PLAN DEVELOPMENT

3.1 Introduction

This third element of the *Port Everglades Master Plan* (Plan) describes how the Phase I planning process was conducted, considers terminal design trends and potential operational enhancements, and summarizes the Port's facility needs to meet the market opportunities forecasted over the 20-year planning horizon. The element concludes with a description of the 20-year Vision Plan prepared during this Phase I effort and a review of how the Port's ongoing projects fit into the Plan. As part of the iterative planning process with Port staff, tenants, and other stakeholders, this Vision Plan was revised to reflect operational, environmental, financial, and other considerations. Element 5 presents the Final Plan resulting from these revisions.

3.2 Conceptual Planning Process and Visioning Goals

The master planning process for the Plan involved an on-going collaborative effort between the Consultant Team, the Port's senior staff, tenants, and stakeholders to achieve the Port's goal of creating a plan that maximizes market share and revenue through a realistic 5-year Capital Improvement Plan (CIP) within a framework of 10- and 20-year vision plans. This initiative also included frequent contact with the Broward County Administration and sister agencies including the Fort Lauderdale-Hollywood International Airport (FLL), the Convention Center, and the Broward Sheriff's Office (BSO). State and federal agencies were also solicited for comments and direction; these included the U.S. Army Corps of Engineers (ACOE), the U.S. Customs and Border Protection (CBP), the Florida Department of Transportation (FDOT), the Florida Fish and Wildlife Conservation Commission (FWC), and others.

Existing Port tenants, prospective tenants, and other affected parties, were interviewed and contacted throughout the planning process to understand their current and future operational requirements. Several productive multi-day charrettes with Port tenants and others served to highlight these requirements, which are reflected in the Final Plan, as described in Element 5.

To keep the public and stakeholders abreast of the goals and progress of this planning initiative, public outreach and individual meetings were held at various intervals throughout the Phase I planning process, as discussed in the Project Introduction. Meetings were also held with officials from the local municipalities within the Port Everglades Development District -- the City of Fort Lauderdale, the City of Hollywood, and the City of Dania Beach -- to discuss the planning process, learn of any concerns, and promote the intergovernmental coordination essential for the Plan's success.

The information collected during the initial tenant interviews, public outreach meetings and discussions with the Port's key staff helped to shape the planning process. The support and review offered by the various federal, state, county, and other local agencies helped to ground the various concepts in reality and minimize future conflicts between the Plan and other ongoing initiatives.

The Consultant Team used an iterative planning and design process to evaluate and refine the land use alternatives for the future Port layout. This iterative process involved working through numerous alternatives, using a collective review technique, selecting the preferred attributes of each alternative, refining the selected elements into a revised plan, and repeating the process until a preferred plan was selected. The results from the market study, capacity analysis, and needs assessment were used to balance the Port's land use options and size the terminal facilities to balance with the projected cargo growth.

During Phase I of the planning process, the Consultant Team focused on developing a long-range 20-Year Vision Plan. Phase II of the project involved creation of interim phasing plans for the 5-Year CIP and the 10-Year Vision Plan to illustrate the development process required to achieve the preferred 20-year Vision Plan.

As the preferred plan emerged from the iterative design process, a number of competing development options were identified which created conflict between the various business lines and the budgetary and environmental goals established at the beginning of the master planning project. In addition, the capacity analyses and market forecast results revealed that the Port's infrastructure, wharves, storage areas, and other features could not support all of the projected cargo growth without significant landfill, environmental impacts, capital investment, or other impacts.

To evaluate the various development options, the Consultant Team conducted a visioning session to reassess the master plan components, develop reasonable alternatives to accommodate future growth, and further narrow the range of conceptual plan options. The conceptual plan created in the visioning session was later refined to include some of the finer details identified during interviews with existing tenants, prospective tenants, and other concerned agencies. In summary, the iterative design efforts focused on the big picture items first and added the finer details as the team worked through the planning process until a final collective vision plan was formed. The preferred 20-year Vision Plan elements are discussed in detail in Section 3.7.

3.3 Terminal Design Trends

This section discusses emerging design trends in marine terminals which are being considered at similar port facilities domestically and internationally. The discussion of emerging design trends identifies some of the key elements included in recently constructed terminals that are setting future design standards for consideration at other ports. The trends considered include wharf design, vessel size considerations, passenger/cargo-handling techniques, cargo storage methods, gate design, security measures, and modes of operation for landside cargo handling. Most of these trends are applicable to the facilities at Port Everglades.

3.3.1 Cruise Terminal Trends

Since the cruise market assessment conducted during the planning process (see Element 2, Section 2.6) projects increasing cruise ship lengths and larger cruise passenger populations on each ship, the Consultant Team has recommended improvements to the Port's cruise facility infrastructure to accommodate the requirements of this larger projected fleet.

Larger cruise facilities need to consider several main elements, namely:

- Type and number of passenger boarding bridges (gangways).
- Limits of the "window of accessibility" (WOA).
- The capacity of the passenger and baggage drop-off and pick-up area, called the intermodal zone, which provides access for the buses, automobiles, vans, taxis, and other vehicles that carry passengers and their baggage to and from the cruise terminal.
- Baggage-handling areas.
- Federal inspection facilities.

Each of these elements is discussed below.

Passenger Boarding Bridges and Window of Accessibility. .The WOA is defined by both a vertical and a horizontal dimension (see Figures 3.3-1, 3.3-2, and 3.3-3). The maximum WOA with the greatest range of vertical and horizontal dimension provides access to the largest number of cruise ships in today's fleets and those of the future. Seaports planning cruise terminals cannot predict long-term uses (up to 40 years) of a terminal by a particular ship. Therefore, their terminals must be sufficiently flexible to accommodate the universe of cruise ships that may call at their port in the future.

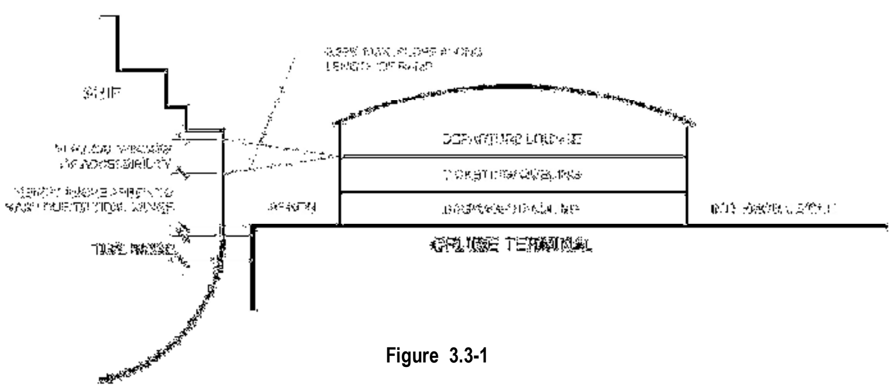


Figure 3.3-1

VERTICAL WINDOW OF ACCESSIBILITY

The WOA is also determined by the ramp slope of the boarding bridge, inasmuch as the slope must comply with Americans with Disabilities Act (ADA) requirements. The ramp slope must not exceed 1 vertical unit in 12 horizontal units. The WOA is also affected by the tidal range, which determines the vertical height of the pax break above the apron. The passenger bridge provides passenger connection to the ship and must be designed to allow both horizontal and vertical ship movements and be provided with specific safety equipment such as a safety net and devices warning of ship movement.

A cruise terminal must thus maximize the WOA for passengers to enter and leave the new generation of cruise ships. Because all ships have different access locations, which also differ from port side to starboard side on the same ship, and because ships are of different lengths, it is critical to allow access to as many passenger access openings (pax breaks) as possible on the various cruise ships via the passenger boarding bridge or bridges

At Port Everglades today, all passenger-boarding bridges are of the pivot type. Other types of passenger-boarding bridges, such as rail and mobile, may provide a larger WOA.

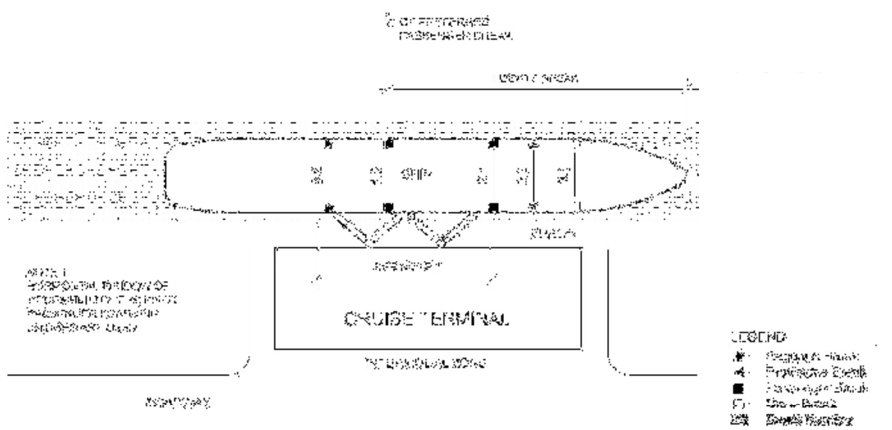


Figure 3.3-2

CURRENT
HORIZONTAL WINDOW OF ACCESSIBILITY FOR PIVOT PASSENGER BOARDING BRIDGES

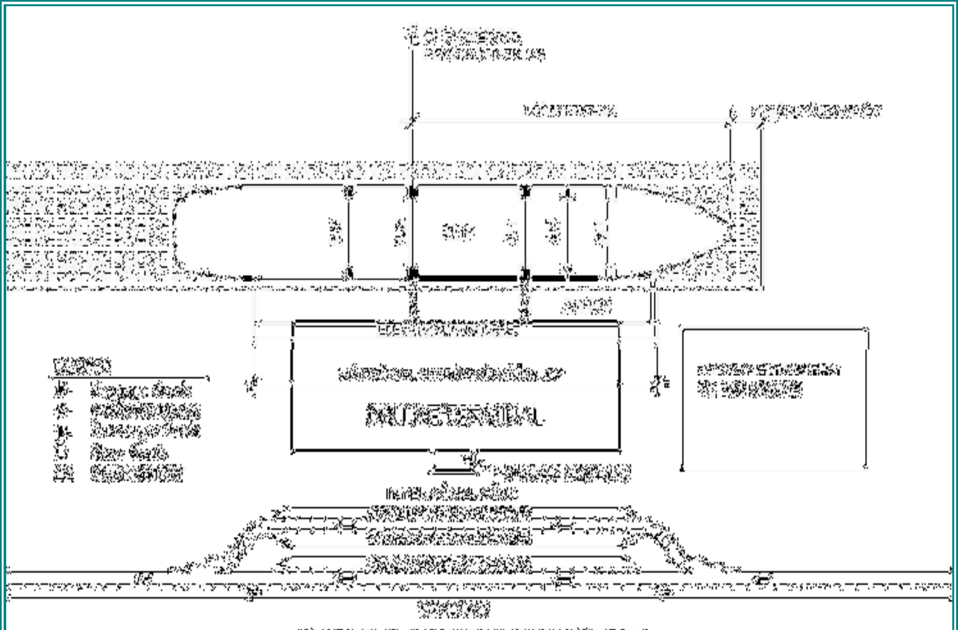


Figure 3.3-3

PROPOSED
HORIZONTAL WINDOW OF ACCESSIBILITY FOR RAIL/MOBILE PASSENGER BRIDGES

Intermodal Zone. A cruise passenger's first and last experience at the cruise terminal is the intermodal zone where buses, taxis, shuttles, and private automobiles load and unload those taking the cruise and their baggage. For cruise terminals serving the mega cruise fleet, the intermodal zone must be expanded to meet the needs of the larger passenger population.

Some cruise lines offer their customers the opportunity to have their baggage transported to their departure airport through a private carrier. This procedure allows cruise passengers to hand their baggage over to the carrier, after processing through the federal inspection services at the cruise terminal, and pick up their baggage at their destination airport. Cruise lines may also offer through baggage services from the departure airport to the cruise ship and on-board airline check-in for the return home.

Baggage-Handling Areas. Port Everglades currently uses the "lay down" method for handling baggage. When planning the footprint for mega cruise terminals, the baggage-handling area will be the largest area to program. Generally, one square meter or 10 square feet per passenger is the minimum needed to lay down the baggage. To this floor area, main circulation aisles, egress, and vertical circulation elements need to be added along with federal inspection service requirements, restrooms, etc. The lay-down method works well and should continue in use at the Port.

To accommodate larger terminals, where the at-grade "footprint" of the structure would be approximately 100,000 square feet and the total floor area could range to 140,000 square feet, the floor areas may need to be programmed into a three-level structure, as Figure 3.3.4 illustrates.

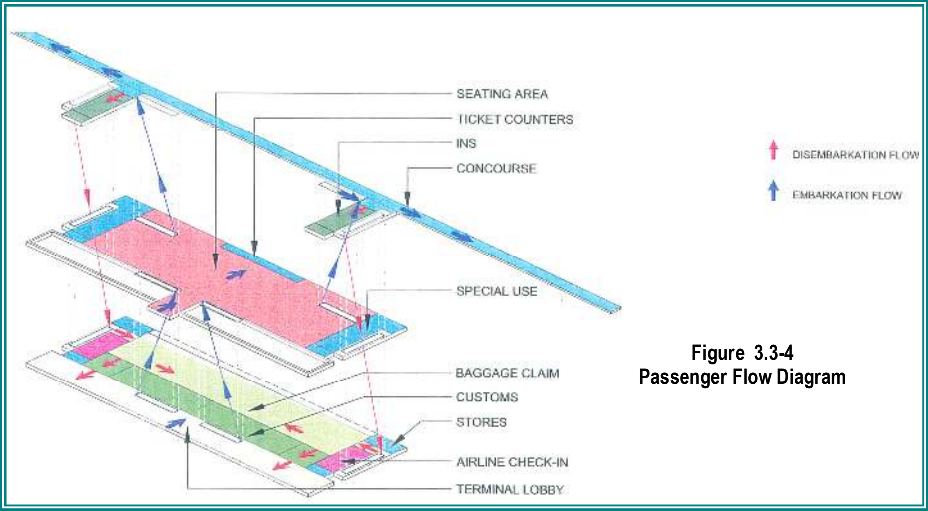


Figure 3.3-4
Passenger Flow Diagram

Federal Inspection Facilities. A "Draft CBP Cruise Terminal Design Standards" is in the process of being developed. The final "CBP Cruise Terminal Design Standards" should be implemented into the final design of future cruise terminals at the Port, including renovations to existing facilities.[1]

3.3.2 Container Terminal Trends

Overview of U.S. Gulf/Southeast Container Terminals. At the beginning of the planning process, the Consultant Team gave a presentation to the Port's senior staff about the regional port system in the Southeastern U.S. to review the status of the competing ports in the region and their potential expansion plans. The discussion covered ports as far west as Texas and north to Maryland. The primary message of the presentation was that there is emerging pressure on the U.S. Gulf and Southeastern port system to absorb containerized cargo for consumption in North America. The effort to locate new ports in these regions is related to the limited ability to expand operations at the primary container ports on the West and East Coast, and the potential opportunity to provide alternative portals in non-congested regions for importing cargo to the U.S. market. In addition to new pressure to develop port facilities, a

[1] Wiley, J., Heidrich, R. (2002, January).

second emerging trend can be observed in the way terminal densification is occurring through increased use of cargo-stacking techniques and operating equipment, including a movement to higher density rubber-tire gantry cranes (RTGs) to maximize terminal capacity.

Wharf Access Road. As today's container terminals increase throughput and terminal velocity, the amount of traffic used to convey cargo between the wharf and container yard areas also increases. Segregating unnecessary terminal traffic from the wharf activity during cargo-handling operations increases worker safety and enhances crane productivity. Vehicles that shuttle workers on the terminal or make ship deliveries should be segregated from the crane load lanes and other terminal circulation routes. Rerouting this traffic can also minimize potential conflicts with terminal traffic. Creation of a wharf service road where adequate space is available can be used to segregate cross-traffic from the cargo-handling operations.

The Consultant Team discussed a number of wharf access options with the Port's senior staff, including no service road and one- and two-lane applications placed between the face of the wharf structure and the waterside crane leg (see Figures 3.3-5 through 3.3-7). These service road options would require relocating the existing crane rails or designing for the placement of a relocated crane rail system on future wharf replacement/construction projects to allow for the additional setbacks.

The legend for Figures 3.3-5 though 3.3-is as follows:

1. Wharf deck; 2. Fender; 3. Waterside crane rail; 4. Bollard; 5. Dimension from bulkhead to waterside crane rail; 6. Service road barrier; 7. Power trench; 8. Employee shuttle; 9. Service vehicle; 10. Service road clearance from bollard to power trench; 11. Distance from wharf face to waterside crane rail.

