Hampton Roads Bridge Tunnel Expansion Project Update to Commonwealth Transportation Board June 19, 2018

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Overview

- **Background on HRBT Expansion**
  - **Tunneling in Hampton Roads**
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- **HRBT Tunnel Construction Considerations**
  - **Immersed Tube Tunnel**
  - **Bored Tunnel**
- **Landside Construction Considerations**
  - **Hampton**
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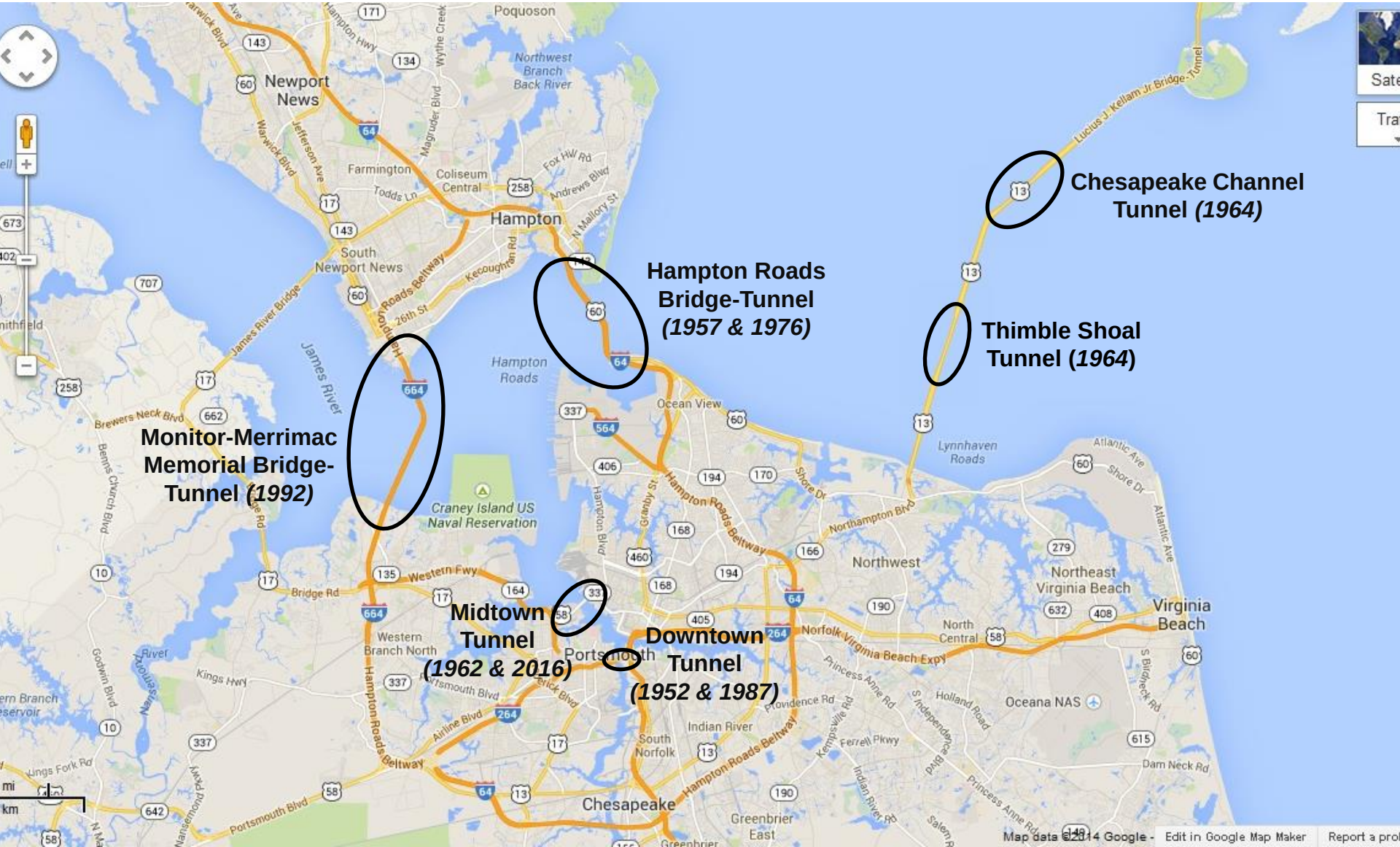
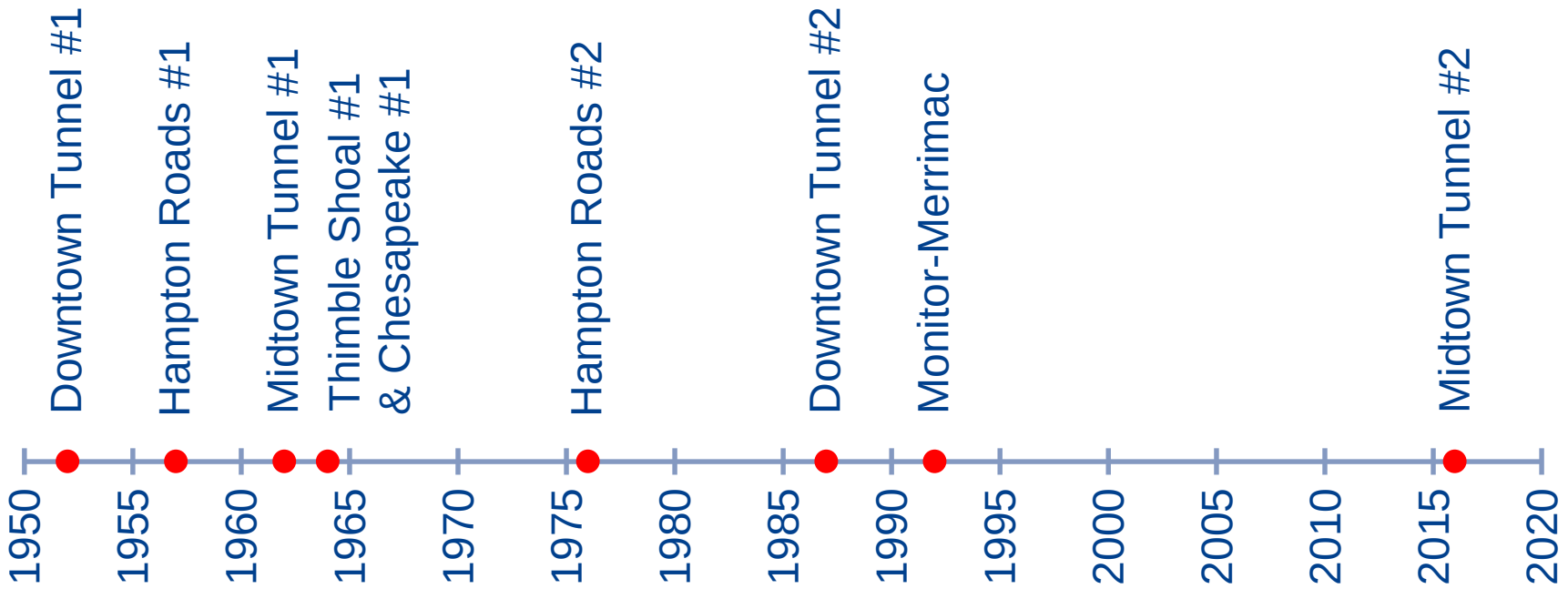
- **Procurement Schedule**

