



# **I-64 Southside Widening and High Rise Bridge**

## **Financial Plan Annual Update**

**September 30, 2019**

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C501, B662-B670, D637, D638  
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## EXECUTIVE SUMMARY

The I-64 Southside Widening and High Rise Bridge Project will improve capacity, enhance safety, and improve traffic operations along Interstate 64 in the City of Chesapeake beginning near Rotunda Avenue east of the I-264 interchange at Bowers Hill and ending east of the I-464 interchange. The project will also improve the ability of the corridor to function as a key emergency evacuation route. The project will be delivered in 2 phases – Phase 1 will widen the corridor from 4 lanes to 6 lanes, including construction of a new High Rise Bridge located south of the existing bridge; and Phase 2 will widen the corridor from 6 lanes to 8 lanes, including the replacement of the existing High Rise Bridge and modifications of the interchanges.

The I-64 Southside Widening and High Rise Bridge Phase 1 Project is underway and is being delivered as a design-build project. The design-build contractor selection process culminated in the Contract Award by the Commonwealth Transportation Board on October 24, 2017. The notice to proceed (NTP) was issued November 2017. Currently, the Design-Builder (DB) has obtained all the required permits for the project. The design phase is completed. The ROW phase is completed – all 19 parcels have been cleared for construction (some were cleared through certificates of take and are still in settlement negotiations). Construction started in August 2018 and is about 20% completed. The Phase 2 Project will be developed and constructed in the future.

The current total Phase 1 Project cost estimate is **\$524,613,765**. The project construction phase funding is comprised of SMART SCALE funds and Hampton Roads Transportation Accountability Commission (HRTAC) Hampton Roads Transportation Fund (HRTF) funds. The project right of way and preliminary engineering phases are funded entirely by HRTF.

### 1. PROJECT DESCRIPTION

The I-64 Southside Widening & High Rise Bridge Project is located on Interstate 64 in the City of Chesapeake beginning near Rotunda Avenue approximately 0.5 miles east of the I-264 interchange at Bowers Hill and ending approximately 1.0 miles east of the I-464 interchange. VDOT will deliver the I-64 Southside improvements as defined in the I-64 / High Rise Bridge Corridor Study and Draft Environmental Assessment (dated October 21, 2014) in two independent projects. The Phase 1 Project consists of widening the interstate from four lanes to six lanes as described below. The Phase 2 Project will be developed and constructed in the future and will consist of widening the interstate from six lanes to eight lanes. The Phase 1 Project will be the primary focus of this Financial Plan Update. Detailed project and financial information is provided for the Phase 1 Project throughout this document, whereas more generalized information is provided for the Phase 2 Project.

The Phase 1 Project includes widening of the existing interstate from 4 lanes to 6 lanes from the point east of the I-264 interchange where the existing lanes reduce from 6 lanes to 4 lanes to the point near I-464 where the existing lanes increase from 4 lanes to 6 lanes. The widening will accommodate one High Occupancy Toll (HOT) lane and two general purpose (GP) lanes, with an outside shoulder that can accommodate hard shoulder running in the eastbound direction; in the westbound direction the widening will accommodate one HOT lane and two general purpose lanes, with an outside shoulder that can accommodate hard shoulder running. The hard shoulder running in the eastbound and westbound directions will be roughly between George Washington Highway (Route 17) and Great Bridge Blvd (Route 190).

Phase 1 Project highlights include the following:

- Addition of one HOT lane in each direction on the median side of the existing interstate. HOT lanes would be available free of charge to high-occupancy vehicles (HOV 2+). Non-HOV 2+ vehicles could use the HOT lanes by paying a variable fee that is adjusted in response to travel demands.
- New high-level High Rise Bridge over the Elizabeth River with a fixed-span built to the south of the existing bridge. The new bridge will carry the three I-64 WB lanes and the existing bridge will be reconfigured to accommodate 1-way traffic (the I-64 EB lanes).

The Phase 1 Project is being delivered as a design-build project.

Highlights of the future Phase 2 Project include the following:

- Addition of one HOT lane in each direction.
- Replacement of the existing High Rise Bridge with a new high-level High Rise Bridge over the Elizabeth River with a fixed-span built on the same alignment as the existing bridge. The new Phase 2 bridge will carry the four I-64 EB lanes and the bridge built in Phase 1 will carry the I-64 WB lanes.
- Modifications to the I-264, Military Highway, Route 17, Route 190, and I-464 interchanges to accommodate the new widening and additional capacity.

### **History and Environmental Process**

Several transportation studies completed in the last 20 years highlighted the critical role that I-64 plays as part of the interstate system in the Hampton Roads region. A 1995 Hampton Roads Congestion Management System Planning Study recommended adding one General Purpose (GP) lane in each direction of I-64. Other notable studies conducted by VDOT (in 1996, 1997, 1999 and 2007) evaluated a range of alternatives for improving the capacity, geometric, safety and operational features of the corridor and the High Rise Bridge.

In March 2013 the Hampton Roads Long-Range Transportation Plan was amended to include an environmental study for the improvement of the Interstate I-64 corridor from I-464 to I-

664/264, including the High Rise Bridge. The purpose of the environmental study was to develop alternative solutions to address insufficient transportation capacity and correct roadway and bridge deficiencies throughout the corridor.

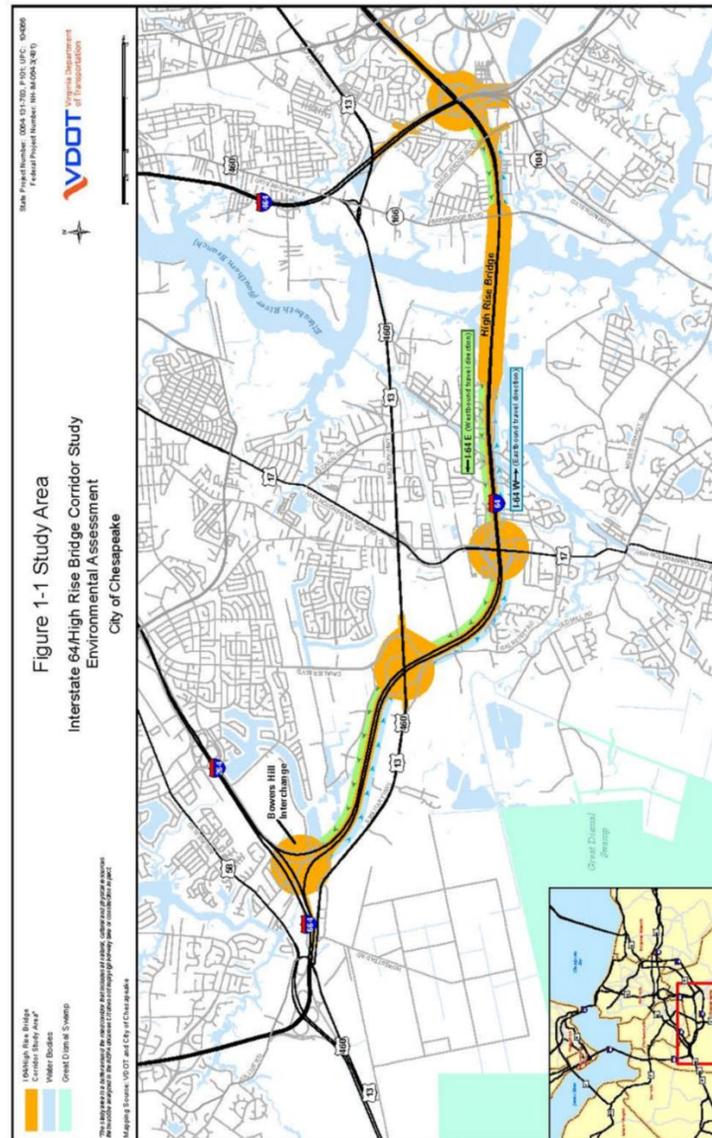
The study area for the 2013 I-64/High Rise Bridge Corridor Study was located in the southwestern quadrant of the Hampton Roads Beltway, which is formed by a loop of I-64 and I-664 (see **Figure 1**).



