COMMONWEALTH of VIRGINIA

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The Honorable S. Chris Jones
Chairman, House Appropriations Committee
Post Office Box 5059
Suffolk, Virginia 23435

The Honorable Ronald A. Villanueva
Chairman, House Transportation Committee
Post Office Box 61005
Virginia Beach, Virginia 23466

The Honorable Charles W. Carrico, Sr.
Chairman, Senate Transportation Committee
Post Office Box 1100
Galax, Virginia 24333

The Honorable Emmett W. Hanger, Jr.
Co-Chairman, Senate Finance Committee
Post Office Box 2
Mount Solon, Virginia 22843

The Honorable Thomas K. Norment, Jr.
Co-Chairman, Senate Finance Committee
Post Office Box 6205
Williamsburg, Virginia 23188

Dear Gentlemen:

Pursuant to Item 449 2c of the 2016-2018 Biennial Budget, please find a copy of a review of the costs and funding sources for a potential Richmond to Hampton Roads Passenger Rail Study. If you have any questions or comments, please do not hesitate to contact me.

Sincerely,

Jennifer L. Mitchell

Jennifer L. Mitchell

JLM/aww
Enclosures
Cc: The Honorable Aubrey L. Layne, Jr.
Secretary of Transportation

Review of Potential Richmond to Hampton Roads Passenger Rail Study

Legislative Mandate

During its 2017 legislative session, the General Assembly mandated a review of a potential Richmond to Hampton Roads Passenger Rail Study in item 449 2c of the 2016-2018 Biennial Budget:

> "No later than July 1, 2017, the Department of Rail and Public Transportation, in collaboration with the Hampton Roads Transportation Planning Organization as well as all relevant stakeholders, shall evaluate the costs of and potential funding sources for completing a Tier II Environmental Impact Study for the purpose of delivering future high speed passenger rail service between Richmond and Hampton Roads, and provide this information to the Chairmen of the House Committees on Transportation and Appropriations, the Senate Committees on Transportation and Finance."

Background

In December 2012, the Federal Railroad Administration (FRA) signed a Record of Decision (ROD) for a Tier I Environmental Impact Statement (EIS)[1] for future higher speed and intercity passenger rail service between Richmond and Hampton Roads, satisfying the requirements of the National Environmental Policy Act (NEPA). The Tier I EIS considered alternatives for improving rail service between the regions. The Virginia Department of Rail and Public Transportation (DRPT) prepared this Tier I EIS.

The ROD identified the existing Southside/Norfolk Southern (NS) Route as the preferred alternative for new higher speed passenger rail service (six round trips at maximum 90 mph). The Southside/NS Route generally follows the U.S. Route 460 corridor south of the James River between Norfolk and Petersburg. This route was made possible due to a i) $93 million series of rail improvements in Hampton Roads and ii) NS's construction of the Collier Connector linking the Southside/NS Route to CSXT's North End subdivision at Collier Yard near Petersburg and allowing for third track accommodation.

The ROD also recommended increased conventional speed intercity passenger rail service (three round trips at maximum 79 mph) along the existing Peninsula/CSXT Route between Newport News and Richmond. Currently, two state-supported passenger trains provide daily round-trip service along this route. A map of these routes is included in Appendix A.

The remaining approximate 24 mile rail corridor that connects Richmond to Petersburg is labeled "alignment to be determined by SEHSR [Southeast High Speed Rail Corridor.]" This area is included in the scope of two adjacent related NEPA studies: i) Richmond to Raleigh Tier II EIS, completed in 2016; and ii) the ongoing Washington, D.C. to Richmond Southeast High Speed Rail project (DC2RVA). Currently, one Virginia state-supported passenger train originating in Norfolk, four Amtrak long distance trains, and an additional North Carolina state-sponsored train utilizes this corridor.

[1] http://www.drpt.virginia.gov/rail/major-initiatives/richmondhampton-roads-passenger-rail-project/

The Richmond to Hampton Roads Tier I EIS Passenger Rail Study ROD made DRPT and FRA eligible to initiate a Tier II NEPA process for the purpose of delivering future higher speed rail service between Richmond and Hampton Roads. A Tier II EIS would develop, evaluate, and recommend specific improvements within the corridor that are consistent with the ROD and that would achieve the purpose and need of the Tier I level EIS.

Current and Future Statewide Rail Investments Benefiting Hampton Roads

DRPT's FY 2018-2023 Six Year Improvement Program (SYIP)[2] includes $311.3 million in significant capital and operating investments in its Intercity Passenger and Freight Rail Program, designed to enhance current and future passenger and freight rail services benefiting the entire Commonwealth of Virginia.