Ten Tunnels of Hampton Roads



65 Years of Tunneling in Hampton Roads



- **9 tunnels are steel-shell immersed tubes**
- **1 tunnel is concrete-box immersed tube**
- **Future tunnel #11 at Thimble Shoal will be bored tunnel**

Overview of HRBT Expansion Project

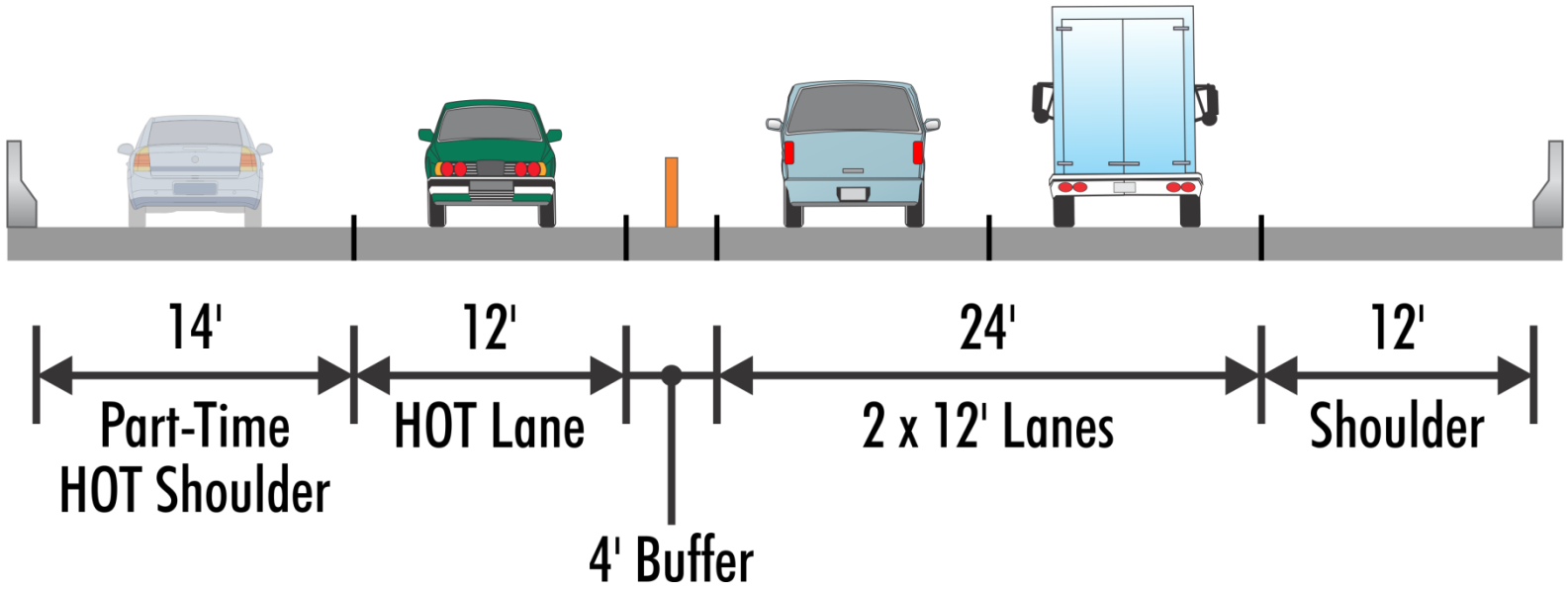
- Settlers Landing in Hampton to I-564 Norfolk (9.5 Miles)
- I-64 improvements include 6 lanes of highway and construction of 4 lane bridge/tunnel
- New 4 lane HRBT tunnel will serve Eastbound traffic
- 2 existing HRBT tunnels will serve Westbound traffic