**Figure 1 – Location Map**

The corridor study area encompasses approximately eight miles of I-64, consisting of two travel lanes in each direction, between the I-464 Interchange and I-664/I-264 interchanges at Bowers Hill. This section of I-64 carries approximately 86,000 vehicles per day (2013), and it includes four interchanges at Route 13, Route 17, Route 190 (partial interchange), and I-464. The Treagle Memorial Bridge (High Rise Bridge), a mile-long bridge with a double-leaf bascule span across the Southern Branch of the Elizabeth River, also is included in the study area. The I-64/High Rise Bridge Corridor study area is shown in **Figure 2**.

Due to the loop that I-64 follows through the Hampton Roads region of Virginia, I-64 WB travels in an easterly direction and I-64 EB travels westerly through the study area. Throughout this document I-64 is described in terms of the road name and not the direction of the road.



**Figure 2 – Corridor Study Area**

In September 2013, a Citizen’s Information Meeting was held, the Environmental Assessment (EA) was approved by FHWA in October 2014, and a Location Public Hearing was held in November 2014. In March 2015 the Commonwealth Transportation Board (CTB) approved Candidate Build Alternative 2 – the addition of two managed lanes in each direction including the construction of a new bridge and replacement of the existing bridge – with a decision regarding the management option to be made at a later date. In its resolution, the CTB encouraged the Hampton Roads Transportation Planning Organization (HRTPO) and the Hampton Roads Transportation Accountability Commission (HRTAC) to work with VDOT to

identify funding for inclusion in the HRTPO planning documents and to determine the appropriate management option(s) for the corridor.

On July 15, 2015 VDOT submitted a Revised Environmental Assessment (REA) to FHWA. Due to lack of fiscal constraint documented in the Hampton Roads Long Range Transportation Plan, FHWA was unable to issue a Finding of No Significant Impact (FONSI) that would have completed the study process and allowed the project to advance to detailed design and procurement. Subsequently in the same month, VDOT embarked on a phasing study to determine how best to deliver the project in operationally independent phases. VDOT evaluated cost and schedule risks with the phased construction approach that would enable construction to begin on the I-64 High-Rise Bridge. The Hampton Roads Transportation Planning Organization endorsed the study's findings and made the decision to build the project in two phases:

- Phase 1 Project: Will widen the corridor from 4 lanes to 6 lanes, including the construction of the new bridge located south of the existing bridge.
- Phase 2 Project: Will widen the corridor from 6 lanes to 8 lanes in the future, including the replacement of the existing High Rise Bridge and the necessary interchange work to properly tie-in to the widened facility.

### **Preliminary Design and Design-Build Procurement**

In February 2016, VDOT started development of a design-build contract for the Phase 1 Project, which would become known as the **I-64 Southside Widening and High Rise Bridge Phase 1 Project**. **As mentioned above, the Phase 1 Project is the focus of this Financial Plan Update.** It is an operationally independent phase of the overall final build described in the EA, which can operate effectively until the Phase 2 Project is built in the future. The Hampton Roads Transportation Accountability Commission allocated right-of-way and construction funding for the project at its June 16, 2016 Regular Meeting.

A Revised Environmental Assessment (REA), to include the project phasing, was completed in July 2016, and on August 22, 2016, the Federal Highway Administration issued a FONSI for the entire project. This concluded the National Environmental Policy Act process and allowed the project to be advanced to more detailed levels of design.

The Request for Qualifications (RFQs) from design-build contractors for the Phase 1 Project was issued in August 2016. The Request for Proposals (RFPs) from qualified design-build contractors who were short-listed was issued in December 2016. The selection process for the design-build contractor was completed in September 2017. The Contract was awarded in October 2017 and the notice to proceed (NTP) for the design-build contractor was issued in November 2017. The final construction completion date is scheduled for July 30, 2021.

### Detailed Scope of the Phase 1 Project

The scope of work for the Phase 1 Project includes, but is not limited to: (a) completing project development activities; (b) developing the final design; (c) acquiring all environmental permits, regulatory approvals, implementing environmental commitments from NEPA documents and ROD; (d) acquiring the US Coast Guard permit for the new High Rise Bridge; (e) acquiring right-of-way; (f) identifying and performing and/or coordinating all required utility relocations and adjustments; (g) coordinating and obtaining required permissions for railroad impacts and agreements; (h) performing roadway, bridge, structures, tolling and operations construction; (i) demolition and removal of existing structures as needed; (j) providing quality assurance and quality control for the project; (k) providing overall project management. The detailed scope is defined in the contract documents and other project agreements.

The proposed improvements include, but are not limited to: a new fixed-span High Rise Bridge south of the existing bridge with 100-foot vertical clearance over the Elizabeth River; realignment of the existing westbound I-64 lanes immediately adjacent to the new High Rise Bridge; sound barrier walls; asphalt overlay over the existing pavement; the addition of new asphalt or concrete 12-foot-wide travel lanes with 4-foot buffers and shoulders west of the High Rise Bridge; the addition of new asphalt 12-foot-wide travel lanes with 4-foot buffers and shoulder east of the High Rise Bridge; emergency pull-offs within the limits of hard shoulder running; replacement of the overpass bridge at Great Bridge Boulevard with a parallel bridge and associated realignment of Great Bridge Boulevard; widening of 6 existing I-64 bridges over Military Highway, Yadkin Road and Shell Road; extension of 2 box culverts and 14 pipe culverts; reconfiguration of traffic control devices on the existing High Rise Bridge to accommodate one-way traffic; installation of storm drain pipes and stormwater management facilities; civil infrastructure for the new HOT lanes; and Intelligent Transportation Systems (ITS). Widening of the existing roadway and bridges is expected to occur mostly in the median of the existing interstate, avoiding impacts to existing interchanges and minimizing impacts to right-of-way.

