The Port of Virginia

Accommodating Mega-Ships at Existing Wharves

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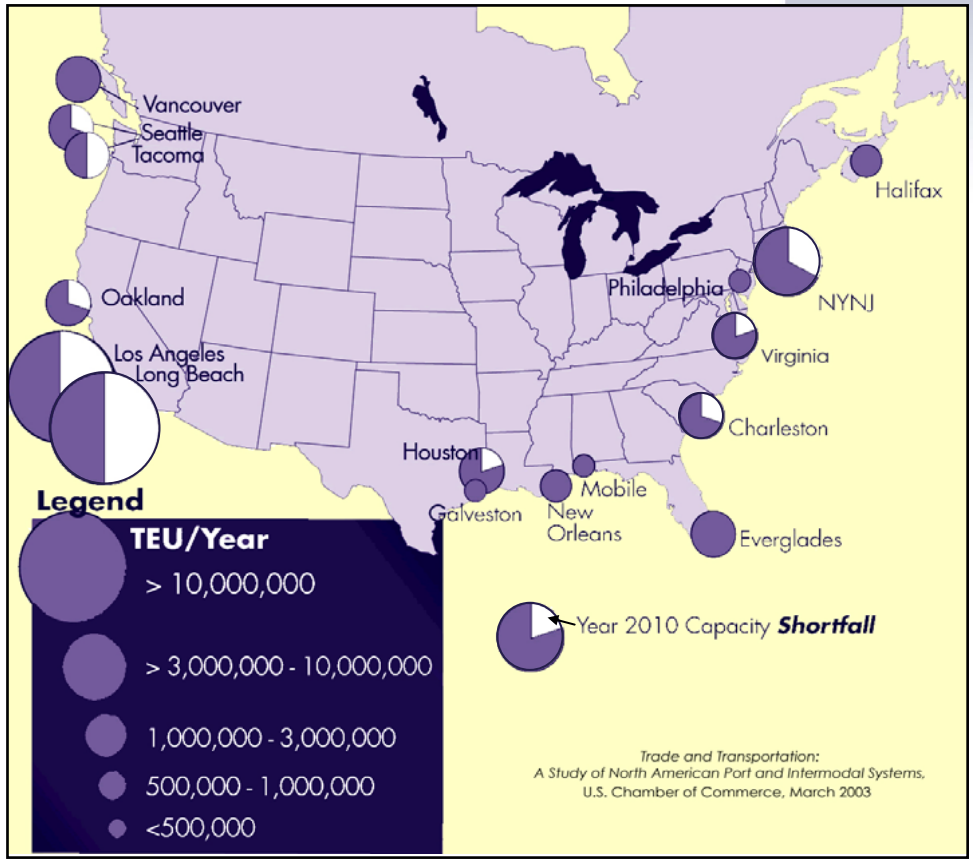
National Cargo Trends

- **U.S. Cargo Will Double in Volume by 2020**
- **Panama Canal Commission Forecast East Coast Cargo to Triple by 2020**
- **Latin American Trade and Transportation Study (2001)**
  - **13 Southern US States Will Reach Capacity Between 2008 and 2012**



The "China Factor"

- **U.S. Ports as a Whole are Experiencing an Increase in Container Trade with Asia**
- **East Coast Ports In Particular are Seeing a Significant Increase in Container Trade with Asia**
  - **All-Water Shipping Routes Both Inexpensive and Stable**

National Cargo Forecasts

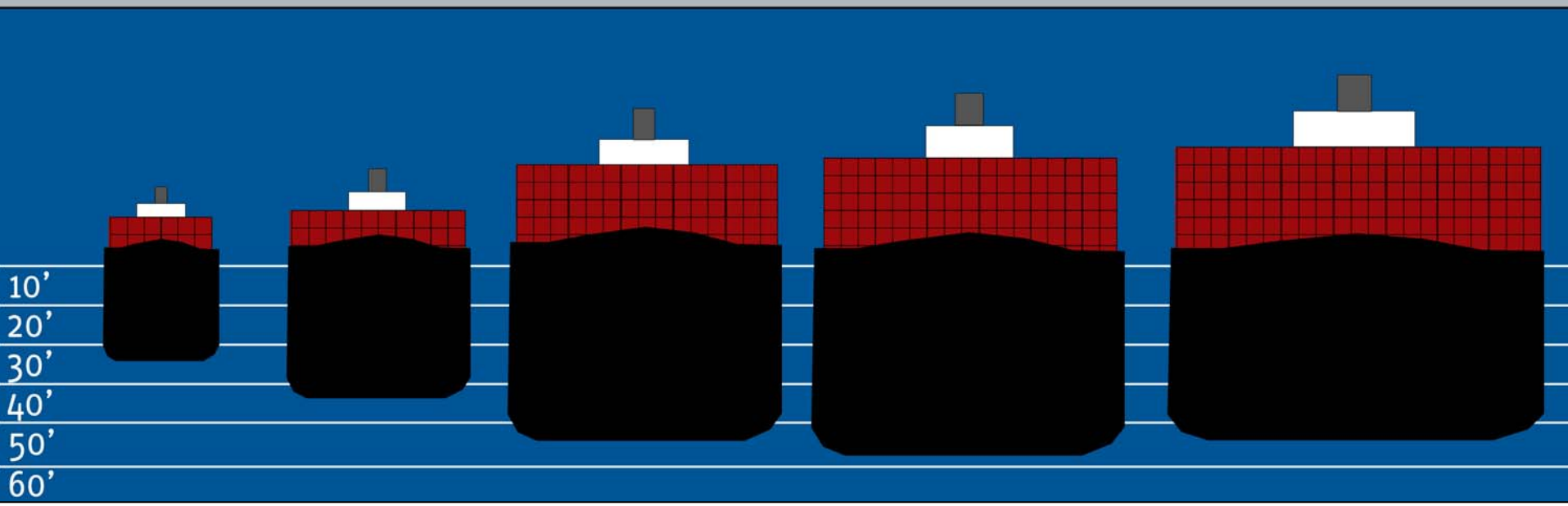
- **All Cargo Growth Forecasts are Based on "Unconstrained" Growth**
- **Port Infrastructure is a Potential Constraint to Growth**
  - **Aging or Inadequate Terminal Facilities Cannot Accommodate Additional Cargo**

Growth in Container Ship Sizes

- **The *MSC Pamela* is Currently the Largest Container Ship in the World**
  - **9,200 TEUs**
  - **1,053 Feet Long**
  - **150 Feet Wide**
  - **49-Foot Draft**

Container Ship Evolution

Pre-1970	1970-1985	1985-2000	2000-2010	Post-2010
1,700 TEUs	2,300 TEUs	4,800 TEUs	8,000+ TEUs	13,000+ TEUs
<10 Boxes Wide	10 Boxes Wide	13-16 Boxes Wide	17 Boxes Wide	21 Boxes Wide
<30' Draft	33' Draft	44' Draft	48' Draft	44' Draft
450' Length	620' Length	900' Length	1,150' Length	1,350' Length



On-Dock Operations

Container Vessel Arrives at the Marine Terminal

On-Dock Operations

Specialized Cranes Unload Containers from the Ship
Straddle Carrier Picks Up Container from Wharf

Container Yard Operations

Containers are Stored in the Yard Until They Are Picked up By a Trucker or Loaded Onto a Train

Container Yard Operations

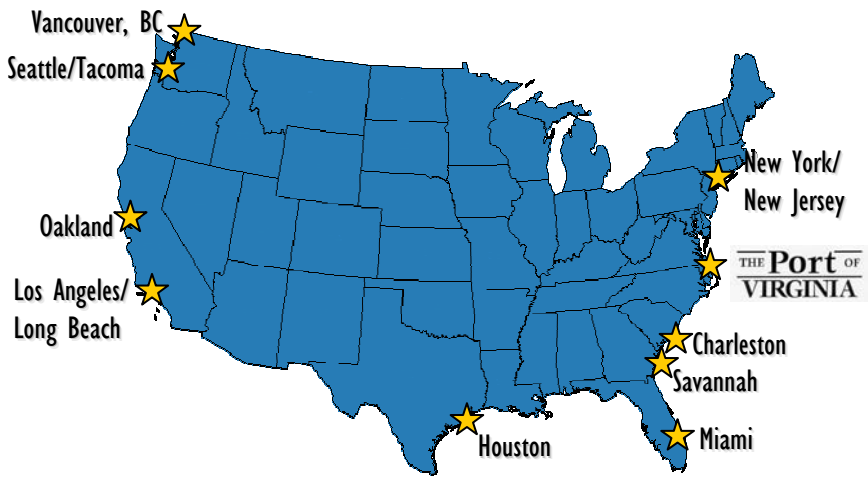
Straddle Carriers Remove the Container from Storage and Load it onto Trucks

