

AGENDA

LAKE WORTH INLET PALM BEACH COUNTY, FLORIDA

CIVIL WORKS REVIEW BOARD

24 January 2014



0900	Welcome	MG John Peabody <i>CWRB Chair and Deputy Commanding General for Civil and Emergency Operations</i>
0905	Introductions	MG John Peabody <i>CWRB Chair</i>
0910	Project Briefing	COL Alan Dodd <i>District Commander, Jacksonville District</i>
0950	Sponsor Support	Mr. Edward Oppel <i>Vice-Chair, Port of Palm Beach District, Board of Commissioners</i> Mr. Manuel (Manny) Almira <i>Executive Director, Port of Palm Beach</i> Mr. Carl Baker <i>Director of Planning and Development, Port of Palm Beach</i>
1000	Division Support	BG Donald (Ed) Jackson, Jr. <i>Commander, South Atlantic Division</i>
1010	Agency Technical Review	Mr. Terry Stratton <i>SAD Senior Economist, on behalf of Deep Draft Navigation Planning Center of Expertise</i>
1015	Independent External Peer Review	Ms. Karen Johnson-Young <i>IEPR Program Manager, Battelle Memorial Institute</i> Mr. Daniel Smith <i>Lead IEPR Panel Member, Economics</i>
1025	Break (15 minutes)	MG John Peabody <i>CWRB Chair</i>
1040	Policy Review Assessment	Mr. Gary Hardesty <i>Review Lead, Office of Water Project Review</i>
1050	Board Discussion <ul style="list-style-type: none">Member QuestionsOffice of ASA(CW), OMB Questions	MG John Peabody <i>CWRB Chair</i>
1120	Action	Mr. Theodore Brown <i>Chief, Planning Community of Practice</i>
1125	Lessons Learned / After Action Report: <ul style="list-style-type: none">What was supposed to happen?What did happen?Why did it happen that way?How will we improve next time?	COL Alan Dodd <i>District Commander, Jacksonville District</i>
1130	Lessons Learned	SAD, OWPR, Sponsor, Others
1135	Close	MG John Peabody <i>CWRB Chair</i>

LAKE WORTH INLET

PALM BEACH COUNTY, FLORIDA

Integrated Feasibility Study and Environmental Impact Statement

National Pilot Planning Project

Presented by Colonel Alan M. Dodd
U.S. Army Corps of Engineers, Jacksonville District
24 January 2014

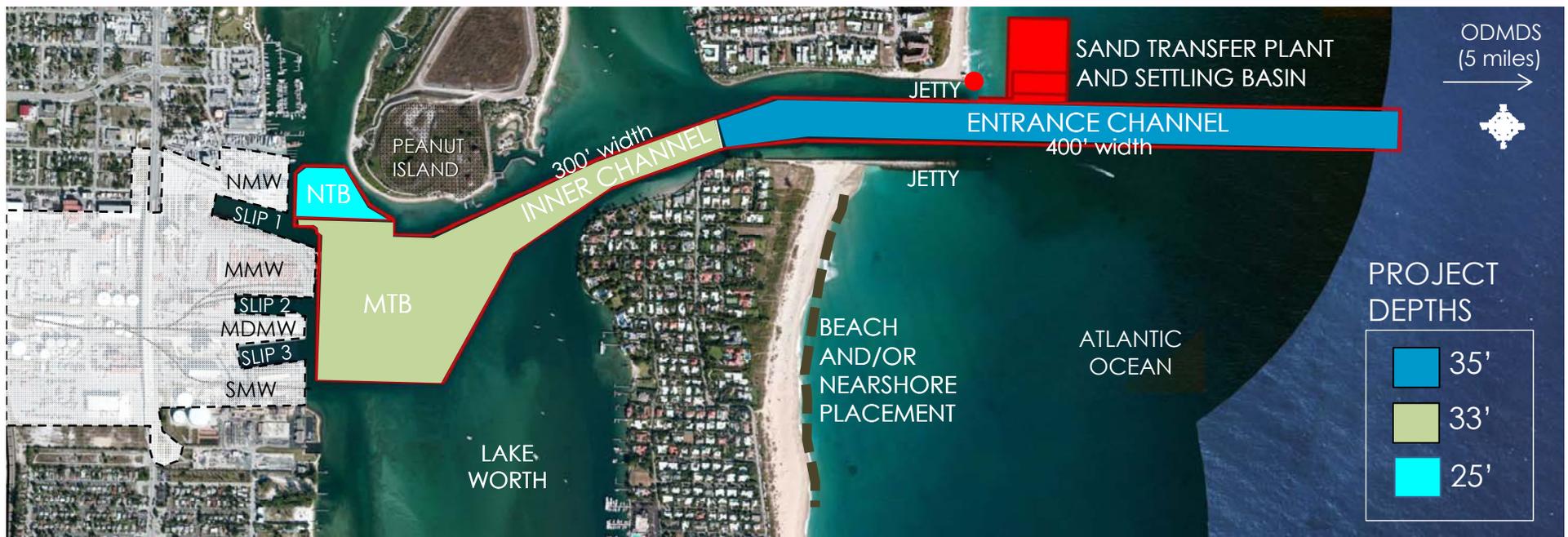


EXISTING AUTHORIZED PROJECT

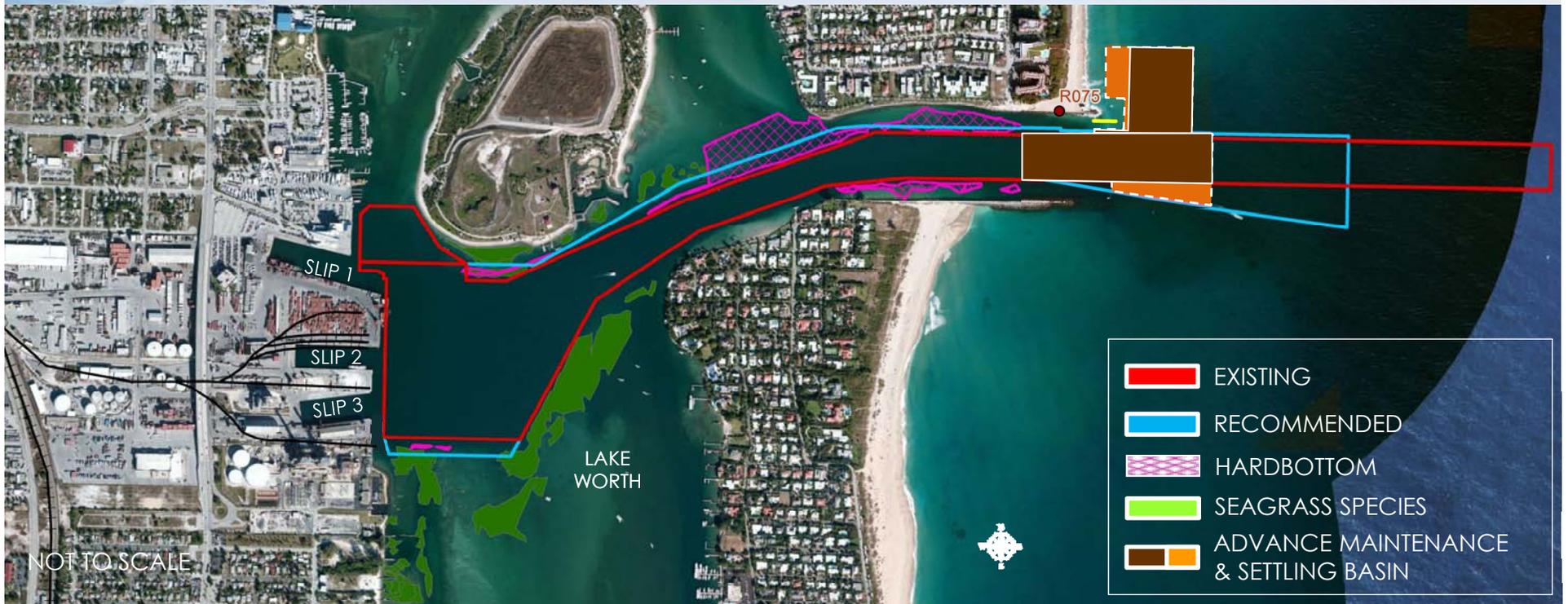
OTHER FEATURES

- Annual dredging of channel and settling basin
- Ocean Dredged Material Disposal Site (ODMDS) 5 miles offshore
- Beach and/or Nearshore Placement
- Upland Disposal Site - Peanut Island (limited capacity)

NMW: North Marginal Wharf
MMW: Main Marginal Wharf
MDMW: Mid Marginal Wharf
SMW: South Marginal Wharf
MTB: Main Turning Basin
NTB: North Turning Basin



BOTTOM LINE UP FRONT RECOMMENDED PLAN



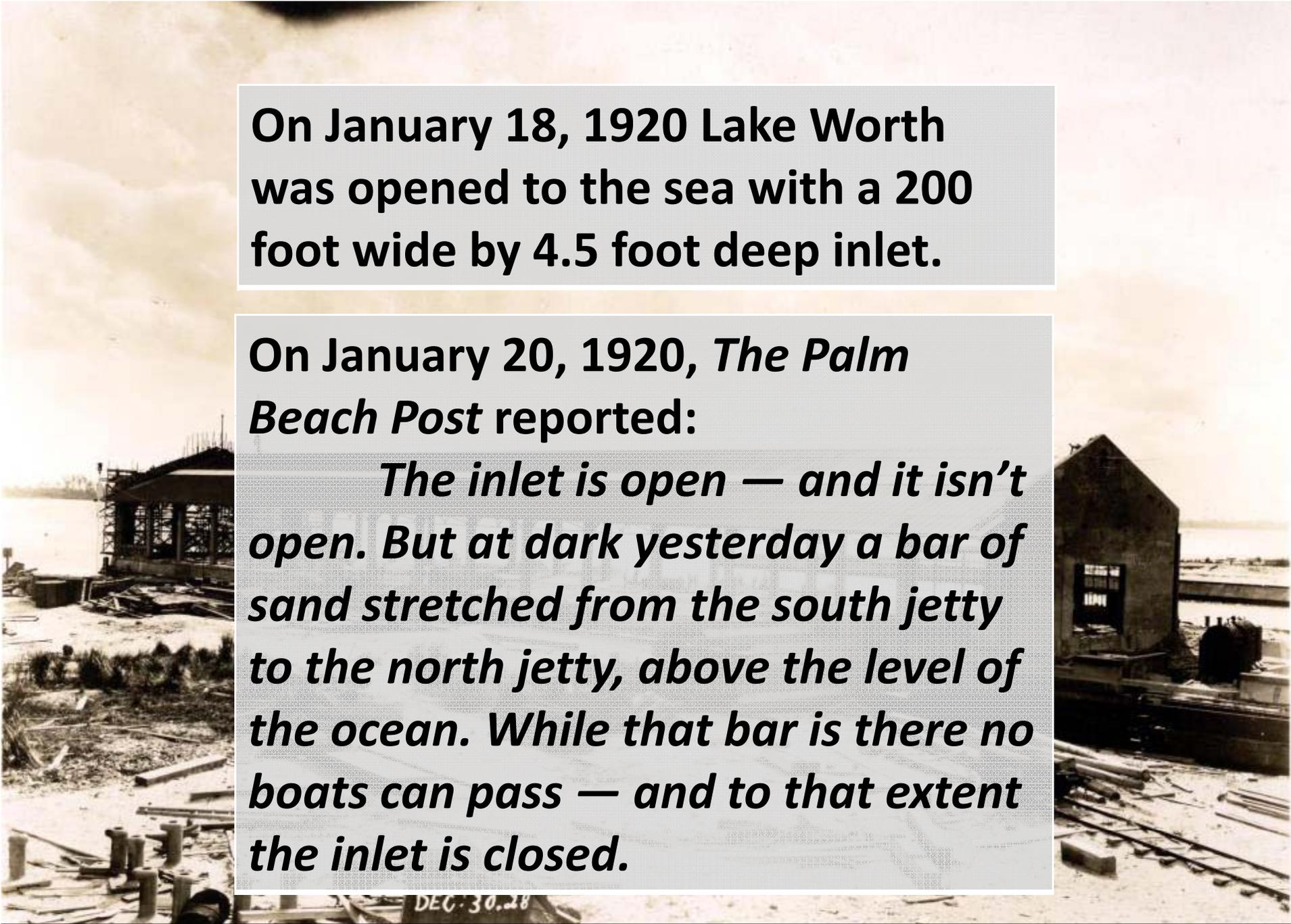


PORT OF PALM BEACH

Carl Baker, Director of Planning and Development
Port of Palm Beach District

An aerial photograph of the Port of Palm Beach, showing a large body of water with numerous boats, a central island, and a complex of industrial and commercial buildings along the waterfront. The sky is clear and blue.