Figure 3.3-5
Minimum Setback without Service Road

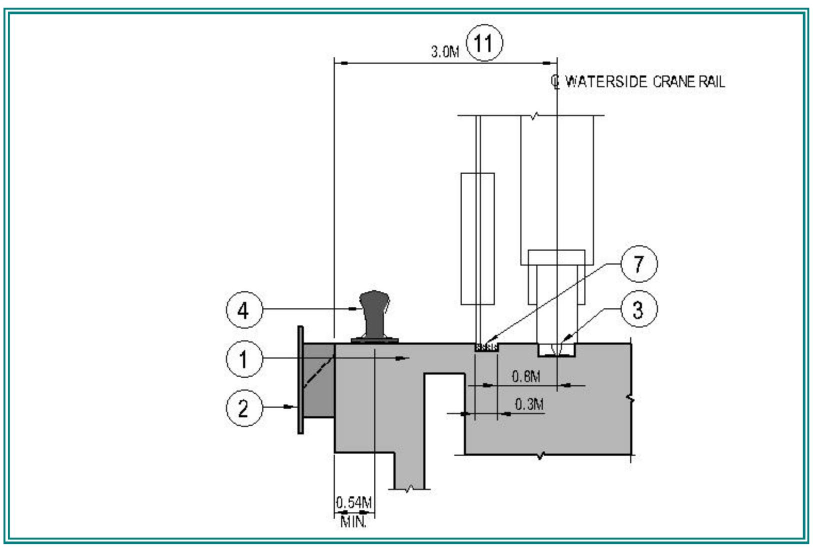


Figure 3.3-6
Minimum Setback with One-Lane Service Road

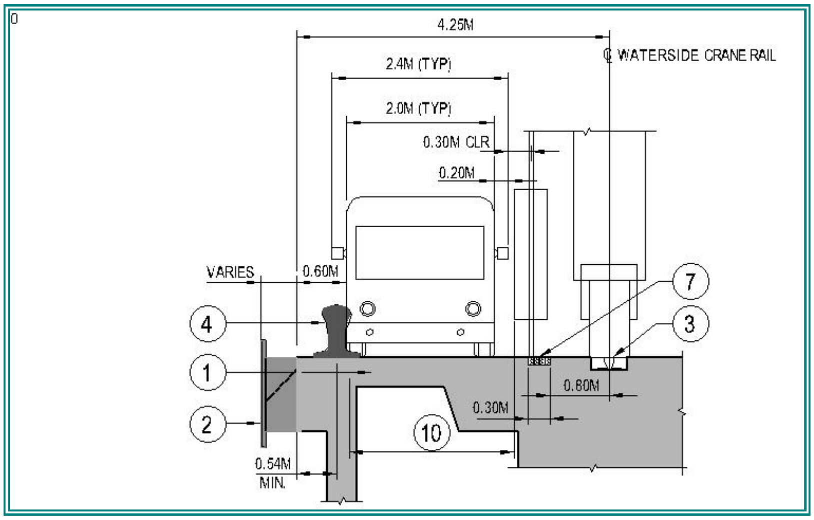
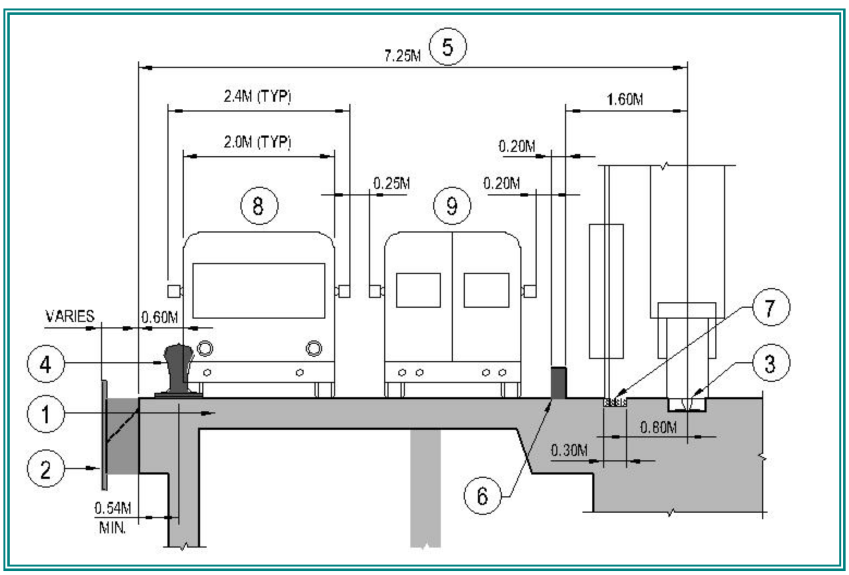


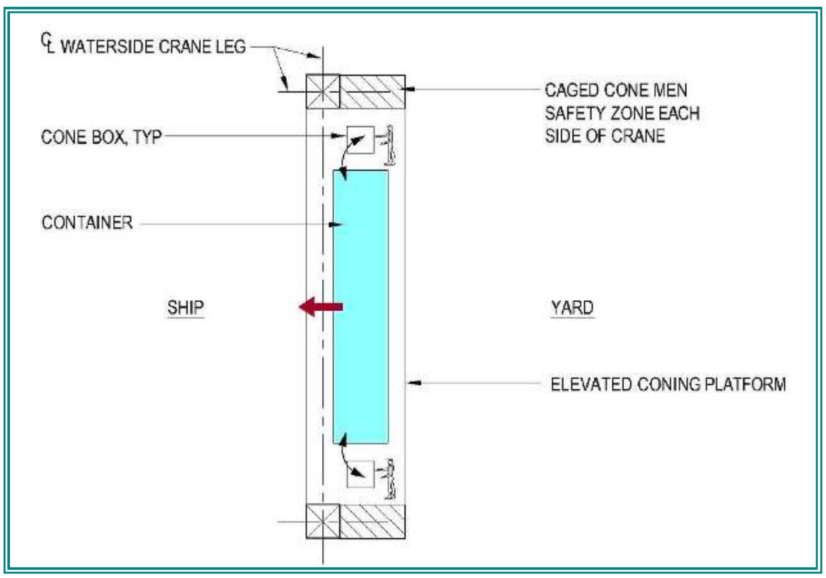
Figure 3.3-7
Minimum Setback with Two-Lane Service Road



Coning Operations. Coning refers to the activity of removing or installing twist locks from the corner casting of the container during loading operations. This is usually a staffed operation that occurs in the load lanes beneath the ship-to-shore (STS) cranes. In an effort to improve worker safety and promote increased wharf performance, coning operations are being removed from the load-lane areas of the wharf. Two options are being promoted: down-stream coning operations and coning platforms.

Down-stream operations occur outside of the crane-operating area using "bomb cart" transfers for conveyance. Use of a street chassis does not support this option. A separate station is established within the traffic pattern between the container yard and wharf operations. Coning platforms (see Figure 3.3-8) are being mounted on the crane itself on an elevated platform, typically attached to the waterside sill beam. A raised platform with a set-down rack allows the workers to access the corner castings and be free of the traffic impacts in the load lanes. A second lifting device is necessary to transfer the container between this intermediate location and the ground, as the STS crane shuttles only between the platform and the vessel.

Figure 3.3-8
Elevated Coning Platform



Container Crane Lifting Capabilities. A number of advancements are underway to increase the lifting capacity of the container cranes or STS cranes. ZPMC has developed a line of cranes capable of using multi-container spreader bars that can lift up to four 20-foot or two 40/45-foot loaded containers with one lift operation. The technology is referred to as "Quad 20's" or "Twin Picks." This new technology can cause operational impacts in the load lanes and container yard operations if not planned properly to accommodate the added capacity of the system. Terminals that operate at this level of productivity also typically use a non-standard crane gauge to accommodate additional load lanes.

A second trend occurring in transshipment terminals that handle a significant number of empty container moves is the use of a dual-lift system for the empties. In this case, the empty containers are stacked on top of each other with interbox connectors (twist locks) and moved as a connected unit in the yard. Specialized bomb carts capable of handling this mode of transportation and double-stacking of the boxes are necessary. Coning operations and extra handling equipment can be problematic with this type of operation.

Both of these options are not suited to the type of cargo-handling operations at Port Everglades due to the make up of balanced cargo moves and lift counts per vessel call. Double lifts of empties may, however, prove beneficial in the long-term as the Port handles more empty containers.

Automated Data Collection on Ship-to-Shore Cranes. The use of optical character recognition (OCR) technology is becoming more commonplace in today's container terminals. The application to gate operations is fairly wide spread and the STS cranes are becoming capable of collecting data from the containers as they are loaded and unloaded from the vessel. This process is commonly referred to as "real time vessel load/discharge transactions" and is used to improve yard utilization and the reuse of slot assignments in the yard. But, more important, this process allows for more accurate time-keeping for demurrage data. The data can also tie into a centralized terminal operating system (TOS) to increase terminal operating efficiencies and terminal operating equipment processing time.

Alternative Marine Power – Cold Ironing. The West Coast ports are facing stringent air quality measures to reduce port-related air emissions. A significant portion of the emissions is related to vessel operations at berth during loading operations. While the ship is at berth, the auxiliary engines run to power the ship for refrigerated cargo and general power service. Applications are in operation at the Ports of Los Angeles and Long Beach to connect the vessel to electric shore power during berth occupancy.

Special design considerations are necessary at the wharf for the installation of power connections and cabling devices, along with provisions for additional power substations and switch gear in the container yard. In addition to the power connections portside, ships need to be retrofitted or built with the ability to accept portside power. As no federal or state standards have been developed for the reduction of air emissions in this context., most seaports and cruise and cargo lines have not as yet invested in the infrastructure needed to provide alternative marine power. The fleet of ships projected to call at Port Everglades in the near term is not expected to have the capability to accept portside power.

Electrification of Yard Equipment. There is a movement within the port industry to minimize air emissions from yard equipment. One effective approach is the use of rail-mounted gantry (RMG) cranes that use electrical power for operations. Significant study has also been underway to develop an electric-powered RTG crane on fixed runways that use diesel power for shuttling between aisles and returning to maintenance areas. In addition to the reduced air emissions, these types of equipment also offer enhanced storage density and performance and could eventually have application at Port Everglades.

Densification and Automation of Yard-Handling Equipment. As the cargo throughput demand increases at a port, the logical transition is to ground, or stack, cargo as opposed to allowing storage of loaded containers on wheeled chassis. There is a progressive nature to the modes of operation and stacking equipment used to increase the storage density in the container yard. The higher the stacking employed, the higher the static storage density per acre. This increased storage density comes with an increased labor component for container sorting and rehandling to service the gate traffic and vessel-loading operations. Some pieces of equipment provide advantages over others as the storage density requirements increase.

The logical progression of stacked storage equipment for servicing loaded containers includes, by order of density and efficiency:

- Top-picks (low-density stacks).
- Top-picks (high-density stacks).
- RTGs.
- RMGs.
- Double cantilevered RMGs.
- Automated stacking cranes (ASCs).

By nature, top-picks are basically fork lifts that can access a stack in a two-dimensional approach, meaning that they can only service the box that lies directly in front of the machine and on the top of the stack. To reach a box in the middle of a pile requires multiple moves and restacking as boxes are displaced. The RTG, RMG, and ASC yard cranes work three-dimensionally and can shuttle between cells and aisles to quickly sort and pick a given box in a stack. The crane also rides over the stack to allow greater access to the storage area.

The ASCs are fairly advanced machines that are unmanned and require sophisticated integration with the TOS to work automatically. The beauty of this system is that it can work at very high speeds, throughout the day and night. On down time, when the gate is inoperative or limited traffic is in the yard, the machine can switch to maintenance mode and begin combing the storage piles to get ready for the next day of operations.

Future operations at Port Everglades may include the high-density top-pick and RTG/RMG modes of operations for the foreseeable future. The RTG and RMG applications are more capital-intensive investments that include improvements such as concrete crane runways or railways, power trenches, maintenance pads, and hurricane tie-downs. The electivity and speed of operation afforded by these types of machines cannot, however, be approached by top-pick operations.

Automation of the Terminal Operating Systems. Connecting the new advanced OCR technology applications at the gates, yard equipment, and STS cranes through the TOS allows the centralized computer system to automatically decide on equipment deployment in the yard. The TOS can assign duties to the yard equipment during down time and allow sorting and pre-stowing of loads. The system also tells a piece of equipment what the operator should be doing after the current task is completed. These advancements have significantly improved terminal productivity and decreased the gate transaction time necessary to service a street trucker at the gate.

Many of the existing Southport container terminals at Port Everglades are using some form of an automated TOS and are seeking measures to further enhance integration of their systems.

Chassis Management Pools/Empty Container Depots. The U.S. container market is one of the only remaining operations internationally that owns and maintains street chassis for the truckers. Most international shipping operations require that the truckers own and maintain their own chassis. Management and deployment of chassis around the U.S. market have become a challenge due to the storage area required on terminal, maintenance/parts storage, timing/availability of chassis equipment during peak periods, and random return patterns of independent street truckers.

Movements are underway within the U.S. shipping community to minimize the impact of street chassis storage at the marine terminals by using centralized chassis pools to remove the exchange, maintenance, and storage of chassis to off-dock facilities located inland of the ports. Typically, third-party operators manage and operate the facilities. The chassis pools can also serve as empty container depots, reducing unnecessary truck trips to the main marine terminals and further improving regional congestion on port roads and enhance gate productivity. A more dramatic policy shift is also being debated throughout the country to provide a free chassis to every street trucker for ownership and maintenance.

At Port Everglades, most terminal operators have transferred ownership and maintenance of the chassis to the street truckers. Most of the terminals that operate as wheeled terminals will continue to own and control use of their privately held chassis pool on site. Empty container transactions and repair at off-site depots may be a concept worth exploring further to maximize the gate and terminal operating efficiencies.

Terminal-Related Process Improvements. In today's modern container terminals, general housekeeping practices, that is, preparing for the day's activities by restoring things undone during the normal course of business, keep the terminal in shape and ready for the next operational onslaught. Some simple measures have been applied to existing operations with elevated success. These measures include trucker appointment systems, pre-stowing cargo, maintaining a pool of empty containers on chassis, re-sorting storage areas to move boxes to the top of the stack, and other similar measures to prepare for the next day's activities.

With an appointment system, the terminal has a relative expectation of when a trucker will arrive to pick up or drop off a box. This allows the TOS to command the yard equipment to prepare for receipt or delivery of a load later in the day. This reduces trucker wait time and provides more efficient yard equipment utilization by reducing sorting and rehandling operations. As the system becomes more advanced, the yard transactions can be pre-stowed to allow the street truckers direct access to their loads as opposed to their waiting for a piece of equipment to find a box, dig it out of the storage pile, and place it on a chassis. All of these basic approaches add up to significant increases in terminal efficiencies.

The Southport container terminal operators at Port Everglades have begun to employ many of these approaches to increase terminal productivity and better utilize their terminal area. The most prevalent activities include mandatory trucker appointments, pre-sorting cargo, and automated integration of TOS and equipment deployment activities. The Midport terminals have delayed integration of these practices at this time. As cargo throughput increases at these terminals, additional measures to improve yard processes will be necessary to use the currently available land area more efficiently and maintain acceptable customer service levels.

Electronic Data Exchange. In today's world of unlimited electronic access to wireless data transfer and communication, many operators throughout the country are using a paperless data exchange to schedule and process gate transactions. This technology is also applied in the terminal to assign work to individual terminal operating equipment and to assign daily work efforts transaction by transaction. Trucking companies and terminals can communicate effectively with cellular phones and wireless internet access.

The trucker can receive data about when a shipment has arrived and is ready for pick up. The yard location can be sent via cell phone, directing the trucker to a slot in the yard for the transaction. Pick-up and delivery confirmation can be transmitted to the trucking company electronically. This last effort is beginning to reduce or eliminate exit gate pedestals for transaction receipts. In-bound gate processing time and lane counts are also being reduced in response to the amount of data transactions that can occur electronically.

Most of the Southport container terminal operators at Port Everglades are taking advantage of this process.

3.4 Cargo Operational Enhancement Opportunities

This section identifies opportunities for operational enhancements at the Port Everglades marine terminals. Operational enhancement opportunities consider technological, equipment, labor, and other operational changes that may improve a given terminal's performance. Some of the concepts are applicable to the conditions prevalent at Port Everglades; others are not applicable. The following sub-sections provide an overview of the topics discussed and their potential future application at the Port.

3.4.1 Container Terminal Opportunities

Southport Container Berths. The Southport area of the Port contains the majority of the high-throughput container operations using low-profile gantry cranes on a public wharf along the Intracoastal Waterway and Turning Notch, with individual terminals located behind the wharf apron. The wharf apron serves as the load lanes beneath the cranes as well as wharf circulation and bomb cart storage areas. The southern end of the wharf, at Berths 33A – 33C, is used to service RO/RO vessels. Four areas of opportunity require further investigation:

overall berth length, wharf apron depth, crane deployment, and RORO/gantry crane operating conflicts.