- Project Estimate: $3.66B

Scope Options Included:

- **Three scope options included in Draft RFP:**
  - **Direct connect ramps from I-64 HOT to I-564**
  - **Increase height clearance at the existing WB Tunnel**
  - **Replace existing marine approach bridges**

Proposed Lane Configuration for Tunnel and Approach Bridges

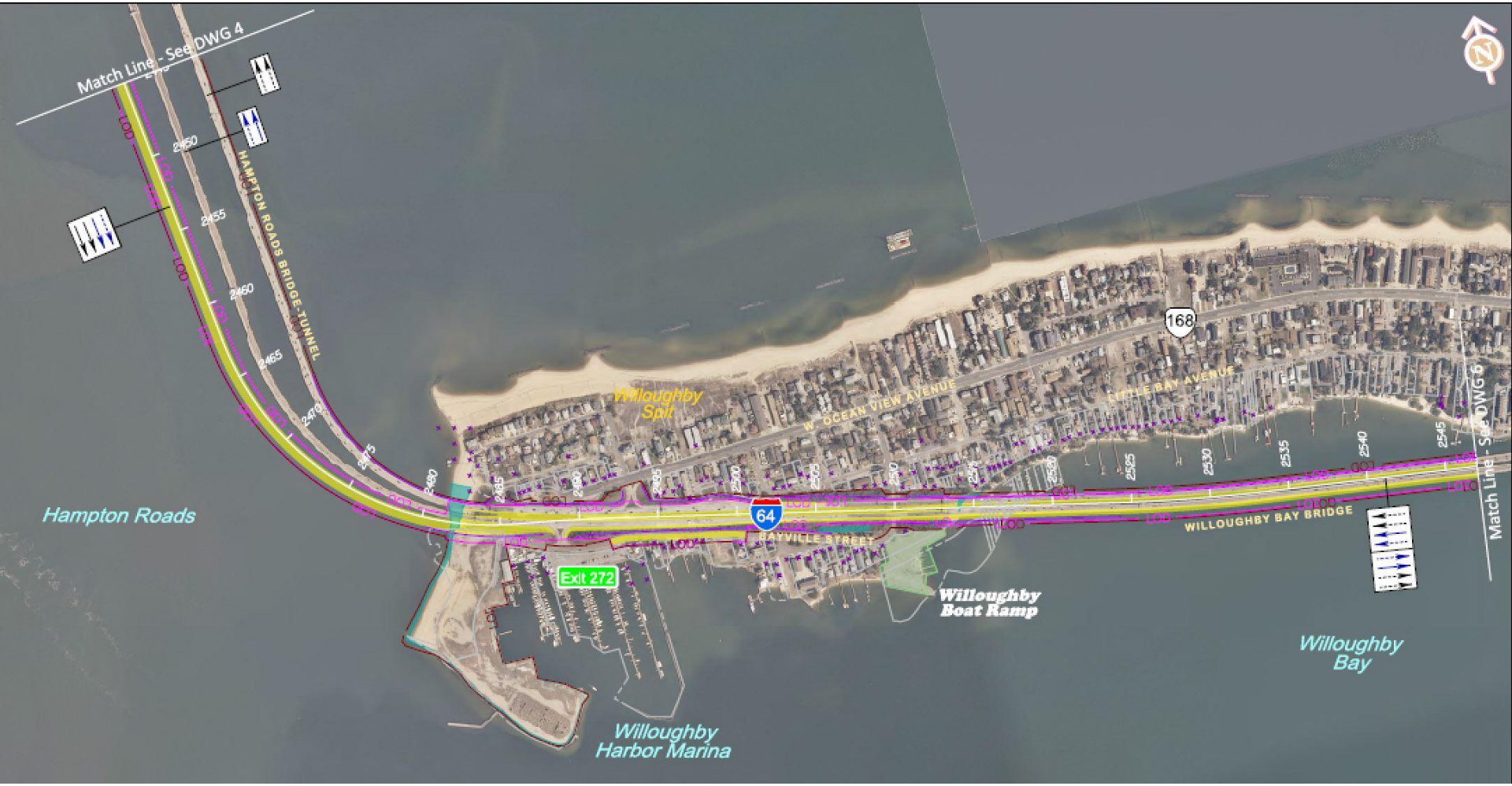
- **2+1+1 concept in each direction:**
  - **2 free General Purpose lanes**
  - **1 full-time HOT lane**
  - **1 peak-hour HOT lane on left shoulder**



