I-64 Hampton Roads Bridge-Tunnel Expansion Project

Initial Financial Plan

March 31, 2019

VDOT
Virginia Department of Transportation

State Project Numbers:
0064-M06-028; 0064-M06-032; 0064-M06-033; 0064-M06-034; 0064-M06-039
UPC's: 110577,115008, 115009, 115010, 115011

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1. PROJECT DESCRIPTION

The I-64 Hampton Roads Bridge-Tunnel Expansion Project is located on Interstate 64 in the Cities of Hampton and Norfolk beginning approximately 0.177 miles west of Settlers Landing Road (Western Terminus) and ending approximately 0.289 miles east of Little Creek Road (Eastern Terminus) at the Interstate 64/Interstate 564 interchange (see **Figure 1**).

The project addresses one of the region's most significant chokepoints by adding more capacity to the HRBT and adjacent segments of the I-64 corridor. The new tunnel and its approach bridges will accommodate four lanes of traffic for a total of eight lanes of capacity across the water. Over the water, the concept design proposes a new eastbound bridge-tunnel just west of the existing crossing, with the existing eastbound HRBT being converted to westbound lanes. Other alignments and configurations for the crossing are also possible, as long as they are consistent with the project's environmental commitments.

In addition to the new bridge-tunnel, the project will widen the landside four-lane sections of I-64 in Hampton between Settlers Landing and the Phoebus shoreline, as well as the four-lane sections of I-64 in Norfolk between the Willoughby shoreline and the I-564 interchange. These segments will be expanded to 6 full-time lanes (4 will be free general-purpose lanes and 2 will be variably-priced High Occupancy Toll (HOT) lanes) plus 2 part-time shoulder lanes that can be used for periods of extremely heavy congestion. To accommodate the roadway widening, the project will rehabilitate or rebuild 30 interstate bridge structures. Additional improvements along the project corridor include new sound barrier walls, lighting, and drainage.

This project is being delivered as a design-build project under the Public-Private Partnership Act of 1995.

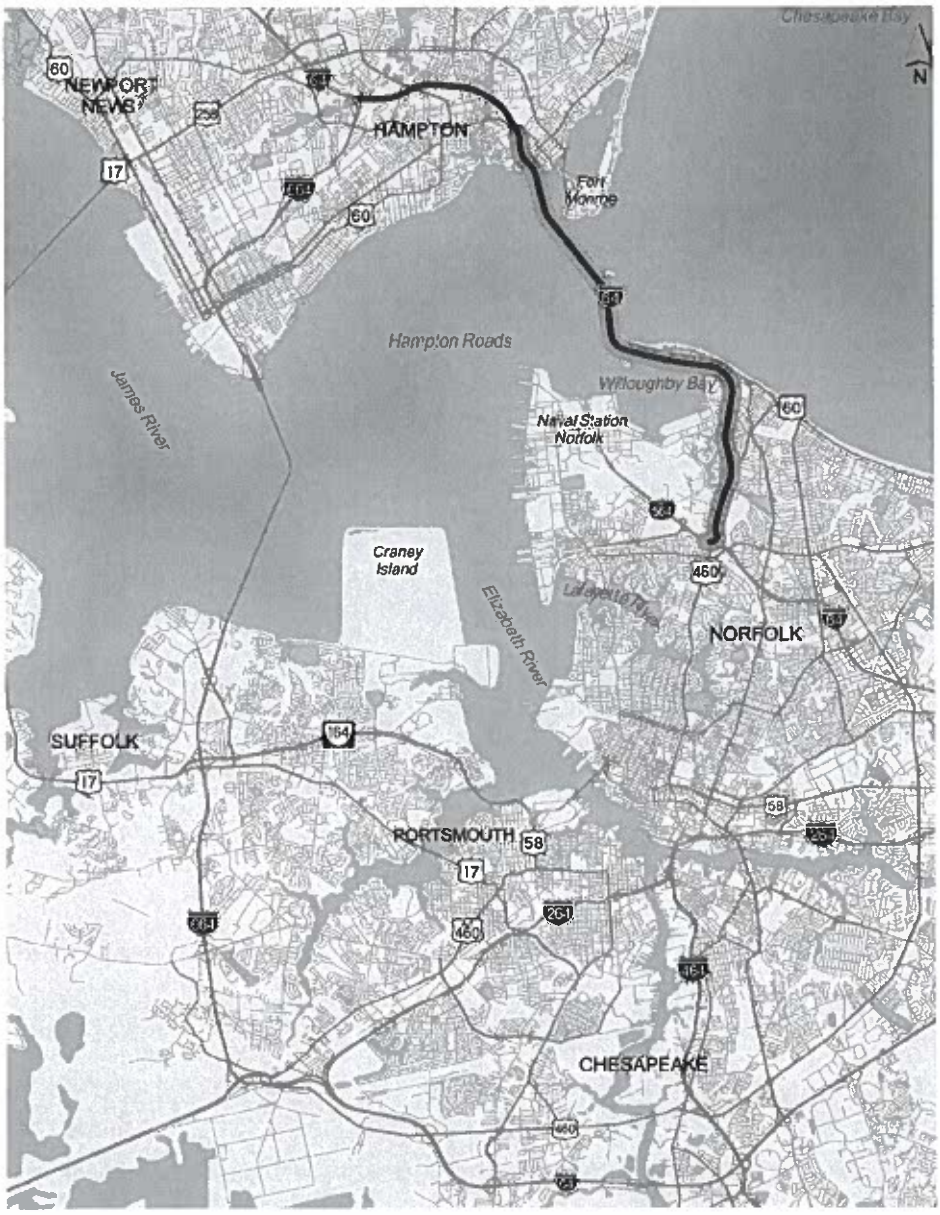

Figure 1 – Location Map

HISTORY AND ENVIRONMENTAL PROCESS

The Intermodal Surface Transportation Act of 1991 allocated funds for highway projects demonstrating innovative techniques of highway construction and finance. The Interstate 64 (I-64) crossing of Hampton Roads was included as one of the innovative projects. A Major Investment Study (MIS) of the I-64 crossing of Hampton Roads was completed in 1997. The MIS documented an initial review of alternatives to reduce congestion at the I-64 crossing. Following the MIS, the Hampton Roads Crossing Study (HRCS) Draft Environmental Impact Statement (DEIS) and Final EIS (FEIS) were published in 1999 and 2001, respectively, documenting the preferred alternative. The Federal Highway Administration (FHWA) issued a Record of Decision (ROD) in 2001, completing the NEPA process. Other studies were completed to further evaluate potential

Hampton Roads crossing improvements. In 2003, FHWA and the Virginia Department of Transportation (VDOT) completed a re-evaluation of the FEIS that analyzed implementing a portion of the preferred alternative. That re-evaluation validated the previous decisions. In 2011, FHWA and VDOT issued an Environmental Assessment (EA)/Re-evaluation of the HRCS FEIS covering the segments of the preferred alternative including what is now referred to as the I-664 Connector, the I-564 Connector, and the VA 164 Connector. While the EA was completed, no NEPA decision was issued due to fiscal constraints and the project did not advance. In 2012 FHWA and VDOT published the Hampton Roads Bridge-Tunnel (HRBT) DEIS. The DEIS evaluated options for improvements to I-64 between Hampton and Norfolk. The DEIS found that the Retained Alternatives would result in high impacts to historic and private properties. High impacts, along with lack of public and political support, led FHWA to rescind the Notice of Intent (NOI) for the project. In 2013, the 2011 EA was revised but the FHWA never made a NEPA decision on the document.

