

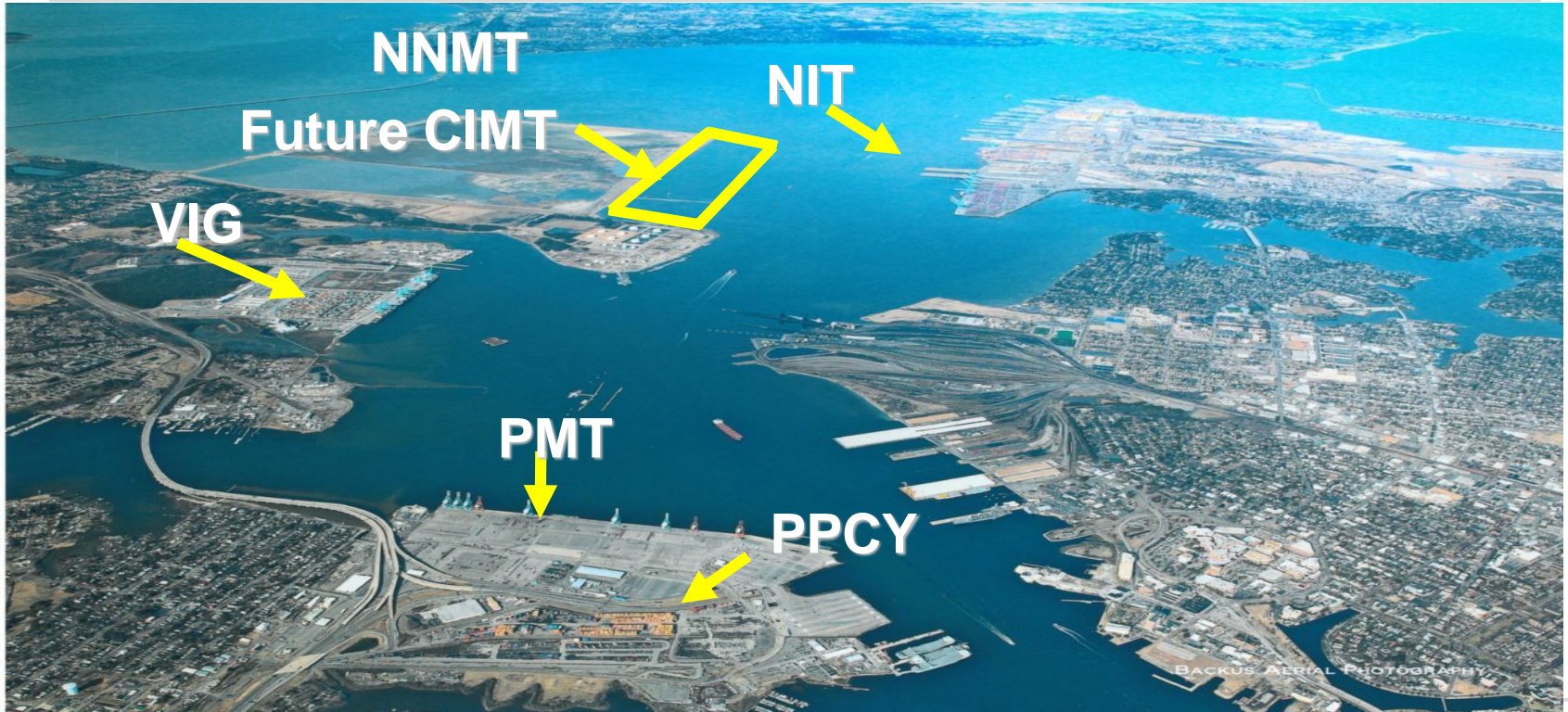
An aerial photograph of a large port terminal. The terminal is filled with numerous blue gantry cranes and a vast area of stacked, multi-colored shipping containers. A large container ship with 'UASC' visible on its side is docked at the pier. The terminal is surrounded by parking lots, roads, and some greenery. In the background, there are industrial structures and a body of water.

Marine Terminal Automation

AAPA Marine Terminal Management Training

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HAMPTON ROADS HARBOR



NIT NORTH GATE EXPANSION

An aerial photograph of the NIT North Gate Expansion project. The image shows a large, newly paved parking lot with 26 new truck gates. The parking lot is situated next to a new I-564 connector. The project is a \$42 million investment and opened in June 2017. The surrounding area includes a large industrial yard with many colorful shipping containers, a road, and some greenery.

26 new truck gates
Ties into new I-564 connector
\$42 million investment
Opened June 2017

Automated Gate Technology



- Automated Truck Identification (RFID)
- Biometric TWIC Security Validation
- Remote Damage Inspection
- Optical Character Recognition
- Fully Automated Outgate Process
- Weight In Motion Scaling – North Gate
- PRO-PASS Truck Reservation System



Semi-Automated Rail Interchange



- Remote Damage Inspection
- Weight-In-Motion Scaling
- Automated UTR Identification
- NIT – 3 OCR Portals (1 x Bi-directional Lane)
- VIG – 4 OCR Portals

Semi-Automated vs Fully Automated

- Fully Automated



- Semi-Automated



Semi-Automated vs Fully Automated

- Fully Automated
 - Automated horizontal transport
 - AGVs, Automated Shuttle Trucks
- Semi-Automated
 - Operator driven transport
 - Shuttle Trucks, UTRs

Semi-Automated vs Fully Automated

PROs

Semi-Automated

- Safer
- Higher Productivity Possible
- Flexibility

Automated

- Safest
- Consistent Productivity

Semi-Automated vs Fully Automated

CONs

Semi-Automated

- Variability
- More to Manage
- Labor Expense

Automated

- Higher Infrastructure Cost/Requirements
- Less Flexibility

VIRGINIA INTERNATIONAL GATEWAY



Phase II Expansion:

Increases capacity to 1.2 million containers

Expanded Rail Operation

Extended Berth

4 new STS Cranes

Q1 2019: All 28 Stacks Complete

\$320 million investment

VIRGINIA INTERNATIONAL GATEWAY



NORFOLK INTERNATIONAL TERMINALS



Increase capacity by 400,000 containers (46%)
2018: first stacks complete
2020: all 30 stacks complete
\$350 million investment

NORFOLK INTERNATIONAL TERMINALS

An aerial photograph of the Norfolk International Terminals, a large port facility. The terminal is situated along a body of water, with several large gantry cranes visible along the waterfront. The facility is filled with numerous stacks of colorful shipping containers, organized in neat rows. A complex network of roads and ramps is visible, leading to various areas of the terminal. The surrounding area includes some greenery and residential buildings in the lower right corner.

Increase capacity by 400,000 containers (46%)
2018: first stacks complete
2020: all 30 stacks complete
\$350 million investment



WE ARE VIRGINIA'S GLOBAL GATEWAY™.



Stewards of Tomorrow

Thank you