

I-64 Hampton Roads Bridge – Tunnel Expansion

Public Sector Analysis and Competition

Pursuant to Va. Code § 33.2-1803.1:1, the Virginia Department of Transportation (VDOT) has undertaken this public sector analysis (Public Sector Analysis and Competition) of the cost for VDOT to develop and/or operate the I-64 Hampton Roads Bridge Tunnel (HRBT) Expansion Project (Project). As part of this Public Sector Analysis and Competition, VDOT has developed a Public Sector Option— i.e., a procurement option defined based on available public funding and financing options.

EXECUTIVE SUMMARY

This Public Sector Analysis and Competition is one of several steps undertaken by VDOT under the Public Private Transportation Act of 1995, as amended (PPTA) to determine whether pursuit of the Project serves the best interest of the public. VDOT has undertaken a screening process in accordance with its 2017 PPTA Implementation Manual and Guidelines, and concluded that pursuit of the Project under the PPTA could provide additional value. Specifically, the PPTA affords VDOT flexibility in contracting, as well as in the procurement process that is appropriate for the Project’s complex risk profile.

After having undertaken this Public Sector Analysis and Competition, VDOT has determined that the Project is suitable to advance to procurement as a Design Build (DB) delivery mode under the PPTA. Both the Immersed Tube Tunnel (ITT) and Bored Tunnel (BT) construction methods are available to this Project, and VDOT will be soliciting submissions for either or both construction methods.

In this case, the DB delivery model itself is the Public Sector Option because it is funded completely from public sources. The DB delivery model is preferred over a Design Build Finance Operate and Maintain (DBFOM) delivery model – which was also analyzed. VDOT determined that a DBFOM delivery model will not be optimal because, as in a DB delivery model, most of the Project capital cost would still be funded through public contribution comprised of funding from the (i) Hampton Roads Transportation Accountability Commission (HRTAC)’s sale of HRTAC Revenue Bonds, secured by Hampton Roads local sales and gas tax revenues dedicated to the Hampton Roads Transportation Fund (HRTF), as well as (ii) HRTAC pay-as-you-go financing and other available public funds. Further, a DB procurement preserves the flexibility to bundle the operations and maintenance of all or part of the Project with the operations and maintenance of the rest of the approximately 40 mile Regional Express Lanes network.

As will be elaborated below, this Public Sector Analysis and Competition examines and compares the financial feasibility of both delivery models.

PROJECT DESCRIPTION

Project Scope

The Project consists of improvements along approximately 12 miles of the I-64 corridor between I-664 in Hampton (Exit 264) and I-564 in Norfolk (Exit 276). Primarily, it will include the construction of a new 3.5-mile (approximately) bridge and tunnel crossing that will run parallel to the existing HRBT. In all, the improvements will provide at least six-lanes of capacity throughout the 12-mile Project corridor, with the existing HRBT being converted to westbound lanes and the newly-constructed bridge and tunnel facility serving the eastbound direction.

The Project has been widely recognized as addressing several transportation needs including travel demand, regional accessibility, transit access, geometric deficiencies, emergency evacuation capability, strategic military connectivity, and port access, as well as resulting in significant benefit to the community, the Hampton Roads region, and to the Commonwealth. The Project's Final Supplemental Environmental Impact Statement (FSEIS) has been approved by the Federal Highway Administration (FHWA) in its Record of Decision (ROD) dated June 12, 2017. The Project has also been included in several transportation plans including the Commonwealth's Virginia Transportation Plan 2040, the Hampton Roads Transportation Planning Organization's (HRTPO's) Hampton Roads 2040: Long-Range Transportation Plan (LRTP) and HRTAC's 2040 Long Range Plan of Finance. Significantly, HRTAC, a regional body composed of elected officials from all Hampton Roads localities with authority over the HRTF has allocated \$3.799 billion (funding for the Project year of expenditure cost, with a 2024 completion date). Project benefits are discussed in further detail in the Project Screening Report dated November 7, 2017.

In conjunction with the Project, VDOT is also pursuing the development of a 40-mile Regional Express Lanes network along the I-64 corridor in Newport News, Hampton, Norfolk, Virginia Beach, and Chesapeake. The Project has been approved to be part of the Regional Express Lanes network.

Major Business Terms of the Project

VDOT has prepared a Draft Project Term Sheet (**Appendix A**) with the following key elements:

1. Parties' responsibilities

Under a DB delivery model, the selected proposer (Preferred Proposer) will be responsible for the design and construction of the new bridge and tunnel, as well as additional highway lanes to meet at least six-lanes of capacity throughout the 12-mile Project corridor. Because both ITT and BT construction methods are available to the Project, proposals on either or both methods will be considered. This will give VDOT and the proposers the advantage of comparing the distinct benefits and risks of each method to identify the best-value solution. The Preferred Proposer's design/construction responsibilities will also include right of way acquisition activities, and utility relocation activities. Construction is anticipated to be completed within five to six years from the issuance of the notice to proceed.