Over 90 percent of the $208.8 million in Intercity Passenger Rail Operating and Capital (IPROC) funds over the next six years, and nearly 45 percent of the $102.5 million in Rail Enhancement Funds (REF) over the next four years are allocated to several major rail projects located along the I-95 corridor. **It is important to note that these improvements provide major passenger and freight rail capacity and reliability improvements to Hampton Roads rail service as well as freight trains serving the Port of Virginia.**

Atlantic Gateway

The Atlantic Gateway project, a $1.4 billion multimodal public and private investment designed to provide essential travel options and reliability to the heavily congested I-95 corridor contains over $495 million in rail projects. Dedicated funding in the SYIP to complete Atlantic Gateway includes $149.5 million in IPROC funds.

Acca Yard Improvements

The Acca Yard improvement project is a $132 million public–private investment in CSXT's heavily congested rail yard near Richmond. This project significantly increases freight fluidity for CSXT, increases passenger rail travel time reliability for the Newport News-Washington passenger rail service, and includes a commitment from CSXT to provide slots for two additional Norfolk passenger rail services, beginning in 2019 and 2022 respectively. Dedicated funding in the SYIP to complete the Acca Yard project includes $26.4 million in IPROC funds as well as $45.8 million in REF.

Arkendale to Powells Creek

The Arkendale project provides a third track along the heavily congested nine-mile stretch of CSXT's main line from Powell's Creek to Arkendale, Virginia. In 2010, the project received a $75 million grant from the federal **High Speed Intercity Passenger Rail Program (HSIPR)**[3]. Dedicated funding in the SYIP to complete the Arkendale project includes $16.5 million in IPROC funds.

Current and Future Rail Investments in Hampton Roads

DRPT currently allocates $27 million in operating costs for existing Hampton Roads passenger rail service and has set aside nearly $15 million in IPROC funds for operating two additional Norfolk passenger rail services, beginning in 2019 and 2022 respectively.

[2] http://www.drpt.virginia.gov/media/2146/fy18-final-syip-june-with-page.pdf
[3] https://www.fra.dot.gov/Page/P0089

DRPT is also providing $20 million in state funding towards Newport News capital improvements which includes construction of the new multimodal facility that will house the Newport News Amtrak station. Additionally, DRPT has set aside nearly $26 million in REF towards significant intermodal rail improvement serving the Port of Virginia including the Commonwealth Railway marshalling yard and the CenterPoint intermodal center.

Timing Considerations for Hampton Roads Tier II EIS

Current planning that is underway for DC2RVA and Atlantic Gateway, which has been performed in coordination with CSX, indicates that no additional capacity will be available for additional passenger trains (beyond the two Norfolk trains generated by the Acca Yard improvements and a passenger train to Lynchburg), until the Atlantic Gateway investments and expansion of the Long Bridge is completed. Long Bridge is a CSX rail bridge over the Potomac River between Arlington and Washington, D.C. which is being studied for future widening. The Long Bridge EIS is currently underway and being led by the Washington, D.C. Department of Transportation and is expected to be completed in late 2019.

The current SYIP has fully programmed its IPROC funding through FY2025 for the Atlantic Gateway projects. There is currently no funding source identified for the Long Bridge expansion project, which could cost over $400 million depending on the final alternative that is selected through the NEPA process. Until the Long Bridge expansion has been completed, any additional infrastructure investments made for higher speed rail in the Hampton Roads corridors would not generate any additional passenger rail service beyond the amount that has already been funded. Programming funding for the Long Bridge expansion should therefore be the Commonwealth's highest priority for its rail funds. Accordingly, the timing of the Hampton Roads Tier II EIS should be performed at a time when it is more likely that the benefits of such investments, such as new passenger service, could be realized.

Environmental Impact Study Cost Estimate

DRPT estimates a Tier II Environmental Impact Study for Future Higher Speed Rail service to Hampton Roads will cost $24.1 million in 2018 dollars. The study would include higher speed passenger rail service along the entire 80-mile Southside/NS Route between Richmond and Norfolk as well as between Newport News and Richmond.

The DC2RVA project served as a comparable project for the purpose of developing a cost estimate. This 123-mile corridor is currently undergoing a similar Tier II effort in Virginia. Consultant costs for the DC2RVA Tier II EIS and related preliminary engineering tasks total approximately $40 million. A straight mile-by-mile comparison yielded a cost of about $365,000 per mile. In determining the cost for a Tier II EIS between Richmond and Hampton Roads, DRPT made adjustments to account for tasks that are less dependent on project area size, such as Purpose and Need development. Details of this analysis are included in Appendix B, Hampton Roads Tier II EIS Cost Estimation Based on Budgeted Costs for DC2RVA Tier II Project.

DRPT also considered costs for other rail EIS efforts in the region:

- The budget to fulfill the NEPA process for the Long Bridge project, based on 2.9 mile long corridor, was $7.1 million, and included some "pre-NEPA" tasks from earlier phases. This project is being funded with a federal Transportation Investment Generating Economic Recovery

(TIGER) grant as well as a local match from the District of Columbia, Virginia Railway Express, and DRPT.

