On June 7, 2018, FHWA approved the Environmental Assessment (EA) re-evaluation.

- Designation of High Occupancy Toll (HOT) lanes.
- Limit of Disturbance (LOD) was widened.

On October 28, 2018, FHWA issued a Finding of No Significant Impact (FONSI) for the Hampton Roads Crossing Study EA re-evaluation.

- Increase in floodplain acreage associated with the Refined Selected Action is not considered significant.
- Increase in wetland impacts have been considered in light of Executive Order 11990. No practicable alternative.

The HRBT Expansion project includes the following elements:

- Roadway Elements
  - Roadway signing, both ground-mounted and overhead.
  - Pavement marking, pavement markers, and delineators.
  - Roadway lighting.
  - Relocation of existing and installation of new intelligent transportation system (ITS) infrastructure and equipment.
  - Traffic signals.
  - Pavement widening to accommodate new lane configurations.
  - Drivable shoulders (inside) for part-time use.
  - Outside shoulders.
  - Retaining walls.
  - Sound barrier walls.
  - Full-depth construction on mainline roadway pavement.
  - Milling and asphalt overlay.
  - Removal and replacement of the overpass bridge at South Mallory Street, including any necessary improvements or realignment of Mallory Street.
  - Bridge widening, repair, and replacement.
  - Entrance/exit ramp modifications.
The HRBT Expansion project includes the following elements:

- Marine Elements
  - Two new two-lane HRBT tunnels, including new tunnel systems and associated facilities.
  - New four-lane trestle-bridges(s).
  - Removal and replacement of all existing tunnel approach trestle-bridges.
  - Expansion of the existing North and South Islands of the HRBT.
  - Installation of storm drain outfall pipes and stormwater management facilities.
  - Temporary features including VPDES outfall pipes, temporary trestles, dock, small vessel access at Willoughby Spit
  - Artificial reef.

- Nine Design Sub-segments. Five are predominantly in the marine environment.
  - Segment 1b North Trestle-bridge
  - Segment 2a – tunnel
  - Segment 3a – South Trestle-bridge
  - Segment 3b – Willoughby Spit
  - Segment 3c – Willoughby Bay Trestle-bridge
Willoughby Spit marine structures

- New Floating Dock on Spud Piles
- New Fixed Pier on Pipe Piles
- New Steel Sheetpile Bulkhead; backfill behind to EL. 7
- 3 New Timber Piers

Willoughby Spit marine structures – Typical Section through new Bulkhead

- New Timber Finger Pier on Timber Piles
- Backfill to EL. 7
- New Steel Sheetpile Bulkhead
- Tie-rod and Deadman
North Trestle
- Spud barges used in areas with more than 4.5 ft of water (at MLW)
- 15 +/- working barges
- First activity after receipt of the JPA
- Last activity in September 2024 + 6 months to remove structures

North & South Islands
- Mooring area to be created near North and South Island Expansions
- 1 mooring pile (42” pipe pile) every 40FT around the footprint of the islands
- Spud barges used in areas with more than 4.5 ft of water (at MLW)
- 1000 ft from expansion boundary for barge anchoring
- 500 ft from expansion boundary for barge operation
- At peak, ~15 working barges
- First activity after receipt of the JPA
- Last activity in September 2024 + 6 months to remove structures
- South Trestle
  - Spud barges used in areas with more than 4.5 ft of water (at MLW)
  - At peak, ~25 working barges
  - First activity after receipt of the JPA
  - Last activity in September 2024 + 6 months to remove structures

- Willoughby Bay
  - Mooring area to be created in Willoughby Bay with mooring piles (42" pipe piles)
  - Spud barges used in areas with more than 4.5 ft of water (at MLW)
  - At peak, ~15 working barges
  - First activity after receipt of the JPA
  - Last activity in December 2024 + 3 months to remove structures
JPA Section 3

- Mooring and anchorage areas

JPA Section 3

- Anchorage area west of Craney Island Disposal Area
JPA Section 3

Anchorage area - Hampton Flats

JPA Section 3 - Willoughby Bay Anchorage Area
JPA Section 5

- Public Notification – HRCP will provide addressed labels
  - USACE: Adjacent to the project site
  - VADEQ: ¼ mile up/down Stream