Transportation Modes

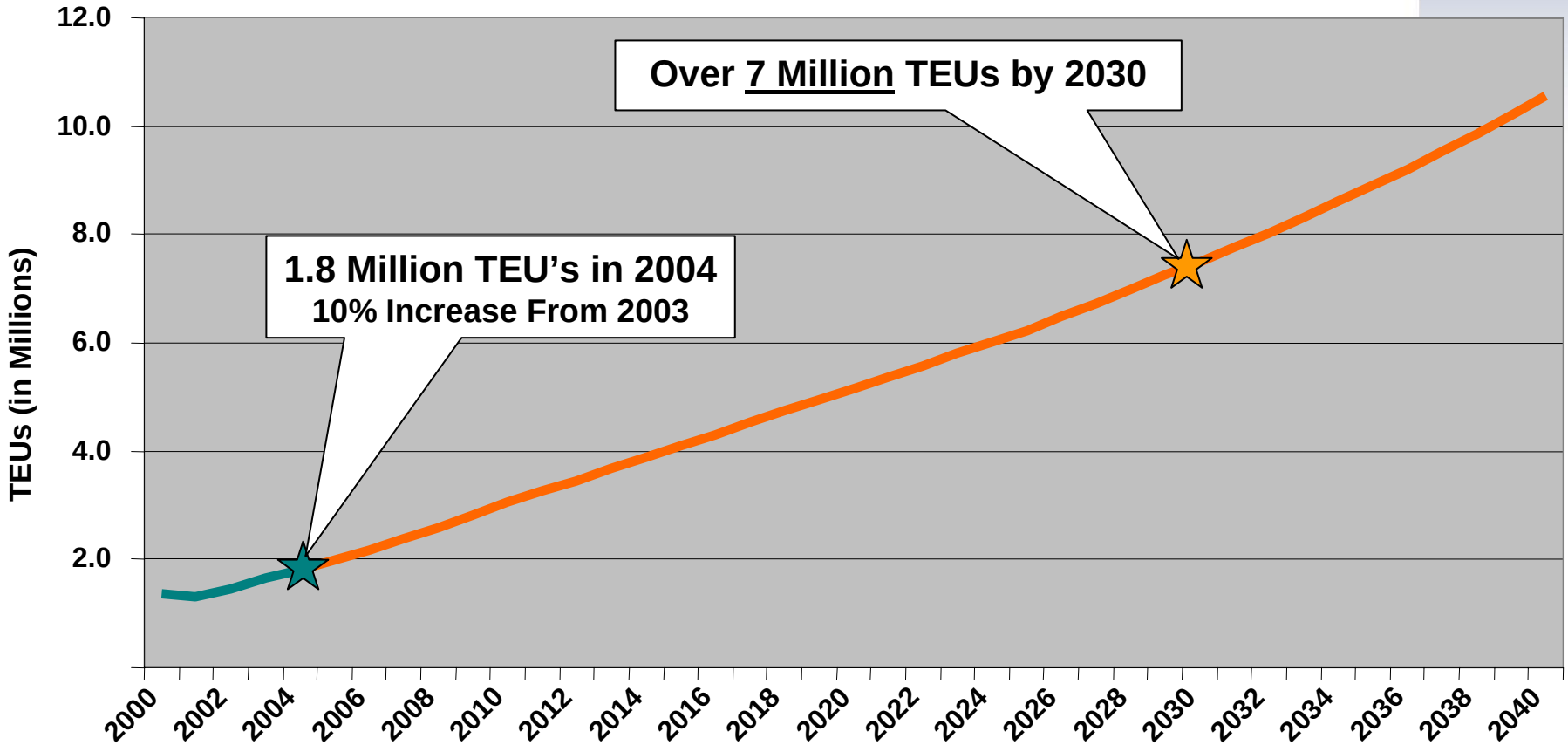
- **The 1.98 Million TEUs Handled by The Port of Virginia in 2005 Were Transported to Inland Markets Using:**
  - **Barge (10% of TEUs)**
  - **Rail (25% of TEUs)**
  - **Truck (65% of TEUs)**

Introduction to The Port of Virginia

- **In the Year 2005, VPA Handled 1.98 Million TEUs of Containerized Cargo**
  - **9.4% Increase Over 2004**
- **VPA is Currently Ranked:**
  - **7th Largest Container Port in the U.S.**
  - **2nd Largest Port on the East Coast in Terms of General Tonnage**



VPA Containerized Cargo Forecast

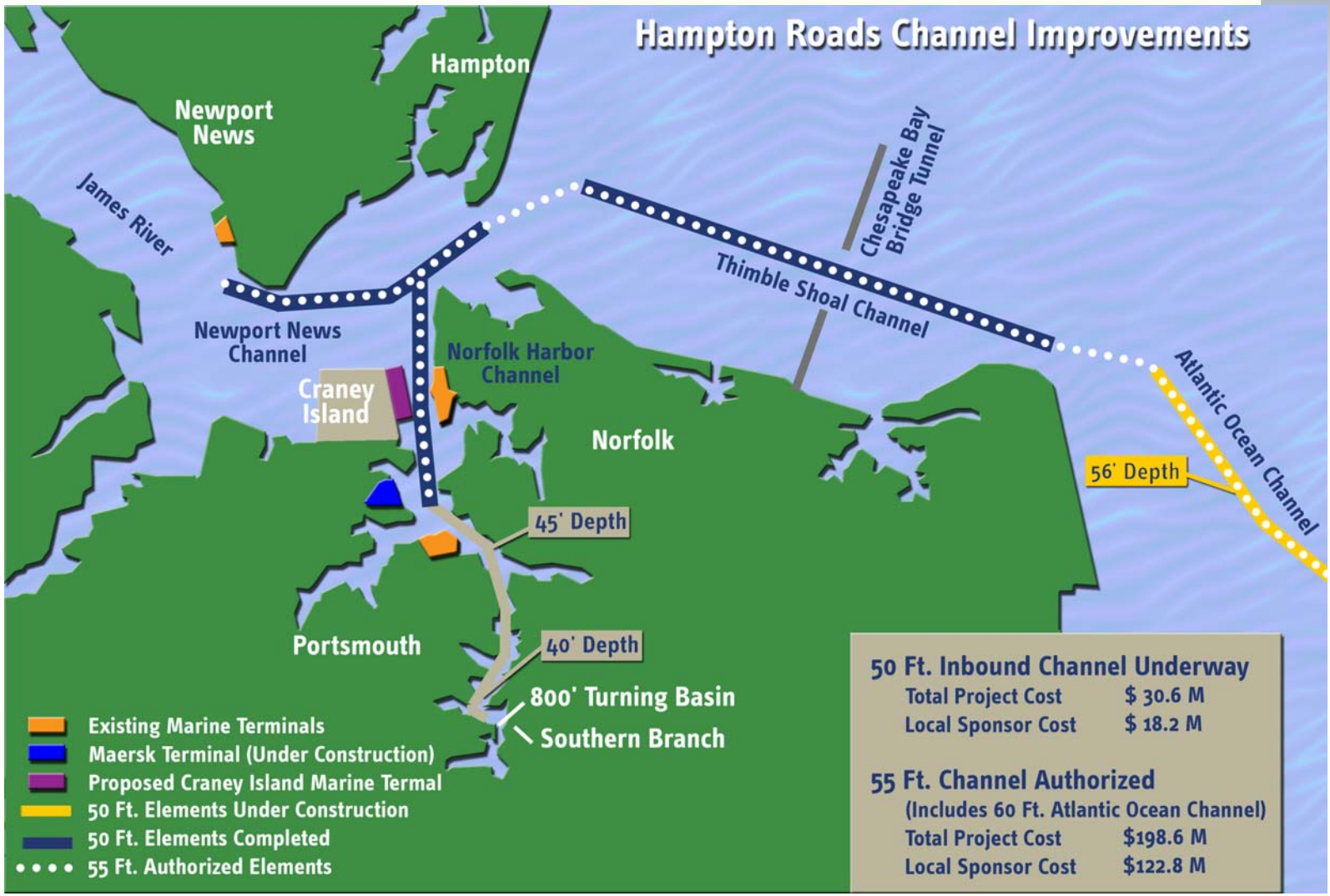


Source: VPA Master Plan. Forecast numbers represent average increase over the forecast period.

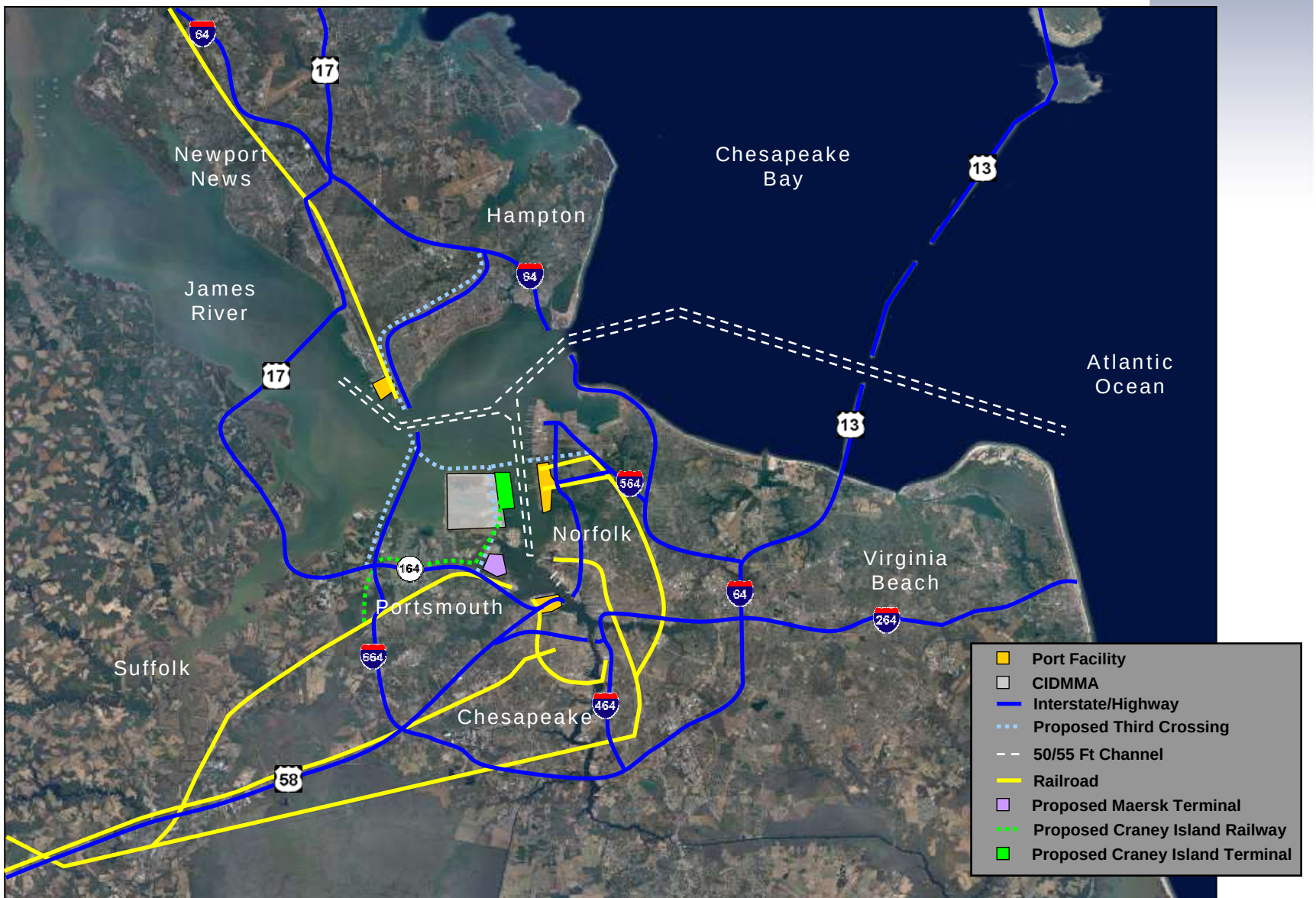
What is Required to Accommodate Growth?