Overall Berth Length. The existing Southport wharf system consists of three berth segments and two RO/RO piers. Berth 30 within the Turning Notch is approximately 900 feet long. Berths 31/32 are located along the Intracoastal Waterway and provide an overall berth length of approximately 1,984 feet, or approximately 992 feet per berth. Berth 33A provides approximately 800 feet of berthing area. The two RO/RO piers -- Berths 33B and 33C -- are located adjacent to Berth 33A. As the overall length (LOA) of the vessels calling at Port Everglades has increased over time, the existing berth lengths are no longer adequate to serve the larger vessels. This issue requires double-berthing or non-standard mooring arrangements that place the vessels closer together on a berthing segment or ship structures that overhang the wharf structure. These practices can lead to less than ideal safety buffers. Expansion of the Turning Notch to accommodate a Maersk S-Class vessel (1,180-foot LOA) is being considered in the future ACOE dredging program.

Typically, a standard berth length is equal to the largest vessel calling at the berth, using the vessel length plus one-half beam on each end of the vessel for mooring lines, as shown in the formula below:

Berth Length = Typical Vessel LOA + (1 x Typical Vessel Beam)

The typical container vessel fleet calling at the Port's Southport terminals is estimated at 900 to 1,000 feet in length and has a beam of approximately 100 to 110 feet in width. Using the formula above, a typical berth length would be approximately 1,000 to 1,100 feet. To accommodate the existing and future vessel fleets calling at Southport, additional berth lengths will be necessary.

Wharf Apron Depth - The existing wharf apron allows for a minimal circulation area behind the crane legs. As discussed previously in Element 1 (Section 1.9), there are opportunities to improve traffic flow and loading operations on the wharf apron areas. Discussions with the Port's senior staff indicated that options to increase the depth of the wharf apron are acceptable and warrant further study for the existing and future wharf structures.

Crane Deployment – The existing Southport berths provide seven low-profile container gantry cranes that are shared among four berths. This provides for an average crane-to-berth ratio of 1.75 cranes per berth. Typically, most other container terminal operations in the region provide an average of two to three cranes per berth, depending on the level of berth activity and vessel call patterns.

Under the existing conditions, the Port controls crane assignments on a first-come, first-served basis unless a terminal lease contains preferential assignment clauses. The limited crane availability means that cargo transactions take more time and causes vessels to occupy the berths for longer periods. As more crane equipment is applied to a vessel, the cargo can be transferred faster and the vessel can leave the berth sooner. The capital cost of building and operating a container vessel is extremely expensive and can reach in excess of $25,000 or more per day. It is imperative that the shipper receive fast service and quick turn-around to keep the vessels at sea. The cost of acquiring additional cranes and berth occupancy goals should be studied further during the individual terminal redevelopment projects, as the Port expands in the future.

The redeployment of cranes or the ability to shuttle cranes between berths is another area that can impact the ability to service a vessel quickly. The existing configuration of the Southport berths does not lend themselves to efficient redeployment between berths because of the angled alignment of the berths. The Port's cranes are equipped with articulated trucks that allow the crane to negotiate curves in the crane rail. In theory, it makes sense to have the ability to go around bends and corners in the wharf structure. In practice, however, this operation is time-consuming and burdensome to the wharf operations as an area of the wharf is cleared to allow crane movement.

At Southport, the cranes are not normally shuttled between berth segments unless there is an urgent need to work a vessel or an equipment failure has occurred. A straight wharf segment provides greater operational flexibility by allowing cranes to be quickly redeployed between vessel berths as necessary. A longer berth segment can also accommodate numerous iterations of short and long vessels and create additional flexibility.

RO/RO/Gantry Crane Operating Conflicts – The Intracoastal Waterway and the Southport landform create a narrow passage that required placement of the RO/RO piers in proximity to Berth 33A. It is difficult to service a vessel at Berth 33A when a RO/RO vessel is on berth at Pier 33B, and maneuvering a vessel into berth while another vessel is occupying a berth is a challenge. To complicate matters further, Crowley has been extremely successful at moving cargo through Port Everglades using the RO/RO piers and achieving some of the highest berth occupancy factors anywhere within the Port. This conflict between the two berthing areas does not allow simultaneous berthing under most conditions.

Extension of Midport Berths and Protection of Mangrove Areas. From the beginning of the planning process, berthing limitations were seen as a potential limiting factor to future growth at the Port. The Southport berth expansion options are limited by the alignment of the Intracoastal Waterway and adjacent environmentally protected state parks. The Midport area provides potential opportunities for expanding berth configurations by filling the Tracor Basin, realignment of the pier-head line, and possible berth extensions to the south in front of the protected mangrove area. In Phase II, however, the latter possibility was determined to be infeasible.

During initial meetings with ACOE staff and the environmental experts on the Consultant Team, options were discussed to construct a pile-supported bridge wharf in front of the protected mangrove dikes. This concept was acceptable to the ACOE, if the location of the mangrove dike could be maintained and some type of perforated deck surface could be implemented that allowed light to partially penetrate the structure and limit shading on the mangroves below the deck surface. The pile-supported structure could be designed to allow free flow of tidal flushing from the Intracoastal Waterway, cooling water from the FPL Discharge Canal, and migration of manatees.

Midport/Southport Intermodal Bridges. The Port is considering options to connect the southern portion of Midport and the northern portions of Southport by constructing a bridge over the FPL Discharge Canal in the vicinity of the existing lumber operations and SE 36th Street. The connector bridge would allow opportunities to shuttle cargo between the two land areas with wharf access along the Intracoastal Waterway. Coordination will be necessary between the existing tenants, the federal agencies using small craft in the FPL Discharge Canal, and protected manatee and mangrove areas.

Consolidation of Midport Non-Contiguous Lease Areas. The Midport area is made up of a patchwork of mixed land uses and multiple terminal operators in a confined land mass. This area services all of the cargo types found at the Port, with the exception of petroleum products. Midport includes a mix of container terminals, break-bulk operations, cement terminals, significant cruise terminal operations, and cruise terminal parking/garages. These intermixed operations create competing traffic patterns of truck operations and passenger cars, especially during the height of the cruise season. In addition to landside access issues created by roadways connecting these activities, the berthing areas are shared among the various users, with cruise vessels receiving the highest berthing priorities.

This pattern of land use has created a series of non-contiguous parcels or lease boundaries that do not promote efficient terminal layouts or traffic patterns. In addition, cruise terminal and other warehouse facilities have been built along the wharves to maximize the shared use of the terminal areas. These buildings are not sited to optimize container wharf operations and support efficient traffic patterns along the wharf apron.

Densification of Container Yard Storage Areas. As discussed in Section 3.3.2, densification is the process of increasing the number of containers that can be stored per gross terminal acre. As cargo throughput increases, but the terminal remains in the same configuration, the boxes are stacked on the terminal to increase storage capabilities. With the exception of the banana carriers and RO/RO operators, most of the container terminal operations are using low-density top-picks due to the lack of terminal-owned chassis. Low-density refers to using 2-wide and 2- to 3- high stacks, which net a lower storage density than wheeled cargo operations. This is due to the relatively low stacking heights, stack widths and equipment maneuvering aisle area adjacent to the stacks. The low stack heights do, however, allow quick access to a given container. Widening the stacks to three to four containers wide will increase storage densities beyond the capabilities of a wheeled operation, but will come with the increased labor costs associated with sorting and retrieval operations. This option could be used as a short-term measure to increase terminal density with no additional investment costs. Top-picks offer greater terminal layout flexibility by changing the amount of equipment and altering the stripping patterns in the yard to increase the size of the storage piles.

Further yard densification can be realized with gantry cranes and additional investment in civil infrastructure to support application of the new cranes. In the case of RTGs, fixed concrete runways are typically required to support the heavier wheel loads and lighting/hydrant spacing modifications may also be necessary as the stack and drive aisle locations are modified. Once the layout is approved, it is difficult to make changes later due to the cost of runway demolition and replacement. RTGs can, however, operate at much higher densities than wheeled or top-pick operations. The cranes are also more adept at sorting and accessing random containers in a dense stack. This is why they are typically employed in the back of the terminal first to service street truck activity with random gate arrivals. Many of the tenants at Port Everglades Southport and Midport container terminals have developed conceptual plans to convert their terminals to RTG layouts in the near future.

Another method used to enhance terminal operations and throughput is dwell-time reduction. Most of the existing wheeled cargo operations at the Port employ a just-in-time terminal delivery method. This effort is further supported by the use of off-terminal warehouses and consolidation facilities that can quickly deliver or retrieve cargo from the terminals. This approach has resulted in a fairly high cargo turnover and annual throughput per acre at the wheeled banana terminals.

Creation of a Free-Storage Limit. The Port currently allows unlimited free time for storage of loaded and empty containers within the terminals. Most of the regional ports and others across the U.S. have adopted free-storage limits on all container types to promote removing the containers from the terminal in a timely fashion and decrease the average dwell time that containers are stored on the terminal. Enacting this type of tariff, when combined with other cost-sharing incentives or minimum cargo-threshold limits, can also be used as an incentive to move more cargo through the facility. Combined, these policy changes can be used to enhance terminal operations. Typically, most ports use a tiered approach where empty containers can remain on site for 15 to 30 days and loaded containers are allowed free storage for 7 to 15 days. On the West Coast, free-time storage has been mandated at less than five days to allow for greater cargo throughput.

A specific example of free-storage abuse can be found at one of the Midport container terminals where approximately 25 to 30 percent of the terminal area has been used to store damaged containers for many years, without any revenue return to the Port from cargo movement other than the base land lease.

Typically, tariff changes of this magnitude require close coordination with the shipping community and terminal operators to develop an equitable approach to resolving this issue and encouraging higher rates of cargo turnover. An area-wide survey of ports in the region and their free-storage limits would act as a guide for the current practices. The new tariff for the free-storage limits would need to be implemented port-wide after an acceptable agreement had been reached with the tenants. An alternative method would be to implement the free-storage limits on a tiered basis to gradually ease the practice into operation. As an example of a tiered application, the initial tariff would be fairly easy to accommodate, based on existing practices, and the time frame would be reduced over a period of five years to achieve the more aggressive practice. This would allow for a gradual change with minimal operational disruptions.

3.4.2 **Petroleum Terminal Opportunities**

The previously cited Purvin & Gertz (P&G) *Petroleum Sector Strategy Study* recommends a number of terminal improvements to enhance the loading operations in Northport. To summarize the recommendations, the study suggests replacing the manifolds and loading arms with larger piping and connecting the manifolds to allow higher transfer of cargo and distribute the flows more efficiently. The study also recommends further analysis to address the narrow slips and adjacent berths and identifies a future need for three petroleum tanker berths and one tanker barge berth. The Consultant Team has reviewed these recommendations with the Port's senior staff and Port tenants; their implementation is discussed later in this element and in Element 5.

3.4.3 Dry Bulk Terminal Opportunities

The Midport cement terminals perform at fairly balanced berth/yard operations. During the tenant interviews, berth-length deficiencies were discussed. The current fleet of bulk vessels calling at Port Everglades has a LOA of approximately 660 feet, which is longer than the berth length. The existing wharf structure at Berths 14/15 within Slip 3 has an overall length of 1,226 feet, or 613 feet per berth. Using the berth standard discussed previously, a typical cement berth should be approximately 750 feet, or 1,500 feet for a two-berth facility. The existing berth length requires non-standard mooring practices that place the vessels closer together, limit mooring options, and require the stern of the ship to jut out beyond the limits of the wharf structure into the Midport Basin.

The current berthing practice at Slip 3 also requires the ship at Berth 15 to relocate temporarily during vessel navigation activities at Berth 14. This delay impacts vessel- loading activities and limits terminal efficiencies.

3.4.4 Break-Bulk Terminal Opportunities

The Port's break-bulk terminal operations are located in Northport and Southport and share common berth and warehouse facilities with the cruise line operators. The dedicated lumber and steel terminal operators also use temporary storage yards adjacent to Slip 2 and in portions of Midport. These temporary lease assignments are referred to as "grid assignments" and are renewed on a 10-day basis as needed. This approach allows the Port the greatest operational flexibility for these shared use areas; however, it also limits the affected tenants' desire to invest in terminal upgrades to enhance operations.

During the tenant interviews, lengthy dwell times were reported for the lumber and rebar/steel cargoes; these ranged from 30 to 45 days or more on average. Other regional ports operate their break-bulk terminals with lower dwell times of 15 to 30 days by using multiple shipping lines and inland storage facilities.

3.4.5 Slip Width Opportunities

The finger piers and narrow slip widths used to develop Piers 1 and 2 are reminders of the Port's earlier development, when smaller vessels were common. These piers typically serviced the smaller petroleum and break-bulk vessels calling at the Port. Since the initial development of these piers, vessels have increased in size and the amount of cargo transferred per vessel call has increased, placing constraints on both the slip widths and the land area on the piers. In some cases, an adjacent berth is not used within the same slip due to navigational constraints. This is especially prevalent in Slip 2, with the larger cruise ships calling at Cruise Terminal 4.

3.4.6 Turning Basin and Other Navigational Opportunities

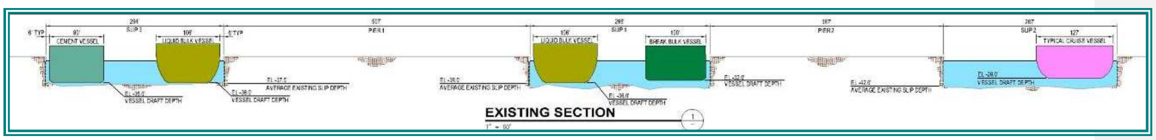
The Port's permitting application with the ACOE to increase the depth and width of its waterways defines the vessel characteristics and navigational requirements throughout the Port, based on previous planning studies; these requirements were reviewed during Phase II to reflect vessel size increases and potential land use relocations and ensure that the Port's terminal facilities can be accessed safely.

3.5 Conceptual Planning Studies

3.5.1 Phase I Slip Width Study (Modified in Phase II)

The existing Northport slip and pier have reached the limits of the original facility design due to changes in use, increases in vessel sizes, and the types of cargo the Port now handles. The existing slip configuration is illustrated for reference in Figure 3.5.1, a larger version of which is contained in the Appendix. The P&G study identifies the navigational deficiencies of the slips servicing the petroleum industry and suggests further analysis to determine an appropriate channel width for the slips. As part of the planning process, the Consultant Team studied the potential future vessel fleet calling at the Northport terminals and the required navigational requirements. Tandem berthing within the slips was considered as a measure to address creation of additional berthing area to accommodate the projected cargo and cruise passenger demands. This would be accomplished by dredging the slips inland to increase berth lengths.

Figure 3.5-1
Existing Slip Configuration



The Slip Width Study design approach included the following tasks:

- Analyze minimum slip widths for anticipated vessel operations.
- Study possible "tandem berthing" operations in Slips 1, 2, and 3.
- Review published vessel navigation guidelines.

Three relevant codes were identified that can guide the establishment of appropriate slip widths;

- *MIL-HDBK-1025/1 Waterfront Facilities Criteria Manuals - Piers and Wharves Military Handbook* (10/30/1987).
- *PIANC, Joint PIANC-IAPH Report on Approach Channels - A Guide for Design (Volume 2) PTC2 Report of WG 30 - Final Report*, *Supplement to Bulletin nr. 95* (June 1997 issue).
- *Unified Facilities Criteria (UFC) Military Harbors and Coastal Facilities Military Handbook UFC 4-150-06 (12/12/2001)* (supersedes *DESIGN MANUAL 26.1, 26.2 and 26.3*).

The military handbook (*MIL-HDBK 1025/1*) for designing piers and wharves provides the standard basis for slip widths. PIANC does not provide direct standards and UFC recommends using the MIL-HDBK. The overall slip width is determined by treating the area remaining between berthed vessels as a navigation channel, using UFC and PIANC standards. The following discussion is provided as an overview of how all three guides were applied. Further detailed analysis and simulation are necessary to gauge the accuracy of study results.

Alternative Standards Considered- MIL-HDBK-1025/1

Recommended basin dimension formula for multiple berth piers:

The greater of seven times Beam of ship, or (B+F) + (3 B+T) + (B+F)

Simplified formula: Greater of (7 x Beam) or ((B^a + F) + (3 x B^b) + (T) + (B^b + F))

Where: B is the ship's beam (B^a is the first vessel & B^b is the second)

F is a separator (Fenders etc.)