In 2014 the Hampton Roads Transportation Accountability Commission (HRTAC) included the HRCS in its list of priority projects, which led FHWA and VDOT to the development of a Supplemental Environmental Impact Statement (SEIS) to evaluate options for this crossing. This SEIS was prepared in part due to the time that has lapsed since the 2001 Record of Decision (ROD). Environmental regulations and conditions in the Hampton Roads region had changed substantially during the fifteen years that passed since the ROD was issued, resulting in the need for a thorough reevaluation. In December 2016, the Commonwealth Transportation Board (CTB) approved "Alternative A" as the preferred alternative for this study, laying the groundwork to complete the SEIS. FHWA issued a ROD on June 12, 2017 identifying Alternative A as the Selected Action. The ROD included environmental commitments that also were made by the CTB. The ROD allowed VDOT to advance with more detailed design activities, using more advanced engineering and other analyses. The advanced engineering and analyses sought to refine the Selected Action, for which the U.S. Army Corps of Engineers (USACE) found no reason to disagree it appeared to be the preliminary Least Environmentally Damaging Practicable Alternative (preliminary LEDPA).

On January 10, 2018, the CTB approved the designation of HOT lanes on I-64. Since the time that approval was made, VDOT has worked to determine how HOT lanes would be accommodated and function within the I-64 corridor. VDOT and FHWA indicated in the Final SEIS and ROD that improvements considered with the HRCS could be implemented and operated as a managed lane, but the management option was not specifically designated as such at the time the ROD was issued. Traffic and associated air quality and noise analyses in the SEIS did account for the potential to include managed lanes.

In June 2018 FHWA issued an Environmental Assessment (EA) Re-evaluation for the Hampton Roads Crossing Study (HRCS) Final SEIS. The Re-evaluation considered refinements proposed by VDOT to the Selected Action documented in FHWA's June 12, 2017 ROD and was informed by environmental analyses completed since the ROD was issued. In order to accommodate the HOT lanes and improvements to existing bridge-tunnel structures, the planning-level Limit of Disturbance (LOD) was widened along the mainline and surrounding the I-64/I-564 interchange.

The detailed engineering and analyses that have occurred since the ROD have also identified additional property to be acquired as part of the project to accommodate future construction staging activities. The EA also identified the potential for a new direct connection between the proposed HOT lanes and I-564. The EA re-evaluation documented these changes and updated the project's estimated impacts that had been previously identified in the ROD. On October 23, 2018, following a public comment period on the EA, FHWA issued a Finding of No Significant Impact (FONSI) for the EA, incorporating the refinements to the Selected Action into the project.

The corridor study area for the 2018 Re-evaluation of the HRCS consists of the I-64 corridor, including interchanges, from just west of the Settlers Landing Road interchange in Hampton to the interchange with I-564 in Norfolk. The study area includes the approach/departure bridges and tunnel area of the Hampton Roads Bridge-Tunnel (see **Figure 2**).

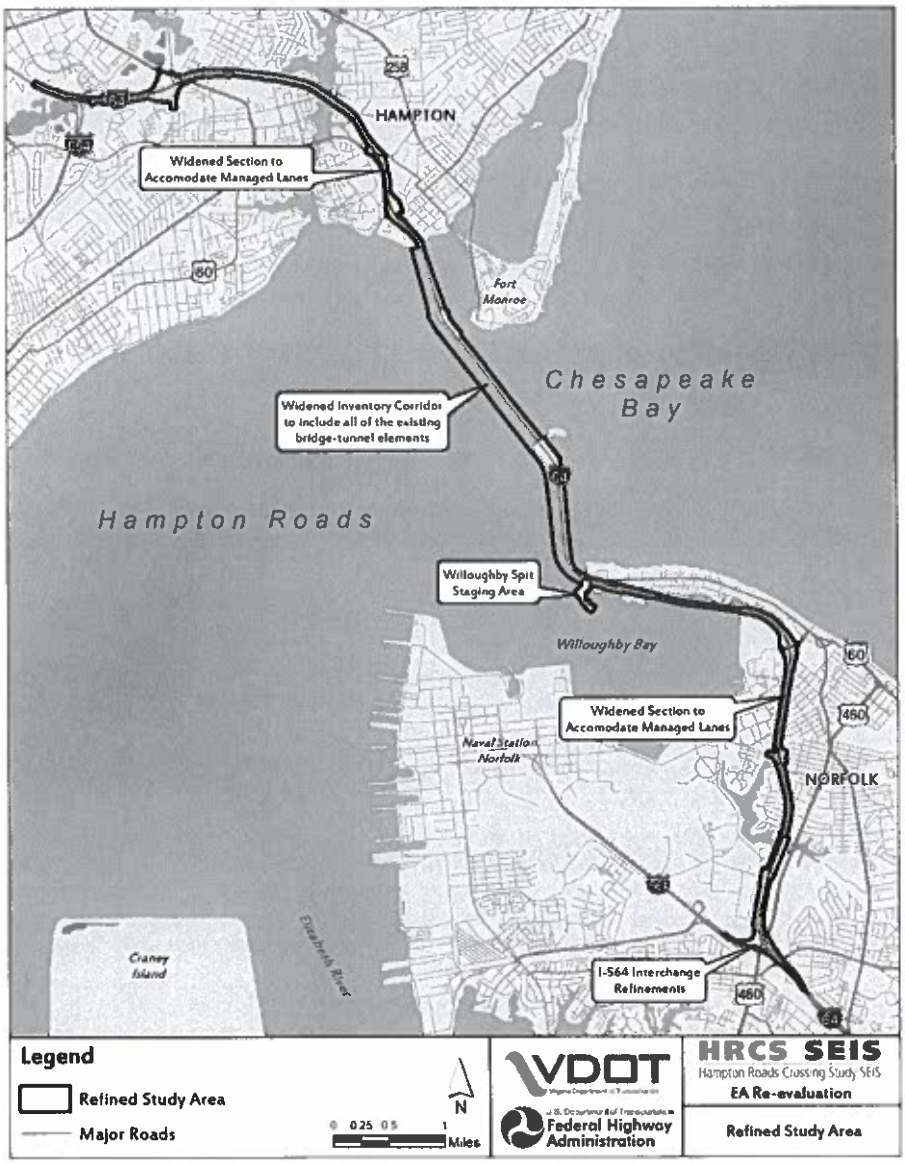

Figure 2 – Corridor Study Area

DESIGN-BUILD PROCUREMENT

The VDOT Office of Public Private Partnerships, the Alternative Project Delivery Division, along with VDOT leadership were responsible for reviewing the project for consideration for DB delivery under the Virginia Public Procurement Act (vs. under the Public Private Procurement Transportation Act of 1995, as amended (PPTA)).

On the basis of a screening report and Public Sector Analysis and Competition (PSAC) conducted by the VDOT Office of Public Private Partnerships, and as indicated in the Commissioner's Finding of Public Interest dated January 2018, the Department concluded that procuring the Project under the PPTA afforded the Department the flexibility necessitated by the size and complexity of the Project.

DETAILED SCOPE OF THE PROJECT

The Department will deliver the I-64 HRBT improvements as defined in the I-64/Hampton Roads Crossing Study Final SEIS. The preferred alternative from the Environmental Impact Statement was the basis for the Project development. In the RFP, the HRBT improvements project consists of widening and reconfiguring the interstate to eight lanes—including provisions for High Occupancy Toll (HOT) lanes as described below.

