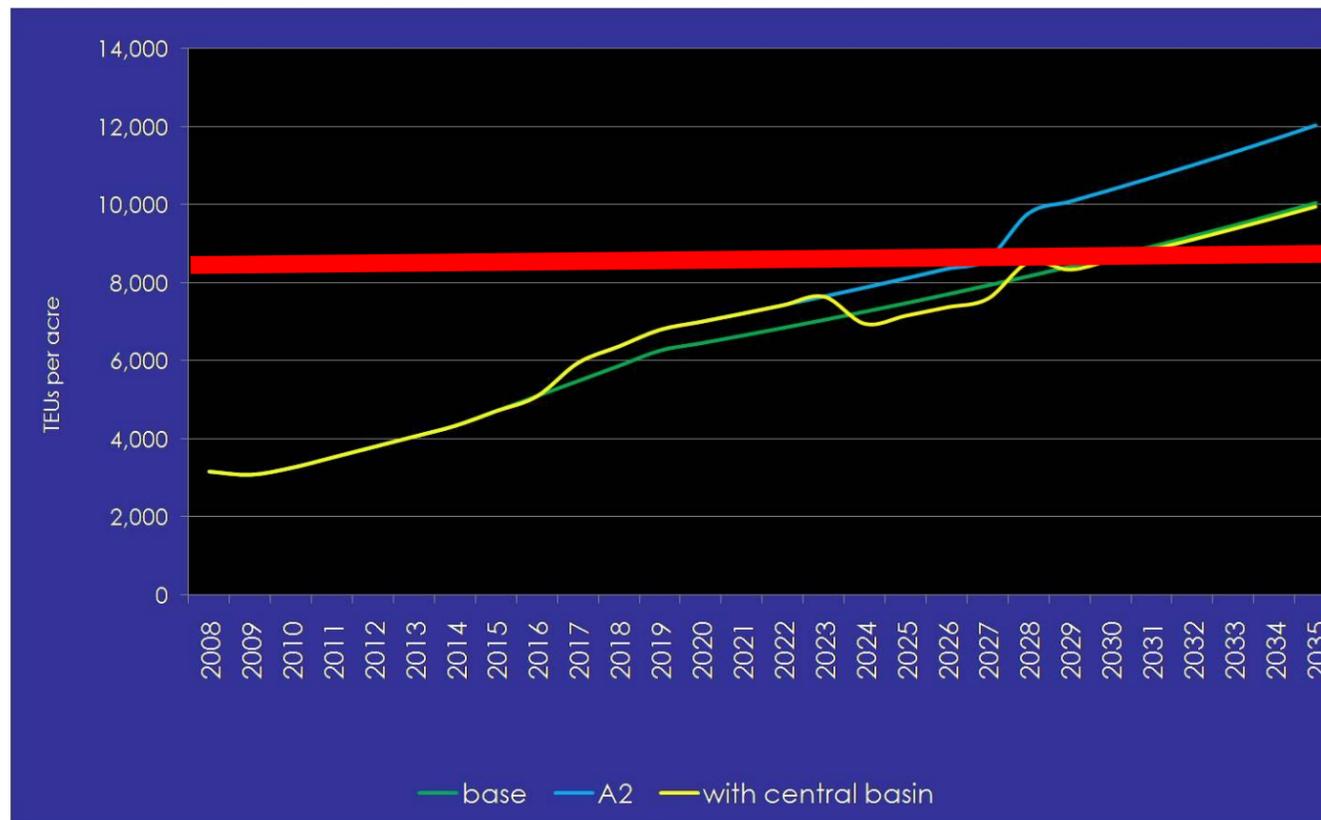
A new space for the transit shed B to allow for continued use of these facilities for bulk commodities will be provided. The Customs area will be expanded and moved to a location adjacent to the gate complexes that can also serve to support cruise operations functions as necessary and the present fumigation yard will be relocated to allow for the safe distance required for use, placing it in an area where it will not impact future cruise and cargo area development.

The master plan also takes into consideration current actions by Seaboard to develop their yard plan. South Florida Container Terminals is most impacted by the reconfiguration of the cruise and cargo areas due to the location of the yard gate complex. This will likely need to be relocated to provide for the completion of the master plan as presented.

To offset the potential loss of cargo yard as land is reallocated to cruise, it is recommended to expand the cargo area along the southwest corner edge by some 13.46 acres to provide a platform for future cargo operations. This expansion program would cost the Port an estimated \$111,800,000 and would include the addition of two 830 to 927-linear foot berths with an area of 4.20 acres. This area would provide for potential river traffic interaction, Ro-Pax and Ro/Ro services.

Figure ES5.4 provides an overview of the projected requirements of TEU's per acre. This forecast was used as a baseline for the cargo master plan development. As shown, when levels reach approximately 8,000 TEU's per acre, there is a need for additional land area to meet the projection demands.