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. VDOT intends to procure a separate contract for the (i) the integration of the tolling hardware and software into the Project, and (ii) the operations and maintenance of the toll collections system.

2. Construction Risk Allocation and Mitigation

VDOT conducts risk assessment activities throughout the P3 process. In an initial risk assessment workshop on May 31, 2017, VDOT identified significant design and construction risks including subsurface geotechnical conditions, working within an active navigation channel, rights of way constraints (as set in the ROD), maintenance of traffic in a highly-congested urban environment, and other technical complications under either a ITT or BT method. VDOT has concluded it will be efficient to transfer all or some of these risks to the private sector.

3. Mitigation of User Fee Financing Risks

Under a DB model, the Project will be funded mostly through HRTAC’s sale of HRTAC Revenue Bonds secured by HRTF (local sales and gas tax revenues). Accordingly, mitigation of the risk of user-fee financing (e.g., assumptions relating to competing facilities or compensation for high usage of the facility by high-occupancy vehicles) will likely be irrelevant to this Project. Such mitigation measures typically are included only under delivery models where toll revenues are used, such as the DBFOM delivery model.

Procurement Under the PPTA

VDOT has the authority under both the PPTA and the Virginia Public Procurement Act (VPPA) to procure the project under a DB delivery model. The analysis shows that procuring the Project under the PPTA provides the necessary contractual flexibility. The Project is very complex (in terms of scope, design and construction), and the resulting comprehensive agreement will need to be customized to contain intricate commercial terms, and robust risk allocation and sharing provisions. PPTA also allows flexibility in procurement that is appropriate here where VDOT will be soliciting submissions for either or both ITT or BT construction methods. Current procedures and documents developed for VDOT’s Design-Build program are not suitable for this procurement. The PPTA’s iterative process is also a better fit because it invites collaboration and feedback from prospective proposers.

ANALYSIS

Initially, VDOT had considered three delivery models: DB, DBFOM, and Design Build Operate Maintain (DBOM). However, as indicated in the High Level Screening Report dated May 9, 2017, a DBOM was excluded based on preliminary analysis and industry feedback. VDOT proceeded to assess DB and DBFOM models under its Project Screening Report, and concluded that a DB model alone be pursued.

This conclusion was based on a preliminary financial assessment (**Appendix B**) that was in turn based on a Level 1 Traffic & Revenue (T&R) Study (**Appendices C and D**), and project cost estimates (**Appendix E**).

Assumptions

The foregoing assessments and studies were based on the following assumptions:

1. Preliminary Financial Assessment Assumptions

A DB model will be funded by HRTAC through (i) its sale of HRTAC Revenue Bonds, secured by local and sales taxes, (ii) HRTAC pay-as-you-go financing, and (iii) other available public funds. No further assessment was made on HRTAC's sources of funding.

The DBFOM model was tested under the following cases (i) conservative (i.e., lower toll revenues based on the base case developed under the T&R study), and (ii) aggressive (i.e., higher toll revenues based on the equity case developed under the T&R study).

The assessment of the DBFOM model was based on the following commercial assumptions:

- A 50-year term composed of a seven-year construction period and a 43-year operations period
- HRTAC funding will be sourced from HRTAC Revenue Bonds proceeds secured by local sales and fuel taxes
- TIFIA credit assistance (in an amount capped at 33% of eligible project costs) will be obtained, and secured by toll revenues
- Average (of lower and higher end of range) design and construction, operation and maintenance (O&M), and major maintenance costs

Accordingly, the following financing assumptions were made:

Financing assumptions: : Design-Build-Finance-Operate-Maintain delivery		
TIFIA	Description – Aggressive case	Description – Conservative case
Pledge	<ul style="list-style-type: none"> Net pledge (Toll Revenues less Toll Operations less O&M less MM) 	<ul style="list-style-type: none"> Net pledge (Toll Revenues less Toll Operations less O&M less MM)
Term	35 years after construction completion	
Credit Rating	BBB range	
Base Rate	SLGS curve for 30 year maturity	
Spread	1 bps	
Cushion	50 bps buffer	
Fees	\$0.5 million Upfront fees and \$0.015 million per year indexed at 2.5% per annum	
Repayment	<ul style="list-style-type: none"> Capitalized interest until 5 years after Substantial Completion Sculpted principal payment until 25 years after Substantial Completion Level debt service after 25 years after Substantial Completion ~27 years weighted average life post Substantial Completion 	<ul style="list-style-type: none"> Capitalized interest until 5 years after Substantial Completion Sculpted principal payment until 25 years after Substantial Completion Level debt service after 25 years after Substantial Completion 25 years weighted average life post Substantial Completion
Minimum DSCR	1.35x Minimum TIFIA DSCR	1.46x Minimum TIFIA DSCR
Debt Service Reserve Account	1 year look forward funded at 1 st interest payment date	
Major Maintenance Reserve Account	Forward looking: 100% / 80% / 60% / 40% / 20% of estimated major maintenance costs for 1, 2, 3, 4, and 5 years out, respectively funded at Substantial Completion	
Ramp Up Reserve Account	40% / 60% / 80% / 90% of expected revenues in years 1,2,3,4, sculpted further to optimize debt service for each case	
O&M Reserve Account	50% 1 years out funded at Ramp Up Reserve Account release date	
Equity	Description – Aggressive case	Description – Conservative case
Target IRR	14.65% pre-tax Equity IRR	14.70% pre-tax Equity IRR
Target leverage	62.50% Debt / 37.50% Equity in construction period excluding construction payments	60% Debt / 40% Equity in construction period excluding construction payments
Equity letter of credit fee	1.50%	

2. T&R assumptions

A base case and equity case were prepared for the T&R study covering the I-64 corridor between I-664 in Hampton (Exit 264) and I-564 in Norfolk (Exit 267) with the following assumptions:

Tolling / Operations Assumptions	
Hours of Operations	The concurrent HRBT HOT lanes will be in operation 24 hours a day, 7 days a week, 365 days a year. The existing reversible HOV lanes on I-64 will be converted to HOT lanes and will be in operation in the westbound direction between 12:00AM and 11:00AM and in the eastbound direction between 1:00PM and 11:00PM.
Opening Date	The HRBT HOT Lanes are assumed open to traffic on January 1, 2025.
Number of HOT Lanes	1 Lane in each direction, except where specifically noted in individual scenarios.
Eligible Traffic	Passenger cars and light commercial trucks are allowed to use the HOT Lanes. All buses are allowed to use the HOT Lanes. Medium and heavy trucks with three or more axles are prohibited from using the HOT Lanes under the base case.
Free/Tolled Usage	All passenger cars with three or more occupants (HOV3+), motorcycles, transit buses and van pools are eligible to use the HOT Lanes for free.
Toll Collection	Tolls are collected only via electronic high speed toll collection (ETC) equipment with transponders that will be lively marketed and widely available to all motorists interested in using the HRBT HOT Lanes.
Minimum Toll	Minimum toll is set to \$1.00 in 2025 and \$1.50 in 2040
Maximum Volume in HOT Lanes	Traffic managed through dynamic pricing to a target maximum volume of 1,400 vehicles per hour per HOT lane (for both base and equity cases) with a focus on maximizing toll revenue (equity case).
Model Inputs/Assumptions	
Trip Table Growth	Based on resulting growth rates from the full HRTPO model. HOV3+ trip growth adjusted downward under an equity case.
Value of Time (VOT) Year 2016	Single Occupant Passenger Vehicle: \$0.21 per min = \$12.5 per hour HOV2+ Passenger Vehicle: \$0.25 per min = \$15.00 per hour
Annual increase in VOT	2.50 percent per year (base case) 3.00 percent per year (equity case)
Revenue Adjustments	No adjustments for leakage, fines, fees, or other income are applied. Gross toll revenue estimates are provided.
Annualization Factors	Traffic and Revenue = 280 average weekdays
Ramp Up Factors	Two-year ramp-up period assumed. 0.80 applied to 2024 and 0.90 applied to 2025.

Other assumptions are found in the T&R study attached as Appendices D and E.

3. Project cost assumptions

Project costs (including design and construction, O&M, and major maintenance) were estimated at both lower and higher ends of range in 2016 dollars. **These costs are planning-level estimates, and are continuously being refined through project development activities.**

RESULTS

The results of the financial assessment are summarized in Table 1 below which shows the projected sources of funding, and the amount of public contribution (in the form of HRTAC Revenue Bonds secured by local sales and fuel taxes) under each delivery model (under various scenarios) required to support the projected costs during the construction phase of the Project.