The general scope of the Phase 1 Project is shown graphically in **Figure 3**. A project website has been established and is available at the following link - [www.64highrise.org](http://www.64highrise.org).

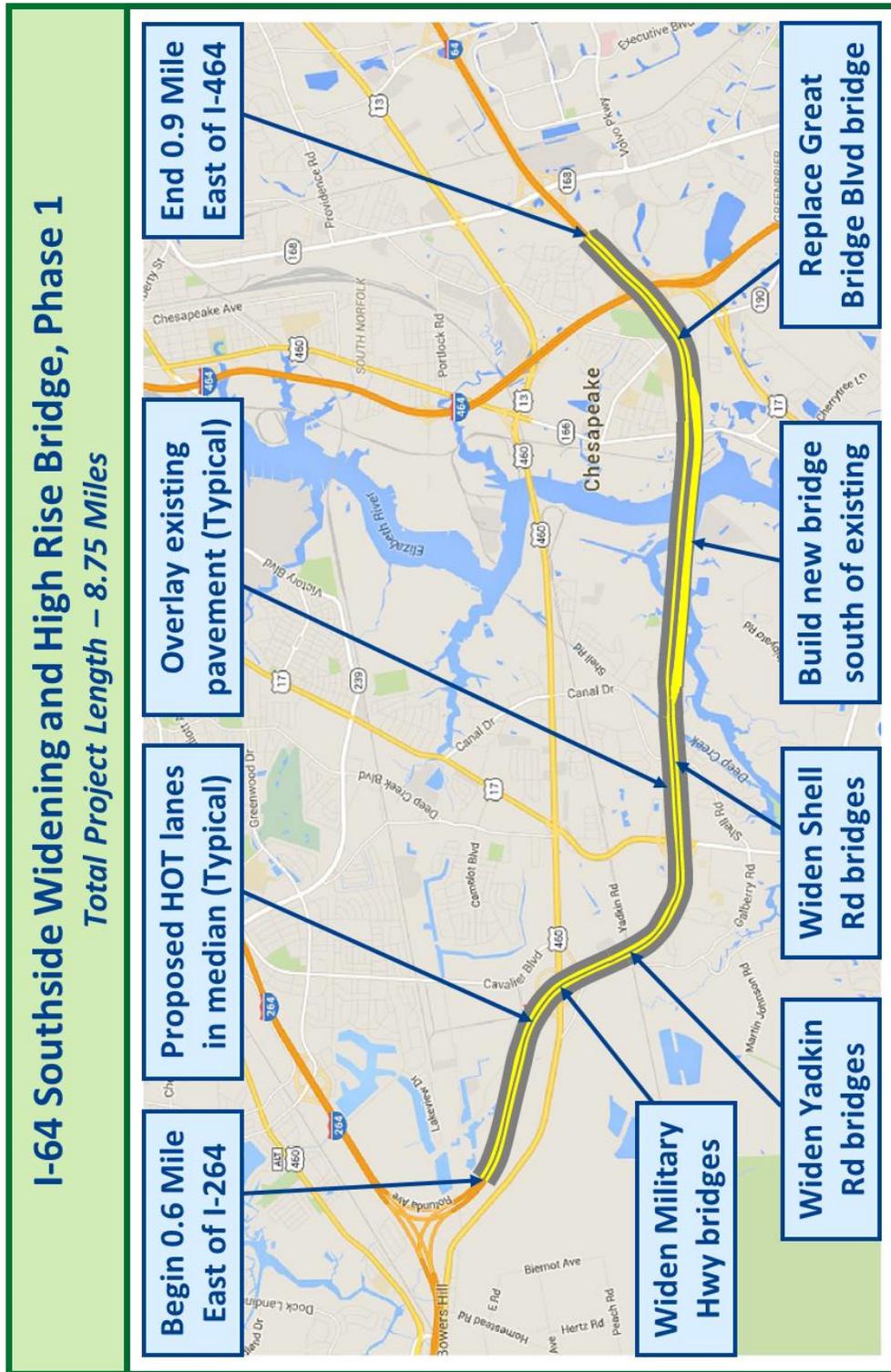


Figure 3 – General Scope of Phase 1 Project

## 2. SCHEDULE

As mentioned above, the design-build contract development and procurement phase of the Phase 1 Project commenced in February 2016, and included the preliminary design, RFQ, RFP, and Design-Builder selection and contracting activities. The design-build phase of the project began in November 2017 with the Design-Builder Notice to Proceed (NTP), and will end in July 2021 with the project completion. Of note for this update is the High Rise Bridge construction schedule which was accelerated to begin in August 2018 instead of February 2019. A project schedule showing key activities, major milestones and updated bridge construction schedule for the Phase 1 Project is presented in **Figure 4**.

A detailed delivery schedule for the Phase 2 Project is presently not certain and, therefore, its activities are not included in Figure 4. However, the Hampton Roads Transportation Planning Organization (HRTPO) has identified the Phase 2 Project in its 2040 Financially Constrained Long-Range Plan. For the purposes of this Financial Plan Update, a mid-point construction year of 2030 is assumed, which corresponds to approximate project start and final completion dates of July 2028 and July 2032, respectively.

| UPC 106892<br>Activity            | Dates     |           | 2016 |   |   | 2017 |   |   | 2018 |   |   | 2019 |   |   | 2020 |   |   | 2021 |   |   |
|-----------------------------------|-----------|-----------|------|---|---|------|---|---|------|---|---|------|---|---|------|---|---|------|---|---|
|                                   | Start     | Finish    | J    | F | M | J    | F | M | J    | F | M | J    | F | M | J    | F | M | J    | F | M |
| NTP with Contract Development     | 19-Oct-17 | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Preliminary Design                | 17-Nov-17 | 9-Dec-16  |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Advertise RFO                     | 16-Aug-16 | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Prepare RFP                       | 1-Sep-16  | 14-Dec-16 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Receive Statements of Quals       | 13-Oct-16 | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Design Public Hearing             | 28-Oct-16 | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Shortlist Notification            | 28-Nov-16 | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Design Approval                   | 19-Dec-16 | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Issue RFP to Shortlisted Offerors | 14-Dec-16 | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Refine RFP - Prop/ATC Mngs        | 10-Jan-17 | 18-Jul-17 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Issue Last RFP Addendum           | 10-Jul-17 | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Receive Technical Proposals       | 8-Aug-17  | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Receive Price Proposals           | 8-Sep-17  | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| CTB Approval / Notice to Award    | 23-Oct-17 | ---       |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Design-Builder Notice to Proceed  | 17-Nov-17 | 22-Nov-18 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Design                            | 17-Nov-17 | 18-Nov-18 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Environmental Permits/Approvals   | 17-Nov-17 | 18-Nov-18 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Coast Guard Permit/Approval       | 1-Dec-17  | 12-Feb-19 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Right of Way Acquisition          | 13-Apr-18 | 27-Feb-19 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Utility Relocation                | 13-Apr-18 | 23-Aug-18 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Roadway Construction              | 14-Jan-19 | 30-May-21 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| High Rise Bridge Construction     | 15-Aug-18 | 24-Nov-20 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |
| Final Project Completion          | ---       | 30-Jul-21 |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |      |   |   |