**FIGURE ES5.4: TEU'S PER ACRE FORECAST WITH CENTRAL TERMINAL**



The proposed long-term master plan provides for 13,252 linear feet of berth. Existing bulkheads along the channel will remain and current Port plans will further enhance these areas. These projects will be done in conjunction with the deepwater channel dredge project. Based upon the cargo market demand projections, the Port of Miami will require additional cargo land in:

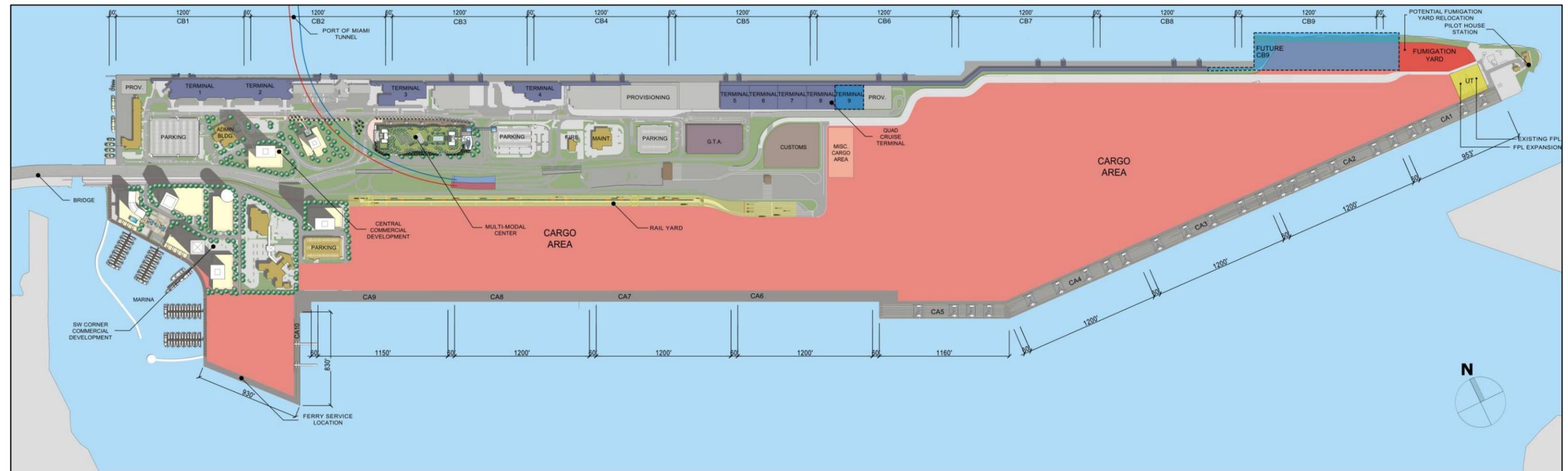
- 2023 with cruise Alternative A1; or,
- 2030 with cruise Alternative A2.

This assessment takes into consideration the acreage lost to cruise development and the addition of land with the new southwest infill. There will be a need for further detailed operational modeling prior to the sustainable development of any new cargo land areas to ensure there is adequate need based upon the TEU per acre metrics.

New berths for cargo will be required in 2029 with a total of 23 cranes by 2034 to meet the cargo market demand based upon the forecast. There are 16 operational cranes at present in the Port of Miami (including 5 operated by Seaboard). Four additional cranes are currently on order and will be placed at the Port as required to meet the operational needs of the Users with these additional cranes being planned for 2014 to coincide with the opening of the widening of the Panama Canal and new Port channel dredge efforts. Three existing gantry cranes (two of which are in use) will then be decommissioned. They have already been sold to another port in the region. Additional units would be added as the vessel sizes expand and new berth area is needed with the first of the master plan cranes being required in 2028 based upon projections. The projections include the entire cargo yard throughput inclusive of the Seaboard Marine facility that currently does not use the large mobile gantry container cranes for the movement of its cargo from ship to shore. See ES5.5 for the Cargo Long-Term Master Plan.

The additional cranes are projected based upon a productivity rate of 40 TEUS per hour and an overall maximum utilization rate of 2,000 hours per year per crane. The actual deployment of new gantry cranes may fluctuate based upon peaking factors, yard and gate efficiencies and other factors. As such the Port of Miami will need to monitor the overall yard effort to accurately time the purchase and deployment of new cranes, as is the case with the deployment of four new cranes to coincide with the completion of the widening of the Panama Canal and dredge project. Thus, actual implementation is a combination of operational needs, financial assessment and throughput over the next 25 years.

**FIGURE ES.5: PROPOSED LONG-TERM MASTER PLAN**



**ES5.7 ON-PORT RAIL AND OFF-PORT CARGO OPERATIONS**

The Port of Miami currently has an existing rail spur of approximately .57 miles in the Port. To provide for the reduced cost benefits associated with an intermodal link, a new on-port rail yard is planned for better accessibility for container movements from and to the Port. The rail yard will be incorporated into the long-term master plan. The yard would use the existing corridor and linkages to the Hialeah FEC yard as its base. The layout of the off-site rail yard is a separate master plan element. It is envisioned that the yard would be accessed by container haulers via a security gate system, assigned a train unit, and then off-loaded by a picker system onto double-stacked trains. The rail reduces truck trips by several hundred thousand trips per year. This will improve road safety, while reducing fuel consumption, oil dependence green house gas emissions and road degradation.

The total yard area would be approximately 9.5 acres and reside adjacent to the tunnel access to the Port and Seaboard Marine yard. The total length of the intermodal rail yard is approximately 2,750-feet. The cost for the on-port rail portion and bascule bridge component of the project is approximately \$22.7 million plus an additional \$2.3 million for RTG equipment.

This rail yard would be used to stack and unload boxes from trains arriving and departing in the nighttime hours, thus not impacting downtown Miami traffic along Biscayne Boulevard. The train could either be used for direct service or interim service to a multi-modal transshipment yard close to the Miami International Airport. This provision provides another tool for marketing the Port and allowing the cargo yard users to compete in the Florida and Southeast U.S. market. It also establishes a sustainable cost effective direct rail service to and from the Port of Miami to lower transportation costs for shippers.