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December 19, 2019
JPA Section 6

- Threatened and Endangered Species Information
- Appendix I: Federal Species
- NMFS Jurisdictional Species Determination
- Species with “No Effect” Determination
  - Hawksbill Sea Turtle
  - Shortnose Sturgeon
  - North Atlantic Right Whale
- Species with “May Affect, but Not Likely to Adversely Affect” Determination
  - Sea Turtles (Loggerhead, Kemp’s Ridley, Green, and Leatherback)
  - Atlantic Sturgeon
  - Fin Whale
- USFWS Jurisdictional Species
  - Piping Plover
  - Bald Eagle
  - Golden Eagle
- No TOYR

JPA Section 6

- Appendix J: State Species
- No Adverse Effects
- VAFWIS Search Report and VDCR Natural Heritage Report
  - Northern long-eared bat (Myotis septentrionalis) (State Threatened)
  - Tricolored bat (Perimyotis subflavus) (State Endangered)
  - Northeastern beach tiger beetle (Cicindela dorsalis) (State threatened)
  - Gull billed tern (Sterna nilotica) (State Threatened)
  - Piping plover (Charadrius melodus) (no critical habitat at HRBT, State threatened)
  - Red knot (Calidris canutus rufa) (State threatened)
  - Peregrine Falcon (Falco peregrinus) (state threatened)
  - Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus) (endangered)
  - Shortnose sturgeon (Acipenser brevirostrum) (endangered)
  - Green sea turtle (Chelonia mydas) (State threatened)
  - Loggerhead sea turtle (Caretta caretta) (State threatened)
  - Kemp’s ridley sea turtle (Lepidochelys kempii) (State endangered)
  - Hawksbill sea turtle (Eretmochelys imbricata) (State endangered)
  - Leatherback sea turtle (Dermochelys coriacea) (State endangered)
  - Canebrake rattlesnake (Crotalus horridus) (State Endangered)
  - Mabee’s salamander (Ambystoma mabeei) (State Threatened)
JPA Section 6

- **Appendix M: Essential Fish Habitat (EFH) Assessment**
  - Atlantic Herring
  - Atlantic Butterfish
  - Black Sea Bass
  - Bluefish
  - Cobia
  - Summer Flounder and Windowpane Flounder
  - King Mackerel and Spanish Mackerel
  - Red Drum
  - Red Hake
  - Scup
  - Atlantic Sharpnose, Sandbar, Dusky, and Sand Tiger Shark
  - Winter, Little, and Clearnose Skate

- **Anadromous Fish**
  - River Herring (Alewife, blueback)
  - Shad (American shad, hickory)
  - Striped Bass
  - White Perch

- **No TOYR**

- **Habitat Condition Assessment and Mitigation**

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JPA Section 6

- **Appendix R: Marine Mammals**
  - Fin Whale (rare)
  - Common Minke Whale (rare)
  - Humpback Whale (regular)
  - North Atlantic Right Whale (rare)
  - Common Bottlenose Dolphin (regular)
  - Harbor Porpoise (regular)
  - Harbor Seal (regular)
  - Grey Seal (regular)

- **Potential Effects on Marine Mammals**
  - Noise (In-Air and Underwater)
  - Habitat Loss and Alteration
  - Prey Availability and Habitat
  - Sedimentation

- **Incidental Harassment Authorization (IHA)**
  - Level B
  - Level A

- **Letters of Authorization (LOA)**
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JPA Section 7

- **Appendix K: Cultural and Historic Resources Information**
  - FHWA and VDOT have complied with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulations at 36 CFR Part 800
  - Programmatic Agreement (PA) requires VDOT to meet specific design commitments for avoidance of adverse effects within the Area of Potential Effect (APE)