The anticipated scope of work to be undertaken by the Design-Builder under their agreement for this project shall include, but is not limited to: (a) survey; (b) developing and completing the design through the Department approval process; (c) acquiring the necessary environmental permits, including United States Coast Guard (USCG) permit and approval; (d) acquiring right-of-way, permanent and temporary easements; (e) coordinating and performing, or causing to be performed, required utility relocations, additions, and adjustments; (f) coordinating and cooperating with the Department existing tunnel operations; (g) roadway construction and widening; (h) tunnel and tunnel systems design and construction; (i) reconstruct portions of existing mainline travel lanes, shoulders, and ramp acceleration/deceleration lanes; (j) bridge demolition and bridge construction; (k) bridge repair and rehabilitation; (l) overall Project management and coordination with other active construction projects in the vicinity. The detailed scope is defined in the contract documents and other project agreements.

The Project includes widening and reconfiguration of the existing interstate to accommodate two (2) general-purpose (GP) lanes, one (1) HOT lane, and one (1) part-time shoulder lane in the eastbound and westbound directions; two (2) new tunnels that can accommodate four (4) lanes of traffic. The proposed improvements include, but are not limited to: two (2) new HRBT tunnels; new trestle(s); removal and replacement of the all existing tunnel approach trestles; expansion of the existing north and south islands of the HRBT; pavement widening to accommodate new lane configurations; full depth shoulder lanes for part time use; outside shoulders; retaining walls; sound barrier walls; full depth construction on mainline roadway pavement where indicated in the RFP Concept Plans, milling and asphalt overlay where indicated in the RFP Concept Plans; 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; installation of storm drain pipes and stormwater management (SWM) facilities; roadway signing, both ground mounted and overhead; pavement marking, pavement markers, and delineators; roadway lighting; relocation of existing and installation of new ITS infrastructure and equipment; and traffic signals.

It is noted that the description and length are approximate and are based on the RFP Concept Plans shown in the RFP Information Package. The final project length may vary depending on the Design-Builder's final design; however, any change in the project limits requires approval by the Department.

The conceptual design contained in the RFP Information Package reflects a basic line, grade, typical sections, minimum pavement structures, major cross drainage structures, potential locations of SWM ponds, conceptual bridge and retaining wall locations, and general length and location of sound barrier walls. These elements are the basic project configuration and not all elements and requirements of the project are illustrated within. The Design-Builder is responsible for final design in accordance with their agreement and the technical requirements.

The general scope of the Project is shown graphically in **Figure 3**. A project website has been established and is available at the following link - www.hrbtexpansion.org.

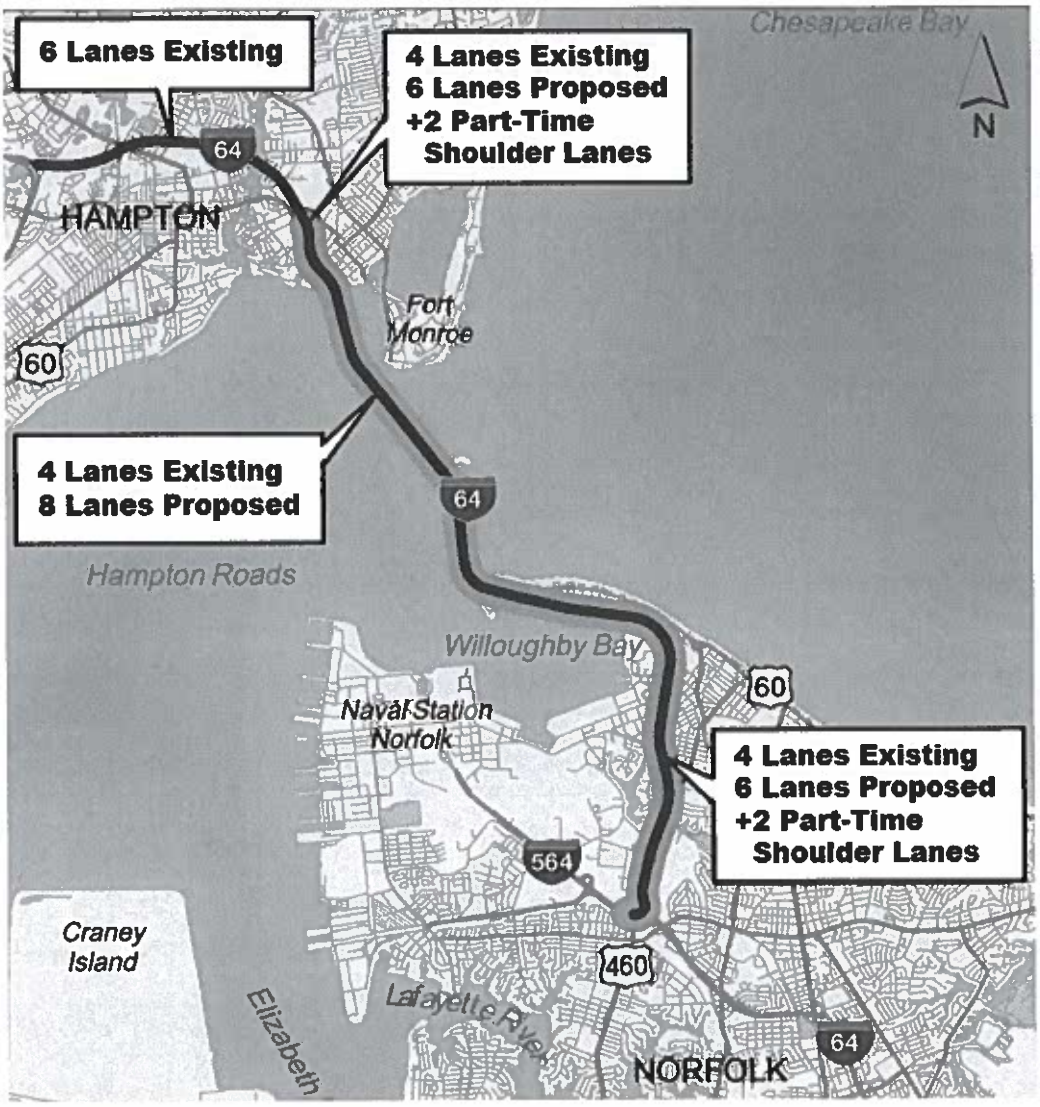

Figure 3 – General Scope of Project

2. SCHEDULE

The design-build contract development and procurement phase of the project commenced in December 2017 with the PPTA Steering Committee and includes the RFQ, RFP, technical proposal submissions, price proposal submissions, and selection of the best value proposal. The design-build phase of the project will begin in April 2019 with the execution of a comprehensive agreement and the Design-Builder Limited Notice to Proceed One (LNTP 1) and will end no later than November 1, 2025 with the final completion. A project schedule showing key activities and major milestones for the Project is presented in **Figure 4**.