**SECTION ES6**

**COMMERCIAL**

**ES6.1 OVERVIEW**

One of the new strategic elements of the Port of Miami will be the introduction of commercial aspects to the business portfolio. The sustainable development will provide the Port with another avenue for generating revenues from the Port's land resource. In many ports throughout the U.S., commercial real estate income is one of the largest revenue figures for the business. Examples include the Port of San Diego and Port of Seattle, among others. The Port of Miami has spare land assets that allow for commercial development opportunities. The Port of Miami's weakness as a Central Business District "downtown" port can be exploited as a major strength in this regard. Furthermore, this allows the Port to develop a much needed "third leg" of the financial stool to provide additional strength to its portfolio of assets and earnings potential. The three "C's" include:

- Cargo;
- Cruise; and,
- Commercial.

Land and waterfront surrounding and adjacent to the existing southwest corner can be used to create a commercial complex for future port development opportunities.

The Master Plan focused on existing properties within the Port which could be developed or redeveloped without impacting the primary business of the Port or requiring land fill. The Port contains some parcels which have been isolated due to the roadway network, or which now have poor waterborne access and can no longer fulfill a maritime mission.

### ES6.2 SOUTHWEST CORNER COMMERCIAL DEVELOPMENT

Lying adjacent to a newly created cargo expansion area, the introduction of new commercial opportunities for the Port will strengthen its financial position and provide growth options into the future. Development of this area will be further defined in the phasing and implementation sections of the master plan report.

The key element of the Southwest Corner is the introduction of a mega-yacht marina complex that would anchor the surrounding commercial development and provide for an active area. This would provide a mirror for Bayside and may enhance development opportunities on the mainland as well over the master plan period. Immediately adjacent to the marina would be a waterfront promenade with retail and restaurant areas. This development would ideally work in conjunction with the cruise area to provide early arriving passengers the opportunity to spend quality time in Miami prior to their cruise. Arrangements could be made to allow cruise passengers easy transportation options to and from the cruise terminals or intermodal facilities for this purpose via electric shuttle buses. See Figure ES6.1.

FIGURE ES6.1: SOUTHWEST CORNER COMMERCIAL DEVELOPMENT ZONE



### ES6.3 ZONING AND ADVERTISING

To better address the needs of its tourist, the Port must develop a comprehensive Wayfinding and Advertising Signage Program. Both Wayfinding and Advertising are consistent with this Master Plan's concept to further explore commercial development on-port. By creating a comprehensive Signage Master Plan the Port will create a more efficient flow of traffic and people on the island while advertising will increase revenue with minimal costs.

The Port will need to develop a comprehensive signage master plan. It will also need to rezone to a designation which will allow commercial signage for advertising. The Port must do a thorough analysis of alternative types of signs that can be installed which will not compromise the aesthetic integrity of the surrounding community. In addition, the Port should look at designs which integrate architectural and artistic components. As a component of this Master Plan a Way finding and Signage Analysis Report was assembled and included as part of the Appendix.