T is tug length

Alternative Standards Considered-UFC 4-150-06

One-way traffic channel design criteria:

- Assumptions:
  - Excellent vessel maneuvering (tugs and/or thrusters-azipod drives)
  - Maneuvering lane width: 1.6 B
  - Bank clearance typically 0.6 B to 2.0 B (2x) (slow travel speed)
  - Bank clearance width: 2.0 B
- Recommended transit lane clearance formula:
  - (1.6 B + 2.0 B x 1.0) B = 3.6 B
- Total slip clearance:

  3.6 B + 2.0 B + 2.0 F (transit lane, berthed vessels & fenders) = 5.6 B + 2.0 F

  Simplified formula: ((3.6 x B) + (2 x F) + Ba + Bb)

Alternative Standards Considered- PIANC

Wbm – Basic Maneuvering Lane

Basic maneuvering lane:	1.3 B (using tugs and/or thrusters)
Aids to navigation (good):	0.1 B
Bottom (smooth and soft):	0.1 B
Depth of waterway:	0.2 B
Cargo hazard (medium):	0.4 B for Liquid Bulk
Total maneuvering lane width: 1.7 B to 2.1 B	

Wp - Passing Lane

Slow speed:	1.0	B
Moderate traffic:	0.3	B
Total passing lane width:	1.3 B	

Wbm (2.1xB) + Wp (1.3xB) + (2xB) Berthed Vessel = 5.4 B

Simplified formula: $((2.1 \times B) + (1.3 \times B) + (2 \times F) + B^a + B^b)$

Alternative Standards Considered-the Consultant Team and Pilot Observations

The following rule-of-thumb is based on observations during maneuvering and simulation sessions for various port facilities around the world. Pilots prefer a maneuvering space of about a 150 FT, or:

Maneuvering lane width = 1.0 B + 1.0 T + 150 FT

Simplified formula: $(1\ B + Tug + 150\ FT) + ((2 \times F) + (B^a + B^b))$

Three vessel configurations were considered to determine the potential slip width requirements. In this example, the respective vessel types would be berthed on opposing berths with a navigation channel between the berthed vessels. The vessel classifications were consistent with the potential land uses under consideration during development of the 20-year Vision Plan.

- Option “A”: Liquid Bulk and Cement Slip.
- Option “B”: Liquid Bulk and Cruise Slip.
- Option “C”: Cruise and Cruise Slip.

The following vessel characteristics were assumed:

- Tug (5000 bhp/2-prop) 125 FT – LOA
- Mega-cruise vessel (Freedom) 126 FT – Beam
- Liquid bulk vessel (Panamax) 106 FT – Beam
- Cement vessel (4-Hold Handymax) 90 FT – Beam
- Standard fender allowance 5 FT (F)

Application of the vessel criteria to the models resulted in a range of solutions. The results of each of the slip width models for tandem-berthing operations are summarized below in Table 3.5-1.

Table 3.5-1
Slip Width Study Summary

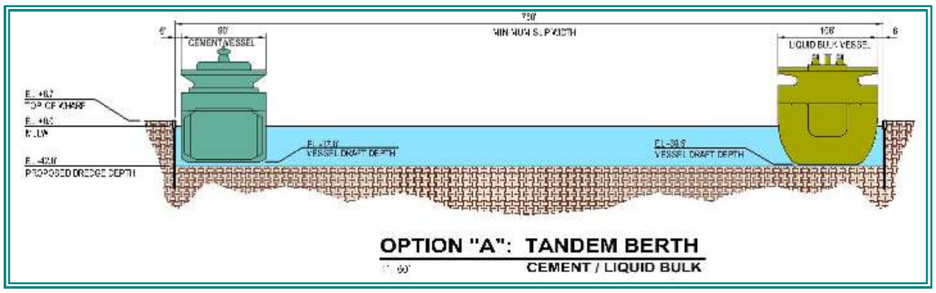
Slip Width Study - Tandem Berthing Summary					
Option	**MIL-HDBK**	**UFC**	**PIANC**	**DMJM/Pilots**	**Average**
"A" - Cement/Petroleum	742	578	694	577	648
"B" - Petroleum/Cruise	896	796	961	681	834
"C" - Cruise/Cruise	1050	840	1005	725	905

The results from the model applications were averaged and rounded to develop a recommended minimum slip width for each of the slip options:

- Slip Option “A” - Cement/Petroleum: Minimum 650 Feet
- Slip Option “B” – Petroleum/Cruise: Minimum 850 Feet
- Slip Option “C” – Cruise/Cruise: Minimum 900 Feet

The recommended slip widths for the various options under consideration are provided below in Figures 3.5-2, 3.5-3, and 3.5-4.

Figure 3.5-2
Recommended Slip Option "A"Figure 3.5-3



Recommended Slip Option "B"

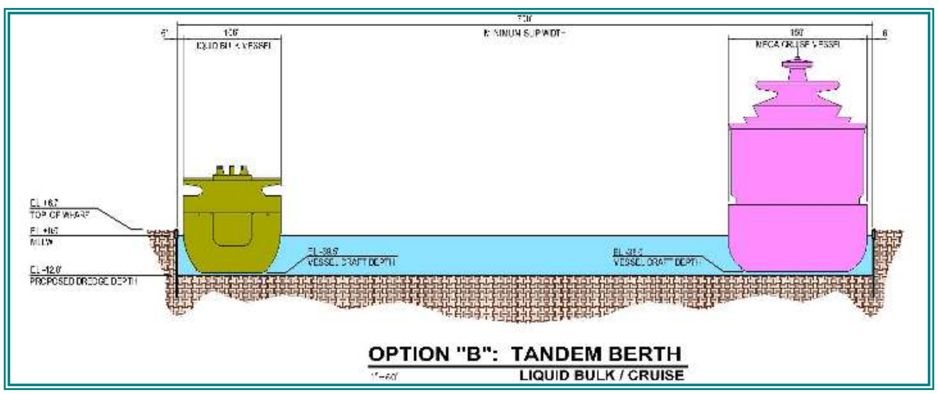
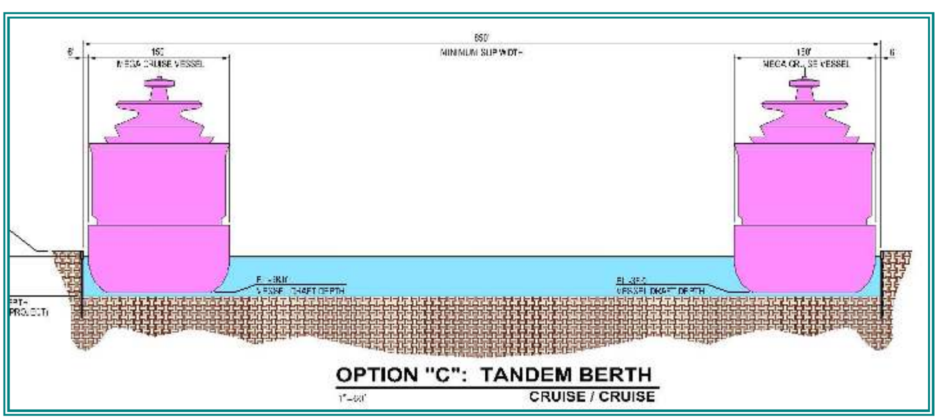


Figure 3.5-4
Recommended Slip Option "C"



After reviewing the Slip Width Study findings, it became apparent that the area available to achieve the recommended slip configurations could not accommodate three slips along the western edge of the Northport Basin. Also, the existing Northport sheet-pile system is aged and its effective structural life is under investigation by an independent study.

An option to reconfigure the location and length of the slips was discussed during evaluation of the land use alternatives. The Consultant Team and the Port's senior staff developed a range of options that strived to retain the existing alignment of the cement berths on the southern edge of Slip 3 and the cruise terminal berths on the northern edge of Slip 2. The resulting configuration provides two berthing slips with a marginal pier between the two basins. The proposed slip reconfiguration and alignment are illustrated for reference in Figure 3.5-5 and 3.5-6, full size versions of which are included in the Appendix.

Figure 3.5-5
Reconfigured Slips - Cross Section

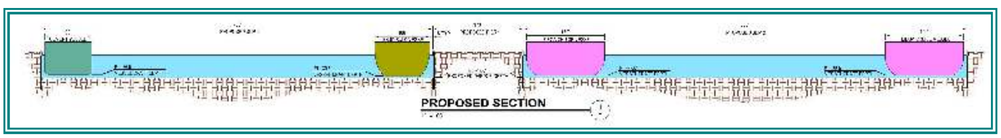
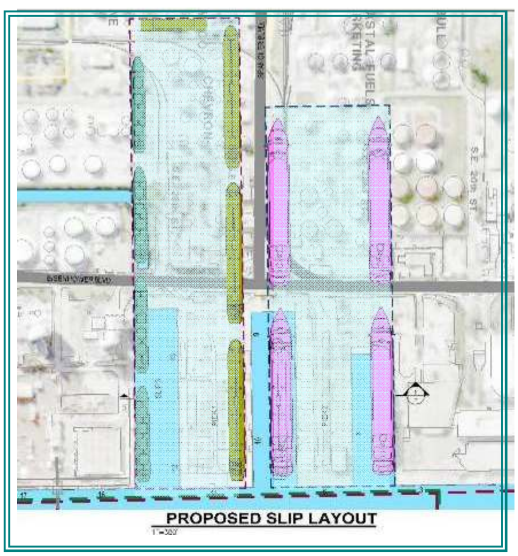


Figure 3.5-6
Reconfigured Slips - Plan View



The Consultant Team and the Port's senior staff decided to eliminate the tandem-berthing option for cruise vessels in the newly created cruise basin and use single berthing to reduce impacts on the petroleum properties. The recommended slip width for single berthing two mega cruise vessels on opposing berths is approximately 750 feet, as reflected in the 20-year Vision Plan discussed in Section 3.7.

3.5.2 Turning Basin Sizing Study

This section deals with the study of potential turning basins and other navigational requirements.

One of the first areas of study involved sizing the turning basins to accommodate larger vessels in the Main Turning Basin, Intracoastal Waterway, Dania Cut-off Canal (DCC), and the Southport Turning Notch. The Consultant Team developed a set of turning basin criteria for further evaluation:

- Review proposed ACOE turning basins and design vessels.
- Review future vessel requirements over the planning horizon.
- Consider the basin needs of the approach channel and the DCC
- Use the PIANC Standard of 1.5 x LOA where possible.

The following discussion summarizes the design criteria established for each of the navigation elements.

Proposed ACOE Turning Basin Designs Presently under Consideration:

- Main Turning Basin (existing concept)
  - Sized for future cruise and container vessels
  - Design vessel: 950-foot LOA
  - Basin diameter: 1,425 feet
- DCC (existing concept)
  - Sized for smaller RO/RO vessels
  - Design vessel: 525-foot LOA
  - Basin diameter: 788 feet
  - Three-point turn design currently proposed

To accommodate the future vessel fleet and allow for the greatest range of vessel flexibility over the next 20 years, the following recommendations were established for sizing the turning basins in the future. A summary of the future vessel sizes and turning basin recommendations necessary to accommodate the larger vessel fleets is provided in Table 3.5-2.

Table 3.5.2
Turning Basin Study Summary

Turning Basin Study - Summary		
Basin/Vessel	**LOA**	**DIA@1.5xLOA**
Main Basin/Mega Cruise	1150	1725
DCC Basin/RORO	700	1050
DCC Basin/Aggregate	800	1200

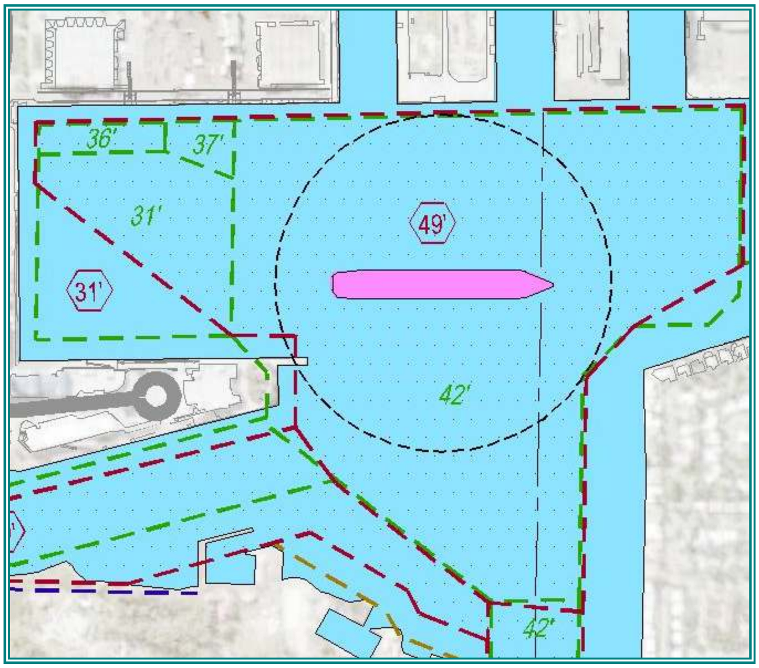
The study addressed sizing the Main Basin for the largest future vessels, including the Maersk S-Class container vessels and the Freedom Class mega cruise vessels and sizing the DCC Basin for the most flexible vessel operations in the future, including cement and larger bulk aggregate carriers

The recommended design criteria to accommodate the future fleet of vessels are provided below:

- Main Turning Basin (Potential future concept)
  - Sized for future cruise and container vessels
  - Design vessel: Mega-Cruise vessel; 1,150-foot LOA
  - Basin diameter: 1,725 feet (1.5 x LOA)
- DCC (Potential future concept)
  - Currently sized for smaller RO/RO vessels
  - Design vessel: Aggregate Vessel; 800-foot LOA
  - Basin diameter: 1,200 feet

The potential turning basin sizes and locations to accommodate the future class of vessels are provided in Figures 3.5-7 and 3.5-8, along with the general design criteria.

Figure 3.5-7
Proposed Approach Channel Turning Basin

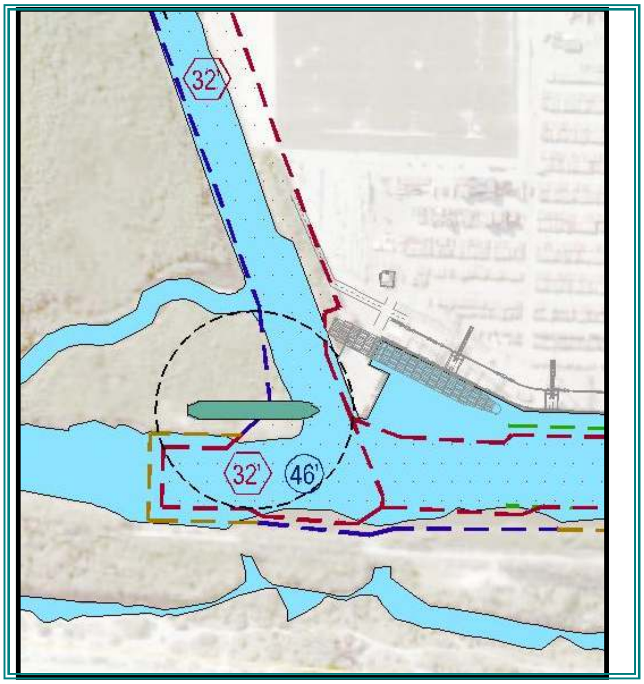


Approach Channel Turning Basin Design Criteria

Mega-Cruise Vessel

- 1,150-foot LOA
- 1,725-foot basin
- 40- to 45-foot depth

Figure 3.5-8
Proposed DCC Turning Basin



DCC Turning Basin Design Criteria

Dry Bulk Cement and Aggregate Vessels

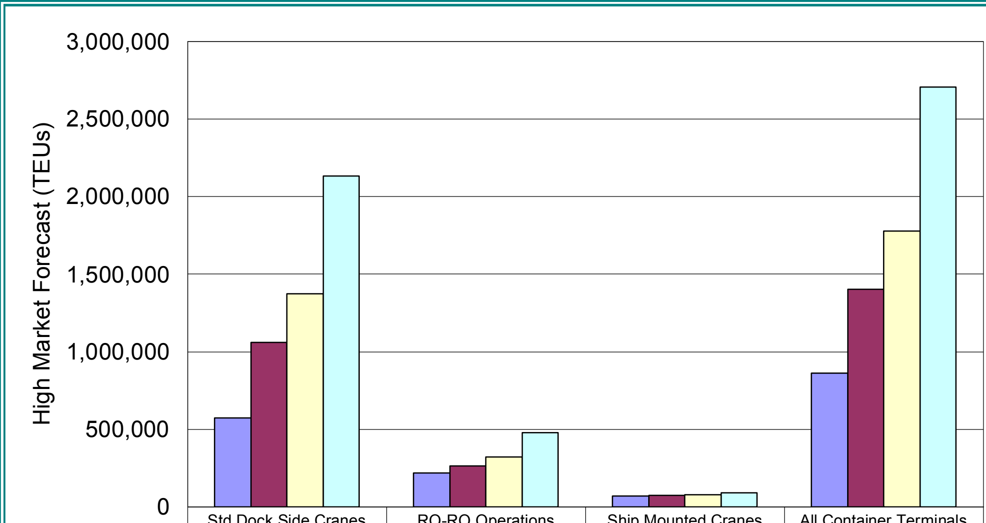
- 800-foot LOA.
- 1200-foot basin.
- 38-44- foot depth.
- Existing RO/RO pier impacts basin location.

