

Birthplace of America Trail Study

A Study to Connect the Virginia Capital Trail to the Hampton Roads Region

Adopted by the HRTPO Board on July 20, 2017 (*Updated on October 10, 2017*)



Acknowledgements

The Virginia Department of Transportation (VDOT) and the Hampton Roads Transportation Planning Organization (HRTPO) thanks the Birthplace of America Trail Advisory Committee for its valuable contributions throughout the planning process.

Committee Co-Chairs:

Alison Alexander (HA)
Susan Wilson (PO)

Committee Members:

Ray Amoruso (HRT)	Jamie Oliver (IW)	Eric Stringfield (VDOT)
Frances Bailey (SY)	Amy Parker (YK)	Roberta Sulouff (JC)
Nick Britton (DRPT)	Bridgette Parker (NN)	Beth Weisbrod (VA Cap. Trail Foundation)
Robert R. Brown (NO)	Rodney Rhodes (WM)	Wayne Wilcox (VB)
Dennis Carney (Windsor)	Mark Shea (VB)	James Wright (PO)
Thelma Drake (NO)	Leroy J. Hansen (SU)	G. Glenn Oder (FMA)
Helen Gabriel (SU)	Carl Jackson (VDOT)	Susan Wilson (PO)

Prepared for:

The Virginia Department of Transportation (VDOT) and the Hampton Roads Transportation Planning Organization (HRTPO)



Prepared by:



October 10, 2017 Update: Figure 2 (Pg. 7) was modified to only reflect the Recommended Routes (not the Alternatives.) See Figure 11 (Pg. 25) for a map of the Recommended and Alternative Routes.

Table of Contents

Figures and Tables.....	4
Key Terms.....	5
Vision.....	6
Introduction.....	6
Why the Birthplace of America Trail?.....	8
What is a Shared-use Path?	10
Building on the Success of the Virginia Capital Trail.....	10
Plans and Projects.....	12
Input.....	15
Analysis	16
Cost Analysis.....	17
Demand Analysis	20
Finalizing the Route	23
Map Segments of the Recommended Route.....	24
Next Steps.....	57
Appendix A: Review of Individual Segments.....	65
Appendix B: Data Sources	82
Appendix C: Birthplace of America Trail Subcommittee	83
Appendix D: Public Comments Report	84
Appendix E: Case Studies	92



Figures and Tables

Figure 1: Study Area.....	6
Figure 2: Recommended and Alternative Routes.....	7
Figure 3: The Birthplace of America Trail – History and Heritage.....	8
Figure 4: Shared-use Path Design Guidelines	10
Figure 5: From Vision to Reality, Virginia Capital Trail Timeline.....	11
Figure 6: Public Input on Destinations and Potential Path Segments.....	16
Figure 7: Preliminary Cost Analysis	20
Figure 8: Demand Analysis – Criteria and Weights.....	21
Figure 9: The HRT MAX 961 – Regional Express Service	22
Figure 10: All Things Considered – Public Input, Cost, and Demand.....	23
Figure 11: Recommended and Alternative Routes.....	25
Figure 12: Map Segments Key.....	65
Figure 13: Capital Trail to Williamsburg (Seg. 1).....	66
Figure 14: Williamsburg to Yorktown Road (Seg. 2).....	68
Figure 15: Colonial Parkway to Yorktown (Seg. 2a, <i>Alternative Route Only</i>).....	69
Figure 16: Yorktown Road to Richneck Road (Seg. 3).....	70
Figure 17: Richneck Road to Route 17 (Seg. 4).....	72
Figure 18: Route 17 to North Armistead Avenue (Seg. 5)	73
Figure 19: North Armistead Avenue to Fort Monroe (Seg. 6)	74
Figure 20: Jamestown-Scotland Ferry to Moonlight Road (Seg. 7)	76
Figure 21: Moonlight Road to Smithfield (Seg. 8).....	78
Figure 22: Smithfield to Chuckatuck (Seg. 9).....	79
Figure 23: Chuckatuck to Suffolk/South Hampton Roads Trail (Seg. 10).....	80
Figure 24: Route 17 to South Hampton Roads Trail (Seg. 10a, <i>Alternative Route only</i>)	81
Table 1: Pedestrian and Bicycle Funding Opportunities (USDOT Transit, Highway, and Safety Funds).....	60
Table 2: Public Comments and Associated HRTPO Responses.....	84

Key Terms

Active Transportation Demand Score: A demand score which draws on a variety of criteria to approximate the relative demand for active transportation (cycling, walking) in a given area. This is discussed in additional detail in the study's Analysis section.

Bike Lane: A portion of a roadway which has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.

Boardwalk Bridges: Found on the Virginia Capital Trail, they are raised wooden bridges that can be used to traverse wetland areas, while minimizing environmental impacts. They are less expensive than traditional bridges and are context-sensitive to wetland areas.

HRTPO: Hampton Roads Transportation Planning Organization is the body created by Hampton Roads localities, as well as state and federal agencies to conduct cooperative transportation planning in the region.

Right of Way: A general term denoting land devoted to transportation purposes. The land may be owned outright by the agency responsible for the roadway or the agency may have a perpetual easement to use it for transportation purposes.

Sharrows: A pavement marking symbol that indicates appropriate bicycle positioning in a vehicle travel lane. Visit the [Virginia Supplement to the Manual on Uniform Traffic Control Devices \(MUTCD\)](#) for the most current standards, guidance, options, and support for the design, application, and placement of Traffic Control Devices (including signs, signals, and pavement markings) on roadways in Virginia.

Shared-use Path: A path or trail that is physically separated from motor vehicle travel and designed to accommodate cyclists, pedestrians, skaters, joggers, users of wheelchairs and other mobility-assisted devices, and other active transportation users.

Strava: A website and phone application that allows users to track and analyze their physical activity using GPS. Strava also offers a "heat map" that shows the most popular routes taken by their users while cycling and running. This is a valuable route-planning tool.

Utility Easement: An area of property that is designated for use by electric, gas, water, or other utilities. The utility company does not own the land, but has a right to use it for transmission. They are typically clear of trees, potentially providing a good opportunity for paths.

VDOT: The Virginia Department of Transportation.

Vision

To connect the Virginia Capital Trail to Fort Monroe and the South Hampton Roads Trail via two off-road shared-use paths, designed for non-motorized traffic.

Introduction

This study is a collaborative effort on behalf of the Virginia Department of Transportation, the Hampton Roads Transportation Planning Organization (HRTPO), and the Birthplace of America Trail (BOAT) Committee – a subcommittee of the HRTPO Transportation Technical Advisory Committee with additional attendance by state agencies, local jurisdictions, and bicycle advocacy groups. This study evaluates prior bicycle and pedestrian plans and studies in the region, considers potential route alternatives, and identifies Recommended Routes for two off-road paths (also referred to as “trails” or “conceptual alignments”). These Recommended Routes are preliminary in nature, likely will be subject to additional analysis as required by the National Environmental Policy Act and related environmental statutes and regulations, and do not constitute a location decision by VDOT, the HRTPO, or the Federal Highway Administration (FHWA). In order to account for unforeseen challenges, this study includes potential Alternative Routes that could be utilized if barriers, such as environmental concerns or right-of-way limitations, are encountered on the Recommended Routes.

While there is no dedicated funding source for design and construction, this study serves as a resource for localities as they pursue state, federal, and non-traditional funding sources for individual trail segments. As such, the region’s jurisdictions are encouraged to use portions of this document in their own planning efforts, whether in comprehensive plan updates, amendments, or in future funding applications.

Figure 1 provides an overview of the study area while Figure 2 shows the Recommended Routes for the Peninsula and Southside. The study’s **Map Segments** section, along with **Appendix A**, which reviews all potential segments (Recommended and Alternative), provide detailed information on anticipated opportunities, costs, and constraints for the off-road paths. For more detail on the routing, visit the [interactive web-map](#).

FIGURE 1: STUDY AREA

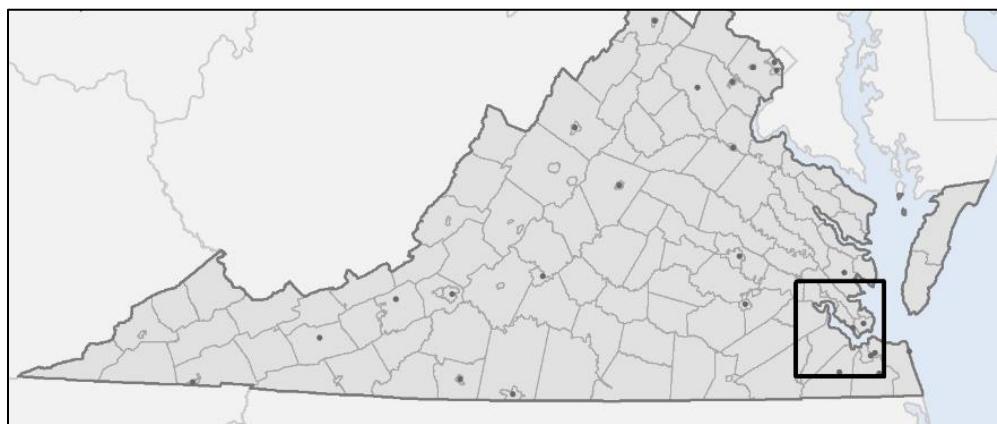
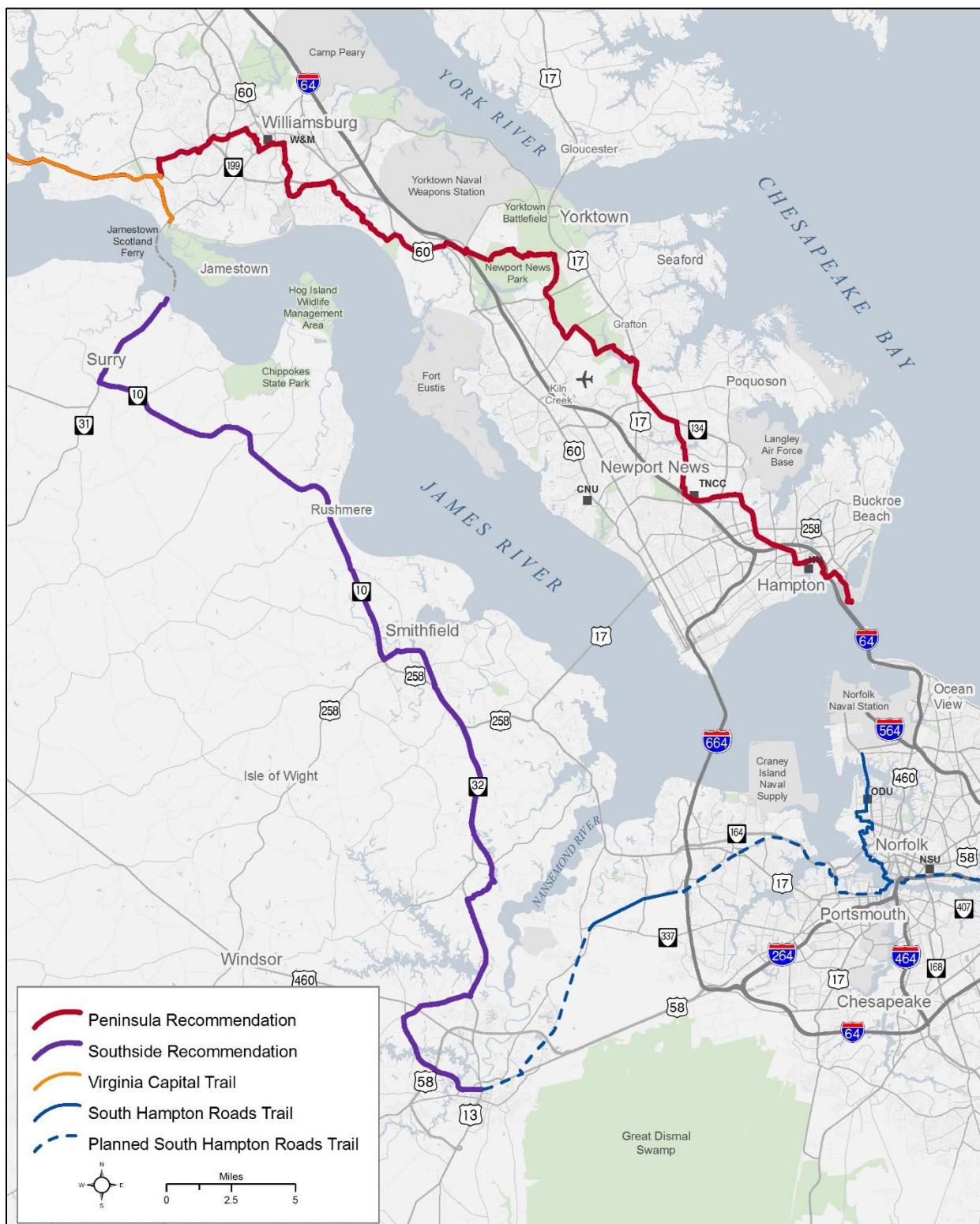


FIGURE 2: RECOMMENDED ROUTES

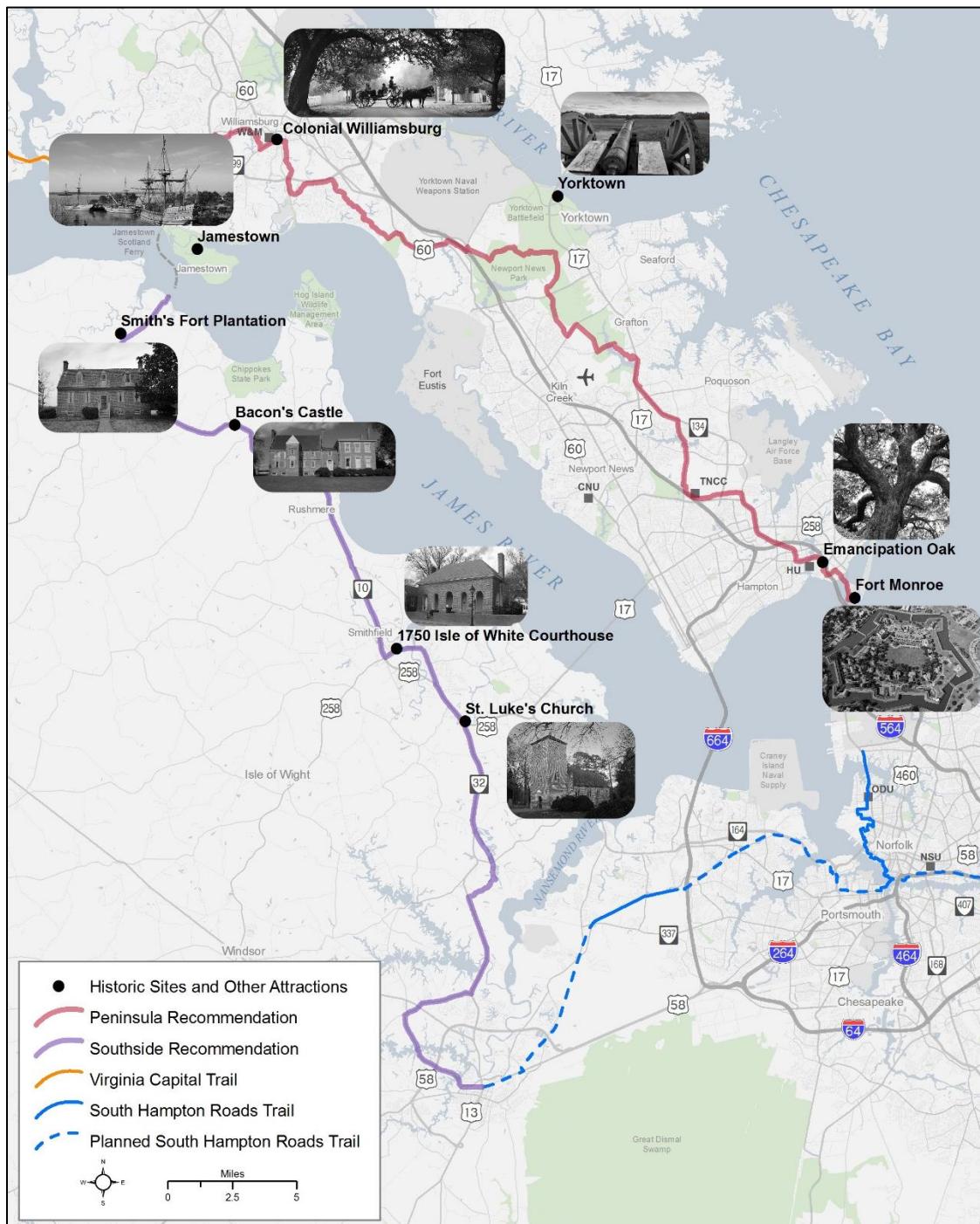


As shown above, the Recommended Routes connect the Virginia Capital Trail to Fort Monroe via the Peninsula and to the South Hampton Roads Trail via the Southside. For more detail on the Recommended and Alternative Routes, please visit the [Interactive Web Map](#).

Why the Birthplace of America Trail?

In addition to connecting the region through active transportation, the Birthplace of America Trail seeks to link and showcase the region's unique cultural and historic heritage. The following map (Figure 3) and summaries illuminate some of the iconic landmarks that are situated along the trail's Peninsula and Southside routes.

FIGURE 3: THE BIRTHPLACE OF AMERICA TRAIL – HISTORY AND HERITAGE



The map above illustrates several of the many historic and cultural sites along the Birthplace of America Trail

The Peninsula Route

The Birthplace of America Trail begins near Jamestown (1607), the first permanent English settlement in the United States. From Jamestown, the trail meanders through the College of William & Mary (founded 1693) before entering Colonial Williamsburg – Virginia's former capital (1699-1780) and now a symbol of the preservation and interpretation of American History. Departing Williamsburg, the trail soon traverses Newport News Park and enters Yorktown Battlefield, the site of the last major engagement (1781) of the Revolutionary War. The Peninsula Route continues south, passing parks, schools, and colleges, such as Thomas Nelson Community College, and ultimately enters the City of Hampton. In Hampton, the trail enters the campus of Hampton University and the VA Medical Center, passing by Emancipation Oak, the site of the first Southern reading of President Lincoln's *Emancipation Proclamation*. The trail continues through downtown Phoebe, crossing Mill Creek and entering historic Fort Monroe (1834), the terminus of the Birthplace of America Trail's Peninsula Route.

The Southside Route

After traveling by ferry from Jamestown to the Scotland Landing in Surry County, the trail continues through a picturesque section of Southside, passing historic homes like Smith's Fort Plantation (1761), the site of one of Captain John Smith's planned forts and also a piece of land that was given by Chief Powhatan as a dowry for his daughter, Pocahontas, upon her marriage to John Rolfe. The trail continues through the Town of Surry and travels southeast, passing Bacon's Castle (1665) and the Isle of Wight Courthouse (1750). Next, the trail journeys to historic Smithfield (1634), home to Colonial, Federal, and Victorian architecture, and known as the "ham capital of the world". The route departs through Smithfield's charming Historic District and travels south, passing St. Luke's Church (1682), Virginia's oldest church. The trail ends in the City of Suffolk, a community whose historic rail beds now provide life to the South Hampton Roads Trail, a regionally significant trail that, when complete, will connect Suffolk and Virginia Beach.

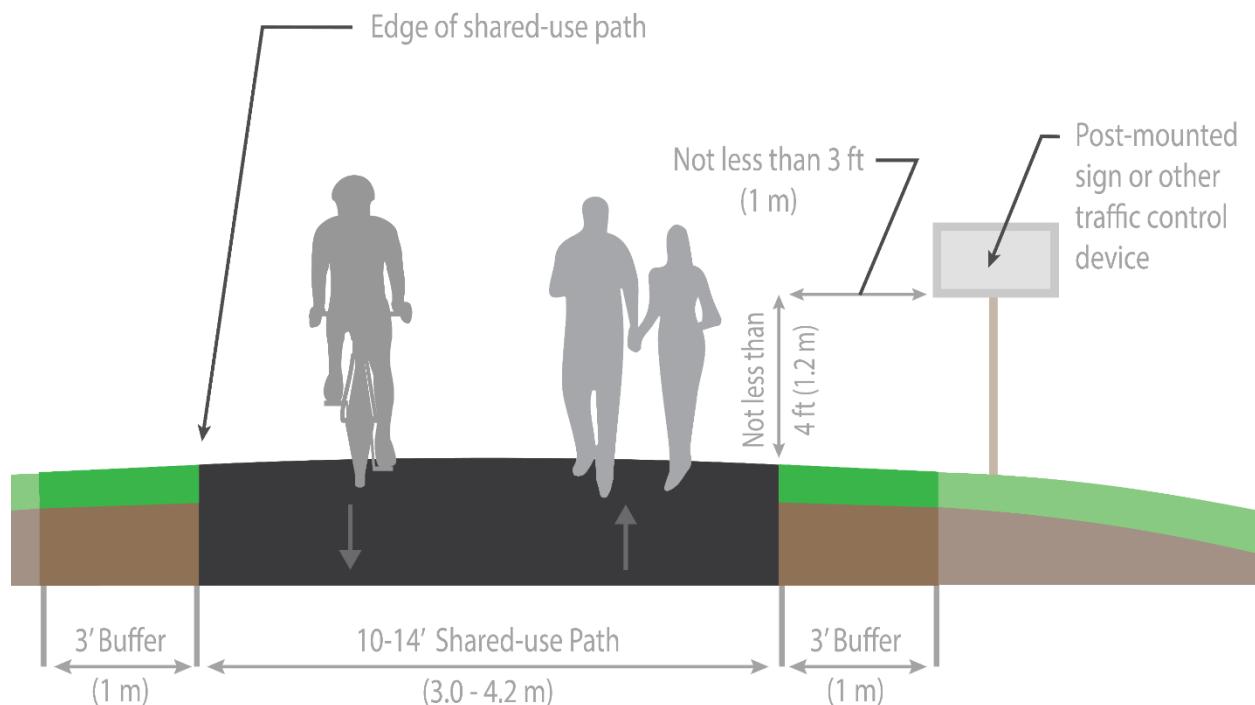


St. Luke's Church (circa 1682)

What is a Shared-use Path?

A shared-use path is a path or trail that is physically separated from motor vehicle traffic and designed to accommodate cyclists, pedestrians, skaters, joggers, users of wheelchairs and other mobility-assisted devices, and other active transportation users. The American Association of Surface Transportation Officials (AASHTO) recommends all-weather pavement surfaces (asphalt, concrete) and widths of 10-14 feet, allowing for two-way travel. VDOT requires a 3' buffer zone adjacent to paths situated along VDOT roadways or right-of-way and recommends wider paths (min. 12 feet) in urban areas or in places where there are high volumes of cyclists and pedestrians (Figure 4).¹ The Virginia Capital Trail, running from Richmond to Jamestown, is a successful example of a shared-use path.