Proposed Bridge and Tunnel Alignment (Hampton Side)

Proposed Bridge and Tunnel Alignment (Federal Channel)

Proposed Bridge and Tunnel Alignment (Norfolk Side)



Landside Construction Considerations

- Landside work is broken into two parts - Hampton and Norfolk
- Environmental, Right of Way and Maintenance of Traffic provide biggest challenges for construction in both Cites
- Hampton
  - I-64 Interchange at Mallory Street to be reconstructed
  - Construction of roadway to approach bridges will require phasing
  - Cultural Resources include Federal Cemetery, Hampton University and Phoebus
- Norfolk
  - Constraints at Bayville Interchange and Willoughby Bay Bridges
  - Four interchanges impacted (Bayville, 4th View, Bay Ave, New Gate)
  - Naval Air Station borders western side I-64 (vertical & horizontal)

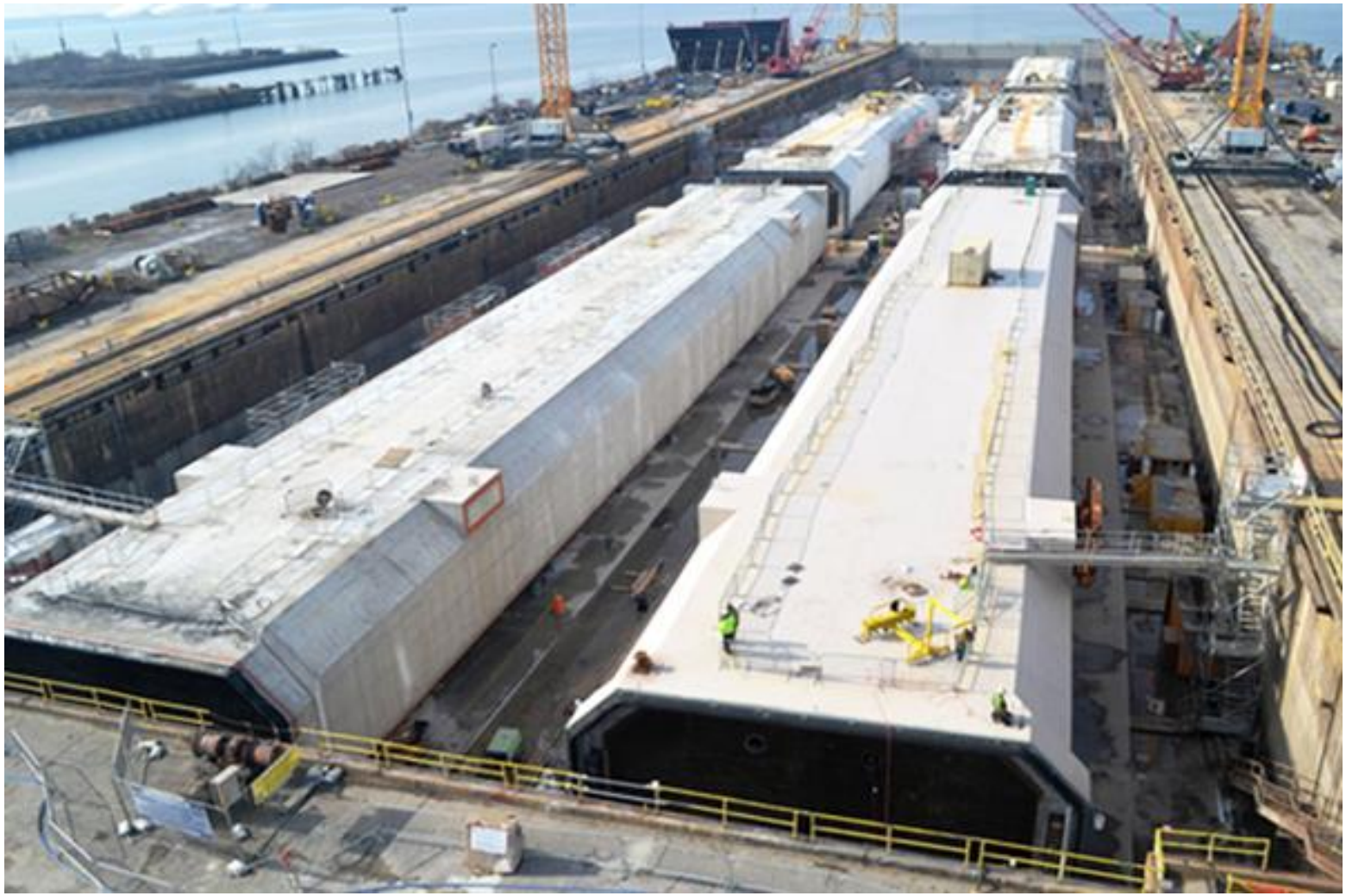
Marine Construction Considerations

- Marine bridges have risks but are largely conventional
- Tunnel work is less conventional and will generate greatest risks from cost and schedule standpoint
- This is a rare location where both immersed-tube and bored-tunnel construction methods are feasible
  - All ten Hampton Roads tunnels to date have been immersed tubes
  - Until recently, bored tunnels were not feasible in soft soils
  - But recent advances in technology now make bored tunnels possible in soft soils
- Both tunnel methods were directly compared in the nearby CBBT - Thimble Shoal Tunnel procurement in 2015
  - Received Bored Tunnel proposals only