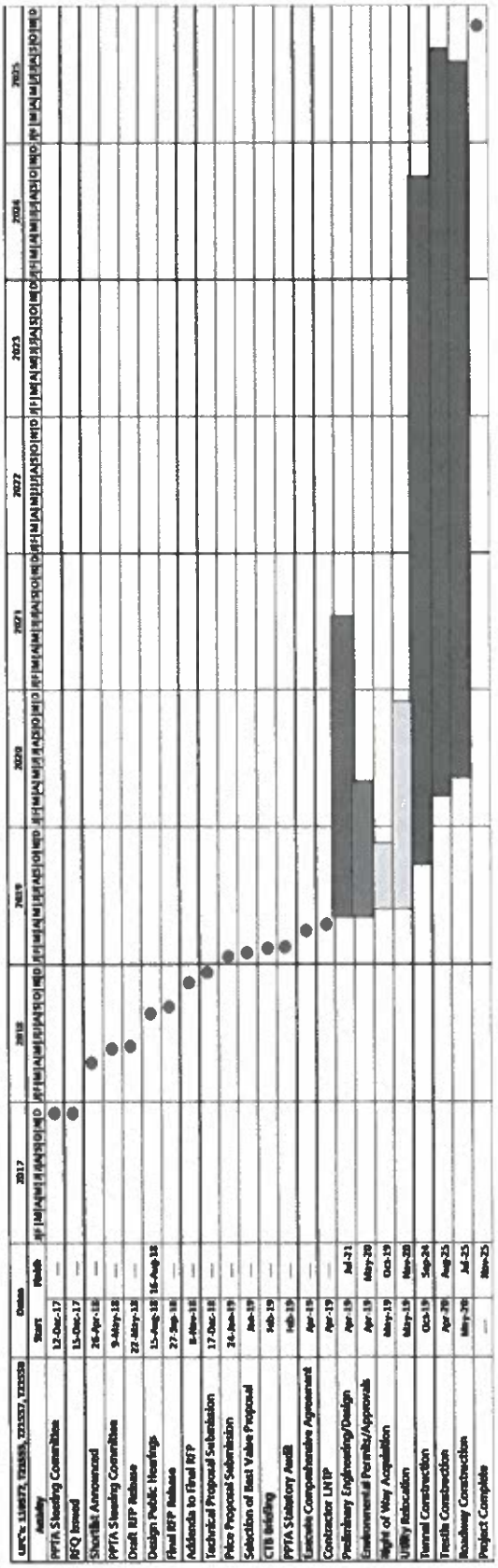

Figure 4 – Project Schedule

3. PROJECT COST

PRE-COST ESTIMATE REVIEW (CER) ENGINEER'S ESTIMATE

The cost estimate for the total project cost (Owner and Design-Builder), which was revised on October 25, 2018, was determined to be **$4,259,783,113**. This cost estimate is Year of Expenditure (YOE) based on the final RFP and RFP conceptual plans. It includes costs for preliminary engineering, right of way/utilities, VDOT construction oversight and management, public communications, external third-party work, final design and construction (Design-Builder cost), contingencies, inflation, and early completion incentive. The engineer's cost estimate is shown in **Table 1** below.

Table 1 – Total Pre-CER Project Cost Estimate

TOTAL PROJECT COST SUMMARY (w/ 3% Inflation and Contingencies)	
Prior Costs/Procurement	Total Cost
Landside	$10,000,000
Trestles	$10,000,000
Tunnel	$10,000,000
Prior Costs/Procurement Total	**$30,000,000**
Preliminary Engineering	Total Cost
Landside	$68,040,802
Trestles	$90,509,144
Tunnel	$167,450,054
PE Total	**$326,000,000**
Right of Way/Utilities	Total Cost
Landside	$10,000,000
Trestles	$0
Tunnel	$0
Right of Way/Utilities Total	**$10,000,000**
Construction	Total Cost
Landside	$812,519,046
Trestles	$1,080,827,989
Tunnel	$2,000,436,078
Construction Total	**$3,893,783,113**
TOTAL PROJECT COST (YOE)	**$4,259,783,113**

The Pre-CER Engineer's Estimate is the input basis for the FHWA CER model, however, the model input requires the use of Current Year (CY) costs without applied inflation. The Pre-CER Engineer's estimate reflects Year of Expenditure (YOE) costs of $4.260 billion based on 3% inflation. As a result, the Pre-CER Engineer's Estimate YOE costs was converted to CY costs and the inflation removed. Based on this conversion, the CY cost Pre-CER Engineer's Estimate is $3.897 billion. The FHWA CER model applied an internal model inflation rate (3%) to produce YOE costs by the model. The converted CY total project costs were then distributed based on the FHWA Major Projects Program Cost Element Guidance for input into the FHWA CER model. A summary of the CY cost estimate used in the CER broken down by cost elements as defined in the FHWA Major Project Guidance is given in **Table 2**.

Table 2 – Pre-CER CY Cost Estimate

FHWA Cost Element	MAJOR PROJECTS GUIDANCE PROGRAM COST ELEMENT	TOTALS (Millions)
1	PRELIMINARY ENGINEERING	$336
2	RIGHT-OF-WAY	$10
3	EXTERNAL THIRD PARTY	$10
4	TRANSPORTATION DEMAND MANAGEMENT (TDM)	$11
5	CONSTRUCTION ESTIMATE	$2,968
6	CONSTRUCTION CONTINGENCY	$188
7	CONSTRUCTION ADMINISTRATION	$367
8	PUBLIC OUTREACH	$7
	MAJOR PROJECTS COST ESTIMATE TOTAL	**$3,897**

PRE-CER ENGINEER'S COST ESTIMATING METHODOLOGY

The cost estimate for the project focused on three major areas: Landside, Tunnels, and Trestles. Due to the scope and size of the project, VDOT historical pricing was not used. Instead the engineer's cost estimate was developed by construction estimators in a similar manner as the offerors.

The estimate was based on the RFP and Technical Requirements, RFP Concept Plans, as well as as-built drawings for the Willoughby Bay trestle and 2nd Chesapeake Bay Bridge Tunnel Crossing projects. Wherever possible, bid items were based on standard VDOT bid item numbers and descriptions. Standard construction means and methods were used to approximate anticipated design and construction quantities. Past project experience and knowledge from local marine and land-based construction was used to assist in creating a basis for the estimate. These projects included:

- The I-64 High Rise Bridge project in Chesapeake
- Elizabeth River Mid-Town Tunnel Crossing project in Portsmouth/Norfolk
- The Chesapeake Bay Bridge Tunnel 2nd Crossing & Parallel Trestle projects in Virginia Beach.

Tunnel: The estimate includes site demolition, island expansion, ground improvement, slope protection, tunnel approach structures, bored tunnels, buildings, and site improvements. The estimate includes onsite handling of tunnel spoils and removal via barge. Utility costs for providing power for the Tunnel Boring Machine (TBM) and facilities were included in the cost estimate. The estimate also includes costs of functional systems such as ventilation, fire life safety and electrical systems. Allowances were included for environmental monitoring, geotechnical monitoring, and the management of contaminated hazardous materials.

Trestles: The estimate assumed general alignment and construction sequencing. The estimate includes precast piles, cast-in-place pile caps, precast concrete beams, cast-in-place concrete decks and parapets. The estimate also includes demolition of the existing trestle structures. The estimate included replacing demolished utilities and new utilities for support facilities. It was assumed three continuous span trestles would be constructed. Storm run-off was assumed to be deposited in the water and no conveyance system was provided.

Landside: The Landside cost elements were in two major categories Landside Roadway and Landside Bridges:

- ***Landside Roadway***: The estimate includes minimum pavement sections from the RFP. Retaining wall heights were based on local government GIS and topographical information. The estimate assumes replacement of all drainage, signs, sign structures, continuous roadway lighting, and ITS system. A general maintenance of traffic scheme was assumed and included in the estimate.

