



PORT EVERGLADES

MASTER/VISION PLAN

2018 UPDATE

Element 4:

Impacts and Strategies for Implementation

FINAL REPORT

Prepared by



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4.0 Glossary of Terms

Air Draft

The maximum height of a structure or vessel.

Apron

Area immediately adjacent to the vessel berth where lines, provisioning, gangway and other operations occur.

Anchorage

Location where a vessel may anchor. For cruise, in destinations where docks are not present to accommodate vessel operations, anchorages are used and passengers are shuttled to/from the cruise vessel to a landside location using a small boat (tender). Anchorages are generally only used in ports-of-call. For cargo, an area outside a port where a vessel anchors to await a berth assignment.

Available Passenger Cruise Days (APCD)

The formula cruise lines typically use to assess and compare cruise itineraries from a financial perspective.

Beam

The width of a vessel at its widest part.

Bed (Berth) Nights

A typical cruise industry form of capacity measurement representing the number of lower berths (a bed on a cruise vessel, with the aggregate total generally determining the vessel's nominal passenger capacity) multiplied by nights of operation in a region.

Berth

- (1) An anchorage or dock space for a vessel in port.
- (2) A bed, generally attached to the deck and/or bulkhead onboard a cruise vessel.

Break-Bulk

General cargo or goods such as steel rebar or pipes that must be loaded/unloaded and handled individually or in pre-determined modular quantities (i.e. pallettes). Break-bulk cargo is not handled in intermodal shipping containers or in bulk quantities as would be the case with petroleum, grain and cement, for example.

Bunker/Bunkering

Marine fuel used for propulsion. The act of delivering marine fuel to a vessel.

Cabotage Laws

Legislation and/or regulation relating to the ability of foreign-flagged vessels to transport goods and passengers between domestic ports. Cabotage Laws are often put into place to protect domestic maritime industries.

Capacity

The number of units (passengers, berths, containers, gallons, tons, etc.) that a given area or space can handle at a given time.

Cruise Brand

Term referring to individual cruise vessel operating companies (i.e. Carnival Cruise Line) to distinguish them from their corporate holding companies (i.e. Carnival Corporation).

Cruise Line

For purposes of this report, cruise line is used to describe a corporate holding company with one or more cruise brand(s) operating under its corporate umbrella (i.e. Carnival Corporation).

Cruise Terminal

Building where cruise passengers embark and/or debark in a homeport destination.

Daily Cruises

Term applied to vessel service transporting passengers and/or vehicles and/or cargo from point to point. The key difference between daily cruises and multi-day cruises is that daily cruises offer transportation services as their primary business focus, not a travel and leisure experience.

Dockage

Fees levied by a port or destination for the right to dock a vessel.

Draft

The depth of water required by a vessel to float; the measurement in feet (or meters) of the extent to which the vessel projects below the surface of the water.

Dry Bulk

Commodity cargo that is transported in unpackaged, non-standardized, non-liquid granular form, usually in large quantities (i.e. cement, bauxite, coal, etc.).

Emission Control Area (ECA)

Geographic boundaries established through treaties to provide for decreased NOx and SOx emissions in select zones such as North America and Europe.

Gross Tonnage (GT)

A measure of a vessel's enclosed volume. This term has emerged as the standard measure of communicating a vessel's size. A *mega-vessel* generally refers to a vessel of 70,000 GT or larger.

Ground Transportation Area (GTA)

Zone in which vehicles, including buses, taxis and private cars are organized and accessed as part of cruise terminal/destination embarkation and disembarkation activities.

Homeport

A marine facility and destination locality that serves as the base of operations from which a multi-day or daily cruise begins and/or terminates.

Itinerary

Sailing routes and ports visited on a given cruise. Two itinerary types are generally observed. *Open-jaw (OJ) itineraries* refer to those deployments where the cruise begins at one homeport and ends at another. *Roundtrip (RT) or Closed-jaw itineraries*—the more common type observed—begin and end from the same homeport.

In Bond

Cargo or baggage that transits directly to and from the port/airport and has a customs approval allowing for a single inspection.

Length Overall (LOA)

Total length of a vessel in feet (or meters), including any incidental structure that may extend this dimension.

Liquid Bulk

Free-flowing liquid cargos, such as gasoline, jet fuel, crude oil, liquefied natural gas, industrial chemicals, etc. that are typically transported in large quantities via tanker vessel and stored in tanks at or near ports for distribution/consumption.

Liquefied Natural Gas (LNG)

Liquefied natural gas is natural gas that has been cooled to a liquid state (about -260 degrees Fahrenheit) for shipping and storage. This process makes it possible to transport natural gas to places pipelines do not reach and to use natural gas as a transportation fuel.

Marine Terminal

Facility, including storage yards as well as associated buildings, where cargo handling activity occurs, usually within a physically defined and secure (i.e. gated) area.

Mixed-Use Facility

Refers to a facility or complex with more than one type of real estate or operational use. Mixed-use facilities generally:

- (1) are contiguous in nature
- (2) are developed within a broader master plan constructed at one time or in phases
- (3) provide for a symbiotic relationship to occur among all uses such that the sum of the mixed-use facility from a real estate or operational perspective is greater than its parts. Mixed-use maritime facilities often include cruise, ferry, marina, commercial, residential, recreational and other upland transportation facilities.

Multi-Day Cruises (Cruises)

Leisure-oriented voyages on deep-water, ocean-going cruise vessels of two or more nights often to a variety of destinations, or port-of-calls. Multi-day cruises are offered either by regional or international operators marketing to a variety of consumer sectors and nationalities.

Neo-Panamax

Vessels classified as Neo-Panamax are of the maximum dimensions that will fit through the newest set of locks in operation by the Panama Canal (366 m/1,200 feet long by 49 m/161 feet wide by 15.2 m/50 feet in depth).

Panamax

Vessels classified as Panamax are of the maximum dimensions that will fit through the original locks of the Panama Canal (304 m long by 33.5 m wide by 25.9 m deep). Thus a Panamax vessel will usually have dimension of close to 294 m/965 feet long by 32.3 m/106 feet wide by 12.04 m/39.5 feet in depth.

Passenger Fee (Head Tax)

Port charges assessed against each passenger aboard a cruise vessel. Generally the principal income stream to ports and destinations for accommodating cruise activities.

Peak (or Peaking)

Period of greatest intensity of use or volume. Port Everglades' peak days for cruise activity, for example, are Saturday and Sunday since those are the days that, on average, see the greatest number of cruise ship calls and/or passenger debarkations during the course of a given cruise season.

Penetration Rate

Percentage of the total potential market that is currently accessible. For example, in 2016, North America (including Canada, the United States, Mexico, the Caribbean and Central America) had a penetration rate for cruise of 2.3 percent (13.34 million cruisers/579 million total population).

Port Authority

Governmental or quasi-governmental public authority for a special-purpose district usually formed by a legislative body (or bodies) to oversee and/or operate ports and other maritime, aviation, road and/or rail transportation infrastructure.

Port-of-call (POC)

One of several destinations visited as part of a cruise itinerary. The focus of the port-of-call is on tourism activities adjacent to the cruise arrival area and the transportation of passengers to regional points of interest.

Post-Panamax

Size standard that exceeds the largest vessel dimension capable of transiting the original Panama Canal locks (304 m long by 33.5 m wide by 25.9 m in depth). Generally based on the beam and LOA of the vessel.

Private Island

Island destinations primarily located in the Caribbean and Central America that are owned and/or developed for exclusive or semi-exclusive use by a single cruise company (cruise line) and its proprietary brands.

Revenue Passenger

This generally refers to homeport passengers or in some very limited cases port-of-call passengers (e.g. Vancouver, where all passengers are charged on/off the vessel), whereby passenger counts reflect the Port's passenger wharfage or tariff rate charging policy. For homeport calls the actual number of passengers is doubled to show that the cruise operator is charged by the port for the passenger embarking/debarking the vessel at a set fee.

Ro-Ro

Maritime term for roll-on/roll-off cargo such as passenger vehicles, tractor/trailers, buses, railcars, etc. that are driven on and off a ship under their own power or using a platform vehicle, such as a truck and trailer or self-propelled modular transporter.

Super Post-Panamax

Generally refers to the largest vessels in existence today. These vessels are defined not only by their dimensions, but also their carrying capacity (i.e. 3,000+ passengers for cruise and 12,000-14,000 TEUs for container ships).

Tariff

A schedule of fees charged to port users, especially marine terminal and vessel operators to cover some or all costs associated with port operations and other fiduciary obligations (i.e. infrastructure development and maintenance).

Terminal Operator (TO)

Entity with primary responsibility for managing marine terminal/cruise terminal and related operations on a daily basis, usually under contract to a public port authority or other public or quasi-public ownership interest.

Transit Passenger

By literal definition, the status of cruise passengers during a port-of-call.

Twenty-Foot Equivalent Unit (TEU)

Unit of cargo used to describe the capacity of modular container ships and container terminals. It is based on the volume of a 20-foot-long (6.1 m) intermodal container, which is the historical standard metal container used in container shipping. The majority of containers in use today are Forty-Foot Equivalent Units (FEU); however, TEU remains the standard unit of measurement.

Use Ratio (Utilization Percentage)

The ratio of days that a berth is actually occupied to available berth days (total calls/total available berth days). For example, in a year-round market, a single berth is theoretically available for a total of 365 days. If that berth receives 52 calls (one vessel sailing weekly roundtrip itineraries year-round) then its use ratio is .142, or 14.2 percent (52/365).

All other terms and acronyms are defined within the text below.

4.1 Introduction

Element 4 of the 2018 Port Everglades Master/Vision Plan combines aspects of Elements 4, 5 and 6 from the 2014 Update in order to more directly connect the strategic drivers of the 2018 Update to its ultimate implementation. As such, Element 4 begins by presenting an analysis of parking and anticipated truck traffic to be generated by the projected growth and an assessment of environmental impacts generated by the proposed new projects in the following areas:

- Vehicular traffic
- The natural environment
- Water resources
- Climate change, resiliency and sustainability
- Air quality

Business, asset, and financial strategies identified in the course of the planning process are then presented. Element 4 concludes with a comprehensive alignment of goals, objectives, and policies between Port Everglades and Broward County as a framework for Plan implementation.

As was done for the 2014 Update, a project decision matrix was developed to evaluate projects proposed in the 2018 Update. This matrix has been moved to Element 3 of the updated plan, however, and is not presented here.

Underlying this element are the following objectives:

- Identify future parking requirements and truck traffic volumes based on implementation of the 2018 Update as proposed
- Identify environmental impacts associated with implementation of the 2018 Update as proposed
- Identify business strategies that will help to drive the Port's future growth and development so it can achieve its vision for the future as outlined in the 2018 Plan
- Identify asset utilization strategies that will optimize benefits to the Port and the County through:
 - Financial return
 - Market opportunities

- Competitive advantage
 - Broader economic benefits
- Identify financial strategies that balance the Port’s “financial sufficiency mandate” with its ability to meet future demand
- Encourage the use of public-private partnerships and other non-port funding sources, as appropriate to achieve value-added infrastructure improvements
- Align the Port’s Master/Vision Plan with broader Broward County goals, policies, objectives and initiatives

The Port’s mission statement provides the foundation for these objectives:

“Port Everglades is Florida’s powerhouse global gateway. A respected leader in trade, travel and financial stability, we create economic and social value by working in partnership with world-class clients. We achieve advancements focusing on efficient facilities, trade and cruise expansion, jobs growth, safety, security and environmental stewardship for our customers, stakeholders and community.”

4.2 Parking and Estimated Future Truck Traffic

For purposes of the 2018 Update, parking is discussed exclusively in the context of the Port’s cruise line of business. Other Port lines of business (i.e. real estate, liquid bulk, containerized, dry bulk and break-bulk cargo) all have their own separate parking requirements for employees, dockworkers, regulatory/enforcement agencies, etc. However, parking specific to these other lines of business is assumed to be both sized to meet the demand of individual tenants and included within the land areas and/or facilities leased by individual tenants, meaning it is not expected to be available for other users or the general public. The same is true of the proposed 2035 commercial consolidation project, which will include only the number of parking spaces commensurate with the size and number of people expected to work in and/or use the new facility.

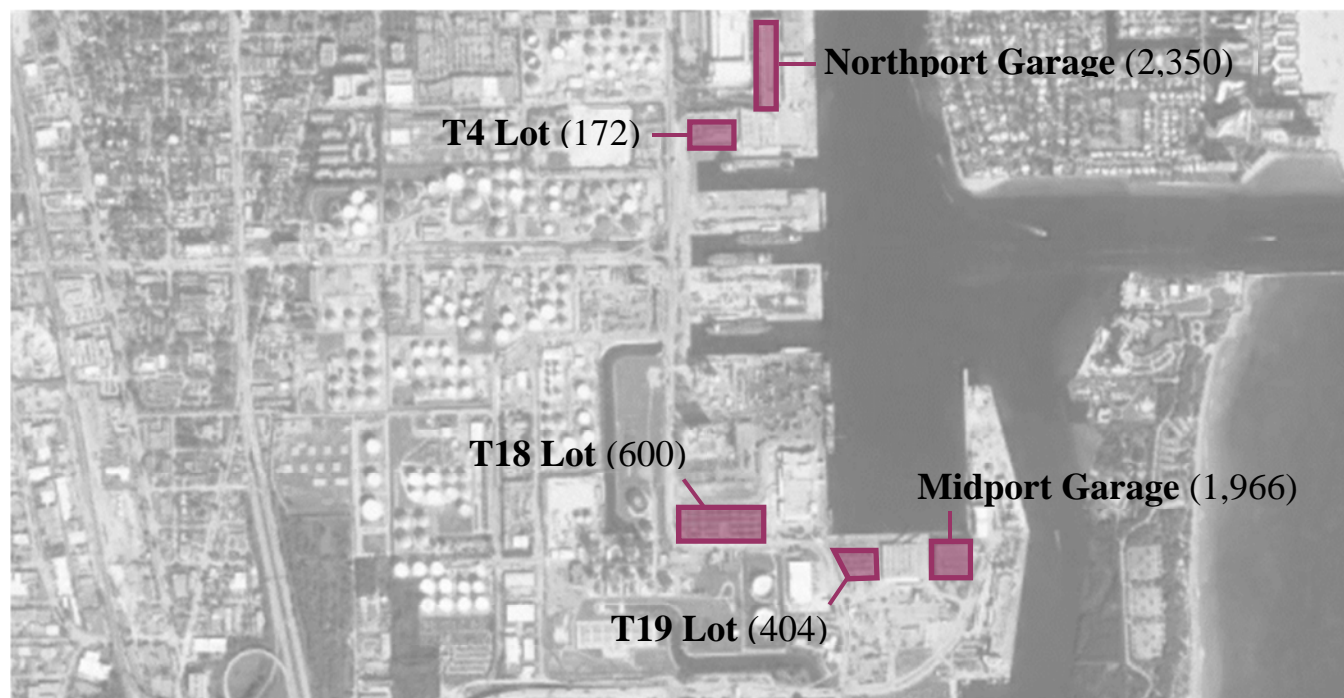
4.2.1 Parking Capacity

As discussed in Element 1 (Section 1.8), Port Everglades has historically had two parking structures: one within the Northport area, adjacent to the Convention Center, and another in Midport between cruise terminal 19 (T19) and cruise terminal 21 (T21). Port

Everglades historically also has had three surface parking areas located adjacent to cruise terminal 4 (T4), cruise terminal 18 (T18), and cruise terminal 19 (T19), respectively. These historical parking areas are shown in Figure 4.2.1, which is identical to Figure 1.8.1 from Element 1.

Figure 4.2.1: Port Everglades Cruise Parking Areas (Spaces) – 2018

Source: B&A



The new 1,818-space T2/T4 parking garage, which is discussed in detail in Element 3, is under construction as of the drafting of this report and scheduled to open in 2020. This new multi-level structure will replace the existing Northport garage and T4 lot. The new structure will serve T2 and T4 exclusively, and will link via an elevated moving passenger walkway to T2. Access to this garage will require users to pass through the Eisenhower Boulevard gate prior to entering the garage.

Port Everglades' Midport garage has a capacity of 1,966 spaces, and serves all Midport cruise terminals, including T18, T19, T21, T25, T26, and T29. Cruise Terminal 29 is served via shuttle, given its distance from the Midport garage. The Midport garage is connected to the Port Everglades Harbormaster tower, and is also used by Port operations staff. Port Everglades' surface parking areas are summarized as follows:

- T18 – 600 spaces
- T19 – 404 spaces

Looking to the future, in order to support growth and eventual partial consolidation of cruise activity in Midport, the 2018 Update calls for the development of two additional multi-level parking garages there. Both of these parking projects are discussed in detail in Element 3. The first of these two future parking projects – the T29/T26 parking structure – is planned to open in 2030 and will include 1,600 total spaces, all of which will be net additional spaces for the Port. The second future parking project – the T19/T20 parking structure – is planned to open in 2038 and will provide an additional 2,200 spaces of garage parking in Midport. However, because this latter project together with the adjacent T19/T20 redevelopment will replace the existing T19 surface parking lot, the net additional number of spaces will be approximately 1,800.

Figures 4.2.2-4.2.4 show the Port's expected cruise parking capacity by location at the 5-, 10-, and 20-year milestones.

Figure 4.2.2: Port Everglades Cruise Parking Areas (Spaces) – 2023

Source: B&A

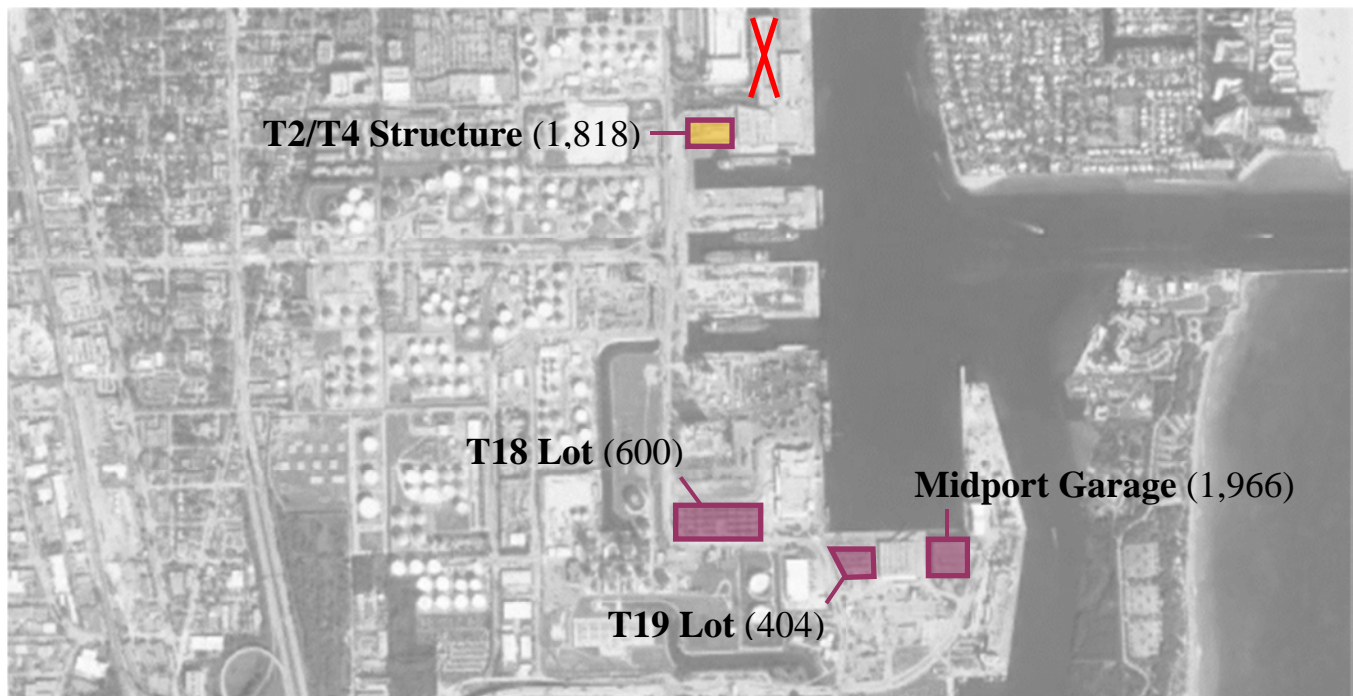


Figure 4.2.3: Port Everglades Cruise Parking Areas (Spaces) – 2028
Source: B&A

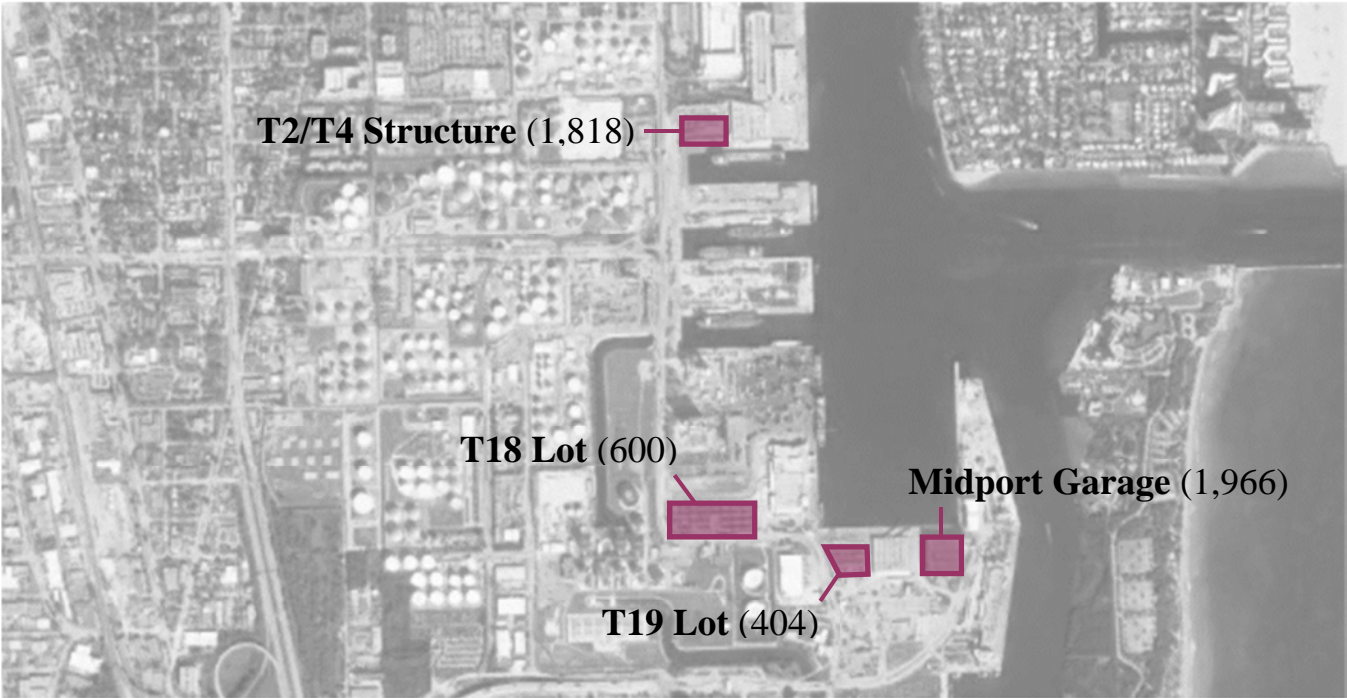
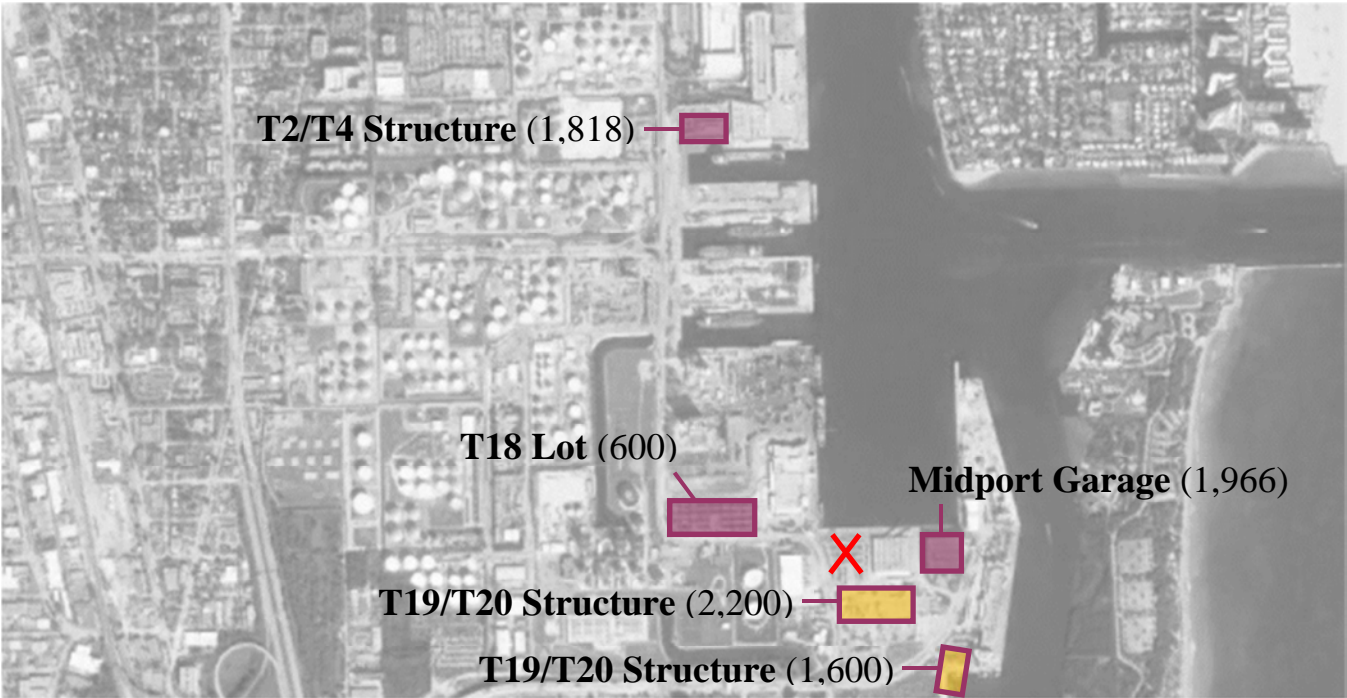


Figure 4.2.4: Port Everglades Cruise Parking Areas (Spaces) – 2038
Source: B&A



4.2.2 Parking Demand/Utilization

Table 4.2.1 summarizes Port Everglades' baseline (FY2017) cruise parking utilization as presented in Element 1.