Figure 4 – Phase 1 Project Schedule

### 3. PROJECT COST

#### Original Engineer’s Estimate

The Initial Financial Plan used a Data Date of June 19, 2017 and a corresponding engineer’s cost estimate for the Phase 1 Project of **\$599,856,096**. This cost estimate was based on the final RFP and RFP conceptual plans. It included costs for preliminary engineering, right of way acquisition, utility relocations, VDOT construction oversight and management, public communications, external 3<sup>rd</sup> party work, final design and construction (Design-Builder cost), contingencies, escalation, and early completion incentive. The engineer’s cost estimate is shown in **Table 1**, which depicts the VDOT Alternative Project Delivery (APD) Cost Finance Summary for the project.

**Table 1 – Total Engineer’s Cost Estimate for Phase 1 Project**

**Cost Finance Summary**

I-64 Southside Widening and High Rise Bridge, Phase 1  
UPC 106692

19-Jun-17  
Prepared by Rick Correa

|  | Expended to Date    | PE - including Stipend | VDOT Oversight & Review - CEI | R/W & UT, Direct Costs | Design/Build Costs    | Contingency (10%)    | TOTAL (Less Contingency) |
|--|---------------------|------------------------|-------------------------------|------------------------|-----------------------|----------------------|--------------------------|
| <b>Preliminary Engineering</b>                         |                     |                        |                               |                        |                       |                      |                          |
| Conceptual Roadway/Bridge Design (Consultant & VDOT)   | \$ 9,645,006        | \$ 354,994             |                               |                        |                       |                      |                          |
| Procurement of D/B (Add'l services not included above) |                     | \$ 200,000             |                               |                        |                       |                      |                          |
| Stipend/Pre-Proposal Activities                        |                     | \$ 950,000             |                               |                        |                       |                      |                          |
| <b>Design Subtotal</b>                                 | <b>\$ 9,645,006</b> | <b>\$ 1,504,994</b>    |                               |                        |                       |                      | <b>\$ 11,150,000</b>     |
| <b>Right of Way &amp; Utilities</b>                    |                     |                        |                               |                        |                       |                      |                          |
| RW Admin   |                     |                        |                               | \$ 50,000              |                       |                      |                          |
| RW Allowance   |                     |                        |                               | \$ 13,563,433          |                       |                      |                          |
| UT Admin   |                     |                        |                               | \$ 50,000              |                       |                      |                          |
| UT PreAward Cost (DVP Transmission Line Relocation)    |                     |                        |                               | \$ 4,637,149           |                       |                      |                          |
| Norfolk Southern Railroad Force Account                |                     |                        |                               | \$ 275,011             |                       |                      |                          |
| Norfolk And Portsmouth Beltline Force Account          |                     |                        |                               | \$ 150,000             |                       |                      |                          |
| <b>RW &amp; UT Subtotal</b>                            |                     |                        | <b>\$ -</b>                   | <b>\$ 18,725,593</b>   | <b>\$ -</b>           |                      | <b>\$ 18,725,593</b>     |
| <b>Construction</b>                                    |                     |                        |                               |                        |                       |                      |                          |
| Final Design (By Dber)                                 |                     |                        |                               |                        | \$ 19,472,919         |                      |                          |
| Mobilization   |                     |                        |                               |                        | \$ 16,919,610         |                      |                          |
| Environmental Permitting                               |                     |                        |                               |                        | \$ 500,000            |                      |                          |
| RW Admin   |                     |                        |                               |                        | \$ 250,000            |                      |                          |
| UT Admin   |                     |                        |                               |                        | \$ 250,000            |                      |                          |
| Utilities  |                     |                        |                               |                        | \$ 7,064,090          |                      |                          |
| Public Communications Plan                             |                     |                        |                               |                        | \$ 1,000,000          |                      |                          |
| Constr./Project Management/Design Review               |                     |                        | \$ 11,683,752                 |                        |                       |                      |                          |
| Early Completion Incentive                             |                     |                        | \$ 9,600,000                  |                        |                       |                      |                          |
| State Police   |                     |                        | \$ 1,040,000                  |                        |                       |                      |                          |
| Construction - Bridges                                 |                     |                        |                               |                        | \$ 207,893,674        |                      |                          |
| Construction - Roadway                                 |                     |                        |                               |                        | \$ 164,645,105        |                      |                          |
| QA/CIP (2% for VDOT; 7.5% for Dber)                    |                     |                        | \$ 7,789,168                  |                        | \$ 29,209,379         |                      |                          |
| <b>Subtotal</b>  |                     |                        | <b>\$ 30,112,919</b>          |                        | <b>\$ 447,204,778</b> | <b>\$ 44,720,478</b> | <b>\$ 477,317,698</b>    |
| <b>Design-Build Risk (5%)</b>                          |                     |                        |                               |                        | <b>\$ 19,472,919</b>  |                      | <b>\$ 19,472,919</b>     |
| <b>Price Adjustments - Fuel, Asphalt, Steel (2.5%)</b> |                     |                        |                               |                        | <b>\$ 9,736,460</b>   |                      | <b>\$ 9,736,460</b>      |
| <b>2018 Ad/Mid Year Inflation (4.81% - From PCES)</b>  |                     |                        |                               |                        | <b>\$ 18,732,949</b>  |                      | <b>\$ 18,732,949</b>     |
| <b>TOTAL</b>   | <b>\$ 9,645,006</b> | <b>\$ 1,504,994</b>    | <b>\$ 30,112,919</b>          | <b>\$ 18,725,593</b>   | <b>\$ 495,147,106</b> | <b>\$ 44,720,478</b> | <b>\$ 555,135,618</b>    |

VDOT Oversight Percentage: 8.3%

Total Cost With Contingency \$599,856,096

**BREAKOUT**

|                         |                      |    |
|-------------------------|----------------------|----|
| Design Builders Bid     | \$495,147,106        | CN |
| Contingency             | \$44,720,478         |    |
| State Police            | \$1,040,000          |    |
| CEI (VDOT ONLY)         | \$29,072,919         |    |
| RW & UT                 | \$18,725,593         | RW |
| PE, including Stipend & | \$11,150,000         | PE |
| <b>Total</b>            | <b>\$599,856,096</b> |    |

The current programming-level cost estimate for the future Phase 2 Project is \$1.4 Billion. The Hampton Roads Transportation Accountability Commission (HRTAC) initially allocated \$600 Million for the Phase 1 Project and \$1.4 Billion for the Phase 2 Project. These allocations are reflected in HRTPO’s 2040 Financially Constrained Long-Range Plan.