- DRPT and the North Carolina Department of Transportation (NCDOT) jointly led the recently-completed Richmond to Raleigh Tier II EIS. This EIS effort lasted over 12 years and received funding through a number of federal and state sources from Virginia and North Carolina. DRPT has incomplete information regarding the total cost of this project, but notes that the budget for the last five years of the project totaled approximately $8 million. The cost of the complete study, however, would have exceeded that figure.

It is important to also note that any higher speed rail services originating in Hampton Roads will utilize the rail infrastructure in these study areas. The findings of the DC2RVA, Richmond to Raleigh Tier II EIS, and Long Bridge EIS will need to be considered in a Tier II EIS for Hampton Roads.

Baseline Assumptions

Using the DC2RVA project as a baseline assumption, the estimate first assumed a 123-mile corridor with a 36-month timeframe. The cost estimate then assumes a 24-month effort to complete the Hampton Roads Tier II EIS. It should be noted that the actual timeframe of DC2RVA has been extended beyond the 36-month period due to a number of external factors, including longer-than-expected FRA review times. A longer project schedule for the Hampton Roads Tier II EIS would potentially increase the cost of the project as well.

The study then examined the seven cost centers currently included in the DC2RVA project budget and factored each relative to the scope of a Tier II EIS study within the Hampton Roads parameters above. The cost centers include:

- Project Management
- Purpose and Need
- Service Development Plan
- Alternatives Development/Conceptual Engineering
- Environmental Studies and Documentation
- Preliminary Engineering
- Stakeholder Outreach

Finally, the cost estimate factored in DRPT employee overhead costs, an average inflation rate of one percent, and 15 percent for project contingencies.

Estimated Project Costs

Richmond to Hampton Roads Tier II EIS Study Estimated Cost			
Task Number	**Task**	**Estimated Cost**	
1	Project Management	$	1,647,427
2	Purpose and Need	$	133,869
3	Service Development Plan	$	1,534,469
4	Alternatives Development/Conceptual Engineering	$	5,399,691
5	Environmental Studies and Documentation	$	5,120,716
6	Preliminary Engineering	$	4,388,800
7	Stakeholder Outreach	$	1,011,437
	Subtotal Consultant Work	**$**	**19,236,408**
	DRPT Salaries	$	442,000
	VDOT project support	$	308,232
	Inflation (at one percent annually for 5 years)	$	999,332
	Subtotal With DRPT/VDOT assistance and 5-year cost escalation	$	20,985,972
	Contingency (at 15 percent of above total)	$	3,147,896
GRAND TOTAL ESTIMATE		**$**	**24,133,868**

Additional details on methodologies and comparable cost bases can be found in Appendix B.

Stakeholder Consultation

To assist in developing a cost estimate for a Hampton Roads Tier II EIS for the purpose of delivering future higher speed passenger rail service between Richmond and Hampton Roads, DRPT consulted with stakeholders including HRTPO, FRA, and host railroads Norfolk Southern and CSXT.

DRPT met with representatives of HRTPO on April 7, 2017 to discuss the cost estimate and funding sources. HRTPO advised DRPT regarding local conditions that could affect cost including the location of a potential future station in the Bowers Hill area of Chesapeake. HRTPO recommended that Peninsula/CSXT route improvements for additional conventional speed service should move forward, as well. DRPT has not studied such improvements and has not allocated any funding for this additional service in its SYIP. It was agreed that HRTPO and DRPT would work together to explore the best path forward for passenger rail improvements in the region.

DRPT also consulted with FRA's office of Rail Program Delivery at various points throughout its analysis. FRA helped determine the best comparable project for a cost estimate, background on DC2RVA costs,

and other factors that can affect cost. FRA confirmed that early cost estimates for DC2RVA were derived as a percentage of construction cost estimates developed over the course of decades for a third track north of Richmond. It is similar to the infrastructure required for higher speeds to Hampton Roads. FRA relayed its experience that additional undefined costs may arise related to the volume of comments from the public and regulatory agencies. Comments can drive substantial changes to alternatives, which lead to additional engineering work, environmental analysis, and documentation. For example, station locations are recommended in a Tier II EIS and typically generate public comments and sometimes controversy.

Host railroads CSXT and Norfolk Southern issued comments during the Tier I process, which lay out the railroads' policy regarding passenger rail specific to this region. CSXT emphasized that any new infrastructure construction must fully preserve both the ability to operate freight trains on demand and the ability to expand freight service, including its coal business. NS emphasized its policy that requires passenger operations at speeds above 79 miles per hour be performed on separate tracks from freight operations. These and other host railroad requirements will have direct bearing on the basis of design guidelines and on the scope of the Tier II effort. In a meeting with DRPT on June 8, 2017, NS officials reiterated this policy as part of their initial review of the cost estimate effort. General Principles Guiding Norfolk Southern's Evaluation of Intercity and Commuter Passenger Rail Proposals are attached as Appendix C.