FIGURE 4: SHARED-USE PATH DESIGN GUIDELINES



The guidelines above reflect design standards from AASHTO and VDOT. Source: Michael Baker International

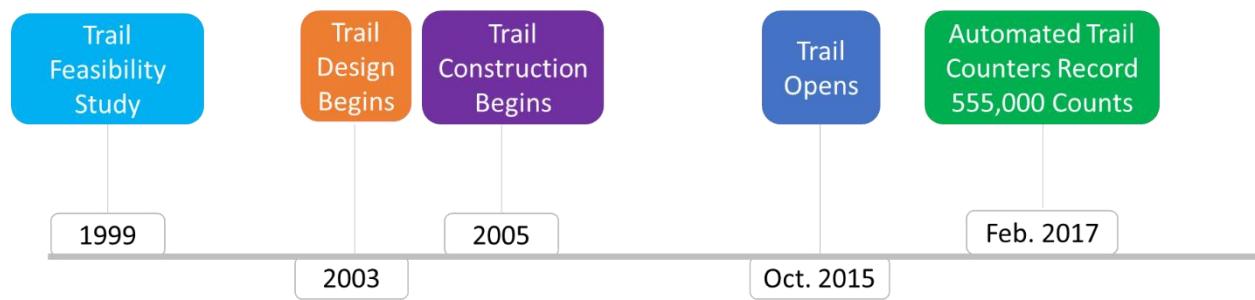
Building on the Success of the Virginia Capital Trail

The Virginia Capital Trail is a separated shared-use path that is generally 10'-wide, paralleling historic Route 5 for approximately 52 miles and connecting Richmond with Virginia's former capitals of Jamestown (1607-1699) and Williamsburg (1699-1780). The trail traverses picturesque urban and rural landscape of the City of Richmond, Henrico, Charles City, and James City counties and provides access to parks, schools, historic sites, shops, restaurants, and wineries. The East Coast Greenway (ECG) currently uses the trail on its way from Maine to Florida and is expected to use the Birthplace of America Trail (upon completion).

¹The [VDOT Roadway Design Manual](#) (Appendix A, Section A-5) provides detailed design standards for shared-use paths. Note: the Manual only opens in Internet Explorer.

A trail feasibility study was completed in 1999, trail design began in 2003, construction started in 2005, and the trail's grand opening was held in October 2015 (Figure 5). VDOT used a unique combination of Federal enhancement, open-container, and National Scenic Byways funds to pay for the design and construction of the Virginia Capital Trail. These funds were specifically designated for non-roadway construction projects, which helped ensure that the trail's funding plan did not compete with VDOT's maintenance and construction budgets. The Virginia Capital Trail Foundation has served as an advocacy partner since 2004, helping to raise public awareness of the trail and seek funding and contributions to enhance and promote the trail.

FIGURE 5: FROM VISION TO REALITY, VIRGINIA CAPITAL TRAIL TIMELINE



The trail attracts thousands of active transportation users per year, ranging from long-distance touring cyclists to commuters and families. As of February 2017, VDOT's automated bicycle/pedestrian counters had recorded nearly 200,000 counts along the Almond Creek portion of the trail (outside Richmond) and over 555,000 counts across segments of the trail. In addition to health benefits, the trail also provides a boost to local businesses along Route 5.

This study also reviewed several shared-use path examples from around the country. See **Appendix E** for details on the case studies, including lessons learned.



The Virginia Capital Trail. Source: VDOT and Michael Baker Int'l



The Virginia Capital Trail. Source: VDOT

Plans and Projects

Communities throughout the region recognize the importance of safe, connected bicycle and pedestrian infrastructure and have launched several recent initiatives to improve active transportation safety and mobility. These efforts, highlighted below, provided a foundation for this planning effort and many of the prior recommendations are reflected in this study's Recommended and Alternative routes. In all, local and regional plan recommendations account for approximately one third (30 miles) of the 93 total miles of Recommended Route (Peninsula and Southside).

Regional Bike Study

In 1993, York County, Williamsburg, and James City County worked together to develop a Regional Bikeway Plan for the three localities. The Plan was updated in 1997 and recommendations were revisited in 2013.

The Regional Bikeways Plan provides a strong foundation for this study and several recommendations are incorporated into the Peninsula's Recommended Route, including: shared-use paths on Monticello Avenue (some of which has already been constructed) and Carters Grove Country Road. In addition, this study utilizes several existing shared-use paths shown in the Regional Bikeways Plan, such as the McReynolds Athletic Complex (MAC) trail.

Bike Walk Hampton

The City of Hampton adopted its first bicycle and pedestrian master plan in 2016, titled, Bike Walk Hampton: A Strategic Bicycle & Pedestrian Plan. The plan highlights key bicycle destinations, such as Fort Monroe, identifies the need for improved partnerships with community institutions, and recommends improvements for sidewalks, sharrows, bike lanes, and shared-use paths. The plan also recommends the creation of a "signature path/trail".

This study incorporates several of the Bike Walk Hampton recommendations, such as a shared-use path on Armistead Avenue, and also solicits input from Hampton University and the VA Medical Center on potential improvements along Emancipation Drive and Martin Luther King Jr. Drive.

Fort Monroe Master Plan

The Fort Monroe Authority completed a Master Plan (Fall 2013) to protect the Fort's historic resources, guide redevelopment, and provide public access to the Fort's recreational opportunities. In addition to addressing land use, urban design, and public access, the Master Plan envisions McNair Drive as a pedestrian and bicycle-friendly street alongside marina and waterfront. Fort Monroe serves as the southern terminus for the Peninsula portion of the Birthplace of America Trail.



The vision for Fort Monroe includes active transportation facilities on McNair Drive and Gulick Drive (illustrative example above). Source: Fort Monroe Authority

Surry County Bicycle Plan

Surry County, with assistance from the VDOT Hampton Roads District, adopted its own Bike Plan in September 2016. The plan identifies areas of interest and proposed recommendations for paved shoulders, shared-use paths, signed routes, bike lanes, and sidewalks.

This study's Recommended Route is consistent with the Surry County Bike Plan's long-term recommendation to construct a shared-use path along Route 31 (Rolfe Highway), from the Scotland-Jamestown Ferry Landing to the Town of Surry. This segment would improve active transportation connections to public, recreational, government, and historic sites, such as Smith's Fort Plantation, the

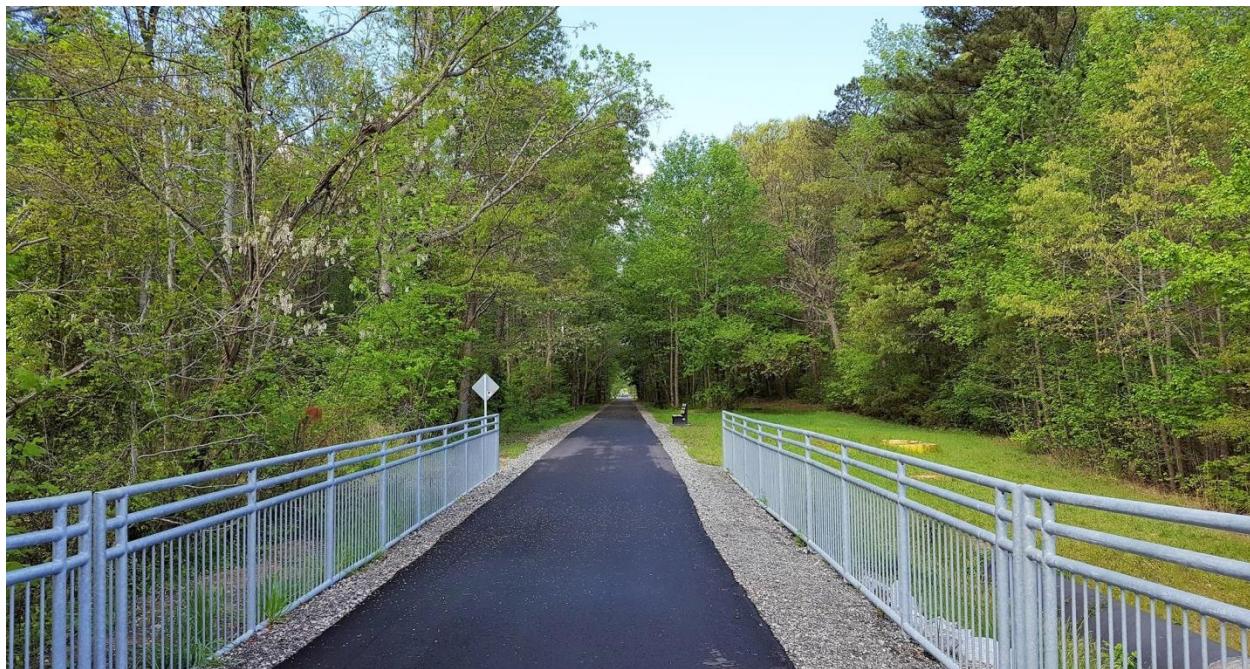
Surry County Historical Society, the Surry County Recreation Center, and Gray's Creek Marina. The study's Recommended Route continues southeast from the Town of Surry in the direction of other prominent places, such as Bacon's Castle and Chippokes Plantation State Park. It is anticipated that the East Coast Greenway will follow this alignment in the future.

Isle of Wight, Nike Park Road

Isle of Wight County completed a Bicycle and Pedestrian Plan in 2006 and made updates in 2009. The 2009 Update proposes shared-use paths along Benns Church Boulevard (Route 10), Battery Park Road, Nike Park Road, and ultimately on Carrollton Boulevard (Route 17) to Chuckatuck Creek. The County has begun implementing the recommendations and several segments are under design, construction, or have received funding. For example, construction is expected to begin in spring 2017 on the 3.3-mile Nike Park Trail, which will connect South Church Street to Nike Park. In addition, the Nike Park Road Extension, running from the terminus of Nike Park Road (at Reynolds Drive) to Route 17, was recently accepted through VDOT's competitive SMART SCALE program and will include a shared-use path, as well. This study's Alternative Route follows the existing and proposed paths along Battery Park Road and Nike Park Road.

South Hampton Roads Trail

The South Hampton Roads Trail is a multi-city initiative to build a 41-mile trail across some of the region's most populous areas. Beginning in downtown Suffolk, the trail, when complete, will connect four downtown areas (Suffolk, Portsmouth, Norfolk, and Chesapeake) before eventually terminating at the City of Virginia Beach resort area. The trail is primarily funded through federal grants. A goal of the Southside portion of the Birthplace of America Trail study is a direct connection to the South Hampton Roads Trail.



*The South Hampton Roads Trail in the City of Suffolk, locally referred to as the Suffolk Seaboard Coastline Trail.
Source: South Hampton Roads Trail Facebook.*

Input

In addition to incorporating recommendations from local and regional plans, the Birthplace of America Trail Study included coordination with the public, advocacy groups, regional stakeholders, and staff from local, state, and federal agencies.

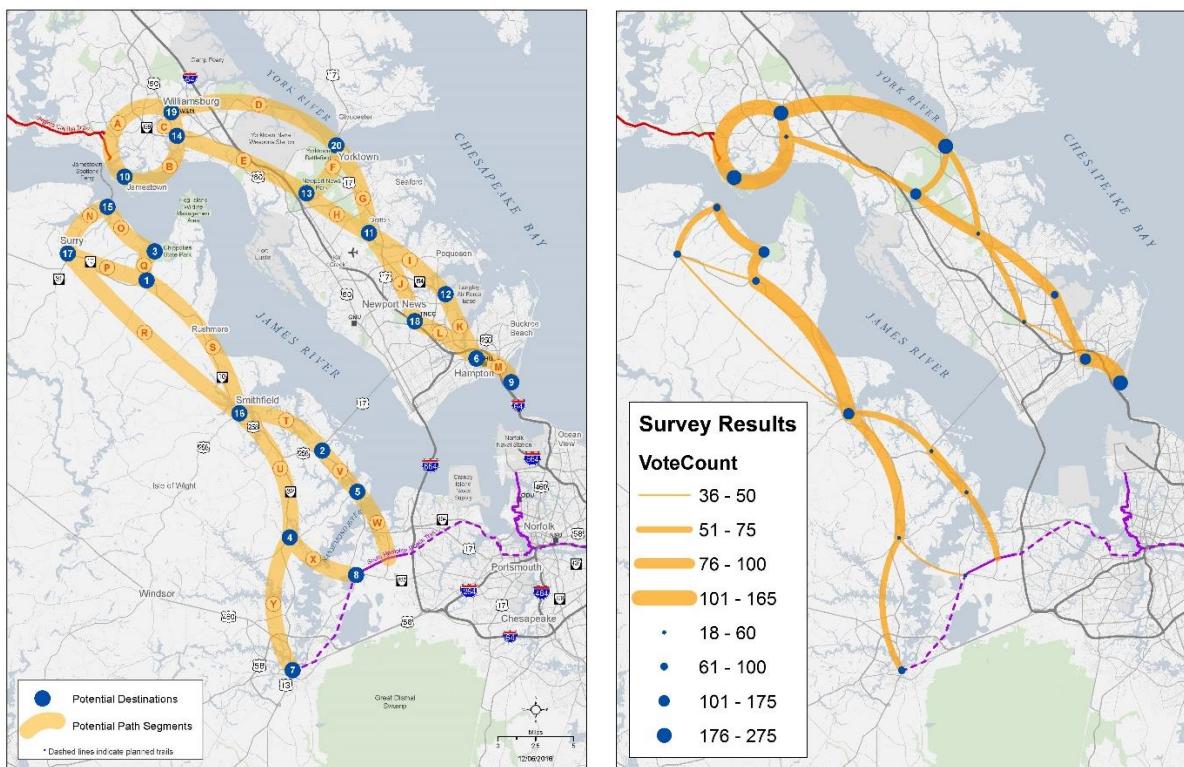
In spring 2016, the Hampton Roads Transportation Planning Organization (HRTPO) and the Transportation Technical Advisory Committee (TTAC) organized a subcommittee ("the committee") to guide the development of a study to connect the Jamestown terminus of the Virginia Capital Trail to Fort Monroe and the South Hampton Roads Trail via a shared-use path.

The committee, comprised of representatives from local, regional, state, and federal agencies/advocacy groups, met throughout this planning process and worked with VDOT and the HRTPO to ensure that the study was consistent with local goals, objectives, and anticipated initiatives. The committee also helped formulate the study vision, evaluate draft routes, distribute materials, and review the draft study. The committee meetings were advertised as open to the public and the press. The committee members and attendees are listed in **Appendix C**. The following committee meetings were held over the course of this study.

- June 14, 2016
- September 27, 2016
- November 11, 2016
- January 25, 2017
- March 25, 2017
- May 23, 2017

In addition to coordinating with the committee, stakeholder meetings were conducted with staff from a variety of organizations and agencies, such as: the National Park Service (Fort Monroe and Colonial National Historical Park), William & Mary, Hampton University, the Hampton VA Medical Center, Newport News Waterworks, and staff from the region's jurisdictions.

On December 1, 2016, the HRTPO developed an online survey to gain more input on the prospective routes. In order to maximize the responses to the online survey, the web address was distributed to the Hampton Roads Transportation Planning Organization Transportation Technical Advisory Committee, advocacy groups and was also displayed on the HRTPO's [Facebook page](#), which has nearly 2,500 followers. The survey, available for approximately 45 days, asked respondents to identify their most desired destinations and connections. The survey results (Figure 6) were used to analyze and assist in drafting the Recommended Routes.

FIGURE 6: PUBLIC INPUT ON DESTINATIONS AND POTENTIAL PATH SEGMENTS

The public survey results, shown above, helped identify desired destinations and connections throughout the region.

Regional bicycle advocates, from the Southside and Peninsula, were instrumental in the planning process. For example, the Peninsula Bicycling Association (PBA), represented on the advisory committee, provided key input throughout the study and its members provided nearly 20 individual Facebook comments on the Draft Routes.

The Draft Birthplace of America Trail Study was posted on the HRTPO website on Wednesday, June 7 for a two-week public comment period. The Virginian-Pilot also published [an article](#) about the Birthplace of America Trail and provided a link where viewers could download the Draft Study.² The public comments and associated responses are summarized in **Appendix D**.

Analysis

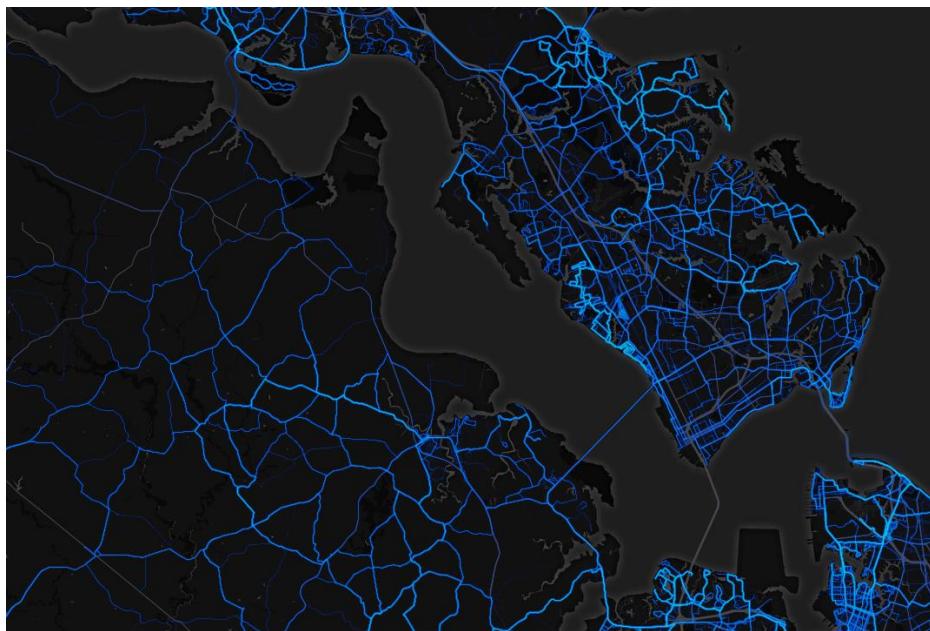
The data-driven components of the route selection process involved cost analysis, demand analysis, and public input for each of the potential segments. Once an initial route was chosen based on those factors, the route was presented to the committee and adjustments were made based on committee input.

As discussed above, this study included a thorough review of prior bicycle plans and studies from around the region. These plans helped identify existing, proposed, and funded active transportation facilities. In addition, funding applications, news articles, jurisdiction staff, and committee members

² [The Virginian-Pilot article](#) was shared over 400 times on social media as of June 23, 2017. Source: pilotonline.com. Pascale, Jordan; The Virginian-Pilot; June 2017.

helped identify other proposed and funded shared-use paths throughout the region. Strava mobile application data were also reviewed to identify popular existing routes for cyclists. This inventory and assessment, catalogued in GIS, provided an understanding of overall connectivity and identified opportunities where the routes could leverage existing and funded paths.

After gathering preliminary data and working with the committee to fill in the gaps, more in-depth analyses were conducted to evaluate cost, demand, and feasibility of potential routes. These analyses are discussed in more detail below.



Strava data were reviewed to identify popular existing routes for cyclists (example above)

Cost Analysis

Planning-level cost estimates were developed for the study's proposed preliminary segments. While the cost estimates account for high-level design and construction and generally reflect any required special considerations, such as: bridges; boardwalks; and underpass reconfiguration, they do not reflect all site-specific conditions, such as: drainage; utility relocation; and unique right-of-way concerns. The following summary provides additional detail on the methodology used to develop the cost estimates. All costs are in 2016 dollars and are intended to provide an indication (not an absolute determination) of the anticipated costs to design and construct the study's various proposed segments. These cost considerations may be referenced in other parts of this study, including the discussion of the Recommended Route.

Unit Costs (Per Mile):

The Virginia Capital Trail's design and construction costs served as the basis for this study's cost assumptions. Excluding the Greenspring segment of the Virginia Capital Trail (which included extensive boardwalks for wetland areas), the Capital Trail cost approximately \$1.4 million per mile (2016 dollars), including design and construction.³ These per-mile unit costs were multiplied by the mileage of the

³ VDOT Planning-level Cost Estimates for Bicycle and Pedestrian Facilities estimate shared-use path costs at approximately \$1.6 million per mile for the Hampton Roads region

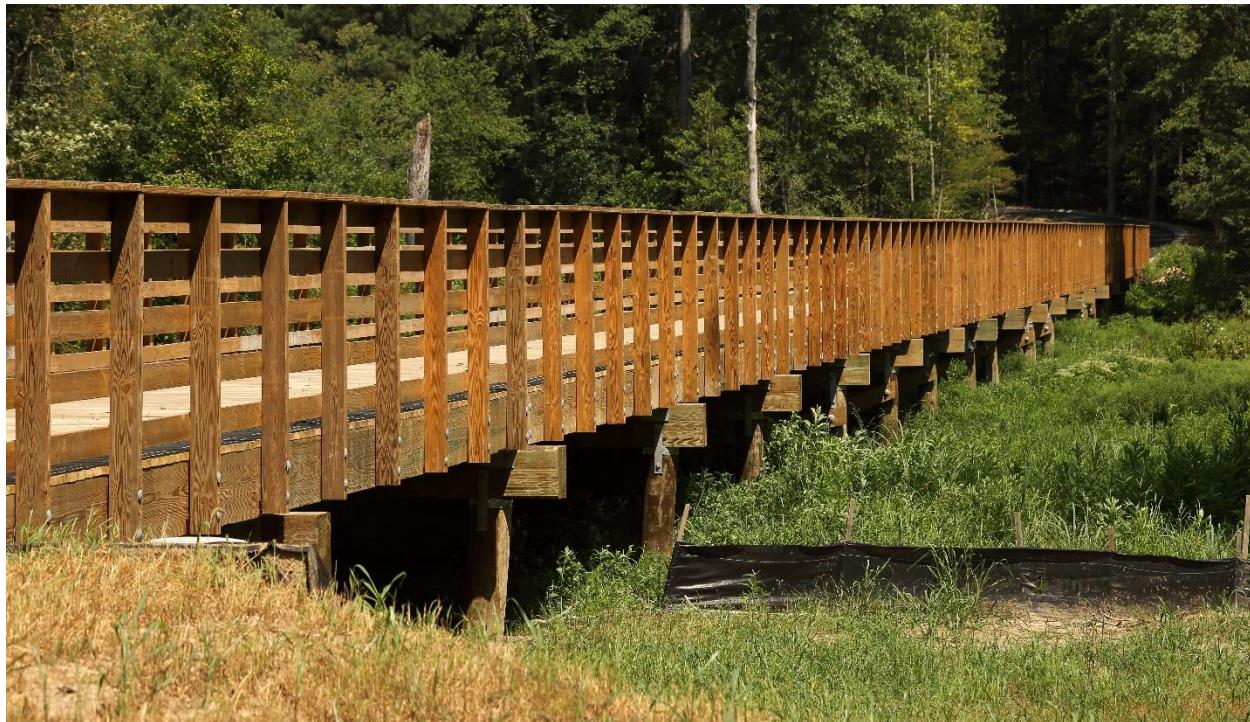
study's proposed segments. Additional analysis and cost adjustments were made for segments which may require special considerations, such as: existing trails; wetland boardwalks; bridges; or underpass reconfiguration.

Existing Paths/Trails

This study accounts for instances where the routes traverse existing or funded path/trail segments. The study assumes that there would be no additional costs for proposed segments that align with existing or funded *asphalt or concrete* paths or are part of larger road replacement projects. Meanwhile, it is assumed that resurfacing existing dirt or gravel roads (ex: those in Newport News Park or along the RC Flying Field in Suffolk) would cost approximately \$126,000 per mile, which reflects the need for additional clearing, grubbing, grading, and asphalt. This per-mile cost is similar to that seen in other planning studies, such as that of the Iowa Department of Transportation (IDOT, 2010).