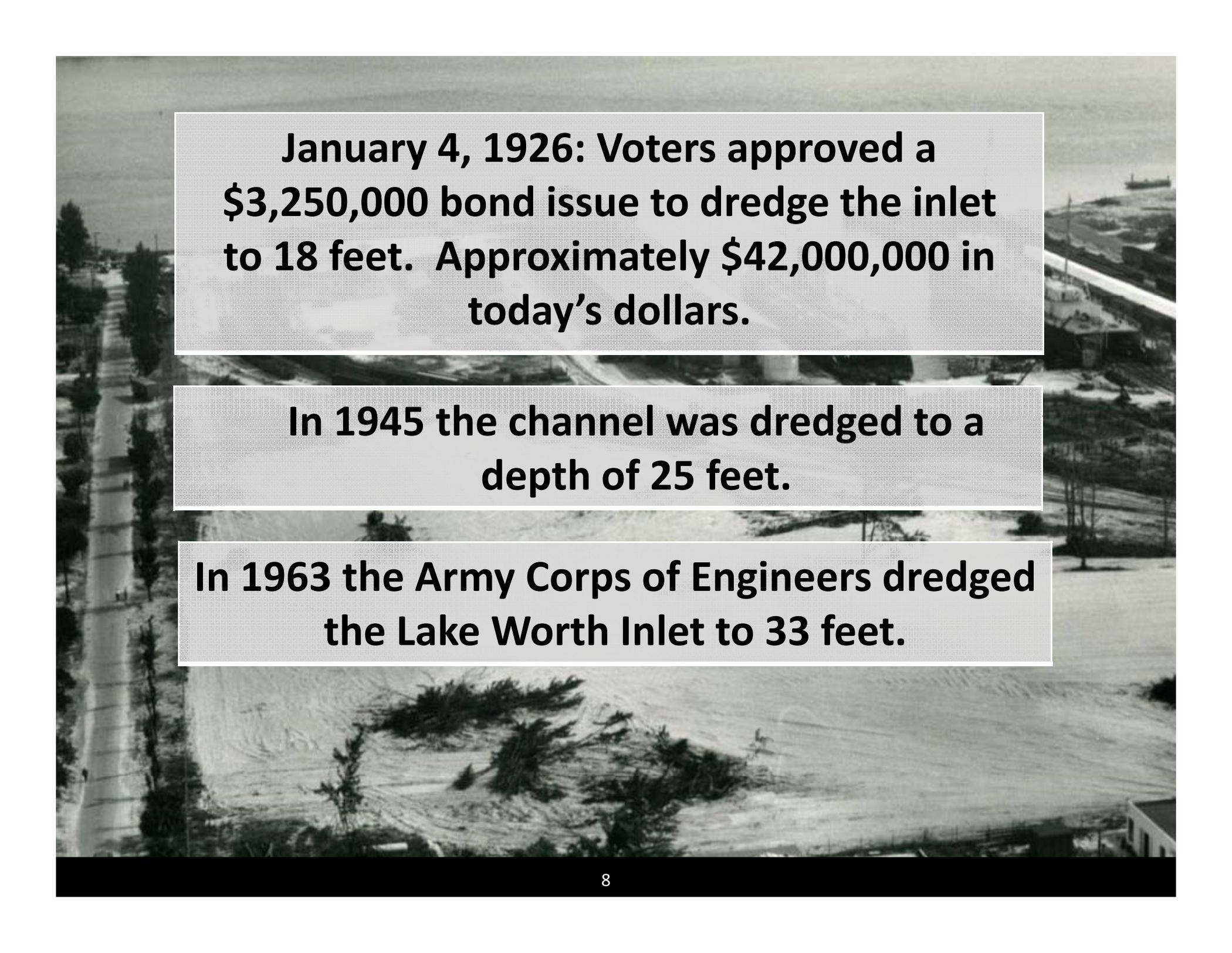
PORT of
Palm Beach
IMPORT • EXPORT • YOUR PORT
PORTOFPALMBEACH.COM



On January 18, 1920 Lake Worth was opened to the sea with a 200 foot wide by 4.5 foot deep inlet.

On January 20, 1920, *The Palm Beach Post* reported:

The inlet is open — and it isn't open. But at dark yesterday a bar of sand stretched from the south jetty to the north jetty, above the level of the ocean. While that bar is there no boats can pass — and to that extent the inlet is closed.

An aerial photograph of Lake Worth Inlet, showing a long, narrow channel of water extending from the top of the frame towards the bottom. The water is a light, silty color. On the left side, there is a line of trees and a road. On the right side, there are some buildings and a pier extending into the water. The background shows a larger body of water with a few ships.

January 4, 1926: Voters approved a \$3,250,000 bond issue to dredge the inlet to 18 feet. Approximately \$42,000,000 in today's dollars.

In 1945 the channel was dredged to a depth of 25 feet.

In 1963 the Army Corps of Engineers dredged the Lake Worth Inlet to 33 feet.