Potential Funding Sources

This section provides a list of federal and state funding sources with eligibilities to fund a Tier II NEPA study for future high speed passenger rail service between Richmond and Hampton Roads. However, there are a variety of factors that may impact future availability of these funds, such as:

- Requirements for matching funds
- Funding availability - funding would need to be appropriated for any EIS study to be performed
- Application guidelines

For the purposes of calculating a comparable cost estimate, this analysis utilized the initial budgeted costs of $39,825,000 for DC2RVA. The DC2RVA project is fully funded up to $55 million, with 80 percent provided by a $44 million federal FRA High Speed Intercity Passenger Rail Program (HSIPR) grant. The Commonwealth of Virginia also committed $6.9 million (12.5 percent) in matching grants, and the host railroad CSXT $4.1 million (7.5 percent). Any funding scenario for a future Richmond to Hampton Roads Tier II EIS would likely come from multiple federal and state sources as well as potential private sector contributions from the host railroad. However, as described in the following section, the potential of receiving future dollars from HSIPR is unknown.

Federal Passenger Rail-Related Programs and Funding

The **High Speed Intercity Passenger Rail Program (HSIPR)**[4], started in 2009, is now fully obligated to projects. The federal portion of the DC2RVA Rail Project is being funded through this program. No appropriations to HSIPR are expected in 2017, and it is unclear when additional funding will become available.

[4] https://www.fra.dot.gov/Page/P0089

The **Fixing America's Surface Transportation Act (FAST Act)** [5] of 2015 authorized a total of $305 billion federal transportation funding to states through 2020. It includes both formula-based and discretionary funds for roads, bridges, transit systems, and rail transportation networks.

The following federal programs authorized in the FAST Act could potentially serve as funding sources for a Hampton Roads Tier II EIS. Similar to previous transportation legislation, FAST Act also made policy changes to streamline the approval processes for transportation projects. For example, FRA will accept a combined Final EIS/ROD document as a result, which could be applied in a Hampton Roads Tier II EIS. The actual dollar savings resulting from this and other reforms is yet to be demonstrated, however. Within the FAST Act, eligible funding programs include:

- **Passenger Rail Reform and Investment Act of 2015 (PRIIA)**[6] provides for $5.5 billion to be spent on the national intercity rail network outside the Northeast Corridor. Funding for this program is dependent on annual Congressional budget appropriations.

- **Consolidated Rail Infrastructure and Safety Improvement Grants Program (CRISI)**[7], authorized in 2015, was first appropriated $68 million in FFY2017 and meant to assist in funding passenger and freight rail transportation systems improvements for safety, efficiency, or reliability. Eligible applicants include states and political subdivisions within states. A wide range of rail capital projects are eligible including corridor service development planning and environmental analyses. The minimum non-federal funding match is 20 percent, but preference is given to projects offering at least 50 percent non-federal matches. Projects should demonstrate a net positive cost-benefit analysis, and twenty-five percent of funds must be set-aside for projects in rural areas.

- **Congestion Mitigation and Air Quality (CMAQ)**[8] funds can be used for rail projects at the discretion of states and with the approval of the administering federal agency. CMAQ funds are intended for transportation projects and programs that improve air quality by reducing transportation-related emissions in non-attainment and maintenance areas for ozone, carbon monoxide, and particulate matter. In Virginia, these funds are used for highway and transit investments in addition to rail.

- **Regional Surface Transportation Program (RSTP)**[9] funds are federal Surface Transportation Planning funds that are apportioned to specific regions within a state. Planning studies are one of the types of projects funded under RSTP funds. Metropolitan Planning Organizations apply for, receive and administer these funds provided from the federal government. In Virginia, these funds are used for highway and transit projects, with HRTPO receiving approximately $30 million annually.

Additionally, the **Transportation Investment Generating Economic Recovery (TIGER)**[10] is a national, highly competitive discretionary grant program that supports innovative multimodal transportation

[5] https://www.fhwa.dot.gov/fastact/
[6] https://www.congress.gov/bill/114th-congress/house-bill/749
[7] https://www.fra.dot.gov/eLib/Details/L17408
[8] http://www.hrtpo.org/page/cmaq-and-rstp/
[9] http://www.hrtpo.org/page/cmaq-and-rstp/
[10] https://www.transportation.gov/tiger

projects that generate economic development by funding projects that improve the access, safety, affordability, or reliability of transportation. The Act does not provide dedicated funding for the planning, preparation, or design of capital projects; however, these activities may be eligible to the extent that they are part of an overall construction project. TIGER grants were appropriated $500 million for Fiscal Year 2017. During the previous seven years of TIGER, USDOT received more than 7,300 applications requesting more than $143 billion for transportation projects across the country, with 20 percent going to rail projects and 1.1 percent to planning.