Wetlands

In some cases, the routes traverse challenging terrain, such as wetlands. Similar to the Virginia Capital Trail, this study assumes wetland boardwalks would be used to guide the path through wetland areas. In addition, it is assumed that the per-mile design and construction cost for wetland boardwalks exceed that of a typical shared-use path segment. In order to derive the unit costs for wetland boardwalks, this study relied on prior project costs, such as the 2.8-mile Greensprings segment of the Virginia Capital Trail, which traversed several wetland areas and cost \$4.1 million. Assuming 20 percent of the Greensprings segment includes wetland boardwalks (with the remainder including typical shared-use paths at \$1.4 million per mile), then the boardwalk section cost approximately \$1.9 million per mile, comparable to estimated unit costs for other wetland path projects, such as that in Ocean City, New Jersey (NJDOT).



Boardwalk-style bridges, like those used on the Virginia Capital Trail (above), can be used to traverse wetland areas. Source: VDOT

Bridges

There are several instances where the routes would require bridge improvements to cross a water feature or rail line. This study assumes that a 12'-14' wide bicycle/pedestrian bridge would cost approximately \$14.8 million per mile, which is consistent with VDOT planning-level estimates (\$14.8 million per mile) and those found in other plans and studies (FHWA 2016; ODOT 2013).⁴

Underpass Reconfiguration

There are four (4) locations where the routes go under I-64. In these cases, the existing I-64 underpasses have limited space for a shared-use path, effectively acting as "pinch points" for any proposed trails. In order for a path to cross behind the underpass bridge piers, the retaining walls would likely need to be reconfigured (dropping the sloped portion). It is estimated that each underpass reconfiguration would cost approximately \$620,000, an estimate which reflects the average cost for other recent underpass reconfiguration projects in Punta Gorda, Florida and Grand Rapids, Michigan.

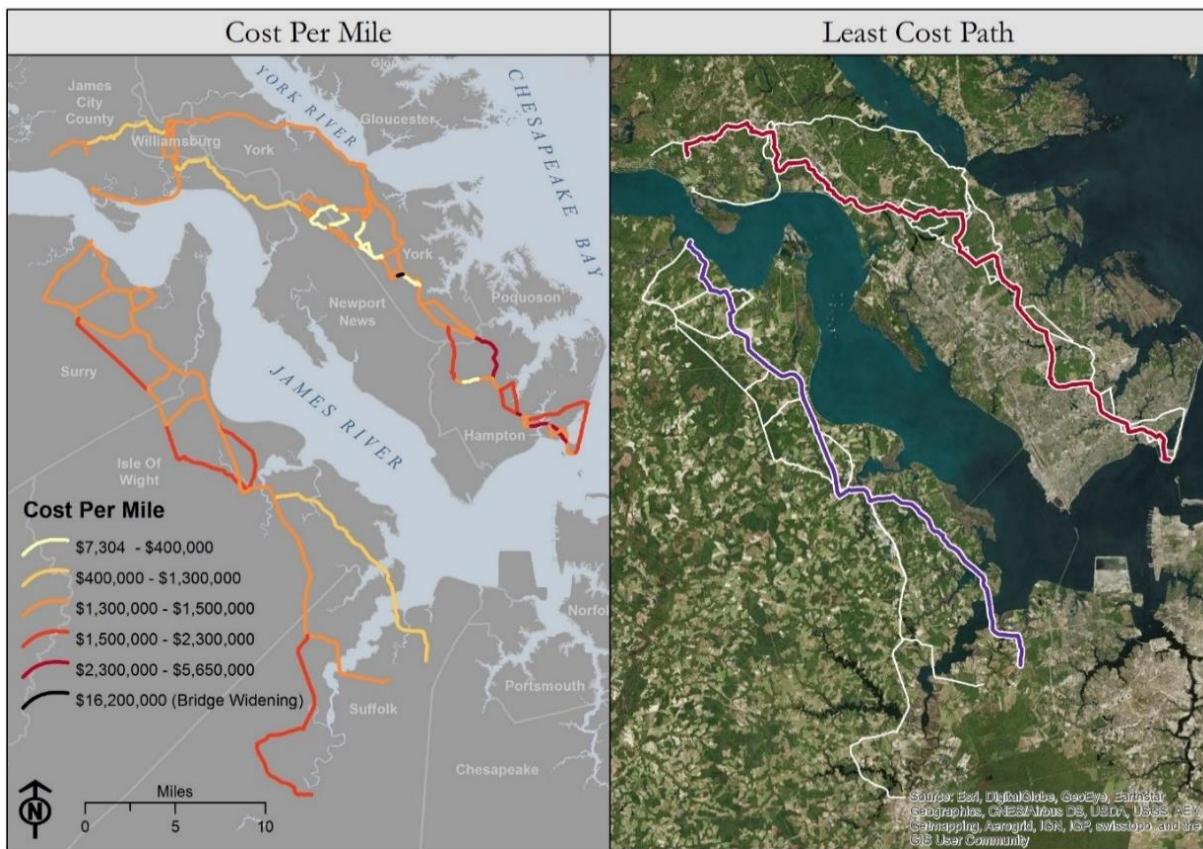


The existing retaining walls in the I-64 underpasses (like the Yorktown Road example above) would need to be reconfigured to accommodate a 10' shared-use path. The blue area above approximates the area of the retaining wall that would require modification.

Least-Cost Path

After estimating individual segment costs, ArcGIS' Network Analyst was used to determine a least-cost path (Figure 7). Given the high number of possible combinations of segments, the tool was very helpful in efficiently measuring relative affordability at the planning level.

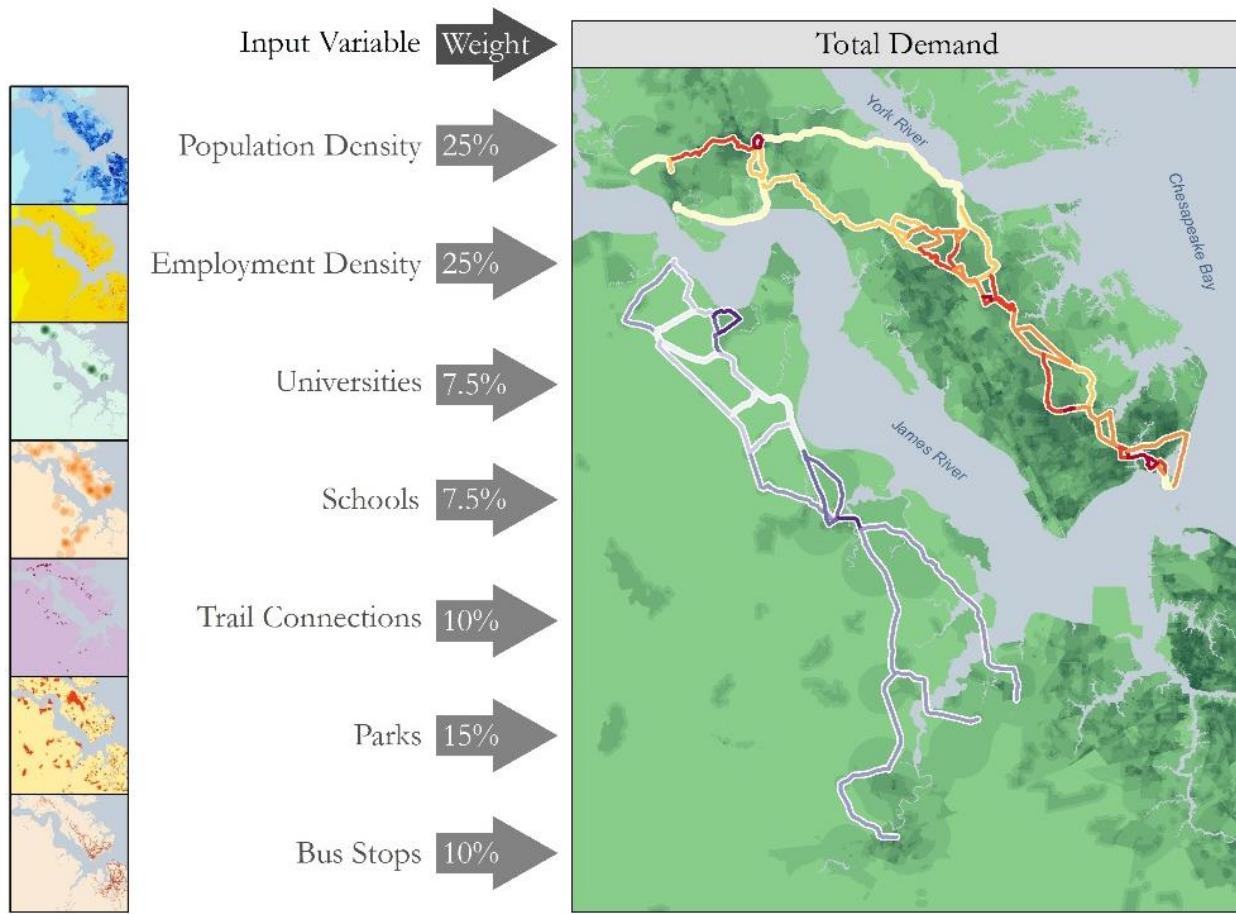
⁴ VDOT Planning-level Cost Estimates for Bicycle and Pedestrian Facilities estimate bridge costs at \$180 per square foot to \$250 per square foot for the Hampton Roads region

FIGURE 7: PRELIMINARY COST ANALYSIS

Cost estimates were developed for the various segments and used to help identify least-cost paths for the Peninsula and Southside.

Demand Analysis

A demand analysis was conducted to approximate relative demand for the proposed path segments. The analysis was developed in GIS and assigned a demand value to each potential segment based on a segment's proximity to various demand generators. The demand generators were weighted and combined into one GIS demand layer, which was used to derive average demand for each segment, accounting for segment mileage. The data, drawn from a variety of local, regional, and national sources, are listed below (and shown in Figure 8), along with each generator's associated demand weight.

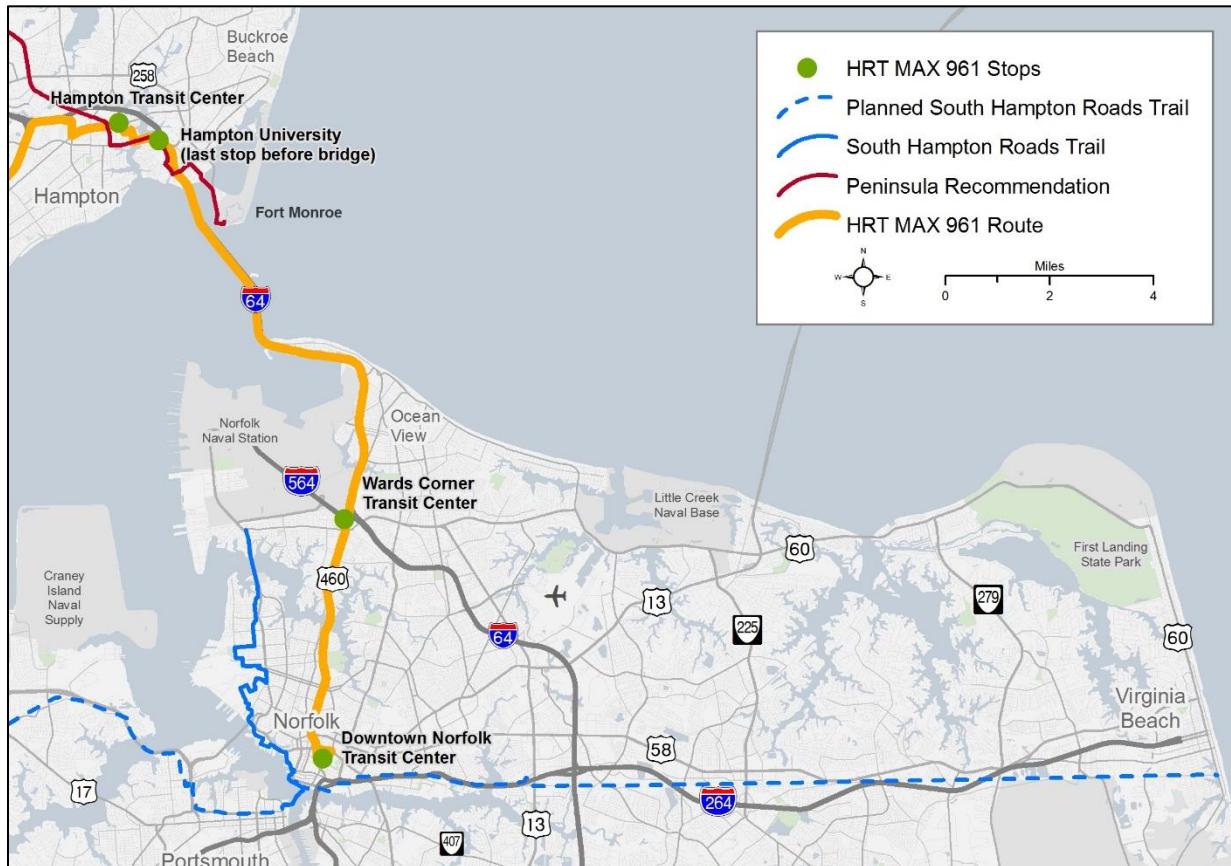
FIGURE 8: DEMAND ANALYSIS – CRITERIA AND WEIGHTS

A draft schematic showing how various demand generators contributed to the overall demand scoring process.

- Population density (25%) – Trail's that are constructed in populous areas can be used for recreational, casual, and commuting purposes and for users of all ages, backgrounds, and abilities. In addition, as echoed by this Study's Advisory Committee, higher trail usage can help foster a safer environment since there will be more “eyes on the street.”
- Employment density (25%) – Employers can benefit from being close to the trail, as trail access allows employees to walk or bicycle to work. This alleviates traffic and parking concerns, provides happier and healthier employees, and is better for the environment.
- Universities (7.5%) – Universities can greatly benefit from proximity to the trail, allowing their students to get to class by a means other than driving. It also alleviates parking concerns.
- Schools (7.5%) – Similarly, public schools can benefit from their students having a safe route to bike or walk to school.
- Trail connections (10%) – The Recommended Route can be even more beneficial if it connects to other trails in the area. This enhanced connectivity offers trail users greater access to the region and gives commuters additional transportation options. The routes can also help bridge gaps in the existing trail network.
- Parks (15%) – Recreational cyclists can access the region’s parks by active transportation.
- Bus stops (10%) – With buses and ferries equipped with bicycle racks, trail users can combine cycling with public transportation, expanding their transportation options and helping to address first and

last mile gaps in the transit system. The region's public transportation network can potentially serve an important role in transporting cyclists to/from the Recommended Route. For example, the [HRT MAX Route 961](#), which is equipped with bike racks, offers regional express service between the Hampton Transit Center (0.3 miles from the Recommended Route), Newport News Transit Center, and Downtown Norfolk Transit Center via the Hampton Roads Bridge Tunnel (Figure 9). From the Norfolk Transit Center, trail users can access the existing/planned South Hampton Roads Trail, either in Norfolk or in Portsmouth (via HRT's bicycle-friendly [Elizabeth River Ferry](#)).

FIGURE 9: THE HRT MAX 961 – REGIONAL EXPRESS SERVICE



The HRT MAX Route 961 offers regional express service and can connect trail users to Hampton, Newport News, Norfolk, and beyond.

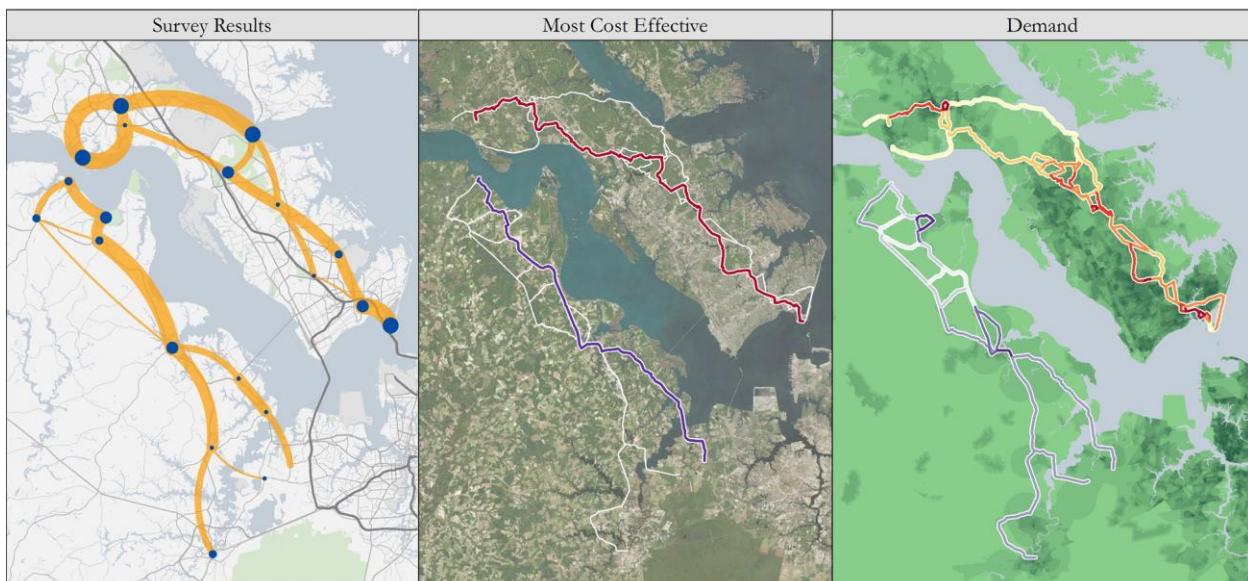


The HRT MAX Route 961 connects to the new Downtown Norfolk Transit Center. Source: gohrt.com

Finalizing the Route

The cost, demand, and survey results for each segment were presented to the study's advisory committee to aid in the discussion and selection of the Recommended Route (Figure 10). The study's advisory committee used these resources alongside local knowledge, input, and existing/planned trails to finalize the Recommended Route (reviewed in detail in the next section). The Alternative Routes are shown on the maps and discussed in **Appendix A**.

FIGURE 10: ALL THINGS CONSIDERED – PUBLIC INPUT, COST, AND DEMAND



The public survey results, along with anticipated cost and demand, were some of the resources used to finalize the Recommended Route and the Alternatives.

Map Segments of the Recommended Route

The following chapter reviews the individual sections (or map areas) of the Birthplace of America Trail and provides detail on the Recommended segments within each area. There are ten (10) total map areas, reflecting the Peninsula and Southside routes, and each map area includes a 3-page summary of the Recommended Route. The first page provides a route summary, total cost, length, and list of opportunities and constraints. The map area's second page takes a closer look at a particular area (ex: a downtown or a complex intersection) and also includes a summary table that reviews the representative path segments within the overall map area. The third page includes several area photos, whose captions reference the individual segments.

While the Alternative Routes are shown on the overview map (Figure 11) and the individual maps, they are *not* discussed in detail in this section. Please see **Appendix A** for additional detail on the Alternatives and their associated costs, opportunities, and constraints.

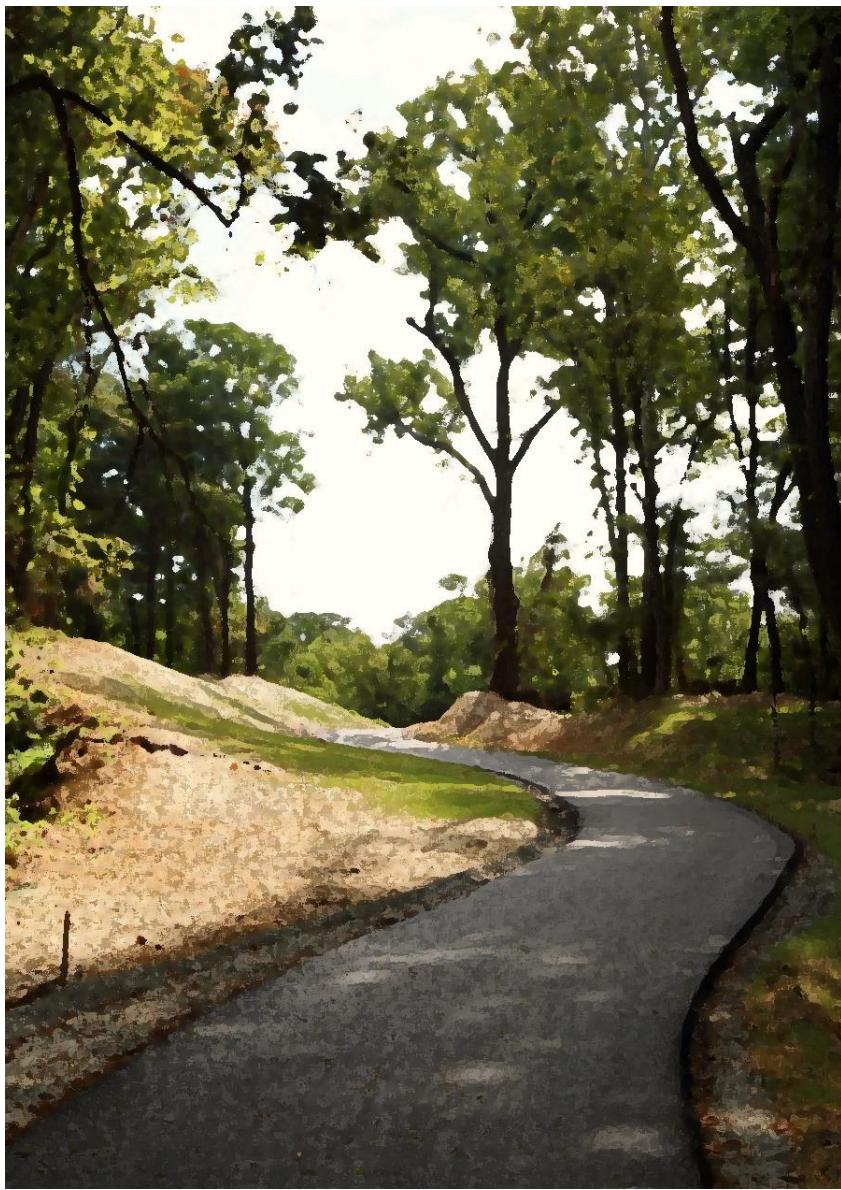
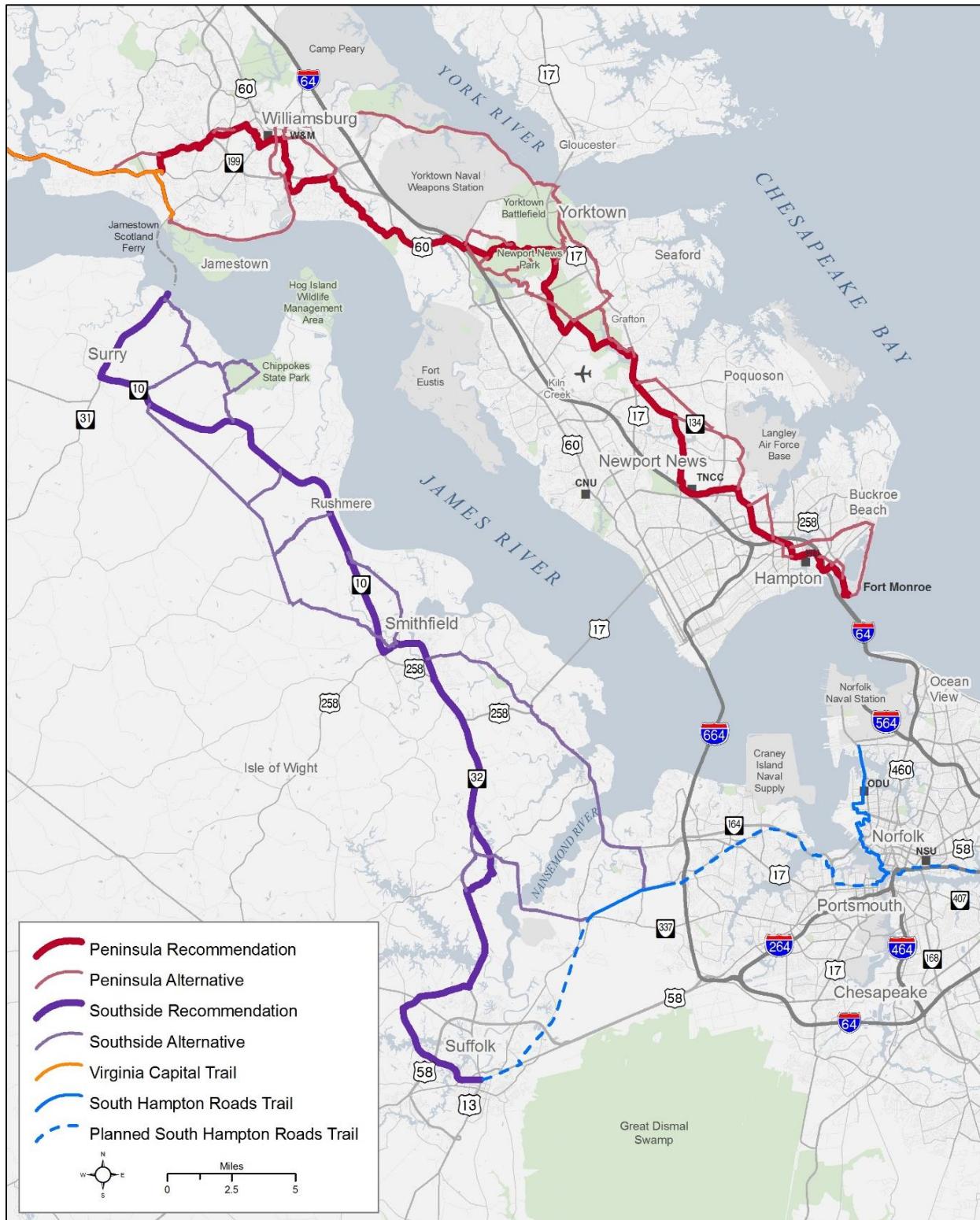


FIGURE II: RECOMMENDED AND ALTERNATIVE ROUTES



Map Segments

Key Elements

Birthplace of America Trail Study

Segment Map Elements:

Number and description of map section, map key in bottom left

The first page of the segment details shows an overall view of the recommended route, alternate routes, existing trails, and any opportunities or constraints. See key for explanation of icons.