3.6 Facility Needs Assessment

As discussed in Element 1 (Section1.8), the future facility needs assessment for the Port was carried out in three steps. In Step 1, market assessments and forecast updates were conducted for all cargo types at the Port over the planning horizon. In Step 2, the amount of cargo each Port facility could handle was calculated, based on existing Port operations and expected changes in future cargo-handling practices. In Step 3, the unconstrained market forecast projections were divided by facility capacity estimates to determine future facility needs for the Port at the prescribed 5-, 10-, and 20-year intervals.

Figure 3.6-1 summarizes the market forecast for the containerized cargo terminals at the Port. The figure shows container forecasts for the three categories of container-handling terminals for the existing (2006), 5- (2011), 10- (2016) and 20-year (2026) planning intervals. The high-growth market forecast scenario was used for the facility needs assessment. The high-growth cargo forecast predicts that, at build-out the Port Everglades container terminals are expected to handle up to 2.7 million TEUs. About 78 percent of the total throughput will be handled using standard dock-side cranes and 22 percent will be handled by a combination of RO/RO operations and ship-mounted cranes for banana carriers. For the 20–year Vision Plan, terminals that use the standard dock-side cranes are forecasted to handle up to 2.1 million TEUs, compared to 479,236 TEUs for the RO/RO terminal and 93,654 TEUs for the terminals that use ship-mounted gantry cranes.

Figure 3.6-1
Containerized Cargo - Market Forecast

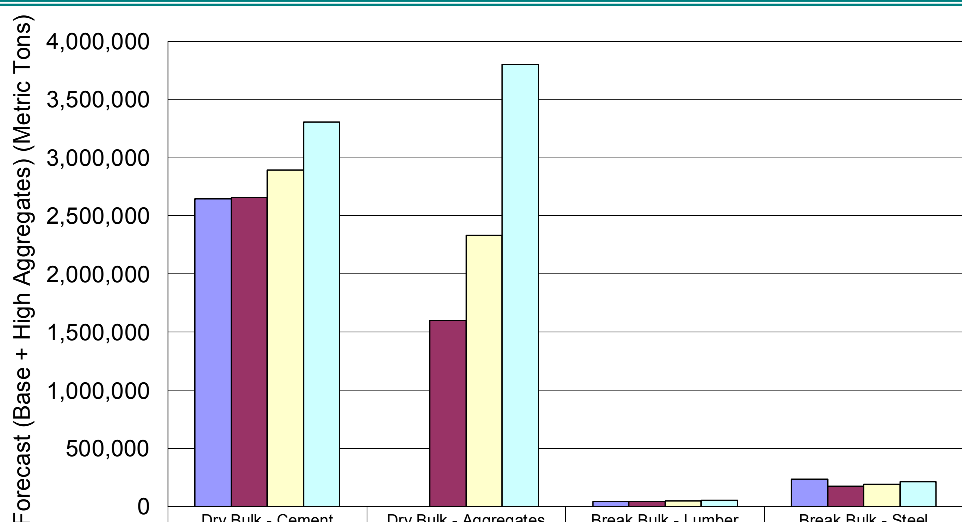


	Std Dock Side Cranes	RO-RO Operations	Ship Mounted Cranes	All Container Terminals
Existing	574,778	218,717	69,535	863,030
5 - Year	1,062,480	266,103	74,909	1,403,491
10 - Year	1,374,132	323,755	80,698	1,778,585
20 - Year	2,133,782	479,236	93,654	2,706,672

Figure 3.6-2 summarizes the market forecast for the non-containerized cargo terminals at the Port. The existing, 5-, 10- and 20-year market forecasts are shown for the dry bulk commodities such as cement and aggregates, along with break-bulk commodities such as lumber and steel products. For the facility needs assessment, the base forecast scenario was used for the cement, lumber, and steel products, whereas the high-growth market forecast was used for the aggregate products.

Cement is forecasted to grow from 2.6 million tons in 2006 to 3.3 million tons in 2026. Currently, Port Everglades does not handle aggregates, but may start handling this commodity by 2011, at approximately 1.6 million metric tons per year. This cargo is forecasted to grow to 3.8 million metric tons by 2026. Under the break-bulk category, the Port currently handles 45,079 tons of lumber per year which is expected to grow to 59,486 tons per year. The steel product market forecast indicates an initial decline in the first five years from 240,803 tons to 175,403 tons, followed by marginal growth to about 218,500 tons per year at the end of the forecast period.

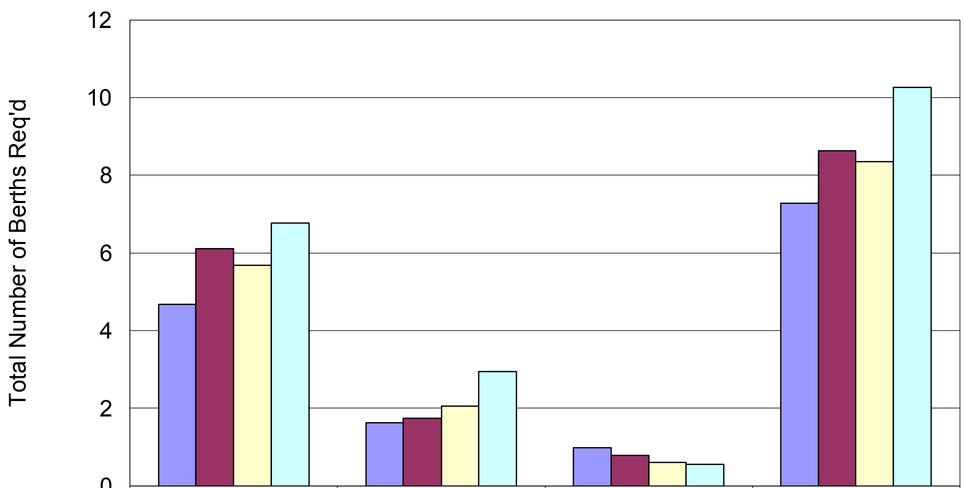
Figure 3.6-2
Non-Containerized Cargo - Market Forecast



	Dry Bulk - Cement	Dry Bulk - Aggregates	Break Bulk - Lumber	Break Bulk - Steel
Existing	2,643,878	-	45,079	239,803
5 - Year	2,653,576	1,600,000	47,732	175,403
10 - Year	2,892,313	2,333,772	52,027	191,184
20 - Year	3,307,010	3,801,469	59,486	218,596

The market forecast projections for the containerized cargo terminals shown in Figure 3.6-1 were divided by the unit yard capacity numbers summarized in Section 1.8 on Tables 1.8-8 through 1.8-13 to calculate the total number of berths required to handle the increase in containerized cargo throughput. Figure 3.6-3 summarizes the number of berths required for all three categories of container terminals for the existing, 5-, 10-, and 20-year plan intervals.

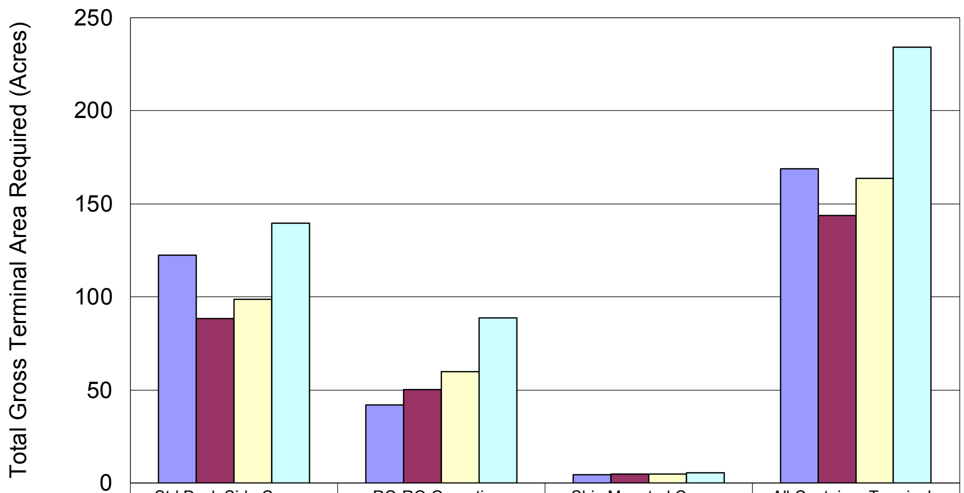
Figure 3.6-3
Containerized Cargo - Number of Berths Required



	Std Dock Side Cranes	RO-RO Operations	Ship Mounted Cranes	All Container Terminals
Existing	4.7	1.6	1.0	7.3
5 - Year	6.1	1.7	0.8	8.6
10 - Year	5.7	2.1	0.6	8.3
20 - Year	6.8	2.9	0.6	10.3

The market forecast projections for the container cargo terminals shown in Figure 3.6-1 were divided by the unit yard capacity numbers summarized in Section 1.8, Tables 1.8-8 through 1.8-18 to calculate the total terminal area required to handle the increase in container cargo throughput. Figure 3.6-4 summarizes the gross terminal acreage required for all three categories of container terminals for the existing, 5-, 10-, and 20-year plan intervals.

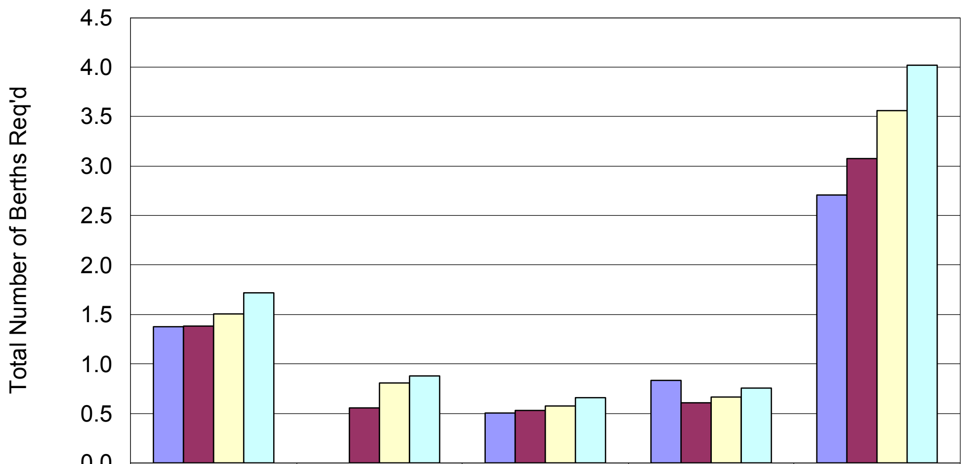
Figure 3.6-4
Containerized Cargo - Terminal Area Required (Gross Acres)



	Std Dock Side Cranes	RO-RO Operations	Ship Mounted Cranes	All Container Terminals
Existing	122.3	42.1	4.6	168.9
5 - Year	88.5	50.2	4.9	143.7
10 - Year	98.9	60.0	4.9	163.7
20 - Year	139.5	88.7	5.7	233.9

The market forecast projections for the non-containerized cargo terminals are shown in Figure 3.6-2 were divided by the unit berth capacity numbers summarized in Section 1.8, Tables 1.8-8 through 1.8-23 to calculate the total number of berths required to handle the increase in non-containerized cargo throughput. Figure 3.6-5 summarizes the number of berths required for all four categories of non-container terminals for the existing**,** 5-, 10-, and 20-year plan intervals.

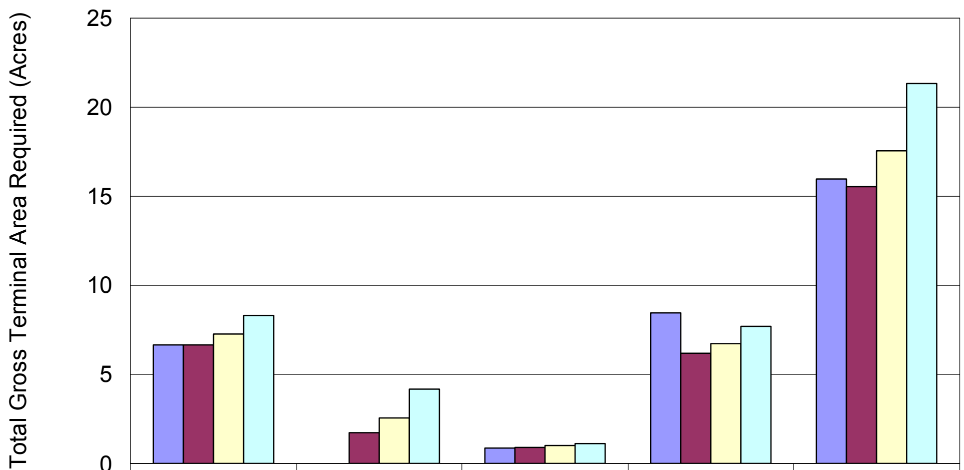
Figure 3.6-5
Non-Containerized Cargo - Number of Berths Required



	Dry Bulk - Cement	Dry Bulk - Aggregates	Break Bulk - Lumber	Break Bulk - Steel	All Non Container Terminals
Existing	1.4	-	0.5	0.8	2.7
5 - Year	1.4	0.6	0.5	0.6	3.1
10 - Year	1.5	0.8	0.6	0.7	3.6
20 - Year	1.7	0.9	0.7	0.8	4.0

The market forecast projections for the non-containerized cargo terminals shown in Figure 3.6-2 were divided by the unit yard capacity estimates summarized in Section 1.8, Tables 1.8 through 1.24 to calculate the total terminal acreage required to handle the increase in non-containerized cargo throughput. Figure 3.6-6 summarizes the gross terminal area requirement for all four categories of non-container terminals for the existing, 5-, 10-, and 20-year plan intervals.

Figure 3.6-6
Non-Containerized Cargo - Terminal Area Required (Gross Acres)



	Dry Bulk - Cement	Dry Bulk - Aggregates	Break Bulk - Lumber	Break Bulk - Steel	All Non Container Terminals
Existing	6.6	-	0.9	8.4	16.0
5 - Year	6.7	1.8	0.9	6.2	15.5
10 - Year	7.3	2.6	1.0	6.7	17.6
20 - Year	8.3	4.2	1.1	7.7	21.3

In summary, the container terminals will require an additional one to two berths and one additional RO/RO pier to meet the unconstrained market forecast. The average berth length will need to increase to a minimum of 1,100 feet, particularly in the Southport area terminals which cater to the larger vessels. Conversion of the storage yards to higher density storage patterns will minimize the need for significant container yard expansion throughout the course of the study interval. This can be accomplished with application of higher density top-pick operations and construction of RTG runways as the market demand increases.

The non-container terminals will require construction of a dedicated aggregate berth and rail loading facility in Southport along with minimal enhancements to the cement silos in Midport. The existing break-bulk facilities are adequate to meet the demands of the projected cargo throughput.

Table 3.6-1 summarizes the needs assessment for the future berths and gross terminal areas required to meet the growth projected in the unconstrained market forecast at build-out in 2026. Tables 3.6-2 and 3.6.3 show how the 20-year Vision Plan accommodates these needs, as discussed in Section 3.7.

Table 3.6-1
Summary – 2026 Market-Based Needs Assessment

	Berth Length	Berths Required (rounded)	Gross Area (acres)
Container Terminals			
STS Dock Side Cranes	1100	5.6 (6)	140
RORO (wheeled)	700	2.9 (3)	89
Bananas (wheeled)	650	0.5 (1)	6
Non-Container Cargo Terminals			
Steel	700	0.8 (1)	7.7 (8)
Lumber	900	0.7 (1)	1.1
Cement	750	1.7 (2)	8.3 (10)
Aggregate	900	0.9 (1)	4.2 (6)
Cruise Terminals	1100-1300	8-10	NA
Petroleum Terminals	3 vessel/1 barge		292

Table 3.6-2
Comparison of 2026 Market-Based Berth Needs and Vision Plan Concepts

	Berths Required	Vision Plan Berths
Container Terminals		
STS Dock Side Cranes	5.6 (6)	6-7
RORO (wheeled)	2.9 (3)	3
Bananas (wheeled)	0.5 (1)	1
Non-Container Cargo Terminals		
Steel	0.8 (1)	shared
Lumber	0.7 (1)	shared
Cement	1.7 (2)	2
Aggregate	0.9 (1)	1
Cruise Terminals	8-11	7+2 Flex
Petroleum Terminals	3 vessel/1 barge	

T able 3.6-3
Comparison of 2026 Market-Based Acreage Needs and Vision Plan Concepts

	Berths Required (acres)	Vision Plan Berths (acres)
Container Terminals		
STS Dock Side Cranes RORO (wheeled) Bananas (wheeled)	235	359
Non-Container Cargo Terminals		
Steel	8	shared
Lumber	2	shared
Cement	10	22
Aggregate	6	10
Cruise Terminals	NA	83
Petroleum Terminals	292	335

3.7 Conceptual Phase I 20-Year Vision Plan

The culmination of the Phase I planning process was the development of a 20-year Vision Plan. This Vision Plan was discussed during a workshop with the Broward County Board of County Commissioners and, as previously stated, was refined in Phase II, following input from County Commissioners, Port tenants, and stakeholders. The 20-year Vision Plan that concluded Phase I suggests infrastructure improvements throughout the Port to be achieved by the planning horizon of 2026, as shown in Figure 3.7-1.