	DBFOM (Million\$)	DB (Million \$)
Sources of Funding (During Construction)		
Debt (TIFIA)*	157 - 217	--
Equity	109 - 137	--
Public Funds	3,427 – 3,439	3,645
Total Estimated Sources of Funds (B)	3,701 - 3,704	3,645
Uses of Funds (During Construction)		
Construction Costs**	3,645	3,645
Reserve Accounts	48 - 51	-
Other financing costs	7 - 10	-
Total Estimated Uses of Funds (A)	3,701 - 3,704	3,645
Revenues	6,443 - 7,516	4,175
Debt Service	328-353	-
O&M	899 - 945	898
Major maintenance	332	332
Excess Cash after Debt Service, O&M and Major Maintenance (discounted at 6%)	0	(312)
Net Public Contribution	3,427 – 3,439	3,333

Note:

The above values have been escalated from 2016 dollars to year-of-expenditure dollars.

* Debt shown here is that backed by cash flows resulting from toll revenues

** These figures are preliminary, planning-level estimates, and were prepared based on FSEIS estimates.

a. Funding during construction

If the Project were procured as a DBFOM, the sources of funding for the Project are as follows: (i) *Debt* - private debt in the form of TIFIA, and (ii) *Equity*.

b. Public Contribution

The Project has been included in the 2040 HRTAC Long Range Plan of Finance, and will be funded through HRTAC pay-as-you-go revenue, HRTAC revenue bonds, and other public funds that are secured by local sales and fuel taxes.

c. Cash flow during operations

Under either DB or DBFOM models, toll revenues would be sufficient to cover debt service, O&M and major maintenance costs of the new facility (including the new bridge and tunnel, and additional highway lanes). Under a DB, the Commonwealth will retain all excess cash flow after debt service, O&M, and major maintenance. On the other hand, under a DBFOM scenario, excess cash flow would be retained by the selected private entity. The discounted excess cash flow, a measure of value that the Commonwealth will receive over time, is summarized in Table 1 above. It should be further noted that a DBFOM will effectively commit toll revenues to the Project, and diminish VDOT's flexibility of leveraging this revenue for use of the entire Regional Express Lanes network.

The above table indicates revenue cannot be leveraged in a significant way to cover capital costs of the Project, resulting in a significant public contribution. Put another way, even under the best DBFOM scenario, HRTAC would still have to fund over 90% of the Project costs. Due to a lower level of expected revenue (as indicated by excess cash flow) in comparison to the capital costs, effective risk transfer may not be achievable if the Project were delivered as a DBFOM toll revenue concession. As a result, DBFOM is not likely to be an optimal delivery option for the Project. This conclusion is further confirmed by feedback received from the industry that a minimal equity contribution (approximately 3% of total project cost) under a DBFOM delivery model would not be attractive to the private sector.

CONCLUSIONS

The maximum public contribution does not apply to the Public Sector Option (the DB model), which option VDOT and HRTAC will pursue based on the preliminary financial assessment. Accordingly, the maximum public contribution contemplated by Va. Code § 33.2-1803.1:1(A) does not apply to this analysis.

It is likely that the final amount of public contribution may be higher or lower than the amount shown in the analysis due to the actual price received from a competitive DB procurement. However, it is reasonable to expect a similar impact under a DBFOM delivery model. In other words, the finding of this analysis in terms of comparison between DB and DBFOM delivery models should still be valid.

1. Under the Public Sector Option, mitigation of risk of user-fee financing through assumptions related to competing facilities, compensation for high usage of the facility by high-occupancy vehicles, or other considerations are not expected because the Project will be funded by HRTAC.
2. Under the Public Sector Option, the Project will not include the transfer of operations and maintenance responsibility to a private entity, thus the Public Sector Option is based on the assumption that VDOT will operate and maintain the Project following the completion of construction. After construction, the HOT lanes delivered as part of the Project will be incorporated into the Regional Express Lanes network. As the current scope of the Project does not include the transfer of operations and maintenance responsibility to a private entity, VDOT preserves the flexibility to bundle the operations and maintenance of all or part of the Project along with the operations and maintenance of the rest of the Regional Express Lanes network.
3. Under the Public Sector Option, no debt pursuant to Article X, 9(c) of the Constitution of Virginia would be required because HRTAC would fund the Project – and no Project debt would be secured by the full faith and credit of the Commonwealth. Thus, financing available under Article X, 9(c) of the Constitution of Virginia is effectively \$0 and HRTAC will contribute the full public contribution to cover all costs necessary to develop the Project.
4. The Project is composed of a new tunnel and bridge facility, and additional highway lanes which will include HOT lanes; there are no non-user fee generating components that will be funded.

APPENDICES

Table of Appendices

APPENDIX*	DOCUMENT
A	Draft Term Sheet
B	Preliminary Financial Assessment
C	Level 1 T&R Study - Base Case
D	Level 1 T&R Study – Equity Case
E	Project Cost Estimates

* All appendices are considered confidential documents pursuant to Va. Code § 2.2-3705.6 subsection 11(a), and are not subject to disclosure under the Virginia Freedom of Information Act.