The total cost estimate of this section of the recommended route. See breakdown by segment on next page, and cost estimates of alternative routes in appendix.

The total length of this section of the recommended route, and how much of that is already built or funded. See breakdown by segment on next page.

Location of this section within overall alignment.

On second page, detail map and description of complicated areas

Table showing data for each individual segment, including total length, existing or funded length, total cost, whether it is VDOT maintained, and whether it is part of an existing plan



Cost
\$8.3 Mil
Recommended Concept

Length
7.1 Miles
Recommended Concept
1.1 Miles Complete/Funded
6 Miles To be Constructed



Route Summary
The Recommended Route begins at Jamestown High School on Route 5, travels north on Greensprings Plantation Drive, and then east on Monticello Avenue. At Veterans Park, the route follows Ironbound Road before eventually reconnecting to Monticello and traveling under Route 19. The route then follows Compton to Monticello, and eventually follows Compton to the William & Mary campus before connecting to Historic Williamsburg via Jamestown Road and Francis Street.

Segment Opportunities

- Includes several segments with existing or funded active transportation facilities.
- Provides access to the commercial area of New Town, including restaurants and a bike shop.
- Provides direct access to William & Mary, (8,617 students).
- Allows users to access Jamestown and Colonial Williamsburg

Segment Constraints

- The interchange at Monticello and Route 199 requires special attention and, in its current state, is unsafe for pedestrians and cyclists. Here, the Recommended Route crosses four (4) ramps (two signalized and two unsignalized). Future study efforts should consider appropriate vehicle alignment and evaluate repositioning the existing bike lanes and sidewalks as a shared-use path (or a sidewalk and a protected bike lane).

shared-use path is infeasible on Compton, additional signage or traffic calming measures could reduce motor speeds and improve safety for active transportation users. Pedestrian flashing beacons are already in place at crossings.

Segment Details:

Segment Number	From	To	Length (Miles)	Existing/Funded Portion	Maintenance	Part of Existing Plan?	Planning-level Cost Estimate
Rec-1A	Greensprings Plantation Dr & John Tyler Mem Hwy (Rt 5)	Greensprings Plantation Dr	0.64	0.00	Local	No	\$.9M
Rec-1B	Monticello Ave (Rt 5000) & Greensprings Plantation Dr	Monticello Ave (Rt 321) & Ironbound Rd	2.73	0.40	Mixed	Yes	\$3.2M
Rec-1C	Monticello Ave (Rt 321) & Ironbound Rd	Monticello Ave (Rt 321) & Ironbound Rd via Ironbound Dr	0.91	0.00	VDOT	No	\$1.3M
Rec-1D	Monticello Ave (Rt 321) & Ironbound Rd	W Francis St & S Henry St	2.55	0.72	Mixed	No	\$2.5M
Rec-1E	W Francis St & S Henry St	Francis St & S England St	0.32	0.00	VDOT	No	\$4.4M
Total			7.15	1.12			\$8.3M

Cost Notes

Rec-1B: Existing SUP through park
Rec-1D: Funded SUP for .72 miles



Map Icon Key:



Bridge



Concern



College



Employment



History



Park



Population



Right-of-Way



School



Transit



Trail Connection



Wetland



Map Segments

Birthplace of America

Trail Study

1. Capital Trail to Williamsburg



Cost

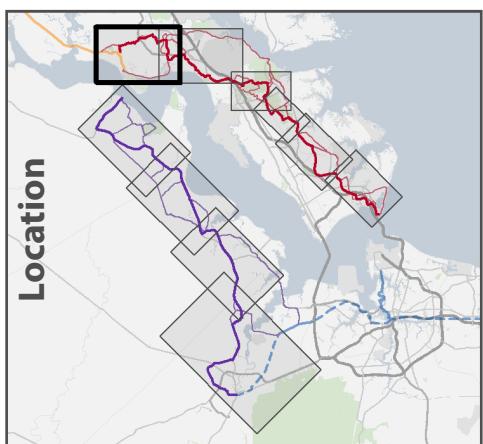
\$8.3 Mil

Recommended Concept

Length

7.1 Miles

1.1 Miles Complete/Funded 6 Miles To be Constructed



Location

Route Summary

The Recommended Route begins at Jamestown High School on Route 5, travels north on Greensprings Plantation Drive, and then east on Monticello Avenue. At Veterans Park, the route follows Ironbound Road before eventually reconnecting to Monticello and traveling under Route 199. The route then follows Ironbound to Monticello and eventually follows Compton to the William & Mary campus before connecting to Historic Williamsburg via Jamestown Road and Francis Street.

Segment Opportunities

Includes several segments with existing or funded shared use paths.

Provides access to the commercial area of New Town & Merchants Square, including restaurants and a bike shop.

Provides direct access to William & Mary, (8,617 students).

Allows users to access Jamestown and Colonial Williamsburg

Segment Constraints

From Ironbound Road, the Recommended Route crosses four ramps (two signalized and two unsignalized) at the Route 199 interchange. Further study should consider appropriate warning signage, signalized trail crossings, repurposing the bike lanes and existing sidewalk as a shared-use path, and construction of a trail overpass over the south-bound acceleration lane.

Map Segments

Birthplace of America

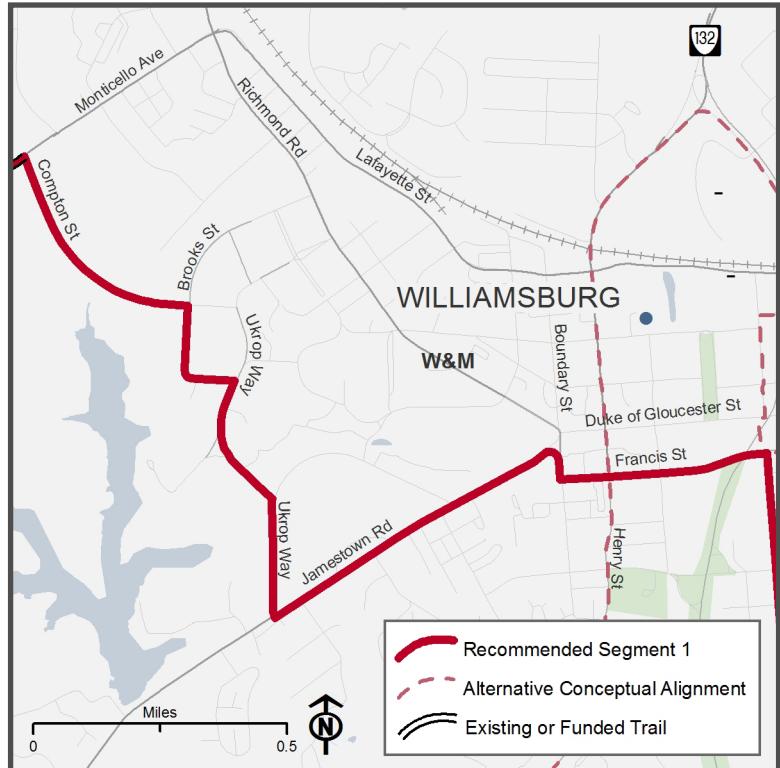
Trail Study

1. Capital Trail to Williamsburg

A Closer Look: Downtown Williamsburg

The map (right) shows the Recommended Route's path into Colonial Williamsburg. The routing was recommended by William & Mary and Colonial Williamsburg as it minimizes environmental impacts and reduces conflicts in areas with high pedestrian traffic (Duke of Gloucester Street).

Shared-use paths may not be feasible on several segments in this area. For example, Compton Drive is bounded by a small ridge on the roadway's west side a steep slope on the roadway's right side. In addition, right-of-way may be limited on Jamestown Road (existing bike lanes) and Francis Street. In the event that shared-use paths are infeasible, additional signage or traffic calming measures could reduce vehicular speeds and improve active transportation safety. Note: William & Mary has submitted a grant application to extend the sidewalks on Compton Drive to connect to Monticello Avenue.



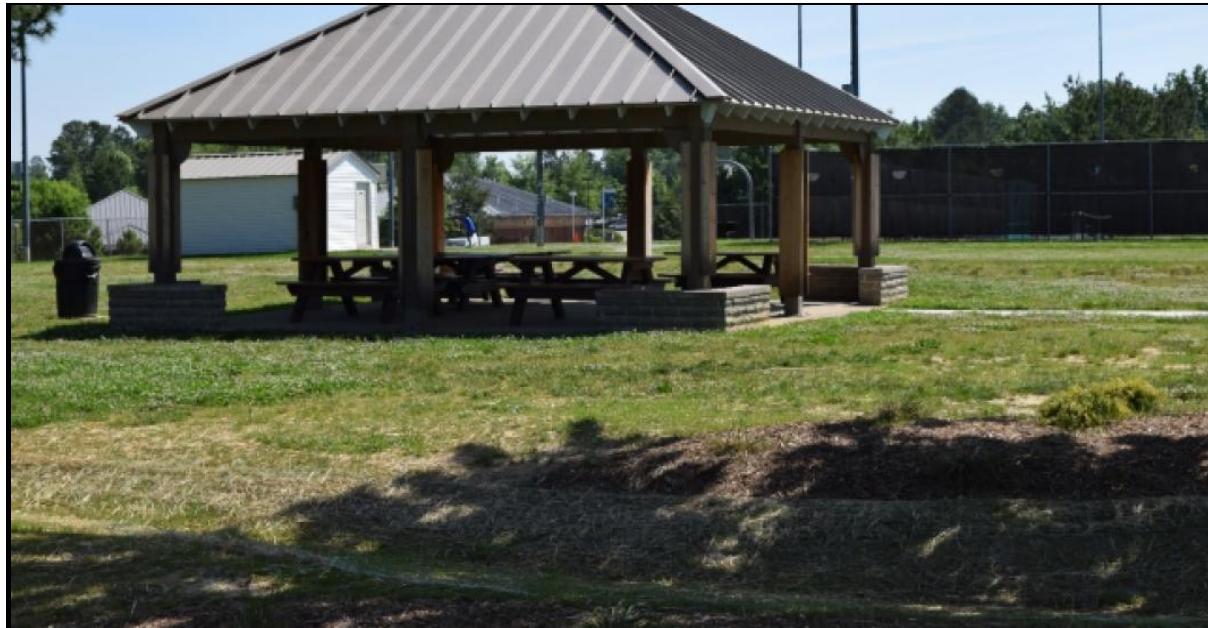
Segment Details:

Segment Number	From	To	Length (Miles)	Existing/ Funded Portion	Maintenance	Part of Existing Plan?	Planning-level Cost Estimate
Rec-1A	Greensprings Plantation Dr & John Tyler Mem Hwy (Rt 5)	Greensprings Plantation Dr & Monticello Ave (Rt 5000)	0.64	0.00	Local	No	\$.9M
Rec-1B	Monticello Ave (Rt 5000) & Greensprings Plantation Dr	Monticello Ave (Rt 321) & Ironbound Rd	2.73	0.40	Mixed	Yes	\$3.2M
Rec-1C	Monticello Ave (Rt 321) & Ironbound Rd	Monticello Ave (Rt 321) & Ironbound Rd via Ironbound Rd	0.91	0.00	VDOT	No	\$1.3M
Rec-1D	Monticello Ave (Rt 321) & Ironbound Rd	W Francis St & S Henry St	2.55	0.72	Mixed	No	\$2.5M
Rec-1E	W Francis St & S Henry St	Francis St & S England St	0.32	0.00	VDOT	No	\$.4M
Total			7.15	1.12			\$8.3M

Cost Notes

Rec-1B: Existing shared-use path through Veterans Park

Rec-1D: Funded shared-use path for .72 miles



Veterans Park, Williamsburg (Rec-1B)

The route follows an existing path through Veterans Park to connect from Monticello Avenue to Ironbound Road



Compton Drive, Williamsburg (Rec-1D)

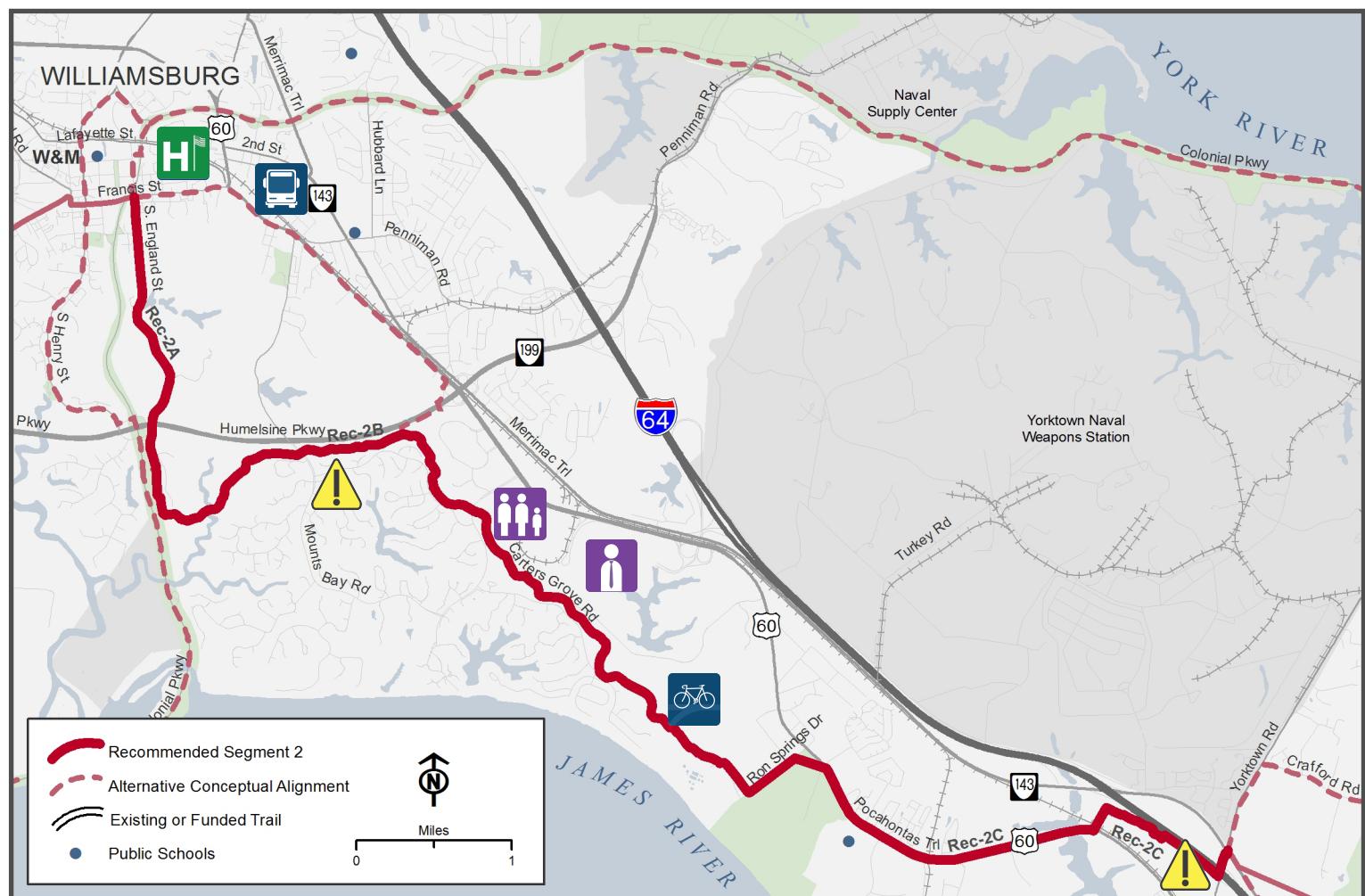
The route enters William & Mary campus on Compton Drive

Map Segments

2. Williamsburg to Yorktown Road

Birthplace of America

Trail Study



Cost

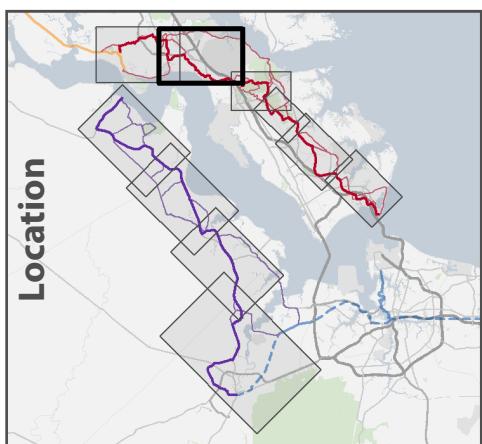
\$14.8 Mil

Recommended Concept

Length
Recommended
Concept

11.5 Miles

0 Miles Complete/Funded 11.5 Miles To be Constructed



Location

Route Summary

From Colonial Williamsburg, the Recommended Route follows South England Street to Carters Grove Country Road and then parallels Route 60 for a short stretch. After crossing Skiffes Creek, the route passes over Route 60 and the rail line and eventually follows Yorktown Road under I-64 before connecting to Jefferson Avenue and Newport News Park.

Segment Opportunities

Carters Grove Country Road (currently closed to the public/vehicular traffic) is a 14-foot asphalt roadway in good condition.

WATA provides bus service/bike racks.

Offers opportunities for active transportation and economic development.

Could potentially provide access to large regional employers, such as Busch Gardens.

Segment Constraints

Carters Grove Road has several property owners (Colonial Williamsburg, Escalante, Kings Mill). Potential public use depends on coordination with existing/future property owners. The structural integrity of two short bridges over Halfway Creek and Grove Creek must be evaluated.

There are several barriers (natural and man-made) at the approach to I-64 (see next page).

Map Segments

2. Williamsburg to Yorktown Road

Birthplace of America

Trail Study

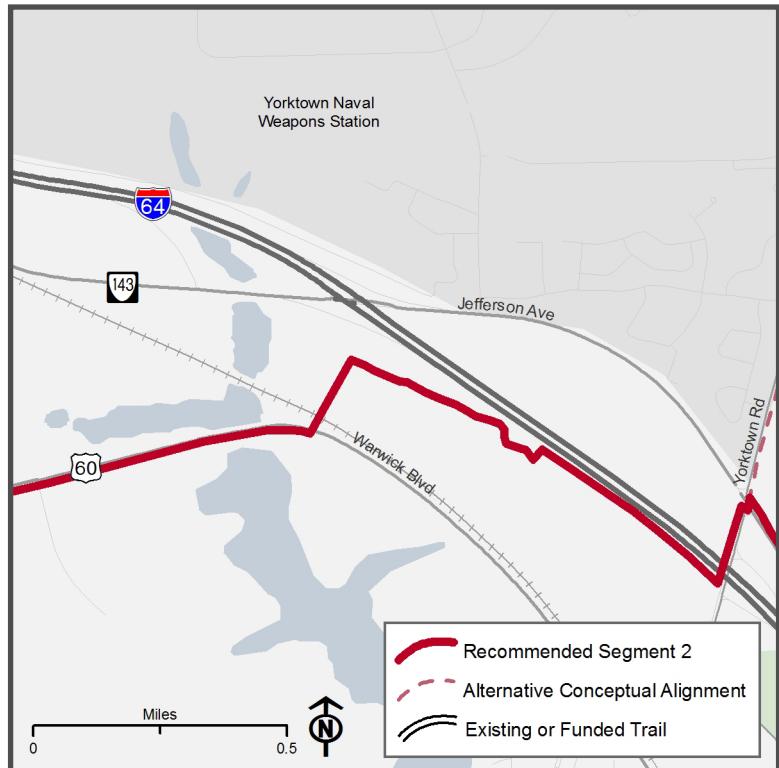
A Closer Look: The Approach to I-64

The US 60 crossing of Skiffe's Creek is currently 2 lanes (totaling 24-feet wide) and is bound by a narrow strip of grass area and guardrails. Further engineering analysis is needed to evaluate suitable bicycle/pedestrian accomodations.

Further study should also evaluate potential alternatives for crossing US 60 and the adjacent rail line.

Estimated cost: \$5.2 million

The I-64 underpass on the west side of Yorktown Road will likely require reconfiguration in order to accommodate a path between the bridge piers and the slope wall. A retaining wall will likely need to be installed, as well. **Estimated cost:** \$600,000



Segment Details:

Segment Number	From	To	Length (Miles)	Existing/ Funded Portion	VDOT Maintained?	Part of Existing Plan?	Planning-level Cost Estimate
Rec-2A	S England St & Francis St	S England St & Pipeline	1.86	0.00	Private	No	\$2.5M
Rec-2B	S England St & Pipeline	Carters Grove County Rd near Tolers Rd	2.12	0.00	Private	No	\$2.9M
Rec-2C	Carters Grove County Rd near Tolers Rd	Yorktown Rd & Jefferson Ave (Rt 143)	7.52	0.00	Mixed	Yes	\$9.3M
Total			11.49	0.00			\$14.8M

Cost Notes

Rec-2B: Overpass over rail line and short bridge on US 60 would require widening. Unknown whether two Carters Grove bridges need to be replaced. Underpass reconfiguration for I-64 would be required.