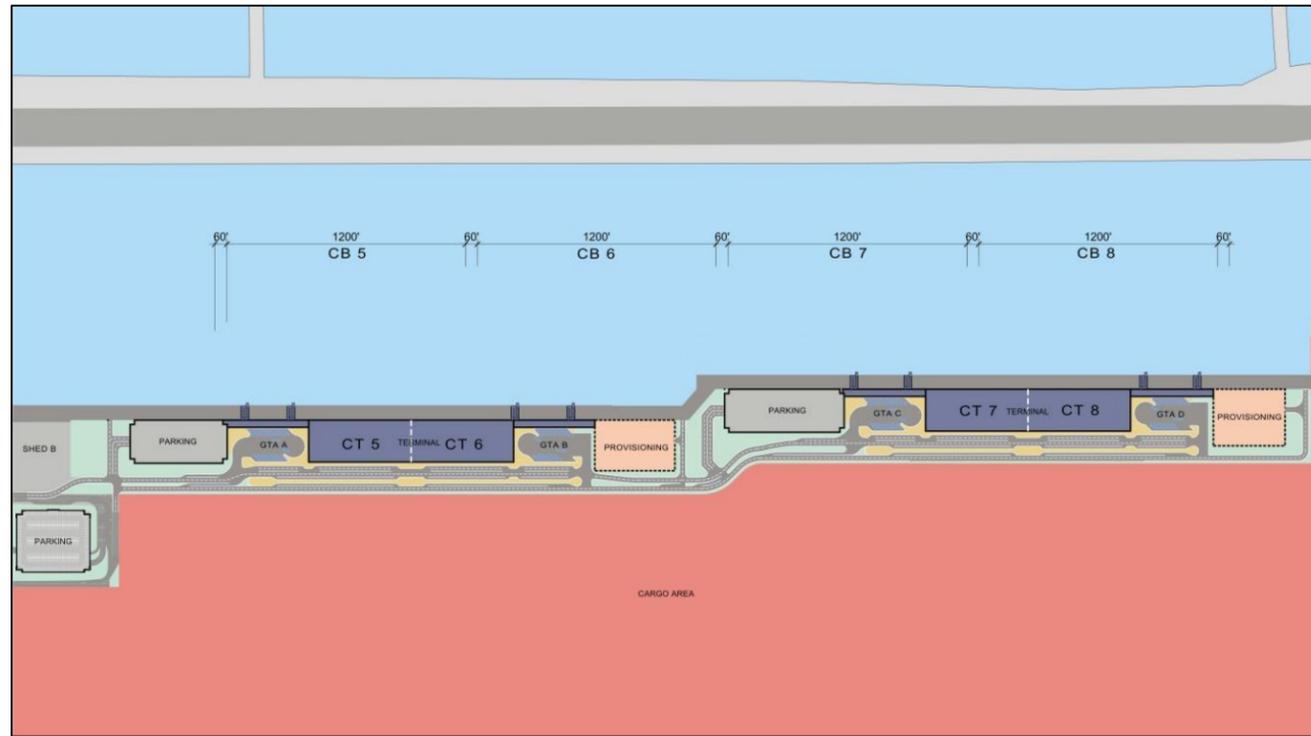
## SECTION ES7

### PREFERRED PLAN

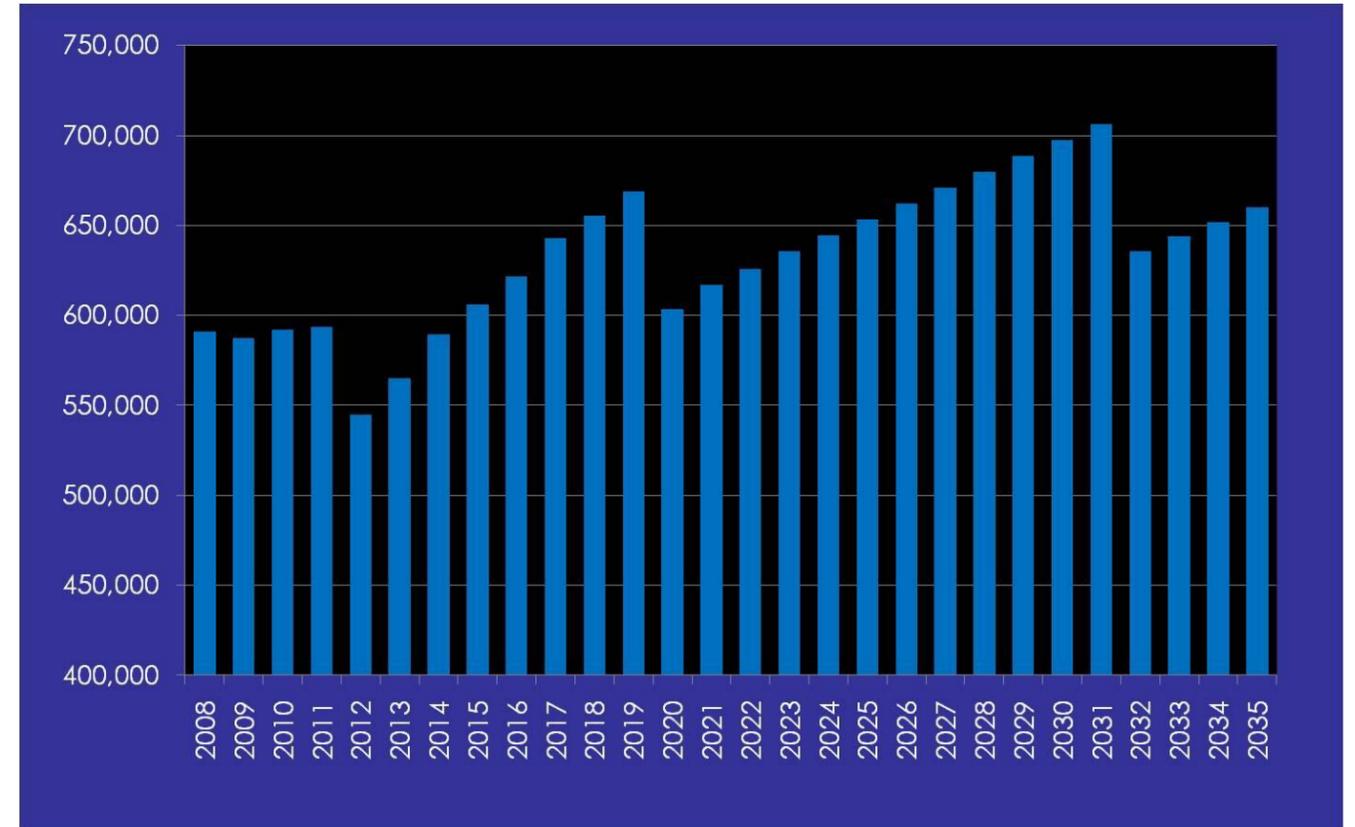
#### 7.1 OVERVIEW

As outlined in the previous sections, the preferred 2035 Plan for the Port of Miami encompasses elements of cruise, cargo, and commercial. The preferred plan is generated through the cruise and cargo 2035 projections, feedback from Port Users and Port of Miami staff, and a review of associated issues and sustainable opportunities over the long-term. The assembly of the plan followed a logical order in the development of cruise and cargo market assessments, definition and assembly of cruise and cargo design vessels and future berth demand requirements, financial and physical analysis of the Port properties, recognition of the role of future technological and operational advancements in the cruise and cargo sectors enhancing operations, needs of the surrounding communities and environment and the development of a third financial leg for the Port with the addition of a commercial component. The plan is shown in Figure ES4.3, ES4.4 and ES5.5 above. Figure ES7.1 shows an alternative layout for the cruise portion of the long-term plan.