Table 4.2.1: Summary of Parking Utilization Data, Baseline Year

Source: Port Everglades

Parameter	Parking Facility				Total Spaces
	Midport Garage	Northport Garage	T18 Surface Lot	T19 Surface Lot	
Parking Capacity	1,966	2,350	600	404	5,320
Peak Month Overnight	March 2017	November 2016	June 2017	November 2016	December 2016
Average Peak Month Overnight	1490	525	543	199	2567
High Peak Month Overnight	1,899	963	596	361	3042

As noted above, the soon-to-be-former Northport garage had 2,350 spaces available during the baseline assessment period. Table 4.2.1 shows increased use during the peak season of mid-November to mid-April. Overall usage of this facility, however, was below 50 percent of available capacity, including during the peak cruise season.

The Midport garage, with 1,966 spaces, was also more heavily utilized during the assessment period during the peak season of mid-November through mid-April. Overall, the garage averaged about 75 percent utilization during the season.

The surface parking West of T18 has a maximum capacity of 600 spaces. Overall, while this surface lot was used at up to 100 percent of capacity on some days, it averaged around 85 percent utilization during the peak season, which is still high.

The former surface lot west of T4, which had 172 spaces, appears to have been minimally used during the baseline year.

Future demand for parking at the Port, as reflected in the addition of two new parking structures in 2030 and 2038, respectively, is directly related to growth of cruise passengers over time as a function of both more future vessel calls and larger average cruise vessels in terms of passenger capacity. Other variables are also directly relevant, including:

- The percentage of fly-in vs. drive-in passengers
- Cruise length (i.e. number of nights), which impacts total parking cost as a percentage of ticket price
- Alternative parking options near the Port that achieve a lower price point than on-port parking options
- Autonomous (self-driving) vehicle technology

The cruise lines serving Port Everglades prefer near-dock parking facilities to provide immediate proximity to the Port's cruise terminals and so too a higher level of service to their cruise passengers. This is a competitive issue for Port Everglades given that PortMiami and Port Canaveral – the Port's primary competitors for cruise business – both offer terminal-adjacent parking for their cruise facilities. Near-dock parking options also minimize operational costs and inconveniences by avoiding the use of shuttles.

Table 4.2.2 provides B&A's estimates of future cruise parking demand for Port Everglades by Plan milestone year; 100 staff/labor parking spaces per terminal are included. Consistent with the baseline parking analysis conducted as part of Element 1 (see Figure 4.2.1) future cruise-related parking demand for the Port has been assessed for two separate conditions during the 6-month peak season beginning in mid-November and ending in mid-April. These are:

- Seasonal daily average conditions
- Seasonal daily peak conditions

As noted in Element 3, since completion of the 2018 cruise market assessment (see Element 2), an additional "constrained likely" cruise forecast has been developed in order to reflect additional input from Port management. This constrained likely forecast serves as the basis for all parking demand estimates completed as part of the 2018 Update.

Table 4.2.2: Projected Port Parking Demand/Utilization by Plan Milestone Year*Source: Port Everglades*

Constrained Forecast	2018	2023	2028	2038
PAX	3,741,408	4,216,522	5,208,885	6,562,543
CALLS	596	731	903	846
Seasonal Daily Average				
Cars per Terminal	345	397	494	519
Staff/Labor	445	497	594	619
Total Ave Daily Demand	3,557	3,977	4,749	5,570
Available Parking Spaces	5,492	4,788	4,788	8,189
Total Demand % Available	64.8%	83.1%	99.2%	68.0%
Ave PAX per Ship	3,164	2,883	3,183	3,880
Ave Parkers per Ship	758	874	1,086	1,142
% PAX Parking	24.0%	30.3%	34.1%	29.4%
Seasonal Daily Peak				
Cars per Terminal	477	546	671	704
Staff/Labor	577	646	771	804
Total Peak Daily Demand	4,619	5,164	6,167	7,234
Available Parking Spaces	5,492	4,788	4,788	8,189
Total Demand % Available	84.1%	107.9%	128.8%	88.3%
Ave PAX per Ship	3,164	2,883	3,183	3,880
Ave Parkers per Ship	1,050	1,200	1,476	1,548
% PAX Parking	33.2%	41.6%	46.4%	39.9%

As shown in Table 4.2.2, total (i.e. portwide) parking demand is expected to increase over time in proportion to total passenger volume, which itself correlates to both the number of vessel calls expected and the average capacity of vessels calling.

For the seasonal daily average condition, existing and planned parking capacity is expected to be sufficient for all milestone years other than 2028, which will see average daily parking demand reach nearly 100% of on-port capacity. The reason for this spike in utilization is that, while the Port is expected to see a 39.2% increase in revenue passenger throughput between 2018 and 2028, once the T2/T4 parking structure is completed in 2020 the 2018 Update includes no increase in on-port parking capacity until 2030. Once the new T29/T26 parking structure comes online in 2030, portwide parking utilization will decrease back to below 80 percent as a result of these 1,600 new spaces being activated. Between 2027 and 2030, however, parking demand will exceed on-port parking capacity, meaning off-port (non-County) parking solutions will need to absorb the surplus demand.

For the seasonal daily peak condition, existing and planned parking capacity is expected to be *insufficient* for all milestone years other than 2038, which will still see peak daily parking demand reach just over 88 percent of on-port capacity. As with the seasonal daily average condition, the seasonal daily peak condition will require off-port (non-County) parking solutions to absorb surplus demand. As previously stated, once the T2/T4 parking structure is completed in 2020, the 2018 Update includes no increase in on-port parking capacity until 2030. This will result in peak demand that exceeds 100 percent of on-port parking capacity during every year across the 2018 Update's planning horizon between 2021 and 2038. In 2038, when the proposed new T19/T20 parking structure comes online, on-port parking utilization is expected to drop to approximately 88 percent due to the addition of 2,200 (1,800 net) new spaces in Midport.

4.2.3 Other Parking Considerations

The above analysis reflects a straightforward projection of parking demand and utilization based on the constrained cruise passenger forecast developed by B&A and the Port. It must be noted, however, that numerous unknown or otherwise unpredictable variables will play a role in the Port's ultimate parking dynamics.

Fly-In vs. Drive-In Passengers

The proportion of fly-in to drive-in passengers is one of the key factors impacting Port

parking demand and utilization. Based on anecdotal information shared with B&A, it is assumed that between 50 percent and 60 percent of all Port Everglades cruise passengers currently arrive in South Florida via air travel, meaning only between 40 percent and 50 percent of the current cruise passenger population requires parking on average during the course of a given cruise season. However, the percent of drive-in vs. fly-in passengers can vary substantially for different types of cruises. For example, the percentage of cruise passengers that drive and park is typically significantly higher for cruises that are 5 days or less in length than for cruises that are 6 days or longer. As a result, parking demand at the Port will be higher during periods when there are more shorter cruises and lower during periods when there are more longer cruises. The cruise brands that homeport at Port Everglades have traditionally offered more 7-day (or longer) cruises than 5-day (or shorter) cruises, meaning the relative percentage of drive-in passengers has historically been smaller at Port Everglades than at other ports such as Port *Miami* and Port Canaveral. This will change over time, however, assuming Port Everglades is successful in attracting more mid-week sailings as part of its overall growth strategy.

Off-Port Parking Options

While the Port offers convenient and safe parking for its cruise passengers, other parking options not affiliated with the Port or Broward County exist. These include less expensive off-port (near-port) parking locations as well as parking incentives offered to cruisers staying at local hotels for pre- or post-cruise packages. The impact of these near-port parking solutions to Port parking revenue is substantial. For example, assuming 50 percent of all Port Everglades cruise passengers require parking in a given week, it is currently estimated that as much as half of this drive-in population is being served by near-port parking options. This represents a massive amount of revenue leakage and so too a substantial potential future revenue stream for the Port. Options related to increasing Port parking revenue are discussed further in Section 4.5 (Financial Strategies).

Autonomous Vehicles

This cutting-edge transportation technology, which did not even exist in the public consciousness during the development of the 2014 Update, merits serious attention in terms of its potential long-term impact both to future parking and to general transportation planning at ports and more broadly. Unfortunately, because this technology is still in its infancy in terms of public and regulatory acceptance, let alone widespread adoption or implementation, it is not possible at this time to predict when it

might be integrated at scale into the broader transportation network within the U.S. let alone in Broward County. It is also not possible to project or quantify in any meaningful way what the impact to cruise parking at Port Everglades might be if and when autonomous vehicles become commonplace. It stands to reason that total parking demand will decline significantly if/when autonomous vehicles do achieve widespread integration as a new modal option. However B&A believes that such integration is likely to occur sufficiently far into the future that cruise parking demand at Port Everglades will not be impacted within the 20-year planning horizon of the 2018 Update. Because technology evolves quickly, it will be important for future Master/Vision Plan updates to monitor and incorporate new developments related to this technology. However, for purposes of this 2018 Update, this technology is simply too new and too nascent to predictably impact 20-year cruise parking dynamics.

4.2.4 Parking Conclusions

It is expected that cruise passenger throughput at the Port will increase by approximately 75 percent during the 20-year planning horizon. A total of nine cruise-related projects are included in the 2018 Update to accommodate this anticipated growth in demand with an additional eight bulkhead repair/replacement projects that will primarily benefit cruise operations also planned. Only three of these 17 cruise-related projects are parking structures and B&A strongly recommends that the Port plan to implement all three of these parking projects in order to achieve the following goals:

- Accommodate as much drive-in cruiser parking demand as possible in near-dock parking facilities in order to remain competitive with other ports
- Capture the maximum possible percentage of cruise parking revenue within on-port, County-owned structures and/or surface lots

As shown in Table 4.2.2, the additional parking capacity being phased in as part of the 5-year Master Plan and 10- and 20-year Vision Plans is expected to be sufficient to meet portwide seasonal daily average demand for parking for all years other than 2027, 2028 and 2029. Portwide seasonal daily peak demand is expected to exceed planned capacity between 2021 and 2038, but will decline once the T19/T20 parking structure is activated in 2038. Non-County near port parking solutions will be required to absorb demand that exceeds on-port parking capacity. However, it is in the Port's best financial interest to capture as much parking on-port within County-owned facilities as possible since this

additional revenue stream is significant and will grow over time with demand. Section 4.5 presents strategies related to capturing additional parking revenue.

4.2.5 Future Traffic Projections

The increases in cruise passenger and containerized cargo throughput projected over the 20-year planning horizon through 2038 will increase the volume of traffic entering and leaving the Port. Impacts associated with this growth-related increase in on-Port traffic are discussed in Section 4.3. What follows is a quantitative assessment and summary of projected growth in truck and other vehicular traffic at the Port at the key milestone years of the 2018 Update.

Truck Traffic

As part of the 2018 Update, B&A partnered with CTS Engineering, Inc. (CTS) to conduct a detailed traffic study. Figure 4.2.5 shows the study area. Future truck forecasts for the Port were developed by CTS based on the market assessments developed for all Port lines of business as part of Element 2. It was determined that the likely unconstrained scenarios should be used as the basis for developing future truck and cruise traffic demand within the study area rather than the subsequently developed constrained scenarios that were developed for cruise and containerized cargo, respectively. The rationale for this decision was that the unconstrained forecasts, which result in more volume in most years of the 20-year projection period than the constrained forecasts, effectively represent a “worst case” scenario vs. the constrained forecasts.

Truck and passenger traffic for roadways with direct access to Port Everglades via security checkpoints and those inside the Port were estimated using volume ratios between future year traffic and 2018 traffic based on the likely growth scenarios for each line of business at the Port. Annual Average Daily Traffic (AADT) for trucks and passenger vehicles were estimated separately. Table 4.2.3 shows the 2018 base year truck traffic and projected truck traffic and volume ratios between the future truck traffic and 2018 truck traffic on roadways with security gates for the years 2023, 2028, 2033 and 2038.

Figure 4.2.5: Port Everglades Traffic Study Area*Source: CTS Engineering, Inc.*

Table 4.2.3: Projected Port Truck Traffic by Gate by Plan Milestone Year*Source: CTS Engineering, Inc.*

Gate	Existing/Projected Weekly Truck Traffic				
	2018	2023	2028	2033	2038
McIntosh Road	15,977	17,502	20,727	23,600	26,548
Eller Drive	19,031	20,499	21,078	21,873	22,893
Spangler Boulevard	11,693	11,650	11,523	11,656	11,811
Eisenhower Boulevard	1,511	1,266	1,235	1,222	1,223
Gate	Truck Traffic Ratio (vs. 2018)				
	2018	2023	2028	2033	2038
McIntosh Road	-	1.095	1.297	1.477	1.662
Eller Drive	-	1.077	1.108	1.149	1.203
Spangler Boulevard	-	0.996	0.985	0.997	1.010
Eisenhower Boulevard	-	0.838	0.817	0.809	0.810

Passenger Vehicle Traffic

For non-truck traffic, the analysis conducted by CTS indicates that passenger vehicle volumes will increase as follows:

- 18 percent (2023)
- 40 percent (2028)
- 65 percent (2033)
- 95 percent (2038)

Future traffic for roadways outside Port Everglades, such as U.S. Highway 1 (US 1), State Route 84 (SR 84), Southeast 17th Street (SE 17th St) and Eisenhower Boulevard (Eisenhower) north of SE 17th St, was estimated using the conventional methodology as described in the 2014 FDOT Project Traffic Forecasting Handbook. The latest Southeast Florida Regional Planning Model, Version 7.071 (SERPM 7.071) was used for travel demand forecasting. SERPM 7.071 is validated to year 2010 conditions and includes a

future year 2040 scenario that contains the adopted cost feasible plans for Palm Beach County, Broward County, and Miami-Dade County. See Section 4.3 below for a more detailed description of results and methodology related to the CTS traffic study. Table 4.2.4 summarizes expected growth rates at each Plan milestone year plus 2033.

Table 4.2.4: Growth Rate Determinations Used for Future Port Traffic Projections

Source: CTS Engineering, Inc.

Location	METHOD 1: Historical Trend Analysis	METHOD 2: 2010-2040 SERPM 7.071 Forecasts		
		2010	2040	Growth Rate
SE 17 th St (east of Eisenhower)	2.22%	30,093	34,998	0.50%
SE 17 th St (west of Eisenhower)	2.18%	32,841	37,514	0.44%
US 1 (north of SR 84)	-1.24%	61,063	68,412	0.38%
SR 84 (east of US 1)	-1.46%	9,888	11,674	0.56%
US 1 (south of SR 84)	-1.54%	59,041	70,836	0.61%
SR 84 (west of US 1)	2.44%	12,704	12,067	-0.17%

Forecasted AADT and truck percentages for future years 2023, 2028, 2033, and 2038 are presented in Table 4.2.5. For future turning movements entering/exiting Port Everglades, the 2018 truck and passenger vehicle turning volumes were adjusted using the volume ratios from the market analysis and peak-to-daily ratios from the previously referenced traffic studies. Future year adjustment (growth) factors used to estimate future turning movements for both trucks and cruise passenger vehicles are presented in Table 4.2.6.

Table 4.2.5: Projected Port AADT and Truck Percentages*Source: CTS Engineering, Inc.*

Location	2023		2028		2033		2038	
	AADT	%Truck	AADT	%Truck	AADT	%Truck	AADT	%Truck
I-595 (west of McIntosh Rd)	19,100	39.7%	20,700	37.7%	22,500	36.0%	24,600	34.4%
Eller Dr (north of I-595)	3,900	4.8%	4,300	4.5%	4,800	4.2%	5,300	4.0%
McIntosh Rd (south of Eller Dr)	6,000	60.2%	7,000	61.1%	7,900	61.7%	8,900	61.6%
Eller Dr (east of McIntosh Rd)	15,600	26.4%	17,000	24.9%	18,700	23.5%	20,600	22.3%
SE 19 th Ave (north of Eller Dr)	16,200	3.0%	18,000	2.8%	20,100	2.6%	22,600	2.4%
Eller Dr (east of SE 19 th Ave)	1,400	2.0%	1,600	1.8%	1,800	1.7%	2,000	1.6%
SE 19 th Ave (south of Eller Dr)	2,300	33.4%	2,500	31.6%	2,700	30.4%	3,000	28.6%
US 1 (north of Spangler Blvd)	57,600	4.4%	59,300	4.4%	61,000	4.4%	62,900	4.3%
Spangler Blvd (east of US 1)	12,300	19.2%	13,500	17.9%	14,800	16.8%	16,400	15.5%
US 1 (south of Spangler Blvd)	59,400	6.4%	61,500	6.4%	63,600	6.3%	65,800	6.3%
SE 24 th St (west of US 1)	20,700	7.5%	21,800	7.3%	23,100	7.0%	24,600	6.8%
Eisenhower (north of SE 17 th St)	6,300	2.0%	6,400	2.0%	6,600	2.0%	6,800	2.0%
SE 17 th St (east of Eisenhower)	32,900	3.6%	33,800	3.6%	34,700	3.6%	35,700	3.6%

Location	2023		2028		2033		2038	
	AADT	%Truck	AADT	%Truck	AADT	%Truck	AADT	%Truck
SE 17 th St (west of Eisenhower)	47,900	3.7%	49,400	3.7%	50,900	3.6%	52,500	3.6%
Eisenhower (south of SE 17 th St)	3,600	9.5%	4,000	8.8%	4,400	8.2%	5,000	7.4%
Eisenhower (north of Spangler Blvd)	3,800	9.6%	4,200	8.9%	4,700	8.1%	5,300	7.4%
Spangler Blvd (west of Eisenhower)	6,200	19.2%	6,800	18.0%	7,500	16.7%	8,300	15.5%
Eisenhower (south of Spangler Blvd)	3,600	3.1%	4,000	2.8%	4,500	2.6%	5,100	2.4%

Table 4.2.6: Truck/Passenger Vehicle Growth Factors by Gate by Plan Milestone Year*Source: CTS Engineering, Inc.*

Vehicle Type	Gate	2023	2028	2033	2038
Truck	McIntosh Road	2.053	2.432	2.769	3.116
	Eller Drive	1.615	1.662	1.724	1.805
	Spangler Boulevard	1.281	1.314	1.348	1.381
	Eisenhower Boulevard	1.281	1.314	1.348	1.381
		2023	2028	2033	2038
Passenger Vehicle		1.182	1.396	1.650	1.950

4.2.6 Rail Usage Projections

As discussed in Element 2, the near-dock FEC ICTF at Port Everglades is a tremendous asset to the Port for a variety of reasons. Since opening in 2014, the FEC ICTF at Port Everglades has handled more international cargo than domestic cargo every single year. In FY2017, the most recent 12-month data available, the ICTF handled 63,142 international moves (113,656 TEUs), compared to 50,030 domestic moves. This represents 14.5 percent of Port Everglades' FY2017 loaded container throughput and 10.6

percent of total throughput. The principal reason that intermodal volume moving via the ICTF at Port Everglades is not higher relates to the size and geographic extent of Port Everglades' current hinterland. The time to market and cost-per-unit advantages of intermodal rail vs. over-the-road trucking typically do not manifest within 250 miles of a port, for either imports or exports. Since the vast majority of containerized imports and exports that currently move through Port Everglades have a point of origin or final point of consumption within South or Central Florida, rail is not competitive with trucking, from either a time or cost perspective.

Looking to the future, the constrained containerized cargo projection favored by Port Everglades management does not anticipate substantial new penetration of out-of-state markets by Port Everglades for dry cargo. For perishable cargo, there is potential to grow out-of-state market shares, and rail could play a key role in that. In FY2017, 18.7 percent of total Port Everglades loaded volume (TEUs) consisted of perishables, making Port Everglades Florida's top port for perishables and the fifth most important container port in the U.S. for perishables by volume. If Port Everglades continues to play such a key role in the perishables supply chain in the future, then there is reason to believe that intermodal rail could help the port to reach new out-of-state markets, certainly for perishable imports, but also potentially for perishable exports, such as frozen (or chilled) meat and poultry from the U.S. Midwest. Rail could also be used increasingly for ro-ro export cargo; specifically, new U.S.-manufactured automobile exports to Latin America and the Caribbean. In terms of the annual number of rail moves at Port Everglades, however, ro-ro cargo amounts to a very small percentage of the total with utilization being driven almost entirely by containerized cargo.

Table 4.2.7 presents projected annual throughput data for the ICTF based on the constrained containerized cargo projection developed by the Port and B&A subsequent to the unconstrained forecasts developed as part of Element 2. This rail volume projection assumes a compound annual growth rate (CAGR) of 1.03 percent between 2018 and 2038 compared to a CAGR of 1.02 percent for containers during the same period. This slight difference reflects a very modest increase in rail vs. truck market share over the 20-year planning horizon to account for proportionately modest growth in over Port market share (i.e. perishable imports, new automobile exports).

Table 4.2.7: Annualized Rail Throughput Projections (TEUs) – Constrained Projection*Source: B&A*

Year	Total TEUs (Constrained)	ICTF TEUs (Constrained)	% Total Container Volume
2018	1,108,465	110,495	10.0%
2019	1,080,000	116,097	10.7%
2020	1,080,000	121,843	11.3%
2021	1,105,000	127,663	11.6%
2022	1,130,000	133,547	11.8%
2023	1,180,000	139,477	11.8%
2024	1,291,492	145,446	11.3%
2025	1,342,831	151,442	11.3%
2026	1,384,577	156,762	11.3%
2027	1,426,227	162,076	11.4%
2028	1,467,883	167,395	11.4%
2029	1,509,719	172,743	11.4%
2030	1,551,845	178,136	11.5%
2031	1,588,525	182,762	11.5%
2032	1,625,263	187,399	11.5%
2033	1,662,036	192,042	11.6%
2034	1,698,907	196,699	11.6%
2035	1,735,913	201,377	11.6%
2036	1,773,091	206,079	11.6%
2037	1,810,383	210,798	11.6%
2038	1,847,891	215,549	11.7%
CAGR (2018-2038)	1.02%	1.03%	

4.3 Environmental Impact Assessment

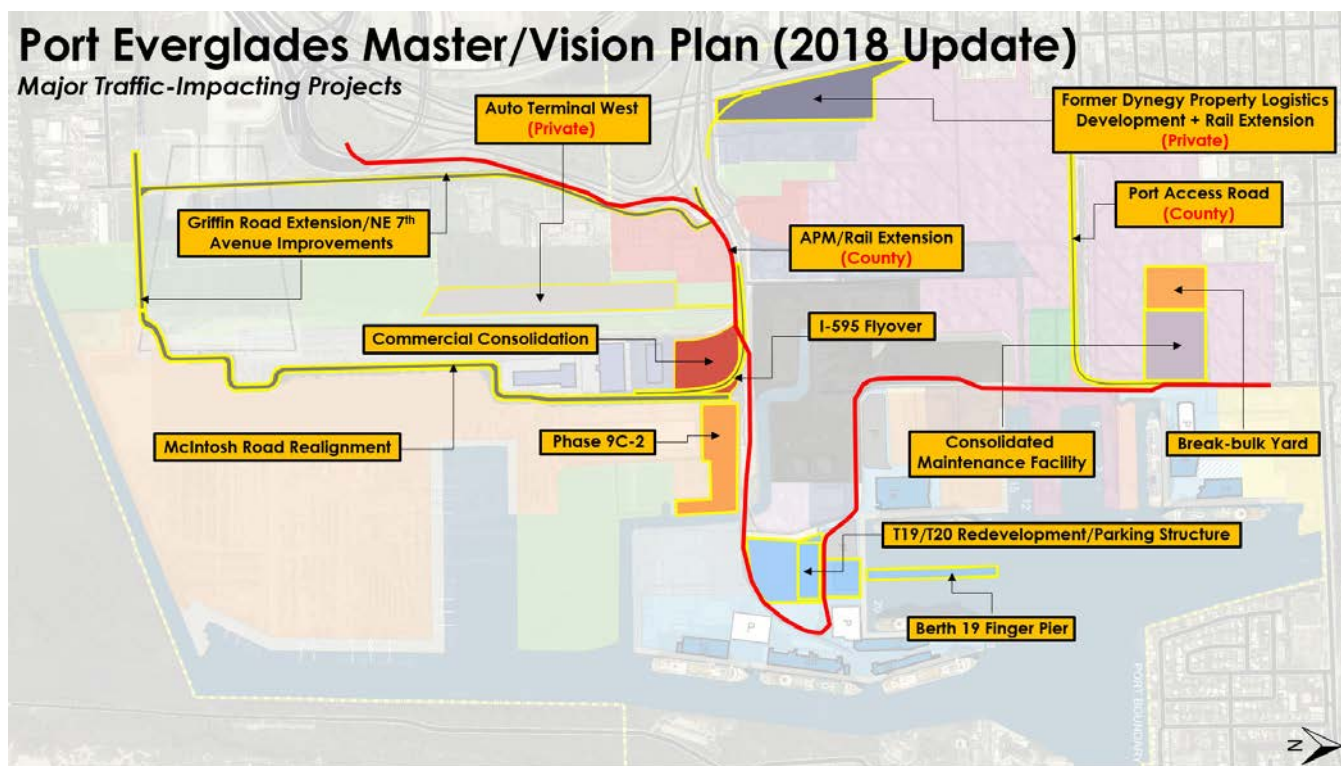
As required by Chapter 163, Florida Statutes, the 2018 Update of the Port Everglades Master/Vision Plan must include an assessment of impacts associated with all proposed new projects. Impact aspects include traffic, the natural environment, water resources, climate change, resiliency and sustainability and air quality.