Port of Palm Beach Today

4th Busiest Container Port in the State of Florida

254,664 TEU's

2,249,779 Tons of Cargo

345,970 Cruise Passengers

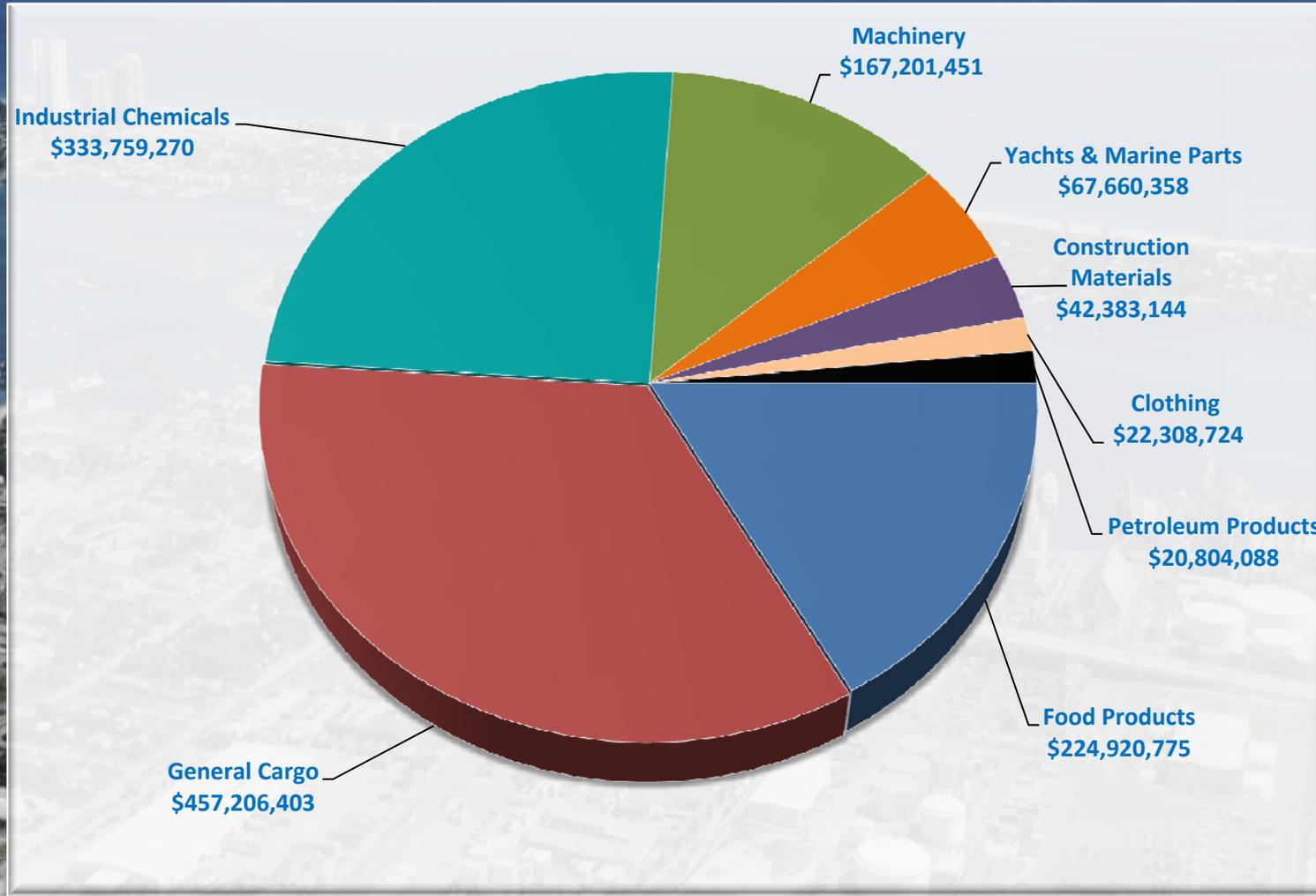
1,234 Vessel Calls

\$5.3 Billion Cargo Value

Acres

161

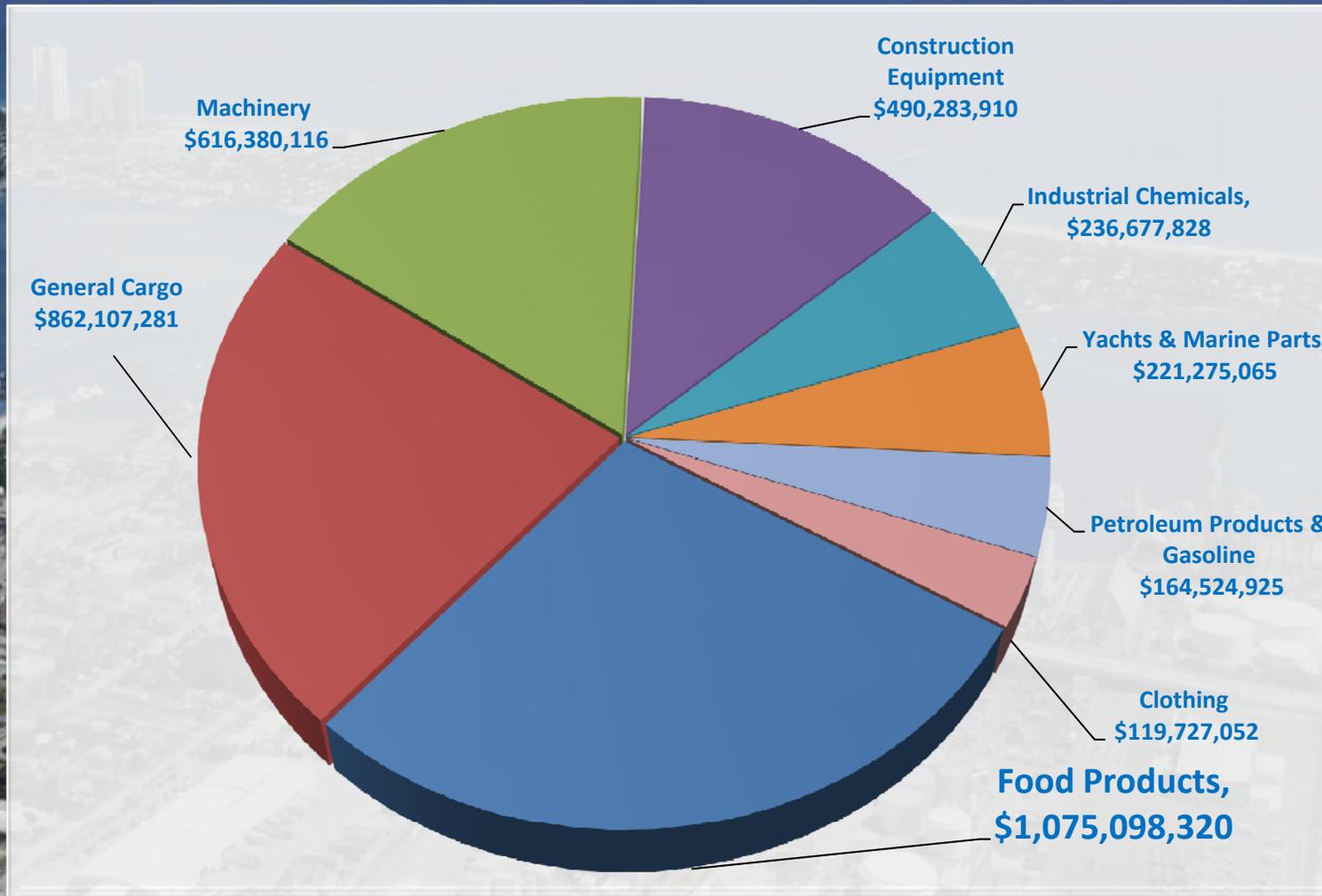
Port Imports – \$1,336,244,213 in 2013



Liquid Asphalt



Port Exports – \$3,786,074,497 in 2013



Sugar - 537,517 Tons

\$188,130,950

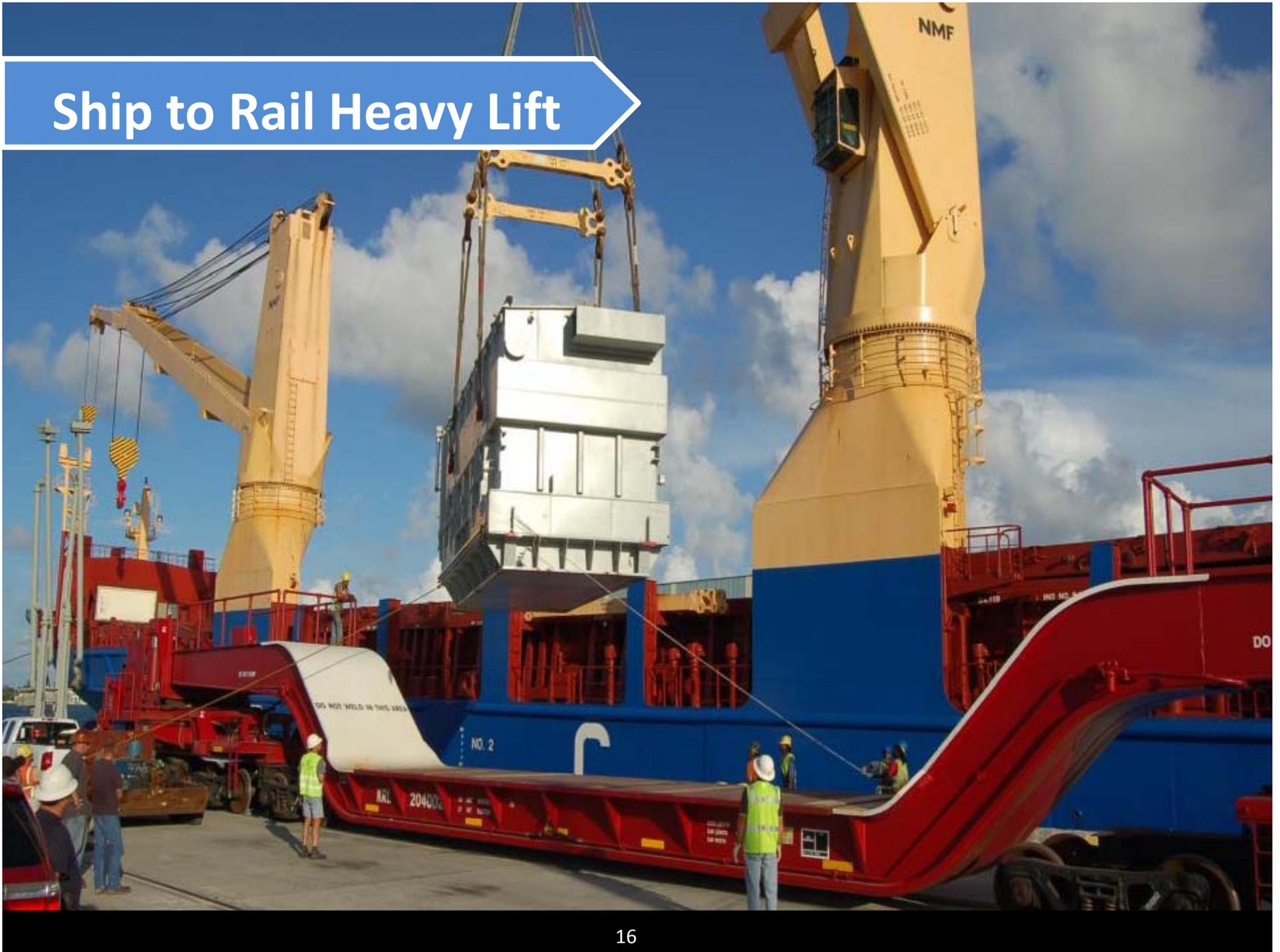
M-95 Maritime Highway



Molasses – Export To Europe



Ship to Rail Heavy Lift



Special Project Cargo - World Wide



Port Infrastructure Improvements

SkyPass - 1999

\$30,000,000

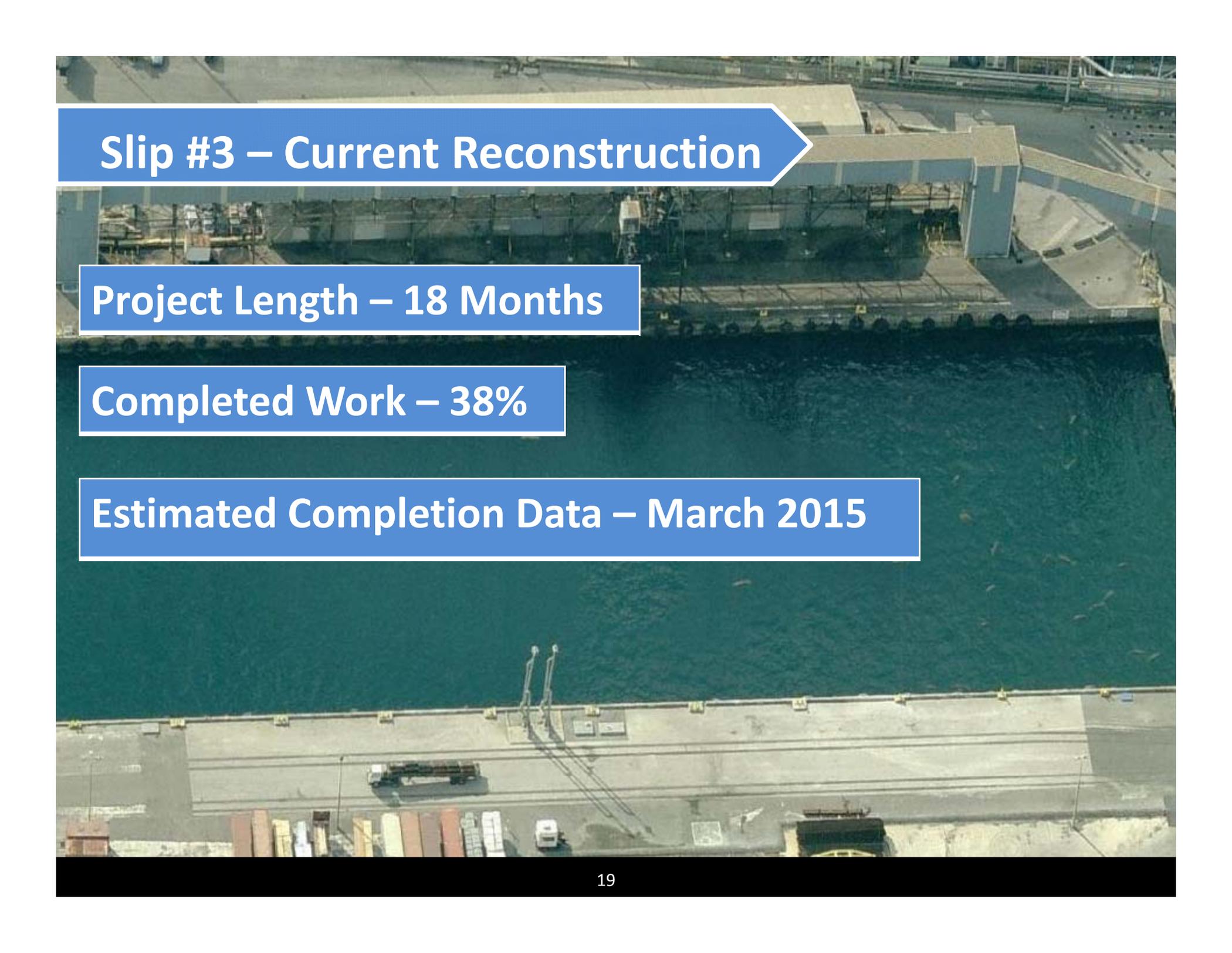
Cruise Terminal

\$16,000,000

Third Slip

\$10,000,000



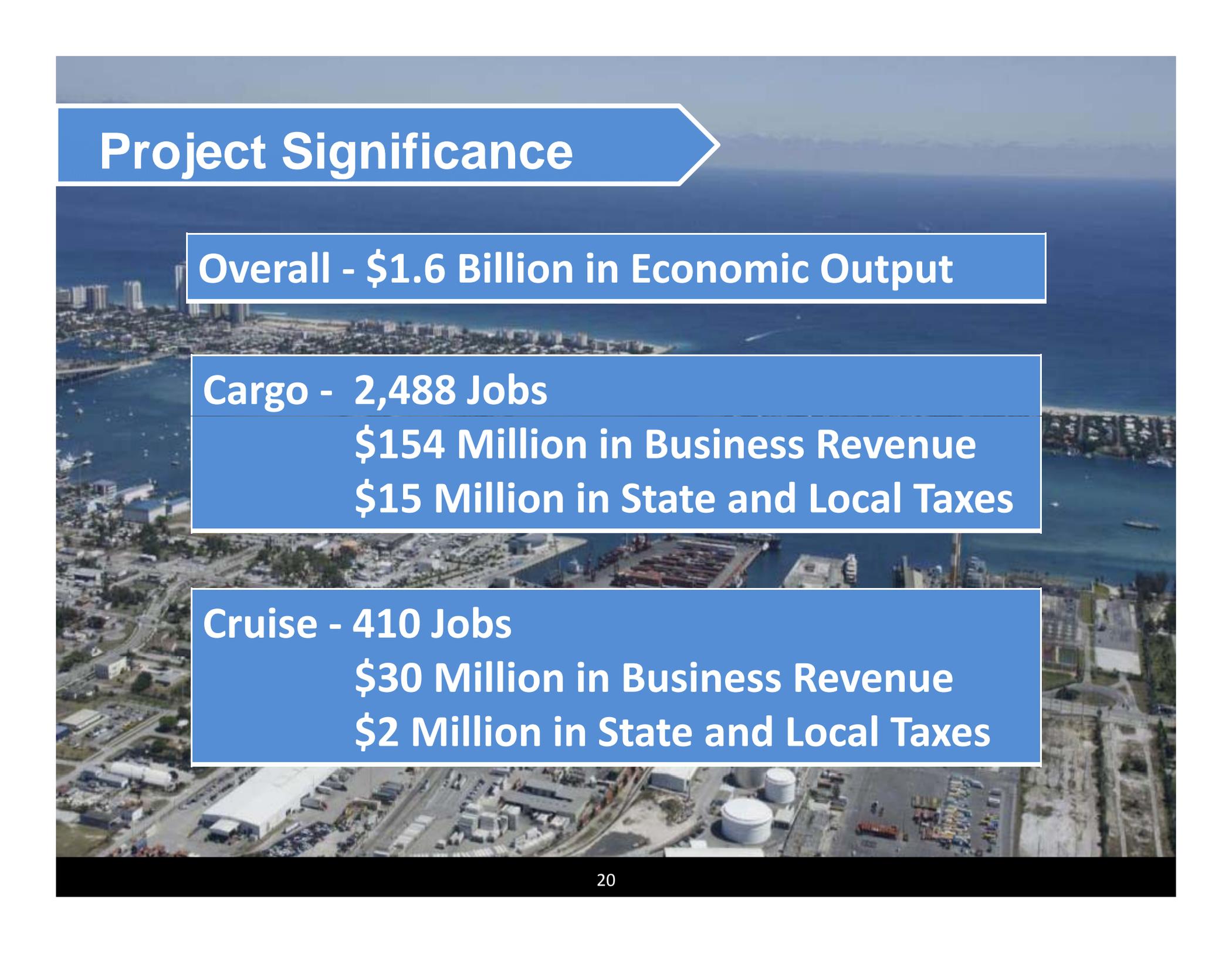


Slip #3 – Current Reconstruction

Project Length – 18 Months

Completed Work – 38%

Estimated Completion Data – March 2015

An aerial photograph of a coastal city, likely Miami, showing a mix of residential buildings, a harbor with boats, and an industrial area with large storage tanks and parking lots. The sky is clear and blue.