**FIGURE ES7.1: PREFERRED LONG-TERM MASTER PLAN ALTERNATIVE TERMINAL LAYOUT**



**FIGURE ES7.2: CRUISE METRIC - PASSENGERS PER BERTH**



**ES7.2 METRICS**

To measure the effectiveness of the plan, a number of parameters were reviewed that allow continuous tracking to make sure that the plan is as efficient as possible. Subsequently, in the financial section of this Master Plan, the financial performance metrics are included that allow comparisons of the multiple uses within the Port. If implemented in concert with the anticipated traffic, the Plan will perform with the following operational performance metrics in cruise and cargo:

**CRUISE**

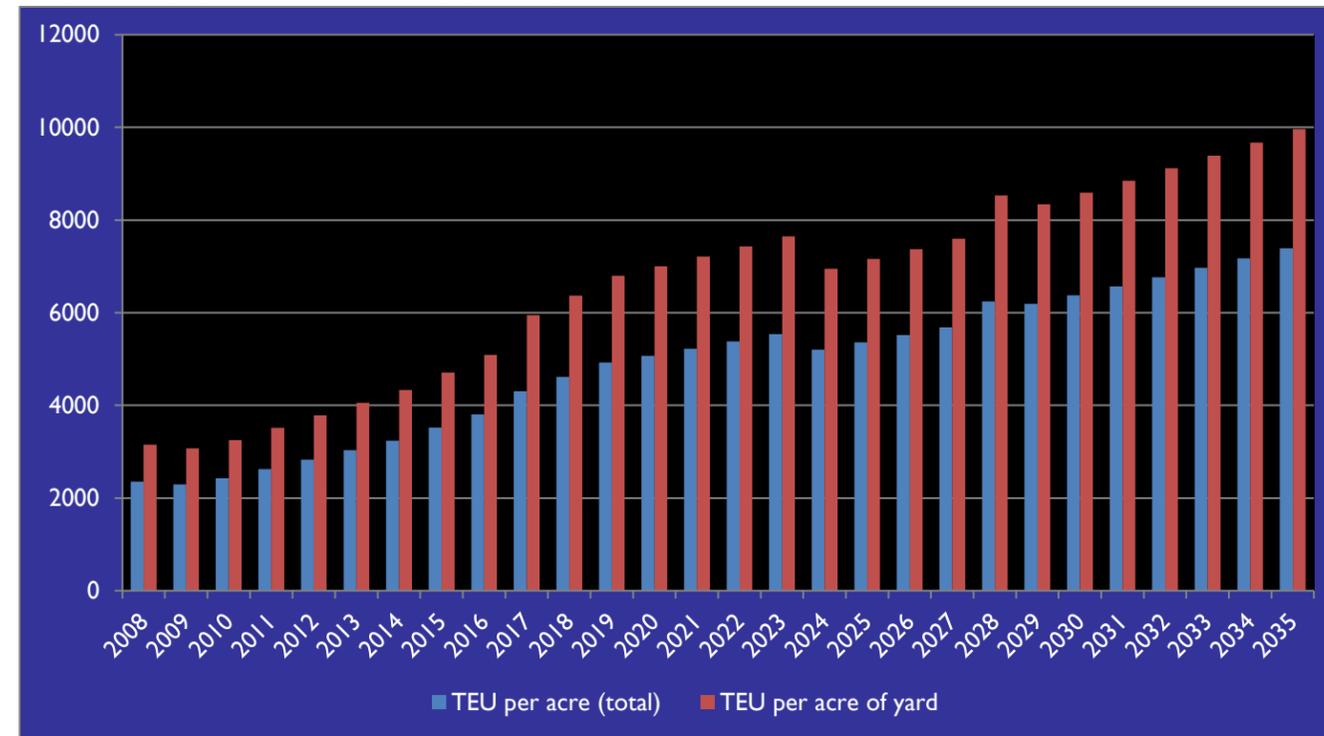
Since cruise is berth-intensive, the best metric is the cruise passengers per berth that is shown in Figure ES7.2. This metric is the best indicator of efficiency. Currently the Port is operating with less than 600,000 passengers per berth.

Although this is at the top of the industry, as cruise ships increase in size, these numbers should go up. The chart reflects a stair step pattern which is due to the introduction of new berths on a particular year, and thus reducing the overall averages. Should the Port exceed the approximately 650,000 to 700,000 passenger per terminal mark, the facility should be generating sufficient revenues to support its costs.