4.3.1 Traffic Impacts

Several major projects included in the 5-year Master Plan as well as the 10- and 20-year Vision Plans will have a significant impact on traffic patterns in and around the Port. These projects are shown together in Figure 4.3.1.

Figure 4.3.1: 2018 Update – Traffic-Impacting Projects

Source: B&A



The projects shown in Figure 4.3.1 are included in the 2018 Update because they meet one or more of the following objectives:

- Increase available berthage/acreage and consolidate land for common uses as

a means to increase the Port's capacity and more effectively meet future market demand

- Speed the flow of trucks moving in and out of the Port, particularly the Southport container terminals, the ICTF and the new Port Everglades International Logistics Center (PEV ILC), thereby enhancing operational efficiency
- Improve safety and security and reduce air emissions by reducing queuing times and lessening overall traffic congestion within the Port
- Increase modal options for moving both passengers and cargo into and out of the Port
- Enhance the transportation network within and surrounding the Port by providing users and members of the general public alternative routes

All projects shown above will require new or revised stormwater surface management permits with Broward County. Some may also have tree impacts that will need to be addressed with the local municipalities under their pre-permitting ordinances. Any areas shown in Figure 4.3.1 that are heavily used by wading birds, wood storks and/or spoonbills, have seagrass, include manatee sanctuaries or require mangrove mitigation will require environmental permits as well. This issue is discussed separately in Section 4.3.2.

As previously mentioned, as part of the 2018 Update B&A partnered with CTS to conduct a detailed traffic study. The goals of this study were to:

- Evaluate the impacts of relevant 5-, 10- and 20-year projects included in the 2018 Update to future traffic both within the Port and on the surrounding roadway network
- Provide recommendations related to existing and proposed roadway infrastructure, including improvements and alternatives to ensure unimpeded passenger and cargo movement in and around Port Everglades

Two scenarios were evaluated to achieve these goals. The first (no-build) scenario assumed status quo conditions (i.e. none of the projects in the 2018 Update will be implemented) through 2038. The second (build) scenario assumed all projects in the 2018 Update will be implemented as proposed in the years identified. Existing traffic conditions, including previous studies, existing traffic patterns, geometry conditions,

traffic controls, queueing and delays were reviewed as part of this study. Existing 2018 AADT and turning movement volumes during morning and midday peak hours on weekdays were developed based on these previous studies. Additional turning movement volumes were also collected as a part of this study. Based on field visits and findings from previous studies, the following peak periods were selected for analysis:

- Weekday morning peak hour from 8:00am to 9:00am
- Weekday midday peak hour from 12:00pm to 1:00pm
- Weekend midday peak hour from 11:30am to 12:30pm

Traffic analysis was performed using VISSIM, which is a microsimulation software that can analyze multimodal traffic operations (cars, trucks, pedestrians, bus, trains, etc.) under various constraints such as lane configuration, traffic signals, and transit stops. The Port VISSIM model was first calibrated to 2018 as the base year by adjusting driver behavior parameters and vehicle characteristics to replicate observed local travel patterns. Traffic analysis was then performed for 2018 existing conditions. AADT and turning movement volumes for milestone years 2023, 2028, 2033, and 2038 were developed based on the Port Everglades market assessments presented in Element 2, with truck and other vehicular counts being derived from those assessments. Traffic analyses were performed for both the no-build and build scenarios for each year. What follows is a summary of findings of the traffic study conducted by CTS related to the Port's key intersections.

Existing Conditions

- Based on the analysis, all intersections included in the study are currently operating at level of service (LOS) D or better during the morning peak hours
- During the weekday midday peak hour, all intersections are operating at LOS C or better except the intersection of US 1 and SR 84/Spangler Boulevard, which is operating at LOS F
- During the weekend midday peak hour, when cruise traffic is heaviest, all intersections are operating at LOS D or better except the intersection of Eller Drive and McIntosh Road, which is operating at LOS F
 - The queues on the eastbound approach at this intersection extend all the way onto I-595 during this period due to high cruise traffic volumes

No-Build

- Under the no-build scenario, due to vehicle processing times at the security checkpoints on Eller Drive and McIntosh Road, queues on the eastbound approach were found to spill back onto I-595
 - During the weekday morning and weekend midday peak hours, the queues of the eastbound through movement were found to impact the eastbound right-turning movements
 - During the weekday midday peak hour, the queue of the eastbound right-turning movement was found to spill back onto I-595 and affect the eastbound through movement
 - Delays for the northbound left-turning movement were found to exceed 120 seconds by 2038
 - Queues on the northbound approach were found to extend to the McIntosh Road security checkpoints during the weekday midday peak hour by 2038
 - The intersection of Eller Drive and SE 19th Avenue was found to operate at LOS F by 2038 during the weekend midday peak hour

Build

- The future build scenario includes a number of projects, particularly in Southport, that will improve the capacity and operations of the roadway network in and around Port Everglades; these roadway improvements include:
 - I-595 flyover
 - Griffin Road extension/NE 7th Avenue improvements
 - McIntosh Road realignment
 - Removal of the security checkpoints on McIntosh Road immediately following the opening of the secondary Southport access point included as part of the Griffin Road extension project
 - Improvements to the intersection at Eller Drive and SE 19th Avenue

Weekday Morning Peak Hour

- Traffic during the weekday morning peak period consists of heavy commuter traffic to work, a modest amount of cruise passenger traffic and truck traffic

- Vehicle processing time at the Port's security checkpoints has a significant impact on traffic operations in and around the Port
- The intersection of US 1 and SR 84/Spangler Boulevard will reach capacity in 2023 and operate at LOS E with an average delay of 57.7 seconds per vehicle under build scenario
 - This intersection is expected to experience longer delays in all future analysis years under the build scenario as compared to the no-build scenario – even though the LOS will remain E under both scenarios - due to increased northbound turning movements and westbound left-turning movements resulting from traffic diversion caused by the construction of the new County Port Access Road
- The intersection of SE 17th Street and Eisenhower Boulevard will operate at LOS C for all future years under both the no-build and build scenarios
 - Similar to the intersection of US 1 and SR 84/Spangler Boulevard, this intersection will also experience longer delays under the build vs. no-build scenario as the result of traffic diversion to and from the new County Port Access Road
- The intersection of Eisenhower Boulevard and Spangler Boulevard will also operate at LOS C during all future analysis years under both the no-build and build scenarios
 - This intersection will experience more delays in future years as traffic continues to grow, but no operational issues are expected
- The intersection of Eller Drive and McIntosh Road is operating at LOS C under existing conditions; it will fail in 2023 and remain problematic for all future analysis years under the no-build scenario
- Under the build scenario, the intersection of Eller Drive and McIntosh Road will still fail in 2023 but with slightly shorter delays
 - By 2028, once the I-595 flyover opens to traffic and both the Griffin Road extension/NE 7th Avenue improvements and the McIntosh Road realignment projects are completed, this intersection will see significant improvement compared to the no-build scenario
 - An average vehicle will experience about 65 seconds of delay after these projects are implemented (build scenario) compared to 109 seconds if

- these projects are not implemented (no-build scenario)
- This intersection will experience longer delays in 2033 with higher volumes, but it will perform better under the build scenario than under the no-build scenario
- In 2035 when the Commercial Consolidation project is completed and the Port Everglades Administrative Building is relocated west of McIntosh Road, the intersection will see shorter delays because the commuter traffic will no longer travel through the intersection into Midport; however, the intersection will still operate at LOS F due to the increased cruise traffic that needs to travel through both the intersection itself and the security checkpoint that follows
- Queues on the eastbound through movement due to delays at Eller Drive gates will spill back onto I-595 and will affect eastbound right-turning movements during morning peak hours.
- The intersection of Eller Drive and SE 19th Avenue will operate at LOS C or better through all future years. With an additional left-turn lane on the eastbound approach on Eller Drive, the intersection will experience shorter delays under the build scenario than under the no-build scenario for all analysis years

Weekday Midday Peak Hour

- Traffic for the weekday midday peak period consists of fewer commuter trips but a significant amount of dining and shopping trips
- There is minimal cruise passenger traffic but truck traffic is the heaviest
- Compared to the weekday morning peak hour, the intersection of US 1 and SR 84/Spangler Boulevard experiences much longer delays during the weekday midday peak hour because of the commercial activities in areas surrounding the intersection
 - The LOS at this intersection will remain F throughout the analysis years for both the no-build and build scenarios; longer delays are experienced under the build scenario than under the no-build scenario because of the traffic diversion from and to the new County Port Access Road
- The intersection of SE 17th Street and Eisenhower Boulevard will operate at LOS D or better until year 2033 under both the no-build and the build scenario;

- This intersection will reach capacity in 2038 with LOS E and an average delay of 70.2 seconds under the no-build scenario
 - The intersection will fail by 2038 with an average delay of 87.1 seconds under the build scenario as a result of traffic diversion to and from the new County Port Access Road
- The intersection of Eisenhower Boulevard and Spangler Boulevard will operate at LOS B throughout future analysis years under both the no-build and build scenarios
 - This intersection will experience more delays in future years as traffic continues to grow, but no operational issues are anticipated
- The intersection of Eller Drive and McIntosh Road is operating at LOS C under existing conditions but will fail in 2023 with a much longer delay compared to the weekday morning peak hour
 - The LOS will remain F for all future analysis years under the no-build scenario
 - Under the build scenario, this intersection will still fail in 2023 but with shorter delays
 - In 2028 when the I-595 flyover opens to traffic and other aforementioned projects are implemented, the intersection will see significant improvement under the build scenario compared to under the no-build scenario
 - With most truck traffic accessing Southport using the I-595 flyover and very few cruise passenger trips; the intersection will experience minimal delays under the build scenario in all future analysis years
 - The Commercial Consolidation project has limited impact on the intersection during the weekday midday peak hour because there are fewer work trips during this hour even under the no-build scenario
- The intersection of Eller Drive and SE 19th Avenue will operate at LOS B or better through all future years
 - With an additional left-turn lane on the eastbound approach on Eller Drive, the intersection will experience shorter delays under the build scenario than under the no-build scenario for all analysis years

Weekend Midday Peak Hour

The traffic for the weekend midday peak period consists primarily of cruise passenger trips with very few commuter trips and minimal truck trips.

- The intersection of US 1 and SR 84/Spangler Boulevard will reach capacity in 2033 for both the no-build and the build scenarios
 - This intersection will remain near capacity in 2038 under the no-build scenario but will fail in 2038 under the build scenario
 - This intersection will see longer delays under the no-build condition than under the build condition due to the traffic diversion from and to the new County Port Access Road
- The intersection of SE 17th Street and Eisenhower Boulevard will operate at LOS D or better until Year 2028 under both scenarios; the LOS will remain D in 2033 for the no-build scenario but will reach capacity under the build scenario during the same year
 - The intersection will fail in 2038 for both scenarios with vehicle processing time experienced at the Eisenhower security checkpoints contributing to the long delays at the intersection
 - Queues on Eisenhower Boulevard will spill back to SE 17th Street by 2038
 - This intersection will experience longer delays under the build scenario than under the no-build scenario as a result of traffic diversion to and from the new County Port Access Road
- The intersection of Eisenhower Boulevard and Spangler Boulevard will operate at LOS B throughout future analysis years under both scenarios
 - The intersection will experience more delays in future years as traffic continues to grow, but no operational issues are foreseen.
- The intersection of Eller Drive and McIntosh Road will experience heavy delays due to the substantial increase in cruise traffic in future years
 - The LOS will remain F for both the no-build and the build scenario throughout future analysis years
 - The proposed I-595 flyover, Griffin Road extension/NE 7th Avenue improvements and McIntosh Road realignment projects will not bring relief to Midport cruise traffic
 - Vehicle processing times at the security checkpoints on Eller Drive are the

primary reason for the long delays, even though high traffic volumes are also a major contributing factor

- Based on the simulation run by CTS, eastbound queues will extend all the way onto I-595. The queues will also affect the eastbound right turning movement although the volume of these movements is low
- The intersection of Eller Drive at SE 19th Avenue will operate at LOS E through Year 2033 and then it will fail in 2038 under the no-build scenario; the same is true for the build scenario despite the addition of another left turn lane on eastbound Eller Drive; delays are shorter under the build scenario than under the no-build scenario, however
- Two signalized intersections are proposed for McIntosh Road between the I-595 flyover and the Griffin Road extension access point
 - The proposed intersections will operate at LOS B or better during all three peak periods in all future analysis years
 - The maximum queue on the southbound left turn is around 500 feet, which is shorter than the proposed storage length
 - No other operational issues are anticipated at these intersections; however, gate fluidity at the different Southport container terminals will have varying impacts on overall future McIntosh Road traffic flows

For years Broward County, Port Everglades, Fort Lauderdale-Hollywood International Airport and the Florida Department of Transportation (FDOT) have pursued the development of an automated people mover (APM) system to connect the airport, seaport and convention center via an alternative mode of public transportation. The goals of this project include reducing vehicle miles traveled, enhancing the efficiency of fly-in cruise passenger movements to and from the Port and improving the overall experience of airline passengers in general. A funding stream for this project was recently approved by Broward County voters and it is now expected to be implemented within the coming decade. While it is not currently clear or possible to quantify what the impact of this project will be to Port-related traffic it will almost certainly result in fewer vehicle trips into and out of the Port with the intersection of Eller Drive and McIntosh Road being one of the primary areas to benefit from this alternative mode of transportation. As this project continues to move forward in concept it will be important for the Port to fully understand its impacts to Port traffic.

4.3.2 Impacts to the Natural Environment

The waters and lands in and around Port Everglades provide habitat for numerous plant and aquatic species. A detailed discussion of the various species and natural resources in the Port environment can be found in Element 1. This section discusses impacts resulting from the projects included in the 5-year Master Plan and 10- and 20-year Vision Plans as proposed in the 2018 Update and discusses mitigation requirements for those impacts specific to the aspects identified in Table 4.3.1.

Table 4.3.1: Summary of 2018 Update Impacts to the Port's Natural Environment

Source: B&A

	Upland Habitats	Beaches and Dunes	Freshwater Wetlands	Mangroves	Seagrasses	Artificial Substrates	Coral, Reef and Hardbottom	Shorebirds & Wading Birds	Manatees	Sea Turtles	American Crocodile	Mobile marine species	Smalltooth Sawfish
Berth & Apron					X	X	X		X	X	X	X	X
Channel	X	X		X	X	X	X	X	X	X	X	X	X
Cruise Terminal								X					
Logistics	X		X					X					
Parking								X					
Transportation	X		X	X				X					

Most of the projects within the categories shown in Table 4.3.1 affecting wildlife and habitat will require environmental permits from regulatory agencies including the U.S. Army Corps of Engineers (USACE), Florida Department of Environmental Protection (FDEP), and Broward County Environmental Protection and Growth Management Division (EPGMD). Any potential impacts to species listed under the Endangered Species Act (Act) must be consulted on under Section 7 of the Act, with the National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service (USFWS). Coral relocation will require a Special Use License (SAL) from the Florida Fish and Wildlife Conservation Commission (FWC).

Additional details on the impacts of the Port Everglades Deepening and Widening project, and proposed mitigation, can be found in the Environmental Impact Statement and associated documents for that project.

4.3.2.1 Upland Habitats

The Port endeavors to create green space throughout its jurisdictional area, with the aim of planting native species mimicking small ecosystems such as native South Florida hardwood hammocks. Landscaping and trees dot the existing roadways and access points. The Port has also acquired large tracts of upland vegetative habitat, some comprised of former landscaping nursery that are now overgrown with various vegetative species.

Proposed logistics projects will convert some wooded and green spaces to paved impervious surfaces. Any impacts to these green spaces could potentially impact wildlife and habitat. However, most of these areas are highly fragmented and degraded, consisting of secondary overgrowth. As such, impacts are considered minor. Various transportation projects may have minor impacts on trees and landscaping; any impacts to trees will be addressed through city tree ordinances.

4.3.2.2 Beaches and Dunes

The Port Everglades inlet is bounded by adjacent Broward County shoreline, which is comprised of sandy beachfront. Fort Lauderdale lies on the north side of the inlet; the shoreline here lacks natural dune features and is characterized by high-rise condominiums and hotels. Von D. Mizell-Eula Johnson State Park lies to the south within the City of Dania Beach and supports more natural beachfront backed by

native dune communities. The park is situated on the peninsula that separates Port Everglades from the Atlantic Ocean and supports maritime hammock, coastal strand, and beach dune systems, the latter of which is used as an active nesting area for sea turtles and overwintering shorebirds such as piping plovers.

The Port Everglades Deepening and Widening project will potentially dredge up to 6.63 million cubic yards of marine sediment and will place beach-compatible material on Mizell-Johnson State Park shoreline. Future maintenance dredging within the Port will also place beach-compatible sand. Sand placement is intended to nourish erosional sections of shoreline, benefitting park tourism as well as wildlife.

4.3.2.3 Freshwater Wetlands

Some small freshwater wetlands are present throughout the Port. There is very little green space within the Port and efforts are made to create mini ecosystems using native vegetation when possible, including freshwater wetlands. Larger wetlands are also present in vacant areas supporting FPL transmission lines and areas used for stormwater storage. Offsite properties acquired by the Port for specific projects also contain pockets of freshwater wetlands. Conversion of these acquired properties to impervious paved surfaces will impact wildlife and habitat, including any freshwater wetlands present. Roadway improvement projects like the Griffin Road extension will have some impacts where proposed expansions cross wetland areas (see Figure 4.6.1). Impacts to wetlands may adversely affect wetland-associated species, as discussed in the following sections. Impacts to wetlands will be offset through Segment 4 of the West Lake Park Mitigation Plan.

4.3.2.4 Mangroves

The dominant vegetation along the Port's waterfront is mangroves. The channels and ditches within Port Everglades are tidally connected and provide suitable habitat for the growth and proliferation of mangroves, which provide important nesting, foraging and nursery habitat for many species as detailed in Element 1. Several Port mitigation projects have included creation of mangrove wetlands: 16.5 acres of new mangrove conservation area were created within the Port as mitigation for the Southport Turning Notch Expansion (STNE) project; as part of ongoing wetland enhancement and restoration efforts at Port Everglades, the Port has created a 25-

acre wetland, inclusive of 160,000 red mangroves (*Rhizophora mangle*) at Mizell-Johnson State Park; the Port is also planning to construct restorative habitat to cover future impacts to mangroves and seagrasses within West Lake Park, Segment 4, to the south.

Various transportation projects may impact ditches, most of which contain mangroves. These projects will have a direct impact. Any impacts to mangroves will be mitigated at the West Lake Park site.

4.3.2.5 Seagrass

Seagrasses have been surveyed throughout the Port Everglades vicinity on numerous occasions. Three species of seagrasses have been observed, including the federally protected Johnson's seagrass (*Halophila johnsonii*). Seagrass communities around Port Everglades occur within isolated patches and beds, particularly along the side slopes of the Intracoastal Waterway. Seagrass has been recorded within the footprint of the Port Everglades Deepening and Widening Project, and may be found within the canals, turning basins and other marine bottoms within the Port.

Seagrasses may be directly impacted by a number of Port projects that will "take" seabottom that supports seagrass. Dredging for the Port Everglades Deepening and Widening project will directly remove areas of documented seagrass. Reconstruction and expansion of berths and bulkheads may also directly impact any seagrass occurring adjacent to the toe of the seawall or within the expansion footprint. Additionally, increased turbidity from construction may temporarily reduce adequate light penetration to underlying seagrasses or cause sedimentation from settlement of suspended sediments onto seagrass. Impacts to seagrasses will be mitigated at the West Lake Park site.

4.3.2.6 Artificial Substrates

Artificial reefs include manmade materials placed for colonization by fish and other marine organisms, and may include sunken ships, barges, oil rigs, limestone rock, concrete culverts, and other materials of opportunity. Other artificial constructs that may be used for marine colonization include riprap and other manmade marine structures that serve as de facto artificial reefs, and serve to create new habitat for fish, corals and other marine life. Broward County has placed multiple artificial reefs

offshore for recreational and fish enhancement purposes, as well mitigation for various coastal construction projects. At least five acres of limestone boulder material will be placed as mitigation for the unavoidable loss of nearly 14.62 acres of hardbottom and coral reef habitat resulting from the outer channel expansion. Corals “rescued” from the direct impact zone will be relocated to these artificial reefs. Corals removed from bulkhead and seawalls prior to demolition of these structures will also be relocated. Multiple relocation sites are being considered, including rip-rap areas along the ICW shoreline at Mizell-Johnson State Park, areas within the West lake mitigation site, and other locations within the Port proper. Coral transplantation is discussed further in the section below.

4.3.2.7 Coral, Reef and Hardbottom

Port Everglades’ outer entrance channel intercepts the Florida Reef Tract, comprised of nearshore hardbottom and outer, middle, and inner reef ridges that run parallel to shore. These hardbottom and reef habitats support communities of algae, sponges, encrusting octocorals, zoanthids, tunicates, hard corals, and various other sessile organisms, as well as a multitude of fish. Individual coral colonies also colonize bulkheads and artificial structures (i.e., riprap) within the Port and surrounding ICW. Of the seven federally listed species of hard coral, five have been documented within and adjacent to Port Everglades.

The USACE Deepening and Widening project will remove existing hardbottom habitat within the channel during excavation activities. As mentioned in Element 1, previous surveys have shown there is an estimated 14.6 acres of hard-bottom and coral reef habitat that will be lost due to the proposed outer channel. To mitigate for the unavoidable loss within the dredge template, off-shore boulder-based artificial reef, at a location to be determined, will be constructed. Bulkhead replacement and improvements will also have a direct effect on the coral colonies growing on the subject bulkheads. 9,713 individual coral colonies that have been documented growing within the Southpoint turning notch. Corals within the turning notch, and other structures that will be impacted by Port projects, that are good candidates for relocation will be transplanted to artificial substrate as a preventative loss initiative. Locations may include riprap at Mizell-Johnson State Park, riprap at Broward County Westlake Park, or artificial substrate within the Port. For those coral colonies that are

not deemed as good candidates for relocation, compensatory mitigation through artificial substrate placement is proposed. Additional mitigation measures for unavoidable coral loss include outplanting coral colonies from local coral nurseries to artificial substrates and degraded nearshore hardbottom communities.

All coral relocation activities will require environmental agency and approval.

4.3.2.8 Birds

Shorebirds

Several shorebirds, including the protected least tern, utilize Broward County as a nesting and foraging site seasonally from April through August. Reported rooftop nests have declined significantly, with a decrease from 106 nests to 2 nests from 2015 to 2016. Nesting by least terns has historically occurred within Port Everglades on the rooftops of some Port facilities. However, monitoring has shown disturbance from the annual Fort Lauderdale Air and Sea Show has caused the abandonment of the Port as a nesting site for this species. An alternative nesting site was created north of the Dania Cut-off Canal to encourage least terns to return; while the mitigation has thus far proven unsuccessful for least terns, other shorebird species have been observed utilizing the site, including black skimmers. Shorebirds may also benefit from placement of dredged material from Port projects onto adjacent Mizell-Johnson shoreline, which enhance beach habitat used for nesting and foraging.