Project Significance

Overall - \$1.6 Billion in Economic Output

Cargo - 2,488 Jobs

\$154 Million in Business Revenue

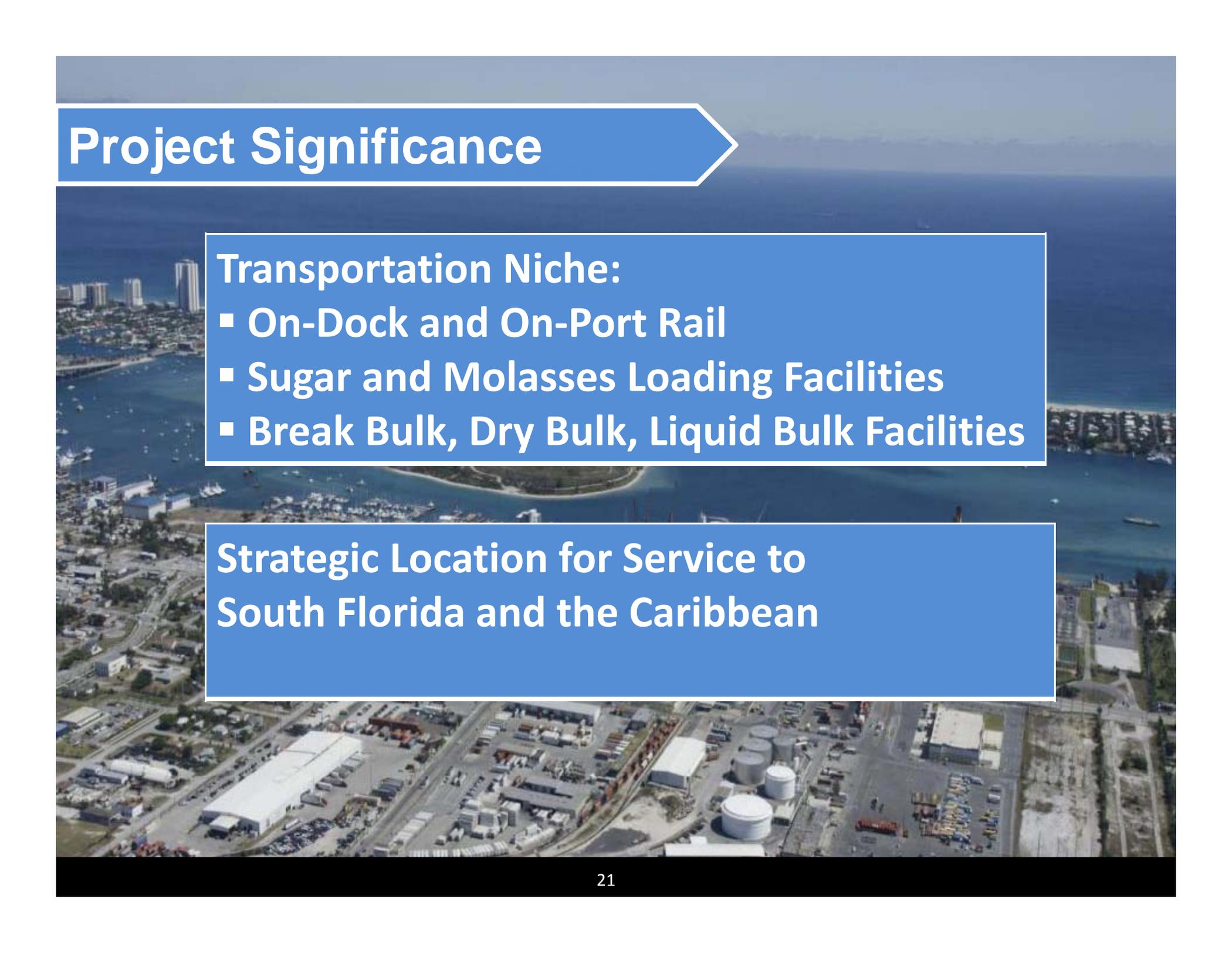
\$15 Million in State and Local Taxes

Cruise - 410 Jobs

\$30 Million in Business Revenue

\$2 Million in State and Local Taxes

Project Significance

An aerial photograph of a port facility, likely in Miami, Florida. The image shows a large body of water with several ships and a city skyline in the background. In the foreground, there are industrial buildings, parking lots, and storage tanks. A blue overlay with white text is positioned in the upper left and center of the image.

Transportation Niche:

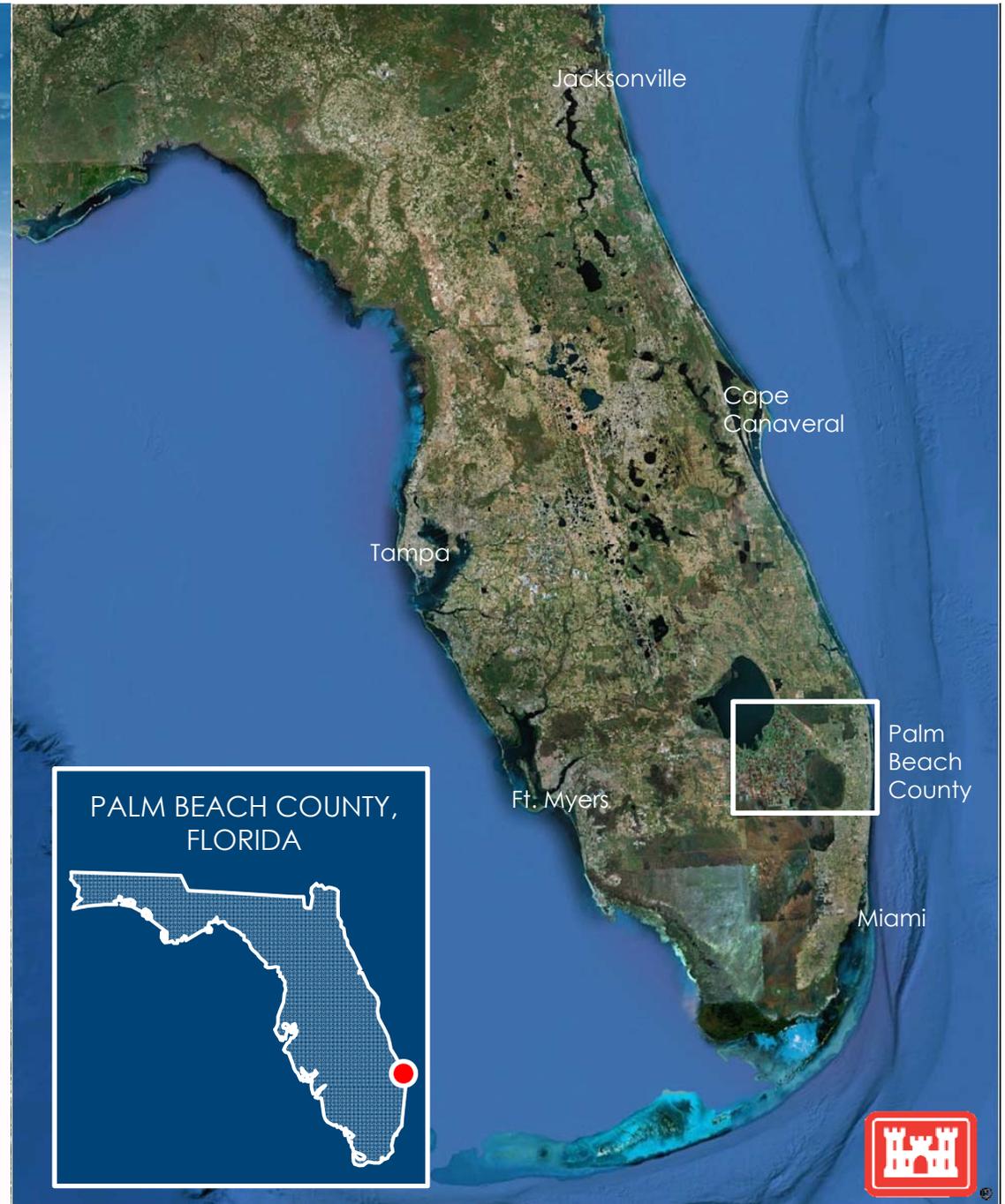
- On-Dock and On-Port Rail
- Sugar and Molasses Loading Facilities
- Break Bulk, Dry Bulk, Liquid Bulk Facilities

Strategic Location for Service to
South Florida and the Caribbean

STUDY AUTHORITY

House Resolution Docket
2559, 25 June 1998:

*"That the Secretary of the Army is requested to review the report...with a view of determining if the authorized project should be modified in any way at this time, with particular reference to **widening** the existing interior channel through Lake Worth Inlet."*



STUDY PURPOSE

To determine a plan to reduce transportation costs, reduce navigation concerns, and improve operation and maintenance at Lake Worth Inlet

LARGEST VESSEL
EXISTING PROJECT:



37,000 DWT 583' LOA 94' BEAM
35.6' DESIGN DRAFT

LARGEST VESSEL
FUTURE PROJECT:



60,000 DWT 656' LOA 106' BEAM
41' DESIGN DRAFT



The Port of Palm Beach is asking to catch up and improve channels and turning basins to 20th century Panamax sizes (versus 21st century Post-Panamax sizes)



LAKE WORTH INLET CHALLENGES

Conditions



- Inadequate Depths/Widths
- Strong currents and tidal influences
- High Shoaling

Navigation Concerns



- Navigation Restrictions
- Maneuverability difficulties
- More frequent O&M

Economic Inefficiencies



- Vessel light-loading
- Tidal delays
- Loss of business
- Higher O&M costs



LAKE WORTH INLET SIGNIFICANCE

Embracing niche' markets...



BULKER

- Specializes in cement and cement production input materials
- Dry bulk
- Break bulk



TANKER

- **Only** Florida port possessing onsite molasses/sugar loading equipment
- Petroleum



SPECIALTY

- Unique cargo services
- Yachts and project Cargo



CONTAINER

- 4th busiest Florida container port
- Serves Caribbean (small container vessels)