Commonwealth of Virginia Passenger Rail Funding Sources

In order to receive state funding, a Tier II EIS study for future higher speed passenger rail service to Hampton Roads would need to submit a grant application to the appropriate agency from which funding is being requested. In the case of DRPT managed funds, this would be to either or both of the IPROC and REF programs, and would be contingent on both program requirements as well as available funding.

The **Intercity Passenger Rail Operating and Capital Fund (IPROC)**[11] provides operational and capital funding for state-supported Amtrak trains and for projects related to growth and enhancement of intercity passenger rail service in the Commonwealth including studies. Refer to Appendix D for an IPROC snapshot that reflects DRPT's current Six Year Improvement Program.

The **Rail Enhancement Fund (REF)**[12] is a dedicated source of funding for retention, maintenance, improvement, and development of freight and passenger railways that create public benefits within the Commonwealth. All projects receiving funds from the REF must include a minimum of 30 percent cash or "in-kind" matching contribution from a non-state source and a cost benefit analysis. Refer to Appendix D for an REF snapshot that reflects DRPT's current Six Year Improvement Program.

IPROC and REF snapshot charts in Appendix D demonstrate that $24.1m is currently not available in either fund. Therefore, any General Assembly requirement to use state funds for a future study if this nature would come at the expense of already programmed projects. These projects include many important to the Hampton Roads region such as passenger trains two and three to Norfolk, Port of Virginia improvements, and Atlantic Gateway projects that address current rail bottlenecks between Richmond and Washington, D.C.

Conclusions

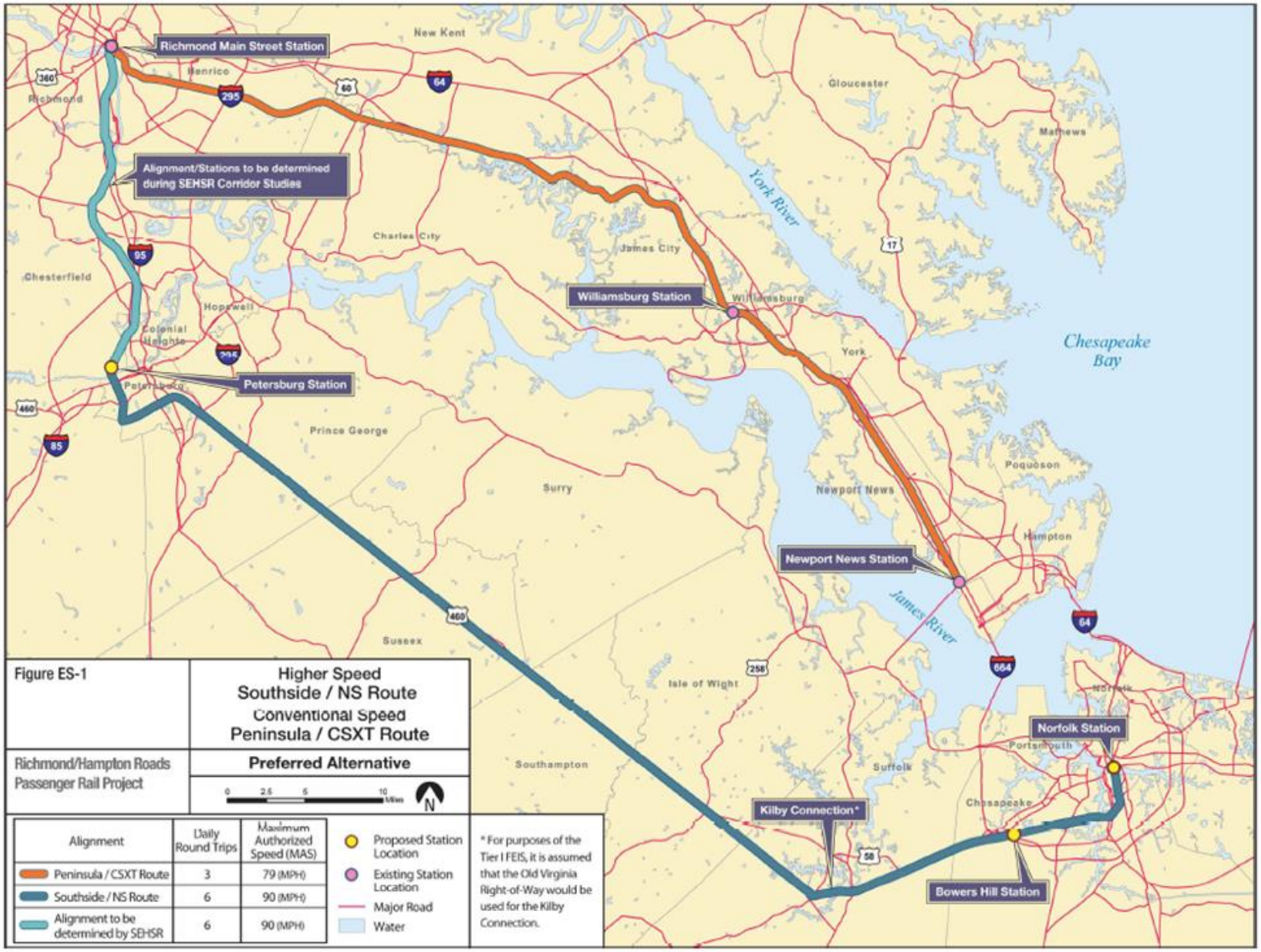
The Hampton Roads region is a substantial economic driver for the Commonwealth; and like other areas throughout Virginia, there is a clear need for more frequent and reliable intercity passenger rail options. While DRPT is committed to facilitate and improve the mobility of citizens in the region, DRPT, as well as other interested parties, must take into account the limited amount of federal and state dollars currently available to fund such a high-cost study especially as the Department and the Commonwealth Transportation Board have made substantial commitments to rail projects statewide that will also benefit Hampton Roads communities and the Port of Virginia.