Wading Birds

Several species of wading birds utilize the freshwater and mangrove wetlands within and owned by the Port, including the federally threatened wood stork and the state threatened roseate spoonbill. Any projects having impacts on freshwater wetlands may potentially impact wading bird species, either through direct removal of foraging and nesting habitat, or indirectly through disturbance. Impacted wetlands will be mitigated through credits at the West Lake Park mitigation site.

4.3.2.9 Manatees

Port Everglades' warm, shallow waters attract manatees during winter months as they escape from cold water temperatures, particularly the FPL power plant discharge basin, which has been designated as Manatee Essential Habitat. While Broward County's Comprehensive Plan prohibits marine construction within

Manatee Essential Habitat, other projects throughout the Port have the potential to impact this species. Dredging and in-water construction associated with berths and seawalls have the potential to directly impact manatees; manatees may also be indirectly impacted through removal or degradation of seagrass, as described above. All new construction will adhere to the USFWS's Standard Manatee Construction Conditions for In-Water Work and will be designed with manatee protection measures per the Broward County Manatee Protection Plan; additionally, the Port is conducting an in-house study of existing manatee data, and working with other institutions, to develop further manatee protection practices.

4.3.2.10 Reptiles

Sea Turtles

The beaches surrounding Port Everglades are common nesting sites for turtles annually, and multiple species of sea turtle may venture into the Port's waterways while foraging or searching for suitable nesting locations. All species of sea turtles are federally protected, and six of the seven species have been observed utilizing Florida's coastlines for breeding and nesting. As with fish and mobile marine species, dredging and in-water works have the potential for direct impacts to sea turtles through entrainment or collision, and indirect impacts through noise disturbance or removal of seagrass foraging habitat. NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions will be implemented during all in-water construction activities. The Port also plans to install "turtle friendly" LED lighting across the Project area in order to prevent hatchling disorientation, as well as analyze necropsy reports for information about cause of mortality to help develop turtle management plans.

Crocodiles

The American crocodile (*Crocodylus acutus*) is federally listed as endangered. Its numbers have risen from around 200 in the 1970's to over 2,000 today. Crocodiles have been observed in and around Port Everglades, including the banks of the Dania Cut-off Canal and the mangrove shorelines of West Lake Park and Mizell-Johnson State Park. These animals are considered shy, more so than their alligator cousins, and noise and disturbance from dredging activities and in-water construction activities will likely cause the species to avoid these areas, making direct impacts unlikely. Indirect impacts from disturbance may temporarily cause increased stress

levels and disruption of normal behaviors. Given the nature of the construction activities, long-term and permanent adverse effects to the American crocodile are not anticipated.

4.3.2.11 Fish and Mobile Marine Species

Port Everglades is connected to the Atlantic Ocean, and surrounded by the Florida Reef Tract. As such, the waters in and around the Port support a variety of marine life, including fish and other mobile marine species. Various construction activities, such as blasting, demolition of seawalls and other marine structures, dredging, and filling of seabed have the potential to impact these species. Direct impacts may include entrainment and collision, while indirect impacts may include removal of habitat or disturbance from noise. Increased noise and vessel/equipment activity can cause temporarily increased stress levels which may ultimately disrupt normal function and behaviors. However, as these effects are temporary due to the nature of the Project, long-term adverse effects are not anticipated.

Smalltooth Sawfish

Smalltooth Sawfish (*Pristis pectinata*) is listed under the ESA as an endangered species. This species is not common within the Port Everglades project area; however, they have been reported in the vicinity and may travel and forage the marine bottoms of Port channels, berths and turning basins, and mangrove shorelines--especially in their juvenile life stage when they prefer shallow (0-3 ft.), nearshore, euryhaline waters. Construction noise and activities may temporarily disrupt smalltooth sawfish behavior if they are present within the Port Everglades waterways during construction activities. Dredging and vessel activity have the potential for collision or entrainment, as described above. In the unlikely event a sawfish is present in the project area, sawfish should not be injured or killed by dredging or construction activities because the dredges advance relatively slowly and are noisy, giving mobile sawfish the opportunity to get out of the way. Additionally, NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions will be implemented during construction.

4.3.3 Water resources

Surface Water Quality

Most of the projects included in the 2018 Update of the Port Everglades Master/Vision Plan consist of expanded or reconfigured cargo yards, renovated cruise terminals, new parking structures, development of currently undeveloped land and new roadways, all of which involve increasing impervious areas within the Port. These projects will impact surface water and will require new or revised surface water management permits. Under Multisector Generis Permit (MSGP) a NPDES permit is required to address stormwater management under permit FLR05B255 charge to implement SWPPP with pollution prevention measures, treatment or removal techniques, monitoring, BMPs and other practices to control water quality by periodically monitoring TN, TP, chlorophyll-H, and copper.

Sea level rise is also a critical factor in the design of the Port's stormwater management systems for new facilities included in the 2018 Update. Bulkheads and berths, parking lots/structures, roadways, new developments, cruise terminals and other development projects must all account for the expected future impacts of climate change. These projects also have the potential to massively reconfigure geomorphology, change tidal variation, alter salinity patterns, impact ecological processes in coastal habitats, including wetlands, mangrove forests, and seagrass beds.

Potable Water quality

In recent years several water quality samples taken at various buildings within Port Everglades have exceeded the action level for lead in the water distribution system. In response to the Lead and Copper Rule (LCR), Port Everglades has completed a corrosion study, a nitrification control plan, has installed Point of Use filters in water fountains and kitchen sinks and has implemented a Public Notice Awareness program as required in the LCR rule and in coordination with FDEDP Health Department. Based on this information, Port Everglades is currently updating the corrosion study and preparing a scope of work for a water distribution model, including the additional water demand flows for the new developments and cruise terminals. This is an issue the Port will need to continue to monitor and management through the 2018 Master/Vision Plan horizon.

4.3.4 Climate Change, Resiliency and Sustainability

As noted in the 2014 Master Plan, the Port has been proactive in the response to climate change, resiliency and sustainability and has continued its program to reduce its carbon emissions and monitor the effects of program initiatives. The Port continues to explore methods of reducing the amount of solid and liquid waste generated during operations by implementing a variety of recycling and waste reduction programs, such as eliminating the use of mineral spirits and aerosols. Currently, the Port continues its recycling program for glass, plastic, colored and white paper, waste oil, absorbent rags, spent absorbent, batteries, tires, fluorescent tubes, print cartridges, and cardboard in the administrative building and are expanding these initiatives to other buildings and terminals. Port Everglades' Environmental Program ensures compliance with all applicable environmental laws and regulations and excels at implementing environmental stewardship initiatives, as directed by the Port's Mission Statement and reflected through voluntary membership in the Green Marine certification program.

As part of the critical infrastructure of Broward County, the Port will implement the Broward County Climate Change Element recently adopted into the County's Comprehensive Plan. The goals and policies in this element provide specific direction to local government agencies, including the Port, on critical issues to address in the context of climate change, including action items that affect immediate planning at the Port.

To evaluate the eventual effects of global climate change on the Port's shoreline, EPGMD and local municipalities are working on several initiatives that will be considered in the evaluation of future developments at Port Everglades

Southeast Florida Regional Climate Change Compact Unified Sea Level Rise Projection

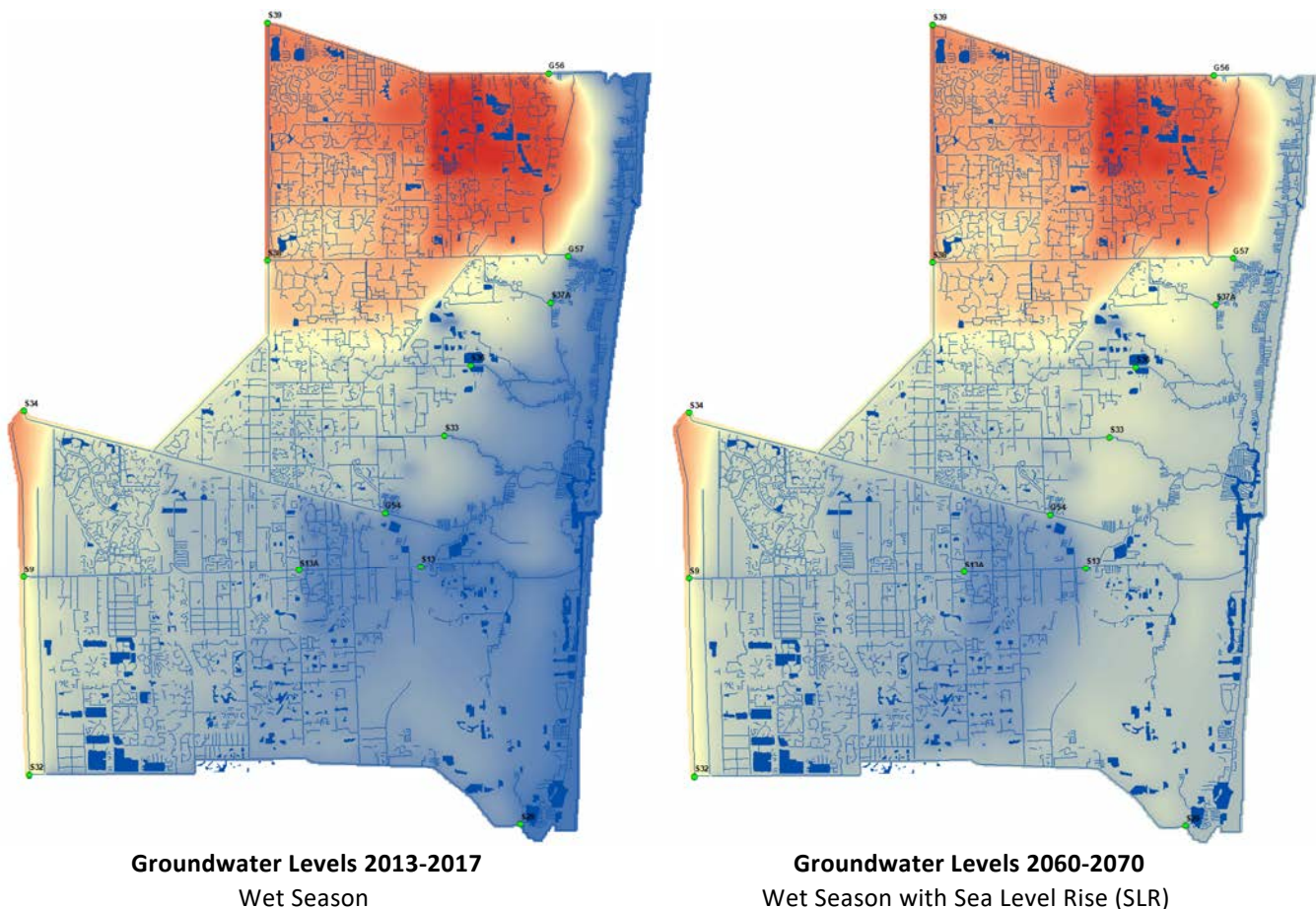
The Southeast Florida Regional Climate Change Compact, a collaborative between Broward, Palm Beach, Miami-Dade and Monroe Counties, updated the unified regional projection in 2019. The unified sea level rise projection is to be used for planning purposes to aid in understanding of potential vulnerabilities and to provide a basis for developing risk informed adaptation strategies for the region. In the short term, sea level rise is projected to be 10 to 17 inches by 2040 (above the 2000 mean sea level).

Evaluation of Drainage Infrastructure Capacity Under Projected Sea Level and Climate Conditions in Broward County, FL

The Future Conditions Groundwater Table Map, shown in Figure 4.3.2 and approved by the County Commission in 2017, requires drainage infrastructure for major development and redevelopment projects to be designed for year 2070 conditions, when sea level rise will have reduced the amount of rainfall that can be stored in the topsoil. The future groundwater table elevation across the Port varies from 1.5 to 2.5 feet North American Vertical Datum (NAVD).

Figure 4.3.2: Future Conditions Groundwater Table Map

Source: bcgis.maps.arcgis.com



Sea-level rise would affect low lying areas with existing vegetation, including mangroves in the environmentally protected areas and shallow seagrass beds present in various locations in the vicinity of the Port. The effects of the projected rate of change may not be inherently visible within the constraints of the Port's 20-Year Vision Plan, but it is imperative that long-term planning strategies look toward the future.

Future Conditions – 100-year Flood Elevation Map

The Broward 100-Year Flood Elevation Map requires the finished floor elevations of buildings to be higher than the flood elevations predicted for a 100-year return interval storm based on community hydrologic modeling under future conditions. A preliminary version of this map is under review by stakeholders and the deliverable to be released in 2020 will include future rainfall and flood projections. Since much of the Port Everglades stormwater infrastructure is at very low elevations, it will be important to consider future flood projections when retrofitting, amending land use or designing new infrastructure to higher elevations.

Regional Resilience Standard for Tidal Flood Barriers

A Seawall and Flood Barrier Standard, adopted into the Broward County Land Use Plan and proposed for code amendment, sets a minimum top elevation requirement of four feet North American Vertical Datum (NAVD) by 2035 and five feet NAVD by 2050 for all tidally-influenced waterfront property owners. This standard was informed by a study undertaken in collaboration with the US Army Corps of Engineers (USACE) and will reduce both the neighborhood flooding occurring now and increased flooding projected in the future because of high tides and rising sea levels. The USACE Flood Risk Management Study for Tidally Influence Areas was inclusive of Port Everglades and included surge and wave simulations for future storms and economic modeling. To encourage waterfront property owners to pursue more naturally resilient adaptation options, a living shoreline toolkit was developed containing four template designs for deep and shallow water and narrow and wide canals with guidance to simplify the permitting process and cost estimates to encourage pursuit of habitat and water quality enhancing adaptations. To support municipal implementation of the tidal flood barrier policy, County staff have coordinated with FDOT to utilize high resolution LIDAR elevation data to extract seawall and shoreline elevations and identify areas in need of priority adaptation. This pilot project demonstrated how pre-planned co-utilization of data can yield cross-jurisdictional cost-savings and expediency in project planning.

Countywide Risk Assessment and Resilience Plan for Capital Improvements

In Fiscal Year 2020, Broward County will initiate procurement for a countywide basin-scale assessment of necessary infrastructure improvements required to mitigate impacts of future flood conditions, inclusive of water management, transportation systems, critical infrastructure, green infrastructure, land use and urban design which

will serve as the foundation for a multi-decade regional resilient infrastructure improvement plan.

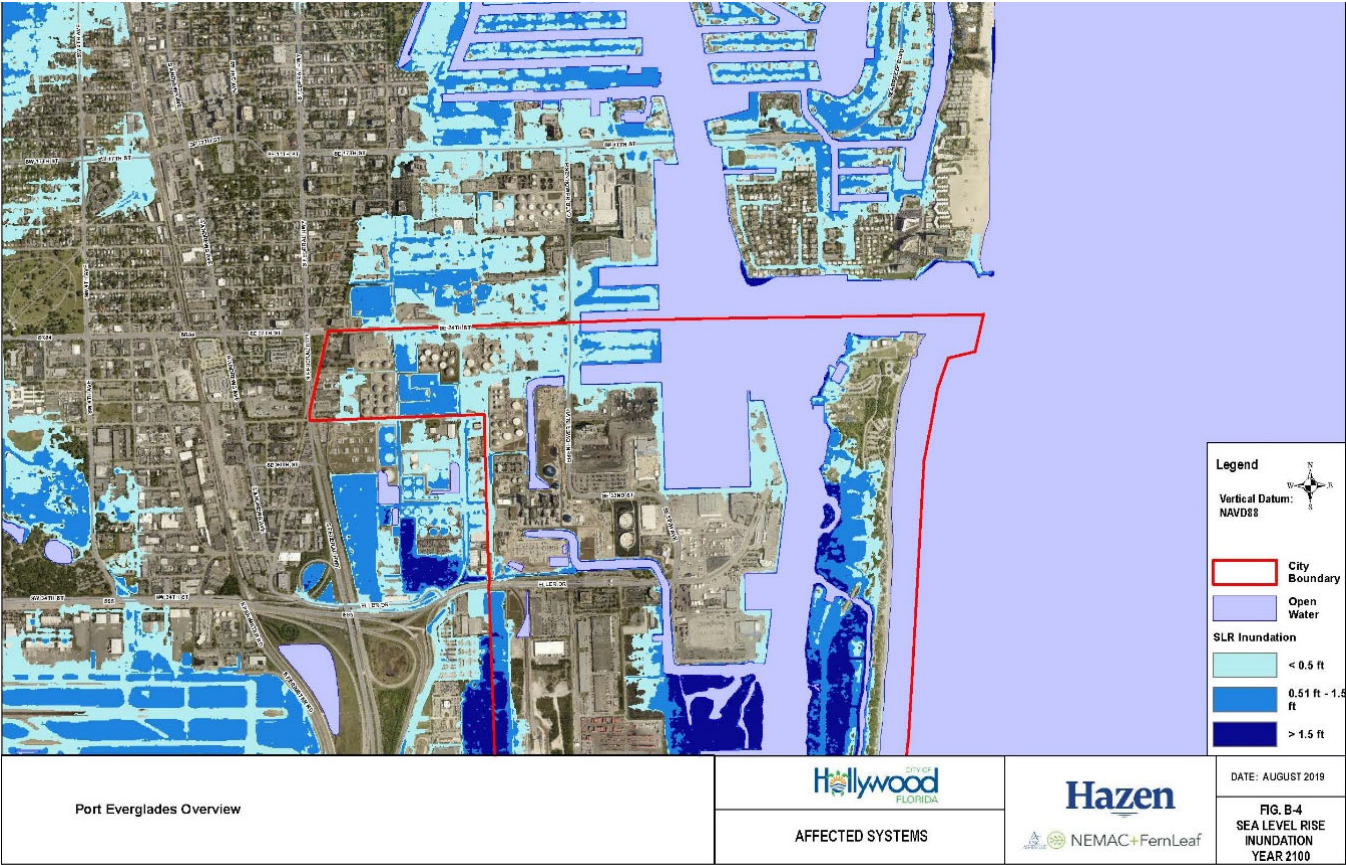
Resilient Design for Convention Center and Hotel Complex

To ensure the long-term resiliency of a nearly \$1 billion capital project and optimize financing terms, the County has incorporated floodproofing and wave and surge protection based on future sea level conditions in the design of the renovation of the Convention Center and Hotel Complex.

City of Hollywood – Vulnerability Assessment

As indicated by the SLR projections completed by Hazen and Sawyer for the City of Hollywood (see Figure 4.3.3), most of the projects for new developments, cargo areas, terminal expansion, etc. are above year 2100 inundation levels.

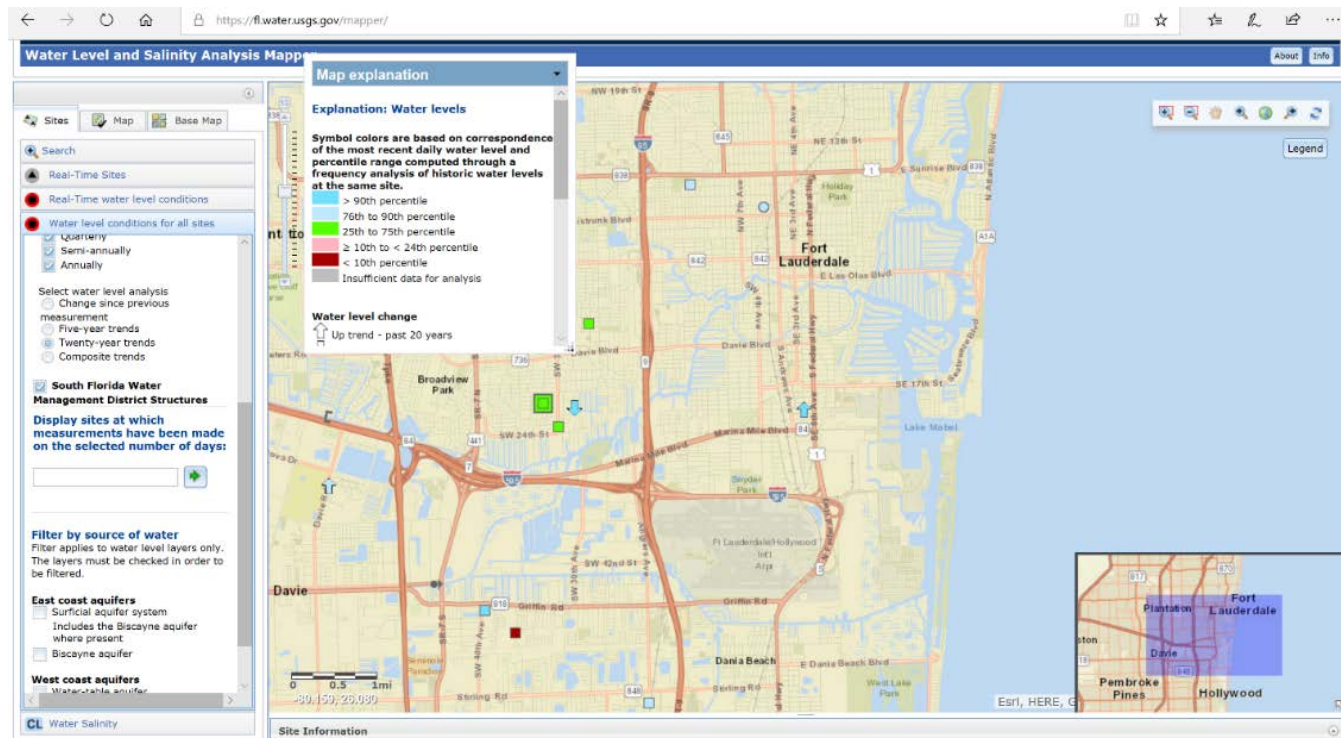
Figure 4.3.3: SLR – Year 2100 Projection Map
Source: City of Hollywood (Hazen and Sawyer)



Framework for a National Hydrological Analysis – USGS

Figure 4.3.4: USGS – Prototype National Hydrological Analysis Website

Source: USGS



The USGS is currently working on a framework for a National Hydrological Analysis prototype website with graphs, tables, statistical analysis for water level and salinity, and specific conductance (<https://fl.water.usgs.gov/mapper/>).

Green Infrastructure

Port Everglades encourages the implementation of Green Infrastructure and Low Impact Design alternatives as much as possible, like in parking lots, landscape and new developments. Port Everglades is currently working with Broward County EPGMD, Community Resiliency Division, to optimize the use of green areas, swales and local native vegetation to create eco-system.

Other Port Everglades Sustainability Initiatives

Port Everglades is committed to optimizing wildlife habitat value in available greenspaces and the Port is a member of the Florida Recycling Partnership with a 75% goal. Vehicle and boat energy-efficient diesel engine retrofits have been implemented and the Port has

replaced its on-road vehicle fleet with hybrids. The Port has also made several roadway improvements to reduce congestion and emissions due to vehicle idling. The Port has completed a \$4.4 Million energy performance plan for reducing air pollutants, including energy efficiency equipment upgrades in its cruise terminals and office buildings to produce an annual reduction of 9.8 million pounds of carbon dioxide, over 60,000 pounds of sulfur dioxide and over 17,000 pounds of nitrous oxide. In addition, almost 6,000 exterior light bulbs have also been mapped and are being replaced with more energy efficient and sea turtle-friendly alternatives; solar power initiatives are also being implemented, including at the new T2/T4 parking structure.

Another important issue regarding climate change is Greenhouse Gas Emissions and all projects proposed in the 2018 Master Plan will consider air quality improvements, as discussed in the following section. For the past several years, Port Everglades has provided to the USEPA data collected by a private consultant (Starcrest LLC) who was contracted by Port Everglades to prepare a 2015 air emissions inventory for Port Everglades. Prior to this collaboration the EPA was not using real data to make conclusions and/or to identify opportunities for ports to reduce air emissions.

4.3.5 Air Quality

Port-related impacts to air quality are driven by four major sources:

- Vessels
- Vehicles (trucks, passenger vehicles, buses and other rolling stock)
- Locomotives
- Yard equipment

Historically, increases in vessel or vehicle traffic, or in aggregate hours of operation of yard equipment, have led to a roughly proportionate increase in emissions. However, the global cruise industry, the international trade community and the State/Federal government are all making significant strides in reducing per-unit emissions by phasing in alternative fuel types and new technologies. This 2018 Update does not include a comprehensive or quantitative assessment of air emissions at Port Everglades. As previously mentioned, the Port is working directly with U.S. EPA to prepare an inventory of air emissions and identify opportunities to reduce them. However, this inventory is not yet complete and no baseline for Port-generated air emissions currently exists. From a

more qualitative perspective, however, it is clear that the projected growth in vessel calls and vehicle trips at Port Everglades along with the need to introduce additional yard equipment to help increase container terminal density and throughput will result in an increase in air emissions if not managed and/or mitigated. What follows is a summary of practices and technologies to be considered for introduction at the Port in the future to help balance growth in economic impacts with potential impacts to air quality associated with such growth. The focus of discussion is vessels and yard equipment rather than vehicles and locomotives due to the fact that the Port is better positioned to take measures to influence vessel and yard equipment emissions than vehicle or locomotive emissions, which are driven entirely by State and/or Federal regulations and standards. One exception as previously noted is the Port's own fleet of vehicles and other rolling stock, which the Port can and should upgrade to low- or zero-emission models following a natural replacement schedule based on the age and utilization of each vehicle in the fleet.