- ***Landside Bridges:*** Estimation is based on the assumption that precast piles will be used in foundation and other bridge elements are estimated in accordance with RFP requirements, existing bridges and T&SL plans. Rehab/Repair estimation for existing bridges are arrived based on the latest inspection reports. The costs include partial demolition of existing bridges for widening.

The estimate included right of way and utility costs taken from the Supplemental Environmental Impact Statement. The right of way and utility worksheets in the PCES tool was used. Based on preliminary construction limits the number of impacted parcels and impacted areas were determined. A general assessment was made of potential relocations and damages for input to the tool.

After direct costs for the tunnels, trestles, and landside were estimated, design and indirect costs were estimated and applied to the direct cost estimate in addition to other markups like escalation, contingencies and the design-builder's fee.

COST ESTIMATE REVIEW (CER) RESULTS

A FHWA Cost Estimate Review workshop was conducted on November 5 and 6, 2018. The CER results were reviewed and updated December 12, 2018 to reflect additional review of risk impacts. The goal was to conduct an unbiased risk-based review to 1) verify the accuracy and

reasonableness of the current total engineer's cost estimate and project schedule and 2) to develop a probability range using a Monte Carlo simulation for the cost estimate that represents the project's current stage of development.

The risk register for the project was updated prior to the workshop. During the workshop, 37 risk items (34 Threats, 3 Opportunities) were modeled in the software for the project. After further risk analysis and coordination with FHWA, 38 risk items (34 Threats, 4 Opportunities) were included in the final model of December 12, 2018.

FHWA requires development of the Year-of-Expenditure (YOE) results at the 70th percentile (P70) as well as a range of probable project costs from 10% to 100% confidence levels based on the various risks evaluated. For the model, finalized December 12, 2018, the following results were determined for FHWA CER purposes:

- Total Design-Build Contract Project Cost – YOE-P70 $ 3,282,000,000
- Total VDOT Project Cost – YOE-P70 $ 524,000,000
- Overall Project Cost – YOE- P70 $ 3,784,000,000

COMPARISON OF PRE-CER AND CER PROJECT COSTS

The pre-CER YOE total project cost was $4.260 billion. The results of the CER showed the 70th percentile YOE total project cost was $3.784 billion. This represents an 11% reduction in the total project cost. Total VDOT costs shows low variability based on the flatter skewed left histogram for the model results. A comparison of CY Total Project Costs shows a 12% reduction from a Pre-CER estimate of $3.9 billion to a 70th Percentile CER estimated cost of $3.418 billion. The 70th percentile CER project costs will be utilized for the purposes of financial planning for the HRBT project.

Table 3: Project Costs by Project Phase

UPC	Phase	Estimate	Current Expenditures as of 12/31/2018	Balance to Complete
110577	PE	$30,000,000	$23,508,696	$6,491,304
	RW	$0	$0	$0
	CN	$0	$0	$0
	TOTAL	**$30,000,000**	**$23,508,696**	**$6,491,304**
115008/ 115009/ 115010/ 115011	PE	$122,000,000	$0	$122,000,000
	RW	$15,000,000	$0	$15,000,000
	CN	$3,617,000,000	$0	$3,617,000,000
	TOTAL	**$3,754,000,000**	$0	$3,754,000,000
GRAND TOTAL		**$3,784,000,000**	**$23,508,696**	**$3,760,491,304**

4. PROJECT FUNDS

The I-64 HRBT Expansion Project was identified as one of the Hampton Roads Regional Priority Projects by HRTAC and the Hampton Roads Transportation Planning Organization (HRTPO) in March 2016. The project was included in HRTAC's Initial Financial Plan adopted March 17, 2016. On March 16, 2017, HRTAC executed an Interim Project Agreement for Funding and Administration with VDOT, which authorized an initial $25,000,000 of funding in support refinement of the preferred alternative and procurement of this project. An additional $5,000,000 was authorized for FY 2019. The additional $3,662,000,000 has been identified in the HRTAC 2045 Long Range Plan of Finance for Priority Projects and will be authorized prior to a Design-Build Offeror being selected and final design and construction is ready to commence. HRTAC would fund costs from the Hampton Roads Transportation Fund (HRTF) and other revenues.

On July 21, 2016, HRTPO approved the 2040 Long Range Transportation Plan. The plan identified the Hampton Roads Bridge-Tunnel Widening Project related to the Hampton Roads Crossing and Regional Connectors Study as a "Regional Priority Project." The project was shown as being funded by the HRTF and other HRTAC revenues.

On June 19, 2018, the Commonwealth Transportation Board (CTB) approved the FY2019-2024 Six-Year Improvement Plan (SYIP), which included the HRBT project.

A summary of current and planned funding is summarized in **Table 4** by funding source.

Table 4 – Summary of Funding by Source and Year*

Funding Source		Fiscal Year							TOTAL
		Previous	2020	2021	2022	2023	2024	2025	
UPC 115008	Other Funds								
	HRTAC AR Funds	$130,903,108	$268,619,366	$741,923,595	$760,471,685	$779,483,477	$798,970,772	$0	
	TOTAL	$130,903,108	$268,619,366	$741,923,595	$760,471,685	$779,483,477	$798,970,772	$0	$3,480,372,003
UPC 115009	Other Funds								
	HRTAC AR Funds	$60,000,001	$0	$0	$0	$0	$0	$0	
	TOTAL	$60,000,001							$60,000,001
UPC 115010	Other funds								
	HRTAC AR Funds	$4,588,641	$9,416,109	$26,007,185	$26,657,365	$27,323,799	$28,006,901	$0	
	GARVEE - High Priority	$0	$0	$0	$0	$0	$110,000,000	$90,000,000	
	TOTAL	$4,588,641	$9,416,109	$26,007,185	$26,657,365	$27,323,799	$138,006,901	$90,000,000	$322,000,000
UPC 115011	Federal Funds								
	CTB Formula - Bridge Federal	$0	$13,043,674	$0	$0	$0	$0	$0	
	CTB Formula - Bridge Soft Match	$0	$3,260,918	$0	$0	$0	$0	$0	
	SGR Bridge Federal NHPP	$0	$0	$81,653	$159,353	$1,070,876	$0	$5,659,759	
	SGR Bridge Soft Match NHPP	$0	$0	$20,413	$39,838	$267,719	$0	$1,414,941	
	SGR STP STWD Bridge Federal	$0	$0	$0	$0	$0	$14,303,334	$0	
	SGR STP STWD Bridge Soft Match	$0	$0	$0	$0	$0	$3,575,833	$0	
	Subtotal	$0	$16,304,592	$102,066	$199,191	$1,338,595	$17,879,167	$7,074,700	
	State Funds								
	SGR Bridge State	$0	$0	$547,164	$450,088	$0	$540,820	$21,416,815	
	CTB Formula - Bridge State	$14,350,708	$0	$0	$0	$0	$0	$0	
	Subtotal	$14,350,708	$0	$547,164	$450,088	$0	$540,820	$21,416,815	
	TOTAL	$14,350,708	$16,304,592	$649,230	$649,229	$1,338,595	$18,419,987	$28,491,515	$80,203,851
GRAND TOTAL		$209,842,453	$294,340,067	$768,580,010	$787,778,279	$808,145,871	$955,397,660	$118,491,515	$3,942,575,855

*The funding is provided in the Draft SYIP presented to the CTB on April 10, 2109.

FEDERAL FUND SOURCES AND SPECIAL FUNDING TECHNIQUES

The HRTPO has included the HRBT project in its Long Range Transportation Plan. Refinement of the preferred alternative and procurement activities for the project are included in HRTPO's FY18-21 TIP. The project is in the Commonwealth's FY18-21 Live STIP under UPC's 110577 and 115008.