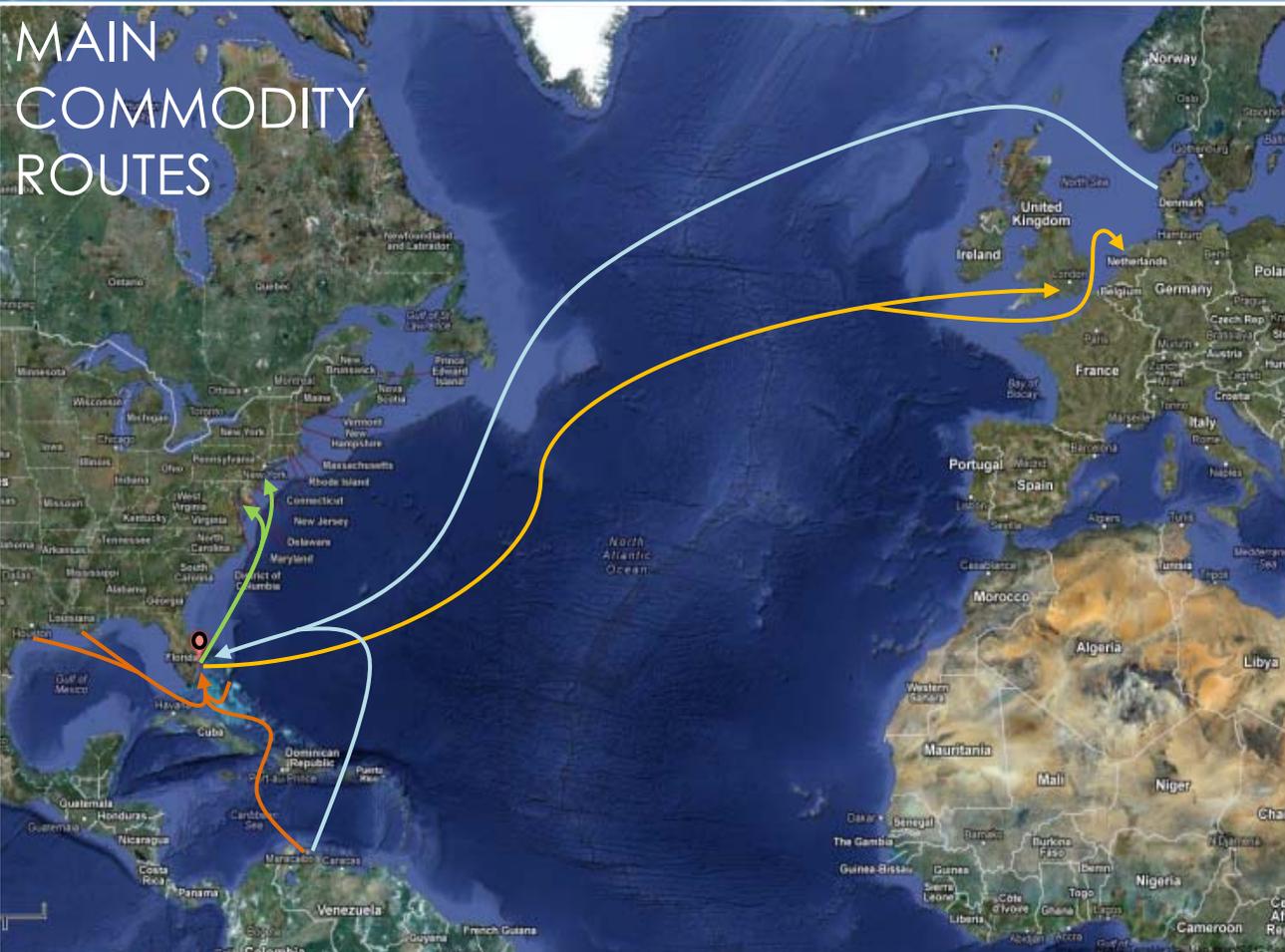


CRUISE

- Home to *Bahamas Celebration*
- Home to day cruise, sailing twice daily



LAKE WORTH INLET SIGNIFICANCE



-  SUGAR: Bulker
-  MOLASSES: Tanker
-  CEMENT: Bulker
-  PETROLEUM: Tanker

One of 16 net export ports in U.S.



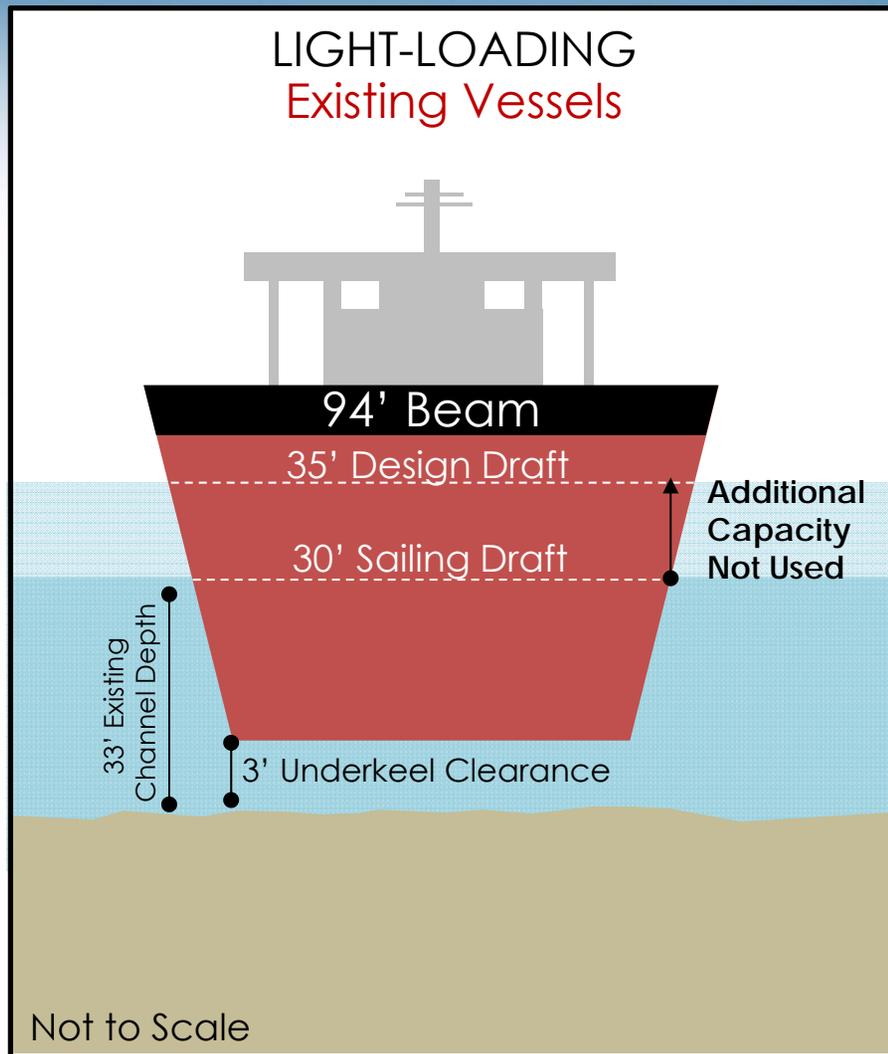
LAKE WORTH INLET

KEY AGENCIES FOR CURRENT STUDY

- Port of Palm Beach
- Palm Beach Pilots Association
- USACE Jacksonville District and South Atlantic Division
- National Marine Fisheries Service (NMFS)
- U.S. Fish and Wildlife Services (FWS)
- Environmental Protection Agency (EPA)
- Florida Department of Environmental Protection (FDEP)
- U.S. Coast Guard
- Palm Beach County
- Town of Palm Beach (and surrounding municipalities)



PROBLEMS



PRIMARY PROBLEM

Economic inefficiencies exacerbated further by channel and turning basins that do not meet current world fleet

- Existing Vessel
Sailing draft (loaded capacity): 30 feet
Tonnage: **26,300** metric tons (77% loaded)
- Potential Vessel
Sailing draft (loaded capacity): 36 feet
Tonnage: **45,800** metric tons (83% loaded)

OTHER PROBLEMS

- Maneuverability
- Tidal Delays
- High Shoaling



OPPORTUNITIES

- Reduce transportation costs (caused by light loading and tidal delays) for:
 - ▶ Bulk carrier vessels with cement/concrete
 - ▶ Tanker vessels with liquid petroleum/asphalt/molasses
 - ▶ General Cargo vessels with specialty cargo
 - ▶ *Bahamas Celebration* cruise ship
- Improve navigation maneuverability
- Reduce frequency of operation and maintenance dredging intervals



Bulk Carriers



Tankers



Cruise Vessels



OBJECTIVES

FEDERAL OBJECTIVE

- Increase net value of national output of goods and services

PROJECT OBJECTIVE (2017 – 2067)

1. Reduce transportation costs
2. Reduce navigation concerns in the harbor
3. Maintain or improve maintenance dredging intervals



CONSTRAINTS

- Avoid or minimize potential impacts on manatees and marine grass beds
- Avoid or minimize impacts on environmental resources including seagrass, hardbottom and softbottom
- Avoid adverse impacts of shoreline erosion along Lake Worth Inlet



EXISTING CONDITIONS

Natural

THREATENED & ENDANGERED SPECIES

- VL Sea Turtles: Green, loggerhead, Kemp's ridley, Hawksbill, leatherback
- VL Seagrass: Johnson's
- NL Whales: Blue, humpback, sei, fin, sperm
- NL Fish: Smalltooth sawfish
- VL Other: West Indian (Florida) manatee

HARDBOTTOM HABITAT

- VL Sponges, bryozoans

FISH & WILDLIFE RESOURCES

- VL Beach habitat, marine life, common shorebirds, seagrasses

ESSENTIAL FISH HABITAT (EFH)

- VL Federally managed species of fish (i.e., brown shrimp, spiny lobster); prey species (i.e., horse conch, bay anchovy)

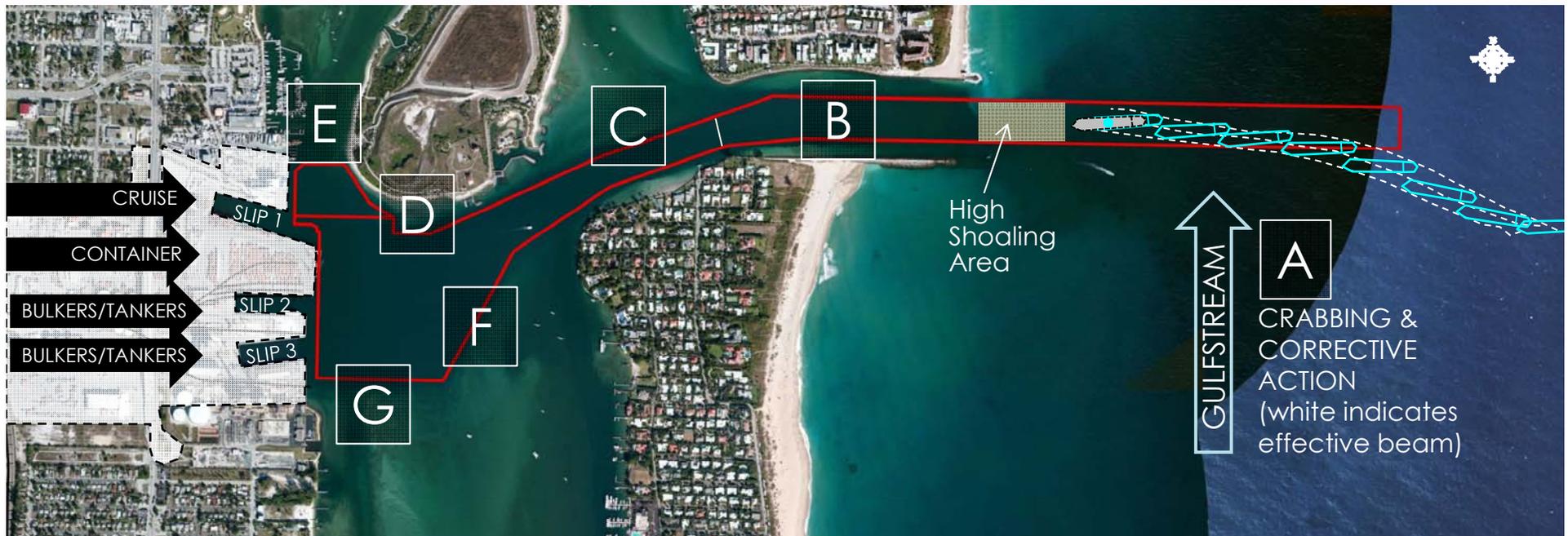
PRESENCE:
VL: Very Likely
NL: Not Likely



EXISTING CONDITIONS

Navigation and Related Restrictions

- A:** Offshore current (up to four knots) render entry difficult
- B:** Too narrow for preparation for sharp turn ahead and recovery from previous corrective action
- C:** Sharp turn and abrupt transition from 400' to 300' width (ebb tide currents pull vessels toward rock outcroppings to northeast)
- D:** Shoaled area affects cruise ship maneuverability, which in turn, blocks container ship access; also suction effects during flood tide
- E/F/G:** Larger vessels may need additional room for turning