The funding and financing of the Phase 1 Project is managed under three UPCs in iSYP. UPC 106692 is the “parent” UPC for the project and is used to track and bill the HRTAC allocations on the project; UPC 108990 (a “child” UPC) was set up to track the \$92.7 million of GARVEE bond proceeds that were applied to the project; and UPC 111982 is the corresponding GARVEE debt service project.

### Cost Estimate Review (CER) Results

A Consultant-Led CER workshop was conducted on August 9 and 10, 2017. 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 CER was performed for the entire project, which includes both the Phase 1 and 2 projects.

The risk registers for the Phases 1 and 2 projects were updated prior to the workshop. During the workshop, 18 major risk items were modeled in the *@risk* software for the Phase 1 Project, and a base variability of plus or minus seven percent was added. Because the Phase 2 design has only been developed to a programming level, only one risk (construction contingency) was modeled for the Phase 2 Project.

FHWA requires development of the Year-of-Expenditure (YOE) results at the 70<sup>th</sup> percentile (P70) as well as a range of probable project costs from 10% to 100% confidence levels based on the various risks evaluated. During the workshop, the following results were determined for FHWA CER purposes:

- Total Project Cost – Phase 1 YOE P70           \$ 558M
- Total Project Cost – Phase 2 YOE P70           \$2.483B
- Overall Project Cost                               \$3.041B

The cost probability forecast demonstrated that VDOT’s engineer’s estimate for the Phase 1 Project was within a reasonable range. The Phase 2 Project costs were expected to have high variability due to uncertainty in design, delivery date and economic variables. Phase 2 risks and assumptions will be re-evaluated as that project develops.

A summary of the cost estimate used in the CER broken down by cost elements as defined in the FHWA Major Project Guidance is given in **Table 2**. The costs in the table reflect the “Pre-CER Cost Estimate” that was evaluated in the CER to calculate the YOE P70 cost.

**Table 2 – Pre-CER Cost Estimate**

| FHWA<br>Cost<br>Element | MAJOR PROJECTS GUIDANCE                   | TOTALS          |
|-------------------------|---|-----------------|
|                         | PROGRAM COST ELEMENT                      | (Millions)      |
| 1                       | PRELIMINARY ENGINEERING                   | \$32.72         |
| 2                       | RIGHT-OF-WAY                              | \$13.31         |
| 3                       | EXTERNAL THIRD PARTY                      | \$7.40          |
| 4                       | TRANSPORTATION DEMAND MANAGEMENT (TDM)    | \$11.29         |
| 5                       | CONSTRUCTION ESTIMATE                     | \$412.27        |
| 6                       | CONSTRUCTION CONTINGENCY                  | \$68.16         |
| 7                       | CONSTRUCTION ADMINISTRATION               | \$51.43         |
| 8                       | PUBLIC OUTREACH                           | \$1.00          |
|                         | <b>MAJOR PROJECTS COST ESTIMATE TOTAL</b> | <b>\$597.58</b> |

### Cost Estimating Methodology

The engineer’s cost estimate for the project focused on eight major areas: Demolition, Roadway & Incidentals, Drainage, Structures, Traffic, Right of Way, Utilities, and Administration. A description of the approach for these major areas is included below:

- **Demolition:** Most non-structural demolition items are not included in PCES tool. Therefore, the quantities and units costs were determined for: demolition of pavement, guardrail removal, drainage removal, overhead sign and lighting removal, milling, and in-plan utility demolition. Removal and disposal of bridge elements are accounted for in the PCES tool.
- **Roadway & Incidentals:** Paving and general grading are accounted for in the PCES tool and assume relatively balanced earthwork and guardrail for less than 5% of the project length. Quantities and unit costs were determined for: earthwork beyond 10% of balance, guardrail in excess of 5% of the project length, permanent concrete barrier, fencing, soundwalls as shown in the Environmental Assessment (EA), reconstructed pavement and overlays.
- **Drainage:** General drainage and erosion & sediment control items are accounted for in the PCES tool. Quantities and units costs were determined for: culverts and pipes greater than 60” in diameter or 20 sf of opening. The number of potential stormwater management facilities was determined that may be needed based on the affected pavement and a cost per facility was estimated. Major outfalls were assumed to require riprap outfall protection. Quantities and unit costs were developed for the outfalls and locations where scour protection is assumed to be needed. Wetland/stream mitigation costs were estimated based on unit costs for mitigation credits at a 2:1 ratio for impacted wetlands and streams.

- Structures: The PCES tool allows entering up to 24 separate bridges. Quantities and unit costs were developed for items not included in the PCES tool such as: approach slabs, retaining walls, and bridge rehabilitation. Costs were also assessed for complex aspects such as height, use of coffer dams, drilled shafts, and access restrictions.
- Traffic: The PCES tool accounts for pavement markings, ground mounted signage, lighting and temporary traffic control and channelization during construction. Quantities and unit costs were developed for overhead signs, major ITS and toll collection components/equipment.
- Right of Way: The right of way worksheet in the PCES tool was used. Based on preliminary construction limits the number of impacted parcels and impacted areas were determined. The PCES unit costs were compared with local unit costs developed based on comparable sales data and the higher of the two unit costs were used. A general assessment was made of potential relocations and damages for input to the tool. A 50% contingency was applied based on FHWA practices for this level of estimate.
- Utilities: Based on existing utility records, potential utilities impacted by the construction were assessed. Potentially impacted water and sanitary lines were assumed to be in-plan. The impacted length multiplied by a factor of 1.5 was entered in the PCES tool to account for rerouting, fittings and appurtenances. Unit costs for other potentially impacted utilities were developed. The impacted length was used as the quantity and a factor of 1.5 was applied to account for rerouting of the utility. No assessment of easements was performed.
- Administration: The PCES tool computes costs for Preliminary Engineering (PE) and Construction Administration costs based on historical percentages. The PE estimate was increased by 10% to account for additional complexity and delivery method. A contingency of 10% of construction cost was used to account for the level of detail and unknowns. For the design/build delivery approach a margin cost of 7.5% of construction cost will be added to account for contractor risk assumptions.