For that reason, DRPT recommends continued coordination and dialogue with the HRPTO, FRA, Norfolk Southern, CSXT, and other stakeholders. It is important to determine the most appropriate scope and

[11] http://www.drpt.virginia.gov/grantees/rail-grants/
[12] http://www.drpt.virginia.gov/grantees/rail-grants/

funding sources, including private dollars, for a Tier II EIS to further higher speed intercity passenger rail in the region.

Appendix A
Higher Speed Southside/NS Route
Conventional Speed Peninsula/CSXT
Route Map


Richmond Main Street Station
Alignment/Stations to be determined during SEHSR Corridor Studies
Williamsburg Station
Petersburg Station
Newport News Station
Norfolk Station
Kilby Connection*
Bowers Hill Station
New Kent
Henrico
Richmond
Gloucester
Mathews
York River
Charles City
James City
Chesterfield
Hopewell
Colonial Heights
Williamsburg
York
Chesapeake Bay
Prince George
Surry
Poquoson
Newport News
Hampton
James River
Sussex
Isle of Wight
Southampton
Suffolk
Chesapeake
Portsmouth
Norfolk
Figure ES-1
Higher Speed Southside / NS Route
Conventional Speed Peninsula / CSXT Route
Richmond/Hampton Roads Passenger Rail Project
Preferred Alternative
0 2.5 5 10 Miles
N
Alignment
Daily Round Trips
Maximum Authorized Speed (MAS)
Peninsula / CSXT Route
3
79 (MPH)
Southside / NS Route
6
90 (MPH)
Alignment to be determined by SEHSR
6
90 (MPH)
Proposed Station Location
Existing Station Location
Major Road
Water
* For purposes of the Tier I FEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

Appendix B
Hampton Roads Tier II EIS Cost Estimation Based on Budgeted Costs for DC2RVA Tier II Project

The following are the major cost centers/tasks considered for this cost estimate. These are the same cost centers that appear in the DC2RVA project budget. Task numbers are meant to align with the DC2RVA budget tasks:

Task #	Name
1	Project Management
2	Purpose and Need
3	Service Development Plan
4	Alternatives Development/Conceptual Engineering
5	Environmental Studies and Documentation
6	Preliminary Engineering
7	Stakeholder Outreach
N/A	DRPT Staffing
N/A	VDOT Project Support
N/A	Contingency
N/A	Inflation

Baseline Assumptions

All unit figures for both man-hours per month and man-hours per mile as well as labor rates come from actual figures in the consultant contract with DRPT for the DC2RVA project. These unit costs were then adjusted by various factors, depending on the nature of task, to reflect the different characteristics of the Hampton Roads rail corridors as compared to the DC2RVA corridor.

The estimate assumed DC2RVA study encompassed a 123-mile corridor with a 36-month timeframe. The estimate assumes a 24-month effort to complete the Hampton Roads Tier II EIS. In addition, the estimate also assumes that approximately 12 miles of additional second track would be required to supplement large stretches of single-track on CSXT's Peninsula Subdivision between Richmond Main Street Station and Downtown Newport News (the Northern Route in the Tier I EIS) in addition to the entire rail distance between the Collier Connection south of Petersburg and the Norfolk Amtrak Station (the Southern Route).

Similar overhead and negotiated profit percentages from the actual DC2RVA contract were included in the calculations to arrive at "loaded" figures for each project task.

Inflation percentages were taken from actual data found on the BLS website and verified by a second independent inflation tracker website. The past three years' average inflation rate was one percent annually. The project cost was escalated 5 years form 2016, putting the estimated end date for the study at 2021.

A 15 percent contingency was also added to the total, post-inflation figure. 15 percent is concurrent with the level of contingency held on the DC2RVA study project.