- **Good Access to Deep Water**
  - **Allows Largest Ships to Call**
  - **Largest Ships can Move Cargo for the Least Cost**
- **Good Access to Road & Rail Lines**
  - **Facilitates and Speeds Distribution to Origin and Destination Points Locally and Nationally**
- **Good Port Infrastructure**
  - **Wharves, Cranes, and Container Yard**
  - **Efficient Cargo Transfer**

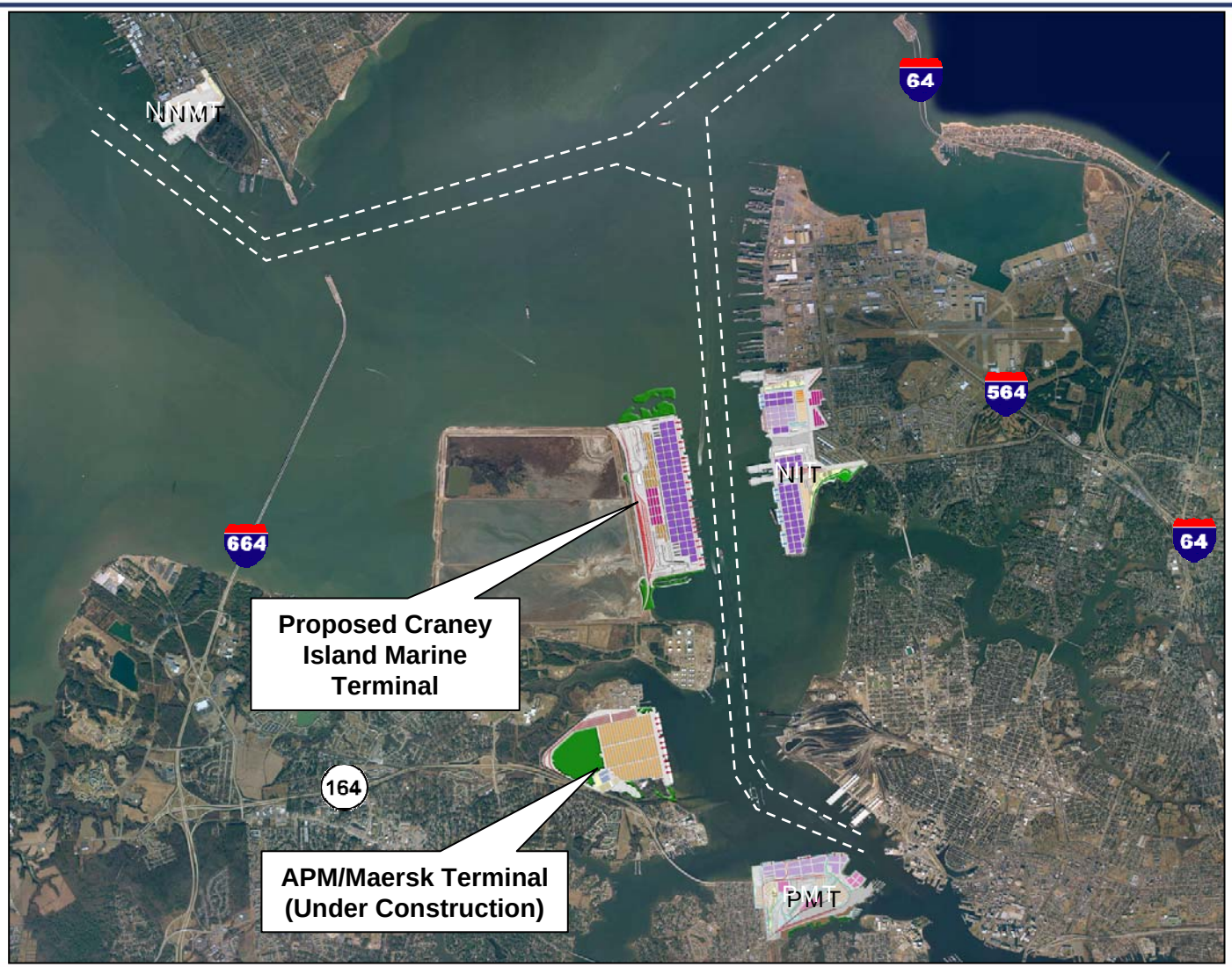
The Port of Virginia
Deep Water Access



Hampton Roads Intermodal Network



The Port of Virginia
Marine Terminal Locations



The Port of Virginia History

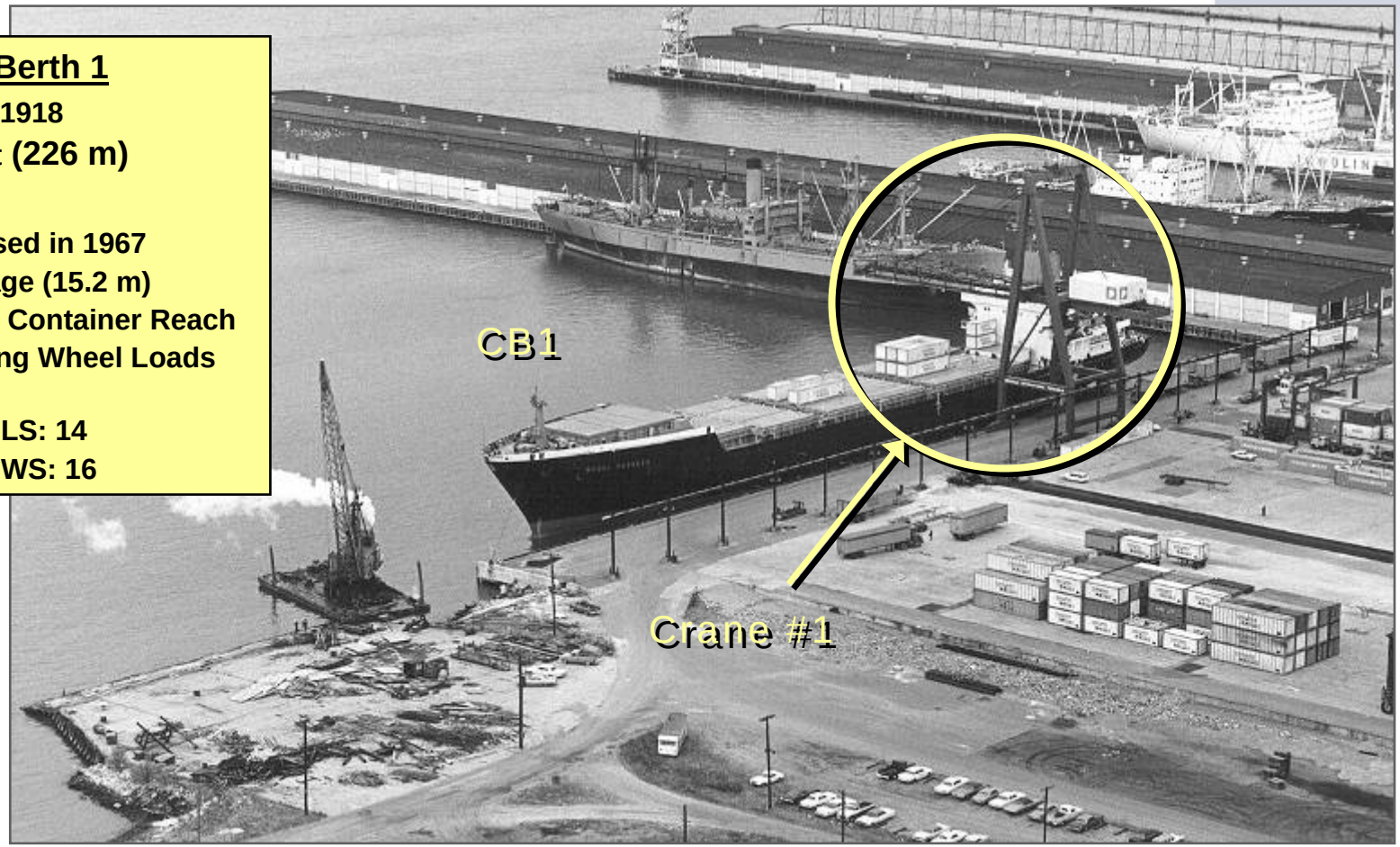
- **Three Marine Terminals Constructed Over Time**
- **Terminals Were Constructed by Various Agencies**
- **Some Structures Date Back to 1918**
- **Approximately Half of the Existing Container Cranes are First and Second Generation (13 Containers Wide)**