- **Commitments in the Programmatic Agreement**
  - No permanent acquisition of property from Hampton University
  - Memorandum of agreement outlining terms for temporary Hampton University property
  - Emancipation Oak: No encroachment into the Tree Limit of Disturbance
    - Baseline Assessment & Monitoring Plan
  - **Noise Barriers**
    - Hampton Institute Historic District & Hampton Institute National Historic Landmark
    - Pasture Point Historic District
    - Hampton National Cemetery
    - Phoebus–Mill Creek Terrace Neighborhood Historic District
    - Norfolk Naval Base Historic District
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JPA Section 8

- Appendix G: Impacts
  - WOUS Impact Tables
    - Summary of Impacts by Segment and Type
    - Fill Impacts
    - Shading Impacts
    - Pile Impacts
    - Dredging Impacts
    - Extended Temporary (>6 mo) Trestles
    - Temporary (<6mo) Impacts
  - Impact Drawings
    - Location and footprint of each numbered site
  - Design Plans
Appendix P: Avoidance Minimization and Mitigation Plan
- Immersed Tube Tunnel vs. Bored Tunnel
  - Avoid substantial in-water impacts, and avoid direct navigation impacts to the federal channel.
- Temporary Construction Trestles
- Minimization by Impact Area
- Supporting Documents
  - HCA
  - 2018 Benthic Survey
  - Mitigation Plan

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JPA Section 13

- Section 13: Free Standing Mooring Piles, Osprey Nesting Poles, Mooring Buoys, and Dolphins main points

- Appendix E: Project Description, Section 2 Marine Operations
  - 42" Mooring Piles
  - Mooring Dolphins – Three 24" Piles
  - Vessels:
    - Tug Boats
    - Barge/Transport Vessels
    - Workboats

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JPA Section 15

- Shoreline stabilization structures
- Replacement bulkheads at the Willoughby Spit Property
- Rock perimeter protection around the North and South Islands

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JPA Section 16

- Beach nourishment

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December 19, 2019
### JPA Section 17 - Dredging

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<th>Location</th>
<th>Cubic Yards</th>
<th>Square Feet</th>
<th>Acres</th>
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<td>North Island</td>
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<td>Dredge Area #4</td>
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<td>Shipwreck Debris removal</td>
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**Diagram:**

- **Dredge Area #1:** 4.75 acres
- **Dredge Area #2:** 0.84 acres
- **Dredge Area #3:** 1.14 acres
- **Dredge Area #4:** 0.27 acres
- **Shipwreck Debris Removal:** 0.08 acres

---

**JPA Section 17 - Dredging**

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**December 19, 2019**
Table 1: Source and Volume of Material to be Removed and Managed

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<tr>
<th>Source Material</th>
<th>Construction Activity</th>
<th>Geotechnical Material (Btu/hr)**</th>
<th>Aerial Material (Btu/hr)**</th>
<th>Drilled Material (Btu/hr)**</th>
<th>Material and Grout (Btu/hr)**</th>
<th>Total Material (Btu/hr)**</th>
<th>Total Volume (cu ft)</th>
<th>Resealable Volume (cu ft)</th>
<th>Non-sealable Volume (cu ft)</th>
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<td>Deck Island</td>
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Notes:
1. Bulk size factor = 1.2
2. Bulk size factor = 1.0
3. No bulk size factor

JPA Section 17 – Barge Routes
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December 19, 2019
Fill – North Island Example – Cross Section B-B
Table 1

<table>
<thead>
<tr>
<th>Source Material</th>
<th>Construction Activity</th>
<th>Excavated Material by (Blended)</th>
<th>Artificial Material by (Blended)</th>
<th>Sediment Material by (Blended)</th>
<th>Artif and Gravim. Unit by (Blended)</th>
<th>Artif and Gravim. Unit by Blended</th>
<th>Total Volume (Bbl)</th>
<th>Residual Volume by Source Material (Bbl)</th>
<th>Proposed Volume by Source Material (Bbl)</th>
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<tr>
<td>On Island</td>
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<td>In Water</td>
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Notation:
1. Blending Factor = 1.5
2. Blending Factor = 1.0
3. Blending Factor = 0.9