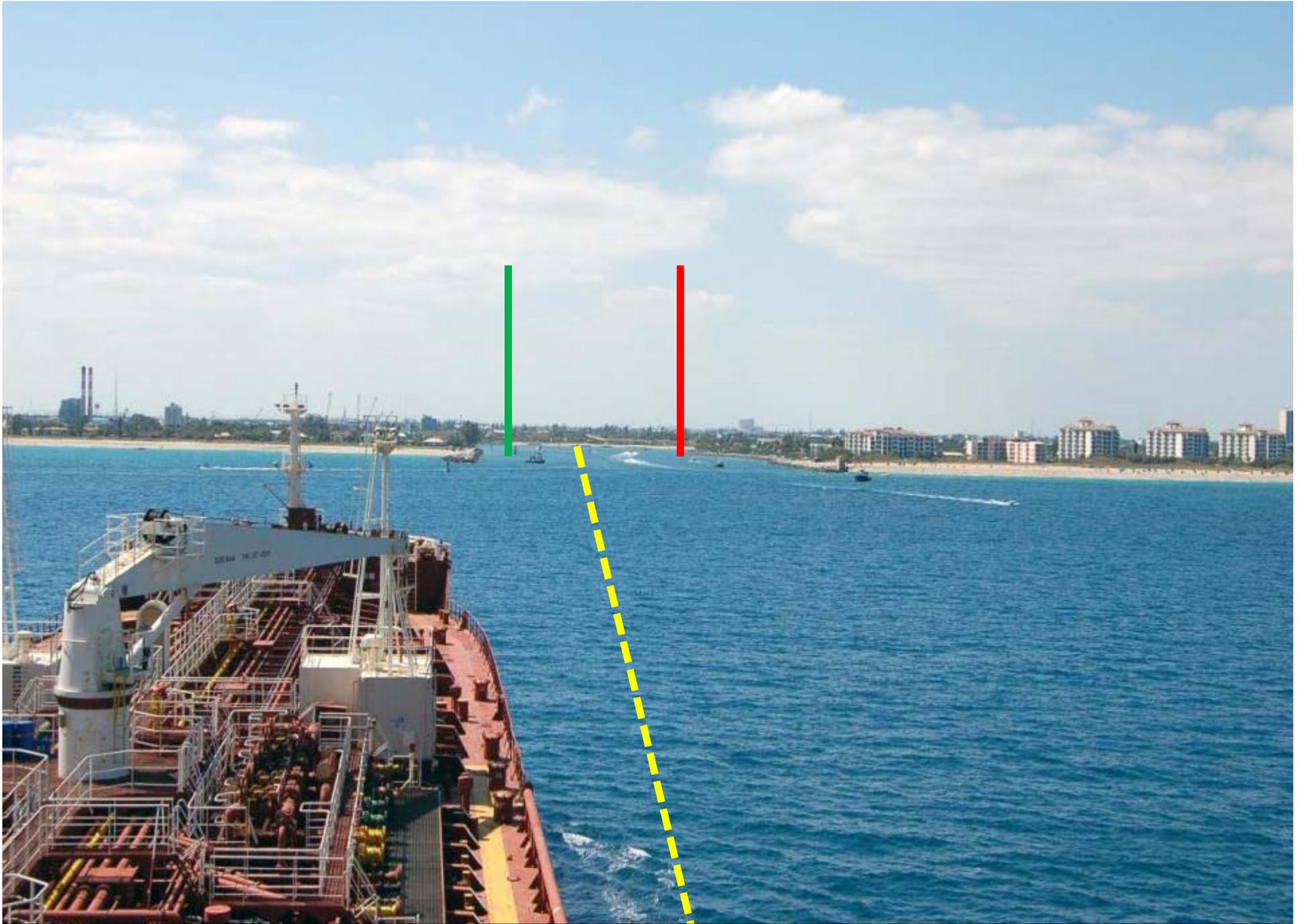


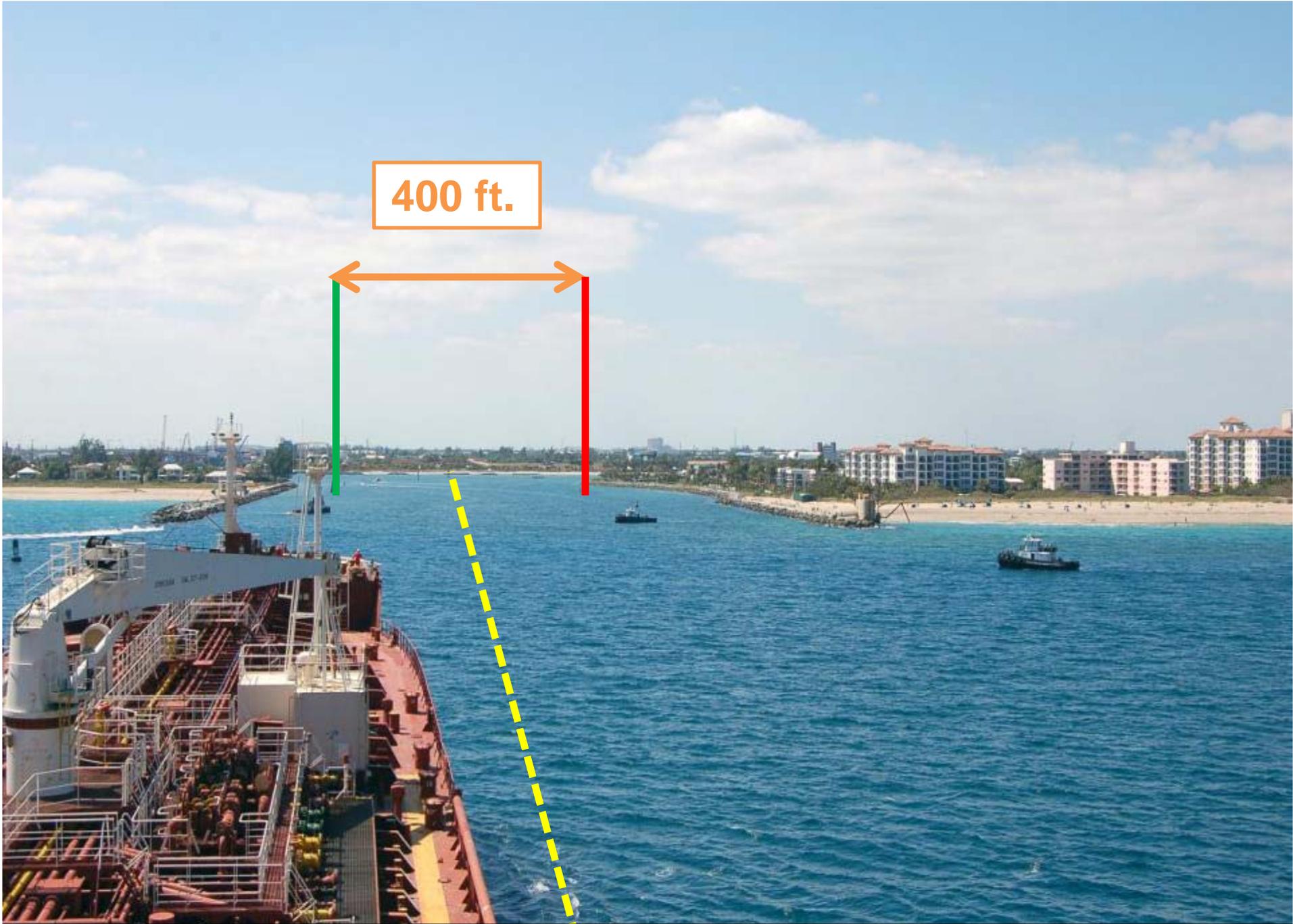


NAVIGATING THROUGH LAKE WORTH INLET PALM BEACH HARBOR

Captain Hansen, Harbor Pilot

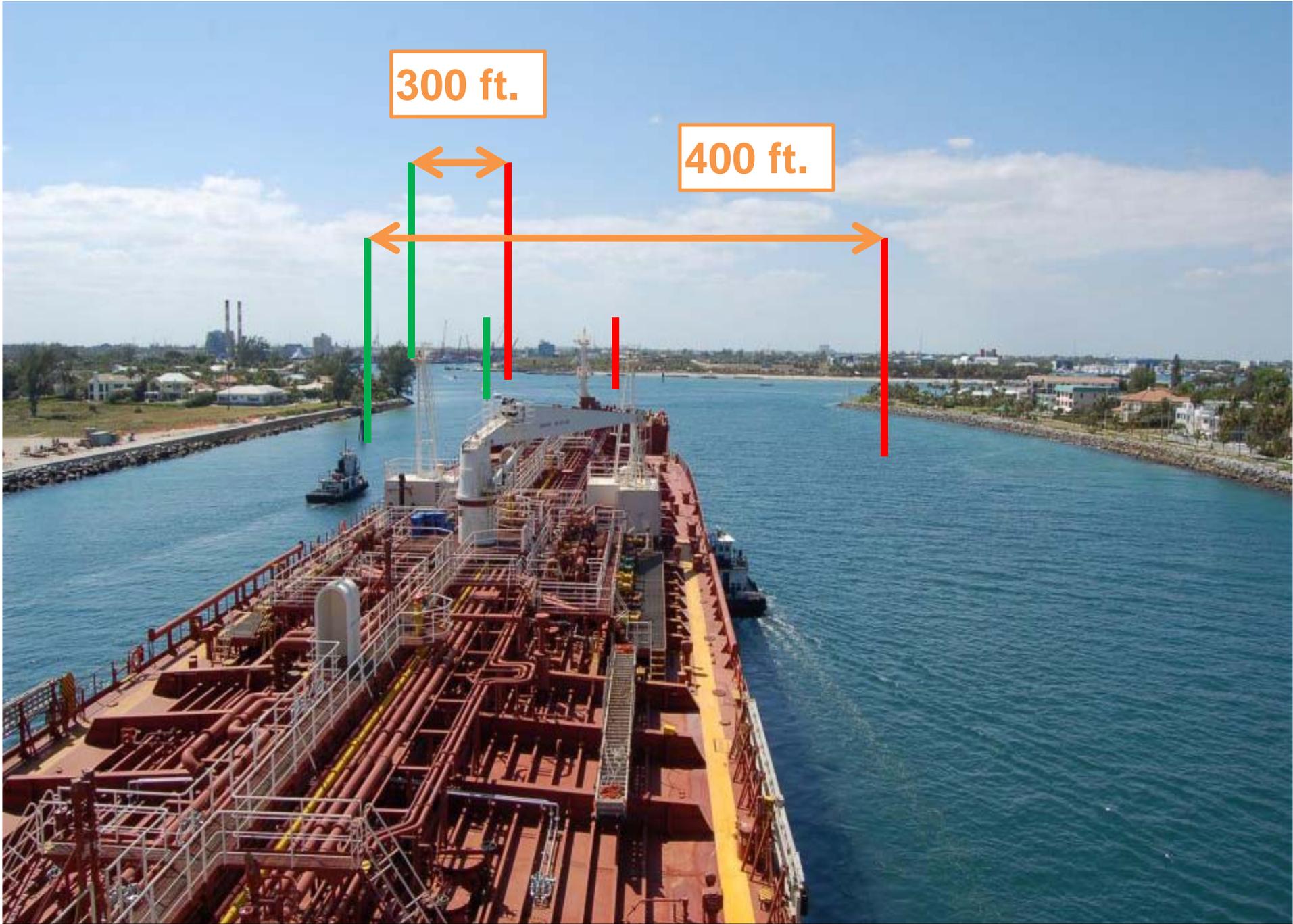






400 ft.





300 ft.

400 ft.









Cruise Ship Departure



EXISTING CONDITIONS

Economic: Main Commodities and Vessels

TYPICAL VESSEL TONNAGE AND SAILING DRAFT

Tide	Existing Sailing Draft	Existing Tonnage	Potential Sailing Draft	Potential Tonnage	Difference (tonnage per trip)
Low	30 ft	26,300 tons	36 ft	45,800 tons	+74%
High	33 ft	30,400 tons	39 ft	51,500 tons	+ 69%



- Existing and future demand to support capacity of potential vessels
- Port can support capacity of potential vessels
- Nearing 75% more tonnage with potential vessel



Tankers



Bulk Carriers

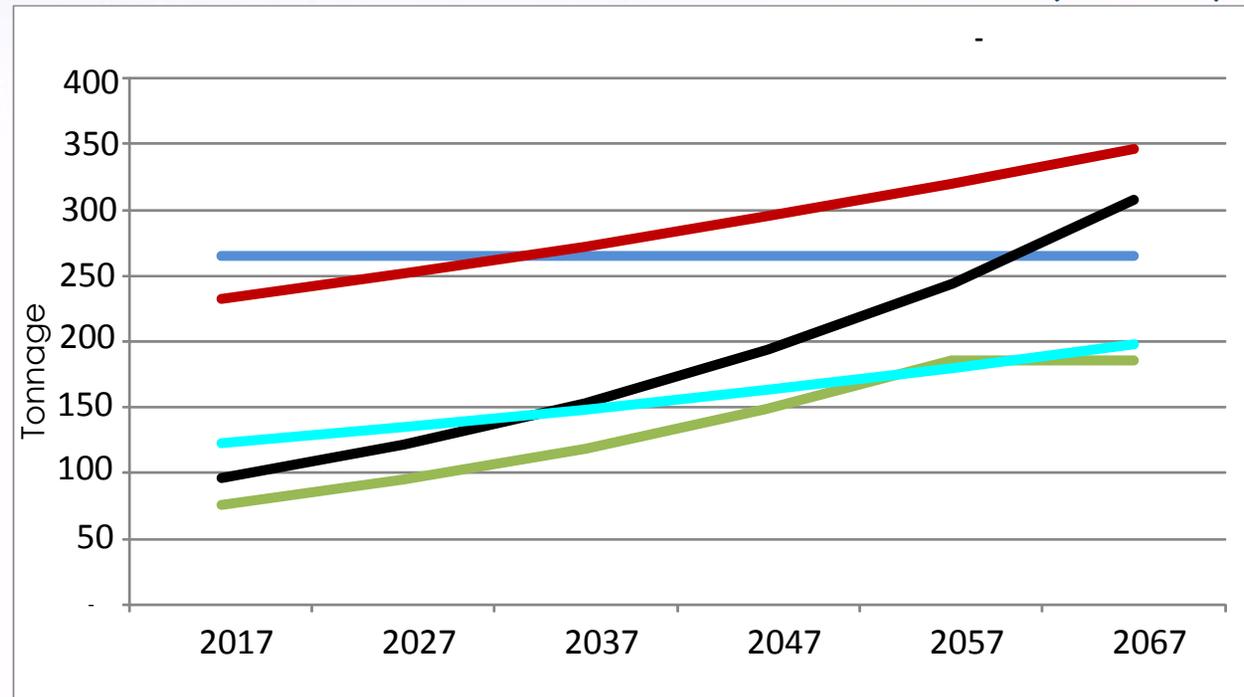


Specialty Cargo

FUTURE CONDITIONS WITHOUT PROJECT

- Due to inadequate widths and depth, continued safety issues and navigation restrictions
- Continued inefficiencies in loading (light loading)
- More frequent vessel calls
- Increased Transportation costs