Norfolk International Terminals

Norfolk International Terminals

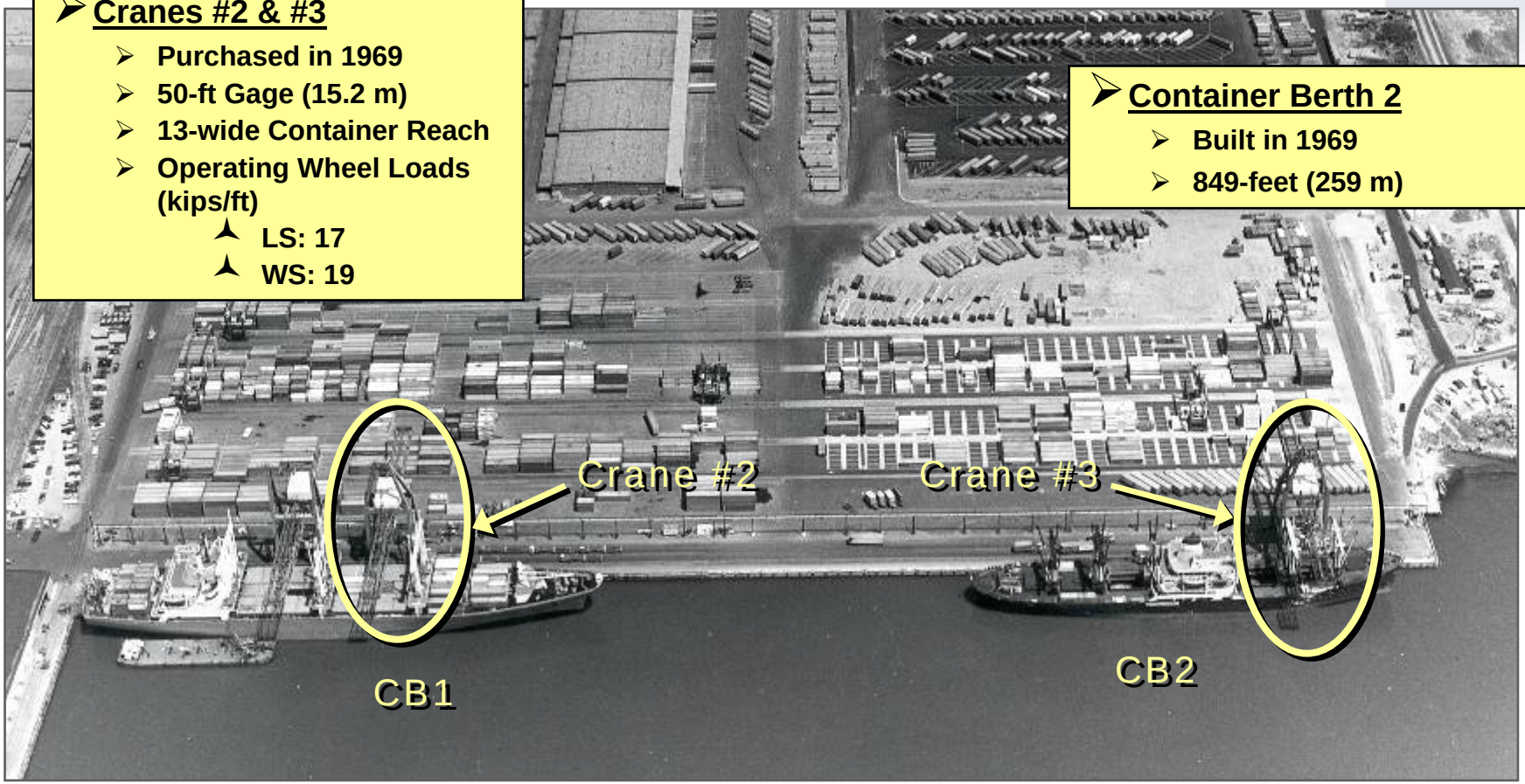
- **NIT Container Terminal Opened in 1967**

- **Container Berth 1**
  - Built in 1918
  - 740-feet (226 m)
- **Crane #1**
  - Purchased in 1967
  - 50-ft Gage (15.2 m)
  - 13-wide Container Reach
  - Operating Wheel Loads (kips/ft)
    - LS: 14
    - WS: 16



Norfolk International Terminals

- **Terminal & Wharf Expansion in 1969**



Cranes #2 & #3

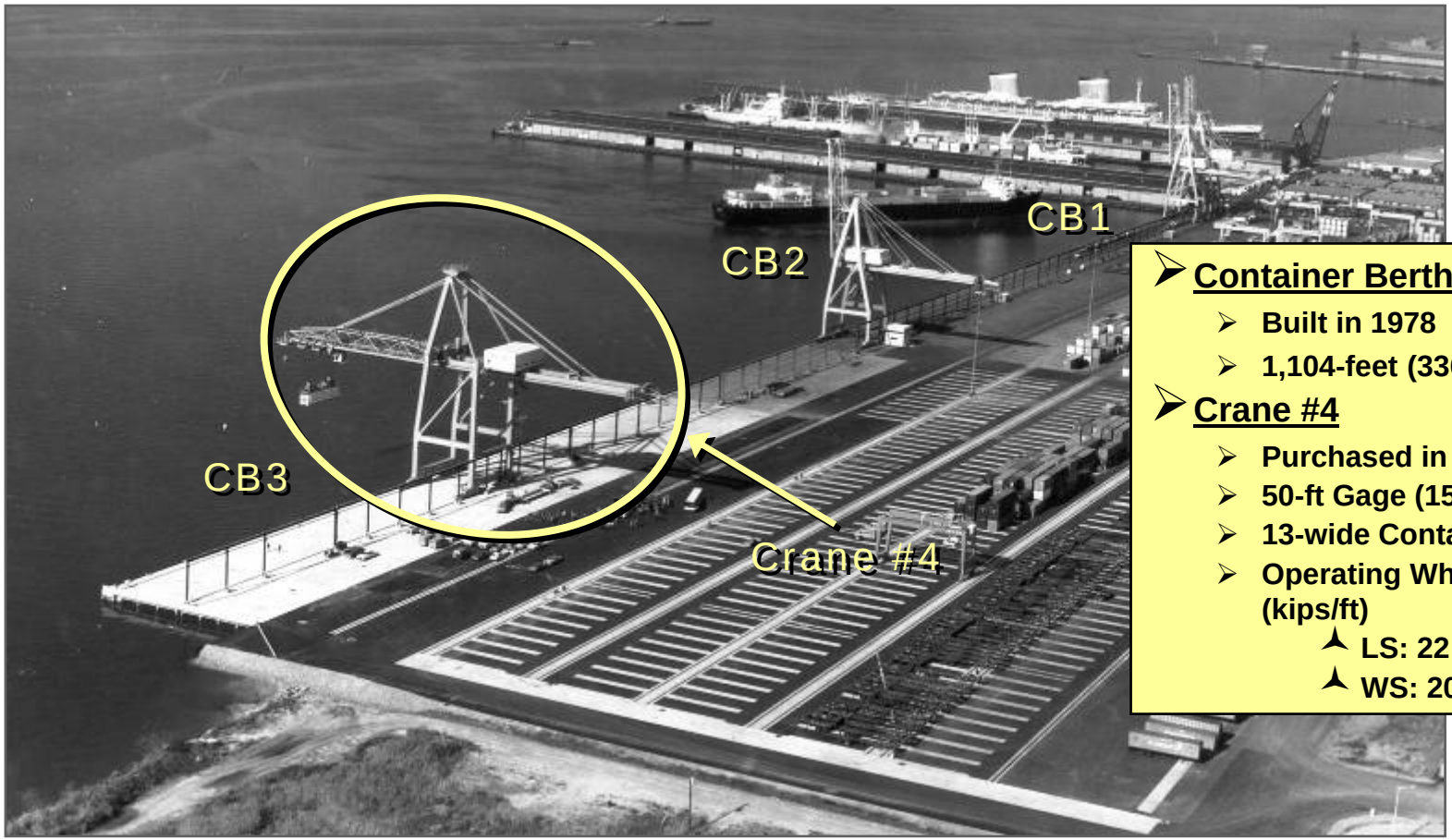
- Purchased in 1969
- 50-ft Gage (15.2 m)
- 13-wide Container Reach
- Operating Wheel Loads (kips/ft)
  - LS: 17
  - WS: 19

Container Berth 2

- Built in 1969
- 849-feet (259 m)

Norfolk International Terminals

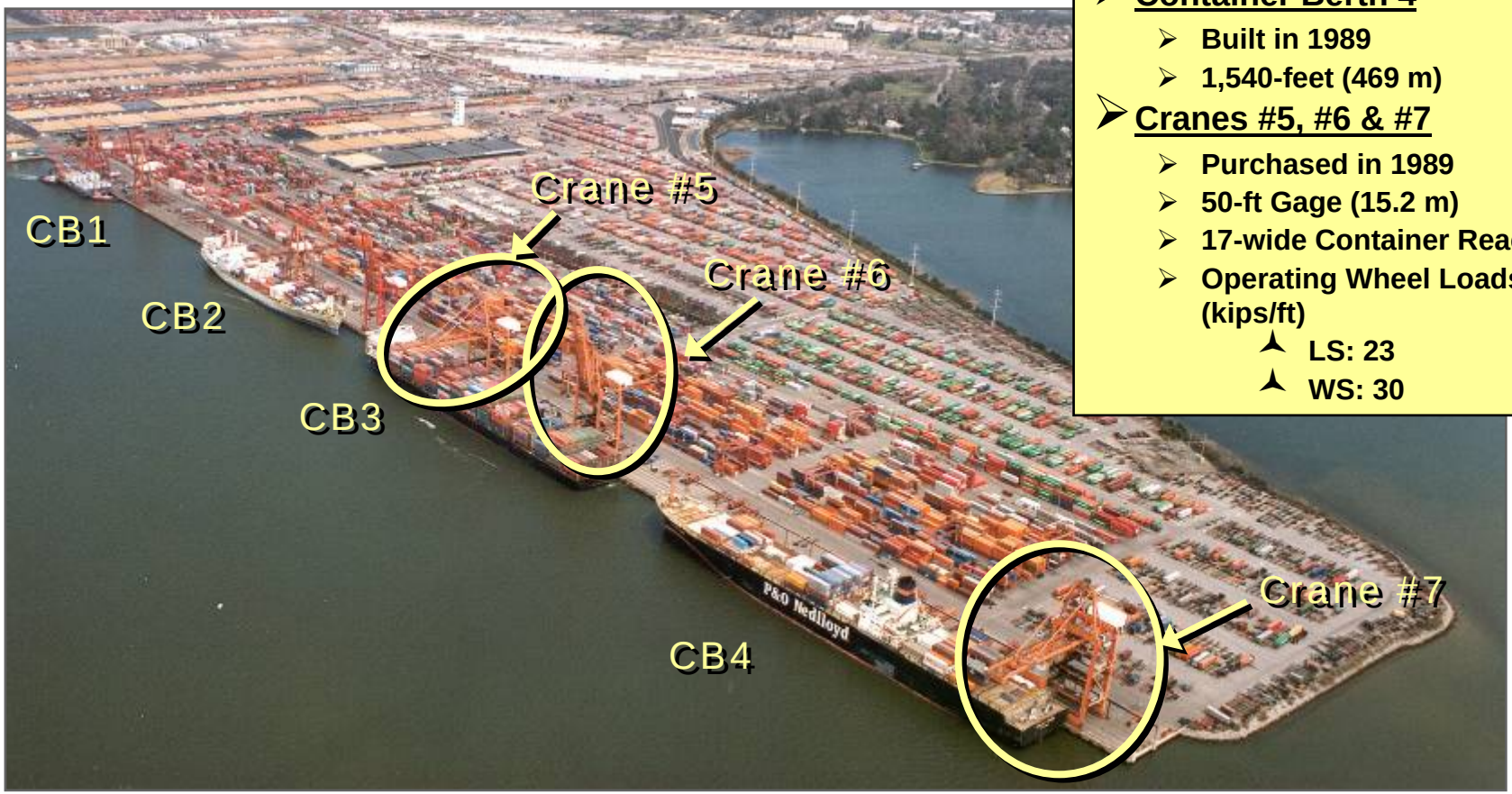
- **Terminal & Wharf Expansion in 1975 & 1978**