Agenda

1. Introduction
2. Joint Permit Application
   1. Section 3 – Description of Project, Purposes, Need, Use(s), and Alternatives
      1. Appendix E: Project Description
      2. Appendix F: Alternatives Analysis
   2. Section 5 – Public Notification
   3. Section 6 – Threatened and Endangered Species Information
      1. Appendix I: Federal Species
      2. Appendix J: State Species
      3. Appendix M: EFH
      4. Appendix R: Marine Mammals
   4. Section 7 – Historic Resources Information
      1. Appendix K: Cultural and Historic Resources
   5. Section 8 – Wetlands, Waters, and Dunes/Beaches Impact Information
      1. Appendix P: Avoidance Minimization and Mitigation Plan
   6. Section 13 – Free Standing Mooring Piles, Osprey Nesting Poles, Mooring Buoys, and Dolphins
   7. Section 15 – Tidal/Nontidal Shoreline Stabilization Structures
   8. Section 16 – Beach Nourishment
   9. Section 17 – Dredging, Mining, and Excavating
      1. Appendix L: Materials Management Plan
   10. Section 18 – Fill and Other Structures in Wetlands or Waters, or on Dunes/Beaches
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   11. Section 21 – Road Crossings
   12. Section 22 – Impoundments, Dams, and Stormwater Management Facilities
      1. Appendix T: Stormwater Facilities
   13. Section 23 – Outfalls Not Associated with Proposed Water Withdrawal Activities
3. Permitting and Construction Schedule
   1. Appendix N: Project Schedule

December 19, 2019
Road Crossings

- Culvert Extension at Bay Ave

Appendix G, JPA Plan Set

- Includes elevations showing the project bridges and clearances
  - North Trestle
  - South Trestle
  - Willoughby Bay
  - Bay Ave
  - Oastes Creek

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Upland Stormwater Management (SWM)

For quantity control, three SWM Best Management Practices (BMPs) will be constructed throughout the project corridor.

- BMP-1 is located at the Mallory Street Interchange in Hampton
- BMP-2 and BMP-4B are located at the 4th View Interchange in Norfolk

All SWM facilities for this project will discharge to existing outfall locations throughout the corridor and no new outfalls are proposed for upland SWM.

---

Island SWM

- Stormwater runoff from North Island, South Island and the connecting tunnels, are captured and discharged at five (5) outfalls

<table>
<thead>
<tr>
<th>Island Outfall</th>
<th>Approximate Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Island (south side) existing outfall</td>
<td>36°59'56.00&quot;N, 76°19'1.00&quot;W</td>
</tr>
<tr>
<td>South Island (north side) existing outfall</td>
<td>36°59'8.00&quot;N, 76°18'16.00&quot;W</td>
</tr>
<tr>
<td>North Island (north side) new outfall</td>
<td>37° 0'11.30&quot;N, 76°19'10.45&quot;W</td>
</tr>
<tr>
<td>North Island TAS outfall</td>
<td>37° 0'5.11&quot;N, 76°19'11.37&quot;W</td>
</tr>
<tr>
<td>South Island TAS outfall</td>
<td>36°58'59.02&quot;N, 76°18'16.47&quot;W</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Island Outfall</th>
<th>Required Design Discharge Rates</th>
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<tbody>
<tr>
<td>North Island (south side) existing outfall</td>
<td>25 CFS</td>
</tr>
<tr>
<td>South Island (north side) existing outfall</td>
<td>60 CFS</td>
</tr>
<tr>
<td>North Island (north side) new outfall</td>
<td>35 CFS</td>
</tr>
<tr>
<td>North Island TAS outfall*</td>
<td>7.9 MGD</td>
</tr>
<tr>
<td>South Island TAS outfall*</td>
<td>7.9 MGD</td>
</tr>
</tbody>
</table>

*This discharge rate for each outfall considers 1 pump running at full capacity for design storm (100-yr) and assuming fire suppression is in operation concurrently.
JPA Section 23