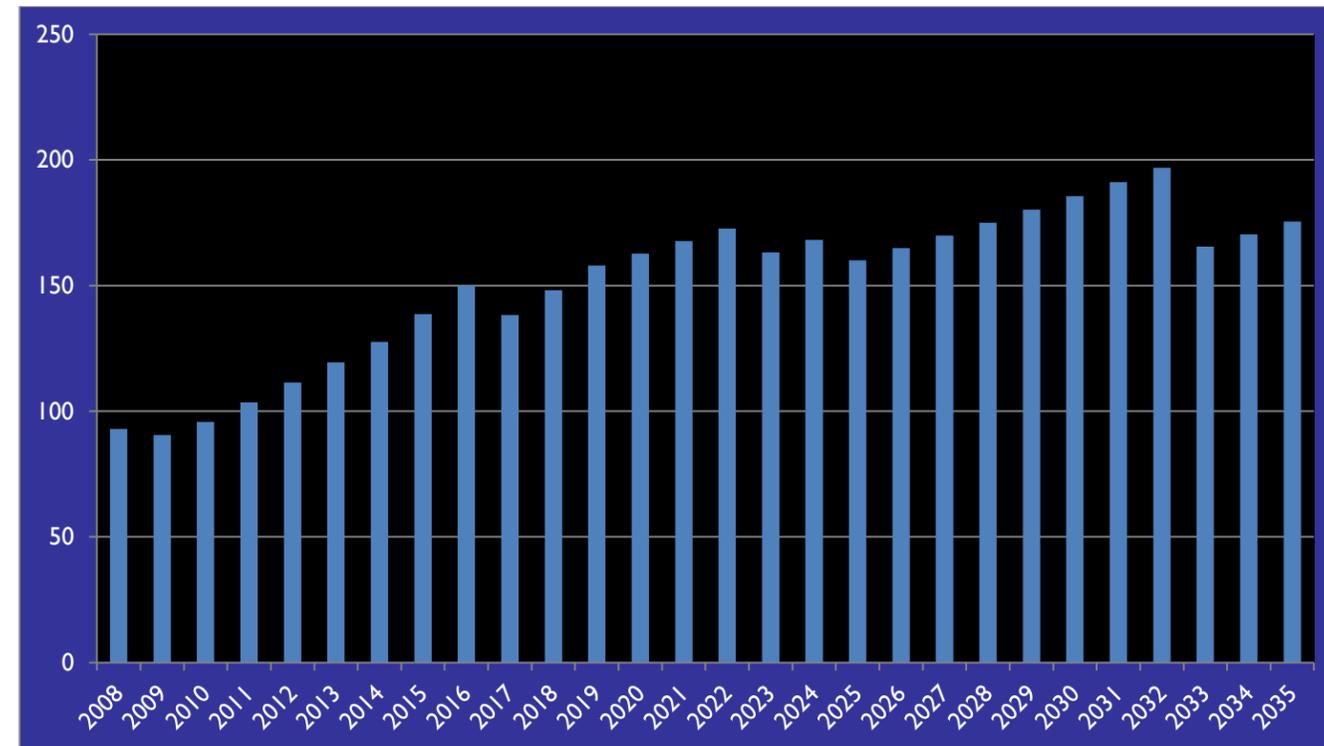
**CARGO**

For cargo, being both berth and land-intensive, two metrics are the most indicative of efficiency: TEU's per acre as shown in Figure ES7.3 and TEU's per lineal feet of berth as illustrated in Figure ES7.4. The throughput of containers per berth fluctuates as the business evolves and new berths are constructed at the Port.

**FIGURE ES7.3: CARGO METRIC - TEU'S PER ACRE**



**FIGURE ES7.4: CARGO METRIC - TEU'S PER LINEAL FEET OF BERTH**



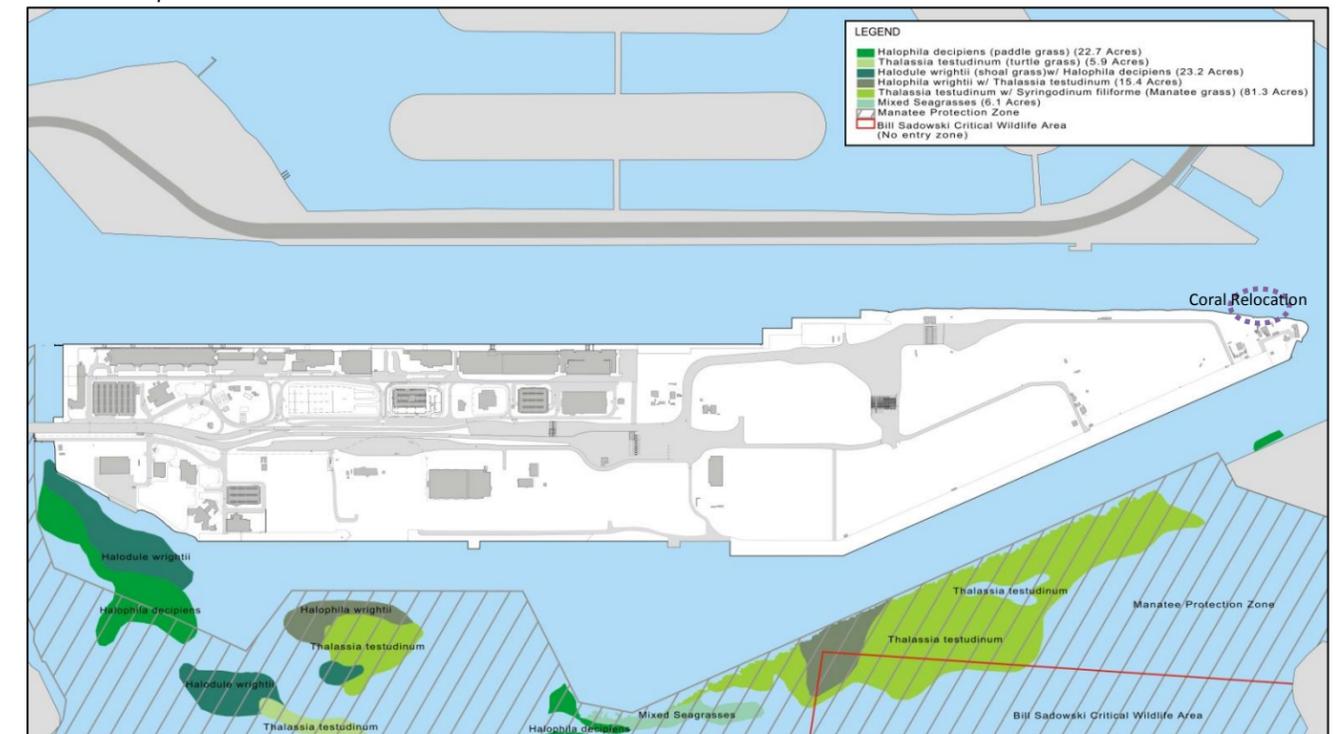
As with the cruise metric, the stair-step pattern shown in Figure ES7.4 reflects the justification for the addition of land to the cargo area when the program begins to near the 8,000 TEU's-per-acre thresholds. In the Plan, the Southwest corner land reclamation is scheduled for approximately 2023.

**ES7.3 ENVIRONMENTAL**

Located within the Biscayne Bay Aquatic Preserve, an area designated by the State of Florida for special environmental protection, the Port of Miami is a manmade land structure formed through beneficial land reuse of three spoil islands (see Figure ES7.5). The Port also provides for a coral relocation site along the northeast corner of the port boundary to assist in mitigation tied to port sustainable development projects.