- **Container Berth 3**
  - Built in 1978
  - 1,104-feet (336 m)
- **Crane #4**
  - Purchased in 1978
  - 50-ft Gage (15.2 m)
  - 13-wide Container Reach
  - Operating Wheel Loads (kips/ft)
    - LS: 22
    - WS: 20

Norfolk International Terminals
South Terminal

- **Terminal & Wharf Expansion in 1989**



- **Container Berth 4**
  - Built in 1989
  - 1,540-feet (469 m)
- **Cranes #5, #6 & #7**
  - Purchased in 1989
  - 50-ft Gage (15.2 m)
  - 17-wide Container Reach
  - Operating Wheel Loads (kips/ft)
    - LS: 23
    - WS: 30

NIT South Backlands

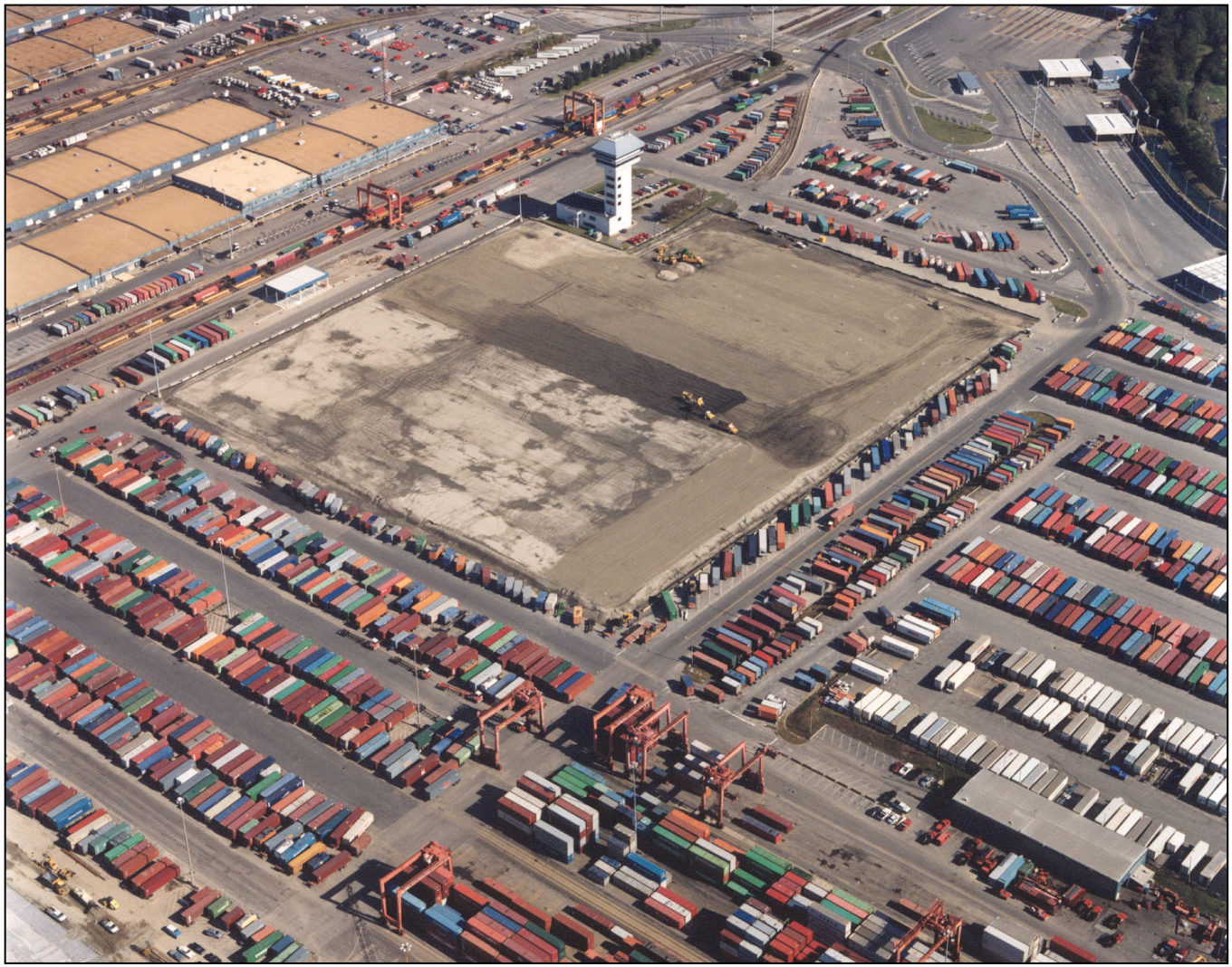
NIT South Renovation
Overall Project Goals

- **Upgrade Aging and Obsolete Terminal Infrastructure**
- **Keep Pace With Containerized Cargo Forecasts**
- **Accommodate Increasing Container Ship Sizes**
- **Allow for Operational Conversions (Rubber-Tire Gantry v. Straddle Carrier)**

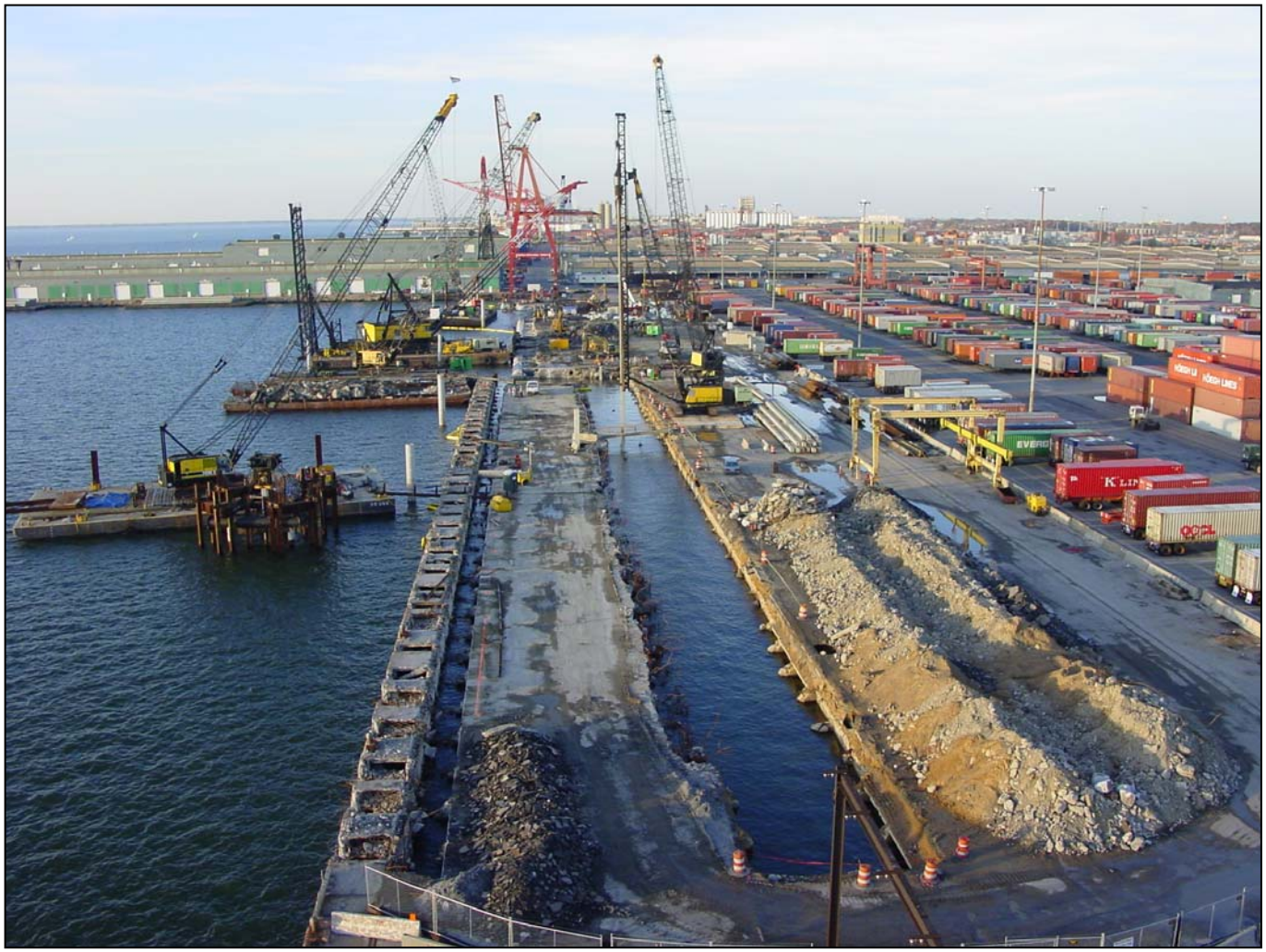
NIT South Renovation
Overall Project Goals