4.3.5.1 Vessels

The vessels calling Port Everglades vary substantially across essentially all categories, including age, size, energy consumption and engine efficiency, among others. Because of this, different vessels contribute to different degrees to air emissions. There are currently three principal means of reducing air emissions from vessels:

- Shore power
- Scrubbers
- Alternative fuels

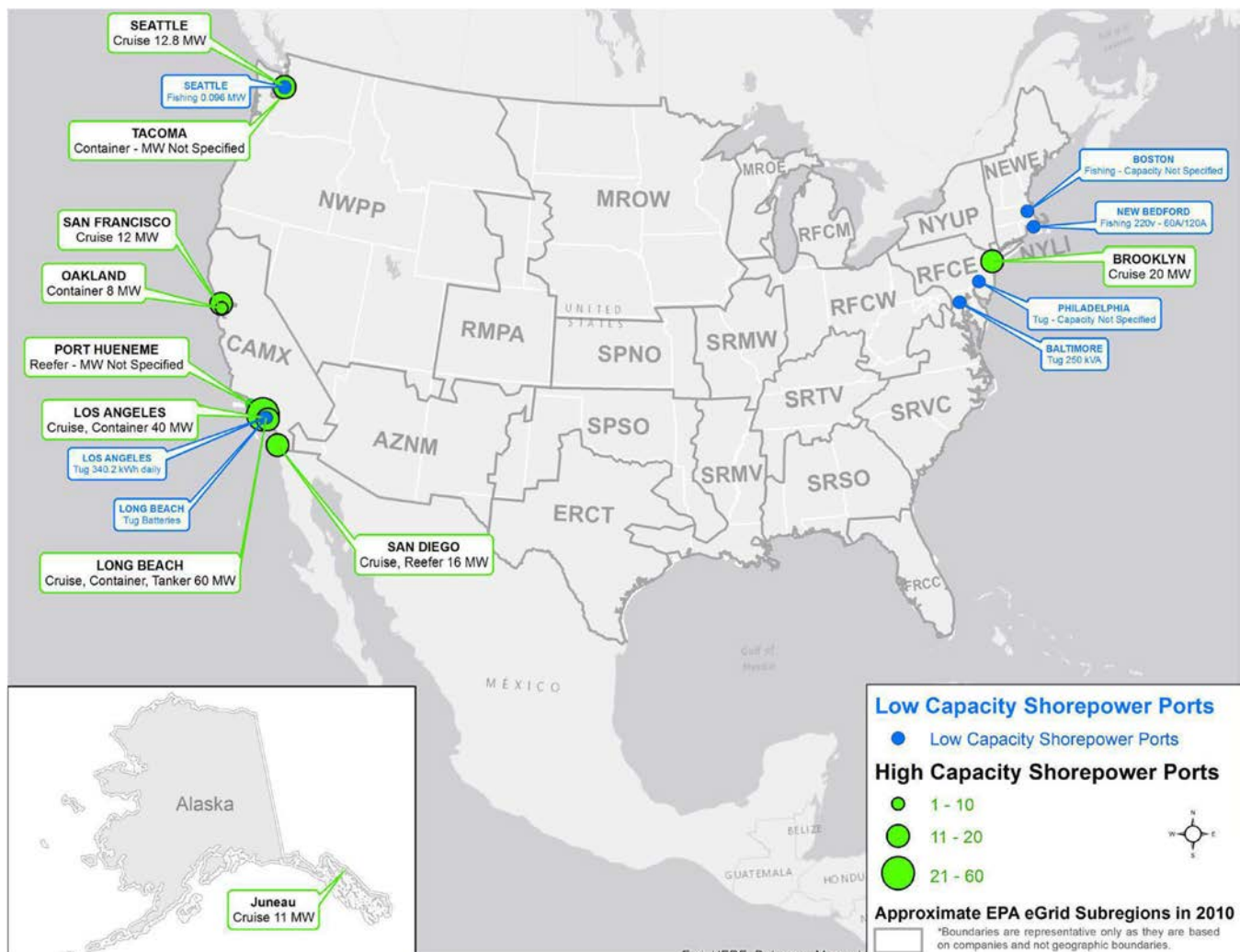
Shore Power

Generally speaking, the combination of cost, power supply, and overall lack of market demand for shore power due to the prevalence of other technological solutions that already surpass shore power as a more cost-effective means of reducing overall emissions has made shore power undesirable both for ports and for vessel owners/operators within North America. Ports are the main gateways for U.S. trade, and are essential to the economies of many cities and regions across the U.S. and throughout the world. The environmental footprint of ports is increasingly important in this context. In particular, as discussed above, impacts to habitat and wildlife, as well as water and air quality, are being scrutinized more than in the past, as a means of ensuring that economic benefits are

achieved in balance with environmental and social benefits. More and more, ports – including Port Everglades – are exploring ways to reduce the air emissions generated by activity within their jurisdictional areas through operational changes but even more so through technology. The terms of the North America Emission Control Area (ECA) require all oceangoing vessels to either: a) use low sulfur marine gas oil (MGO), in lieu of heavy fuel oil (HFO) to achieve sulfur emission reduction mandates at all times while within the ECA; or b) to achieve these same sulfur reductions via alternative means. In addition, most major cruise lines have adopted sustainability policies that include emission reduction targets. One technology that has been explored and selectively implemented during the past two decades to achieve emission reductions is shore power, also referred to as cold-ironing. Shore power allows vessels to plug into landside electrical power sources. Turning off vessel auxiliary engines at berth can significantly reduce diesel emissions compared to burning standard bunker fuel, in some cases. However, the benefits and desirability of shore power depend on several factors unique to individual ports. These include, but are not limited to:

- Geography
- Infrastructure (including upland electrical generation and distribution/transmission infrastructure in addition to berth delivery infrastructure)
- Availability and source of landside electricity (i.e. fuel oil vs. LNG vs. hydroelectric vs. other renewable sources)
- Prevailing rates for electricity delivery
- Existing regulations on vessel fuel type and/or emissions (i.e. ECAs)
- Other factors

Figure 4.3.5 (which is also included in Element 1 as Figure 1.10.17) shows active shore power installations at U.S. ports as of 2017.

Figure 4.3.5: Shore Power Installations at U.S. Ports, 2017*Source: U.S. EPA*

The basis for emissions reduction claims when using shore power stems from the potential to produce the electricity ships need to power their ancillary systems with fewer polluting emissions from landside electricity power sources (i.e. power plants), as compared to onboard diesel-powered auxiliary engines. Potential emissions savings associated with shore power therefore depend very directly on the type and grade of fuel being used by a given vessel at berth, as compared to the type and grade of fuel being used to generate electricity at the upland power plant serving that berth.¹ The emphasis

¹ Source: <https://www.epa.gov/sites/production/files/2017-05/documents/420r17004-2017-update.pdf>

for Port Everglades is cruise vessels, as opposed to liquid bulk, container, or bulk vessels for two reasons. First, cruise vessels have greater potential for emissions reductions at the port, given their far more substantial hoteling energy needs, compared to other vessel types. Second, cruise vessel call activity is far more predictable than that of other vessel types, meaning the logistics of supplying landside electrical power to cruise ships while at berth is more technically, though not necessarily economically, feasible.

Typically, shore power systems are supplied by the regional electricity grid. In the case of Port Everglades, this would be FPL. Thus, the emissions associated with producing electricity for shore power will vary, depending on the relative shares of zero/low-emission sources (i.e. wind, solar, hydroelectric, etc.) and higher emission sources (i.e. coal, fuel oil, natural gas, etc.). The relative shares of fuel sources can change over time (and even vary hour-to-hour, depending on electricity demand). Shore power proponents note that as the electricity grid becomes cleaner and more efficient, the potential emissions reductions, compared to auxiliary engines, will grow. However, the cost of shore power electric generation and delivery, for both the vessels and the terminal, can be substantial.

The emissions reduction benefits of shore power have been estimated or reported by a number of organizations and researchers. For example, in 2007, CARB estimated that their at-berth regulations applicable to California ports would reduce localized emissions of particulate matter (PM) by 75 percent and oxides of nitrogen (NOx) by 74 percent by 2020. These emissions reductions are expected to be achieved in one of two ways. First, fleet operators can use the “limited engine use” compliance approach by shutting off auxiliary engines (except for three or five hours of total operation), during 80 percent of port visits in 2020, and connect to grid-supplied shore power instead. Second, fleet operators can use the “emissions reduction option” compliance approach by reducing their fleet auxiliary engine emissions at berth by 80 percent; this implies that auxiliary power would come from other, lower emission sources (i.e. fuel cells) or through the use of emissions control technologies (i.e. scrubbers, or the Advanced Maritime Emissions Control System).² CARB compliance requirements were 70 percent in 2017, and will move to 80 percent in 2020.

² Source: <https://www.epa.gov/sites/production/files/2017-05/documents/420r17004-2017-update.pdf>

It is important to note that the North America ECA had not yet been established at the time the CARB emission reduction estimates above were projected. The ECA for North America entered into force in 2012, and has resulted in the use of cleaner, low-sulfur fuels in commercial marine vessels, which in turn has substantially reduced NO_x, SO_x and Diesel PM emissions from engines on newer vessels within 200 nautical miles of the U.S. coast. Under the ECA, fuel sulfur content was limited to 1.00 percent when the ECA entered into force in August 2012, and was further limited to 0.10 percent in January 2015. Additionally, marine engines installed on vessels built on or after January 1, 2016, and operating within the ECA are subject to stringent Tier III NO_x standards. These standards reduced NO_x emissions by 80 percent, compared to Tier I standards.

For U.S. ships, auxiliary engines are also subject to the Federal Clean Air Act (FCAA) program. Ship auxiliary engines typically fall under Category 1 (< 5L displacement per cylinder) or Category 2 (5L to 30L displacement per cylinder), as classified by the U.S. EPA. Tiers 3 and 4 exhaust emission standards put forward by EPA require Categories 1 and 2 engine manufacturers to reduce NO_x, hydrocarbon, and particulate PM emissions in newer engines for US-flagged vessels.³ The combination of the ECA NO_x emission requirements and the FCAA standards for engines on U.S. ships means that auxiliary engines are getting consistently cleaner. Therefore, the expected and observed emissions reductions from shore power vary, depending on the fuel mix of the landside electricity source and may or may not be material.

Ultimately, the studies examined by the U.S. EPA in its 2017 *Shore Power Technology Assessment* suggest that shore power could be an effective way to reduce port-related emissions of air pollution, particularly in non-attainment areas, but it is not the only means to that end. It is also the case that Port Everglades is an attainment area.

The principal challenges with implementing shore power specific to Port Everglades include:

- Availability of electricity
- Cost
- Competitive landscape/industry trends

³ Port Everglades does not currently feature a significant mix of U.S. flag vessels.

Apart from cost, which is discussed below, the biggest challenge with implementing shore power on a multiple berth basis is sourcing sufficient electricity to service the loads required, particularly during peak periods (i.e. Saturdays and Sundays from November-April). A single mid-sized cruise ship (i.e. *Queen Mary 2*) requires electrical demand roughly equal to that of a mid-sized airport, such as FLL (13 megawatts) during the course of a 10-hour homeport operation. On an eight-ship cruise day – or in the future, a nine-ship day – total demand at Port Everglades just for cruise-related shore power activity could range from 104-130 megawatts. To put this amount in perspective, it is equivalent to approximately 10 percent of the total output capability of the new FPL Clean Energy Center located at Port Everglades. This demand can also be erratic.

Given the loads involved, substantial power grid improvements would be required to support 1-2 high-utilization berths at Port Everglades, let alone eight or more (i.e. all cruise berths). Extensive underground transmission infrastructure would also need to be developed to connect each berth at Port Everglades to the grid.

Shore power can be expensive, particularly for ports that do not have low-cost access to renewable power (i.e. hydroelectric). Shore power becomes more economically attractive when bunker prices are high, since the cost of landside electricity must be compared directly with the cost of burning fuel onboard while at berth. In this sense, cost-effectiveness of shore power depends very directly on the cost of powering a given vessel at berth, using landside electricity vs. running the vessel's engines during the same amount of time.

In 2014, the most recent year in which the feasibility of shore power specific to Port Everglades was studied, it was determined that the cost to power a single cruise vessel at Port Everglades using shore power exceeded the cost of powering the same vessel, using onboard engines by 17 percent to 23 percent.⁴ This very significant premium has major potential competitive implications for Port Everglades, which are discussed below. However, the head-to-head comparison of variable costs associated with powering a vessel at berth – particularly a cruise vessel – is only part of the equation, since fixed capital costs associated with generating and transmitting electricity to berths is substantial and must also be considered.

⁴ Source: Port Everglades and FPL cost estimates, 2014

In 2008, FPL estimated the cost to develop shoreside infrastructure for shore power at a single berth to be \$7.5 million. More recently, based on 2016 cost estimates from the Massachusetts Port Authority (Massport), shore power installation at a single berth was estimated to cost as much as \$10 million (shoreside infrastructure only). The sole existing high-capacity shore power installation on the U.S. East Coast, the single-berth Brooklyn Cruise Terminal (BCT) shore power installation in Brooklyn, New York (see Figure 1.10.17), cost approximately \$20 million to develop (shoreside infrastructure only).

In addition to shoreside infrastructure costs, there are usually major costs associated with expanding power generation capability to meet the large electrical demands associated with shore power, particularly during the peak season and on peak days. Port Everglades is no different. FPL estimated in 2014 that the cost of a single substation capable of powering a single cruise berth was \$17.5 million.

Altogether, then, the cost per berth to develop shore power infrastructure at Port Everglades is in the range of \$25 million. To power all eight of Port Everglades' existing cruise berths would likely cost as much as \$200 million. Should the Port wish to install shore power at its Southport container terminal berths, additional per-berth costs would obviously factor in.

Competitive Landscape/Industry Trends

Separate but related to cost is the competitive factor. As shown in Figure 4.3.5, Brooklyn Cruise Terminal (BCT) is the only port on the U.S. East Coast to have implemented high-capacity shore power (cruise only), and shore power has not been implemented at any port on the U.S. East or Gulf Coast for containerized or non-containerized cargo vessels. The sole East Coast port (New York/New Jersey) to have installed shore power did so at just one berth.

Within Florida, the B&A team is unaware of a single port that is seriously contemplating installation of shore power. The primary reasons are cost and other feasibility issues as discussed above, but also lack of market demand, due to other technological solutions that are already surpassing shore power as a more cost-effective means of reducing overall emissions, including while at berth/in port.

The industry has made huge progress in recent years toward addressing air emissions using onboard solutions, including scrubbers and alternative fuels, primarily LNG. As of

the end of 2017, onboard scrubbers had been installed on at least 137 cruise vessels as follows:

• Carnival	85
• MSC	4
• NCLH	8
• RCCL	20

Given that Carnival and RCCL accounted for 99.9 percent of Port Everglades' 2017 cruise passenger volume, the vast majority – indeed almost all – cruise vessels that regularly call Port Everglades now have scrubbers installed, either as a retrofit or as an original design component.

Looking to the future, in light of additional IMO regulations that took effect on January 1, 2020, as well as long-term economic factors, the global cruise industry has clearly initiated a shift toward LNG as a fuel source. LNG produces zero emissions of sulfur dioxides, and compared to marine diesel oil, has a 95 to 100 percent reduction in particulate matter, an 85 percent reduction in nitrogen oxides, and a 25 percent reduction in carbon emissions.⁵ As of October, 2019, a total of 30 cruise vessels in service or on order had the capability to use LNG as a primary fuel. These vessels are distributed by brand as follows:

• AIDA	5
• Carnival Cruise Line (CCL)	2
• Costa	3
• Disney	3
• MSC	5
• P&O	2
• Ponant	1
• Princess	2
• RCI	3
• TUI	2
• Viking	2

⁵ Source: Carnival Corporation & Plc's LNG Vision

Converting to LNG offers numerous advantages. In terms of emissions, as noted above, using LNG as a primary fuel source allows cruise vessel operators to meet or exceed ECA requirements – not just while in port and not just within 200 nautical miles of the coast, but continuously; therefore, it reduces the overall impact of the global cruise fleet, including its carbon footprint. In terms of economics, the cost differential between LNG and HFO varies, but can be as much as 40 percent, and between LNG and MGO can be as much as 65 percent. Therefore, using LNG as a primary fuel source in the future could save the industry billions of dollars annually in fuel costs, assuming the majority of the global fleet eventually adopts this technology.⁶

By comparison, there are currently 59 cruise vessels in the fleets of the major global cruise brands that are shore-power capable.

In the absence of regulation that mandates local use of shore power, onboard emission reduction methods are strongly preferred from the perspectives of both a port and a vessel operator. For ports, onboard solutions reduce the capital burden for the port by transferring the cost of emission reduction to the rightful bearer of the cost (the vessel operator). For vessel operators, since cruise ships are inherently mobile assets that move and change locations constantly, onboard solutions allow for more flexibility in meeting different requirements at different ports in different regions around the world; they give cruise lines more control over vessel design criteria and operating parameters, since onboard solutions can be designed and integrated to meet the specific performance targets of the vessel operator fleet-wide, as opposed to on a ship-by-ship basis, depending on the region/port in which the vessel is deployed at any given time. From an overall public benefit perspective, onboard solutions also address emissions – not just locally, but more broadly, and not merely for 8-10 hours while the vessel is berthed, but continuously throughout the vessel's global, year-round operations.

Given all of the above information related to the current status of shore power, a fair assessment would seem to be that shore power represents a past solution to reducing air emissions, with scrubbers representing the predominant interim solution and LNG being the most viable long-term solution currently envisioned. A statewide regulatory mandate for all ports in Florida to implement shore power would theoretically level the playing

⁶ Comparative fuel rates sourced from shipandbunker.com; aggregate fuel savings calculation based on percentage savings applied to total fleets of major cruise brands.

field between Florida ports, and would almost certainly be strongly resisted by the industry, in light of the major investments being made in scrubbers, and especially LNG going forward. Therefore, doing so uniquely at Port Everglades would not only provide a competitive advantage, but would almost certainly serve as a major competitive disadvantage for two reasons.

First, if sustained over time, the differential in cost between powering a given cruise vessel using shore power vs. doing so using ships' engines as the current practice would serve as a business deterrent, since it would effectively increase the cost of calling Port Everglades by imposing a shore power premium that Port Everglades' principal competitors – Port *Miami* and Port Canaveral – do not impose.

Second, the high costs associated with developing shore power infrastructure at Port Everglades would add as much as \$200 million to the port's long-term capital program, and would create a very large opportunity cost. Since a \$200 million increase in capital expenditures for shore power would most likely have to be offset by a \$200 million reduction in other capital expenditures, other projects that are far more urgent in nature from a competitiveness and efficiency standpoint would need to be postponed or canceled to accommodate shore power, and such postponement or cancellation would very likely have negative commercial implications and potentially impact Port Everglades future volumes and revenue.

In summary, shore power does not appear to be feasible at Port Everglades. However, the global cruise industry and international regulatory bodies have made, and continue to make, major strides related to emission reduction policies and onboard emission reduction solutions. In other words, vessel-generated air emissions are likely to continue to decline long term, even without shore power being implemented.

4.3.5.2 Yard Equipment

Apart from vessels, the other major source of air emissions at the Port that the Port may be able to influence is yard equipment. Yard equipment includes STS cranes as well as other heavy-duty rolling stock used to move cargo, such as rubber-tire gantry cranes (RTGs), reach stackers, forklifts, etc. Electrified and/or alternative fuel models of most such equipment is already commercially available and Port Everglades has already implemented numerous strategies to manage air emissions generated by yard

equipment. All of the Port's STS cranes connect to the local FPL grid and run on electricity, for example as do all RTGs currently in service in Southport. Going forward, the Port can continue to partner with its marine terminal operators and other parties to ensure that best environmental practices are followed, including the prioritization of low- or "zero" emission yard equipment. As a landlord port, Port Everglades does not have the ability to force its tenants to purchase specific types of equipment. Nor is it likely in the Port's best interest to do so from a competitive perspective. However, a variety of incentives can likely be used to move individual tenants toward more sustainable operating practices on their leaseholds, thereby resulting in lower air emissions over time.

4.4 Business and Asset Utilization Strategies

4.4.1 Challenges and Success Factors

The following strategic challenges were addressed during the planning process:

- Developing strategies that help close the gap between the B&A team's unconstrained market assessments and the current Port business levels and affordability
- Maintaining assets in a state of good repair to maximize operational efficiencies while making investments to capture new or evolving market opportunities
- Identifying strategies to obtain maximum utilization of existing assets
- Ensuring that the 2018 Update delivers a mix of revenues and economic benefits that align with the Port's overall goals and objectives

To meet these and other challenges across its different lines of business, the Port must take the following actions:

- Port Everglades' waterside infrastructure must be modernized (i.e. deepened and widened) to meet the demands of larger vessels; this is particularly critical for containerized cargo and liquid bulk, but also applicable for cruise
- For cruise, substantially larger cruise ships and larger peak passenger volumes must be accommodated to increase multi-day passenger volume and remain competitive with other homeports serving the Caribbean
- For liquid bulk, operational efficiencies at Berths 7-13 and expanded/enhanced

petroleum terminal infrastructure and capabilities are required to maintain the Port's market share of petroleum products and its ability to continue to serve as a critical energy facility for all of South Florida

- For containerized cargo, operational efficiencies and landside infrastructure improvements are required to support the forecasted growth in volume
- Overall Port infrastructure must be maintained (i.e. bulkheads) and enhanced to maximize Port Everglades' value proposition and provide Port users with the highest possible levels of service as well as infrastructure that allows them to minimize operating costs; this includes upgrades to both cruise and container terminals as well as ancillary landside assets, particularly the multi-modal transportation network within and surrounding the port
- Responsible and responsive corporate citizenship must remain a focus of Port Everglades in order for it to continue to grow
- Security must remain a priority while facilitating Port commerce and minimizing costs

In addition to these actions, the following are key success factors in the Port's strategic business development, reflecting the Port's operating principle of sustainability and a planning model that balances the economy, the environment, and the community:

- Revenue must be sufficient to maintain bond coverage requirements, meet matching requirements for new funding, and fund both asset maintenance and new capital projects
- New revenue requirements must be tempered by market dynamics so that Port tariff and lease rates remain competitive in regional, state, and national markets
- Leasable real estate within the Port must be renovated and modernized or in several cases replaced
- Long-term parking capacity constraints must be addressed through the addition of new capacity; near-term parking capacity constraints must be addressed by adapting existing locations to accommodate overflow parking during peak periods
- Port Everglades must continue to be responsive to its tenants and customers while proactively partnering with them to achieve port-wide capital and operating improvements
- Critical support services for Port operations, such as inspection services and customs

must be accommodated as existing facilities and functions are relocated within the Port to accommodate new capital projects coming online, such as the STNE and the Tracor Basin fill project

- Environmental stewardship, sustainability principles and future resiliency must not be compromised

4.4.2 Summary of Strategic Considerations

To achieve the previously mentioned success factors, the Port's business strategies must consider the following:

- Status and integration of ongoing projects
- The Port's updated 5-year Master Plan (CIP) and 10- and 20-year Vision Plans
- The Port's likely future market position (i.e. most probable trade/cruise markets) and correlating volumes
- Implementation and timing of the U.S. Army Corps of Engineers (USACE) deepening and widening project
- Ways to adapt current operations to capture the full benefit of major projects as they come into service, especially the STNE, the USACE deepening and widening project and modifications to the Port's Midport cruise infrastructure – including construction and activation of the new Automated People Mover (APM)
- Ongoing challenges related to air-draft and crane-height restrictions in Southport
- Higher density container terminals and greater operational efficiencies
- Affordability and phasing of proposed infrastructure improvements so as to balance available funding with construction costs and maximize return on investment
- Impact of construction to replace aging bulkheads and modernize petroleum pipelines
- Near- and long-term traffic and parking management
- Design parameters to increase operational savings
- New approaches to land leases, user agreements and overall development of Port assets, including opportunities to more creatively partner with private and other third-party stakeholders to achieve common goals
- Balance between commerce and security

4.4.3 Port Strategies to Implement Broward County Commission Goals

As a Broward County Department, the Port Everglades Department (PED) is committed to implementing strategies that reflect and advance the goals of the County Commission. Consequently, the 2018 Update of the Port Everglades Master/Vision Plan identifies 16 strategies to meet nine specific County Commission goals as follows:

County Commission Goal 1

Attract and retain all types of business, especially high-wage industries that offer employee benefits, through partnerships with the Alliance, chambers of commerce, colleges and universities, CareerSource, and any other available avenues

- Port Strategy 1.1: Improve efficiencies within the Port to reduce operating costs for Port users
- Port Strategy 1.2: Ensure flexibility by anticipating and allowing for changing conditions over time so as to retain existing customers and attract new business opportunities where possible
- Port Strategy 1.3: Integrate related uses through physical adjacency, co-location and/or other forms of synergy in order to maximize the Port's value to its diverse users

County Commission Goal 2

Increase the economic strength and impact of revenue-generating County enterprises balancing economic, environmental, and community needs

- Port Strategy 2.1: Increase Port Everglades' operating capacity in order to meet as much future demand for cruise and cargo as possible while minimizing the impact of growth on the environment and surrounding community

County Commission Goal 3

Diversify the local economy, attract industries offering high-wage jobs with benefits while balancing economic, educational, environmental, and community needs

- Port Strategy 3.1: Ensure that Port Everglades continues to serve a diverse group of maritime and related users by developing infrastructure that allows growth across all existing lines of business while encouraging new business opportunities

County Commission Goal 4

Seek local, state, federal funding and public support for transportation projects that connect to existing transportation corridors, balancing ridership with community redevelopment demands

- Port Strategy 4.1: Partner with FDOT and, where possible, USDOT, to secure funding for projects that enhance multimodal opportunities and reduce traffic within and surrounding Port Everglades
- Port Strategy 4.2: Partner with County Administration and the cities of Hollywood, Dania Beach and Fort Lauderdale to implement creative solutions to improve traffic conditions within and surrounding Port Everglades

County Commission Goal 5

Support the development, design and construction of sustainable, multi-modal transportation facilities throughout the County, to meet the demands of residents, travelers and businesses

- Port Strategy 5.1: Partner with County Administration to ensure successful development of the Port Access Road
- Port Strategy 5.2: Partner with County Administration to ensure successful near-term development of the APM project connecting Fort Lauderdale-Hollywood International Airport and the Broward County Convention Center to the Port's Midport and Northport cruise facilities

County Commission Goal 6

Seek funding for, implement policies and pursue projects promoting, the use of alternative energies and sustainable practices

- Port Strategy 6.1: Partner with energy companies and the global cruise industry to implement near-term use of liquefied natural gas (LNG) as a primary fuel for cruise vessels
- Port Strategy 6.2: Implement LEED broadly across all Port facilities, striving for a minimum of LEED Gold certification, to minimize the carbon footprint and maximize the energy efficiency of the Port's many buildings
- Port Strategy 6.3: Work with all Port users to adopt more sustainable practices and

with cargo customers to increase use of electrified yard equipment

County Commission Goal 7

Proactively lead in the planning, design and construction of projects supporting resilience and climate adaptation, including coordination with other entities to foster resilient design as part of local and regional projects, especially shore protection efforts

- Port Strategy 7.1: Include coastal resilience and climate change adaptation as a key consideration in all future Port development projects

County Commission Goal 8

Support and seek local, state, and federal funds for coastal management of coral reefs through collaboration with other governmental jurisdictions

- Port Strategy 8.1: Where possible, support Countywide coastal management and coral reef protection and revitalization efforts

County Commission Goal 9

Provide diverse artistic, cultural, educational, and historical amenities and programs that contribute to a vibrant, multi-cultural and economically-viable community, including an annual signature event

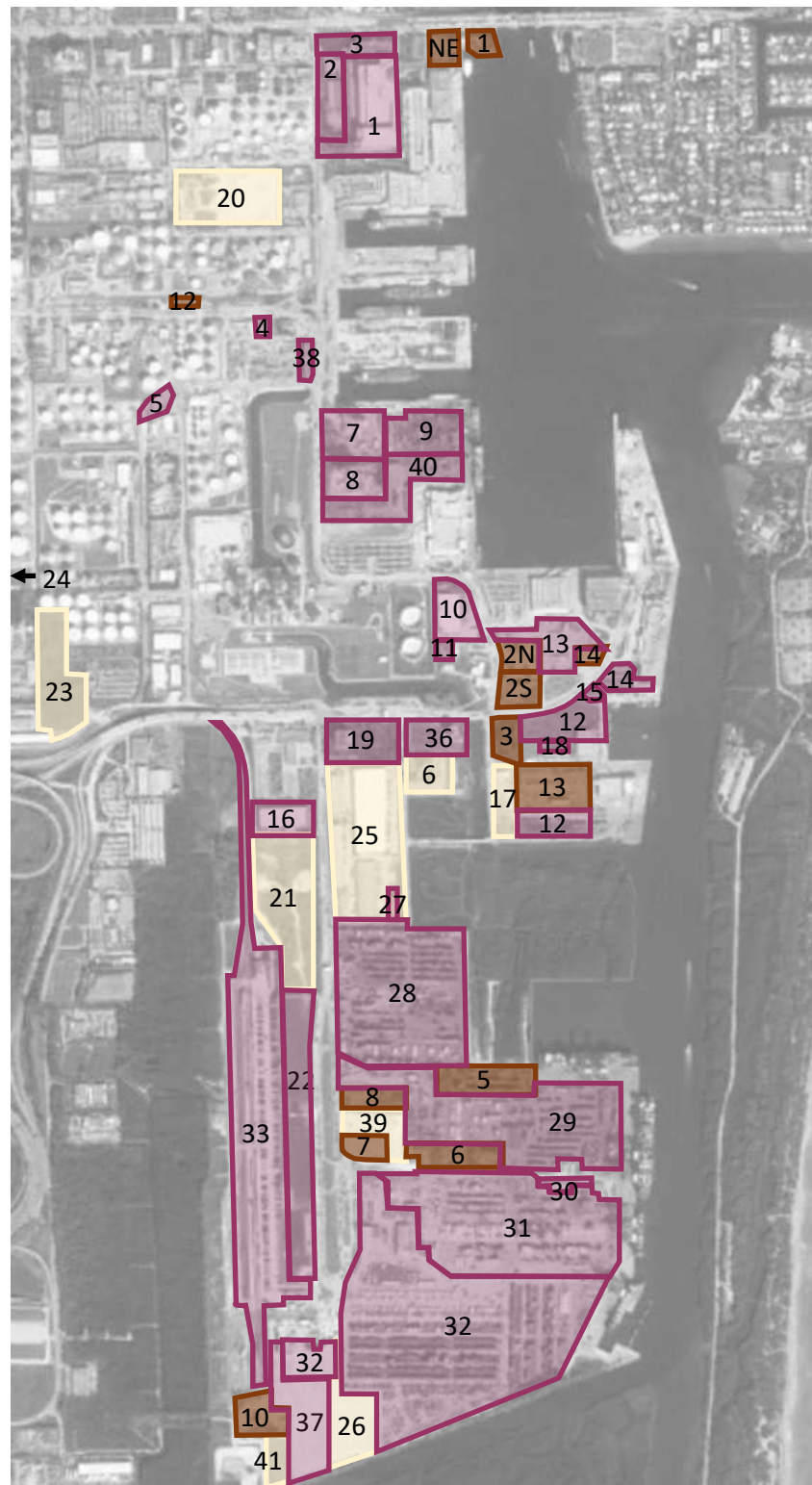
- Port Strategy 9.1: Continue to support the County's art in public places initiative by including world-class works by local/regional artists as part of all future cruise terminal development/redevelopment projects
- Port Strategy 9.2: Continue the Port's Shipshape event which gives local community members the opportunity to paint recycled oil drums for use as trash receptacles

4.4.4 Lease Opportunities

Port Everglades is a landlord port, meaning it leases most of its assets to private-sector tenants/users (i.e. marine terminal operators) rather than operating these assets using County staff. Port leases consist of two general categories:

- Land leases for marine terminal operations; and
- Office leases for maritime-related administrative functions

See Figure 4.4.1 for a list of all Port leases as of May, 2018. This same figure is included in

Figure 1.3.2: Port Everglades Land Leases and Grid Areas, May 2018*Source: Port Everglades; B&A***Land Leases (user: acres)**

1	Broward County Convention Center: 10.25 CVB
2	offices parking: 4.27
3	Portside Yachting: 3.894
4	Pittville: 0.40
5	Penn Tank Lines: 1.15
6	Vacant: 3.57
7	Lehigh Hanson: 4.91
8	CEMEX Construction: 4.61
9	H.T. Shipping: 7.00
10	Colorado Boxed Beef: 5.00
11	Resolve Fire & Hazard Response: 0.59 Horizon
12	Terminals: 8.67
13	Sol Shipping: 5.20
14	Seacor Holdings: 2.10
15	Tugz: 0.15
16	Chiquita ripening facility: 6.00
17	Vacant: 2.00
18	Horizon (warehouse & office): 27,560 sq ft High
19	Woods/Florida Holdings: 5.09
20	Vacant: 13.25
21	Vacant: 16.65 (future PE-ILC)
22	King Ocean Services: 18.40 (container yard 9b)
23	Vacant: 8.54
24	Vacant: 18.55 (off map, "Dynergy property")
25	Existing FTZ (future container yard): 24.67
26	Vacant: 5.06
27	IWS: 0.2328
28	Florida International Terminals: 36.03
29	King Ocean Services: 33.80
30	U.S. Customs & Border Protection: 1.18
31	Mediterranean Shipping Company/PET:
32	39.18 Crowley Liner Services: 78.00
33	FEC ICTF: 43.00
34	AMI Kids Greater Fort Lauderdale: 1.62 (off map)
35	Wildlife Care: 4.11 (off map)
36	Port Everglades Administrative Offices
37	Florida International Terminals: 12.00
38	Amman Building
39	Vacant: 3.75 acres
40	King Ocean Services: 7.00
41	Vacant: 4.00

Grid Areas (acres)

NE	1.50
1	1.14
2N	3.00
2S	2.34
3	2.80
5	5.00
6	4.60
7	2.64
8	3.42
10	3.96
12	0.23
13	6.59
14	1.60

The first category of lease typically consists of long-term multi-acre land plus facilities leases with companies that manage international containerized, dry bulk, break-bulk and/or ro-ro facilities at the Port. Other port users, such as tug boat companies and warehouse operators, among others, also lease Port land and/or facilities. These land + facilities leases constitute the vast majority of the Port's real estate agreements in terms of revenue.

The second category of lease is a basic commercial building lease. Port-owned office and warehouse spaces are available for lease by a variety of maritime users including cruise lines, cargo and petroleum companies, security companies, import/export companies, steamship agents, and others. The primary commercial office spaces available at the Port are located within the Port Administration Building located at 1850 Eller Drive, the nearby 1800 Eller Drive building or the Amman Building located on Eisenhower Boulevard near the corner of Spangler Boulevard. Seacor Holdings (Seacor) also leases an office building on 2.1 acres located just north of the Tracor basin in Midport.

Existing conditions at the Port as pertain to leasing opportunities are as follows:

Land Leases

- Overall leasing practices provide for relatively short-term agreements with opportunities for flexibility
- Southport marine terminal leases are negotiated independently, have staggered execution and expiration dates, and tend to be structured as 10-year agreements with one or two five-year options beyond the initial term
- Cargo leases typically involve a negotiated rate per acre (or per square foot) in addition to a minimum annual tonnage/container guarantee at a negotiated per unit wharfage rate
- Cargo leases typically include designated preferential berth and crane assignments; these can be named or unnamed berths/cranes
- Midport cargo leases primarily feature 5- or 10-year terms and/or may include short-term "grid" assignments ranging from 10 days up to a full year
- Limited "grid" assignments are also available in Southport to allow for maximum flexibility and functionality between different marine terminal operators
- Land suitable for occupancy within Port Everglades is almost entirely leased or otherwise under agreement on a continuous basis, reflecting extremely high market

demand

Commercial Office/Building Leases

- Most office spaces at the Port Administration Building and Amman Building are leased on a short-term basis
- The 1800 Eller Drive building and the parking area adjacent to it is leased in its entirety a private company who sub-leases individual spaces within the building to tenants; the current lease for this building expires in 2031
- The cold storage warehouse in Midport has a 50-year lease, which was executed in 1982 (i.e. expires in 2032)
- Commercial office and warehouse space within Port Everglades is almost entirely leased on a continuous basis, reflecting extremely high market demand

For the cruise line of business, rather than land leases the Port typically enters into long-term (i.e. 15-20 years) user agreements with individual cruise companies that are based on minimum annual passenger guarantees and a negotiated per-passenger wharfage rate. While cruise lines have preferential berth and terminal assignments designated in their agreements the Port does retain a limited amount of discretion related to the sharing of berths and terminals between different cruise lines.

The Northport tank farm area consists primarily of privately held land and is therefore not among the Port's real estate assets.

Going forward, a substantial amount of land redevelopment and repurposing of Port assets is envisioned in the 5-year Master Plan as well as the 10- and 20-year Vision Plans in order to achieve better adjacencies of like uses and so too greater operating synergies and efficiencies. In order to facilitate such redevelopment and repurposing of assets, it is crucial that Port Everglades develop and implement leasing guidelines and practices that ensure the most efficient use of Port land and facilities while achieving market rates that are competitive but also compensatory. This is especially important for the cruise and containerized cargo lines of business, which are the two largest users of port berths and acreage and also the two largest financial contributors to the Port. Future leases and user agreements should be negotiated in the context of, and aligned with, the same principles that served to guide the development of this 2018 Update of the Port Everglades Master/Vision Plan, namely:

- Capacity – does the lease/user agreement require the tenant/user to commit to higher volumes consistent with projected demand?
- Efficiency – does the lease/user agreement facilitate improvements in operating efficiencies and consider strategic long-term Portwide needs rather than just short-term individual tenant needs?
- Flexibility – does the lease/user agreement anticipate and allow for changing conditions over time?
- Integration – does the lease/user agreement integrate the long-term vision for the Port such that executing the lease/agreement does not preclude this vision from being achieved?

Additional key considerations for future Port leases and user agreements include:

- Term – does the length of the lease/user agreement impede implementation of other projects envisioned in the 5-, 10-, and/or 20 year plans?
- Compensation – are negotiated rates at Port Everglades similar to or higher than relevant comps?
- Creativity – are new leases/user agreements maximizing public-private partnerships and/or otherwise creatively exploring new ways to implement projects so as to achieve the long-term goals of the Port, its users and Broward County as a whole?

Including the above considerations, among others, as part of all future Port land use decisions, particularly as relate to lease/user agreement negotiations, is critical to the Port's development strategy and core to the Port's ability to achieve its long term vision.

4.4.5 Asset Utilization Strategies

Asset utilization is a systematic process for keeping infrastructure in what is generally called a "state of good repair." The purpose of an asset utilization strategy is to ensure that appropriate actions are taken to preserve the longevity, functionality, and economic return of the Port's capital investments.

Every two years, the Port has a report prepared to assess the condition of Port facilities. This biennial bond engineering report is published in three volumes; Port Facilities and Utilities, Port Cranes, and Port Underwater Infrastructure. The report documents the results of a months-long visual inspection of all Port owned and maintained facilities,

including buildings, open areas, lift stations, berths, roadways, railroad crossings, security gates, utilities, and cranes, as well as underwater infrastructure. A total of 3,776 individual items were identified across all categories during the most recent report (2017). Required repairs and estimated costs associated with executing these 3,776 repairs to the 165 facilities inspected as part of the 2017 Biennial Report are discussed in detail in Element 1. Generally speaking, as documented in the most recent biennial report, the condition of Port property is generally good and has shown continued improvement over the years due to ongoing investment.

A good asset management program has two components:

- 1) A computerized database that contains basic information about every asset
- 2) An optimization tool or set of rules to determine the best sequence for spending the funds that are available for maintenance, replacement, and new capital improvements

The asset management tool also permits an evaluation of tradeoffs between rehabilitation and full replacement to determine which is most cost-effective.

The Port's assets can be categorized into three major physical groups:

- Land
- Buildings, equipment, and site improvements
- Transportation infrastructure, both waterside and landside

Both "land" assets and "buildings, equipment, and site improvements" assets can be a source of direct revenue for the Port. Transportation infrastructure, however, is generally needed to service the other two groups and does not generate revenue directly.

Improvements to financial return on the Port's different asset types can be accomplished by:

- Adding to capital improvements with an increased rate of return
- Improving existing utilization rates without capital enhancement
- Reducing operating costs

Improved utilization rates for the Port's infrastructure can be accomplished as follows:

- Increased intensity of use of the Port's berths where possible; for example

- Handle more cruise vessel calls and revenue passengers at existing cruise berths
 - Handle additional non-cruise vessel calls (i.e. cargo) at existing cruise berths on non-cruise days to maximize berth utilization
- Development of longer, contiguous (straight) berths where possible to increase berthing flexibility and accommodate the maximum number of ships of various lengths
- Increased number of STS cranes per container berth to allow container vessels to “turn” more quickly, thereby reducing dwell time and increasing overall berth productivity as well as container throughput
- Consolidation of related spaces where appropriate to realize greater scale advantages and avoid infrastructure duplication and operational redundancies (i.e. shared container yards)
- Improved container yard densification using higher-density stacking technologies (i.e. RTGs, refer racks) to increase effective container yard capacity
- Transportation improvements that minimize traffic-related inefficiencies outside container terminal gates
- Modernized petroleum distribution facilities to realize greater throughput

Reducing operating costs – those of the Port but more importantly of the Port’s tenants and users – is one of the most important means of improving the financial return on the Port’s capital investments. If the cost of providing core services can be reduced without detrimentally affecting service quality and value, the asset will be better utilized and have a higher inherent utility-based value. Operating costs must be evaluated on an ongoing basis in partnership with the Port’s tenants and users in the following areas:

- Preventative maintenance program – evaluation and funding of a program to continuously maintain assets in good repair
- Weatherization of building facilities – evaluation of building roofs and rapid implementation of needed repairs; protection of buildings and equipment with advanced corrosion-resistant painting/coating systems
- Corrosion resistance of marine structures – installation of cathodic protection for bulkheads
- Stormwater management – evaluation of stormwater flows and temporary pooling

and whether they are accelerating asset depreciation; this is also an important sustainability issue for Port Everglades

Operating cost reductions can also be accomplished by linking the Port's maintenance management system to its planning activities. The Port uses a "real time" software system to organize the maintenance program further. This system, MP2, is a completely integrated asset management system that enables the Port to:

- Organize and track inventory
- Manage equipment costs
- Track equipment history
- Schedule preventive maintenance tasks
- Maintain labor records
- Allocate resources
- Generate and track work orders
- Requisition and purchase parts
- Project equipment failure and maintenance needs; for the Port's public works group, this tracking leads to:
 - Information about equipment downtime
 - Identification of hot maintenance spots in a facility
 - Justification for additional resources and personnel
 - Support for new equipment purchases.

For the Port's finance team this information can be used as the basis for cost accounting; for the Port's property management team, this information allows the Port to be proactive and responsive to the facility needs of its tenants

The MP2 system's information on asset downtime and utilization can also be used to provide valuable feedback into the Port's planning processes and efforts. Information from the asset management system offers Port planners access to system-wide, 24-hour data that can help characterize the performance of key assets, prioritize funding, and provide operations data and expertise to improve forecasts of future asset condition, and analyze the effectiveness of alternative investments.

Asset utilization strategies, when adopted by public entities, demonstrate that they operate in a businesslike manner. With an asset utilization system in place, Port Everglades

is able to manage, maintain, utilize, and obtain peak performance of its assets while also potentially reducing operating costs.

4.4.6 Key Business and Asset Utilization Concepts

There are six key business and asset utilization concepts that the Port must incorporate into its ongoing planning efforts to meet near-term and long-term growth objectives while ensuring sustainable financial and operating practices. These are summarized as follows:

- The Port must continue to increase its capacity in order to meet projected future demand, particularly for the cruise and containerized cargo lines of business
- Capital improvements should enhance flexibility and facilitate higher utilization of infrastructure assets, particularly berths and supporting upland areas (i.e. marine terminals, cruise terminals, parking structures)
- Diversification of commodity throughput should be maintained but also prioritized consistent with the individual business line market assessments completed as part of Element 2
- Operational efficiencies, such as mitigating traffic congestion and increasing petroleum-receiving system efficiencies should be prioritized in order to ensure the Port remains competitive
- Land use efficiencies (i.e. container terminal densification/reduced container dwell times) and traffic management solutions (i.e. terminal appointment systems) within and relating to leased areas, particularly in Southport, should be encouraged, incentivized and/or required as part of future lease negotiations
- Integration among Broward County's many assets – including Port Everglades, Fort Lauderdale-Hollywood International Airport, Broward County Convention Center, Port users, the local maritime/marine industry, the broader Broward County business community and the environmental community, among others – will help to align goals across County agencies and different stakeholder groups, and so too ensure that the Port continues to be able to grow

4.5 Financial Strategies

The 5-year Master Plan and the 10- and 20-year Vision Plans, which are presented in Element 3, are the road maps to identifying the infrastructure required to meet projected market demand at the respective planning milestones. The 10- and 20-year Vision Plans answer the question: “If Port Everglades is to meet the expected market demand at a milestone year, what infrastructure will be needed?” The 2018 Update has been further refined by establishing estimated order-of-magnitude design and construction costs for all projects included in the Plan.

The projects in the 5-year Master Plan are incorporated with the Port’s continuing general infrastructure, maintenance, and renewal programs to create a 5-year Capital Improvement Program (CIP). This CIP, which covers the fiscal period from and including 2019 through 2023 (October 2019 through September 2023, consistent with Broward County’s fiscal year), consists of a development program that can be implemented within identified project budgets with funding available at the time needed. The Port’s 5-year Master Plan/CIP as presented in this 2018 Update (see Element 3) has been developed in close collaboration with and in some cases by County staff – including the executive leadership of Port Everglades as well as the County Administrator and her senior staff – and represents a near-term development program that is capable of being implemented within the established time frame and anticipated overall program budget.

As shown in Element 3, projects included in the 5-year Master Plan of this 2018 Update were selected and approved because of their ability to add immediate value to the Port, consistent with the need to increase capacity, enhance efficiency, maintain flexibility and ensure long-term integration with other near-term and long-term development programs and projects.

As with past Master/Vision Plan updates, the principal financial strategy guiding the development of the 5-year Master Plan portion of the 2018 Update applies the asset utilization strategies outlined above to analyze and prioritize key requirements and incorporate sustainable and high value-added projects into the CIP to meet those requirements. This strategy recognizes that projected gross revenue from a project cannot be the only criterion used to evaluate the project since other criteria, such as those included in the project decision matrix presented in Element 3 must also be used to assess

the overall benefit of the project more holistically, including its economic and environmental impacts.

There are four key financial concepts that the Port must use to meet its near-term and long-term growth objectives while ensuring sustainable financial and operating practices. These are summarized as follows:

- Port revenues should be maximized – with an emphasis on opportunities to generate new revenue streams – within competitive constraints and Port operating costs – including labor, utilities and other expenses – should be minimized where possible to increase net income
- Utilization of alternative funding sources, such as Federal and State grants as well as public-private partnerships, should continue to be pursued aggressively and implemented whenever possible to ensure that the Port achieves its future vision in close partnership with other vested Port interests (i.e. shared financial risk) and to ensure that the Port sustains acceptable levels of debt coverage
- A project decision matrix that evaluates and assigns relative values to competitiveness, economics and sustainability should be used to make go/no-go decisions on all proposed infrastructure projects
- Port revenues must, at minimum, cover bond requirements and fund investments to maintain assets in a state of good repair as well as make much needed capital improvements, consistent with the 2018 Update of the Master/Vision Plan

The third and fourth bullet points above are discussed at length in Element 3 (Section 3.8 – Project Decision Matrix; Section 3.10 – Affordability Analysis). The remainder of this section focuses on the first two bullet points, namely: 1) opportunities to maximize revenue to the Port/incorporate new revenue streams; and 2) opportunities to use third-party funding sources to lessen the Port’s financial burden and better distribute financial risk across a broader segment of stakeholders.

4.5.1 Opportunities to Maximize Port Revenue/Generate New Revenue

As an asset of Broward County, Port Everglades is a public enterprise whose mission does not include maximizing net income. However, in order to achieve its core mission, which includes being an economic powerhouse, the Port must be positioned to be financially self-sustaining. This means that part of the Port’s mandate is to

operate efficiently and generate sufficient net income to fund ongoing operations as well as new projects that facilitate future growth, such as those included in the 2018 Update of the Master/Vision Plan.

As previously discussed, the Port must balance its need for revenue with its need to remain competitive. Since competition inherently puts constraints on how much the Port can charge for its services, and since land available for beneficial use within the Port is not only finite but already highly utilized, there is an upper limit on the revenue that the Port can generate from its ongoing cruise, liquid bulk and cargo operations. Still, the Port is a highly specialized, highly valuable waterfront asset and as such demand for space within the Port can and should command a price premium.