Following the Phase I workshop with the Broward County Board of County Commissioners, the Phase I 20-year Vision Plan was reevaluated and reviewed with Port tenants, other stakeholders, and governmental agencies and modified into the Final Plan described in Element 5. The Phase II changes to the Phase I 20-year Vision Plan are significant; thus the discussion below is provided only to document the iterative and collaborative nature of this master planning process. For a detailed picture of what is in the Final Plan, the reader is referred to Element 5.

As discussed in Section 3.2, the various alternatives considered during the Phase I process were reviewed during a visioning session with the Consultant Team and the Port's senior staff. This collaborative visioning session started with restatement of the Port's goals and objectives to help to guide the formation of the preferred 20-year Vision Plan.

The collective team broke into groups representing each of the Port's business lines and literally "laid pen to paper" to develop a range of conceptual plans that incorporated the concepts discussed during previous study sessions. This process promoted "ownership" of the vision plan by the Port's senior staff. The individual business line plans were compared to identify the strengths and weaknesses of each and form an integrated Vision Plan that incorporated all of the stronger concepts. The concepts were further refined in following meetings to address the political and technical realities of the visioning concepts.

To help visualize the suggested infrastructure improvements in the preferred Phase I 20-year Vision Plan, the Plan has been divided into six Vision Plan areas. Each of these areas is discussed below.

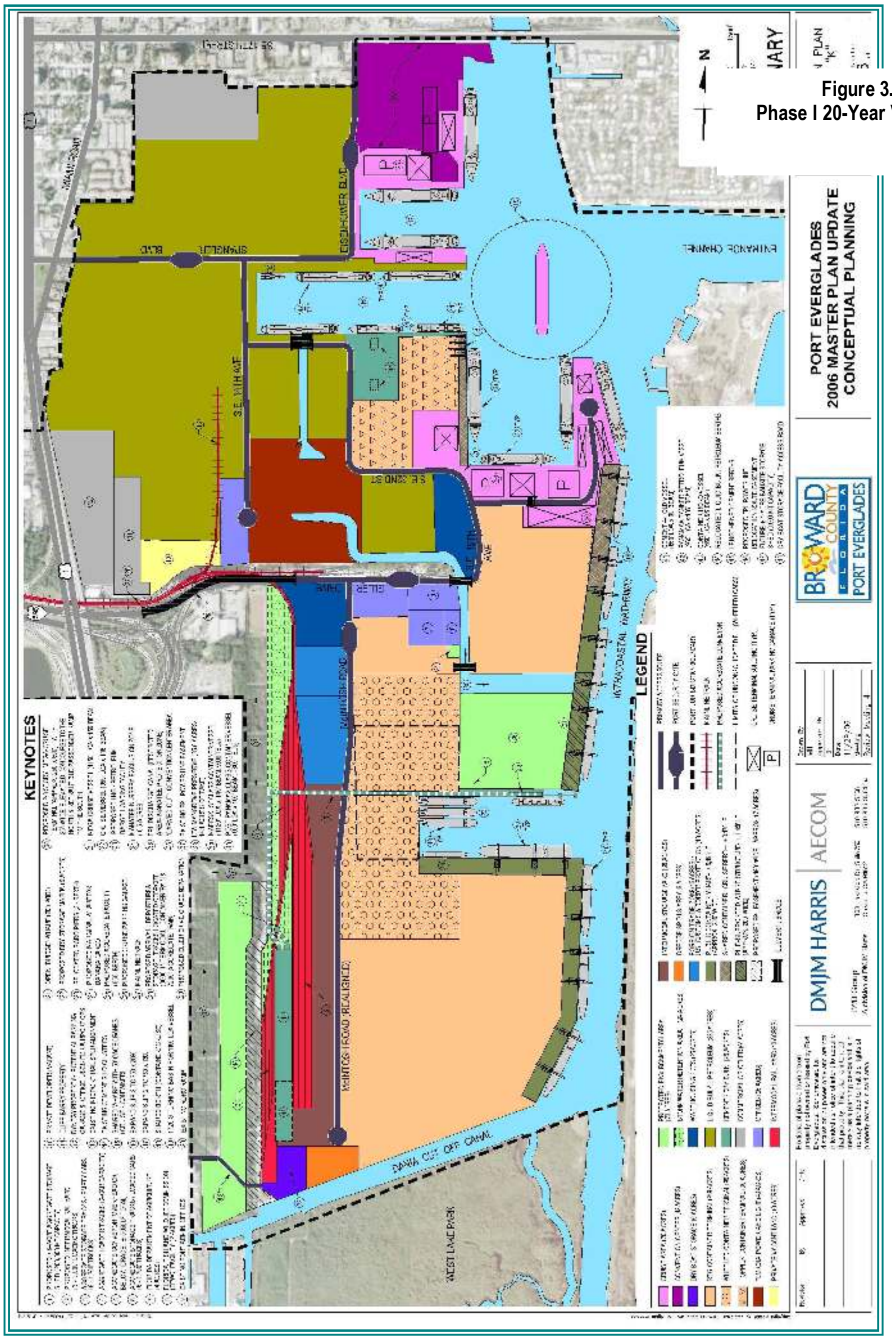


Figure 3.7-1
Phase I 20-Year Vision Plan

Vision Plan Area 1. Vision Plan Area 1 encompasses existing Berths 1 through 15, including the Northport Cruise Terminals 1, 2, and 4 and the petroleum and bulk berths that use Slips 1, 2, and 3 (see Figure 3.7-2). The following modifications are envisioned to take place in this area by the planning horizon of 2026:

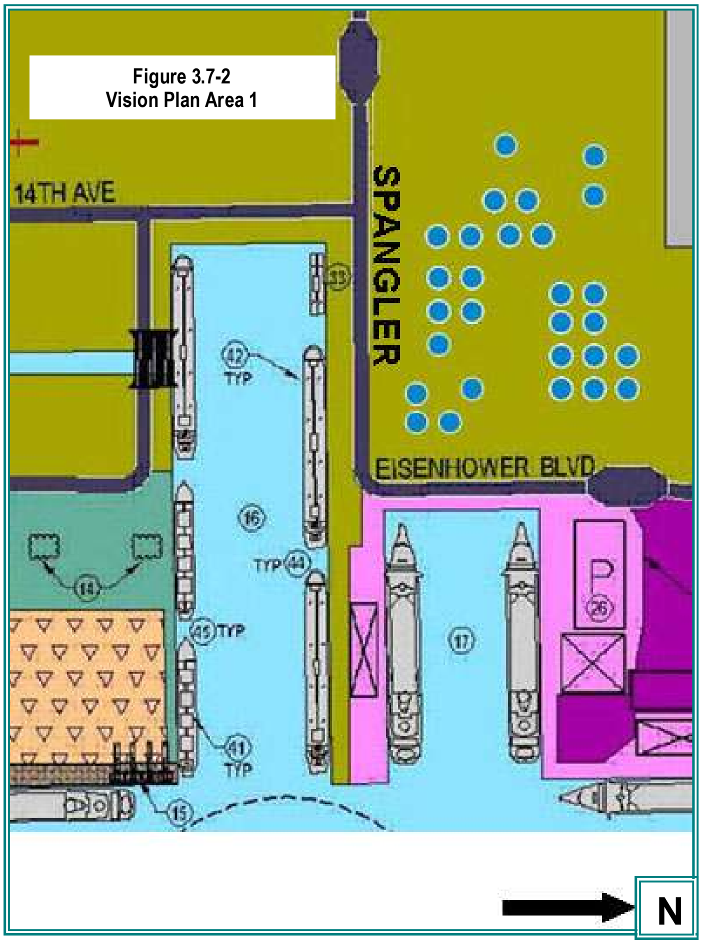
- To accommodate its anticipated expansion, the Convention Center would assume the footprint currently occupied by Cruise Terminal 1.
- The current day cruises using Cruise Terminal 1 would be assigned to other berths, when Cruise Terminal 1 is no longer available.
- Cruise Terminal 2 would be developed into a facility to serve cruise ships of the Freedom Class, having an approximate overall length of 1,121 feet, thereby requiring an overall berth dimension of 1,321 feet to allow for string lines. This berth length provision is also accommodated in the expansion of the Convention Center.
- Cruise Terminal 4 is also envisioned to expand its cruise operations within the footprint of the existing building to accommodate passengers from mega cruise ships and their baggage.
- Slip 2 in the Vision Plan would be lengthened from the current 900 feet to 1300 feet by expanding to the west and the slip would be widened by excavation to the south to accommodate two mega cruise ships.
- A new cruise terminal is proposed on the south side of the expanded slip. Expanding the slip for mega cruise facilities can be accomplished without change to the alignment of Eisenhower Boulevard and can provide for the proposed public Bypass Road from Spangler Boulevard to Eisenhower Boulevard (see Section 3.8.4).
- Slips 1, 2, and 3 would be reconfigured into two slips. The northern slip, as noted above, would be for cruise ships and the southern slip would accommodate petroleum tankers, petroleum barges, and ships that serve the cement industries. The southern slip would be extended to the west to an approximate overall length of 2,650 feet. To accommodate through traffic between Northport and Midport, SE 14th Avenue would be extended to Spangler Boulevard.

  Reconfiguring Slips 1, 2 and 3 into two slips has the following benefits:

  - Creates one additional mega cruise berth and enlarges an existing berth to accommodate a mega cruise ship.
  - Separates cruise and petroleum activities.
  - Accommodates larger vessels.
  - Increases navigational safety.
  - Adds berth length for the cement industries.
  - Mitigates existing soil contamination in a state clean-up site.
  - Increases petroleum distribution efficiencies.

- Reconstructs deteriorating bulkheads.

Among the issues to be addressed in this area are the significant construction costs of bulkhead reconfiguration, dredging, and reconstruction of petroleum piping facilities. It would also be necessary to acquire private property to extend the southern slip to the west. Reconfiguration of the bulkheads does have the benefit of replacing deteriorated bulkheads and removing sub-surface contaminants.



Vision Plan Area 2. Vision Plan Area 2 is bordered by the western edge of the Intracoastal Waterway and extends from the northern end of Berth 26, south of existing Cruise Terminal 25, to the north side of the Turning Notch (see Figure 3.7-3). The following modifications are envisioned to take place in this area by the planning horizon of 2026:

- Wharves would be expanded in a straight linear manner to increase berth length. Expanding the berths in a linear manner adds flexibility to accommodate longer ships and, at Berths 26 and 27, the flexibility to provide berths for cargo ships on non-cruise days.
- Cruise Terminal 26 would be relocated further west and combined with a proposed Cruise Terminal 27 into a central processing facility where larger cruise facility footprints and intermodal zone areas can be accommodated. At the new berths, formerly Berths 26 and 27, cruise passengers would be able to access cruise vessels by the use of elevated concourses.
- Existing Cruise Terminal 29 would be removed from service so that the area can be used for cargo operations.

Among the issues to be addressed in the vision for this area are significant development costs and impacts to the mangroves on the eastern edge of the conservation easement. The benefits include increased berth capacity, increased flexibility for various size ships, and the provision of multi-purpose berths for mega cruise ships and cargo ships as well as replacement of the existing deteriorating bulkheads.

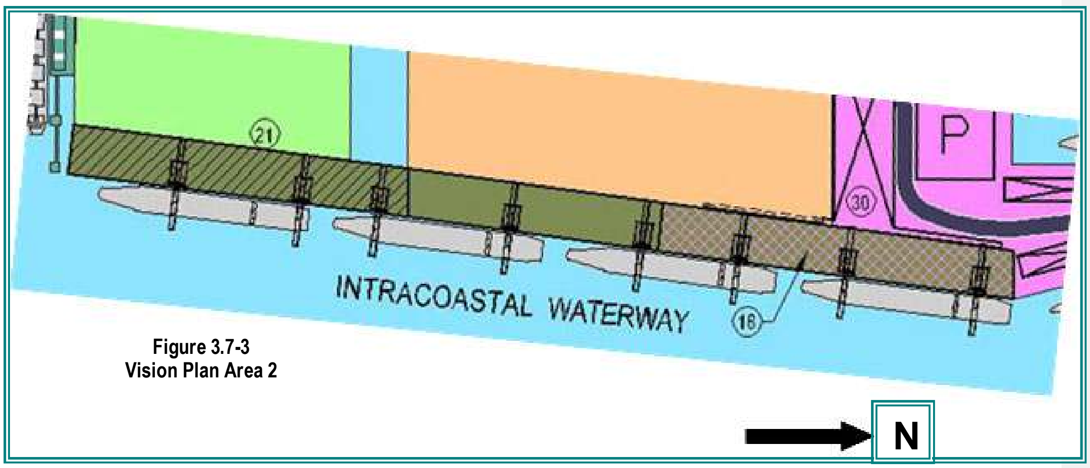


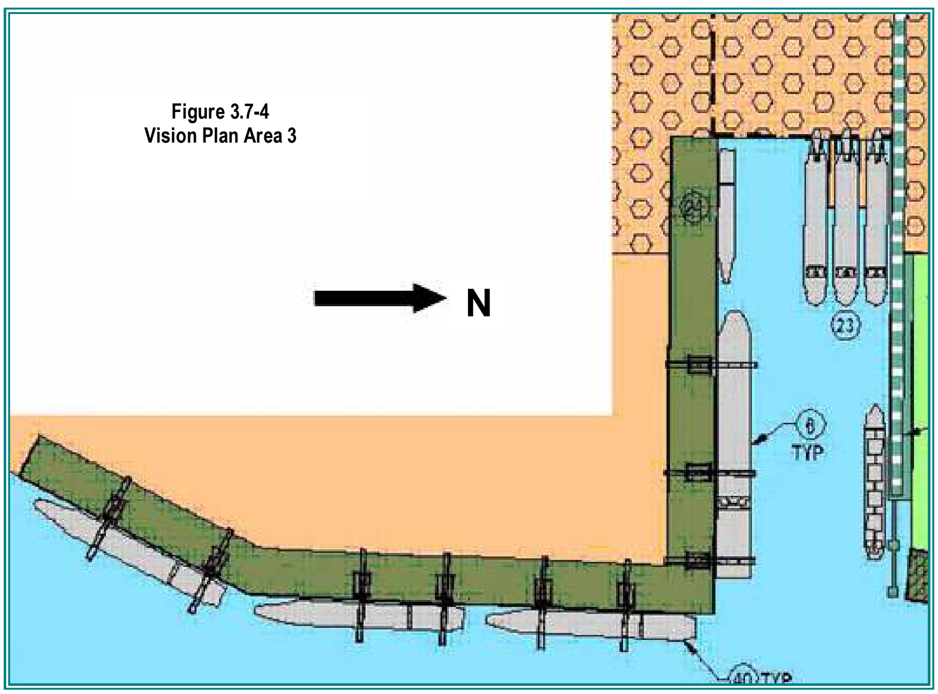
Figure 3.7-3
Vision Plan Area 2

Vision Plan Area 3. Vision Plan Area 3 encompasses the area around the Turning Notch and along Berths 31, 32, and 33 (see Figure 3.7-4). The following modifications are envisioned to take place in this area by the planning horizon of 2026.

- The existing Turning Notch would be extended to the west to allow three berths to accommodate RO/RO cargo along the western edge of the Notch. Relocating the RO/RO ships to the western part of the Turning Notch places the lower height ships, which do not use cranes, under the lower height area defined by the aviation flight protection surfaces, as discussed in Element 1.
- A larger container berth would be located at the existing RO/RO piers along the Intracoastal Waterway.
- A new berth would be provided on the north side of the Turning Notch for bulk import operations that may include rock aggregate and other bulk materials used in the manufacture of cement.

The Vision Plan for this area minimizes dredging impacts at the Dania Cut-off Canal in Westlake Park. The RO/RO ramps and the wheeled operation for this type of cargo would be located in the area of a closed landfill and would involve permitting and other mitigation efforts. As the landfill is, however, an unstable geotechnical property, it is best suited for wheeled operation and not for RTGs that require enhanced soil-bearing capacity.