- **Full Renovation of NIT South Terminal**
  - **4,230 Feet (1,289 Meters) of Wharf**
  - **8 New Suez-Class Container Cranes**
  - **140 Acres (57 Hectares) of Container Yard**
  - **New Stormwater Treatment Systems**
  - **Environmental Impacts Included 5.1 Acres of River Bottom and .02 Acres of Vegetated Tidal Wetlands**

NIT South Backlands
Warehouse Demolition



NIT South Wharf
Stage 1 Construction

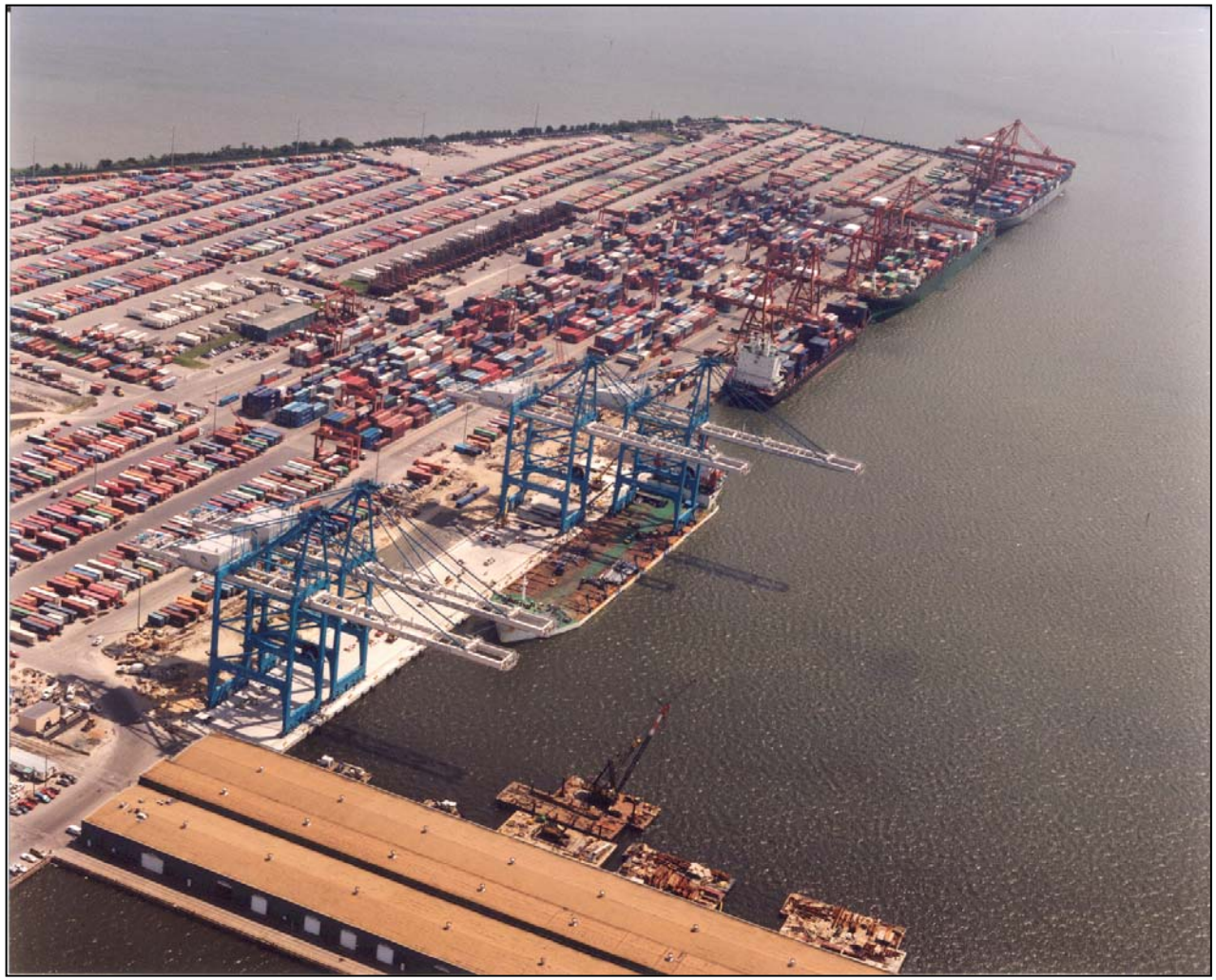


NIT South Wharf
Stage 1 Construction

NIT South Wharf

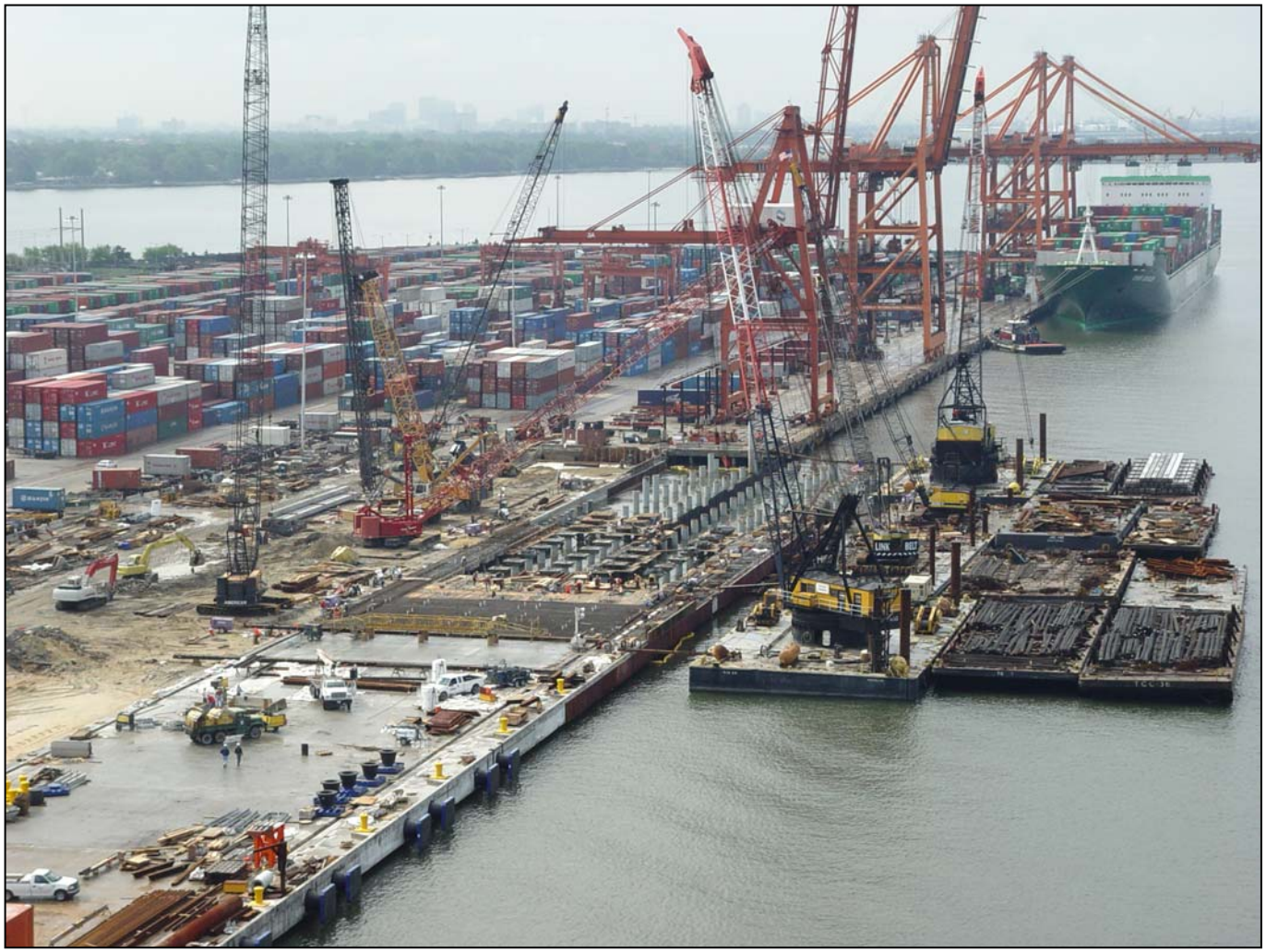
Arrival of First Shipment of Cranes

NIT South Wharf
First Shipment of Cranes



NIT South Wharf
Stage 2 Construction

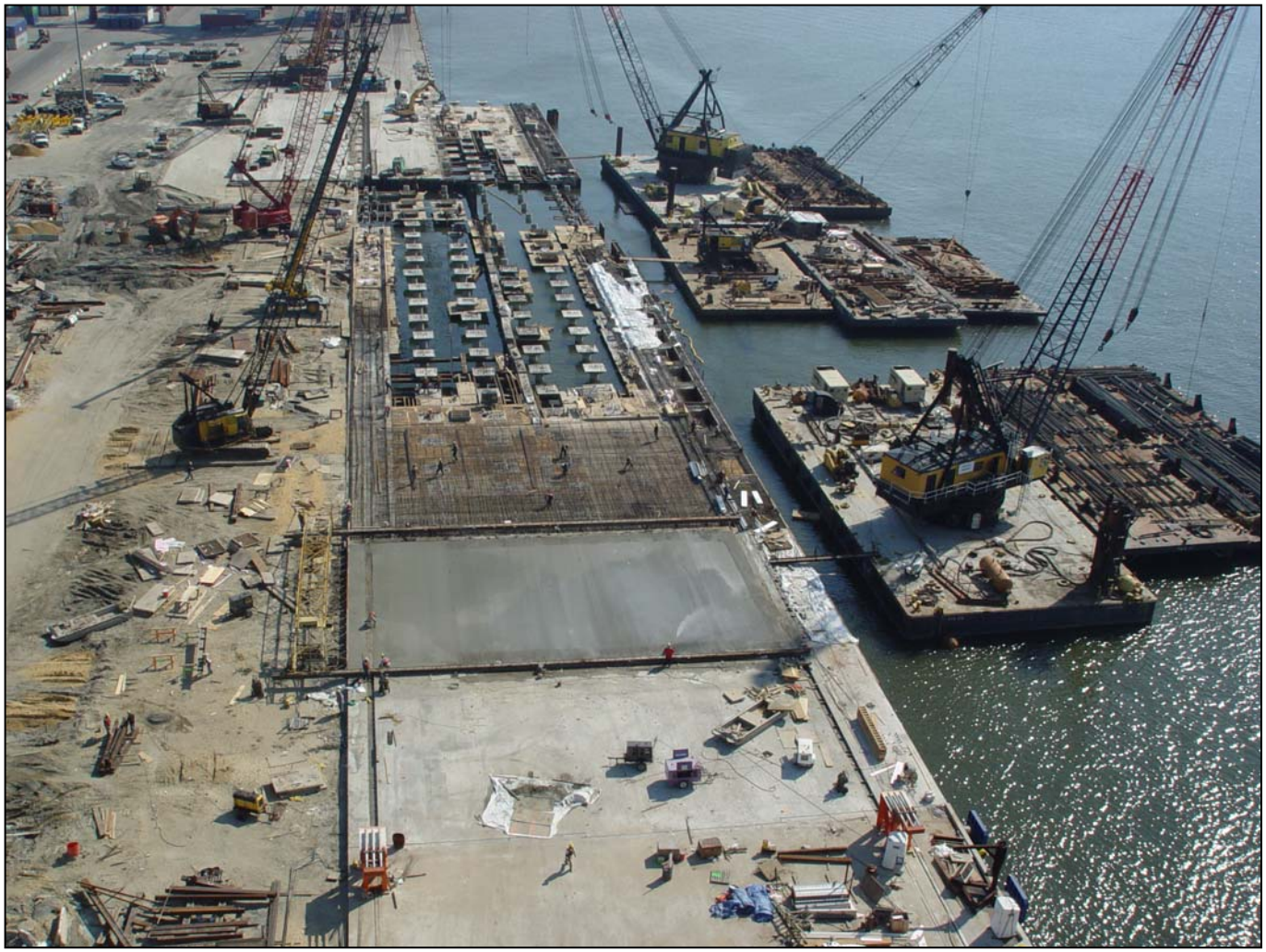
NIT South Wharf
Stage 2 Construction



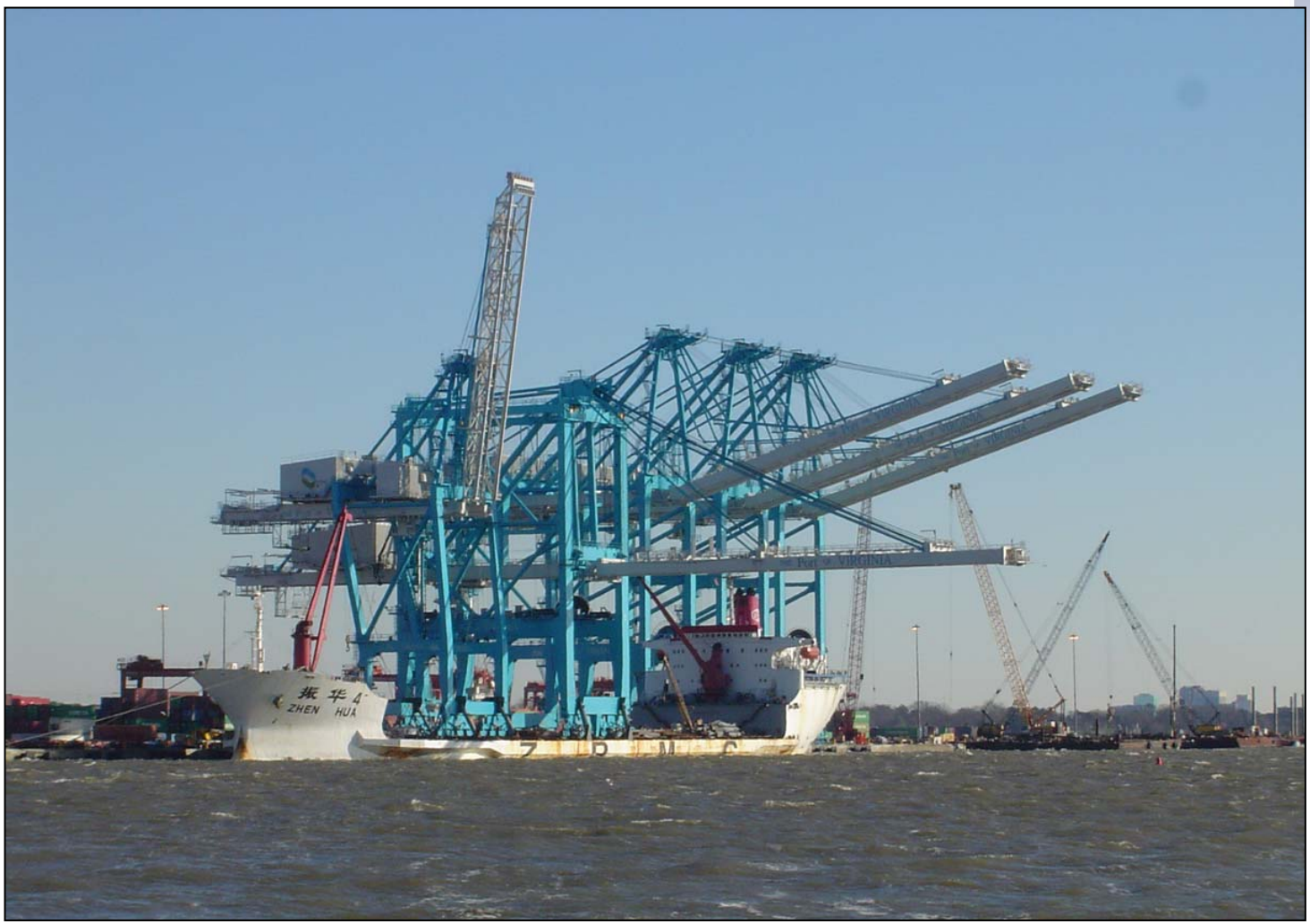
NIT South Wharf
Stage 3 Construction

NIT South Wharf
Second Shipment of Cranes

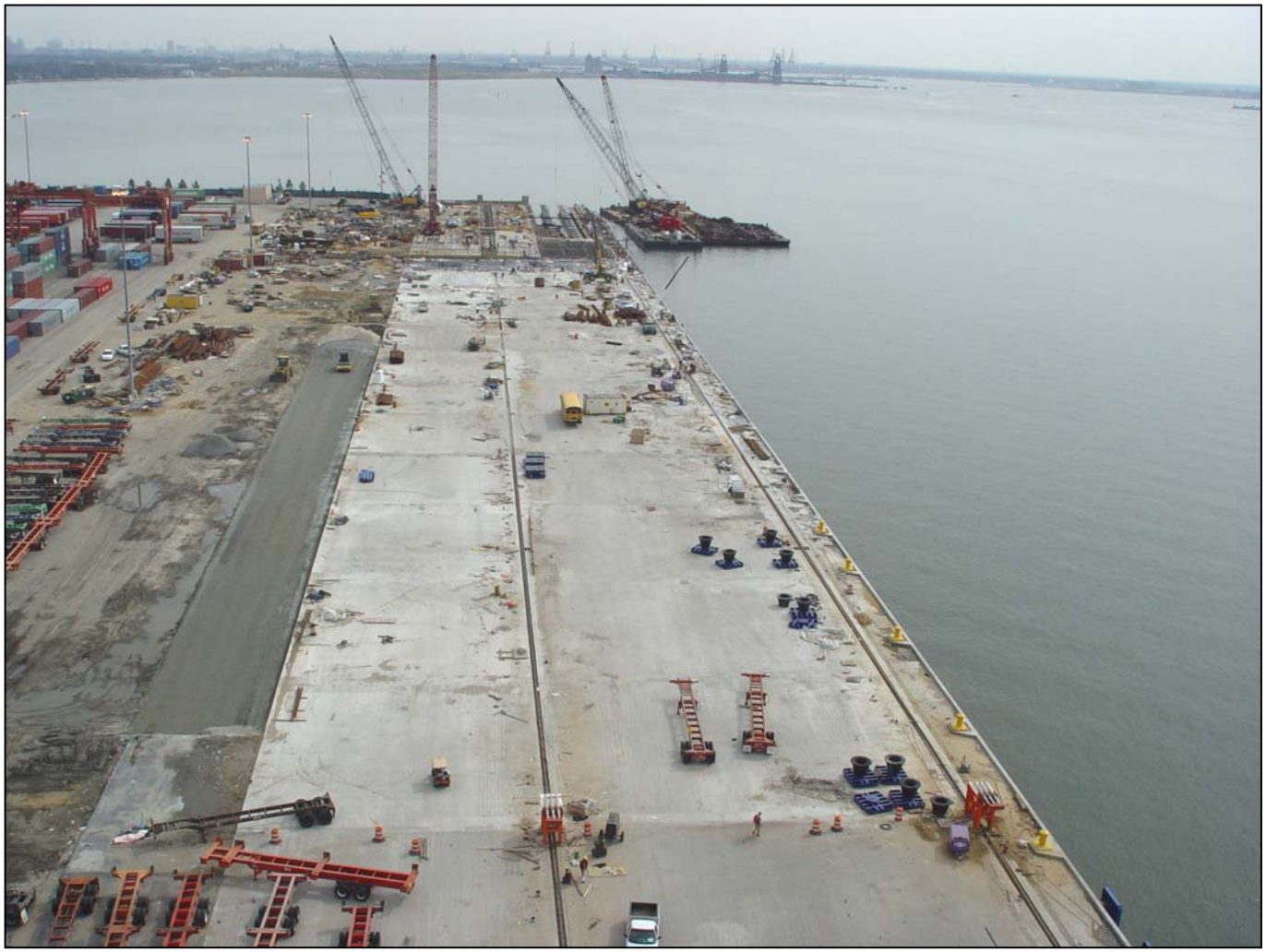