### Summary of VDOT Cost Estimate and Expenditures

The cost estimate of the Phase 1 Project as programmed in the VDOT iPM system was updated in March 2018 to include the contract award amount and resulted in the cost estimate of the project to be reduced by \$75,386,235 (see **Table 3** below).

**Table 3 – Cost Estimate of Phase 1 Project**

| Phase        | Initial Estimate     | Current Estimate     |
|--------------|----------------------|----------------------|
| PE           | \$20,000,000         | \$12,200,000         |
| RW           | \$42,000,000         | \$18,726,000         |
| CN           | \$538,000,000        | \$493,687,765        |
| <b>TOTAL</b> | <b>\$600,000,000</b> | <b>\$524,613,765</b> |



and the remaining costs-to-complete. The table depicts the project expenditures as of June 19, 2017 (from the Initial Financial Plan), expenditures as of June 30, 2018 (from the 2018 Financial Plan Update), and expenditures as of June 30, 2019 (the Data Date for this Financial Plan Update).

**Table 5 – Phase 1 Project Costs by Project Phase**

| Phase | Estimate/Budget | Expenditures as of 6/19/2017 | Expenditures as of 6/30/2018 | Expenditures as of 6/30/2019 | Balance to Complete   |
|-------|-----------------|------------------------------|------------------------------|------------------------------|-----------------------|
| PE    | \$12,200,000    | \$9,645,006                  | \$12,189,098                 | \$12,204,771                 | -\$4,771 <sup>1</sup> |
| RW    | \$18,726,000    | \$0                          | \$140,032                    | \$8,732,063                  | \$9,993,937           |
| CN    | \$493,687,765   | \$0                          | \$44,789,374                 | \$119,124,917                | \$374,562,848         |
| TOTAL | \$524,613,765   | \$9,645,006                  | \$57,118,504                 | \$140,061,751                | \$384,552,014         |

#### 4. PROJECT FUNDS

The “I-64/High Rise Bridge Project” was identified as one of the Hampton Roads Regional Priority Projects by HRTAC and HRTPO in March 2013. On April 16, 2015, HRTAC executed an Interim Project Agreement for Funding and Administration with VDOT which authorized \$20,000,000 of funding in support of this project. On November 9, 2016, a Standard Project Agreement between VDOT and HRTAC was executed authorizing the remaining \$580,000,000 of funding for the Phase 1 Project. The contract assumes that HRTAC would fund costs out of the Hampton Roads Transportation Fund (HRTF) on a “pay as you go” basis. That approach is consistent with the initial funding plan approved by HRTAC.

On July 21, 2016 HRTPO approved the 2040 Long-Range Transportation Plan. The plan identified both the Phase 1 and Phase 2 Projects related to the I-64/High Rise Bridge Project as “Regional Priority Projects”, and both projects were shown fully funded by the HRTF.

The initial financial plan included \$700 million of total funding allocated to the project. Since the initial financial plan, the HRTPO processed a Transportation Improvement Plan (TIP) amendment in their September 2017 meeting to reallocate \$100 million of HRTF funds, which reduced total allocations to \$600 million - \$500 million from the HRTF and \$100 million from SMART SCALE funds. In March 2018, the HRTF funds were further reduced by \$68,043,780 when the contract award amount was less than estimated. Similarly, the SMART SCALE funds were reduced by \$7,342,455. The source of funds provided as a result of the SMART SCALE selection process is GARVEE bond proceeds.

Funding currently allocated to the Phase 1 Project is summarized in **Table 6** by fund source and year.

<sup>1</sup> Excess expenditures were incorrectly charged to PE phase and will be moved to CN phase via journal voucher.

**Table 6 – Summary of Funding by Source and Year**

| Funding Source  | Fiscal Year          |                      |                     | TOTAL                |
|---|----------------------|----------------------|---------------------|----------------------|
|   | Previous             | 2020                 | 2021                |                      |
| HB1887-HPP(2): GARVEE - High Priority<br>(Project UPC 108990) | \$57,601,924         | \$35,055,621         | \$0                 | \$92,657,545         |
| HRTAC Funds<br>(Project UPC 106692)                           | \$191,324,076        | \$161,520,773        | \$79,111,371        | \$431,956,220        |
| <b>TOTAL</b>  | <b>\$248,926,000</b> | <b>\$196,576,394</b> | <b>\$79,111,371</b> | <b>\$524,613,765</b> |

### Federal Fund Sources and Special Funding Techniques

The HRTPO has included all phases of the project in its Long Range Transportation Plan. The PE, RW and CN phases of the project are included in HRTPO’s TIP as well as the Commonwealth’s FFY15-18 STIP. The HRTPO processed a TIP amendment at their September 2017 meeting to update planned obligations on the project which includes planned debt service obligations for principal associated with the GARVEE Bond proceeds; additionally, the HRTPO processed a TIP amendment to add GARVEE Debt Service project UPC 111982 which includes planned debt service obligations for interest associated with the GARVEE Bond proceeds allocated to the project.

Preliminary engineering associated with this project was authorized by the Federal Highway Administration (FHWA) on May 12, 2015 under federal project number 0643488. The authorization did not include any federal funds.

Right of way and construction were authorized on October 26, 2017, and debt service was authorized on October 31, 2017 under the same federal project number 0643488, with debt service obligations totaling \$5.4 million and advance construction (AC) totaling \$566.4 million.

Detailed information concerning federal fund sources and special funding techniques associated with the project authorization is provided in **Table 7** below. Any needed adjustments or modifications to the federal authorization are made annually, typically in the October timeframe, as part of the GARVEE debt service review process.

**Table 7 – Project Authorization Details as of June 30, 2019**

| Federal Project Number 0643488<br>UPC 106692, 108890, and 111982*<br>PE, RW, and CN  |                      |                         |                      |                    |
|--|----------------------|-------------------------|----------------------|--------------------|
| Program Code   | Total Cost           | Federal Funds Obligated | AC                   | Soft Match         |
| M001   | \$12,200,000         | \$0                     | \$9,760,000          | \$0                |
| Z001   | \$546,295,228        | \$10,330,869            | \$534,924,359        | \$2,066,174        |
| <b>TOTAL</b>   | <b>\$558,495,228</b> | <b>\$10,330,869</b>     | <b>\$544,684,359</b> | <b>\$2,066,174</b> |
| *UPC 111982 – GARVEE debt service UPC associated with project<br>UPC 108990 established to allow for billing of HRTF allocations |                      |                         |                      |                    |

## 5. FINANCING ISSUES

The original SMART SCALE application award included \$100 Million of GARVEE bonds. Due to the reduction in project cost, the GARVEE bonds were reduced to \$92,657,545. VDOT will be issuing GARVEE Bonds over the five years to fund its obligation to the project. Based on the current spend plan shown in **Table 8** below, GARVEE bond proceeds will be available with no financing issues anticipated at this time. 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. **Table 8** shows that 17% of the funding will be VDOT/Federal and 83% will be HRTAC funding.