- Point source discharge of construction process water
- Characterized as Industrial Minor
- Flow rate <0.5 MDG
- Two planned outfalls 001 and 002
  - 001 South Island
    - Water treatment from
      - Jet Grouting – construction
      - Slurry Wall - construction
      - Excavation water of tri-cell (Pit for TBM entry) north bore
      - TBM boring of tunnels
  - 002 North Island
    - Water treatment from
      - Jet Grouting – construction
      - Slurry Wall - construction
      - Excavation of water tri-cell for south bore of TBM

December 19, 2019
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Permitting and Construction Schedule

- **JPA**
  - JPA submission – August 30, 2019
  - Anticipated public notice date September 15, 2019
  - JPA Post-Submission Follow-up – September 26, 2019
  - Anticipated permit issuance – April 2020

- **Section 408 Concurrence**
  - Public Notice
  - Package Submittal November 2019
  - Approval before April 2020

- **USCG Bridge Permit**
  - Approval after Section 408

- **VPDES**

- **Construction**
  - Commence field construction activities – scheduled for April 2020
  - Project Substantial Completion – July 2025

Comments/Questions?
Meeting Minutes

Project: Hampton Roads Bridge-Tunnel Expansion

Meeting Title: Joint Permit Application Pre-Submittal Meeting

Date | Time: August 28, 2019; 10:00 AM

Location: HRCP Offices, Norfolk VA

Meeting Attendees

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Email</th>
<th>Phone</th>
<th>Present (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Call-in</td>
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<td>(212) 202-5716</td>
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Discussion Items

<table>
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<tr>
<th>Discussion Item Description</th>
<th>Discussion/Decisions</th>
<th>Action</th>
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<tbody>
<tr>
<td>Introduction and Update</td>
<td>DG presented the agenda and made introductory remarks. Items being discussed at this pre-submittal meeting will focus on environmental impact maps, compensatory mitigation,</td>
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<tr>
<td>Alternatives Analysis</td>
<td>GJ: The Alternatives section of the PN should just briefly describe the 4 alternatives in the EIS and the preferred LEDPA, and the final plan.</td>
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<td>Public Access to files</td>
<td>GJ: There should be an FTP site for transmitting files, and a site for public access of the maps. Files should be approximately 10 MB each. PR: VDOT will host a website for this purpose. GJ: A Public Hearing won't be triggered by Right of Way (ROW) type comments.</td>
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<td>Willoughby Spit</td>
<td>GJ: distinguish between temporary and permanent structures and impacts. If a structure is to be left in place, it needs a valid reason. A permit modification will re-open 408.</td>
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<td>Dredge Plans</td>
<td>GJ: Dredge plans need footprint, material type, volume, depth and disposal locations. Chemistry results (PCBs) will need to be included in the description. Make sure FHWA gets a full set of JPA documents.</td>
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<td>Potential Beachfill Material</td>
<td>GJ: VMRC encourages beneficial re-use, but since this is undefined as yet, it will be left off the PN. If the ~40,000 cy is acceptable for re-use, then it would be permitted separately. Leave JPA application blank.</td>
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<td>Baylor Grounds</td>
<td>DG: Proposed in-water staging areas within Baylor Grounds have been removed.</td>
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<td>NMFS and USFWS</td>
<td>GJ: list genus of all species in the species list. Note life-cycle stage where appropriate. GJ: USFWS needs concurrence coordinated by FWHA. For the ESA Section, Dave O'Brien will be providing his perspective on the language “Not likely to significantly adversely affect” PN needs to list temporary and permanent impacts by habitat type.</td>
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<tr>
<td>Marine Mammals</td>
<td>GJ: the IHA and LOA will be a condition on the USACE Permit.</td>
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<tr>
<td>Mitigation</td>
<td>GJ: Compensatory Mitigation needs to be “in-kind&quot; as much as possible. TSp: Applicant proposing mitigation through in-leui fee fund. GJ: Have to follow the mitigation rule for flow down. TSp: recommending Oyster reefs for SAV beds in the same HUC from LRT at 1:1 ratio. Lyle Varnell (VIMS) did not support the $2/S.F. mitigation proposed at earlier meetings. GJ: asked for rationale, and to include shading impacts. TSp: Clams (maybe writing a check for chowder clams) will be negotiated with VMRC. GJ: just keep USACE in the loop. There will be negotiation meetings after the JPA is submitted, so no voucher requests needed at this time.</td>
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<td>VPDES Chemistry</td>
<td>GJ: wants a paragraph on VPDES water discharge and monitoring. We should be prepared to respond to public comment pertaining to the chemistry of discharge water.</td>
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<tr>
<td>Impact Plates and Tunnel Construction</td>
<td>GJ: suggested an OCR file of the impact plates to assist in bookmarking and cross referencing elements of the JPA appendices. Add tunnel cross sections, typical lane width section of trestles, in Appendix G. GJ stated that USACE will not run VMRC’s Public Notice. Future changes to the drawings need to be clearly tracked.</td>
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<td>Adjacent Property Owners (APO) List</td>
<td>APO list, labels and maps will be provided to GJ 8/29/19.</td>
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<tr>
<td>JPA Submittal</td>
<td>Include Section 408 submittal separately. Provide an FTP site for the files and provide 2 CD’s to USACE. 1 Paper copy would be appreciated. GJ will provide an e-mail confirmation that starts the review clock.</td>
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JPA Pre-submittal Page Turn Meeting
28 August 2019
I-64 Hampton Roads Bridge-Tunnel (HRBT) Expansion Project