**FIGURE ES7.5: EXISTING ENVIRONMENTAL MAPPING, PORT OF MIAMI AND SURROUNDS**

Source: Westthorp & Associates and B&A



Although estuarine conditions (i.e., water quality and movement) in the vicinity of the Port are generally good, human-influenced changes have resulted in increased overall turbidity and water quality awareness due to input from industrialized canals (e.g., the Miami River). The Port is well flushed by tidal action and Port-related activities are unlikely to impact natural environments outside the Port vicinity.

The proposed North Channel Cruise Terminal Expansion has been designed to accommodate more berthing area for cruise lines. The development of this expansion will involve new bulkhead construction along the seawall eastwardly adjacent to the current cruise line berthing area. Environmental impacts to the Port and its proximity are minimal for this project since it is located in an already much disturbed and altered area.

It is expected that the Port will conduct mitigation measures for this project type. The normal mitigation is to create one cubic yard of rip-rap for each linear foot of new berth or most likely the establishment of an artificial reef based upon this

formula plus dredging of 1 cubic yard of rip rap for every 100 cubic yards of dredged bottom material. The Port will also relocate any existing corals to its established coral relocation site.

The North Channel is currently at a depth of 36 feet below sea level which does not provide the proper environment for sea grass to thrive due to the lack of sunlight. In the barren soft bottom communities that dominate the Port, wildlife is limited to a few burrowing animals and a few other burrowing invertebrates.

The Southwest expansion, located in the southwestern corner of the Port adjacent to the current Western Turning Basin, is designed to potentially accommodate a marina for vessels, a ferry, and a transshipment area. Although the exact layout of the expansion has not yet been determined, filling will be required and will consist of approximately 17.51 acres. The chief environmental concern associated with this project is the unavoidable removal of sea grass in the area. These sea grass beds provide low-to-moderate quality habitat for some juvenile fish and invertebrates and are also a staple to the endangered West Indian manatee. Due to the proposed marina on the southwestern side of Dodge Island, the Port will need to conduct mitigation activities for the sea grass that will be displaced. Providing for marina in an existing marine environment with the Port of Miami will mitigate other potential impacts into the future that may occur if such a marina facility would be placed in another location outside of the traditional port area.

#### **GLOBAL CLIMATE CHANGE AND NATURAL DISASTER PLANNING**

Southeast Florida has experienced 34 hurricanes between 1994 and 2007, nine of which were a Category 3 or above. During Hurricane Andrew in 1992, record high flooding occurred due to 17 feet of storm surge.<sup>1</sup> In addition, flooding due to torrential rainfall or a rise in sea level poses a serious threat to portions of Miami-Dade County, specifically in low lying areas such as Dodge Island (Port of Miami).

#### **CLIMATE CHANGE AFFECTING THE PORT OF MIAMI**

One of the biggest concerns involving the future of the Port of Miami is global climate change and the threat of sea level rise. Sea level rise, one of the likely effects of global warming, is a major threat to all coastal communities and infrastructure. Along much of the Florida coast, sea level has been rising at a rate of 7 to 9 inches per century.<sup>2</sup> In response to this matter, the Miami-Dade Board of County Commissioners passed an ordinance to establish the Miami-Dade Climate Change Advisory Task Force (CCATF) to provide technical assistance and advice on mitigation and adaptation with regard to global climate change. The scientists on the CCATF predict a rise in sea level of at least 1.5 feet in the next 50 years as reported in their Second Report and Initial Recommendations approved in March 2008. A 2-foot rise in sea level would result in spring tides at 4.5 to 5 feet higher than present mean sea level.<sup>3</sup> This would cause frequent flooding of barrier islands, fill islands, and low-lying mainland areas as the Port is classified. Areas along the coast are assigned a ranking from low to very high risk, and the Southeastern Coast of Florida is considered at high risk.

Of major concern is Dodge Island whose elevation is approximately 7.5 feet NGVD with a base flood elevation of 10 feet NGVD, while the elevation of Lummus Island is approximately 11.5 feet NGVD. During Hurricane Wilma in 2005, Dodge Island experienced severe flooding and minor damage while Lummus Island did not experience effects to the same degree. Dodge Island may be more susceptible to damage and flooding due to sea level rise and storm surge than Lummus Island. Dodge Island's elevation should be raised to a minimum of 10 feet NGVD, which is the FEMA base flood elevation. The Port must also consider future project modifications that may reduce or eliminate the adverse impacts from sea level rise and evaluate the structural integrity of structures near the ocean that are subject to potential hazards caused by sea level rise.

<sup>1</sup> Miami-Dade County, FL Comprehensive Emergency Management Plan. June 2008. Miami-Dade County Department of Emergency Management and Homeland Security Plan

<sup>2</sup> *Climate Change and Florida*, September 1997, EPA.

<sup>3</sup> *Second Report and Initial Recommendations*, April 2008, Miami-Dade County Climate Change Advisory Task Force.

#### **PERMITS**

In the past 30 years, the Port has completed several expansion and improvement projects. All of these projects are examined on a project-by-project basis in reference to mitigation and permitting requirements.

An Ocean Dredged Material Disposal Site is already in place, its capacity may not be sufficient to contain the footprint of dredged material from future projects beyond the already approved – 50 ft. dredge. In keeping with the Port's Sustainability Committee's initiatives to reduce waste during construction, the Port should decant the water at a permitted location and coordinate possible beneficial uses of the remaining material for future projects that require fill, if possible.

#### **SUSTAINABILITY**

The Master Plan is underpinned by thoughtful consideration of future sustainable development in environmental, social and economic terms. This process considers the surrounding areas and outlines projects that will help preserve and improve conditions.