Pocahontas Trail, Williamsburg (Rec-2C)

The route parallels Pocahontas Trail (Route 60) for approximately 2 miles



Yorktown Road, Newport News (Rec-2C)

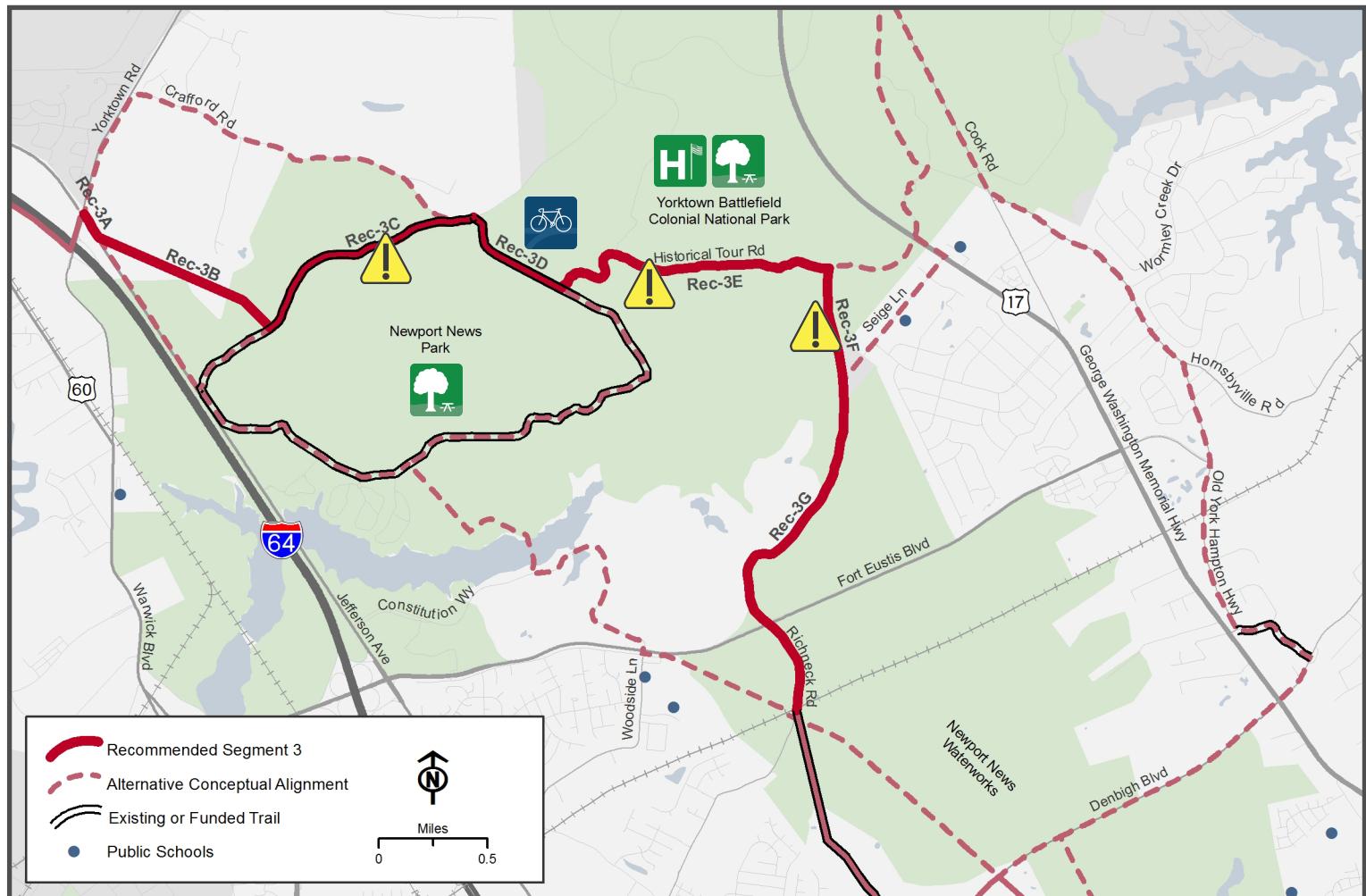
The route crosses under I-64 on Yorktown Road (as discussed, the underpass requires reconfiguration in order to accommodate a shared-use path)

Map Segments

3. Yorktown Road to Richneck Road

Birthplace of America

Trail Study



Cost

\$3.6 Mil

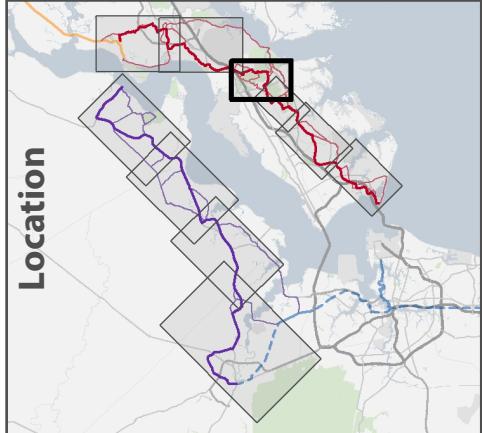
Recommended Concept

Length
Recommended
Concept

6.5 Miles

1.7 Miles Complete/Funded 4.8 Miles To be Constructed

Location



Route Summary

The Recommended Route crosses Yorktown Road and proceeds southeast along the eastern edge of Jefferson Avenue for 640 feet. The route then runs southeast along a utility easement and follows the northern section of the Newport News Park Bikeway, connecting to the Encampment Tour Road at Yorktown. The route follows the Tour Road towards Route 17 and proceeds south along a dirt road (outside the National Park) before crossing Fort Eustis Boulevard and following Richneck Road.

Segment Opportunities

The route uses existing trails and trails proposed by the Regional Bikeways Plan (see next page).

Provides access to camping facilities and other outdoor activities.

The route could bring more non-motorized visitors to the Yorktown Battlefield Colonial Nat'l Park.

Segment Constraints

The existing trails are primarily dirt and gravel. Improvements may be necessary to ensure proper maneuverability and safety for road cyclists.

A shared-use path may not fit the rural, historic character of the Encampment Tour Road. Though supportive of this segment, the National Park Service may wish to consider alternatives, including signage or on-road bike lanes.

Map Segments

Birthplace of America

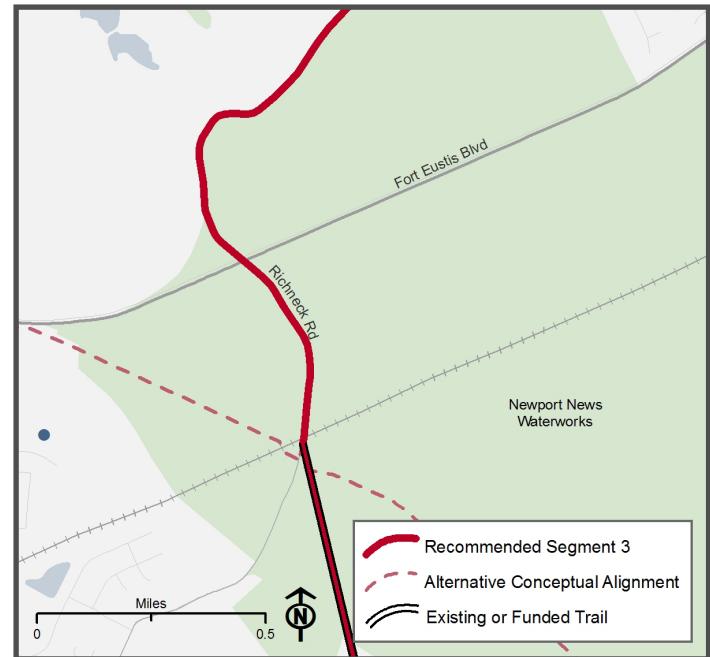
3. Yorktown Road to Richneck Road

Trail Study

A Closer Look: The Fort Eustis Boulevard Area

After exiting the National Park, the trail follows an unnamed dirt road/path towards the terminus of Siege Lane and then follows a closed roadway (proposed trail via Regional Bikeways Plan) southwest to Fort Eustis Boulevard. This section provides access to York High School via the proposed bike lanes on Siege Lane (Regional Bikeways Plan).

Further study should evaluate improvements for crossing Fort Eustis, which is four lanes with a speed limit of 55 mph. Signalization, crossing islands, reduced speed limits, and rapid rectangular flashing beacons could all help improve pedestrian and cyclist safety at this location.



Segment Details:

Segment Number	From	To	Length (Miles)	Existing/ Funded Portion	VDOT Maintained?	Part of Existing Plan?	Planning-level Cost Estimate
Rec-3A	Jefferson Ave (Rt 143) & Yorktown Rd (Rt 238)	Jefferson Ave (Rt 143) & Newport News Park Powerline	0.13	0.00	Local	No	\$.2M
Rec-3B	Newport News Park Powerline & Jefferson Ave (Rt 143)	Newport News Park Powerline & Newport News Park Bikeway	0.90	0.00	Local	No	\$.1M
Rec-3C	Newport News Park Bikeway & Newport News Park Powerline	Newport News Park Bikeway & Crawford Rd (Rt 637)	1.16	1.16	Local	No	\$.2M
Rec-3D	Newport News Park Bikeway & Crawford Rd (Rt 637)	Newport News Park Bikeway & Historical Tour Dr	0.56	0.56	Mixed	No	\$.1M
Rec-3E	Newport News Park Bikeway & Historical Tour Dr	Historical Tour Dr & Warwick Rd	1.41	0.00	NPS	No	\$2.0M
Rec-3F	Warwick Rd & Historical Tour Dr	Warwick Rd & Siege Ln	0.56	0.00	NPS	No	\$.8M
Rec-3G	Warwick Rd & Siege Ln	Richneck Rd (Rt 636) & rail line	1.76	0.00	Mixed	Yes	\$.3M
Total			6.47	1.71			\$3.6M

Cost Notes

Rec-3E: Cost assumes resurfacing existing path through Newport News Park





Jefferson Avenue, Newport News (Rec-3A)

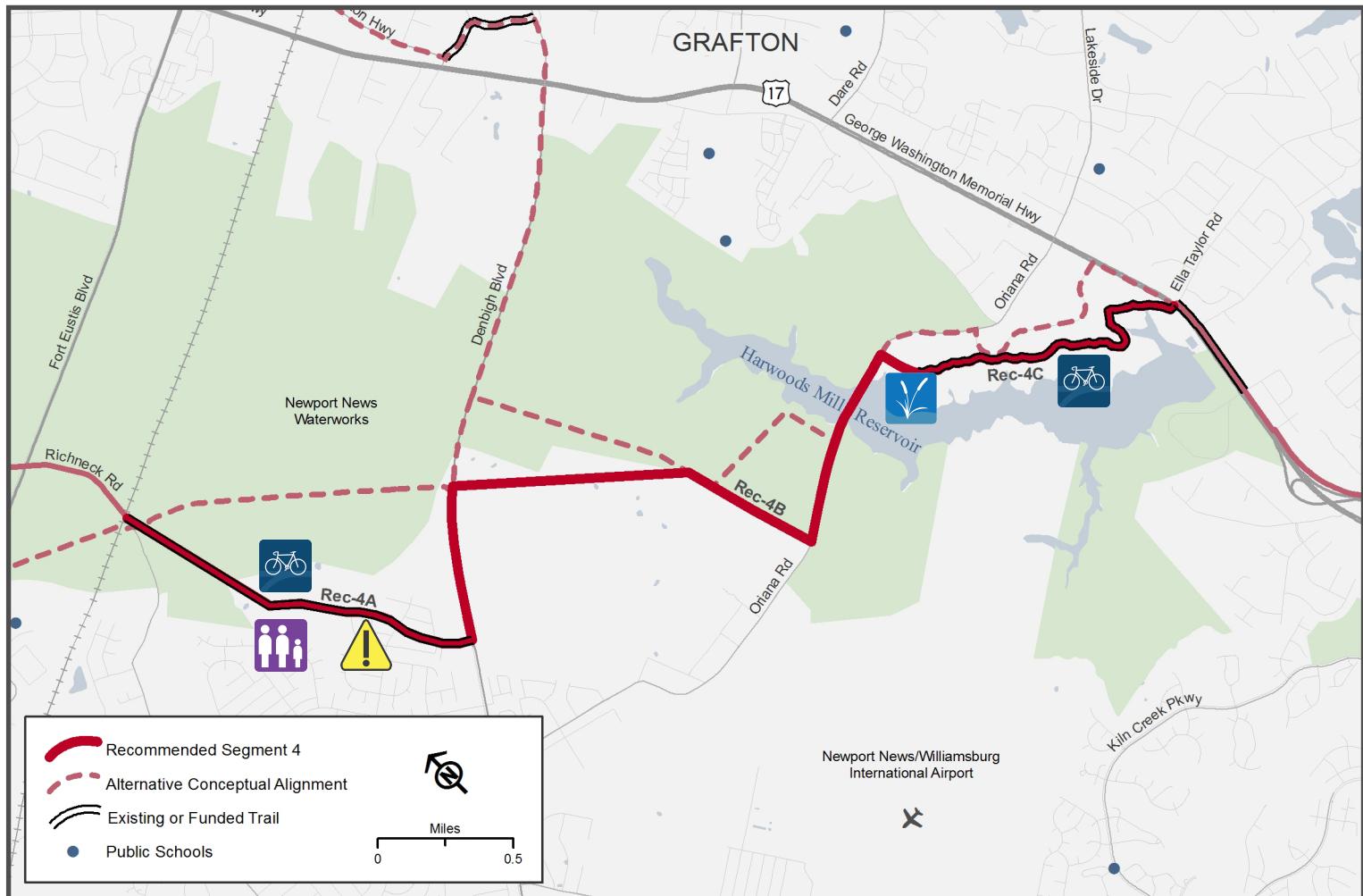
The route briefly travels on Jefferson Avenue before following a utility easement into Newport News Park



Richneck Road, York County (Rec-3G)

After crossing Fort Eustis Boulevard, the route travels south on Richneck Road

4. Richneck Road to Route 17



Cost

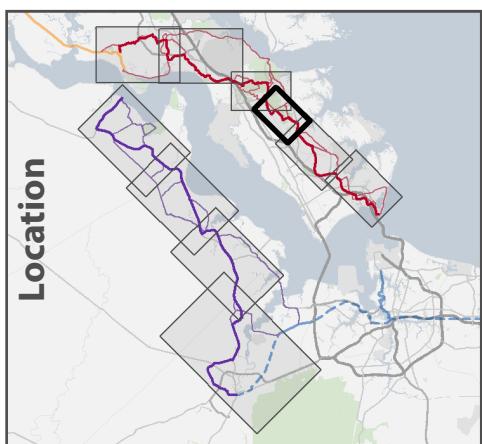
\$3.9 Mil
Recommended Concept

Length

5.5 Miles
Recommended Concept

2.5 Miles Complete/Funded 3 Miles To be Constructed

Location



Route Summary

From Richneck Road, the Recommended Route travels southeast through an area scheduled for development (just east of Colony Pines). The route then follows Denbigh Boulevard and meanders southeast through the Newport News Waterworks property before connecting to Oriana Road, crossing the Harwoods Mill Reservoir and utilizing existing trails in the McReynolds Athletic Complex (MAC). The route departs the MAC and proceeds southwest to Route 17 via a utility easement.

Segment Opportunities

Bicycle icon: The route utilizes existing trails and proposed paths such as at Huntington Pointe and the McReynolds Athletic Complex.

People icon: The route will offer opportunities for the future residents of Huntington Pointe (a 2,500-unit development that will extend from Richneck Road to Denbigh Boulevard) and Newport News residents in Woods Run, Colony Pines, and Cliveden.

Segment Constraints

Exclamation mark icon: The route depends on the successful phased completion of Huntington Pointe and the associated proffers used to construct shared-use paths.

Plant icon: The route encounters several environmentally sensitive areas, including the Harwoods Mill Reservoir and a wetland area between Oriana Road and the McReynolds Athletic Complex (discussed on next page).

Map Segments

Birthplace of America

Trail Study

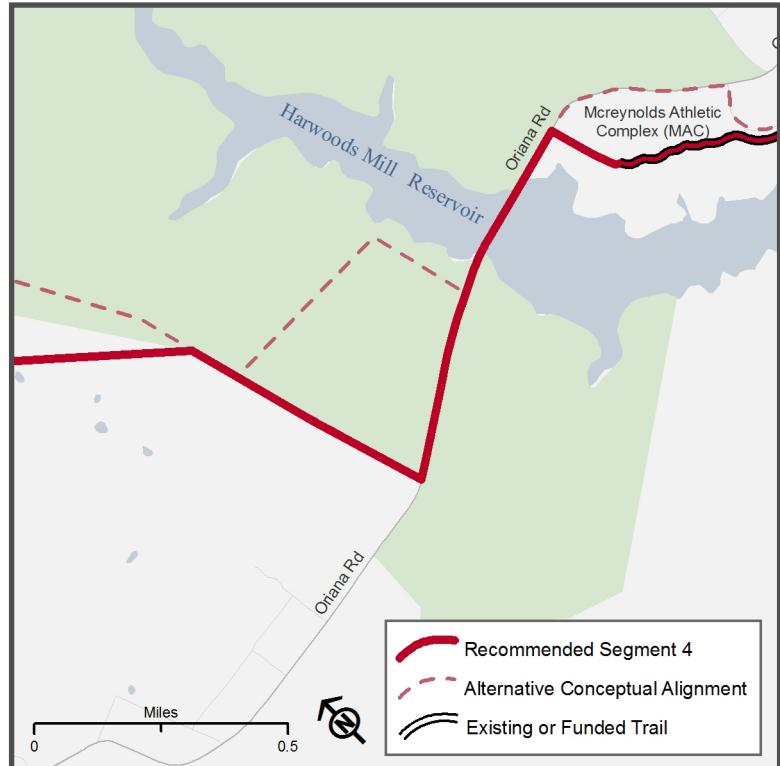
4. Richneck Road to Route 17

A Closer Look: The Harwoods Mill Reservoir

The Oriana Road crossing of the Harwoods Mill Reservoir is currently 2 lanes (no shoulder) and cannot currently accommodate a shared-use path. Further study should evaluate alternatives such as boardwalk bridge installation (depending on water depth), roadway widening, or other suitable options for active transportation users.

After crossing the reservoir, the route follows a utility easement to the McReynolds Athletic Complex (MAC). There is a small wetland area along this easement, approx. 280 feet south of Oriana Road. Further study should aim to minimize environmental impacts in this area and consider using boardwalk bridges.

This connection to the MAC will provide unprecedented access to the park facility, which includes walking trails and baseball and soccer fields.



Segment Details:

Segment Number	From	To	Length (Miles)	Existing/ Funded Portion	VDOT Maintained?	Part of Existing Plan?	Planning-level Cost Estimate
Rec-4A	Richneck Rd (Rt 636) & Train tracks	RC Club Rd & Denbigh Blvd (Rt 173) via Independence Blvd	1.96	1.38	Mixed	No	\$.8M
Rec-4B	RC Club Rd & Denbigh Blvd (Rt 173)	Oriana Rd (Rt 620) & Powerline	2.13	0.00	Mixed	No	\$3.1M
Rec-4C	Oriana Rd (Rt 620) & Powerline	GW Hwy (Rt 17) & Ella Taylor Rd via MAC	1.37	1.13	Local	No	\$39K
Total			5.46	2.51			

Cost Notes

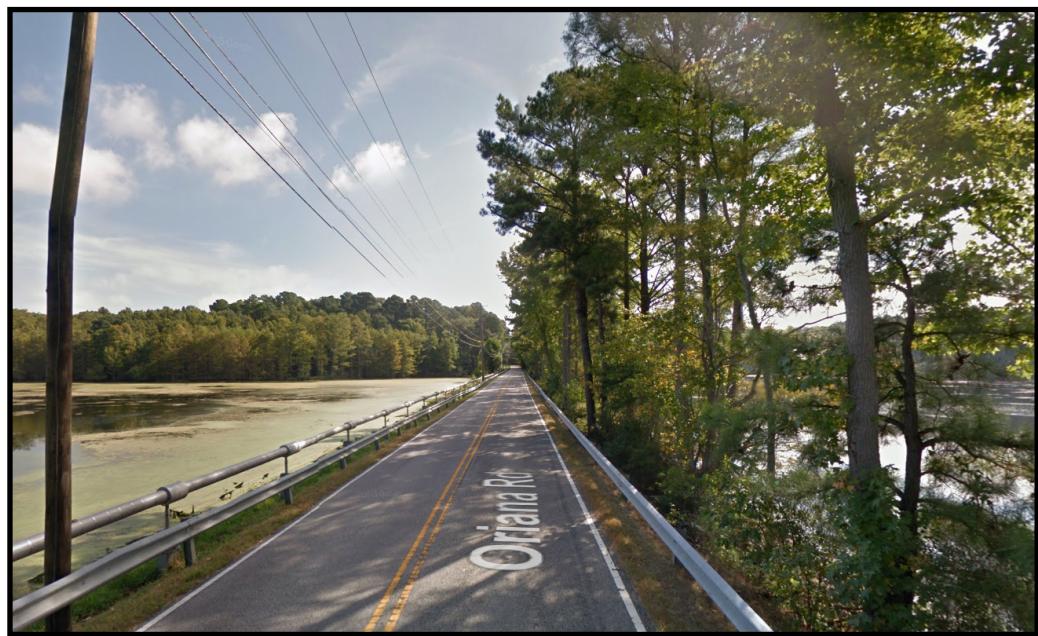
Rec-4A: Funded as part of new development

Rec-4B: ROW through Newport News Waterworks property. Assumes boardwalk bridge over reservoir, reflected in wetland mileage



Denbigh Boulevard, York County (Rec-4A)