Methodology

The following sections describe the assumptions that were used to develop the draft cost estimate, by task. These assumptions include adjustments made to the tasks to reflect the unique characteristics of the Hampton Roads corridors, including improvements to both the southern and northern corridors included in the Record of Decision for the Tier I EIS.

Task 1: Project Management

The estimated man-hours needed per month for project management was multiplied by 24 months to arrive at this total.

Task 2: Purpose and Need

Because purpose and need statements generally take the same amount of time regardless of the length and complexity of the corridor being studied, the man hours included in the DC2RVA purpose and need effort was used.

Task 3: Service Development Plan

The DC2RVA project has proposed 9 additional round trip trains. Because service planning is generally influenced by the complexity of service assumptions, the man-hours-per-new train was calculated and then multiplied by 6, which is the number of total additional round trips proposed for the northern and southern routes (5 additional for the southern route and 1 additional for the northern route).

Task 4: Alternatives Development/Conceptual Engineering

Because conceptual engineering is largely dependent upon the total length of the corridor being engineered, the man-hours-per-mile for this task was multiplied by the rail mileage (measured in GIS) of the two routes under study. The northern route's rail mileage was reduced by the ratio of the estimated length of additional sidings (12 miles) to the total northern route mileage (71.5 miles).

Task 5: Environmental Studies and Documentation

The level of effort associated with environmental analyses is influenced by the size of the total study area. Man-hours-per-acre (with acres being measured by the area formed by a 500-ft buffer on each side of the centerline of the DC2RVA rail corridor) were multiplied by the total acreage within a 500-ft buffer for the southern route's entire length and 12 miles of the northern route's length.

Task 6: Preliminary Engineering

The estimated Man-hours-per-mile for preliminary engineering was multiplied by the entire southern route's length and 12 miles of the northern route's length. These separate subtotals were then multiplied by a discount factor that takes into consideration a lower population density of the Hampton Roads corridors relative to the DC2RVA corridor, reflecting the difference in urbanization along the corridor and the level of complexity of any engineering. The discount factor for the northern route was 60 percent, while the southern route was 50 percent. Population densities were calculated using GIS and U.S. Census data.

Task 7: Stakeholder Outreach

To develop and estimate for stakeholder outreach costs, the man-hours-per-mile estimate was multiplied by the entire southern route's length and 12 miles of the northern route's length. These separate subtotals were multiplied by a discount factor that takes into consideration a lower population density relative to the DC2RVA corridor, reflecting the difference in urbanization and stakeholders along the corridor. The discount factor for the northern route was 60 percent, while the southern route was 50 percent. Population densities were calculated using GIS and U.S. Census data.

DRPT Staffing Estimate

DRPT staff effort was assumed to be the following for the 24-month duration:

- One $100,000 employee working at 50 percent for 2 years
- One $75,000 employee working 100 percent for 2 years
- One $45,000 employee working 100 percent for 2 years
- 30 percent added to salaries for payroll taxes, benefits, etc.

VDOT Support Calculation

The DC2RVA budget for VDOT support (in dollars per month) was multiplied by the ratio of miles under consideration for the Hampton Roads study (the full southern route length and 12 miles of the northern route length) and then multiplied by 24 months for the expected duration of the Hampton Roads study. This figure was then multiplied by a discount factor for the southern route only (50 percent reduction), which reflects the population density in the corridor compared to the population density of the DC2RVA Corridor, to arrive at the final estimate.

Estimated Project Costs

The following table summarizes the estimated costs per task for the Hampton Roads Tier II EIS.

Richmond to Hampton Roads Tier II EIS Study Estimated Cost		
Task Number	**Task**	**Estimated Cost**
1	Project Management	$ 1,647,427
2	Purpose and Need	$ 133,869
3	Service Development Plan	$ 1,534,469
4	Alternatives Development/Conceptual Engineering	$ 5,399,691
5	Environmental Studies and Documentation	$ 5,120,716
6	Preliminary Engineering	$ 4,388,800
7	Stakeholder Outreach	$ 1,011,437
	Subtotal Consultant Work	**$ 19,236,408**
	DRPT Salaries	$ 442,000
	VDOT project support	$ 308,232
	Inflation (at one percent annually for 5 years)	$ 999,332
	Subtotal With DRPT/VDOT assistance and 5-year cost escalation	$ 20,985,972
	Contingency (at 15 percent of above total)	$ 3,147,896
GRAND TOTAL ESTIMATE		**$ 24,133,868**

Appendix C
General Principles Guiding Norfolk Southern's Evaluation of Intercity and Commuter Passenger Rail Proposals

GENERAL PRINCIPLES GUIDING
NORFOLK SOUTHERN'S EVALUATION OF
INTERCITY AND COMMUTER PASSENGER RAIL
PROPOSALS

The following principles are a guide for planners of intercity and commuter rail proposals when working with Norfolk Southern. Of course, each proposal necessarily is unique, and NS' application of the principles to particular proposals will often be unique as well.