Preliminary engineering associated with this project was authorized by FHWA on March 22, 2017 under federal project number NHPP-064-3(507). The authorization did not include any federal funds. Detailed information concerning federal fund sources and special funding techniques associated with the project authorization is provided in **Table 5**.

Table 5 – Project Authorization Details as of December 31, 2018

Federal Project Number NHPP-064-3(507) UPC 110577 PE				
Program Code	**Total Cost**	**Federal Funds Obligated**	**AC Funds**	**Soft Match**
Z001	$25,000,000	$0	$20,000,000	$0
TOTAL	**$25,000,000**	**$0**	**$20,000,000**	**$0**

On January 18, 2018, HRTAC issued its Preliminary Official Statement (POS) and Road Show to market the HRTAC Senior Lien Revenue Bonds Series 2018 A backed by the Hampton Roads Transportation Fund.

5. FINANCING ISSUES

The overall project cost based on the FHWA CER workshop is $3,784,000,000. The total identified funding for the HRBT project based on HRTAC's 2045 Long Range Plan of Finance Update for the HRTAC High Priority Projects identifies $3,662,000,000. The project is scheduled to end in late 2025. Identified HRTAC funding is based on collection of tax revenues and other revenues. These revenues can vary year-to-year. HRTAC monitors market and interest rates and if any issues arise with funding timing, HRTAC-issued bond sale expectations may be changed year-to-year to provide additional flexibility in the funding schedule.

The FHWA CER 70th Percentile YOE Total Project Cost was determined to be $3,784,000,000, however, the current identified funding is $3,942,575,855. The current spending plan is based on the existing forecasted funding and is summarized in **Table 6**.

Table 6 – Project Spending Plan (in thousands of dollars)

Expenditure Item	Previous	FY20	FY21	FY22	FY23	FY24	FY25	FY26
Preferred Alternative Refinement	$30,000	$0	$0	$0	$0	$0	$0	$0
VDOT Project Delivery	$6,177	$18,532	$18,532	$18,532	$18,532	$18,532	$18,532	$4,631
Right of Way	$15,000	$0	$0	$0	$0	$0	$0	$0
Design-Build Contract	$100,000	$150,000	$399,000	$769,500	$969,000	$565,000	$211,000	$28,500
Incentives	$0	$0	$0	$0	$0	$0	$90,000	$0
Contingency	$0	$150,000	$30,328	$36,393	$36,393	$36,393	$36,393	$9,100
TOTAL Spending	$151,177	$318,532	$447,860	$824,425	$1,023,925	$619,925	$355,925	$42,231
Cumulative Spending	$151,177	$469,709	$917,569	$1,741,994	$2,765,919	$3,385,844	$3,741,769	$3,784,000

VDOT anticipates issuing GARVEE Bonds over two years to fund its obligation to the project. VDOT anticipates no financing issues with the GARVEE bond proceeds. If any issues arise with funding timing, GARVEE bond sale amounts can be changed year-to-year to provide additional flexibility in the funding schedule. The total estimated debt service for the project is $268,285,004 ($200,000,000 principal and $68,285,004 financing costs (issuance costs, interest, etc.)) with an estimated interest rate of 4%.

6. CASH FLOW

The HRBT Project's annual cash expenditures are based on the project schedule developed by the VDOT project design team. The cash flow analysis for the project is summarized in **Table 7**. It shows the comparison of previous and projected expenditures by fiscal year against the total annual allocations. The table will be updated annually as actual expenditures are incurred.

Table 7 – Cash Flow Analysis for HRBT Project (in thousands of dollars)

Allocation/Expenditure	Previous	FY20	FY21	FY22	FY23	FY24	FY25	FY26
Annual Expenditures	$151,177	$318,532	$447,860	$824,425	$1,023,925	$619,925	$355,925	$42,231
Annual Allocations	$209,842	$294,340	$768,580	$787,778	$808,146	$955,398	$118,491	$0
Cumulative Expenditures	$151,177	$469,709	$917,569	$1,741,994	$2,765,919	$3,385,844	$3,741,769	$3,784,000
Cumulative Allocations	$209,842	$504,182	$1,272,762	$2,060,540	$2,868,686	$3,824,084	$3,942,575	$3,942,575
Allocation Surplus or (Deficit)	**$58,665**	**$34,473**	**$355,193**	**$318,546**	**$102,767**	**$438,240**	**$200,806**	**$158,575**

7. P3 ASSESSMENT

The Public-Private Transportation Act of 1995, as amended (PPTA), is the Commonwealth of Virginia enabling legislation for the development and operations of transportation projects utilizing the private sector. The VDOT Office of Public Private Partnerships, the Alternative Project Delivery Division, along with VDOT leadership were responsible for reviewing the project for consideration for P3 delivery.

In 2017, the VDOT P3 Office of Public Private Partnerships undertook a screening process, and assessed the viability of several delivery models including the Design-Build (DB), Design-Build-Finance-Operate-Maintain (DBFOM), and the Design-Build-Operate-Maintain (DBOM). As indicated in the High-Level Screening Report dated June 12, 2017 and the Project Screening Report dated November 7, 2017, the Department concluded that DB was the most viable project delivery model. The DB method would enable a higher quality product and a greater control of cost. A DBOM model was excluded based on preliminary analysis and industry feedback; whereas a DBFOM model was excluded because it was projected that toll revenue could not be significantly leveraged to cover capital costs. Further, the Department found that procuring the Project under the Public-Private Partnership Act of 1995, as amended (PPTA), instead of the Virginia Public Procurement Act, afforded the Department the optimal flexibility to customize contracting terms to fit the project's complexities and achieve best value. Specifically, the PPTA provides flexibility through an iterative contract development process that gives VDOT the ability to refine key procurement documents through feedback from potential proposers. Efficiencies would also be gained in pursuing the project using the DB method through optimal risk transfer to the private sector of design and construction risks (including permitting and innovation through alternative technical concepts (ATC)). The ATC approach allows contractors to draw upon their experience and expertise to develop innovative techniques for increasing efficiencies, reducing construction durations, reducing risks, and reducing costs. A Limited Notice-to-Proceed (LNTP) process will also be used to limit the public's exposure to risk in the permitting process and increase the likelihood of project delivery by not allowing the contractor to proceed past certain milestone points until the United States Army Corps of Engineers (USACE) issues the Joint Permit. The results of the screening process were further confirmed by a Public Sector Analysis and Competition (PSAC) conducted by the VDOT Public Private Partnership Office.

Consistent with VDOT practice, the VDOT P3 Office of Public Private Partnerships managed the project during the procurement phase, after which a dedicated project office would oversee the design and construction phase.

As mentioned in Section 4 above, the project was identified as one of the Hampton Roads Regional Priority Projects by HRTAC and HRTPO. Since then the HRTPO and the HRTAC have been committed to seek a plan to fund the project. Also mentioned in Section 4 is the approval of the HRTAC 2045 Long Range Plan of Finance for Priority Projects which included the HRBT project for identified funding through the HRTF. It was determined that although funding for the project was identified there were financial and schedule benefits to procure the project using the PPTA regulations using a DB delivery without any private investment. The access to and cost of capital is not applicable because this project has no element of private financing.