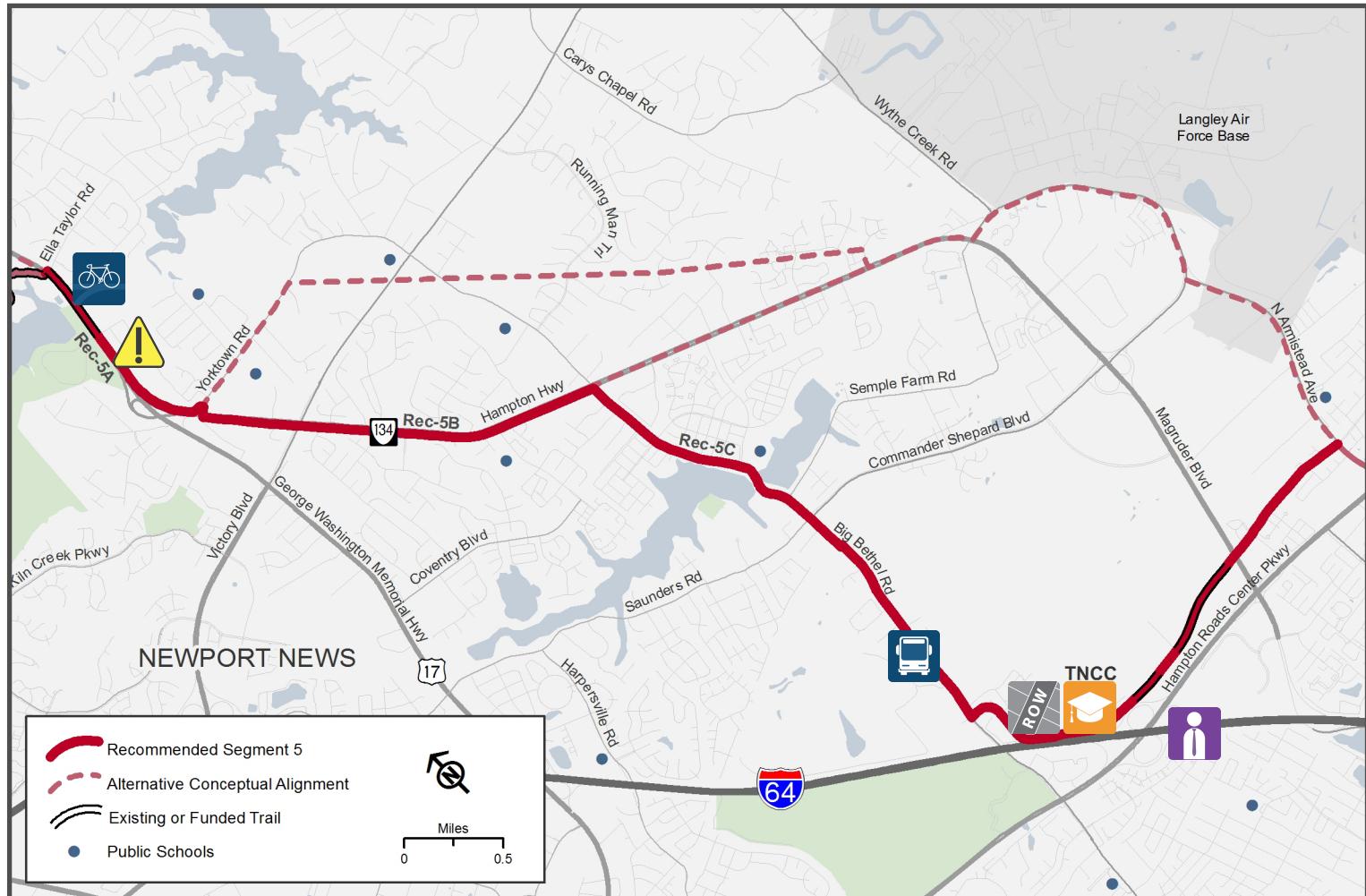
The route follows Denbigh Boulevard before traveling southeast to Oriana Road (via the Newport News Waterworks property)



Oriana Road, York County (Rec-4B)

After crossing the Harwoods Mill Reservoir (above), the route travels through the McReynolds Athletic Complex

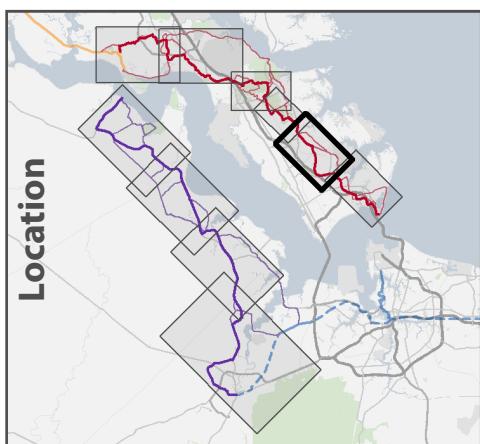
5. Route 17 to North Armistead Avenue



Cost **\$13.3 Mil**
Recommended Concept

Length **8.5 Miles**
Recommended Concept

0.4 Miles Complete/Funded 8.1 Miles To be Constructed



Route Summary

The Recommended Route crosses Route 17 at Ella Taylor Road and proceeds south along Route 134 and transitions to Hampton Highway via Cardinal Lane & Yorktown Road. The route follows the western edge of Hampton Highway, takes a right on Big Bethel Road and then follows Thomas Nelson Drive and Butler Farm Road to North Armistead Avenue.

Segment Opportunities

The route follows an existing path along Route 17 and could potentially utilize existing paths along the north side of Butler Farm Road.

The route follows an existing transit route (HRT) and provides access to Tabb Middle School, Thomas Nelson Community College (TNCC) and employers, such as the Virginia Employment Commission (VEC), Health Net Federal Services, and Sprint.

Segment Constraints

There are several commercial driveways on Route 17 between Mill Road and Francis Circle.

ROW may be limited on Thomas Nelson Drive (2-3 lanes with center turn lane) between Big Bethel and TNCC. Further study should consider a road diet (eliminating center turn lane) or other traffic calming measures.

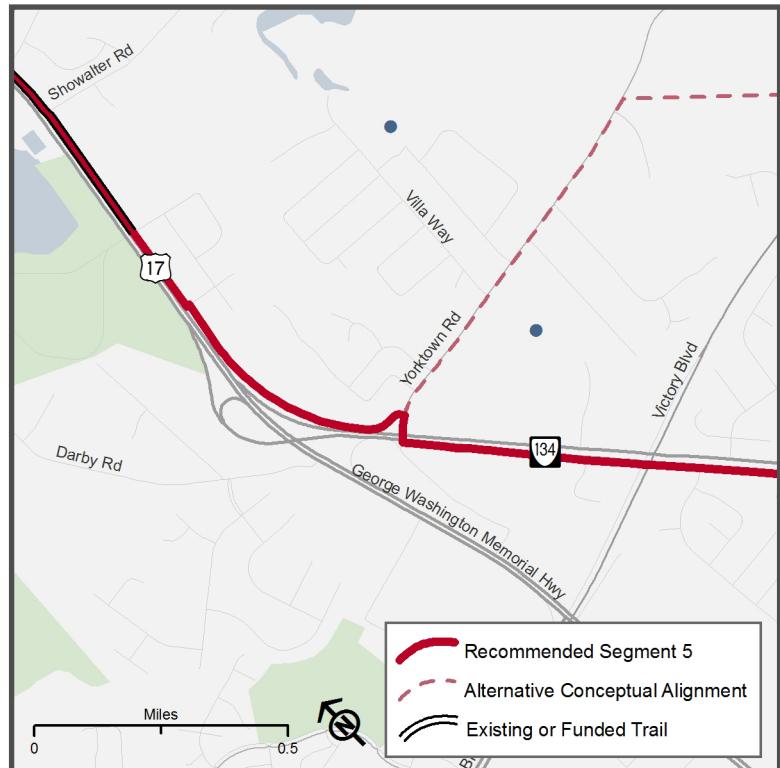
See the next page for detail on Hampton Highway.

5. Route 17 to North Armistead Avenue

A Closer Look: Thomas Nelson Drive & Butler Farm Road

The intersection of Yorktown Road and Hampton Highway is signalized, allowing left and right turns on Hampton Highway, but does not currently have any bicycle or pedestrian accommodations. Further study should evaluate pedestrian signalization and design treatments (ex: median refuge islands) to improve safety and mobility for active transportation users.

Hampton Highway appears to have sufficient right of way but further study must ensure that cyclists and pedestrians can safely cross Victory Boulevard. The southbound channelized right-turn lane (slip lane) should be retrofitted to reduce turning speeds, allow motorists and pedestrians/cyclists to see each other, and decrease pedestrian crossing distances (through a pedestrian island with curb ramps or cut-throughs). The FHWA and www.pedbikesafe.org provide design guidance for channelized right-turn lanes.



Segment Details:

Segment Number	From	To	Length (Miles)	Existing/ Funded Portion	VDOT Maintained?	Part of Existing Plan?	Planning-level Cost Estimate
Rec-5A	GW Hwy (Rt 17) & Ella Taylor Rd	Yorktown Rd (Rt 705) & Cardinal Ln	1.14	0.40	VDOT	Yes	\$1.0M
Rec-5B	Yorktown Rd (Rt 705) & Cardinal Ln	Hampton Hwy (Rt 134) & Big Bethel Rd (Rt 600)	2.08	0.00	VDOT	No	\$2.8M
Rec-5C	Big Bethel Rd (Rt 600) & Hampton Hwy (Rt 134)	Butler Farm Rd & N Armistead Rd	5.27	0.00	Mixed	No	\$9.4M
Total			8.49	0.40			

Cost Notes

Rec-5A: Existing shared-use path from Showalter to Mill

Rec-5B: Intersection improvements needed at Victory Blvd

Rec-5C: Widening required for bridge over Big Bethel Reservoir, proposed bike lanes



George Washington Highway (Route 17), York County (Rec-5A)

After exiting the athletic complex, the route follows an existing shared-use path on the east side of Route 17



Thomas Nelson Drive, City of Hampton (Rec-5C)

The route travels east on Thomas Nelson Drive (above) and Butler Farm Road

Map Segments

Birthplace of America

Trail Study

6. North Armistead to Fort Monroe



Cost **\$18.4 Mil**
Recommended Concept

Route Summary

The Recommended Route proceeds south on North Armistead Avenue and then east on Settlers Landing Road. The route turns right on East Tyler Street (prior to I-64) and left on Emancipation Drive, which transitions to Martin Luther King Jr. Boulevard. The route takes a left on South Mallory Street towards Phoebus and follows East Mellen Street and McNair Drive to Fort Monroe, the peninsula terminus of the Birthplace of America Trail.

Segment Opportunities

The route follows a proposed shared-use path on North Armistead Avenue.

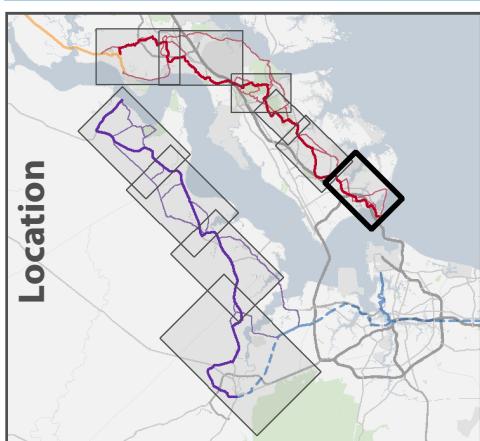
The route connects to historic sites, such as Emancipation Oak and Fort Monroe.

The route connects Hampton University and the VA Medical Center to downtown Phoebus.

HRT offers bus service/bike racks in the area and across the HRBT.

Length **7.6 Miles**
Recommended Concept

0 Miles Complete/Funded 7.6 Miles To be Constructed



Segment Constraints

Armistead Avenue carries approx. 17,000 vehicles per day (VDOT, 2015) and currently lacks bicycle facilities. Further study should evaluate shared-use path alternatives and address key barriers, such as the intersection of West Mercury Blvd and the I-64 underpass, which will need to accommodate a path between the bridge piers and the slope wall.

See next page for more on the Rt. 60 crossing of the Hampton River.

Map Segments

Birthplace of America

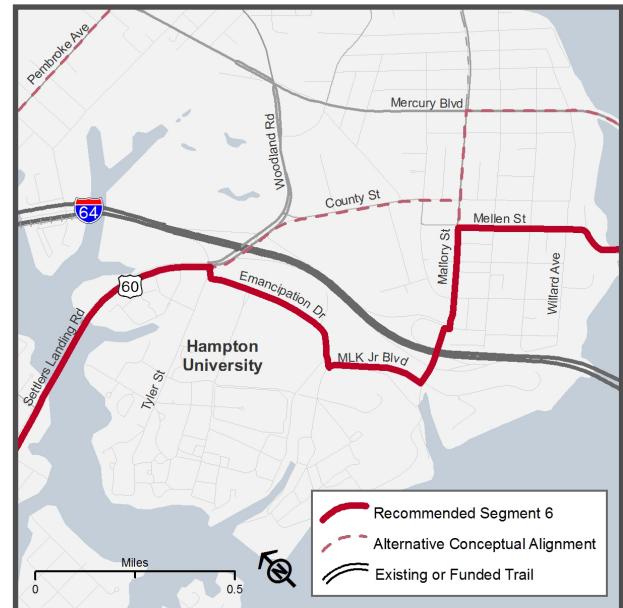
Trail Study

6. North Armistead to Fort Monroe

A Closer Look: Hampton University and Phoebus

The Route 60 bridge (Settlers Landing Road) over the Hampton River is a four-lane divided arterial that carries 14,000 vehicles per day (VDOT, 2015). While there is no available space for a shared-use path or cycletrack, further study should evaluate active transportation improvements, including, but not limited to: a road diet, protected bike lanes, or cantilevered paths off the existing sidewalks (which may require additional structural support).

While coordination meetings were held with Hampton University and the VA Medical Center, both institutions require additional time to discuss the project with their respective committees and decision-makers. The path would connect students, faculty, staff, patients, and visitors to Phoebus and Fort Monroe via active transportation facilities.



Segment Details:

Segment Number	From	To	Length (Miles)	Existing/ Funded Portion	VDOT Maintained?	Part of Existing Plan?	Planning-level Cost Estimate
Rec-6A	N Armistead Ave & Butler Farm Rd	N Armistead Ave (Rt 134) & Tide Mill Ln	0.81	0.00	Local	No	\$1.1M
Rec-6B	N Armistead Ave (Rt 134) & Tide Mill Ln	N Armistead Ave (Rt 134) & Lasalle Ave (Rt 167) via Armistead Ave	1.79	0.00	Local	No	\$3.6M
Rec-6C	N Armistead Ave (Rt 134) & Lasalle Ave (Rt 167)	N Armistead Ave (Rt 134) & Patterson Ave	0.16	0.00	Local	No	\$.8M
Rec-6D	N Armistead Ave (Rt 134) & Patterson Ave	N Armistead Ave (Rt 134) & W Pembroke Ave (Rt 351)	0.64	0.00	Local	No	\$.9M
Rec-6E	N Armistead Ave (Rt 134) & W Pembroke Ave (Rt 351)	N Armistead Ave (Rt 134) & Settlers Landing Rd	0.37	0.00	Local	No	\$.5M
Rec-6F	Settlers Landing Rd & N Armistead Ave (Rt 134)	Settlers Landing Rd (Rt 143) & Tyler St	1.08	0.00	Local	No	\$6.0M
Rec-6G	Settlers Landing Rd (Rt 143) & Tyler St	S Mallory St & Mellen St	1.10	0.00	Mixed	No	\$1.5M
Rec-6H	E Mellen St (Rt 143) & S Mallory St (Rt 169)	Mercury Blvd (Rt 258) & Ingalls Rd (Rt 143)	0.69	0.00	Local	No	\$2.8M
Rec-6I	Mercury Blvd (Rt 258) & Ingalls Rd (Rt 143)	Fort Monroe	0.93	0.00	Mixed	No	\$1.3M
Total			7.58	0.00			\$18.4M

Cost Notes

Rec-6B: Widening or new bike ped bridge required SW Branch Back River

Rec-6C: Underpass reconstruction required under I-64

Rec-6F: Widening or new bike ped bridge require over Hampton River

Rec-6G: Coordinate I-64 underpass with the proposed improvements arising from the Hampton Roads Crossing Study

Rec-6H: Widening or new bike ped bridge required on Mellen Street over Mill Creek





Armistead Avenue, City of Hampton (Rec-6B)

The route follows a proposed shared-use path on North Armistead Avenue (Bike Walk Hampton)



East Mellen Street, City of Hampton (Rec-6H)

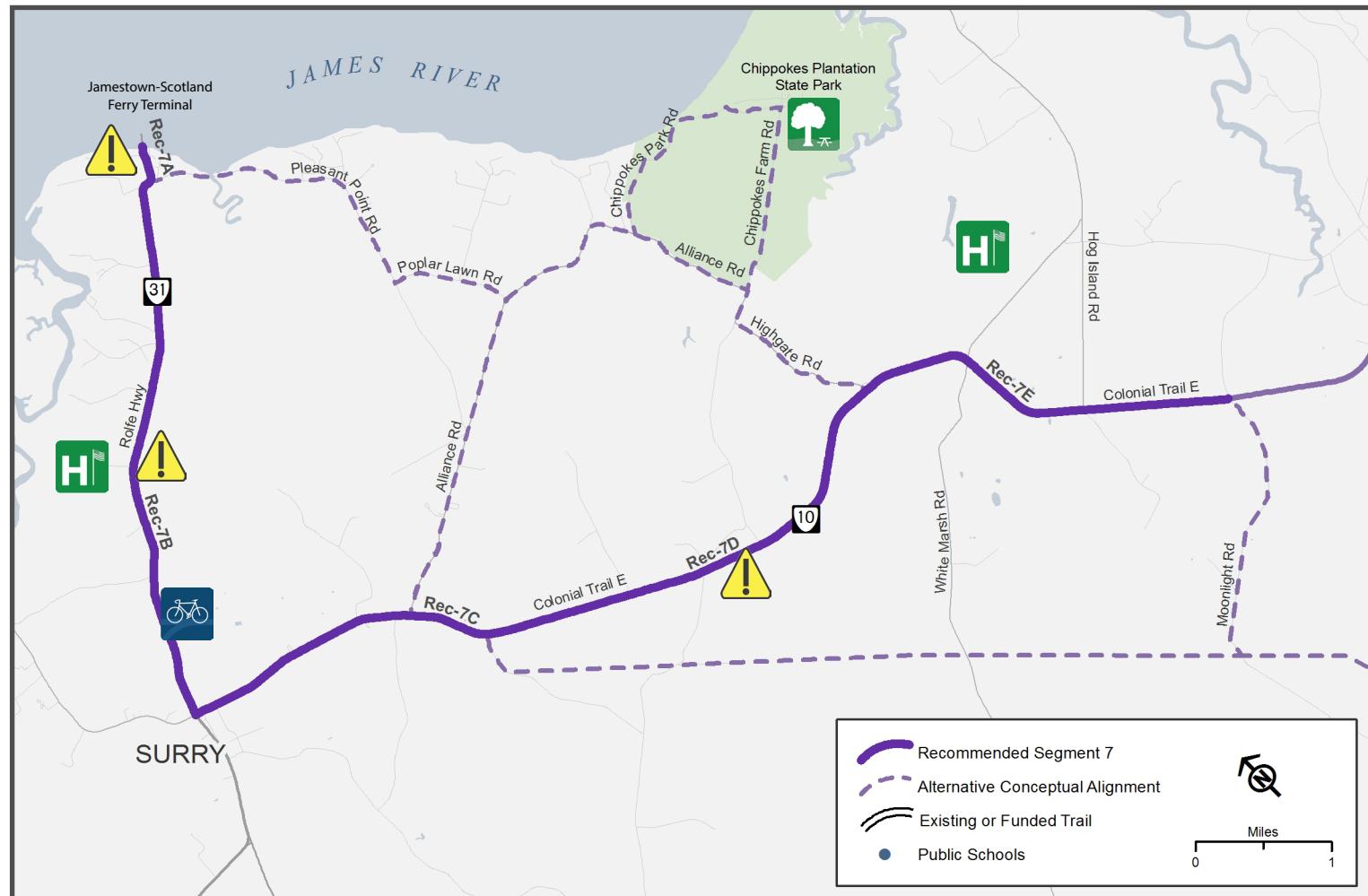
The route follows East Mellen Street across the Hampton River before arriving at Fort Monroe

Map Segments

Birthplace of America

Trail Study

7. Jamestown-Scotland Ferry to Moonlight Road



Cost

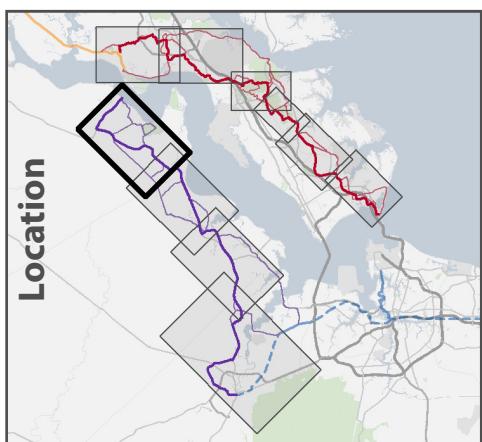
\$17.9 Mil

Recommended Concept

Length
Recommended Concept

13.1 Miles

0 Miles Complete/Funded 13.1 Miles To be Constructed



Location

Route Summary

From the Jamestown-Scotland Ferry, the Recommended Route travels southwest along Route 31 (Rolle Highway) to Surry. The route takes a left on Route 10 (Colonial Trail) and proceeds southeast to Moonlight Road, near the Isle of Wight County Line. It is anticipated that the East Coast Greenway (ECG) will follow this alignment in the future.

Segment Opportunities

Shared-use path proposed in Surry County Bicycle Plan. Est. 80 feet of ROW along most of Route 31.

Provides access to historic sites, such as Smith's Fort Plantation, and Bacon's Castle, the oldest brick dwelling in the U.S. (1665) and new development, such as Gray's Creek Marina.

Provides access to swimming and camping facilities at Chippokes Plantation State Park.

Segment Constraints

The proposed shared use path (from the Surry Bike Plan) ends 1,000 feet before the ferry terminal.

Route 31 and Route 10 offer limited shade, which provides challenges for summer cycling. Appropriate signage, alerting cyclists of stores, fountains, and rest areas, is encouraged.

Map Segments

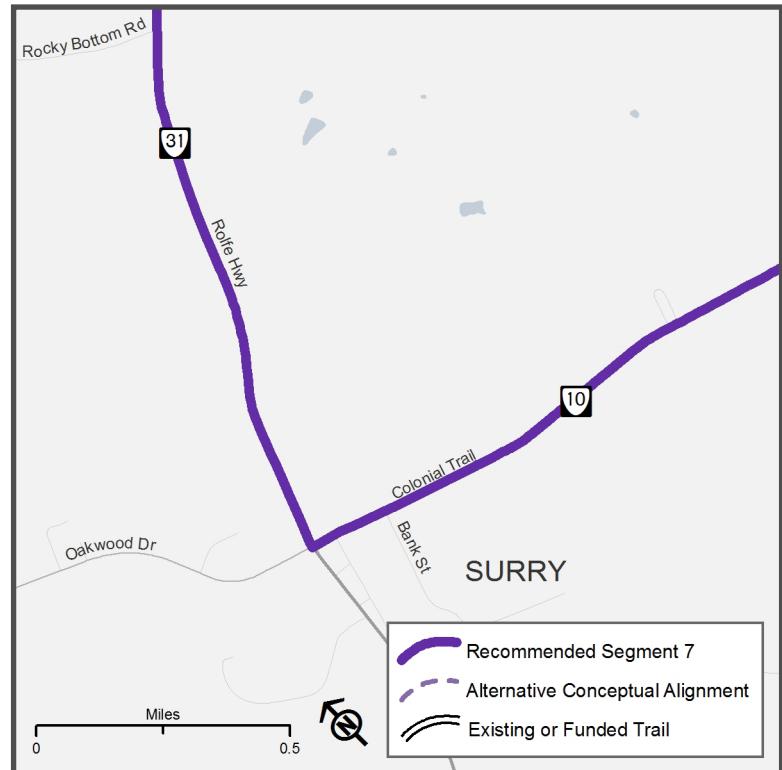
Birthplace of America

Trail Study

7. Jamestown-Scotland Ferry to Moonlight Road

A Closer Look: Downtown Surry

Surry, located just four miles from the Jamestown-Scotland Ferry, has restaurants, markets, and historic sites that would serve as an important destinations along any future path. The new Surry Visitors Center, housed in one of the community's oldest buildings (1825), can provide cyclists with an introduction to the county.