**Table 8 – Project RW/CN Spend Plan**

| Funding Source | Fiscal Year         |                     |                      |                      | TOTAL                |
|----------------|---------------------|---------------------|----------------------|----------------------|----------------------|
|                | 2018                | 2019                | 2020                 | 2021 & 2022          |                      |
| VDOT/Federal   | \$50,217,801        | \$3,154,728         | \$37,416,652         | \$1,868,364          | \$92,657,545         |
| HRTAC          | \$32,651,209        | \$31,161,048        | \$217,832,996        | \$150,310,967        | \$431,956,220        |
| <b>TOTAL</b>   | <b>\$82,869,010</b> | <b>\$34,315,776</b> | <b>\$255,249,648</b> | <b>\$152,179,331</b> | <b>\$524,613,765</b> |

The estimated financing costs associated with the GARVEE bonds issued to the project are shown in **Table 9**. Adding the \$33,525,841 financing cost to the overall project cost of \$524,613,765 results in a total cost to the Department of \$558,139,606.

**Table 9 – Cost of Financing**

| <b>Date</b>  | <b>Principal</b>    | <b>Interest</b>     | <b>Debt Service</b>  |
|--------------|---------------------|---------------------|----------------------|
| 3/15/2018    | \$524,348           | \$563,272           | \$1,087,620          |
| 9/15/2018    | \$976,664           | \$1,021,472         | \$1,998,136          |
| 3/15/2019    | \$1,506,712         | \$1,525,036         | \$3,031,748          |
| 9/15/2019    | \$1,946,459         | \$1,909,751         | \$3,856,210          |
| 3/15/2020    | \$1,995,102         | \$1,861,089         | \$3,856,191          |
| 9/15/2020    | \$2,047,384         | \$1,811,212         | \$3,858,596          |
| 3/15/2021    | \$2,098,146         | \$1,760,027         | \$3,858,173          |
| 9/15/2021    | \$2,151,488         | \$1,707,574         | \$3,859,062          |
| 3/15/2022    | \$2,202,249         | \$1,653,787         | \$3,856,036          |
| 9/15/2022    | \$2,260,290         | \$1,598,731         | \$3,859,021          |
| 3/15/2023    | \$2,315,750         | \$1,542,223         | \$3,857,973          |
| 9/15/2023    | \$2,374,850         | \$1,484,329         | \$3,859,179          |
| 3/15/2024    | \$2,431,369         | \$1,424,958         | \$3,856,327          |
| 9/15/2024    | \$2,494,108         | \$1,364,174         | \$3,858,282          |
| 3/15/2025    | \$2,555,326         | \$1,301,821         | \$3,857,147          |
| 9/15/2025    | \$2,620,184         | \$1,237,938         | \$3,858,122          |
| 3/15/2026    | \$2,686,101         | \$1,172,434         | \$3,858,535          |
| 9/15/2026    | \$2,752,017         | \$1,105,281         | \$3,857,298          |
| 3/15/2027    | \$2,821,573         | \$1,036,480         | \$3,858,053          |
| 9/15/2027    | \$2,892,189         | \$965,941           | \$3,858,130          |
| 3/15/2028    | \$2,963,864         | \$893,636           | \$3,857,500          |
| 9/15/2028    | \$3,039,177         | \$819,540           | \$3,858,717          |
| 3/15/2029    | \$3,112,970         | \$743,561           | \$3,856,531          |
| 9/15/2029    | \$3,192,984         | \$665,736           | \$3,858,720          |
| 3/15/2030    | \$3,270,416         | \$585,912           | \$3,856,328          |
| 9/15/2030    | \$3,352,547         | \$504,152           | \$3,856,699          |
| 3/15/2031    | \$3,437,259         | \$420,338           | \$3,857,597          |
| 9/15/2031    | \$3,524,088         | \$334,406           | \$3,858,494          |
| 3/15/2032    | \$3,611,977         | \$246,304           | \$3,858,281          |
| 9/15/2032    | \$3,700,926         | \$156,004           | \$3,856,930          |
| 3/15/2033    | \$1,787,954         | \$72,241            | \$1,860,195          |
| 9/15/2033    | \$1,824,074         | \$36,481            | \$1,860,555          |
| <b>TOTAL</b> | <b>\$80,470,545</b> | <b>\$33,525,841</b> | <b>\$113,996,386</b> |

## 6. CASH FLOW

The Phase 1 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 10**. It shows the comparison of previous and projected expenditures by fiscal year against the total annual allocations. The table will be updated annually as expenditures are incurred. The allocations in the table reflect the total allocations in the approved VDOT FY2020-2025 SYIP<sup>2</sup>.

**Table 10 – Cash Flow Analysis for Phase 1 Project**

| Activity                  |              |               |               |               |               | TOTAL         |
|---------------------------|--------------|---------------|---------------|---------------|---------------|---------------|
|                           | Previous     | 2019          | 2020          | 2021          | 2022          |               |
| Annual Expenditures - PE  | \$12,200,000 | \$4,771       | \$0           | \$0           | \$0           | \$12,204,771  |
| Annual Expenditures - RW  | \$1,560,500  | \$7,171,563   | \$9,993,937   | \$0           | \$0           | \$18,726,000  |
| Annual Expenditures - CN  | \$69,108,510 | \$50,016,407  | \$236,754,081 | \$110,872,028 | \$26,931,968  | \$493,682,994 |
| Total Annual Expenditures | \$82,869,010 | \$57,192,741  | \$246,748,018 | \$110,872,028 | \$26,931,968  |               |
| Cumulative Expenditures   | \$82,869,010 | \$140,061,751 | \$386,809,769 | \$497,681,797 | \$524,613,765 | \$524,613,765 |
| Annual Allocations        | \$82,869,010 | \$165,824,111 | \$198,937,422 | \$65,252,869  | \$11,730,353  |               |
| Cumulative Allocations    | \$82,869,010 | \$248,693,121 | \$447,630,543 | \$512,883,412 | \$524,613,765 | \$524,613,765 |

## 7. P3 ASSESSMENT

The VDOT Alternative Project Delivery Division was responsible for reviewing the project for consideration for P3 delivery. As mentioned in Section 4 above, the project was identified as one of the Hampton Roads Regional Priority Projects by HRTAC and HRTPO in March 2013. Since then the HRTPO and the HRTAC have been committed to seek a plan to fund the project through the HRTF. Also mentioned in Section 4 is the approval in July 2016 of the 2040 Long-Range Transportation Plan that identified both the Phase 1 and Phase 2 Projects related to the I-64/High Rise Bridge Project as fully funded by the HRTF. Having full funding, the Phase 1 project does not need a P3 delivery. An additional P3 assessment will be conducted for the Phase 2 project when its project development is initiated and when its financial details are added to the Financial Plan.