#### **ES7.4 TRANSPORTATION**

Port traffic is generated from cargo, cruise and other commercial operations within the Port. Determining traffic impacts that may occur to the adjacent roadways based upon the 2035 Master Plan projects shown within the preferred plan, and the anticipated Capital Improvements Projects (CIP) already planned for by the Port, is required to understand the overall impacts these future expansion efforts play for the Port of Miami and downtown core. Additionally, the creation of another access way to and from the Port of Miami via tunnel also provides for a different level of impacts to the surrounding roadway system. The traffic impacts were determined based on the following preferred plan program elements<sup>4</sup>:

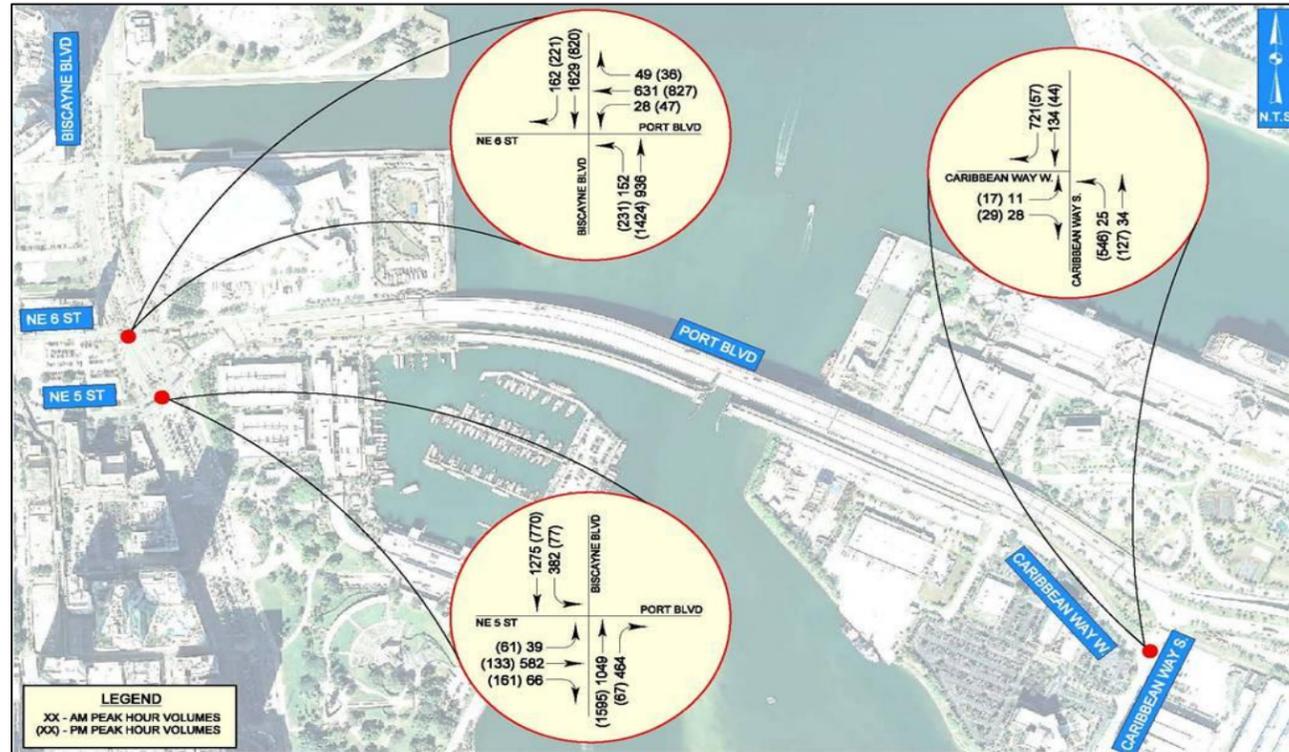
- A composite projection of 3,911,204 total passengers in 2009 moving to 5,821,46 in 2035;
- Cargo terminal mid-level summary of twenty-foot equivalent units (TEU) projection of 828,349 TEUs in 2009 to 2,682,545 TEUs in 2035; and,
- Commercial development in the southwest corner of the Port of Miami with a potential of approximately 600,000 square feet (SF) of office and other space, as well as marina.

The Port of Miami Master Plan has an established build-out year of 2035. Future traffic is established as described below. An annual growth rate was determined to forecast traffic volumes from 2009 through to 2035. The intersection volumes are provided in Figure ES7.6.

<sup>4</sup> 2009 cruise and cargo projection figures provided and used for the transportation study were FY preliminary data. They do not accurately reflect the final projected numbers for 2009 to 2035 for the 2011 Master Plan Update.

**FIGURE ES7.6: PROJECTED INTERSECTION VOLUMES, 2035**

Source: Miami-Dade Public Works Department, FDOT and David Plummer & Associates



**PORT TRAFFIC DISTRIBUTION**

Traffic traveling to and from the Port is destined for one of three main areas inclusive of cruise terminal / parking facilities, cargo gates / terminals, or to the various offices / support facilities within the Port. The Port of Miami Tunnel Project is underway and will provide direct access between the Seaport, I-395 and I-95. This will relieve congested downtown Miami streets of Port passenger and cargo traffic, improving safety and circulation. The change in traffic patterns for vehicular access to the Port of Miami via the tunnel was considered for the traffic analysis. The amount of diverted traffic was based on the *POM 2020 Master Implementation Plan*. See Figure ES7.7.



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Mayor

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**Bill Johnson**  
Director Seaport Department



PORT MIAMI

# 2035 MASTER PLAN

EXECUTIVE SUMMARY

NOVEMBER 2011