As discussed in Section 4.4.4 above, future leases (and other user agreements) must ensure the most efficient use of Port land and facilities while achieving market rates that are competitive but also compensatory. With a 20-year capital program in excess of \$3 billion it is critical that Port Everglades have sufficient debt coverage and cash flow to make the proposed improvements. Since the Port's tenants and other users are the primary beneficiaries of Port investment it is only fair that the fees they pay to the Port reflect the value they realize from this ongoing investment.

Apart from pursuing the maximum return on investment possible from negotiated agreements with its core tenants and users, Port Everglades should pursue new revenue opportunities wherever practical. B&A believes there are at least three such potential opportunities for new revenue. These include:

- Parking/Port Access Fees
- Commercial Office/Building Leases
- Alternative/secondary use of cruise terminals

Parking/Port Access Fees

Section 4.2 discusses future cruise-related parking demand at length. As stated in that section, one of the main challenges with parking at Port Everglades is the substantial leakage of parking revenue that occurs due to the presence of numerous third-party parking operations in very close proximity to the Port. The Port offers convenient and safe parking for its cruise passengers. This should allow the Port not only to capture the vast majority of cruise-related parking demand, but to charge a slight premium for on-

port parking as well. This is not currently happening, however, because the alternative parking options surrounding the Port have limited or no capital costs to cover and are therefore able to undercut the Port from a cost perspective.

It is no surprise that lower-cost parking is attractive to a certain segment of the cruiser population. However, uniquely at Port Everglades, these alternative parking options are not only less expensive, but also relatively convenient due to their proximity to the Port's Midport entrance located on Eller Drive. This combination of cost and convenience has prevented Port Everglades from capturing a higher percentage of cruise parking demand and has forced the Port to charge less for premium parking than the market would otherwise support.

In order to capture additional parking revenue going forward Port Everglades should seriously consider a Port access fee that either levels the playing field or tips it in the Port's favor by charging shuttles, taxis, app-rides and other third-party transportation providers to enter the Port. Such a fee – which would not be assessed to cars parking in on-port structures – if structured properly, would not only eliminate the cost advantage of off-port parking but actually create a disincentive to park off-port by making on-port parking either cost-neutral or cost-advantageous (depending on the amount of the fee) while also being more convenient. At minimum, the per-day cost of parking in an on-port structure should be equalized with that of parking off-port.

The expected impact of such a fee would potentially be two-fold in that the Port would either see an increase in on-port parking utilization due to the additional value offered by terminal-adjacent structures or utilization would remain lower, but with an additional revenue stream in place to make up for the leakage to off-port lots. Such a fee is not unlike what many airports, including Fort Lauderdale-Hollywood International, already charge taxis and other transportation providers for access. The amount of this fee and policies and rules related to its application would have to be further studied in order to determine its feasibility and/or desirability, but B&A believes that the Port should prioritize exploring such a fee in the near-term since the potential incremental parking utilization and revenue to the Port could be significant.

As shown in Table 4.2.2, long-term parking demand is expected to be sufficient to support all current and planned capacity during periods of average use, but peak periods will require additional parking options, so even with such a fee in place some amount of off-

port parking capacity will be required. The goal is therefore not to eliminate all parking competitors, but rather to restructure the flow of cruise passenger parking revenue from nearby surface lots that currently contribute nothing to the Port's capital needs back to County-owned structures that support the Port's cruise value proposition by providing safe, secure and convenient terminal-adjacent parking for cruise guests.

Commercial Office/Building Leases

The Port has historically seen high demand for its available on-port office space with occupancy above 90% being common at any given time. Looking to the future, the commercial consolidation project included in the 20-year Vision Plan of the 2018 Update seeks to increase both the quantity and quality of commercial office space available at the Port by consolidating several existing facilities into a new commercial campus that includes a minimum of 25 percent in additional capacity along with services (i.e. food and beverage) that are not currently available within the Port's secure perimeter. While a detailed commercial real estate assessment would need to be performed prior to developing such a facility, B&A believes that demand would be very high and that the incremental revenue potential of such a commercial campus would be substantial over the life of the asset.

Alternative/Secondary Use of Cruise Terminals

As discussed in Element 3, many ports across the U.S. and internationally have realized that cruise terminals can be highly-desirable, premium waterfront event venues. Port Everglades has not historically allowed for-profit events within its cruise terminals. However, B&A strongly recommends that a market study be conducted to determine whether or not there is sufficient demand for waterfront event venues in Broward County to justify a change in policy such that one or more cruise terminal at the Port could generate supplemental revenue as an event space. Options for secondary uses include conventions, meetings, exhibitions, weddings, fundraising events, dinners, food and beverage festivals and other corporate, non-profit and private functions. B&A cannot accurately estimate the amount of potential revenue that the Port might be able to generate from events held at its cruise terminals and such revenue is unlikely to come close to that generated by cruise operations. However, based on results at other ports who have allowed such uses, it is not unreasonable to think that anywhere between \$500,000 and \$1 million per year might be possible.

Demurrage

As noted in Element 3, the Port currently allows unlimited free time for storage of loaded and empty containers within its terminals. Most other ports within the U.S. and many international ports have adopted strict free-storage limits on all container types to promote higher throughput rates and avoid congestion. This policy-based solution, which can easily be enacted and modified via the Port's tariff, incentivizes owners of containers to move them off-port as quickly as possible in order to avoid incurring monetary penalties for on-port storage. This type of tariff, known as demurrage, is not intended to be a source of Port revenue and would first and foremost be used as a tool to increase terminal throughput rates. However, since it would also involve a monetary penalty, this tariff could and should be sufficient to cover any Port costs associated with administering and enforcing its free time policies.

4.5.2 Alternative Funding Sources

Port Everglades has been successful in the past in securing private, State, and Federal funding in the form of public/private co-investment, grants and loans that have helped to develop several critical projects, including among others:

- Cruise Terminal 18 (T18) (public/private co-investment)
- ICTF (public/State/private)
- STNE (Federal)
- Eller Drive-I-595 overpass (State)

The 2018 Update assumes that Port Everglades will continue to be successful not only in securing State and Federal grant dollars but in achieving a greater degree of public/private co-investment in its facilities in partnership with its tenants and other users. These third-party partnerships are vital to the feasibility of the overall Plan. Not only can the Port not afford to develop all projects included in the 2018 Update using only Port funds, but it is no longer a reasonable expectation that the Port should have to do so given the number of public/private co-investment precedents that exist for both cruise and cargo projects at other ports across the U.S.

In light of this new reality as relates to port development, the 2018 Update of the Master/Vision Plan assumes that Port Everglades will be responsible for roughly two thirds (\$2.01 billion) of the \$3.02 billion overall capital improvement program included in the updated Plan. Tables 4.5.1-4.5.3 identify minimum third-party funds that are expected to be available to support the implementation of the proposed 5-year Master Plan and 10- and 20-year Vision Plans.

Table 4.5.1: Anticipated Project Funding by Source – 5-Year Master Plan

Source: Port Everglades; B&A

Project		\$ (000)				
Funding Source	Port	Private	County	FDOT/ FSTED	Federal	TOTAL
T2/T4 Parking Garage	\$112,401					\$112,401
Maintenance Facility Consolidation	\$17,500			\$3,500*		\$21,000
Slip 1/Phase 1 (Berths 9/10 Bulkheads)	\$88,809	\$40,000		\$8,691		\$137,500
Port Access Road			\$35,000			\$35,000
T21 Redevelopment	\$69,000	\$51,418		\$3,500*		\$123,918
Ro-Ro Yard Relocation/ Expansion	\$9,549					\$9,549
3 SPP STS Cranes	\$45,207			\$9,400		\$54,607
PEV ILC	\$2,500	\$27,500				\$30,000
Phase 9A	\$18,500					\$18,500
STNE	\$335,744			\$97,433**		\$433,177

* Anticipated future FSTED funds

** Includes \$34.5 million bond

Project						
\$ (000)						
Funding Source	Port	Private	County	FDOT/ FSTED	Federal	TOTAL
SP Crane Rail	\$64,371			\$15,211		\$79,582
3 SPP STS Cranes	\$41,400					\$41,400
USACE Deepening & Widening (USCG Recon)	\$9,800				\$29,300	\$39,100
USACE Deepening & Widening	\$57,634			\$94,826	\$231,577	\$384,037
Former Dynegy Logistics Development		\$50,000				\$50,000
Auto Terminal West		\$20,000				\$20,000
I-595 Flyover	\$6,897			\$39,081*		\$45,978
Berths 1A, 1B, 2, & 3 Bulkheads	\$22,000			\$3,500*		\$25,500
Berths 7, 8, 8A & 32 Bulkheads (Design)	\$3,400					\$3,400
Berths 16-18 Bulkheads	\$15,330			\$10,866*		\$26,196
Berths 21 & 22 Bulkheads	\$21,058					\$21,058
Entrance Channel North Wall	\$12,000					\$12,000
TOTAL	\$953,100	\$188,918	\$35,000	\$286,008	\$260,877	\$1,723,903

* Anticipated future FSTED funds

Table 4.5.2: Anticipated Project Funding by Source – 10-Year Vision Plan*Source: Port Everglades; B&A*

Project		\$ (000)				
Funding Source	Port	Private	County	FDOT/ FSTED	Federal	TOTAL
Break-bulk Yard	\$3,100			\$3,500*		\$6,600
Slip 1/Phase 2 (Berths 7, 8, 8A & 32 Bulkheads)	\$37,000			\$3,500*		\$40,500
Tracor Basin Fill	\$64,526			\$3,500*		\$68,026
Ro-Ro Yard Expansion	\$1,106					\$1,106
T29 Redevelopment	\$61,959	\$61,959				\$123,918
T26 Redevelopment	\$61,959	\$61,959				\$123,918
T29/T26 Parking Structure	\$41,190					\$41,190
Phase 9C-1	\$3,765					\$3,765
Griffin Road Ext/NE 7th Ave Improvements	\$21,234					\$21,234
McIntosh Road Realignment	\$18,439					\$18,439
Container Terminal Reconfiguration	\$37,628					\$37,628
APM/Rail Extension (TBD)	\$0					
Berth 29 Bulkheads	\$13,800			\$3,500*		\$17,300
Berths 4-6 Bulkheads	\$29,800			\$3,500*		\$33,300

* Anticipated future FSTED funds

Project		\$ (000)				
Funding Source	Port	Private	County	FDOT/ FSTED	Federal	TOTAL
Berths 14 & 15 Bulkheads (Design Only)	\$2,810			\$3,500*		\$2,810
TOTAL	\$398,316	\$123,918	\$0	\$17,500	\$0	\$539,735

* Anticipated future FSTED funds

Table 4.5.3: Anticipated Project Funding by Source – 20-Year Vision Plan

Source: Port Everglades; B&A

Project		\$ (000)				
Funding Source	Port	Private	County	FDOT/ FSTED	Federal	TOTAL
Slip 3 Expansion (Berths 11-13 Bulkheads)	\$132,480			\$3,500*		\$135,980
Ro-Ro Yard Expansion	\$5,098					\$5,097,756
Berth 19 Finger Pier	\$121,120			\$3,500*		\$124,620
T19 / T20 Redevelopment	\$103,562	\$107,062		\$3,500*		\$214,124
T19 / T20 Parking Structure	\$53,266			\$3,500*		\$56,766
Phase 9C-2	\$17,691			\$3,500*		\$21,191
1 Small STS Cranes	\$11,167			\$3,500*		\$14,667
Commercial Consolidation	\$137,498					\$137,498

* Anticipated future FSTED funds

Project		\$ (000)				
Funding Source	Port	Private	County	FDOT/ FSTED	Federal	TOTAL
Berths 19 & 20 Bulkheads	\$16,000			\$3,500*		\$19,500
Berth 23 Bulkhead	\$3,600					\$3,600
Berths 24 & 25 Bulkheads	\$17,000			\$3,500*		\$20,500
Berths 26 & 27 Bulkheads	\$16,600			\$3,500*		\$20,100
TOTAL	\$659,581	\$107,062	\$0	\$35,000	\$0	\$801,643

* Anticipated future FSTED funds

In addition to the non-Port funds identified in Tables 4.5.1-4.5.3, there will be numerous opportunities to pursue additional State and Federal funds during the coming 20 years. These opportunities include Better Utilizing Investments to Leverage Development (BUILD – formerly known as TIGER) grants, Diesel Emission Reduction Act (DERA) grants, Transportation Infrastructure Finance and Innovation Act (TIFIA) loans, Infrastructure for Rebuilding America (INFRA) program funds and Maritime Administration (MARAD) Port Infrastructure Development grants, among other opportunities, and additional FDOT/FSTED grants at the State level. Most Federal funds are awarded through a highly competitive application and lobbying process, meaning there is no guarantee that the Port will be successful in securing additional Federal funding for its projects. However, several ports – including at least two in Florida – have been very successful in securing competitive Federal grant awards so the Port should continue to pursue such opportunities aggressively using a strategic approach that increases the chance of success. It may also be possible for the Port to achieve higher levels of direct investment by Southport tenants to support the additional work required to consolidate land, improve operations and increase overall container terminal throughput there. Such opportunities should be explored on an ongoing basis and integrated into the lease negotiation process.

4.6 Goals, Objectives and Policies

Port Everglades is a powerful economic generator for Broward County, generating over \$30 billion and supporting roughly 13,000 local residents directly and facilitating over 231,000 jobs Statewide in 2018.⁷ Economic vitality is, therefore, a fundamental focus area for the port. There are several policies and systems established to guide the efficient and successful operation of Port Everglades so that it can continue as a viable world-class port, meet the needs of its users and other customers, substantiate its diverse revenue sources, capitalize on funding opportunities, and continue to boost tourism, trade, private commerce, and the wider economy.

The Deepwater Port Component (DPC) of the Broward County Comprehensive Plan aims to clearly define a core vision for the Port's coordination, operation, and development under the following four focus areas:

- Economic Vitality
- Safety & Security
- Environmental Stewardship
- Community Engagement

The Port Everglades Master/Vision Plan serves as the state-mandated port master plan for the Port Jurisdictional Area (PJA). The Local Government Comprehensive Planning and Land Development Regulation Act, Chapter 163, Florida Statutes, requires that port master plans include goals, attainable objectives, and specific implementation policies to measure a port's progress in achieving its adopted goals. The DPC is therefore not a substitution for the 20-year Master/Vision Plan but, rather, shares the long-term objectives of the plan and sets the foundation by which this vision can be achieved.

This section presents the goals, objectives, and policies identified by Port Everglades (referred to within the DPC as "PED") to comply with state requirements and implement this Plan over the planning period in response to market demand and the availability of funding resources. Underlying these goals, objectives, and policies, which reflect the Port's commitment both to local and regional economic growth and to the sustainability of the surrounding ecosystems, is the Port's previously cited mission statement (see Section 4.1).

⁷ Source: Martin Associates 2018 Economic Impact Report for Port Everglades

4.6.1 Economic Vitality

DPC Goal 1

Continue to develop, maintain, and improve the Port as a competitive and viable deepwater facility to serve local and regional shipping and cruise tourism needs. In so doing, it shall provide for the economic well-being and environmental sustainability of Broward County and the surrounding region through the planned use of the land in the Port Jurisdictional Area (PJA). Additionally, Port Everglades shall maintain financial capability, self-sufficiency, and fiscal responsibility while implementing its development programs.

- **Objective 1.1 – Infrastructure Development**

Port Everglades Department (PED) shall provide adequate maritime facilities, consistent with the need for trade, industry, and commerce, to ensure the availability of the land and infrastructure necessary to meet the projected requirements of the Port's core business sectors

- Policy 1.1.1

During the 5-year planning period, PED shall implement infrastructure improvements in Northport, Midport, and Southport, increasing berth capacity and efficiency, expanding cargo-handling and cruise terminal areas, acquiring additional cranes and other equipment, and pursuing further capital improvements, as necessary to serve forecasted demand

- Policy 1.1.2

PED shall provide adequate maintenance and upkeep of in-water and upland infrastructure to gain the best use from its facilities

- Policy 1.1.3

PED shall continue to promote the use of multi-purpose berths and other facilities for cruise and cargo activities to maximize their occupancy

- Policy 1.1.4

PED shall continue to develop the Port in a manner that achieves a pattern of land uses characterized by the concentration and interconnection of related compatible land uses

- Policy 1.1.5

PED shall pursue the development of intermodal facilities within the Port Jurisdictional Area (PJA), capitalizing on the completed intermodal container

- transfer facility (ICTF) to ensure the Port's continued ability to compete for global trade, and multimodal access facilities to enhance the Port's cruise passenger business
- Policy 1.1.6
PED shall maintain its designation as a Foreign-Trade Zone and pursue expansion, as feasible
 - Policy 1.1.7
As described in the 10-year and 20-year Vision Plans that are part of the complete Port Everglades Master/ Vision Plan, PED shall pursue additional capital improvements to provide the supporting infrastructure needed for future Port operations
 - Policy 1.1.8
Broward County will expand the Greater Fort Lauderdale/Broward County Convention Center and plan for the development of a convention center hotel to meet demand for larger conferences and conventions
- **Objective 1.2 – Cargo and Cruise Industry Expansion**
PED shall maintain the diversity of its cargo and cruise base to sustain balanced volumes of its key business lines: containerized cargo, liquid bulk (petroleum products), dry bulk, and cruise
 - Policy 1.2.1
PED shall continue to update and implement marketing plans that sustain or encourage the growth of existing waterborne commerce activities at the Port
 - Policy 1.2.2
PED shall maintain the diversity of its operations by marketing the Port to shippers and carriers in the Port's active cargo lanes and to cruise lines in the Port's diverse market areas
 - Policy 1.2.3
PED shall encourage private port-related businesses to construct and utilize appropriate facilities within the PJA
 - **Objective 1.3 – Land Use Compatibility and Development Regulation**
PED shall maintain land use compatibility, consistent with the Port Everglades Master/Vision Plan and with the goals, objectives, and policies in the Broward County Comprehensive Plan, while pursuing economic development opportunities

customarily associated with ports and foreign trade zones

- Policy 1.3.1

PED shall ensure that land uses are consistent with future land use designations of the Broward County Land Use Plan (BCLUP) and the land use patterns in the Port Everglades Master/Vision Plan and that they maximize the use of Port property

- **Objective 1.4 – Deepwater Access**

In coordination with the U.S. Army Corps of Engineers (USACE), which maintains project depths within the PJA and Port expansion areas, PED shall continue to pursue maintenance and other dredging activities to provide the channel, turning basin, and berth water depths needed to serve existing and future users. The harbor channel and turning basins connecting to the Atlantic shipping lane are the Port's waterway connectors on the state's Strategic Intermodal System (SIS)

- Policy 1.4.1

PED shall undertake maintenance dredging within the berthing and turning basin areas when necessary to ensure safe navigational conditions for the ships calling at its facilities and shall develop and implement a dredging management program for the PJA, in coordination with other agencies. These include the USACE, the Florida Inland Navigation District, the Florida Department of Environmental Protection (FDEP), the Florida Seaport Environmental Management Committee of the Florida Ports Council (FPC), and the Environmental Protection and Growth Management Department (EPGMD). The Atlantic shipping lane adjacent to the Port is part of the Federal Marine Highway System, specifically the M-95 corridor

- Policy 1.4.2

As the local, non-Federal sponsor for the Federal civil works channel deepening and widening project to be undertaken by the USACE, PED shall continue working with the USACE to implement the improvements required to serve the Port's anticipated market growth and fleet of larger ships forecast to call at the Port over the planning horizon

- **Objective 1.5 – On-Port Road and Rail Network**

PED shall continue to improve its internal road and rail network to serve expanded and relocated operations and facilitate on-Port circulation

- Policy 1.5.1
PED shall construct new roads and improve intersection capacity and circulation; install signs and other traffic control devices; and develop capacity queuing, parking, security processing, and approach areas for trucks, tractors, and trailers, as needed to support Port growth
 - Policy 1.5.2
PED shall promote near-Port rail infrastructure, including the ICTF
 - Policy 1.5.3
PED shall establish and maintain a traffic-count monitoring system that will identify areas of traffic congestion and promote pavement management within the PJA
 - Policy 1.5.4
To maintain and expand the high-speed intermodal access and connections needed for the efficient movement of goods to and from its facilities, PED shall work with the FDOT, the MPO, and other regional entities to prioritize needed improvements to roads over which Port truck traffic must travel. Such roads include the Port's SIS connectors – I-595 east into the Port's entrance (Eller Drive) and I-95 to SR 84 to Spangler Boulevard to the Port entrance
 - Policy 1.5.5
PED shall work with the Florida East Coast Railway (FEC) to identify and pursue improvements to the off-Port rail infrastructure and operations, which could facilitate goods movement by maximizing rail service and interchanges for the Port and its related industries. The Port's SIS rail connector includes the FEC spurs from seaport property to the FEC lines
 - Policy 1.5.6
The Port will continue to collaborate with transportation partner agencies to support transit investments that will conveniently and efficiently transport passengers between Fort Lauderdale-Hollywood International Airport (FLL) and Port Everglades in order to relieve traffic congestion and improve cruise passenger experience
- **Objective 1.6 – Transportation Agency Coordination**
PED shall coordinate future transportation system improvements within the PJA

with the MPO, FDOT, and other appropriate agencies to obtain the funding needed to implement Port-related transportation projects on and off the Port

- Policy 1.6.1

PED shall annually update the Port Everglades Projects Section of the MPO's Transportation Improvement Program (TIP), to be consistent with the Port's Five-Year Capital Improvement Program (CIP) and the Capital Improvements Element of this Comprehensive Plan

- Policy 1.6.2

PED shall annually update the Port-related projects listed within the FDOT District 4 Annual Work Program and shall identify intermodal projects for SIS funding

- Policy 1.6.3

PED shall annually update the unfunded Port Everglades transportation projects listed within the Broward County Capital Plan, in coordination with the Unfunded Priority List of the Broward County MPO's TIP

- Policy 1.6.4

PED shall actively participate in the Florida Seaport Transportation and Economic Development (FSTED) Council, as administered by the FPC, which reviews and approves funding applications for the Port's transportation projects under the FSTED Program, Chapter 311, Florida Statutes

- Policy 1.6.5

PED shall continue to give the provision and maintenance of water access to the Port's berths and facilities for Port-related and maritime uses the highest priority for future development and redevelopment within the PJA

- Policy 1.6.6

PED shall continue to give priority to the redevelopment of Port-owned structures and facilities that serve water-dependent uses, water-borne commerce, international trade, and cruise tourism within the PJA

- Policy 1.6.7

PED shall collaborate with other governmental agencies and private interests to protect and enhance vehicular access and the flow of commodities between the Port and regional transportation facilities. These entities include the Florida Department of Transportation (FDOT), the Broward Metropolitan Planning Organization (MPO), and the FEC

- **Objective 1.7 – Budgetary Process**

PED shall continue to follow a budgetary process for long-term planning that balances Port revenues, operating expenses, and capital expenditures needed to satisfy the anticipated market demand and capture new market share

- Policy 1.7.1

PED shall keep abreast of tariffs and fees charged by other competing seaports and shall maintain a competitive fee structure to achieve growth targets

- Policy 1.7.2

PED shall base business decisions on revenue trends, returns on investments, and cash flow trends

- Policy 1.7.3

PED shall consult with the County's financial officers to establish benchmarks for expense control

- Policy 1.7.4

Within the Coastal Storm Area, PED shall use public funds only to support water-dependent uses and associated ancillary and accessory facilities, consistent with the Port Everglades Master/Vision Plan and with the goals, objectives, and policies of the Broward County Comprehensive Plan

- **Objective 1.8 – Capital Improvement Plan**

PED shall maintain a 5-Year CIP that identifies the infrastructure improvements necessary to meet the Port's projected needs in the 5-year period and shall look beyond into the 10-year and 20-year planning horizons

- Policy 1.8.1

PED shall update its 5-Year CIP annually to reflect budgetary and market changes, prioritizing its project implementation to obtain the best return on facility investments, and shall comply with State mandates for the submission of annual CIP updates to Broward County for inclusion in the Capital Improvements Element of the Broward County Comprehensive Plan and the Broward County Capital Program, with unfunded projects to be incorporated into the Broward County Capital Plan

- Policy 1.8.2

PED shall prepare 10-Year and 20-Year Vision Plans as part of their biannual

Plan updates to identify capital needs beyond the 5-year planning horizon

- **Objective 1.9 – Funding Opportunities**

PED shall pursue diverse funding opportunities to accelerate the rate at which it can implement its Capital Improvement Plan

- Policy 1.9.1

PED shall participate in ongoing efforts to maintain legislative and agency awareness of the Port’s economic impact on the region and the importance of its needs being addressed in the State’s budget process

- Policy 1.9.2

PED shall actively seek matching grant funds from State and federal sources

- Policy 1.9.3

PED shall explore opportunities for public/private partnerships, joint ventures, and lease purchases to expedite development of the maritime and other facilities needed for economic development and job creation

- Policy 1.9.4

PED shall utilize its borrowing power to fund Port growth and/or maintenance projects within the norms of sound financing criteria and protection of value for the County and bondholders

4.6.2 Safety and Security

Port Everglades has a long-standing history of providing safety and security even at the national level, having served as a military base for the U.S. Navy during World War II, and has been the “liberty” port of choice for the U.S. Navy for many years. Today, a major focus of the Port is to provide a safe and secure environment to its roughly 13,000 employees and the general public, including approximately 3.8 million cruise ship passengers annually. The Port has adopted several strategies to mitigate exposure to a diverse range of threats, some of which include: natural hazards, manmade disasters, hazardous materials, criminal activity, and terrorism.