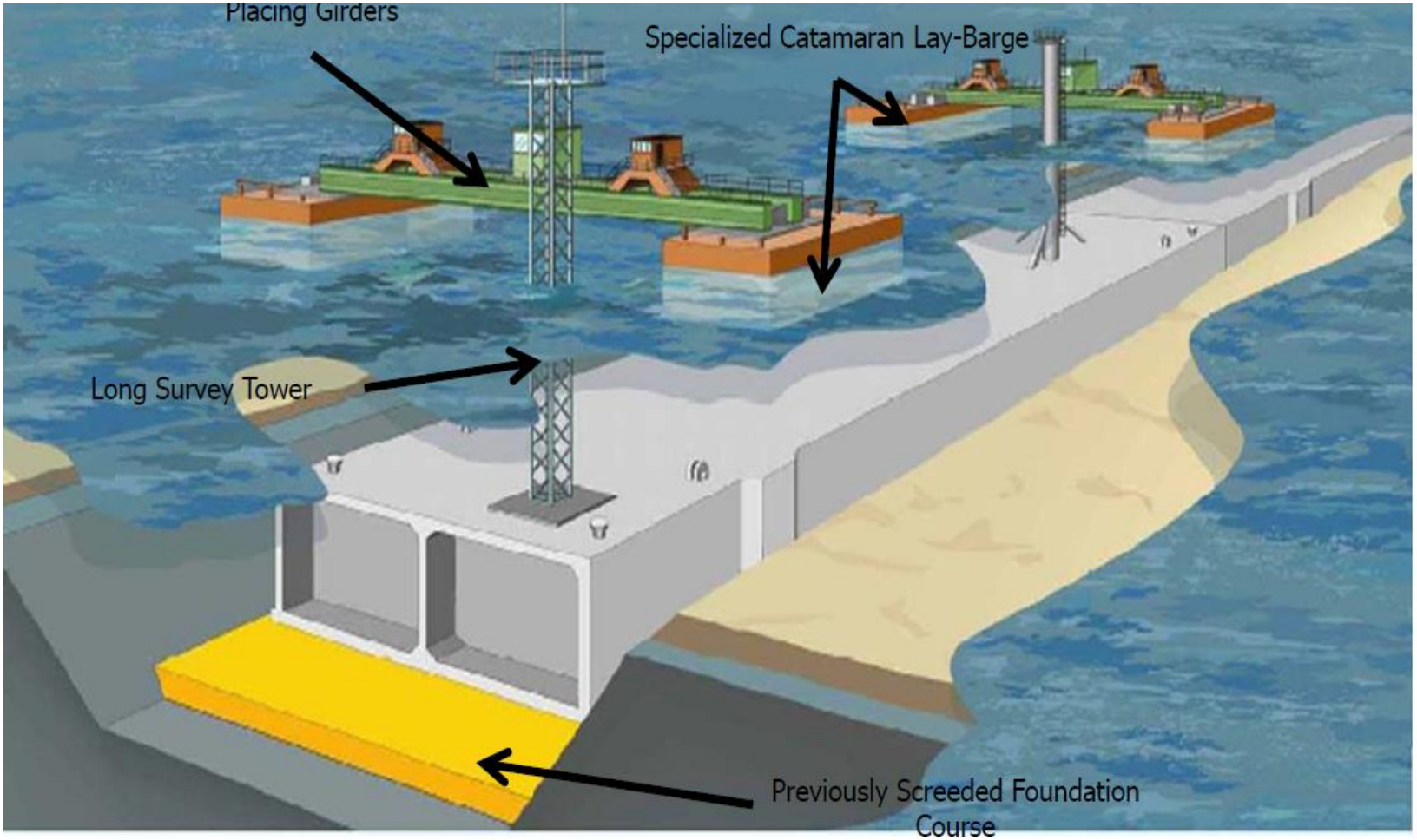
Immersed-Tube Tunnel Considerations

- **Concept design:**
  - Approx. 7,500 ft. long
  - Approx. 3.5 million cubic yards dredged material
  - Dredged trench approx. 90 ft. wide with 3:1 side slopes
- **Navigational considerations at channel:**
  - Trench dredging
  - Placement & screeding of gravel bedding
  - Immersion of tunnel elements
  - Placement of cover fill
- **Other navigational considerations:**
  - Barge transport of dredged material for ocean disposal
  - Island expansion (fill & armor stone)
  - Limited additional geotechnical investigation is anticipated

Immersed-Tube Elements



Immersed-Tube Tunneling (ITT)