Segment Details:

Segment Number	From	To	Length (Miles)	Existing/Funded Portion	VDOT Maintained?	Part of Existing Plan?	Planning-level Cost Estimate
Rec-7A	Rolfe Hwy (Rt 31) at Ferry	Rolfe Hwy (Rt 31) & Short Dr	0.23	0.00	VDOT	No	\$3M
Rec-7B	Rolfe Hwy (Rt 31) & Short Dr	Colonial Trl E (Rt 10) & Alliance Rd	5.83	0.00	Mixed	Yes	\$8.0M
Rec-7C	Colonial Trl E (Rt 10) & Alliance Rd	Colonial Trl E (Rt 10) & Chapel Bottom Rd	0.58	0.00	Mixed	No	\$.8M
Rec-7D	Colonial Trl E (Rt 10) & Chapel Bottom Rd	Colonial Trl E (Rt 10) & Highgate Rd	3.58	0.00	VDOT	No	\$4.9M
Rec-7E	Colonial Trl E (Rt 10) & Highgate Rd	Colonial Trl E (Rt 10) & Moonlight Rd	2.86	0.00	VDOT	No	\$3.9M
Total			13.09	0.00			\$17.9M

7. Jamestown-Scotland Ferry to Moonlight Road



Rolfe Highway (Route 31), Surry County (Rec-7B)

The route follows Rolfe Highway from the ferry landing to downtown Surry



Colonial Trail (Route 10), Surry County (Rec-7D)

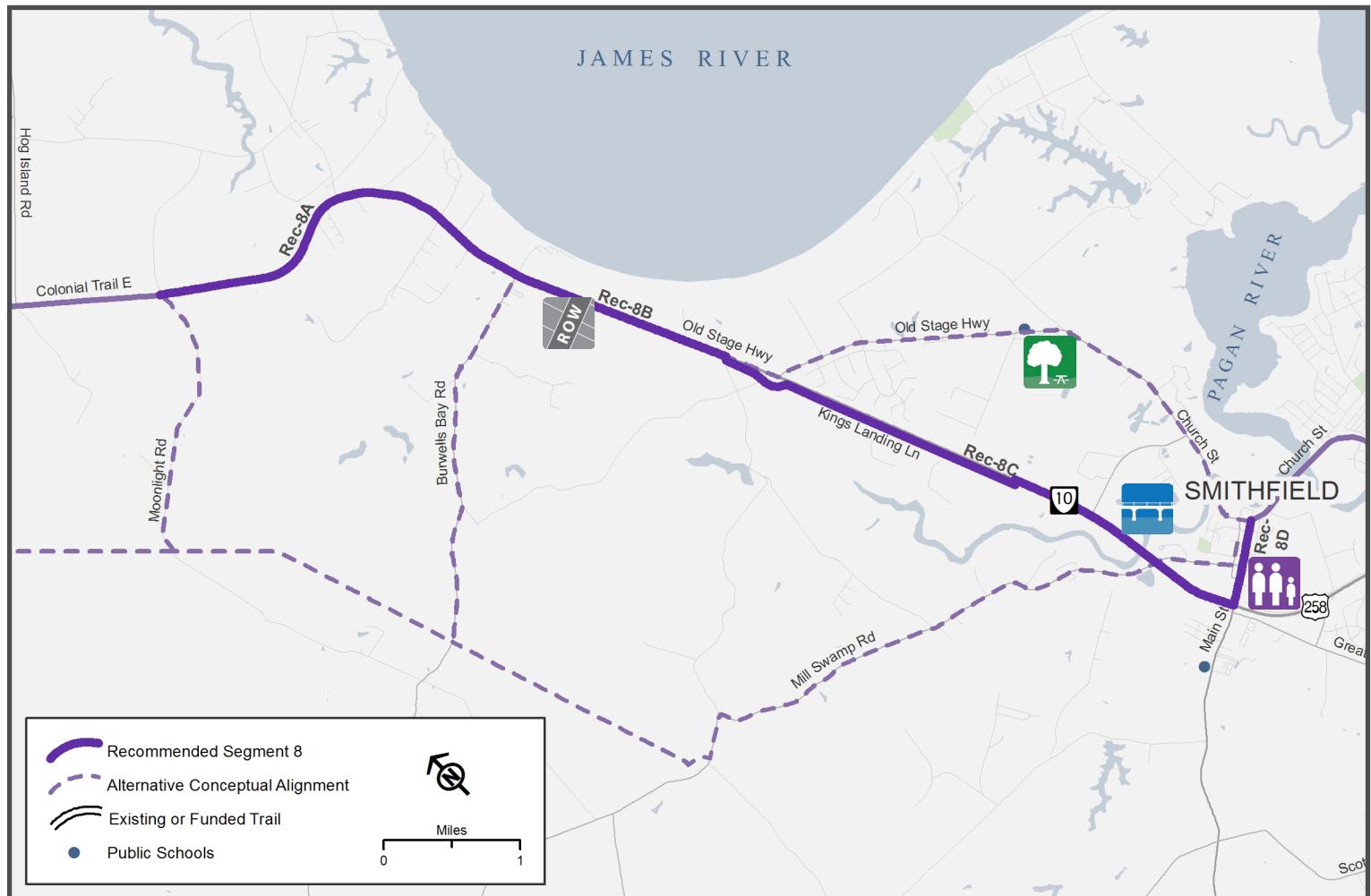
The route travels southeast on Colonial Trail towards Smithfield

Map Segments

8. Moonlight Road to Smithfield

Birthplace of America

Trail Study



Cost

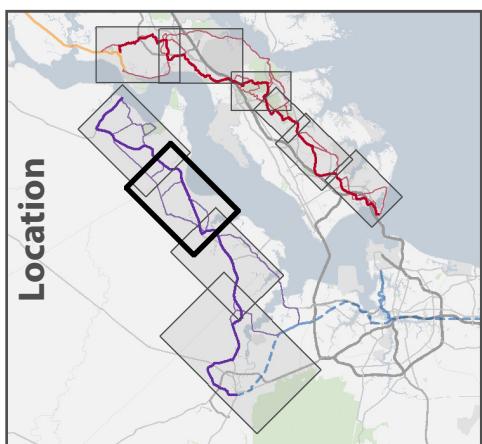
\$13.2 Mil

Recommended Concept

Length
Recommended Concept

9.7 Miles

0 Miles Complete/Funded 9.7 Miles To be Constructed



Location

Route Summary

From Moonlight Road, the Recommended Route continues south along Route 10 into Isle of Wight County, potentially utilizing a segment of Kings Landing Lane, which parallels Route 10 and has low traffic volumes. The route ultimately follows Route 10 to Smithfield and then travels east on Main Street and connects to South Church Street.

Segment Opportunities

 Plan sheets for route 10 generally show 80 feet of VDOT Right of Way from Surry Courthouse to Smithfield.

 The route travels through a scenic section of Surry County and the surrounding rural landscape provides good visibility for cyclists.

 See next page for detail on opportunities in Smithfield.

Segment Constraints

 The Route 10 bridge over the Pagan River is two lanes with sidewalks. At 36 feet wide, the bridge could potentially accommodate a 10 foot-path, but further study is required to evaluate alternatives for reducing lane widths and/or repurposing the bridge's existing sidewalks.

Map Segments

8. Moonlight Road to Smithfield

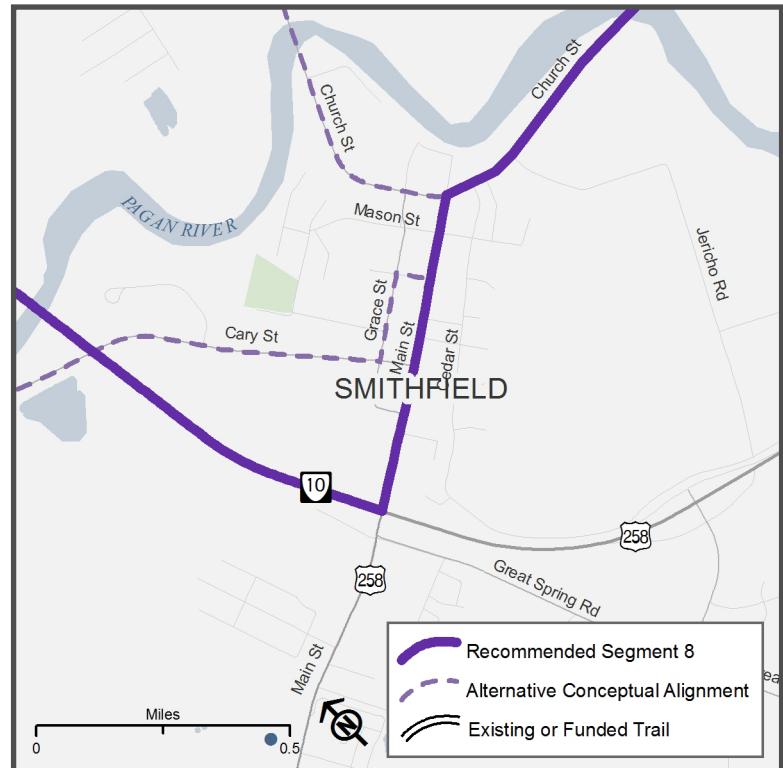
Birthplace of America

Trail Study

A Closer Look: Smithfield

Smithfield offers restaurants, ice cream shops, a brewery, a winery and is also home to Windsor Castle Park, which has picnic areas, mountain bike trails, and more. The Birthplace of America Trail Study's advisory committee identified Smithfield as one of the most important destinations along the route, a sentiment that was echoed by the public through the web survey.

Although Main Street in Smithfield cannot accommodate a shared-use without removing street parking, the street generally has low vehicle speeds. Additional traffic calming measures, such as curb extensions, speed humps, or mini traffic circles could help further reduce motor vehicle speeds and increase comfort and safety for cyclists and pedestrians.



Segment Details:

Segment Number	From	To	Length (Miles)	Existing/ Funded Portion	VDOT Maintained?	Part of Existing Plan?	Planning-level Cost Estimate
Rec-8A	Colonial Trl E (Rt 10) & Moonlight Rd	Old Stage Hwy (Rt 10) & Burwells Bay Rd	3.12	0.00	VDOT	No	\$4.3M
Rec-8B	Old Stage Hwy (Rt 10) & Burwells Bay Rd	Old Stage Hwy (Rt 10) & Wrenns Mill Rd	1.65	0.00	VDOT	No	\$2.3M
Rec-8C	Old Stage Hwy (Rt 10) & Wrenns Mill Rd	Main St (Rt 258) & Institute St	4.73	0.00	Mixed	No	\$6.5M
Rec-8D	Main St (Rt 258) & Institute St	Main St (Rt 258) & Church St (Rt 10)	0.17	0.00	Local	No	\$2M
Total			9.66	0.00			\$13.2M



Old Stage Highway (Route 10), Isle of Wight (Rec-8C)

The route continues on Old Stage Highway south towards Smithfield



Main Street, Smithfield (Rec-8D)

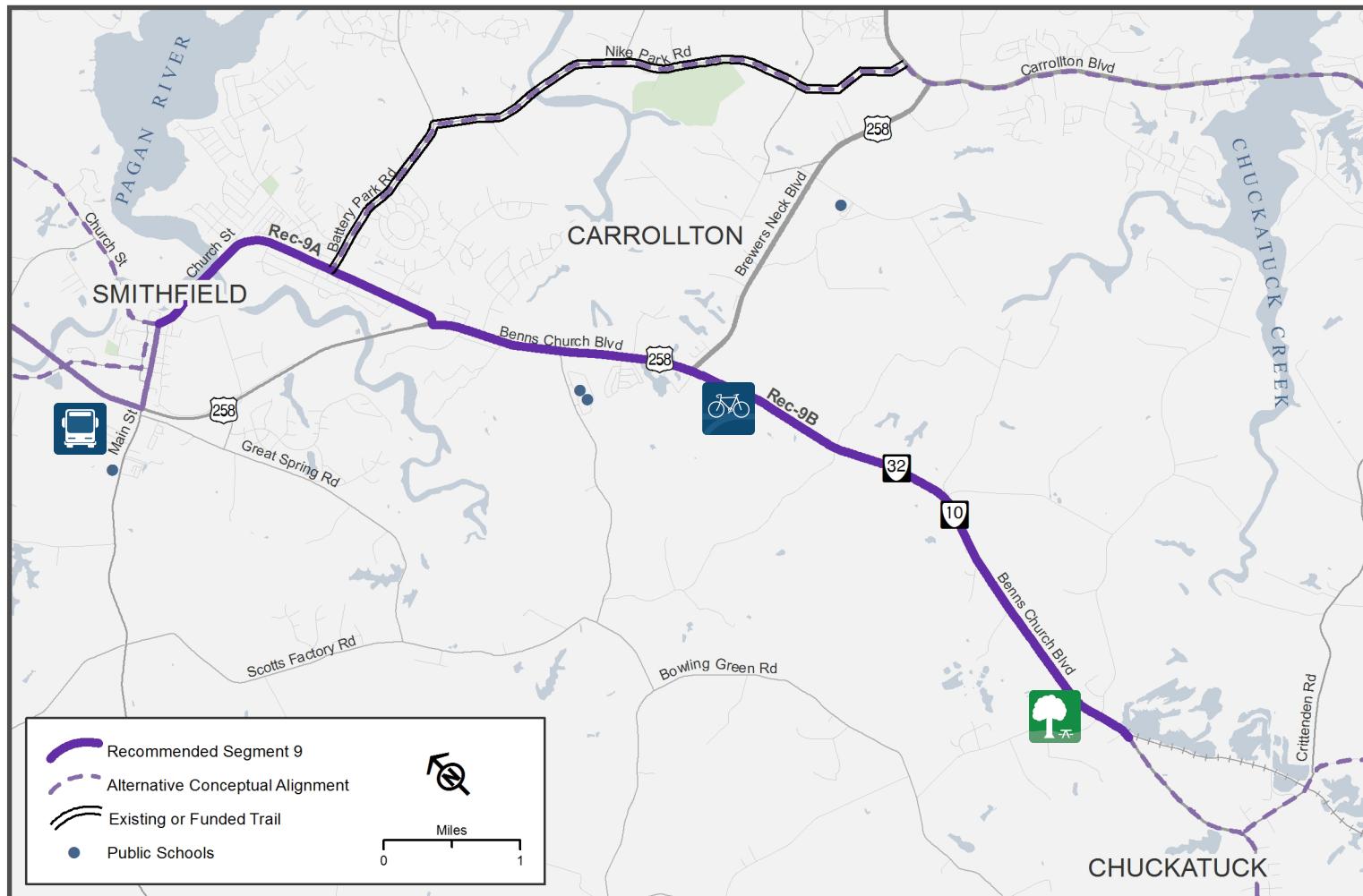
The route travels through historic Smithfield, which was identified as a prominent destination in the public survey

Map Segments

9. Smithfield to Chuckatuck

Birthplace of America

Trail Study



Cost

\$11.9 Mil

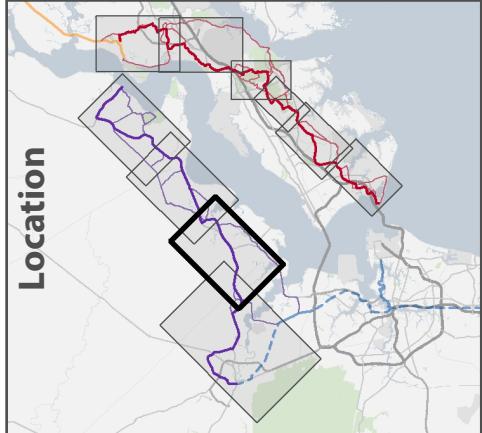
Recommended Concept

Length
Recommended
Concept

8.7 Miles

0 Miles Complete/Funded 8.7 Miles To be Constructed

Location



Route Summary

The Recommended Route travels east on South Church Street (Route 10 Business) and proceeds south on Benns Church Boulevard (Route 10/258/32) to the City of Suffolk Line, just northwest of Butler Tract Lake.

Segment Opportunities



Hampton Roads Transit operates a bus route (with bike racks) to Newport News



The route would utilize a proposed shared-use path from Batterson Park Road to the county line as well as other proposed bicycle and pedestrian improvements.



Route 10 is scenic, has lower traffic volumes than the Route 17 Alternative.

Segment Constraints



The Recommended Route from Smithfield to Suffolk, is longer and potentially more expensive than the Alternative, which utilizes existing/funded paths and crosses the Nansemond on Route 17 but potentially faces fewer obstacles.

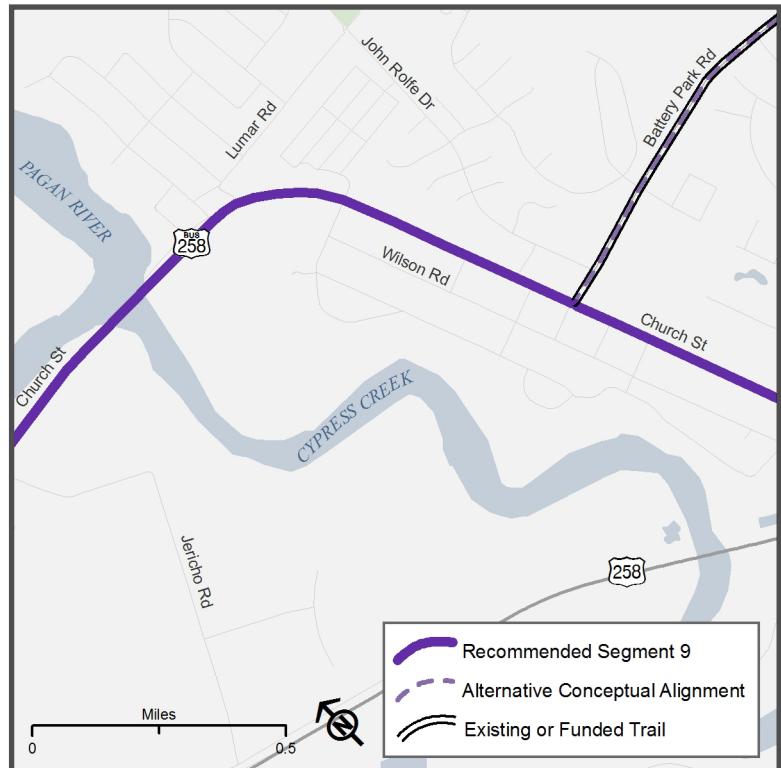
See next page for more detail on Smithfield and on the routes, in general.

9. Smithfield to Chuckatuck

A Closer Look: Church Street, Smithfield

South Church Street is in Smithfield's Historic District and part of the "Genuine Smithfield Walking Tour." While South Church likely cannot accommodate a shared-use path, the street has brick sidewalks and is dotted with planters, which help visually narrow the roadway and reduce vehicle speeds. The bridge over the Pagan River is two lanes with a sidewalk on the south side and a 10-foot shoulder on the north side. Further study should examine reconfiguration to accommodate a protected path or bike lanes.

The Recommended Route to Smithfield is longer and more expensive (23.8 miles at \$33.9 million) than the Alternative Route (14.2 miles at \$14.3 million) but faces fewer obstacles (right of way, traffic volumes, commercial driveways, development pressures, and bridge funding). The Alternative Route is dependent on funding for widening the Mills Godwin Bridge.



Segment Details:

Segment Number	From	To	Length (Miles)	Existing/ Funded Portion	VDOT Maintained?	Part of Existing Plan?	Planning-level Cost Estimate
Rec-9A	Church St (Rt 10) & Main St (Rt 258)	Church St S (Rt 10) & Battery Park Rd (Rt 704)	1.56	0.00	Local	No	\$2.1M
Rec-9B	Church St S (Rt 10) & Battery Park Rd (Rt 704)	Godwin Blvd (Rt 10) & Rolling Acres Ln	7.15	0.00	Mixed	No	\$9.8M
Total			8.71	0.00			\$11.9M

Cost Notes

Rec-9A: Church Street bridge has 9' shoulders; consider protected bikeway rather than new bridge



South Church Street, Smithfield (Rec-9A)

The route follows South Church Street, which is part of Smithfield's Historic District



Benns Church Boulevard (Route 10), Isle of Wight (Rec-9B)

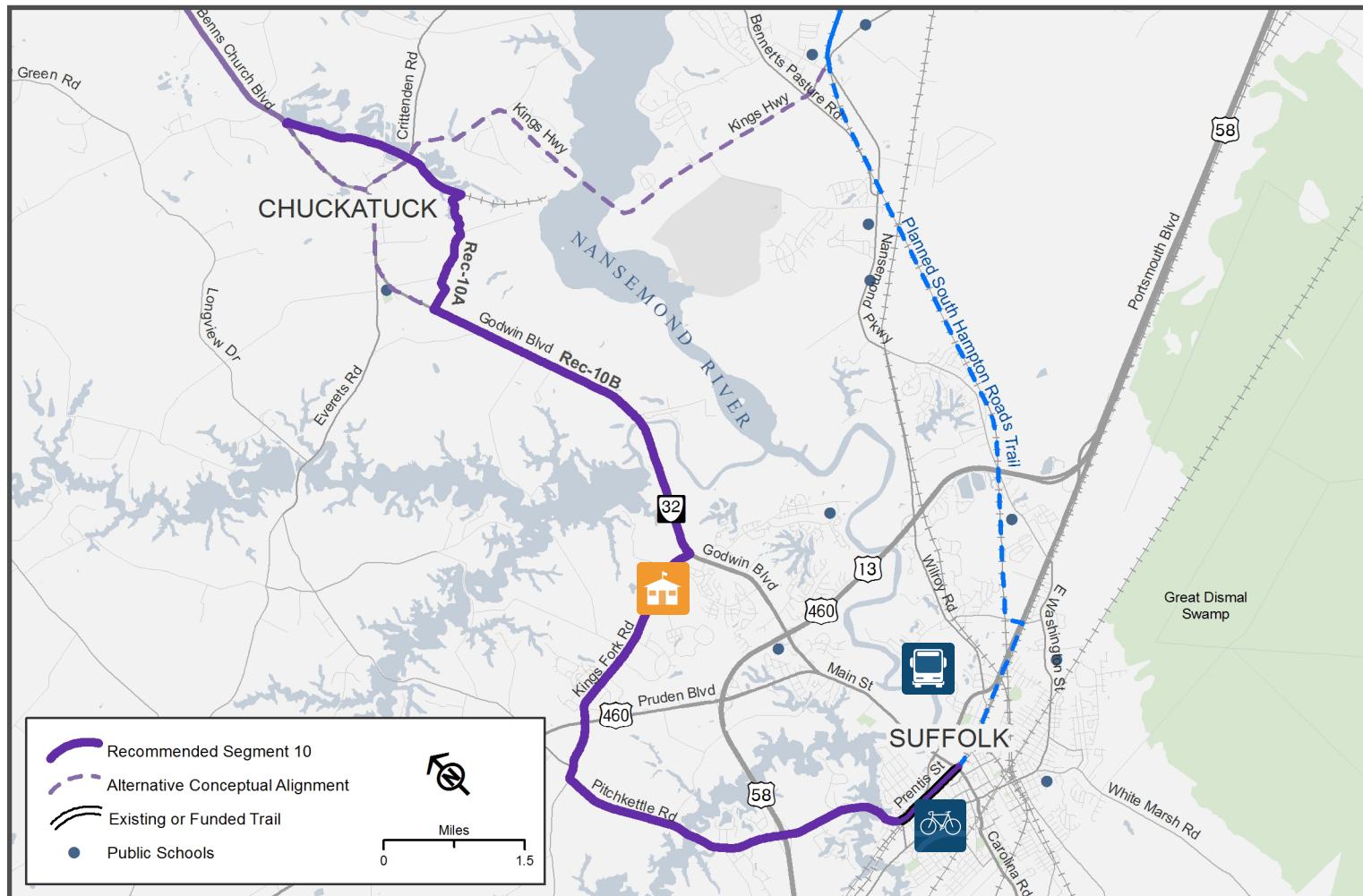
The route continues on Benns Church Road to the City of Suffolk line, at which point it diverts through Lone Star Lakes Park

Map Segments

Birthplace of America

Trail Study

10. Chuckatuck to Suffolk/South Hampton Roads Trail



Cost

\$22 Mil

Recommended Concept

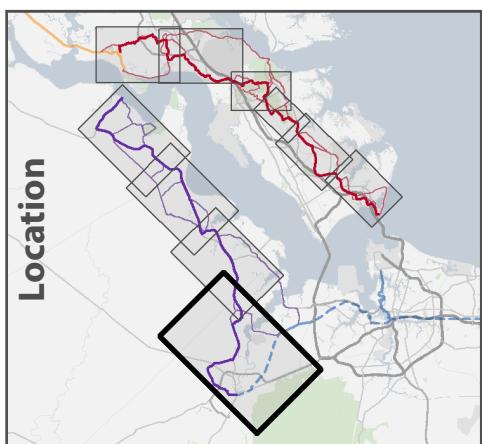
Length

15 Miles

1 Miles
Complete/Funded

14 Miles
To be Constructed

Location



Route Summary

The Recommended Route travels south through Lone Star Lakes Park, following a gravel roadway and utilizing parkland along the RC Flying Field. The route then travels west on Pembroke Lane and follows a utility line to Godwin Boulevard (Route 32). The route proceeds south on Godwin, west on Kings Fork Road, south on Pitchkettle Road, and follows the Prentis Street shared-use path to Downtown Suffolk and the South Hampton Roads Trail.