DPC Goal 2

Reduce exposure of human life and property to harm by natural hazards through use of hazard mitigation and hurricane evacuation measures. Protect Port employees, tenants, users, and the public as well as Port facilities from acts of terrorism or criminal activities through safety and security programs. Continue to uphold safety standards and measures

established to protect employees from occupational hazards.

- **Objective 2.1 – Protection from Natural Hazards**

PED shall implement the measures required by Broward County and other agencies to protect human life and property from natural hazards, including airborne hazards, and will work with Broward County in implementing the Broward County Enhanced Local Mitigation Strategy (2017)

- Policy 2.1.1

PED shall ensure that any habitable, non-residential buildings in special flood hazard areas are designed and constructed to reduce the potential for flooding and wind damage. All structures within the defined flood zones shall be constructed in accordance with the provisions specified in the Florida Building Code

- Policy 2.1.2

PED shall ensure that all buildings are designed and constructed in accordance with the Florida Building Code and as approved by Broward County and the appropriate municipality

- **Objective 2.2 – Coastal Storm Areas**

PED shall follow Broward County's requirements for Coastal Storm Areas, which shall be defined as the Category 1 and 2 Hurricane Evacuation Zones identified within the Broward County Land Use Map (Series) entitled "Flood Plains, Flood-Prone Areas, and Coastal Storm Areas"

- Policy 2.2.1

The Coastal Storm Area, as identified in this Comprehensive Plan, shall be designated the Coastal Storm Area within the Port

- Policy 2.2.2

PED shall continue to disallow the allocation of public expenditures for infrastructure improvements that would promote residential development or the concentration of permanent populations within the Coastal Storm Area. It shall also continue to discourage any amendment to the Port Everglades Transportation Area permitted uses section of the BCLUP and of the Port Everglades Development District to allow permanent residential uses within the PJA

- **Objective 2.3 – Hurricane Preparedness**

PED shall maintain an up-to-date Hurricane Evacuation Contingency Plan, ensuring that it is consistent with County and other governmental emergency plans and procedures and shall encourage all persons within the Port area to be familiar with Port evacuation to ensure safe evacuation before a hurricane strikes. Relevant plans and procedures include the Broward County Emergency Management Plan and the US Coast Guard Marine Evacuation Procedures for Deepwater Ports

- Policy 2.3.1

PED shall continue over the planning horizon to maintain or reduce documented hurricane evacuation times for Port personnel and marine vessels in accordance with Broward County Emergency Management Division (EMD) and U.S. Coast Guard standards

- Policy 2.3.2

PED shall continue to designate Eller Drive as the primary evacuation route within the PJA, with Spangler Boulevard serving as a secondary evacuation route

- Policy 2.3.3

PED shall continue to coordinate its plans with the hurricane evacuation plans of the EMD and the U. S. Coast Guard

- Policy 2.3.4

PED's essential personnel, who may include the Port Director and senior staff, or their designees, should participate in Broward County's annual hurricane simulation exercise.

- **Objective 2.4 – Hazardous Materials**

PED, working with appropriate public safety, governmental, and private agencies, shall maintain procedures to respond to and mitigate hazardous material spills within the PJA.

- Policy 2.4.1

PED shall comply with appropriate federal, State, regional, and local regulations and procedures for the safe and expedient cleanup of hazardous spills and shall continue to implement the hazardous material-handling and cleanup provisions of the effective Port Tariff.

- Policy 2.4.2

PED shall continue to comply with applicable federal, State, and local oil spill contingency planning requirements within the PJA and the protocol for reporting, cleaning, and disposal of toxic spill or emission incidents, which may include oil spills, gas leaks, and leaks of unknown substances.

- Policy 2.4.3

PED shall cooperate with governmental agencies to provide complete and timely information to the public in the event of a hazardous material spill.

- **Objective 2.5 – Safe Operating Environment**

PED shall reduce the potential of harm from manmade disasters by implementing safety and security programs for Port employees, tenants, users, and visitors.

- Policy 2.5.1

PED shall implement required safety and health measures and ensure that operations are conducted to the maximum extent possible in accordance with those measures.

- Policy 2.5.2

PED shall ensure its operations comply with applicable health and safety standards.

- **Objective 2.6 – Port Security**

PED shall strive to protect Port employees, tenants, users, and the public as well as the facilities at the Port from acts of terrorism or criminal activities

- Policy 2.6.1

PED shall maintain and implement the security plan mandated and approved under State and federal guidelines, consistent with funding availability

- Policy 2.6.2

PED shall coordinate with the appropriate agencies, including the Federal Bureau of Investigation, the U.S. Coast Guard, the Florida Department of Law Enforcement, and the Broward County Sheriff's Office, in implementing the Port's security plan and making any changes required by new development

- Policy 2.6.3

PED shall continue over the 5- and 10-year planning horizons to maintain adequate public access to the PJA, consistent with federal, State, and local security mandates, and shall continue to maintain public ingress and egress through security checkpoints at Eller Drive and I-595, Spangler Boulevard/SR

84 and US 1, and Eisenhower Boulevard at SE 17th Street. The latter security point was recently relocated to reduce traffic congestion and to allow visitors seamless access the Greater Fort Lauderdale/Broward County Convention Center and new T2/T4 Parking structure

- Policy 2.6.4

PED shall continue to control public access to dockside operational areas by requiring the issuance of a permit to access the designated “secure area”

- Policy 2.6.5

PED shall participate in local, State, and federal efforts to implement new anti-threat technologies that will facilitate cargo and passenger movements and help protect the Port and its users

- **Objective 2.7 – Emergency Management**

PED shall endeavor to protect Port employees, tenants, users, and the public, as well as the facilities at the Port and the surrounding areas in various emergencies

- Policy 2.7.1

PED shall maintain an Emergency Management Plan to respond to emergencies at the Port and shall ensure that Port staff and tenants are familiar with its provisions

- Policy 2.7.2

PED shall coordinate with State, regional, and local emergency management agencies to maintain and update emergency management procedures

- Policy 2.7.3

PED shall provide safe and efficient vehicular movement, off-street parking, and adequate access for service and emergency vehicles within the PJA through the implementation of adopted land development codes in accordance with the Interlocal Agreement

- **Objective 2.8 – Post-Disaster Redevelopment**

PED shall work with the EMD in the ongoing initiative to develop a Broward County Recovery Framework, a long-term strategic framework for post-disaster redevelopment in compliance with State guidelines

- Policy 2.8.1

PED shall identify appropriate post-disaster redevelopment procedures to reduce or eliminate exposure of human life and property to hazardous

conditions, restore Port services, and reconstruct Port facilities in the aftermath of a disaster

- Policy 2.8.2

Following a disaster, the Port Director or his designee shall give first priority to removal of hazardous conditions necessary to protect the public health and safety, second priority to restoring essential Port services, and third priority to long-term repair and redevelopment activities

4.6.3 Environmental Stewardship

Port Everglades encompasses a total of 2,190 acres, of which 1,742 acres are upland and 448 acres are submerged land, and included several diverse ecosystems. These ecosystems support several imperiled species such as the West Indian Manatee, American crocodile, least tern, and smalltooth sawfish. The Port Everglades Discharge Canal is the second largest manatee aggregation in Broward County, accommodating as many as 455 manatees in 2010; and in 2015, the rooftop of Terminal 26 supported the largest nesting colony of least terns in Southeast Florida. Environmental stewardship is a key component of the mission statement, and Port Everglades is committed to optimizing habitat value in its green spaces. In 2017, Port Everglades was recognized by the National Wildlife Federation as a Certified Wildlife Habitat, and by the EPGMD as a Broward County NatureScape. Port Everglades is a certified member of the Green Marine Program, is collaborating with Florida Atlantic University and University of Illinois Critical Infrastructure Resilience Institute on resiliency studies, and has voluntarily partnered with the US Environmental Protection Agency (EPA) on a pilot study of air emissions at ports. This section identifies and defines the Port's responsibility for coordinating environmentally sustainable practices, operation, maintenance, and development.

DPC GOAL 3

Develop and operate facilities in a manner that avoids and minimizes adverse impacts on the natural environment and mitigate unavoidable impacts of such Port development and operation on the functions of the natural ecosystem, including wetlands, water quality, wildlife habitat, living marine resources, and beach and dune systems. The Port is committed to preserving and protecting the quality of the environmental resources within its purview and shall conserve and protect those resources, consistent with continued Port maintenance and expansion requirements.

- **Objective 3.1 – Natural Resource Preservation and Protection**

PED shall conserve, protect, and, where possible, enhance environmental resources consistent with the Port Everglades Development District, the Broward County Land Development Code, and the Broward County Natural Resource Protection Code. In so doing, the Port shall work with federal, State, regional, and local agencies in developing sound environmental policies and measures to minimize the environmental impacts of Port development and operations

- Policy 3.1.1

PED shall evaluate specific and cumulative impacts on coastal resources before undertaking maintenance and expansion activities and shall take measures to minimize or avoid negative impacts and to mitigate for damage that cannot be avoided

- Policy 3.1.2

PED shall maintain a current inventory and map of unique and productive terrestrial and aquatic habitats that exist in the Port's vicinity that could be adversely affected by Port activities and shall implement the environmental policies and statements in the Port Everglades Master/Vision Plan to manage Port facilities in a manner that will protect natural habitat

- Policy 3.1.3

PED shall continue to assist the FDEP, the Florida Fish and Wildlife Conservation Commission, and the EPGMD in maintaining and enhancing manatee habitat within the FPL Discharge Canal on the Port

- Policy 3.1.4

PED shall implement approved mitigation plans addressing measures to be taken should Port facilities adversely affect productive terrestrial and aquatic habitat existing in the Port's vicinity

- Policy 3.1.5

PED shall identify and provide best management practice environmental guidelines for staff and tenants to observe in conducting their operations

- Policy 3.1.6

PED shall continue to encourage and coordinate with the EPA and USACE with respect to the use of previously agreed-upon ocean dredged material disposal sites and management goals: marine environmental protection, beneficial use of dredged material whenever possible, and documentation of

disposal activity at the site

- Policy 3.1.7

PED shall pursue water-depth maintenance, new deepening activities, and the management of dredge material in a manner consistent with the State Comprehensive Plan and the other elements of this Comprehensive Plan

- Policy 3.1.8

PED, in coordination with the USACE and the FDEP, shall continue planning for its long-term dredge disposal needs

- **Objective 3.2 – Estuarine Quality**

PED shall maintain and, where appropriate, improve the quality of the estuarine environment within its purview by continuing to control the introduction of pollution into the Port estuarine system

- Policy 3.2.1

PED shall see that development within the PJA is consistent with the rules and regulations of the EPGMD and the Broward County Land Development Code to ensure the protection of estuarine systems and prevent estuarine pollution within the PJA

- Policy 3.2.2

PED shall maintain a standard of avoidance and minimization of water-quality degradation for discharges to surrounding water bodies by improving the quality of stormwater run-off

- Policy 3.2.3

PED shall continually monitor water quality to ensure its standard of avoidance and minimization of water-quality degradation for adjacent water bodies is not violated. This standard shall be in accordance with an approved water-quality monitoring plan that includes existing data and standards as well as additional monitoring necessary to establish conditions trends

- Policy 3.2.4

PED shall continue to provide and maintain man-made drainage facilities that are monitored for water quality in accordance with its National Pollution Discharge Elimination System (NPDES) permit

- Policy 3.2.5

PED shall continue to conduct an annual hydrographic survey of in-water

facilities which will aid in the monitoring of sediment deposition within the Port

- Policy 3.2.6

PED shall ensure that tidal circulation and flushing are maintained as the Port development program is implemented

- Policy 3.2.7

New and existing development within the PJA shall comply with the South Florida Water Management District (SFWMD) and the EPGMD requirements for drainage and stormwater management, consistent with SFWMD's published Best Management Practices

- **Objective 3.3 – Water-Dependent Uses**

PED shall continue over the 5-, 10-, and 20-year planning horizons to prioritize shoreline land uses for water-dependent activities

- Policy 3.3.1

PED shall maintain shoreline land uses within the PJA in accordance with the recommendations of the Port Everglades Master/Vision Plan, which gives priority to water-dependent uses

- **Objective 3.4 – Beach and Dunes**

PED shall continue over the 5-, 10-, and 20-year planning horizons to support beach and dune protection programs, consistent with FDEP policies and procedures

- Policy 3.4.1

PED shall continue to see that all oceanfront development and redevelopment conforms to FDEP's effective Coastal Construction Control Line regulations

- Policy 3.4.2

PED shall continue to encourage and coordinate with the EPGMD with respect to constructing a sand bypass system to transport sand from the north side of the Port's Entrance Channel north jetty to the south side of the south jetty

- Policy 3.4.3

PED shall encourage implementation of contracts and memoranda of understanding between the Port and the appropriate State agencies, with the intent of preventing estuarine pollution, controlling surface water runoff,

protecting marine resources, and reducing exposure to natural hazards

- Policy 3.4.4

PED shall see that beach quality sand resulting from maintenance dredging activities is made available for beach renourishment purposes prior to deposition into a designated on-shore or off-shore dredge disposal site

- **Objective 3.5 – Sustainability**

PED shall be proactive in implementing energy conservation and other measures that promote sustainability

- Policy 3.5.1

PED shall initiate efforts to reduce greenhouse gas emissions. These efforts may include over time converting Port and tenant equipment to alternative fuels, transitioning the Port's fleet of service vehicles to fuel-efficient models, and promoting the use of energy-efficient designs in new buildings at the Port, as feasible

- Policy 3.5.2

PED shall initiate efforts to implement energy-saving measures in its operations. These efforts may include transitioning rail-mounted gantry cranes to shore power, promoting the use of rail rather than truck to move commodities on and off the Port, and identifying opportunities to reduce idling time for trucks moving through the Port's facilities, as feasible

- Policy 3.5.3

PED shall support the initiatives of the Broward County Climate Change Action Plan with respect to greenhouse gas emissions, climate change mitigation and adaptation efforts, and infrastructure planning

- Policy 3.5.4

PED shall continue to protect and preserve any historical and archeological resources that may be identified within the PJA, in coordination with the Broward County Historical Commission, Fort Lauderdale Historical Society, EPGMD, and the Florida Department of State

4.6.4 Community Engagement

A major element of Port Everglades' success is its ability to cooperate and coordinate with stakeholders, including other Broward County departments, the State and federal

government, and local institutions. Port Everglades prioritizes its impact on the community and engages in cooperative programs to enhance the local community through outreach, environmental awareness initiatives, and employment opportunities.

DPC Goal 4

Coordinate development, operational, and expansion efforts with other Broward County departments, appropriate municipalities, and other governmental entities, and facilitate initiatives to promote economic development opportunities in Broward County and the South Florida region. Additionally, Broward County, through the PED, shall cooperate with local, regional, State, and federal agencies and with private entities responsible for transportation infrastructure (water, road, rail) connectivity to ensure that the intermodal transportation is in place.

- **Objective 4.1 – Plan Implementation**

PED shall be proactive in coordinating its development efforts with local, State, and federal permitting agencies and with private stakeholders to ensure development and operations are carried out in accordance with the public interest and regulatory requirements and promote environmental sustainability

- Policy 4.1.1

PED shall continue to cooperate with local, regional, and other governmental agencies and stakeholders, including environmental interests, to ensure that environmental planning and management activities are coordinated. Among the requisite agencies and stakeholders are the FDEP, the SFWMD, and the EPGMD

- Policy 4.1.2

PED shall see that development orders within the PJA – including zoning, platting, site plans, building permits, and developments of regional impact – are consistent with the Port Everglades Transportation Area designation of the BCLUP and are reviewed for compatibility with residential uses located near or adjacent to the PJA

- **Objective 4.2 – Coordination with Other Broward County Departments**

PED shall support the plans and programs of Broward County, including economic development initiatives that expand opportunities in trade, industry, and commerce, and shall coordinate its planning and development initiatives with the

appropriate County departments

- Policy 4.2.1

Compatibility with Broward County's Comprehensive Plan. PED shall coordinate its planning and development efforts with the EPGMD to ensure that planned projects and land uses at the Port are compatible with and support the programs and policies contained in the Broward County Comprehensive Plan. The Port shall also evaluate proposed amendments to the Broward County Comprehensive Plan, particularly the Coastal Management Element, as to potential impacts on Port activities

- Policy 4.2.2

PED shall continue to coordinate its development plans for Southport and Midport with the Broward County Aviation Department (BCAD) to address Port expansion impacts on FLL's approach and departure surfaces

- Policy 4.2.3

PED shall:

- 1) Coordinate with Broward County departments and with other service providers, including the City of Fort Lauderdale, which provides potable water and sanitary sewer services within the PJA;
- 2) Ensure adequate infrastructure and utilities for Port operations;
- 3) Meet adopted level-of-service standards for p within the PJA;
- 4) Ensure that standards are consistent with the goals, objectives, and policies of the Broward County Comprehensive Plan and the Broward County Land Development Code; and
- 5) Meet the level-of-service requirements enforced by the affected municipal jurisdictions in accordance with the Interlocal Agreement among Broward County and the Cities of Fort Lauderdale, Hollywood, and Dania Beach

- Policy 4.2.4

PED shall see that future development within the PJA is consistent with the adopted local comprehensive plans and land development codes within Broward County and the Cities of Fort Lauderdale, Hollywood, and Dania Beach, in accordance with the Interlocal Agreement dated May 6, 1994, among the respective municipalities and Broward County

- Policy 4.2.5

PED shall continue to review land use amendments within the PJA for

consistency with the Port Everglades Master/Vision Plan, compatibility with adjacent land uses, compatibility with existing and planned transportation facilities within Broward County, and the availability of adequate facilities and services concurrent with the impact of development

- **Objective 4.3 – Community, Agency, and Stakeholder Coordination**

PED shall coordinate its development and expansion program with applicable community entities, agencies, and stakeholders to promote sound planning and economic growth

- Policy 4.3.1

In implementing the goals, objectives, and policies of the Port Everglades Master/Vision Plan, PED shall coordinate with the municipalities within the PJA, the Cities of Fort Lauderdale, Hollywood, and Dania Beach

- Policy 4.3.2

In addition to Broward County agencies, PED shall cooperate with the South Florida Regional Planning Council, the Broward County MPO, SFWMD, FDOT, Florida Department of Environmental Protection (FDEP), and the State Division of Community Development; the USACE and the U.S. Coast Guard, and other applicable agencies in implementing the goals, objectives, and policies of the Port Everglades Master/Vision Plan

- Policy 4.3.3

To help achieve its primary goal of economic development, PED shall cooperate with South Florida interests and stakeholders, including the other South Florida seaports, as they seek to expand the region's commercial and industrial base

Table 4.6.1 summarizes these goals, objectives, and policies, which have been incorporated into the Goals, Objectives, and Policies section of the Deepwater Port Component of the Coastal Management Element in Broward County's Comprehensive Plan.

Table 4.6.1: Summary of Port Everglades Goals, Objectives and Policies*Source: B&A*

Goal	Objective	Policy
DPC Goal 1: Economic Vitality		
	1.1: Infrastructure Development	
		1.1.1: Short-term Infrastructure Improvements
		1.1.2: Infrastructure Maintenance
		1.1.3: Multi-purpose Terminals
		1.1.4: Interconnected Land Uses
		1.1.5: Intermodal Facilities
		1.1.6: Foreign-Trade Zone
		1.1.7: Future Development
		1.1.8: Convention Center Integration
	1.2: Cargo and Cruise Industry Expansion	
		1.2.1: Marketing Plans
		1.2.2: Marketing Activities
		1.2.3: Private Businesses
	1.3: Land Use Compatibility and Development Regulation	
		1.3.1: Development Consistency
	1.4 Deepwater Access	
		1.4.1: Maintenance Dredging
		1.4.2: Channel Deepening and Widening
	1.5: On-Port Road and Rail Network	
		1.5.1: On-Port Road
		1.5.2: On-Port Rail
		1.5.3: Traffic Monitoring
		1.5.4: High Speed Intermodal Connections

		1.5.5: Off-Port Rail
		1.5.6: Connectivity with FLL and BCCC
1.6: Transportation Agency Coordination		
		1.6.1: MPO Transportation Improvement Program
		1.6.2: FDOT District 4 Annual Work Program
		1.6.3: Broward County Capital Plan
		1.6.4: Florida Seaport Transportation and Economic Development Program
		1.6.5: Infrastructure Maintenance
		1.6.6: Water-Dependent Access
		1.6.7: Interagency Coordination
1.7: Budgetary Process		
		1.7.1: Competitive Pricing
		1.7.2: Port ROI
		1.7.3: Expense Benchmarking
		1.7.4: Coastal Storm Area
1.8: Capital Improvement Plan		
		1.8.1: 5-Year CIP Updates
		1.8.2: 10- and 20-Year Vision Plan Updates
1.9: Funding Opportunities		
		1.9.1: Economic Impact Awareness
		1.9.2: State and Federal Funds
		1.9.3: Public/Private Partnerships
		1.9.4: Sound Financial Management
DPC Goal 2: Safety and Security		
2.1: Protection from Natural Hazards		
		2.1.1: Development in Flood Zones
		2.1.2: Florida Building Code Compliance

	2.2: Coastal Storm Areas (CSA)
	2.2.1: CSA Designation
	2.2.2: Prohibited CSA Development
	2.3: Hurricane Preparedness
	2.3.1: Evacuation Times
	2.3.2: Evacuation Routes
	2.3.3: EMD/USCG Coordination
	2.3.4: Hurricane Simulation Participation
	2.4: Hazardous Materials
	2.4.1: Handling and Cleanup
	2.4.2: Oil Spills
	2.4.3: Public Communication
	2.5: Safe Operating Environment
	2.5.1: Health and Safety Measures
	2.5.2: Compliance with Applicable Standards
	2.6: Port Security
	2.6.1: Port Security Plan
	2.6.2: Interagency Coordination
	2.6.3: Security Checkpoints
	2.6.4: Dockside Access
	2.6.5: Anti-Threat Technology
	2.7: Emergency Management
	2.7.1: Port Emergency Management Plan
	2.7.2: Interagency Coordination
	2.7.3: Safe and Efficient Vehicular Movement
	2.8: Post-Disaster Redevelopment
	2.8.1: Procedures

		2.8.2: Hazardous Condition Removal/Public Safety
DPC Goal 3: Environmental Stewardship		
	3.1: Natural Resource Preservation and Protection	
		3.1.1: Cumulative Impacts on Coastal Resources
		3.1.2: Habitat Inventory and Protective Policies
		3.1.3: Manatee Habitat
		3.1.4: Mitigation Plans
		3.1.5: Portwide Best Management Practices (BMPs)
		3.1.6: Dredged Material Disposal and Management
		3.1.7: Consistency with Comprehensive Plans
		3.1.8: Long-Term Planning
	3.2: Estuarine Quality	
		3.2.1: Estuarine System Protection
		3.2.2: Avoidance and Minimization of Water-Quality Degradation
		3.2.3: Water Quality Monitoring
		3.2.4: Drainage
		3.2.5: Annual Hydrographic Survey
		3.2.6: Tidal Flushing and Circulation
		3.2.7: Stormwater Management BMPs
	3.3: Water-Dependent Uses	
		3.3.1: Prioritization of Water-Dependent Uses
	3.4: Beach and Dunes	
		3.4.1: Coastal Construction Control Line
		3.4.2: Sand Bypass System
		3.4.3: Interagency Agreements and Coordination
		3.4.4: Beach Renourishment
	3.5: Sustainability	

		3.5.1: Greenhouse Gas Emissions
		3.5.2: Energy Efficiency/Conservation
		3.5.3: Climate Change
		3.5.4: Historical and Archaeological Resources
DPC Goal 4: Community Engagement		
	4.1: Plan Implementation	
		4.1.1: Interagency Coordination
		4.1.2: Port Everglades Transportation Area Compatibility
	4.2: Coordination with Other Broward County Departments	
		4.2.1: Compatibility with Broward County's Comprehensive Plan
		4.2.2: Airport-Seaport coordination
		4.2.3: Level of Service (LOS) Standards
		4.2.4: Interlocal Agreements
	4.3: Community, Agency and Stakeholder Coordination	
		4.3.1: Municipal Coordination
		4.3.2: Interagency Cooperation
		4.3.3: Regional Collaboration