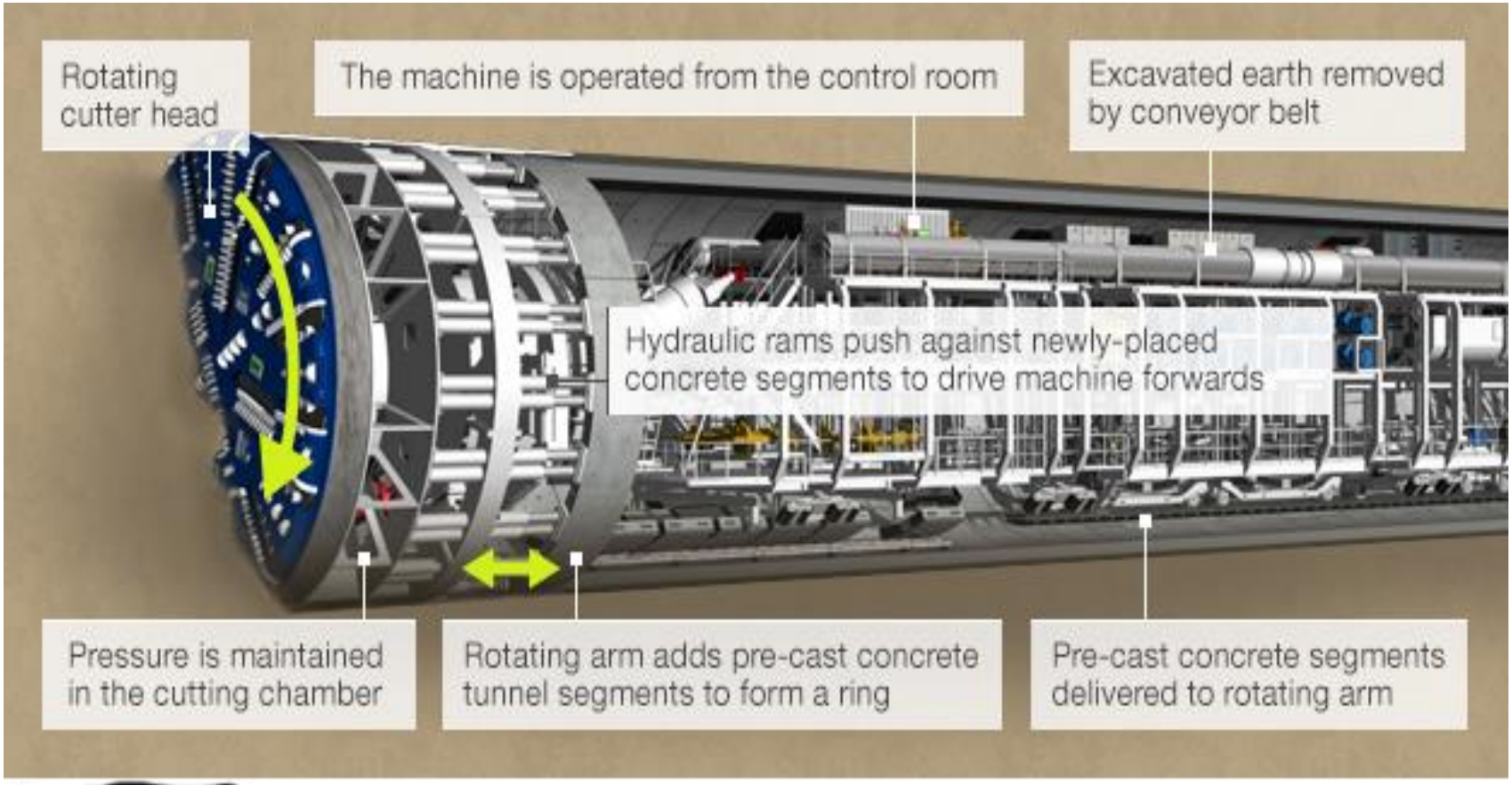


Conceptual Tunnel Section (Immersed)

Bored Tunnel Considerations

- **Concept design:**
  - Approx. 7,800-8,300 ft. long
  - Deeper than immersed tube tunnel because more cover is needed for buoyancy control – therefore tunnel is longer
  - 4-5% roadway grades will require island expansion lengthwise