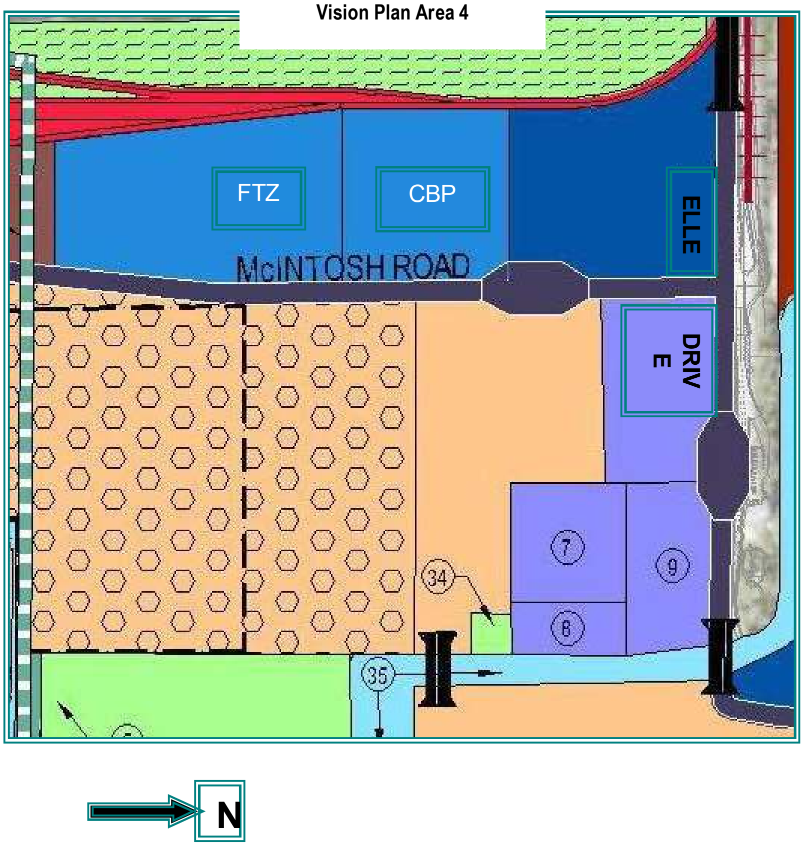
Figure 3.7-4
Vision Plan Area 3



Vision Plan Area 4. Vision Plan Area 4 encompasses the area west of the Turning Notch, south of Eller Drive and east of McIntosh Road (see Figure 3.7-5). The following modifications are envisioned to take place in this area by the planning horizon of 2026

- The Foreign Trade Zone facility and the CBP facility would be relocated west of McIntosh Road. This relocation would increase the land area available for contiguous container terminal operations between Southport and Midport in the areas adjacent to the water.
- An intermodal bridge would be constructed over the FPL Discharge Canal to provide for traffic circulation among the cargo areas in Southport and Midport.
- Vehicular circulation among the cargo areas at Southport and Midport, the Foreign Trade Zone, and CBP would be within the restricted area and internal Port traffic movements would not increase traffic on Eller Drive or on the security gates. The existing buildings in the Foreign Trade Zone area are aged and deteriorating; their replacement is recommended.

Figure 3.7-5
Vision Plan Area 4



Vision Plan Area 5. Vision Plan Area 5 is the preliminary study area under consideration by the ACOE for dredging (see Figure 3.7-6). The proposed dredging would deepen and widen the entrance channel and harbor, allowing longer and deeper vessels to be accommodated within the limits of today's standards for navigational safety. This dredging project to accommodate the longer and deeper vessels is needed to meet the requirements of Port Everglades' tenants and their future markets. The Phase I Vision Plan does, however, deviate from the ACOE study by not requiring the Dania Cut-off Canal to be dredged to the depth under study.

Figure 3.7-6
Vision Plan Area 5: Proposed ACOE Harbor-Deepening Program

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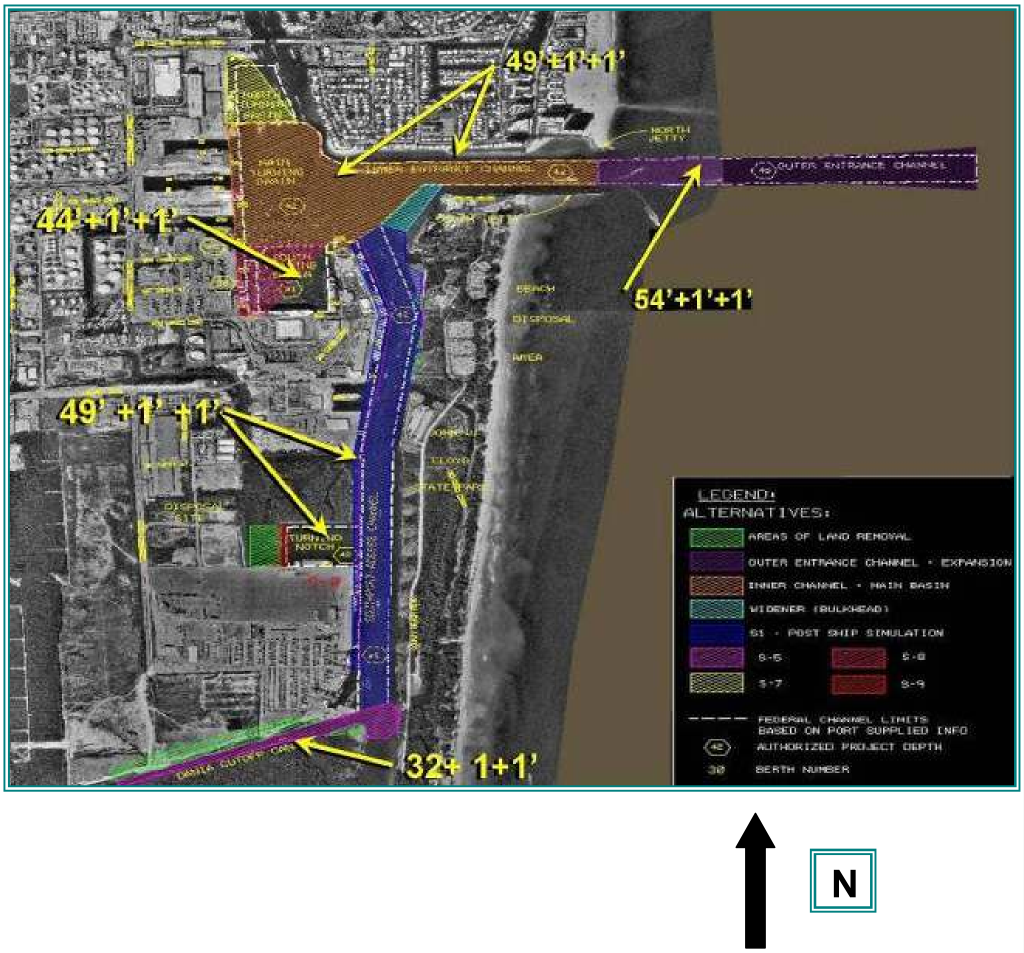


Vision Plan Area 6. Vision Plan Area 6 encompasses the area proposed for a future ICTF, to the west of existing McIntosh Road (see Figure 3.7-7). The following modifications are envisioned to take place in this area by the planning horizon of 2026.

- An Intermodal Container Transfer Facility (ICTF) and imported crushed rock aggregate and other bulk material facility will be incorporated into Southport.

The ICTF would reduce truck traffic both within the Port and within the region. The use of intermodal rail also creates the potential for greater hinterland market penetration for the Port's freight commodities. The import rock and bulk facility would be of great value to the construction industry for the manufacture of both cement and ready-mix concrete.

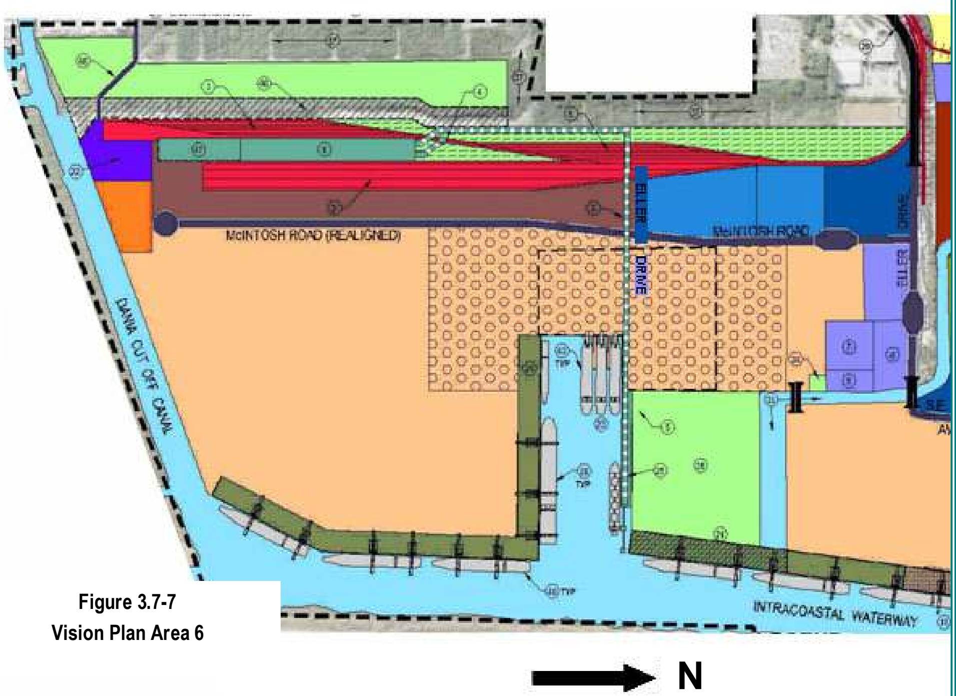


Figure 3.7-7
Vision Plan Area 6

Summary. In summary, berth capacity is the primary limiting factor to growth at Port Everglades. Therefore, the most obvious element of the 20-year Vision Plan is reconfiguration of the Port's bulkheads where it would be most practical to increase the linear length of the berths to provide the maximum flexibility, berthing options, and multi-use for the Port's expanded cargo and cruise operations and need to accommodate larger cargo and cruise ships.

3.8 Interface of the Phase I 20-Year Vision Plan with Ongoing Port and Adjacent Projects

As discussed in Element 1, the Consultant Team considered the impact of ongoing projects throughout the planning process. How the Phase I Vision Plan interfaces with these projects is summarized below.

3.8.1 Cruise Terminals

Cruise Terminal 4. The Port 's current engagement in designing Cruise Terminal 4 to enlarge its cruise operations is consistent with the Vision Plan.

The Vision Plan envisions the need to maximize the number of berths to handle cruise ships having an LOA of at least 1,100 linear feet. The Vision Plan envisions that Berth 4 would be lengthened to 1,300 linear feet by expanding Slip 2 to the west. The 1,300 linear feet can berth a 1,100-foot LOA cruise ship with sufficient distance for string lines.

The Vision Plan also recognizes the need to increase the cruise operational area in the building for baggage-handling and for the federal inspection service facilities.

The Port's current planning efforts to expand cruise operations to accommodate mega cruise ships and to relocate the intermodal zone under a proposed parking structure at Cruise Terminal 4 are consistent with the Vision Plan.

Cruise Terminal 18. The Port's current design of Cruise Terminal 18 to enlarge its cruise operations is consistent with the Vision Plan.

The Vision Plan reinforces the concept of using Berths 16, 17, and 18 for the largest of cruise vessels in the fleet. Expanding the baggage operational area and the addition of passenger boarding bridges at Cruise Terminal 18 is consistent with the Vision Plan. The impact to adjacent cargo tenants of expanding the site area around Cruise Terminal 18 for increased intermodal services needs to be considered during design.

The extent of expansion for both the building footprint and its intermodal zone area needs to be programmed by the passenger capacity of the future cruise vessels that would use Cruise Terminal 18. If a ship of the "Project Genesis" class were to become the design vessel, with a guest capacity of 5,400 double/6,360 maximum, significant improvements would need to be added to current designs.

Cruise Terminal 18 and its intermodal zone serve a berth that is used for cargo operations on non -cruise days. This concept of supporting cargo traffic movement to and from the gantry cranes would need to be incorporated into future designs for the terminal.

Cruise Terminal 21. The Port's plan for the expansion of Cruise Terminal 21 to enlarge its baggage-handling accommodations should be re-evaluated. The Vision Plan envisions Berths 21 and 22 to have the capability to serve mega cruise ships. To be consistent with the Vision Plan, re-evaluation of the cruise facility building, passenger boarding bridge(s), and adjacent intermodal zone operations is recommended to establish the program requirements necessary for these berths to be suitable for mega cruise ships. Cruise Terminals 21 and 22, when combined, could serve as a mega cruise ship at Berths 21/22.

Cruise Terminal 27. The Port's current planning efforts to establish a cruise facility at Berth 27 are consistent with the Vision Plan, but not in the currently planned configuration. The Vision Plan suggests filling in the Tracor Basin and providing gantry crane access to Berth 28 during non-cruise days.

To maximize berth capability, the provision of continuous berths in an uninterrupted linear pattern is recommended where possible. Also recommended is the use of multi-purpose berths where cargo can use the berths on non-cruise days.

3.8.2 Eller Drive Improvements

Although the Vision Plan envisions the re-alignment of Eller Drive, this concept will provide near-term relief to the traffic congestion at the Midport cruise facilities.

3.8.3 Broward County Intermodal Center and People Mover System

The alternative corridors and seaport station locations, as identified in the PD&E for the Intermodal Center and people mover system, can be accommodated by the Vision Plan. The Vision Plan concepts are not, however, dependent on the realization of the people mover system to achieve the market projections for the Port.

3.8.4 "Carve Out" of the Broward County Convention Center

Through a series of cooperative meetings among the Convention Center staff and its master plan team, Port Everglades staff and its master plan team, Broward County Administration, and the BSO, a solution has been proposed which includes new definition of the Port's secured area at Northport and a new public by-pass road.

The proposed solution, which is illustrated in Figure 3.8.1, is summarized as follows:

- The existing Northport parking structure would be in the public area.
- The proposed parking structure, west of Cruise Terminal 4, would be in a Port secured area and would serve as the primary parking facility for cruise passengers going to Cruise Terminals 2 and 4.
- Cruise passengers going to Cruise Terminal 2 would pass through Port security checkpoints at the perimeter of the Cruise Terminal 2 building.

- Vehicles loading/unloading passengers going to Cruise Terminal 2 in the area between Cruise Terminal 2 and 4 would be in a public space.
- The public would be able to travel from the Intersection of S.E 17th Street and Eisenhower Boulevard to Spangler Boulevard and U.S. 1 on the proposed new by-pass road, eliminating the need to pass through a Port security gate.
- Through the use of barriers between the public by-pass road and the Port secured area, the Port would be able to maintain a security perimeter around a single secured area compliant with federal and Florida law.
- The present security gates at Eisenhower Boulevard and S.E. 20th Street would be eliminated.
- Emergency entrance/exit gates would be established to allow emergency vehicles to enter both Eisenhower Boulevard and S.E. 20th Street from the north.
- Areas on both sides of the barriers along the public by-pass road would be monitored by Broward Sheriff's Office with closed circuit TV.