Agenda

Introduction

- HRBT Expansion – Proposed Work and Purpose
  - Project Purpose and Need
  - Alternatives
  - Authority

- Federal Evaluation of Application
  - CZM
  - OEIR
  - EFH
  - Section 106 (NHPA)
  - Review NEPA

- Dredging (Section 404)

- Navigation (Section 10)

- VPDES Application (Section 401)

- JPA drawing set Construction Methodology

- Compensatory Mitigation
1. Joint Permit Application
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      1. Appendix P: Avoidance Minimization and Mitigation Plan
   9. Section 9 – Applicant, Agent, Property Owner and Contractor Certifications
   10. Sections 10, 11, 12 and 14 – N/A
   11. Section 13 – Free Standing Mooring Piles, Osprey Nesting Poles, Mooring Buoys, and Dolphins
   12. Section 15 – Tidal/Non-tidal Shoreline Stabilization Structures
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   15. Section 18 – Fill and Other Structures in Wetlands or Waters, or on Dunes/Beaches
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   16. Sections 19 and 20 – N/A
   17. Section 21 – Road Crossings
   18. Section 22 – Impoundments, Dams, and Stormwater Management Facilities
      1. Appendix T: Stormwater Facilities
   19. Section 23 – Outfalls Not Associated with Proposed Water Withdrawal Activities
   20. Sections 24, 25 and 26 – N/A

JPA Section 3

- On June 12, 2017 the FHWA issued a ROD for the HRCS Final SEIS identifying refined Alternative A as the Selected Action, replacing the previous ROD, issued in 2001, for a different alternative. FHWA identified the following reasons for identifying Alternative A (with refinements) as the Selected Action:

  - Acceptably addressed the purpose and need to be considered a reasonable alternative under NEPA;
  - Had the **least environmental impacts**;
  - Had the **lowest estimated cost** and would allow other regionally funded transportation priorities to advance;
  - Was **unanimously endorsed by all the localities** comprising the Hampton Roads Transportation Planning Organization (HRTPO) and the HRTAC, which includes the Cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg, and the Counties of Isle of Wight, James City, Southampton, and York;
  - Was concurred with by the **federal cooperating agencies as the recommended Preferred Alternative**;
  - Had the least aquatic resource impacts, which allowed the US Army Corps of Engineers to state it appears to be the **Least Environmentally Damaging Preferred Alternative (LEDPA)**; and
  - Had the second highest number of Public Hearing comments submitted in support of it (Alternative D received the highest number of comments in support, but it could not be the LEDPA per input from the US Army Corps of Engineers).
JPA Section 3

- On June 7, 2018, FHWA approved the Environmental Assessment (EA) re-evaluation.
  - Designation of High Occupancy Toll (HOT) lanes.
  - Limit of Disturbance (LOD) was widened.