PORT OF PALM BEACH FUTURE COMMODITY GROWTH PROJECTIONS (2017-2067)



- Molasses (Exports)
- Asphalt (Imports)
- Cement & Concrete (Imports)
- Liquid Petroleum Products (Imports)
- Non- Containerized General Cargo (Both Directions)



PLAN FORMULATION

Measures Evaluated

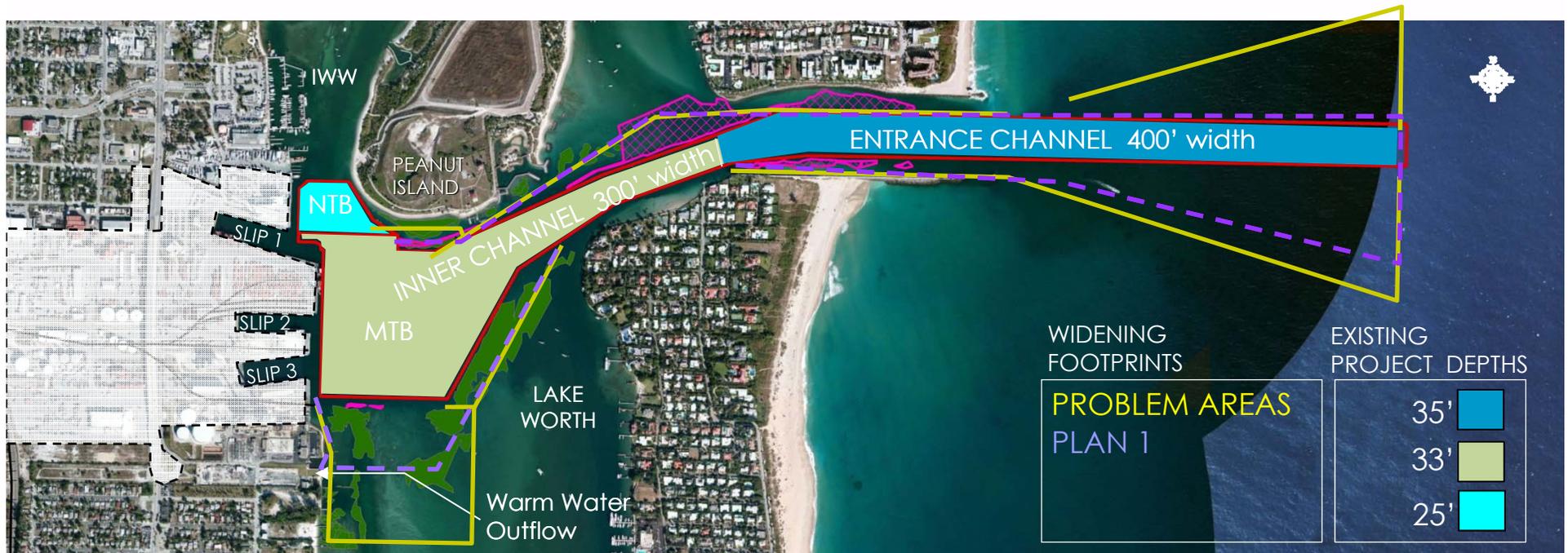
- No-Action
- Non-Structural Measures
 - ▶ Tug additional assists
 - ▶ High-tide transiting
 - ▶ Light-loading
- Structural Measures
 - ▶ Deepening and widening of navigational channels
 - ▶ Expansion of the turning basins



PLAN FORMULATION

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PLAN FORMULATION

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PLAN FORMULATION

Widening Footprint + Deepening

PROJECT (DEPTH)	AVERAGE ANNUAL BENEFITS	AVERAGE ANNUAL COSTS	NET BENEFITS	BCR
38'+Widening	\$6,416,498	\$2,982,771	\$3,433,727	2.15
39'+Widening	\$7,325,811	\$3,311,091	\$4,014,720	2.21
40'+Widening	\$7,746,616	\$3,599,861	\$4,146,755	2.15
41'+Widening	\$7,793,759	\$4,297,090	\$3,496,669	1.81

FIRST ROUND | COSTS, BENEFITS, BCR

- ✓ Rough Order Magnitude Costs
- ✓ Fewer Inputs and Iterations of HarborSym Model
- ✓ 25% Cost Contingency
- ✓ No Advance Maintenance Included

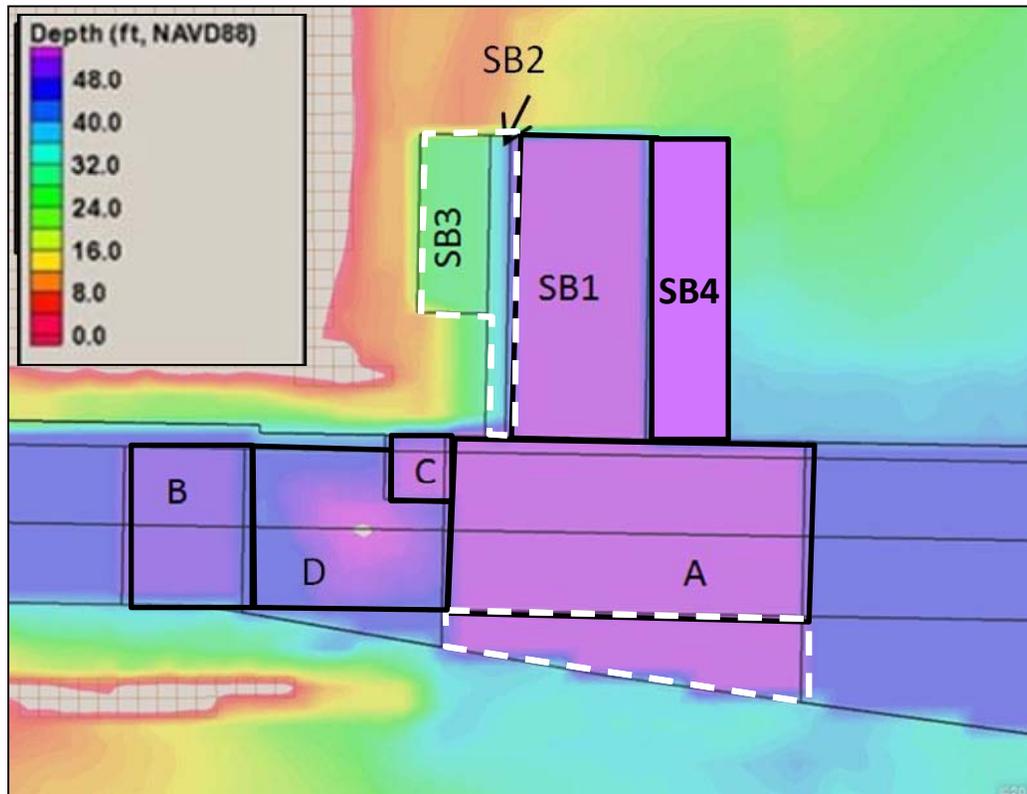
SECOND ROUND | COSTS, BENEFITS, BCR

- ✓ Greater Detail in Costs
- ✓ More Inputs and Iterations of HarborSym Model
- ✓ 25% Cost Contingency
- ✓ No Advance Maintenance Included



IMPROVED ADVANCE MAINTENANCE FORMULATION

- **Historical Condition:** O&M occurred up to **2 times/year**
- **Existing Condition:** Advance Maintenance package (approved Dec. 2011, constructed March 2013) reduces frequency of dredging to **1 time/year**
- **Future With-Project:** Reduces frequency of dredging to **1 time/2 years**



PROPOSED SETTLING BASIN (SB) DEPTHS

AREA SB1	51 feet
AREA SB2	34 feet
AREA SB3	26 feet
AREA SB4	No change

PROPOSED ADVANCED MAINTENANCE ZONE (AMZ) DEPTHS

AMZ A	51 feet
AMZ B	47 feet
AMZ C	51 feet
AMZ D	47 feet



IMPROVED ADVANCE MAINTENANCE JUSTIFICATION

AVERAGE ANNUAL BENEFITS AND COSTS FOR 39-FOOT PLAN WITHOUT IMPROVED ADVANCED MAINTENANCE PLAN

- Annual Benefits \$ 7,090,000
- Annual Costs \$ 3,600,000
- Net Annual Benefits \$ 3,490,000
- **BCR = 2.0 to 1** (FY14 Price Level/Discount Rate of 3.5%)

AVERAGE ANNUAL BENEFITS AND COSTS FOR ONLY IMPROVED ADVANCE MAINTENANCE PLAN

- Annual Benefits \$ 850,000
- Annual Costs \$ 450,000
- Net Annual Benefits \$ 400,000
- **BCR = 1.9 to 1** (FY14 Price Level/Discount Rate of 3.5%)

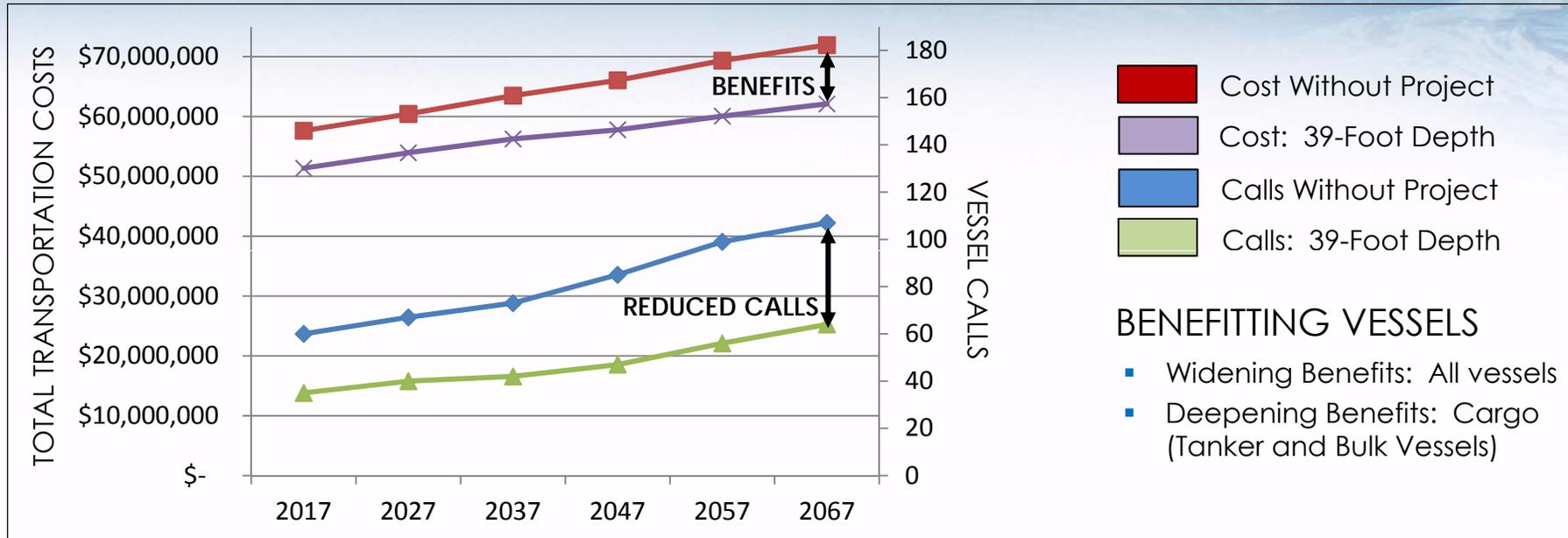
ADVANCE MAINTENANCE FIRST COST: \$10,524,000