On the basis of the results of the screening process, the Commissioner, in his Finding of Public FOPI, determined that it was in the public's best interest to pursue the Project as a DB under the PPTA, and to solicit proposals under either or both an Immersed Tube Tunnel and Bored Tunnel construction methodology. The FOPI was submitted to and concurred by the Secretary of Transportation.

The Transportation Public-Private Partnerships Screening Committee ("Steering Committee") affirmed the Commissioner's FOPI and concurred with the PSAC on December 12, 2017 and May 9, 2018; thereby, allowing the Department to initiate procurement.

On December 15, 2017, the Department issued a Request for Qualifications (RFQ) culminating in the short-listing of Hampton Roads Capacity Constructors, Hampton Roads Connector Partners, and the Skanska-Kiewit Joint Venture as qualified Offerors. Subsequently, Skanska-Kiewit Joint Venture decided to discontinue its pursuit of the Project. On May 22, 2018, the Department issued a draft Request for Proposals (RFP). The draft RFP was further modified on June 29, 2018 and August 24, 2018, based on public comment, feedback from the remaining Offerors and other Project stakeholders. A final RFP was issued on September 29, 2018. Technical Proposals were due on January 15, 2019; while Financial Proposals were due on February 8, 2019. The Department anticipates entering into a Comprehensive Agreement with the successful Offeror by April 2019, along with a re-affirmation by the Commissioner to the Governor and General Assembly that his FOPI is still valid, a briefing to the Commonwealth Transportation Board and undertaking a statutory audit required by the PPTA. The Department has 60 days from executing a Comprehensive Agreement to brief the Steering Committee.

Market conditions were monitored throughout the procurement process through activities such as Proprietary/ ATC meetings, a risk workshop, and one-on-one meetings with private sector teams.

A qualitative risk register for the project was developed at a joint workshop with FHWA in October 2018. During the workshop the qualitative risk register was used as a basis for evaluation of risks during the CER and population of the risk register module within the model for threats and opportunities. A post-CER qualitative risk register was developed based on the collaboration and results of the CER. The qualitative risk register will continue to be a working document throughout project development and delivery. It will be updated at key milestones and at a minimum quarterly.

VDOT will remain responsible for routine operations and maintenance (O&M) and major maintenance of the entire facility which, upon completion of the Project, will be comprised of the existing HRBT, the new bridge and tunnel, and additional highway lanes. Efficiencies will be gained by having the entire facility responsibilities under the control of one entity rather than multiple entities.

8. RISK AND RESPONSE STRATEGIES

The project risks were rated on a scale of 1 to 5 in the areas of Probability of Impact, Cost Impact, and Schedule Impact with 1 being the lowest and 5 being the highest. The risks that had at least one rating greater than 1 that could impact the project are listed below in **Table 8**.

Table 8 – Project Risks

Risk Description Bold Text = Notes from FHWA CER Workshop	Mitigation (via FINAL Technical Requirements)
ROW	
Limited ROW width for new improvements and for construction activities, Properties with impact restrictions (Hampton U, Cemetery, Navy). Acquiring ROW and Easements from property owners a risk. May limit ability to replace bridges, cause work stoppage during construction, and delay project due to acquisition process.	Contractor may need to obtain temporary construction easements for staged construction with Hampton U, but will not be able to do so with Navy or Cemetery. Design must account for restrictions.
Potential sound barrier wall at Willoughby Bay may impact view-shed value. (If Noise Wall is not installed there is a cost savings to the Project.	If Sound Barriers Walls on the Willoughby Bay bridge structures are needed, residents will vote whether they want the SBW or not. If they want, then they are accepting the resulting view shed impacts.
Additional ROW to allow for stormwater / drainage needs beyond those identified in the FEIS/ROD.	Monitoring of SWM needs and implementation of innovative methods in lieu of large facilities that require additional ROW. Partnering with localities to develop SWM facilities to address water quality requirements. Can buy credits for quality.
Risk Description **Bold Text = Notes from FHWA CER Workshop**	**Mitigation (via FINAL Technical Requirements)**
Design	
Uncertainty in scope of existing bridge repairs could cause cost increases and schedule impacts to bridges and MOT.	TR shifts risk to DB. Base price to include cost to repair bridges to General Condition 7 for decks, substructure, and superstructure. Potential opportunity if repairs are later found unnecessary. Scoring allows for bridge replacement.
Delay to approval (or lack of approval) of Design Exceptions could cause delay to design process or require engineering solutions.	VDOT can obtain Design Exceptions shown in the Concept Plans in advance.
Concept Plans show IMRs needed at Bayville interchange (introduction of weave) and I-564 (new ramp). Delay to approval (or lack of approval) of IMRs could cause delay to design process or require engineering solutions.	Modifications requiring IMRs shown in Concept Plans. DB can mitigate delays through engineering solutions.

Risk Description Bold Text = Notes from FHWA CER Workshop	Mitigation (via FINAL Technical Requirements)
Utilities	
Risk of discovery of unknown utilities could delay design or construction depending upon time of discovery. Includes abandoned utilities unclaimed by utility owners.	VDOT has performed preliminary utility identification to identify major unknown utilities and listed separately. Unknowns encountered expected to be minor impacts.
Dominion Energy (Existing Substation & Transfer Relocation) - Risk of delays due to delayed installation/cutover/abandonment of utilities. Risk of delays to installation and connection for temporary TBM power.	Dominion to relocate; coordinate throughout design and construction. VDOT provided initial TBM load requirements and held utility coordination meeting with DBs. Need to have service available at launch pit by TBM arrival.
Third Party Utility Service / Relocations - Risk of delays due to delayed installation/cutover/abandonment of utilities.	Determine locations and plan relocation accordingly. Use utility approved designers and subcontractors
Discovery of unknown secret Government ("black") communications lines	Work with Navy and utility owners to determine locations
Public Utility Relocations and Betterments - Risk of delays due to extended approvals of relocations or delayed installation/ cutover/ abandonment of utilities. **(Combined with LC11 for FHWA Cost Estimate Review)**	Determine locations and plan relocation accordingly. Use utility approved designers and subcontractors
Delays to cutover and maintenance of power, water, communications on existing structures could delay MOT phase shifts and schedule.	Stage utility construction to ensure completion prior to demo of existing
Tropical/Severe weather events (locally, regionally, or national) could pull away utilities crews working on the project causing delays to utility relocations and overall schedule.	Require de-mobilization and extended delays by utility contractors to address weather event repairs under the utility companies cooperative agreement.
Risk Description **Bold Text = Notes from FHWA CER Workshop**	**Mitigation (via FINAL Technical Requirements)**
Third Party Stakeholders	
Risk that Cities, Hampton University, and US Navy will delay approval process for items under their review, (specifically landscape architecture or noise barriers) or seek architectural enhancements (e.g., bridges).	Address consensus building in Public/Community Outreach Plan; Landscape Arch. Treatments shall be coordinated with Locality
Virginia Maritime Association and Virginia Pilots Association coordination - risk of maintaining access to Hampton Roads Harbor for commercial and recreational boats. Could impact Coast Guard and Army Corps permits.	Address in TR's 14.3.1 and 14.3.2
Navy, USCG, and USACE coordination - Risk of maintaining adequate channel access	Address in TR's 14.3.1 and 14.3.2