  - Approx. 1 million cubic yards excavated tunnel material
  - Ground improvement at islands to support weight of tunnel boring machine
- **Navigational considerations:**
  - Additional geotechnical investigations
  - Island expansion (fill & armor stone)

Tunnel Boring Machine (TBM)



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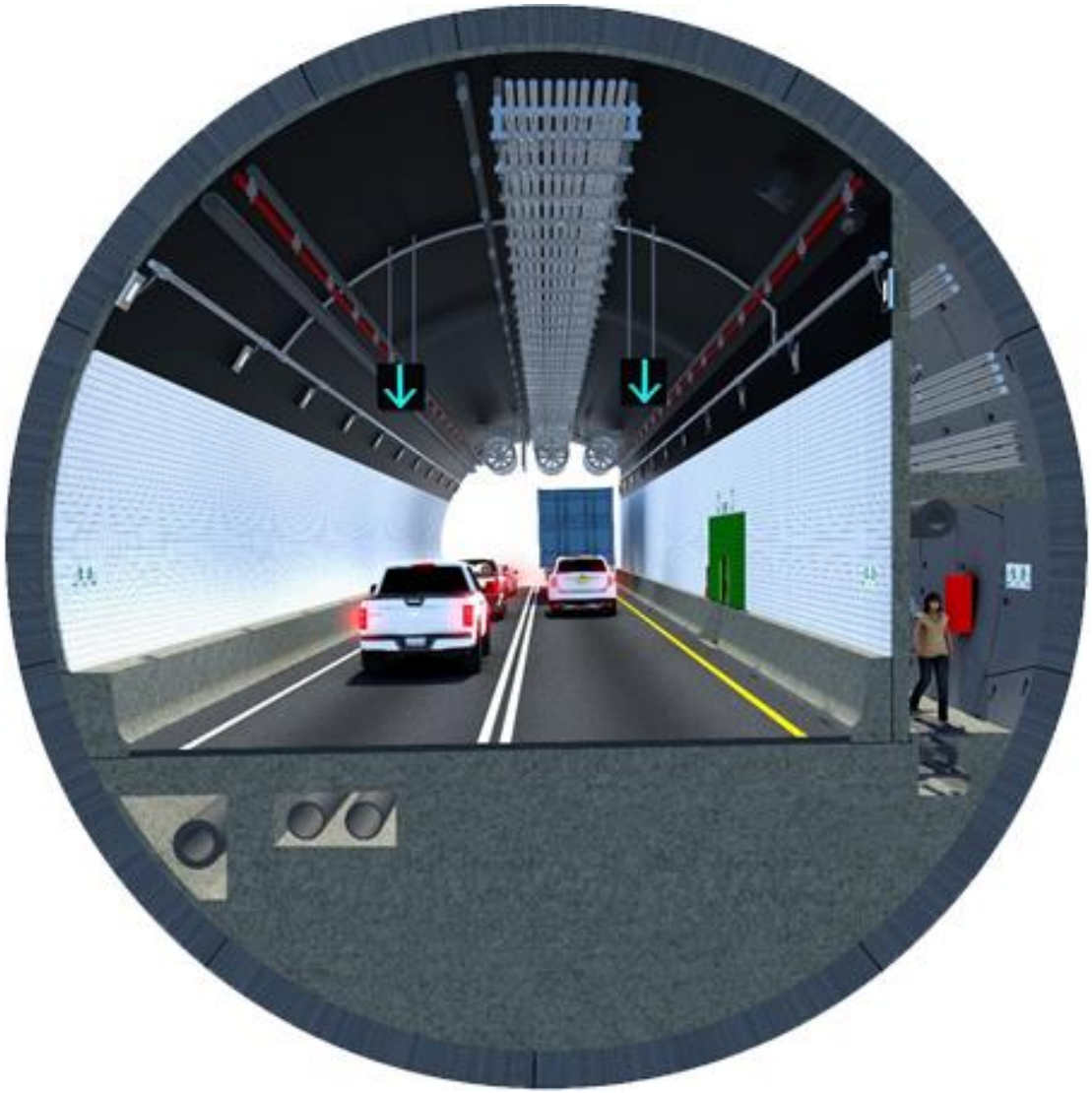
Person to scale