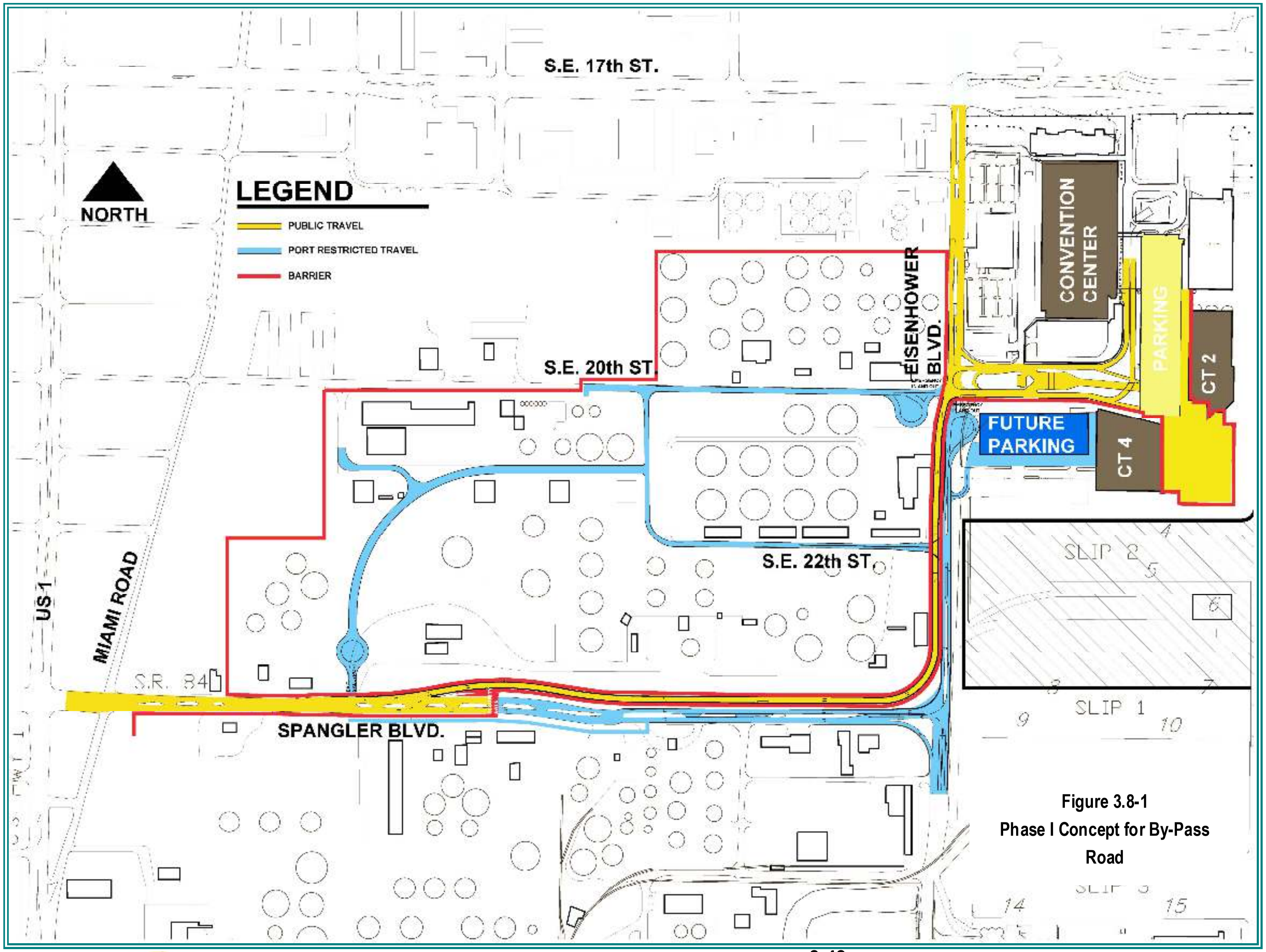


Figure 3.8-1
Phase I Concept for By-Pass Road

3.8.5 Interface with FLL Master Plan

The November 2006 technical memorandum entitled "Preliminary Obstacle Clearance Analysis, Crane and Vessel Heights at Port Everglades," which identifies potential obstacles and hazards for aviation has been utilized in locating berths and STS cranes. This memorandum, prepared by Jacobs Consultancy, is included in the Appendix.

3.8.6 U.S. Customs and Border Protection Facility

The Phase I Vision Plan establishes an approximate ten-acre site for Customs and Border Protection (CBP), perhaps including fumigation services within the Port's secured area, south of Eller Drive and west of McIntosh Road. By relocating CBP inspection facilities further west, additional acreage is allocated for cargo operations.

The following are the facility program requirements requested by the CBP:

- 100,000 to 125,000 square feet of warehouse space, including at least two ramps providing access to drive a 10-foot wide vehicle from street side directly into the warehouse.
- Freezer space of at least 1,500 square feet.
- Electrical supply sufficient to simultaneously operate:
  - Pallet VACIS.
  - 101-XL X-Ray system.
  - Three 101-x-Ray vans (shore side power hookups).
- A separate area for workbenches and a machine shop type of operation, including a hydraulic vehicle capable of lifting a 6,000-pound vehicle at least five feet and a mechanic's pit.
- At least 60 covered warehouse dock slots (60 containers side-by-side or 30 containers on each of two sides of the building) with adjustable ramps to facilitate forklift movement into the container, and reefer container plugs in no less than 30 of the 60 slots.
- 10,000 square feet of office space including at least 25 private offices for managers and supervisors (at least 12 feet x 12 feet each).
- Two conference rooms of at least 450 square feet each (15 feet x 30 feet).
- One training room of at least 1,200 square feet (20 feet x 60 feet) The training room is to be cabled with either CAT -5 or Fiber data runs sufficient to contain twenty-four workstations and two instructor's station, and should be dividable into two separate rooms (20 feet x 30 feet each) using an accordion-style hidden wall divider.
- Parking facilities for a least 100 personal vehicles.

- Parking facilities for at least 75 government vehicles, including spaces for several oversize vehicles (i.e., Mobile VACIS and HCV-2).
- Several rest room areas at difference locations within the warehouse and throughout the office spaces as required by applicable code and regulations.
- Locker rooms and shower areas for each gender sufficient to house lockers and provide sanitary facilities for at least sixty officers in each facility.
- An employee break room/lunch room/kitchenette area including ovens, sinks and garbage disposals, microwave ovens, refrigerators, vending machines, coffee pots, and sufficient electrical outlets to provide for all appliances.
- A kitchen area with an island/counter for inspecting and/or cutting produce with a sink/industrial strength garbage disposal either in the center of the counter of conveniently available close to the counter This facility is for the AQI Enforcement examinations and disposal of produce.
- A LAN room and an adjacent telephone room constructed to the then current standards.
- A secure storage lockup facility constructed to the approved CBP standards for the temporary storage of seized cargoes.
- A secure storage lockup facility to approved CBP standards for the temporary storage of seized contraband (small narcotics amounts, currency, weapons, etc.).
- A sufficient number of separate rooms properly situated and equipped for use by CBP Canine Units for the preparation, handling, and storage of training aids.
- A secure room for use as a conference room for supervisors and storage of a STU-III fax/telephone and associated file storage and shredder.
- A separate room (at least 20 feet x 20 feet) to review and control Radiation Portal Monitor activities and response.
- A separate air-conditioned room with an abundance of electrical supply to house TCET NII equipment (Itemizers; Vapor Tracers, RIID's, Radiation Survey Meters, K910 Busters, Air Quality monitors for CSE, camera equipment, and other sensitive items requiring electrical supply in an air conditioned environment when not in active use).

3.8.7 Foreign-Trade Zone No. 25

In lieu of major repairs or replacement of existing structures on site, the Vision Plan recommends the Foreign-Trade Zone No. 25 be relocated into new building(s) west of McIntosh Road. The relocation will provide additional land for cargo terminal operations and place Foreign-Trade Zone No. 25 within the Port's secured area, requiring access through the Port's security gate on McIntosh Road.

3.8.8 McIntosh Road Realignment

The Phase I Vision Plan calls for McIntosh Road to have a loop configuration at the southern end so that trucks can enter the terminal yards from the south, thus making right-hand turns into each terminal.

3.8.9 FPL Easement at Southport

The proposed FPL easement at the western edge of Port property can be accommodated in the Phase I Vision Plan.

3.8.10 Intermodal Bridge over the FPL Discharge Canal

The Vision Plan recommends connecting the land areas east and west of the FPL Discharge Canal with a proposed bridge structure. The bridge will connect the proposed cargo yard areas on each side of the FPL Discharge Canal and permit vehicles to move within the cargo yards without going onto Eller Drive and without going in and out of the Port's security gates. The Vision Plan recommends the southern alignment for the Bridge, as identified in the Preliminary Engineering Report for this project.

3.8.11 Dry Stack Marina

The Vision Plan identifies a 5-acre site along the Dania Cut-off Canal to provide an available site for a dry stack boat facility with appropriate water access.

3.8.12 Calypso Pipeline

Currently, Port Everglades is working with Calypso to ensure that the location of the Pipeline Onshore Work Area does not prohibit or limit any potential infrastructure development that may be identified in the Plan. (The previously proposed AES pipeline is no longer an active project.)

3.8.13 Bulkhead Study

Element 5 presents the Port's assessment of its existing bulkhead structures..

3.8.14 Intermodal Container Transfer Facility

The layout and design of the proposed ICTF at the Port would need to provide:

- Three classification tracks for near-dock container-on-flat-car and trailer-on-flat-car loading and unloading.
- The ability for the facility operator to block FEC local, CSX, and Norfolk Southern train sections efficiently, therefore expanding the scope of the intermodal services provided.
- Marine terminal parcels to extend back to the west for vessel-to-train logistics (imports) and train-to-vessel (exports) logistics.

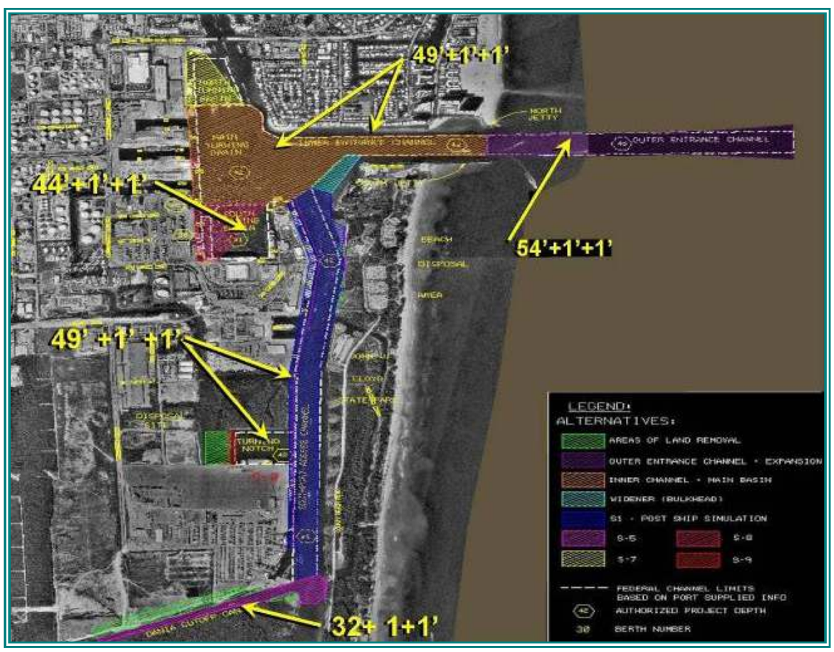
3.8.15 Eller Drive Overpass

Since the Phase I Vision Plan suggests that a near-dock ICTF for international freight be established at the Port, the Eller Drive Overpass is needed to avoid an on-grade rail crossing on Eller Drive. Such an on-grade rail crossing at Eller Drive, the main entrance to Port Everglades, would not be acceptable during the normal working hours of the Port due to the blocking of roadway traffic by slow-moving trains.

3.8.16 ACOE Dredging Program

The Phase I Vision Plan incorporates major concepts of the channel and harbor-deepening program under study by the ACOE (see Figure 3.8-2).

Figure 3.8-2
Proposed ACOE Harbor-Deepening Project



3.8.17 Crushed Rock Aggregate Bulk Import and Handling Facility

The Phase I Vision Plan identifies the proposed crushed rock aggregate bulk import and handling facility to have:

- A completely enclosed facility designed to handle up to 4 million tons per year of crushed, washed, and finished aggregate imports.

- A facility that includes a hopper with a dust control system on the pier and an enclosed conveyor belt that would be in an underground tunnel when crossing the cargo terminal yards.
- Aggregate vessels moving in and out of Port in 16 hours.
- A completely enclosed conveyor to ensure a dust-free operation.
- Material stored in a 100,000-ton covered facility until ready for rail load-out.
- A covered facility to minimize land utilization and meeting FAA height restrictions.
- A covered rail-loading system to avoid dust.
- An underground conveyor to eliminate impact to other user traffic flows.

3.8.18 Southport Terminal Yard Expansion. The Port is engaged in the engineering and permitting of the Phase VIII terminal yard expansion of Southport. This project would be consistent with the Vision Plan as a temporary terminal for tenants wishing to convert their yards to RTG operations or for added terminal operational area.

3.9 Circulation and Parking

3.9.1 On-Port Rail Track. At present, the main line rail track enters the Port's jurisdictional area on the north side of Eller Drive. The industry track switches off the main line just west of SE 14th Avenue and runs north. The track then turns east just north of Spangler Boulevard and turns north to SE 20th Street and Cruise Terminal 4. Another industry track switches off at SE 26th Street, runs to Eisenhower Boulevard, and then runs south. The industry track north of the Eller Drive main line track is currently out of service. Figure 3.9-1 shows the existing rail configuration and track location for reference.

The Vision Plan envisions that a portion of the proposed by-pass road discussed previously would be located in the area of the present track, north of and parallel to Spangler Boulevard. Due to the alignments of the by-pass road, Spangler Boulevard, and the security barriers, the industry track is envisioned to be terminated just south of Spangler Boulevard.

Figure 3.9-1
On-Port Rail Alignment Diagram

3.9.2 Parking Needs Assessment

Current Parking Capacity. As noted in Element 1, the Port, at the close of 2006, had two structured parking facilities: one at Northport and one at Midport. Table 3.9-1 summarizes the parameters at the Midport and Northport parking facilities, including the average and high number of spaces used during the peak months at the respective locations.

Table 3.9-1
2006 Parking Parameters

Parameter	Parking Facility		
	Midport	**Northport**	**Total**
Parking Capacity	1,950 spaces	2,350 spaces	4,300
Peak Month Overnight	December 2006	March 2006	
Average Peak Month Overnight	1,578 spaces	831 spaces	2,409
High Peak Month Overnight	1,878 spaces	1,243 spaces	3,121

Future Capacity Requirements. The cruise lines serving Port Everglades currently require near-dock parking facilities to provide an acceptable level of transport service to and from the cruise terminals for their cruise passengers. The Vision Plan recommends continuing the provision of near-dock structured parking facilities for cruise passengers, as long as these structures utilize the “air rights” over the intermodal zone, the at-grade area used to load and unload cruise passengers and their baggage into and from buses, taxis, and privately owned vehicles. Near-dock parking facilities, if properly located, can eliminate the operational cost of shuttles and provide a higher level of cruise passenger service. The Vision Plan also suggests that, prior to the 5-year milestone, the site of the 400-space on-grade parking facility be used to build a 1,200-space structured parking facility.

This assessment of the Port’s parking needs for the 5-, 10- and 20-year planning horizons is based on the revenue passenger projections from Figure 2.6-23, Approach B Projections - Multi-Day Target Market Capture, 2007 - 2026, in Element 2, using the “B MID” graph line. The multiplier used to project the Port’s future parking capacity needs over the three planning horizon milestones is the ratio of revenue passenger increases to current passenger volumes shown in that figure.

Table 3.9-2 shows the parking spaces required to accommodate the multi-day cruise passengers projected for the 5-, 10-, and 20-year planning horizon milestones.

Table 3.9-2
Projected Future Parking Requirements

	Planning Horizon			
	Present (2006)	**5-Year (2011)**	**10-Year (2016)**	**20-Year (2026)**
Number of Multi-Day Cruise Revenue Passengers	2.6M	3.6M	4.3M	6.0
Peak Parking Requirements for Multi-Day Cruise Passengers	3,121	4,321	5,161	7,203
Ultimate Parking Capacity	3,200 (1)	5,000 (2)	6,830 (3)	9,150 (4)

Notes:
(1) 1,950 (Midport) + 1,250 (Northport).
(2) 1,950 (Midport) + 1,200 (Midport) + 1,250 (Northport) + 600 (on grade at Cruise Terminal 18).
(3) 1,950 (Midport) + 1,200 (Midport) + 1,680 (Northport) + 2,000 (Phase I Intermodal Center).
(4) 1,950 (Midport) + 1,200 (Midport) + 1,680 (Northport) + 4,320 (Phase II Intermodal Center).

In addition to parking for the multi-day cruise passengers, parking will also need to be provided for employees working at the Port and possibly for day-cruise passengers. The assumptions used in the Vision Plan to assess the total parking needs are:

- The majority of tenant employee parking will be on tenant-leased facilities.
- Day cruises will not continue to be scheduled at Cruise Terminal 1. Also, the volume of day cruises will decrease in the future.
- Since the parking needs assessment was based on the present peak demand for multi-day cruise passengers, the typical demand factor when applied will provide parking for other needs.

The additional capacity allowance in the parking demand factor can be illustrated by considering the demand factor for December and March 2006. As previously shown in Table 3.9-1, the average overnight parking at the Midport facility was 1,578 spaces in December while the peak was 1,878 spaces or an average demand factor of 84 percent. Similarly, at the Northport facility, the average overnight parking was 831 spaces while the peak was 1,243 spaces or an average demand factor of 67 percent.

Although the demand factor may be sufficient to accommodate the needs of other than multi-day cruise passengers on a typical day, peak days can occur more often than projected. Parking should, therefore, accommodate peak days for the multi-day cruise passengers, plus potential single-day cruise passengers, plus personnel working at the Port. This additional capacity, if provided at a remote facility, will need to be sufficient for these temporary peak periods.

In summary, parking requirements will need to be continually monitored and re-evaluated prior to the commitment of capital improvement funds.