Safety is our paramount concern. Design, maintenance practices, and operating patterns always will emphasize safety.

An operational feasibility study is necessary to fully understand all potential impacts.

- The proposed passenger operation must create "transparency" in the affected rail system. Transparency is the capacity for passenger trains and freight trains to operate without delay, however minimal, to each other, while still allowing for route maintenance.
    - Passenger projects are meant to be successful, so the study will focus on the proposal's full-build scenario versus any interim plan. Along the same lines, freight volumes will grow, so any study will anticipate future freight levels.
    - Freight operations are long distance and customer-driven, which precludes "passenger only" operating windows and temporal separation such as night-time-only freight operations.
    - Passenger projects might cause "network effects" on the NS system that are broader than the project area. Often, the studied geographic scope will have to be larger than the passenger project area in order to identify and address these effects.
    - Project costs associated with compliance with Federal Railroad Administration regulations are the responsibility of the project sponsor.
- The rail environment changes. Conditions attached to various forms of funding differ. Therefore, until funding is available, any passenger study is necessarily hypothetical.
    - A completed operational feasibility study by NS is a prerequisite to progress a project. NS will support only passenger project requests that have been fully studied and modeled.
    - As the transportation industry is dynamic, any proposal that does not secure funding cannot be shelved for future use – each proposal is unique, requiring its own up-to-date study.
    - Sometimes public funding comes with special conditions and requirements (including so-called "service outcome requirements"), which represent additional costs. Just as NS does not customarily agree to similar guarantees with our freight customers, the public sponsor will be responsible for any passenger guarantees.
    - It is possible that public funding may be taxable to Norfolk Southern, so the public sponsor must indemnify Norfolk Southern for any income taxes paid or incurred as a result of the receipt of public funding.

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- NS will coordinate the operational feasibility study. The cost of the study (including NS' time) is the responsibility by the sponsoring public agency. For planning purposes, NS can estimate study costs in advance. Studies are detailed and specific and take a year, and often longer, to complete.

NS will receive fair compensation for use of its transportation corridors.

- NS' corridors consist of track and right-of-way that might, or might not, be fully utilized at any given time. As rail traffic flows change over time, this capacity, and the flexibility and potential it represents, is a key NS asset.

- Amtrak has certain statutory intercity passenger service access rights and therefore is not a good example to use in determining the fair and commercial price for use of NS assets.

- In determining a fair price for use of assets, NS will factor in any new equipment (including Positive Train Control) and costs, as well as additional property and other taxes, that would not be incurred absent passenger service.

New and expanded passenger operations require adequate liability protection.

- Passenger operators must compensate or indemnify NS for additional risk created by passenger projects, and any such indemnification needs to be backed up by an adequate level of insurance.

- Liability issues can create major hurdles. Often, sovereign immunity issues must be overcome. The cost to the passenger carrier for insurance and indemnification is substantial, as borne out by our experience with commuter authorities.

Special considerations are necessary for high speed rail service and corridors.

- Norfolk Southern is pleased to assist states planning for dedicated HSR and will work with planners to insulate those corridors from interference with and from NS freight corridors.

- Passenger trains operating in excess of 79 mph require their own dedicated tracks. Passenger trains operating in excess of 90 mph require their own private right-of-way.

- Where higher-speed trains share tracks with conventional freight trains, they will be able to reach 79 mph maximum. Where shared track is concerned, higher-speed trains must meet the same safety standards as conventional trains.

Special considerations are necessary for light rail service.

- Light rail service involves use of equipment that is not appropriate for use on NS tracks. Physical separation is required.

- Proposals for operating "non-compliant" passenger equipment (equipment that does not meet Federal Railway Administration standards) are not viable.

- Light-rail and non-compliant project sponsors should approach NS early in the process, and so that NS can advise if any of the project elements are compatible with freight trains and track.

Appendix D
IPROC and REF Snapshot

IPROC Snapshot

$ Millions	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total
IPROC Sources	$ 86.7	$51.3	$52.4	$53.4	$56.7	$57.8	
IPROC Commitments in FY 18-23 SYIP*	$63.8	$49.5	$20.3	$23.1	$25.8	$26.3	$208.8
IPROC Commitments – Atlantic Gateway	$22.9	$1.8	$32.1	$30.3	$30.9	$31.5	$149.5
IPROC Balance - Cumulative	-	-	-	-	-	-	

* - Includes Trains 2 and 3 to Norfolk

REF Snapshot

$ Millions	FY 2018	FY 2019	FY 2020
REF Sources	$67.5	$29.2	$27.1
REF Commitments in FY 18-23 SYIP*	$58.5	$22.9	$17.0
REF Balance - Cumulative	**$9.0**	**$6.3**	**$11.1**

* - Includes Port of Virginia Improvements