150m

Twin Bore with TBM

Conceptual Tunnel Section (Bored)



Key Differences between Bored and Immersed-Tube Tunneling

- **Alignment**
  - ITT alignment must be further away from existing tunnel (Hampton Roads rule of thumb → about 200 feet)
  - Bored tunnel can be much closer to existing facilities (general rule of thumb → about one diameter ≈ 50 feet)
- **Geotechnical**
  - ITT method has limited concern for soil properties, since soil along tunnel path is dredged out and removed
  - Bored method is specifically tailored to local soil properties
- **Environmental and Permitting**
  - Section 408 coordination with marine stakeholders / federal channel
  - Section 103 concurrence for offshore disposal of ITT spoils
  - JPA permit for disposal of bored-tunnel spoils

Marine Stakeholder Involvement

- Initial discussions held with a number of Stakeholders:
  - Maritime Security Council
  - Harbor Safety Committee
  - US Navy Staff Level
  - Virginia Maritime Association (including VPA)
  - USACE Section 408
  - USCG
  - US Navy Senior Level
- Concerns over Construction Impacts to Federal Channel
  - Commercial Vessels (size and number)
  - Coordination with Channel Widening
  - Naval Vessels (impeding transit could impact National Security)
- Contractor ability to access/work in Federal Channel
  - Project Cost/Schedule Risk

Procurement Milestones

ACTIVITY	DATE
PPTA Steering Committee	Dec 12, 2017
RFQ Issued	Dec 15, 2017
Shortlist Announced	Apr 26, 2018
PPTA Steering Committee	May 9, 2018
Draft RFP Release	May 22, 2018
Proprietary/ATC Meetings #1	Jun 11-12, 2018
Proprietary/ATC Meetings #2	Jul 17-18, 2018
Proprietary/ATC Meetings #3	Aug 7-8, 2018
Proprietary/ATC Meetings #4	Sept 5-6, 2018
Final RFP Release	Sept 10, 2018
Proprietary/ATC Meetings #5 (if needed)	Sept 26-27, 2018

Procurement Milestones

ACTIVITY	DATE
Addenda to Final RFP	Oct 26, 2018
Technical Proposal Submission	Nov 30, 2018 at 5:00 PM
Price Proposal Submission	Jan 10, 2019 at 5:00 PM
Selection of Best Value Proposal	Jan 18, 2019
CTB Briefing	Feb 2019
PPTA Statutory Audit	Feb 2019
Execute Comprehensive Agreement	Mar 2019
PPTA Steering Committee	NLT 60 days from execution of CA
Contractor NTP	Mar 2019
Construction Complete	Dec 2024


THE
END