Risk Description Bold Text = Notes from FHWA CER Workshop	Mitigation (via FINAL Technical Requirements)
Construction	
Weather delays for bored tunnel option and construction other than tunneling (e.g., ground improvements, island expansion, etc.). Potential for flooding excavations, including tunnel due to storm surge.	Weather Delays are not excusable or compensable per the Agreement. Risk is to schedule but is DB's to mitigate.- TRs require 100-yr elevation +2 ft. for SOE and 100-yr elevation +5 ft. for tunnel structure. DB is required to prevent flooding. Flood above baseline level is Force Majeure
Risk that TBM becomes "muck bound". Site or traffic conditions do not allow prompt removal of material which would cause tunnel excavation to slow or stop.	Provide sufficient storage on site.
Ground improvement for bored tunnel causes environmental contamination adding cost for remediation and schedule delay.	Ensure compliance with regulatory requirements and additives
Schedule delays due to TBM procurement and manufacture delays.	TBM procurement is complete risk of contractor. VDOT has variable LNTP levels to give DB NTP for TBM procurement after LNTP1 complete. TRs include TBM technical and certification requirements
Schedule delays due to tunnel liner segment production	Local precast plant set up for PTST likely to be low cost supplier for HRBTX. Quality Control will be established. Tight QC Requirements in TRs to avoid rejecting segments on-site.
Schedule delays due to breakdown of major TBM component	TRs to require state-of-the-art features for TBM.
Potential impact to existing or new islands when slope protection is removed during island expansion	TRs to state minimum design storm for temporary conditions
Potential damage to existing VDOT facilities in ROW and adjacent properties. Could cause cost for DB for repairs and delays.	TRs require ground movements and building damage assessments with limitations on damage risk and settlement limits
Coordination with other contractors within and adjacent to the project (specifically tolling contractor) leads to impact on cost and schedule	VDOT to maintain program schedule integrating the toll concession schedule and HRBT schedule.
Demolition of marine bridges will require cutting off of piles at seabed, leaving obstructions for construction of new bridges.	Proper design / design reviews with innovative designs to increase span length needs to be utilized to minimize potential conflict of new piles with existing piles
Risk Description **Bold Text = Notes from FHWA CER Workshop**	**Mitigation (via FINAL Technical Requirements)**
Environmental	
Risk of obtaining and maintaining Tunnel/Dredge material disposal sites	DB to identify approved upland disposal sites. DEQ familiar with requirements from PTST.
Schedule Risk due to Time of Year restrictions and missing windows (Sturgeon fall/early winter), (Anadromous fish spawning (Feb - June), (Oyster May - Sept)	Noise dampening may ease TOYR

Risk Description Bold Text = Notes from FHWA CER Workshop	Mitigation (via FINAL Technical Requirements)
Procurement/Contracting	
High DBE / SWaM participation requirements affect labor availability and project quality	Due to the complexity and size of the Project and other significant projects in the Hampton Roads region, this is a real risk to the Design-Builder. VDOT and DB should be working with the local communities to initiate job fairs, establish relationships with local and regional contractors and initiate a campaign to promote job growth, training and growth opportunities for local and regional labor force
Delay due to protest from unsuccessful team.	Under current State Law (PPTA Law), there is no protest mechanism. The unsuccessful bidder would have to bring a case in State Court against VDOT if they felt there was unfair practices in the procurement or a significant advantage given to the other Proposer. The current procurement is following appropriate, fair and balanced procurement processes and if maintained until award of the contract, should lead to a successful procurement.
Risk Description **Bold Text = Notes from FHWA CER Workshop**	**Mitigation (via FINAL Technical Requirements)**
Operations/Maintenance	
Construction, Integration, Testing, Commissioning conflict with VDOT Tunnel Operations	The current Contract Documents address TMP and specifically defines the Design-Builder's role for lane closures, detours, congestion mitigation and other traffic operational issues.
Limitations for access of First Responders (insufficient width for firetrucks, closed shoulders, etc.) could slow response times and cause Public Involvement issues. Political pressure could cause expensive modifications during the construction period.	TMP can mitigate by anticipating incident response needs. Review with first responders.
Traffic Operations - Construction friction impacts current congestion. Increased congestion could impact production rates, delivery of resources, or alter work plans. Work Zone Restrictions can impact traffic congestion.	The current Contract Documents address TMP and specifically defines the Design-Builder's role for lane closures, detours, congestion mitigation and other traffic operational issues.
Incident management requirements are clear in TRs, but level of effort needed to fulfill the requirements is dependent upon unknown number of incidents.	The current Contract Documents address TMP and specifically defines the Design-Builder's role for incident management within the construction limits.

Risk Description Bold Text = Notes from FHWA CER Workshop	Mitigation (via FINAL Technical Requirements)
Permits	
All permits, except VPDES, are Design-Builder's responsibility. Risk that Design-Build project team is unfamiliar with processing permits causing delays to permit approvals.	Both teams have partners with experience in Virginia.
Permitting issues, including JPA impact, the schedule for ground improvements, island expansion, bored tunnel installation (anticipated critical path). Delay to JPA approval - risk of slow permit approval from Corps/VMRC/DEQ/USCG; a greater number of resource impacts to be permitted; new species or species habitat being identified within the project area, especially if a special status species (state/federal threatened or endangered)	Increased engagement of VDOT departments and other stakeholders in drafting TRs before final RFP and preferably before draft RFP. Regulatory agencies more familiar with technology after Thimble Shoal Tunnel permit.
Permit approval delays. If permit reviews greater than 24 months, Delay Event.	Increased engagement of VDOT departments and other stakeholders in drafting TRs before final RFP and preferably before draft RFP. Regulatory agencies more familiar with technology after Thimble Shoal Tunnel permit.
Delay of NW6 and Section 408 Permit (Army Corp) for geotechnical investigations, could impact scope validation period	VDOT can help reduce this risk through advance engagement with stakeholders/agencies and by assisting Design-Builder through approvals process. DB can use VDOT application for geotech program as go-by for their applications.
Risk Description Bold Text = Notes from FHWA CER Workshop	**Mitigation (via FINAL Technical Requirements)**
Security	
Risk of changes to security requirements; i.e. increase in Homeland Security Advisory Level requiring additional security measures	Not anticipated. Force Majeure may apply for events that directly impact the project.
Navy Security Zone / Fence +20' - Risk of encroaching in security zone with design elements or physically during the work period (temp easements).	In TR Section 11 Security. DB likely to refine design to avoid security zone where possible.
CII, SSI clearance for contractor workforce - Availability of cleared workers. Unknown how logistics will be handled with deliveries, and cost/production impacts.	While a process exists, security requirements will exacerbate current labor constraints. Create a physical separation of work zones where possible on islands.

9. ANNUAL UPDATE CYCLE

The first annual update of the Financial Plan will be submitted by March 31, 2019 and will be based on a data date of December 31, 2018. Future annual updates will be submitted by March 31 of that year using a data date of December 31 of that year.

10. SUMMARY OF COST CHANGES SINCE LAST YEAR'S FINANCIAL PLAN

This section will be updated during the Annual Update. This section will include the changes that have reduced or increased the cost of the Project since last year's financial plan.

11. COST AND FUNDING TRENDS SINCE INITIAL FINANCIAL PLAN

This section will be updated during the Annual Update. This section will identify the trends that have impacted project cost and funding since the initial financial plan.

12. SUMMARY OF SCHEDULE CHANGES SINCE LAST YEAR'S FINANCIAL PLAN

This section will be updated during the Annual Update. This section will include a list of changes that have caused the completion date for the project to change since the last financial plan.

13. SCHEDULE TRENDS SINCE INITIAL FINANCIAL PLAN

This section will be updated during the Annual Update. This section will identify the trends that have impacted the project schedule since the initial financial plan.