NIT South Wharf
Stage 3 Construction



NIT South Wharf
Arrival of Elevating Girder Crane

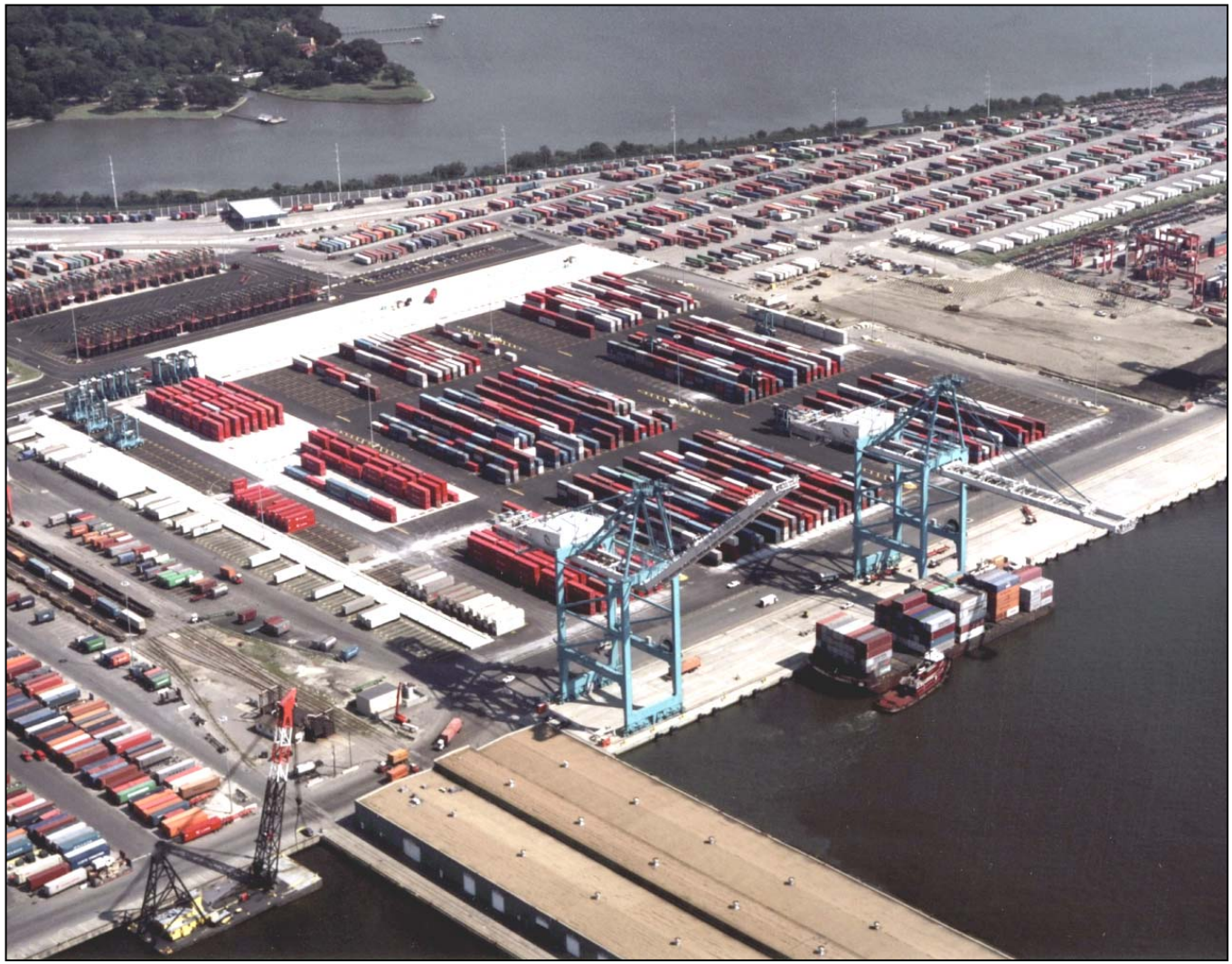


NIT South Wharf
Stage 4 Construction



Completed NIT South Wharf

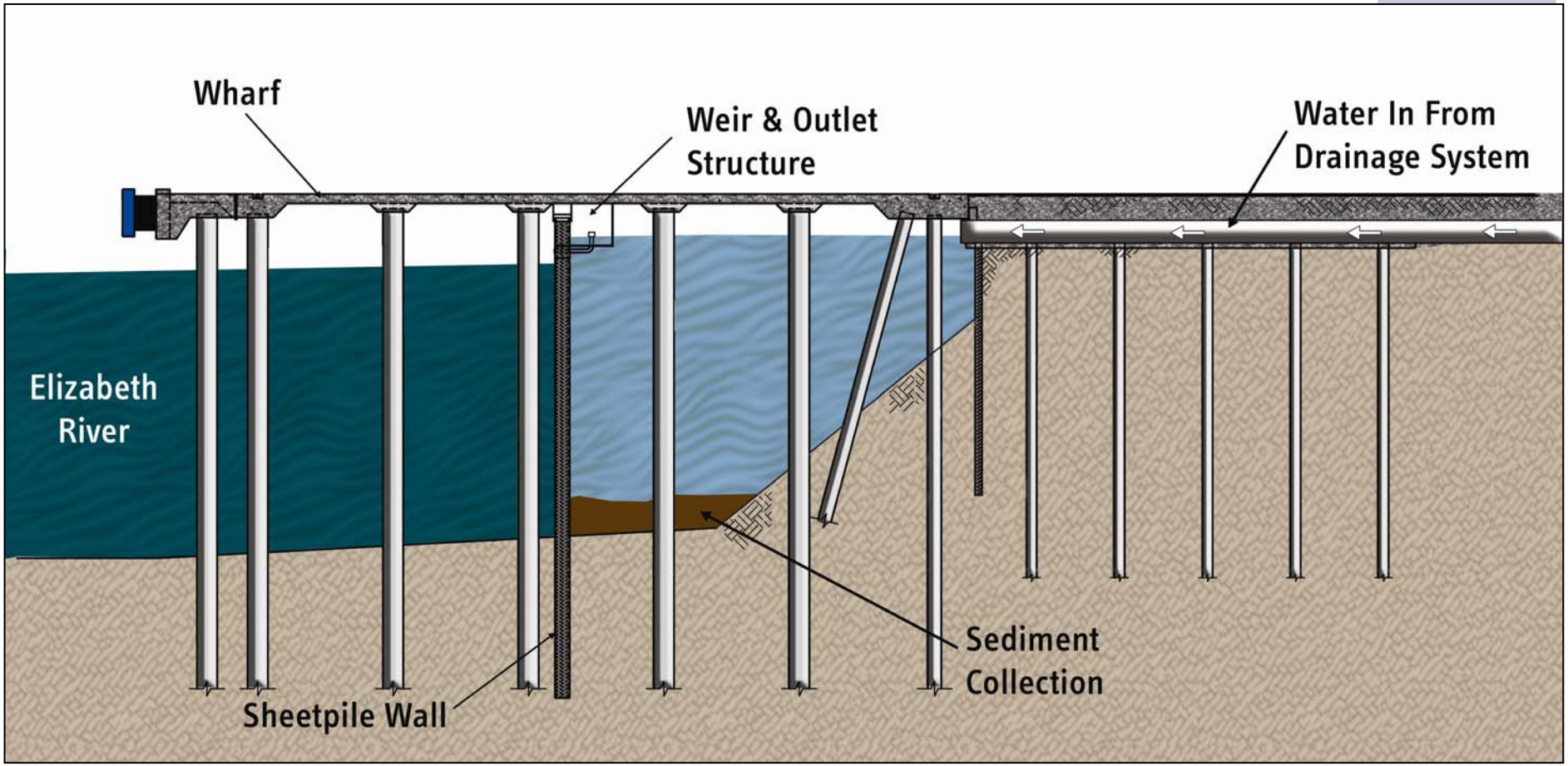
NIT South Backlands
Stage 1 Completed



NIT South Backlands
Completion of Remaining Stages

Under-Wharf Detention Basin

Section View



Under-Wharf Detention Basin

Plan View

Under-Wharf Detention Basin

- **Met Treatment Requirements**
- **Located in Unused, Available Space Under Wharf**
- **Installation Concurrent with Wharf Construction**
- **Can Accommodate Sediment Volumes Anticipated Over the Life of the Structure**
- **Obviated Need for 7-Acre (3-Hectare) Treatment Pond**

Plum Point Park Environmental Restoration

- **VPA Believed NIT Renovation Project Deserved High-Profile Mitigation Project**
- **"Landscape Approach" Convinced Regulatory Agencies of Project Benefits**

Proposed Mitigation Type	Compensatory Mitigation Ratio	Required Mitigation for NIT Renovation Impact	Proposed Plum Point Compensation
Tidal Wetlands	2:1	10 acres	1 acre creation
Submerged Lands	1:1	5 acres	1 acre restored
Open Space Preservation	20:1	100 acres	5 acres preserved and enhanced

Plum Point Park
Environmental Restoration

- **5-Acre Tract of Unused Land Along Norfolk's Urban Waterfront**
- **Eroding Shoreline**
- **Low Valued Vegetation**
- **Adjacent Waterway Littered With Debris**

Plum Point - April 2002

Plum Point Park Environmental Restoration

- **1 Acre of Spartina Grass Wetlands Creation**
- **1 Acre of Submerged Bottom Land Restoration**
- **5 Acres of Open Space Preservation and Enhancement**

Plum Point – November 2005

NIT South Terminal
Prior to Renovation Project

NIT South Terminal
After Renovation Project

The Port of Virginia

400th Anniversary 1607 - 2007