- On October 28, 2018, FHWA issued a Finding of No Significant Impact (FONSI) for the Hampton Roads Crossing Study EA re-evaluation.
  - Increase in floodplain acreage associated with the Refined Selected Action is not considered significant.
  - Increase in wetland impacts have been considered in light of Executive Order 11990. No practicable alternative.
JPA Section 3

- The HRBT Expansion project includes the following elements:
  - Roadway Elements
    - Roadway signing, both ground-mounted and overhead.
    - Pavement marking, pavement markers, and delineators.
    - Roadway lighting.
    - Relocation of existing and installation of new intelligent transportation system (ITS) infrastructure and equipment.
    - Traffic signals.
    - Pavement widening to accommodate new lane configurations.
    - Drivable shoulders (inside) for part-time use.
    - Outside shoulders.
    - Retaining walls.
    - Sound barrier walls.
    - Full-depth construction on mainline roadway pavement.
    - Milling and asphalt overlay.
    - Removal and replacement of the overpass bridge at South Mallory Street, including any necessary improvements or realignment of Mallory Street.
    - Bridge widening, repair, and replacement.
    - Entrance/exit ramp modifications.

JPA Section 3

- The HRBT Expansion project includes the following elements:
  - Marine Elements
    - Two new two-lane HRBT tunnels, including new tunnel systems and associated facilities.
    - New four-lane trestle-bridges(s).
    - Removal and replacement of all existing tunnel approach trestle-bridges.
    - Expansion of the existing North and South Islands of the HRBT.
    - Installation of storm drain outfall pipes and stormwater management facilities.
    - Temporary features including VPDES outfall pipes, temporary trestles, dock, small vessel access at Willoughby Spit
    - Artificial reef.
The HRBT Expansion project includes the following elements:

- Nine Design Sub-segments. Five are predominantly in the marine environment.

- Segment 1b North Trestle-bridge
- Segment 2a – tunnel
- Segment 3a – South Trestle-bridge
- Segment 3b – Willoughby Spit
- Segment 3c – Willoughby Bay Trestle-bridge
JPA Section 3

- Willoughby Spit marine structures

- Hampton Roads Harbor

- Willoughby Bay

- New Floating Dock on Spud Piles

- New Fixed Pier on Pipe Piles

- Existing Timber Pier to be Demolished

- New Steel Sheetpile Bulkhead; backfill behind to EL. 7

- 3 New Timber Piers
Willoughby Spit marine construction areas

Willoughby Spit marine structures – Typical Section through new Bulkhead

New Timber Finger Pier on Timber Piles

New Steel Sheetpile Bulkhead

Backfill to El. 7

Tie-rod and Deadman
North Trestle
- Spud barges used in areas with more than 4.5 ft of water (at MLW)
- 15 +/- working barges
- First activity after receipt of the JPA
- Last activity in September 2024 + 6 months to remove structures

North & South Islands
- Mooring area to be created near North and South Island Expansions
- 1 mooring pile (42” pipe pile) every 40FT around the footprint of the islands
- Spud barges used in areas with more than 4.5 ft of water (at MLW)
- 1000 ft from expansion boundary for barge anchoring
- 500 ft from expansion boundary for barge operation
- At peak, “15 working barges
- First activity after receipt of the JPA
- Last activity in September 2024 + 6 months to remove structures
JPA Section 3 – Segment 3a

- South Trestle
  - Spud barges used in areas with more than 4.5 ft of water (at MLW)
  - At peak, ~25 working barges
  - First activity after receipt of the JPA
  - Last activity in September 2024 + 6 months to remove structures

JPA Section 3 - Segment 2-c

- Willoughby Bay
  - Mooring area to be created in Willoughby Bay with mooring piles (42” pipe piles)
  - Spud barges used in areas with more than 4.5 ft of water (at MLW)
  - At peak, ~15 working barges
  - First activity after receipt of the JPA
  - Last activity in December 2024 + 3 months to remove structures