In August 2016 VDOT completed a Finding of Public Interest (FOPI) for the Phase 1 Project that evaluated the design-build project delivery method against the traditional design-bid-build delivery method. The FOPI demonstrated that the design-build method would enable a higher quality product, a greater control of cost (with a larger portion of project risks transferred to the Design-Builder), and allow the project to be completed about 2.5 years earlier than with the design-bid-build method. Therefore, it was determined that the design-build process was in the best interest of the Commonwealth of Virginia. The FOPI was submitted to the Commissioner’s

<sup>2</sup> CTB approved the FY2020-2025 SYIP on June 19, 2019.

office and on August 11, 2016 he authorized the use of the design-build procurement process for the development of the project.

## **8. RISK AND RESPONSE STRATEGIES**

The contingency budget included in the Phase 1 Project is \$40,960,000. To date 4 change orders totaling \$443,347 have been approved. It is anticipated that the remaining contingency budget will be sufficient to mitigate the project risks.

A risk register for the project was originally developed in October 2015 for the original “I-64/High Rise Bridge Project” (combined Phases 1 and 2 projects). The risk register has been a working document throughout the project development and it was updated 3 times during the procurement phase of the project.

Significant risks that could impact the design-build cost and schedule are listed in **Table 11**. Many of the risks that were identified in the Initial Financial Plan have been resolved and, therefore, have been removed from the table. Additional risks encountered during the design-build phase of the project have been added.

**Table 11 – Significant Project Risks**

| Risk   | Response Strategies  |
|--|--|
| The contractor may encounter differing, unforeseen site conditions on the project, resulting in change requests  | <ul style="list-style-type: none"> <li>- The scope validation contract provisions were followed. During the scope validation period, the contractor identified no unforeseen site conditions.</li> <li>- Consider risk sharing for differing site conditions.</li> <li>- Keep open communication with DB.</li> </ul> |
| Phase I design-build estimate of \$410M may not include all project risk contingencies   | <ul style="list-style-type: none"> <li>- Work closely with DB to monitor potential scope changes and cost impacts.</li> </ul>  |
| The potential for encountering unidentified hazardous materials (late discovery) would require mitigation/cleanup resulting in a change order and schedule delay | <ul style="list-style-type: none"> <li>- Keep open communication with DB.</li> </ul>   |
| Delay in determining appropriate tolling and connectivity for HOT lanes for inclusion in the RFP and delay in obtaining CTB approval                             | <ul style="list-style-type: none"> <li>- Work closely with DB to monitor potential scope changes that would result in cost and schedule impacts.</li> <li>- Coordinate with adjacent HOV/HOT conversion project since its Concept of Operations and tolling MOU will cover the HRB project segment also.</li> </ul>  |
| If the DB does not comply with environmental regulatory agencies' oversight and approvals, injunction or fines may occur   | <ul style="list-style-type: none"> <li>- Continued coordination with regulatory agencies.</li> <li>- Monitor/oversight during construction.</li> </ul>   |
| The presence of certain species during construction could result in schedule delay   | <ul style="list-style-type: none"> <li>- Continue to participate in DB coordination meetings with environmental agencies and provide support as needed.</li> </ul>   |
| Unforeseen utility conflicts on some of the adjacent local roads that were not included in the original survey   | <ul style="list-style-type: none"> <li>- Follow-up with the DB regarding the utility conflicts encountered during the scope validation process to determine the validity of a change order or claim.</li> </ul>  |
| Unforeseen geotechnical conditions encountered during foundation construction  | <ul style="list-style-type: none"> <li>- Carefully review subsurface test data gathered during construction to determine actual conditions and compare to design criteria.</li> <li>- Redesign foundations as needed using the gathered subsurface conditions and revised design criteria.</li> </ul>                |
| Six additional change orders are currently under review for work that VDOT has determined to be additional scope   | <ul style="list-style-type: none"> <li>- Thoroughly follow and document the change order process.</li> <li>- Carefully review DB cost estimates and evaluate against independent VDOT estimates to arrive at fair and reasonable change order amounts.</li> </ul>  |
| Possible claim for redesign of special design retaining wall because steel sheet piles are not allowed   | <ul style="list-style-type: none"> <li>- Evaluate DB CO request, and only consider the additional cost of prestressed concrete piles corresponding to the same area of steel sheet piles in the original design.</li> </ul>  |
| Possible claim for MOT redesign because lane closures shown in MOT are not allowed   | <ul style="list-style-type: none"> <li>- Collaborate with DB to develop revised MOT plans to comply with contract provisions.</li> <li>- Carefully evaluate whether or not a CO has merit.</li> </ul>  |
| Possible claim that shutdown due to environmental deficiencies was not lifted as early as it should have   | <ul style="list-style-type: none"> <li>- Thoroughly document the timeline of events and facts.</li> <li>- Prepare to defend VDOT's position and actions.</li> </ul>  |

## **9. ANNUAL UPDATE CYCLE**

This second annual update of the Financial Plan will be submitted by September 30, 2019 and will be based on a Data Date of June 30, 2019. Future annual updates will be submitted by September 30 of that year using a Data Date of June 30 of that year.

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

There has been no cost change from the last year's Financial Plan to the current plan.

## **11. COST AND FUNDING TRENDS SINCE INITIAL FINANCIAL PLAN**

The Initial Financial Plan indicated an engineer's cost estimate for the Phase 1 Project of \$599,856,096. In March 2018 the project cost was reduced by \$75,242,331 to a total of project cost of \$524,613,765 due to the contract award amount being less than initially estimated.

No trends have been identified that impact the project costs. The VDOT project management team continuously implements best project management practices to monitor and control project costs. Costs will be monitored during the construction phase and any trends will be identified in the 2020 annual update.

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

There are no schedule changes since last year's Financial Plan. The Design Build work began with Notice to Proceed on November 17, 2017 and is scheduled to be completed in July 2021.

The VDOT project management team continuously implements best project management practices to monitor and control schedule changes. As an example, VDOT carefully reviews the monthly project schedule update and then discusses its details in partnership with the Design-Builder to determine adjustments and/or corrections needed to keep the project on schedule.

## **13. SCHEDULE TRENDS SINCE INITIAL FINANCIAL PLAN**

There are no discernable Schedule Trends since last year's Financial Plan. The schedule will continue to be monitored during project construction.

The Design-Builder has submitted a Notice of Intent (NOI) to file a claim for time extension related to the project-wide shut-down from 6/10/19 to 7/2/19. VDOT has responded to the Design-Builder with strong arguments against their position, but will continue to track the NOI.