RECOMMENDED PLAN WITH IMPROVED ADVANCE MAINTENANCE PLAN

Economic Summary

TRANSPORTATION SAVINGS BY BENEFITTING VESSEL CALLS



- Cost Without Project
- Cost: 39-Foot Depth
- Calls Without Project
- Calls: 39-Foot Depth

BENEFITTING VESSELS

- Widening Benefits: All vessels
- Deepening Benefits: Cargo (Tanker and Bulk Vessels)

AVERAGE ANNUAL BENEFITS AND COSTS

- Annual Benefits \$ 7,940,000
- Annual Costs \$ 3,960,000
- Net Annual Benefits \$ 3,980,000
- **BCR = 2.0** (FY14 Price Level/Discount Rate of 3.5%)

Last Round-Costs, Benefits, BCR :

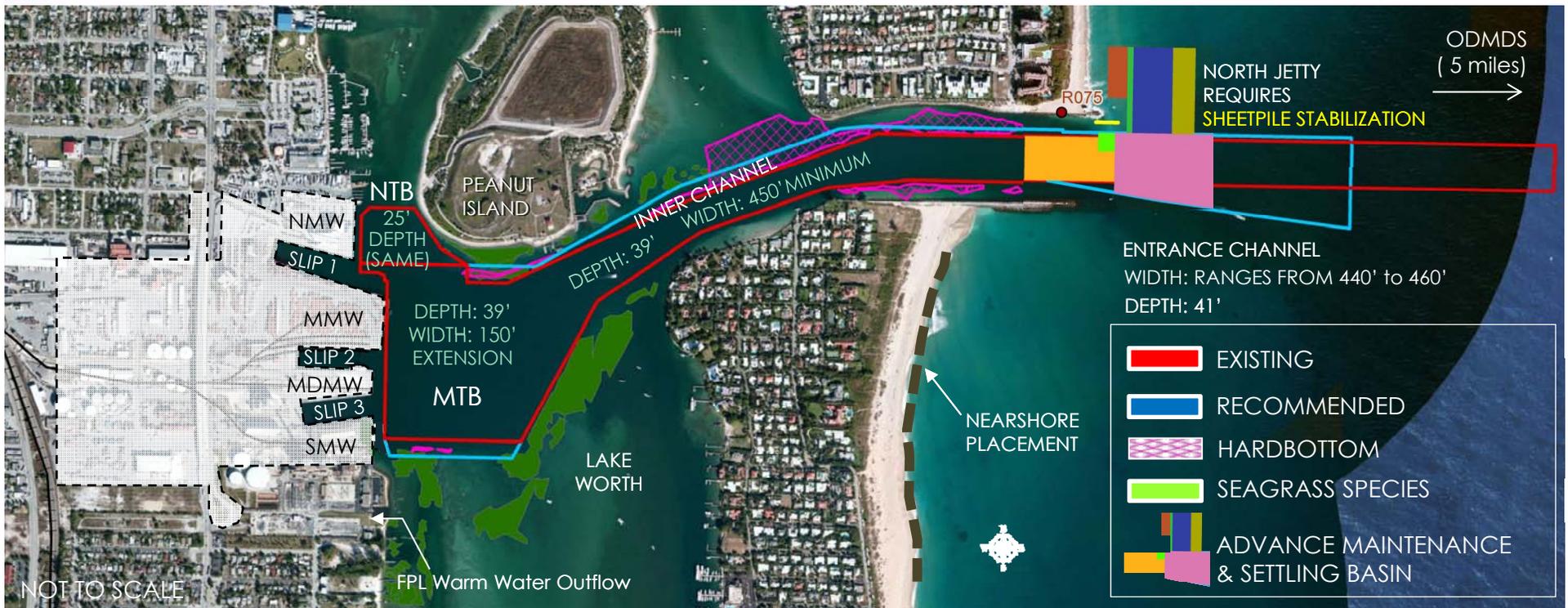
- ✓ Advance maintenance cost and benefits included
- ✓ Certified cost



RECOMMENDED PLAN

FEATURE (DEEPENING)	EXISTING	RECOMMENDED PLAN
North Turning Basin (NTB)	25'	SAME
Main Turning Basin (MTB)	33'	39'
Inner Channel	33'	39' (PROJECT DEPTH)
Entrance Channel	35'	41'
Advance Maintenance: Reduces maintenance to once every two years		

NMW: North Marginal Wharf
MMW: Main Marginal Wharf
MDMW: Mid Marginal Wharf
SMW: South Marginal Wharf
MTB: Main Turning Basin
NTB: North Turning Basin



RECOMMENDED PLAN

Environmental Aspects



Seagrass Mitigation

- 11.25 acres (4.5 acres impact)
- Recommended site can accommodate capacity and has similar species currently growing in vicinity
- **Method:** Fill existing holes in the lagoon with dredged material to elevation; allow natural colonization



Hardbottom Mitigation

- 11.25 acres (4.9 acres impact)
- Recommended site can accommodate capacity and has had proven success with same methodology
- **Method:** Purchase quarry limestone, create low relief artificial reefs

22.50 total acres of mitigation



RECOMMENDED PLAN

Sea-level Rise Analysis

- Used EC 1165-2-212 for guidance
- Scenarios based on:
 - ▶ Low: extrapolation of historic sea-level rise rates
 - ▶ Intermediate: NRC Curve I
 - ▶ High: NRC Curve III
- Regional sea-level change: +2.39 mm/year
- Results of analysis for the period of 2017 – 2067:
 - ▶ Low: .39 feet
 - ▶ Intermediate: .89 feet
 - ▶ High: 2.47 feet

CONCLUSION:

Based on these sea-level rise projections and elevations of current and planned port facilities, no impacts are anticipated for berths of benefiting vessels



RECOMMENDED PLAN Cost-Sharing Summary

Total Project First Cost* = \$88,531,000

Federal Share = \$66,393,000

Non-federal Share = \$22,138,000

Total Project Cost ** = \$88,556,000

Federal Share = \$57,581,000

Non-federal Share = \$30,975,000

* Includes Land, Easements, Right-of-way, and Relocation (LERR)

** Aids to Navigation costs



PILOT STUDY PUBLIC AND AGENCY INVOLVEMENT

RE-SCOPING FOR PILOT PROCESS

- Pilot Re-scoping Risk Workshop: August 2011
- Public Workshop: May 2013

ISSUES RAISED

- Public Issues: opposed mitigation sites were removed, all other comments addressed
- Resource Agency issues resolved
- IEPR comments resolved

AGENCY COORDINATION

- Formal comments received:
 - ▶ U.S. Environmental Protection Agency
 - ▶ U.S. Fish and Wildlife Service
 - ▶ National Marine Fisheries Service
 - ▶ Florida Department of Environmental Protection

Prior to pilot study (original scoping and draft EIS): 2007-2008



USACE COMPLIANCE

- Value Engineering - June 2012
- Independent External Peer Review (IEPR) – July 2013
- Final Agency Technical Review (ATR) – August 2013
- Cost Certification – August 2013
- Legal Certification – August 2013
- Mitigation Model (HEA) Approval - October 2013



ENVIRONMENTAL COORDINATION

- National Environmental Policy Act
 - Scoping Letter (6 Dec 2007), Scoping Meeting (January 9, 2008)
 - Draft EIS Notice of Availability (April 19, 2013), Draft EIS Public Meeting (May 9, 2013)
 - Notice of Availability Final EIS (February 7, 2014)
 - Record of Decision (April 2014)
- Issues Raised
 - Concern over two proposed mitigation locations (Turtle Cove & Little Lake Worth)
 - Concern over potential use of blasting
 - Concerns addressed in Final EIS
 - Mitigation plan updated to remove Turtle Cove & Little Lake Worth
- Agency Coordination
 - Formal comments received:
 - U.S. Environmental Protection Agency (EPA)
 - U.S. Fish and Wildlife Service (USFWS)
 - National Marine Fisheries Service (NMFS)
 - Florida Department of Environmental Protection (FDEP)
 - Florida State Historic Preservation Office (SHPO)

There has been no opposition or major issues raised in relation to the deepening and widening itself



ENVIRONMENTAL COMPLIANCE

- **Endangered Species Act**
 - USFWS Concurrence Report (December 12, 2012)
 - NMFS Biological Opinion (November 7, 2013)
- **Clean Water Act**
 - State of Florida Water Quality Certificate
- **Coastal Zone Management Act**
 - State of Florida Consistency Determination (1 June 14, 2013)
 - Final Consistency Determination upon receipt of WQC
- **National Historic Preservation Act**
 - Florida State Historic Preservation Office Compliance Letter (20 Nov 2013)
- **Marine Protection, Research and Sanctuaries Act**
 - Section 103 permit to be obtained prior to construction
- **Clean Air Act**
 - Suggested revisions by EPA to Draft EIS incorporated
 - Increased growth in use of Port with or without widening & deepening
 - Widening & deepening will allow for larger, more efficient ships (# of ships will remain the same)
 - Project in compliance with the Clean Air Act
- **Environmental Justice (E.O. 12898)**
 - No disproportionate effects to low-income, minorities, or children as a result of the project



ENVIRONMENTAL OPERATING PRINCIPLES



Foster sustainability



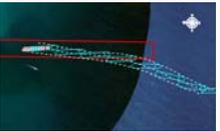
Proactive consideration of environmental consequences



Mutually supporting economic and environmentally sustainable solutions



Accountability for activities which may impact human and natural environments



Collaborative leveraging of scientific, economic, and social knowledge to understand environmental context



Consideration of environment and risk management in context of project and program lifecycle



Open, transparent process respecting views of individuals and groups interested in Corps activities

RECOMMENDED NATIONAL PRIORITIES



Reduce deficit



Create jobs/restore economy



Improve resiliency and safety



Restore and protect the environment



Maintain global competitiveness



Increase energy independence

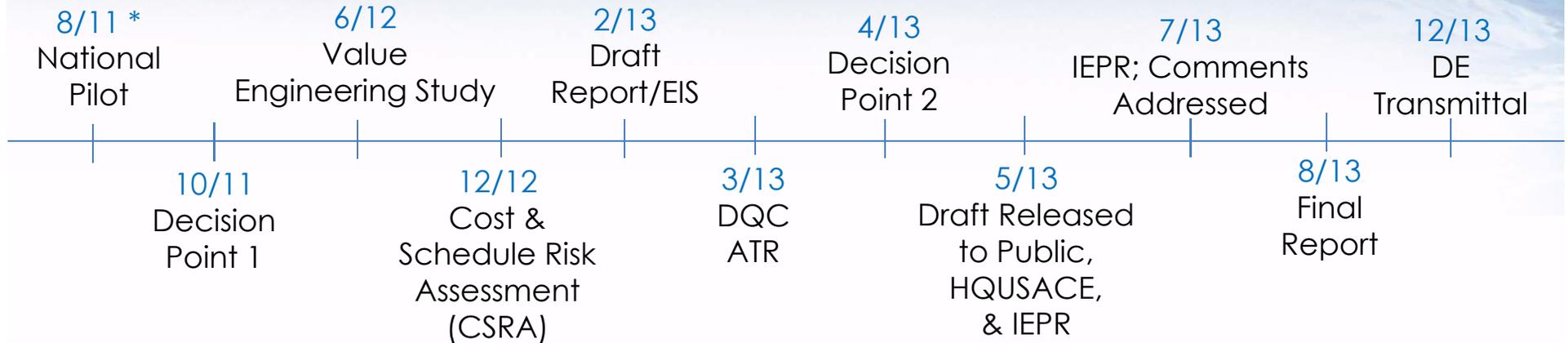


Improve quality of life



STUDY MILESTONES

COMPLETED MILESTONES



REMAINING MILESTONES

- Final Chief's Report: 4/14
- PED Duration: 24 months
- Construction Duration: 24 months



* Prior to pilot study (original scoping and draft EIS): 2007-2008



IN CONCLUSION

Brings a port last updated more than 50 years ago to current standards:

- Allows today's vessels to call at the Port, one of 16 net export ports
- Improves efficiency and overall economic contributions to the Nation
- Reduces risk for commercial and recreational vessels
- Significantly reduces annual O&M maintenance requirements