Segment Opportunities

Utilizes the existing shared-use path along Prentis Street. The Recommended Route has support from City staff and preliminary evaluations show available right of way along Godwin Boulevard.

Improves bicycle & pedestrian access to Kings Fork High School and Middle School.

Suffolk Transit provides bus services to the area, equipped with bicycle racks

Segment Constraints

As discussed in Map 9, the Recommended Route, from Smithfield to Suffolk, is less direct than the Alternative Route and potentially more expensive due to the additional mileage. However, the Recommended Route also likely faces fewer obstacles, such as right of way concerns, development pressures, and bridge constraints.

Map Segments

Birthplace of America

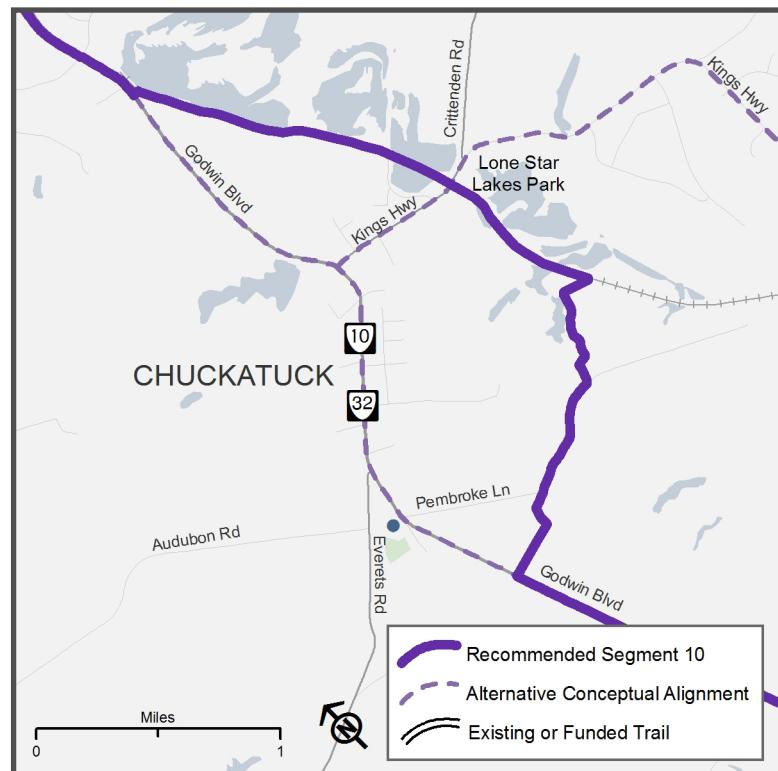
Trail Study

10. Chuckatuck to Suffolk/South Hampton Roads Trail

A Closer Look: Chuckatuck and Lone Star Lakes Park

The route travels south through the City's Lone Star Lakes Park, a 1,000-acre park with 11 lakes. After crossing Kings Highway, the route continues south for 0.7 miles and follows the edge of the flying field to Pembroke Lane, eventually reconnecting to Godwin Boulevard via a utility easement, just south of Dominion Power.

While the detour through the park is one-mile longer than simply following Godwin Boulevard, the route offers shade, picnic areas, playgrounds, and nature trails. In addition, the route could provide a cost savings since it utilizes the City's parkland. Further study is needed to evaluate specific costs, ensure that environmental impacts are limited, and coordinate with appropriate stakeholders, such as Dominion Power.



Segment Details:

Segment Number	From	To	Length (Miles)	Existing/ Funded Portion	VDOT Maintained?	Part of Existing Plan?	Planning-level Cost Estimate
Rec-10A	Godwin Blvd (Rt 10) & Rolling Acres Ln	Godwin Blvd (Rt 10) & Dominion Power Building	3.51	0	Local	No	\$4.1M
Rec-10B	Godwin Blvd (Rt 10) & Dominion Power Building	Suffolk	11.53	0.81	Local	No	\$17.9M
Total			15.04	0.81			

Cost Notes

Rec-10A: Suffolk believes Route 32 has available ROW. Pitchkettle would require two small bike ped bridges. Existing shared-use path on Prentis Street

Rec-10B: Reflects reduced costs for shared-use path through parkland



Kings Fork Road, City of Suffolk (Rec-10B)

The route travels west on Kings Fork Road, providing access to King's Fork Middle School and High School



Prentis Street, City of Suffolk (Rec-10B)

The route connects to the South Hampton Roads Trail via the Prentis Street shared-use path (above)

Next Steps

This study represents a regional effort to identify two Recommended Routes – one from the Virginia Capital Trail to Fort Monroe and the other from the Virginia Capital Trail to the South Hampton Roads Trail. While there is no funding set aside for the design and construction of the proposed Birthplace of America Trail, this study's input, analysis, and recommendations can be used to guide future coordination and investments. This section details some of the anticipated next steps in the path's development, including anticipated roles and responsibilities.

Continued Coordination

The Birthplace of America Trail advisory committee, which was instrumental in guiding the study's vision and recommendations, should continue to meet on a quarterly basis to discuss the trail's funding and phasing. This continued regional coordination can help ensure that the trail is constructed in a logical and connected fashion rather than a piecemeal approach of disconnected segments. The committee members should continue to share findings with their respective agencies and organizations and work with their local governments to ensure that the Recommended and Alternatives routes are reflected in local Comprehensive Plans and in any other transportation plans, such as bicycle master plans. The committee meetings, which are open to the public, provide a continuous opportunity for input as the trail enters project development. Finally, the Committee should continue discussions about trail marketing and help develop a recognizable and consistent "brand" that can be applied to marketing materials and future wayfinding signage.



Branding is an important consideration when designing and developing a trail. A unique, recognizable brand can help distinguish the trail during a project's marketing and outreach phase and can ultimately be adapted to serve as wayfinding signage for the route. Logo Credits: Seaway Trail (New York and Pennsylvania, Great Lakes Seaway Trail Inc.); Bitterroot Trail (Missoula, Montana to Hamilton, Montana); Flagstaff Loop Trail (Flagstaff, Arizona), Gorton Heritage Trail (Manchester, United Kingdom), Indianapolis Cultural Trail (Indianapolis, Indiana); Huckleberry Trail (Blacksburg, Virginia to Christiansburg, Virginia); El Camino Real de Tierra Adentro (Texas, National Park Service); Portland Trails (Portland, Maine); East Coast Greenway (Maine to Florida, East Coast Greenway Alliance).

Forming a Foundation

As a next step, this study recommends forming a Foundation for the Birthplace of America Trail. The Foundation, similar to the Capital Trail Foundation, should serve as a nonpartisan advocacy partner who provides trail expertise, helps raise public awareness of the trail, and seeks funding for trail development and construction.

[OUR MISSION](#) [HISTORY OF THE TRAIL](#) [ENDORSEMENTS](#) [BOARD & STAFF](#) [CONTACT](#)

OUR MISSION

The Virginia Capital Trail Foundation (VCTF) is a nonprofit, 501 (c)(3) organization, with a mission to enhance, promote, and advocate for the continued development of the Virginia Capital Trail, a 52-mile dedicated multi-use trail connecting Richmond and Williamsburg along the historic and beautiful Route 5 corridor.

To make the Trail the world-class attraction it should be, the Foundation raises money to promote it within the region, the state, and the nation through partnerships and larger trail affiliations. The VCTF is also charged with enhancing the Trail by providing signs, trailheads, benches, and other amenities to make the trail experience safe, educational, and—most importantly—unforgettable.

The Mission of the Virginia Capital Trail Foundation

Funding

Local governments should apply for funding through the HRTPO and VDOT. [VDOT's SMART PORTAL](#) is a one-stop shop for information about VDOT funding programs, including: SMART SCALE, Transportation Alternatives Set-Aside Programs, Revenue Sharing, the Bicycle and Pedestrian Safety Program (BPSP) under the Highway Safety Improvement Program (HSIP). More than 900 applications were submitted in 2016 for these programs. The programs are briefly described below.

- The **SMART SCALE** program is a competitive application process and scores projects based on an objective, outcome-based process. Bicycle and pedestrian improvements are eligible for SMART SCALE funding. For example, the Nike Park Road Extension, which includes a shared-use path, was a successful recipient of SMART SCALE funding. Over 436 applications were submitted in 2016, requesting more than \$9 billion in funding.
- The **Transportation Alternatives (TA) Set-Asides** are intended to improve non-motorized transportation, enhance the public's traveling experience, revitalize communities, and improve quality of life. The program requires a 20% local match (80% federal). VDOT allocated \$23 million in Transportation Alternatives (TA) in FY 2017.
- The **Revenue Sharing Program** provides additional funding for use by a county, city, or town to construct or improve the highway systems within such county, city, or town, with statutory limitations on the amount of state funds authorized per locality. The program requires a 50% local match (50% state) and a portion of the funds must be expended within one year of allocation. Sidewalks and shared-use paths are eligible activates under the Revenue Sharing Program.
- The **Highway Safety Improvement Program (HSIP)'s Bicycle and Pedestrian Safety Program (BPSP)** provides funds for implementing short-term, low-cost bicycle and pedestrian safety projects in Virginia. This initiative is administered by evaluating each project application on a case-by-case basis and does not require a local match.



Welcome to SMART Portal

The screenshot displays the VDOT SMART Portal interface, featuring five distinct funding program categories arranged in a grid:

- SMART SCALE** (20 applications): Features a colorful bar chart graphic and the text "Funding the Right Transportation Projects in Virginia".
- Transportation Alternatives Set-Aside Program** (103 applications): Features the "Transportation Alternatives" logo and the VDOT Virginia Department of Transportation logo.
- Revenue Sharing** (241 applications): Features the "Revenue Sharing" logo and the VDOT Virginia Department of Transportation logo.
- Bicycle and Pedestrian Safety Program (BPS)** (60 applications): Features the "Bike Pedestrian Safety" logo and the VDOT Virginia Department of Transportation logo.
- Highway Safety Program (HSP)** (117 applications): Features the "Highway Safety Programs" logo and the VDOT Virginia Department of Transportation logo.

Each program card includes a "View Applications" button and a "More Info" link.

The VDOT SMART Portal provides a one-stop shop for information about VDOT funding programs.

Visit the Portal at <https://smartportal.virginiahb2.org/#/>

In addition, localities and the HRTPO should explore other Federal funding programs, many of which vary in terms of eligibilities and guidelines. For example, the Federal Lands Transportation Program (FLTP) includes transportation projects that provide access to, adjacent to, or through Federal lands. While the FLTP program is highly specific to areas in and around Federal lands, it could offer an appropriate funding source for segments of the Birthplace of America Trail, which provides access to Yorktown Battlefield (Colonial National Historic Park) and Fort Monroe National Monument. The tables and information below summarize the variety of Federal programs, which included hyperlinks to the specific programs.



TABLE I: PEDESTRIAN AND BICYCLE FUNDING OPPORTUNITIES (USDOT TRANSIT, HIGHWAY, AND SAFETY FUNDS)

Activity or Project Type	TIGER	TIFIA	FTA	ATI	CMAQ	HSIP	NHPP	STBG	TA	RTP	SRTS	PLAN	NHTSA	NHTSA	FLTP
Access enhancements to public transportation (includes benches, bus pads)	\$	\$	\$	\$	\$		\$	\$	\$						\$
ADA/504 Self Evaluation / Transition Plan								\$	\$	\$	\$				\$
Bicycle plans			\$					\$	\$		\$	\$			\$
Bicycle helmets (project or training related)								\$	\$SRTS		\$		\$*		
Bicycle helmets (safety promotion)								\$	\$SRTS		\$				
Bicycle lanes on road	\$	\$	\$	\$	\$	\$	\$	\$	\$		\$				\$
Bicycle parking	~\$	~\$	\$	\$	\$		\$	\$	\$	\$	\$				\$
Bike racks on transit	\$	\$	\$	\$	\$			\$	\$						\$
Bicycle share (capital and equipment; not operations)	\$	\$	\$	\$	\$		\$	\$	\$						\$
Bicycle storage or service centers at transit hubs	~\$	~\$	\$	\$	\$			\$	\$						\$
Bridges / overcrossings for pedestrians and/or bicyclists	\$	\$	\$	\$	\$*	\$	\$	\$	\$	\$	\$				\$
Bus shelters and benches	\$	\$	\$	\$	\$		\$	\$	\$						\$
Coordinator positions (State or local)					\$ 1 per			\$	\$SRTS		\$				
Crosswalks (new or retrofit)	\$	\$	\$	\$	\$*	\$	\$	\$	\$	\$	\$				\$
Curb cuts and ramps	\$	\$	\$	\$	\$*	\$	\$	\$	\$	\$	\$				\$
Counting equipment			\$	\$		\$	\$	\$	\$	\$	\$	\$*			\$
Data collection and monitoring for pedestrians and/or			\$	\$		\$	\$	\$	\$	\$	\$	\$	\$*		\$
Historic preservation (pedestrian and bicycle and transit facilities)	\$	\$	\$	\$				\$	\$						\$
Landscaping, streetscaping (pedestrian and/or bicycle route; transit access); related amenities (benches, water fountains); generally as part of a larger project	~\$	~\$	\$	\$			\$	\$	\$						\$
Lighting (pedestrian and bicyclist scale associated with pedestrian/bicyclist project)	\$	\$	\$	\$		\$	\$	\$	\$	\$	\$				\$
Maps (for pedestrians and/or bicyclists)			\$	\$	\$			\$	\$		\$	\$*			
Paved shoulders for pedestrian and/or bicyclist use	\$	\$			\$*	\$	\$	\$	\$	\$					\$

Key: \$ = Funds may be used for this activity (restrictions may apply). \$* = See program-specific notes for restrictions. ~\$ = Eligible, but not competitive unless part of a larger project.



TABLE I (CONT.): PEDESTRIAN AND BICYCLE FUNDING OPPORTUNITIES (USDOT TRANSIT, HIGHWAY, AND SAFETY FUNDS)

Activity or Project Type	TIGER	TIFIA	FTA	ATI	CMAQ	HSIP	NHPP	STBG	TA	RTP	SRTS	PLAN	NHTSA	NHTSA	FLTP
Pedestrian plans			\$					\$	\$		\$	\$			\$
Recreational trails	~\$	~\$						\$	\$	\$					\$
Road Diets (pedestrian and bicycle portions)	\$	\$				\$	\$	\$	\$						\$
Road Safety Assessment for pedestrians and bicyclists						\$		\$	\$			\$			\$
Safety education and awareness activities and programs to inform pedestrians, bicyclists, and motorists on ped/bike								\$SRTS	\$SRTS		\$	\$*	\$*	\$*	
Safety education positions								\$SRTS	\$SRTS		\$		\$*		
Safety enforcement (including police patrols)								\$SRTS	\$SRTS		\$		\$*	\$*	
Safety program technical assessment (for peds/bicyclists)								\$SRTS	\$SRTS		\$	\$*	\$		
Separated bicycle lanes	\$	\$	\$	\$	\$	\$	\$	\$	\$		\$				\$
Shared use paths / transportation trails	\$	\$	\$	\$	\$	\$*	\$	\$	\$	\$	\$				\$
Sidewalks (new or retrofit)	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$				\$
Signs / signals / signal improvements	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$				\$
Signed pedestrian or bicycle routes	\$	\$	\$	\$	\$			\$	\$	\$	\$				\$
Spot improvement programs	\$	\$	\$					\$	\$	\$	\$				\$
Stormwater impacts related to pedestrian and bicycle projects	\$	\$	\$	\$				\$	\$	\$	\$				\$
Traffic calming	\$	\$	\$					\$	\$	\$	\$				\$
Trail bridges	\$	\$				\$*	\$	\$	\$	\$	\$				\$
Trail construction and maintenance equipment									\$RTP	\$RTP	\$				
Trail/highway intersections	\$	\$				\$*	\$	\$	\$	\$	\$				\$
Trailside and trailhead facilities (includes restrooms and water, but not general park amenities; see guidance)	~\$*	~\$*						\$*	\$*	\$*					\$
Training						\$	\$		\$	\$	\$	\$	\$*	\$*	
Training for law enforcement on ped/bicyclist safety laws									\$SRTS	\$SRTS		\$			\$*
Tunnels / undercrossings for pedestrians and/or bicyclists	\$	\$	\$	\$	\$*	\$	\$	\$	\$	\$	\$				\$

Key: \$ = Funds may be used for this activity (restrictions may apply). \$* = See program-specific notes for restrictions. ~\$ = Eligible, but not competitive unless part of a larger project.



Table Abbreviations

ADA/504: Americans with Disabilities Act of 1990 / Section 504 of the Rehabilitation Act of 1973

TIGER: Transportation Investment Generating Economic Recovery Discretionary Grant program

TIFA: Transportation Infrastructure Finance and Innovation Act (loans)

FTA: Federal Transit Administration Capital Funds

ATI: Associated Transit Improvement (1% set-aside of FTA)

CMAQ: Congestion Mitigation and Air Quality Improvement Program

HSIP: Highway Safety Improvement Program

NHPP: National Highway Performance Program

STBG: Surface Transportation Block Grant Program

TA: Transportation Alternatives Set-Aside (formerly Transportation Alternatives Program)

RTP: Recreational Trails Program

SRTS: Safe Routes to School Program / Activities

PLAN: Statewide Planning and Research (SPR) or Metropolitan Planning funds

NHTSA 402: State and Community Highway Safety Grant Program

NHTSA 405: National Priority Safety Programs (Nonmotorized safety)

FLTCP: Federal Lands and Tribal Transportation Programs (Federal Lands Access Program, Federal Lands Transportation Program, Tribal Transportation Program, Nationally Significant Federal Lands and Tribal Projects)



Program-specific notes (Source: USDOT)

Federal-aid funding programs have specific requirements that projects must meet, and eligibility must be determined on a case-by-case basis. For example:

- TIGER: Subject to annual appropriations.
- TIFIA: Program offers assistance only in the form of secured loans, loan guarantees, or standby lines of credit, but can be combined with other grant sources, subject to total Federal assistance limitations.
- FTA/ATI: Project funded with FTA transit funds must provide access to transit. See [Bikes and Transit](#) and the FTA Final Policy Statement on the [Eligibility of Pedestrian and Bicycle Improvements under Federal Transit Law](#).
 - Bicycle infrastructure plans and projects funded with FTA funds must be within a 3 mile radius of a transit stop or station, or if further than 3 miles, must be within the distance that people could be expected to safely and conveniently bike to use the particular stop or station.
 - Pedestrian infrastructure plans and projects funded with FTA funds must be within a ½ mile radius of a transit stop or station, or if further than ½ mile, must be within the distance that people could be expected to safely and conveniently walk to use the particular stop or station.
 - FTA funds cannot be used to purchase bicycles for bike share systems.
 - FTA encourages grantees to use FHWA funds as a primary source for public right-of-way projects.
- CMAQ projects must demonstrate emissions reduction and benefit air quality. See the CMAQ guidance at: www.fhwa.dot.gov/environment/air_quality/cmaq for a list of projects that may be eligible for CMAQ funds. Several activities may be eligible for CMAQ funds as part of a bicycle and pedestrian-related project, but not as a highway project. CMAQ funds may be used for shared use paths, but may not be used for trails that are primarily for recreational use.
- HSIP projects must be consistent with a State's [Strategic Highway Safety Plan](#) and either (1) correct or improve a hazardous road location or feature, or (2) address a highway safety problem.
- NHPP projects must benefit National Highway System (NHS) corridors.
- STBG and TA Set-Aside: Activities marked "\$SRTS" means eligible only as an SRTS project benefiting schools for kindergarten through 8th grade. Bicycle transportation nonconstruction projects related to safe bicycle use are eligible under STBG, but not under TA (23 U.S.C. 217(a)).
- RTP must benefit recreational trails, but for any recreational trail use. RTP projects are eligible under TA and STBG, but States may require a transportation purpose.
- SRTS: FY 2012 was the last year for SRTS funds, but SRTS funds are available until expended.
- Planning funds must be used for planning purposes, for example:
 - Maps: System maps and GIS;
 - Safety education and awareness: for transportation safety planning;
 - Safety program technical assessment: for transportation safety planning;
 - Training: bicycle and pedestrian system planning training.
- Federal Lands and Tribal Transportation Programs (FLTTP) projects must provide access to or within Federal or tribal lands:
 - Federal Lands Access Program (FLAP): Open to State and local entities for projects that provide access to or within Federal or tribal lands.
 - Federal Lands Transportation Program: For Federal agencies for projects that provide access within Federal lands.

- Tribal Transportation Program: available for federally-recognized tribal governments for projects within tribal boundaries and public roads that access tribal lands.
- NHTSA 402 project activity must be included in the State's Highway Safety Plan. Contact the State Highway Safety Office for details: <http://www.ghsa.org/html/about/shsos.html>
- NHTSA 405 funds are subject to State eligibility, application, and award. Project activity must be included in the State's Highway Safety Plan. Contact the State Highway Safety Office for details: <http://www.ghsa.org/html/about/shsos.html>

Cross-cutting notes (Source: USDOT)

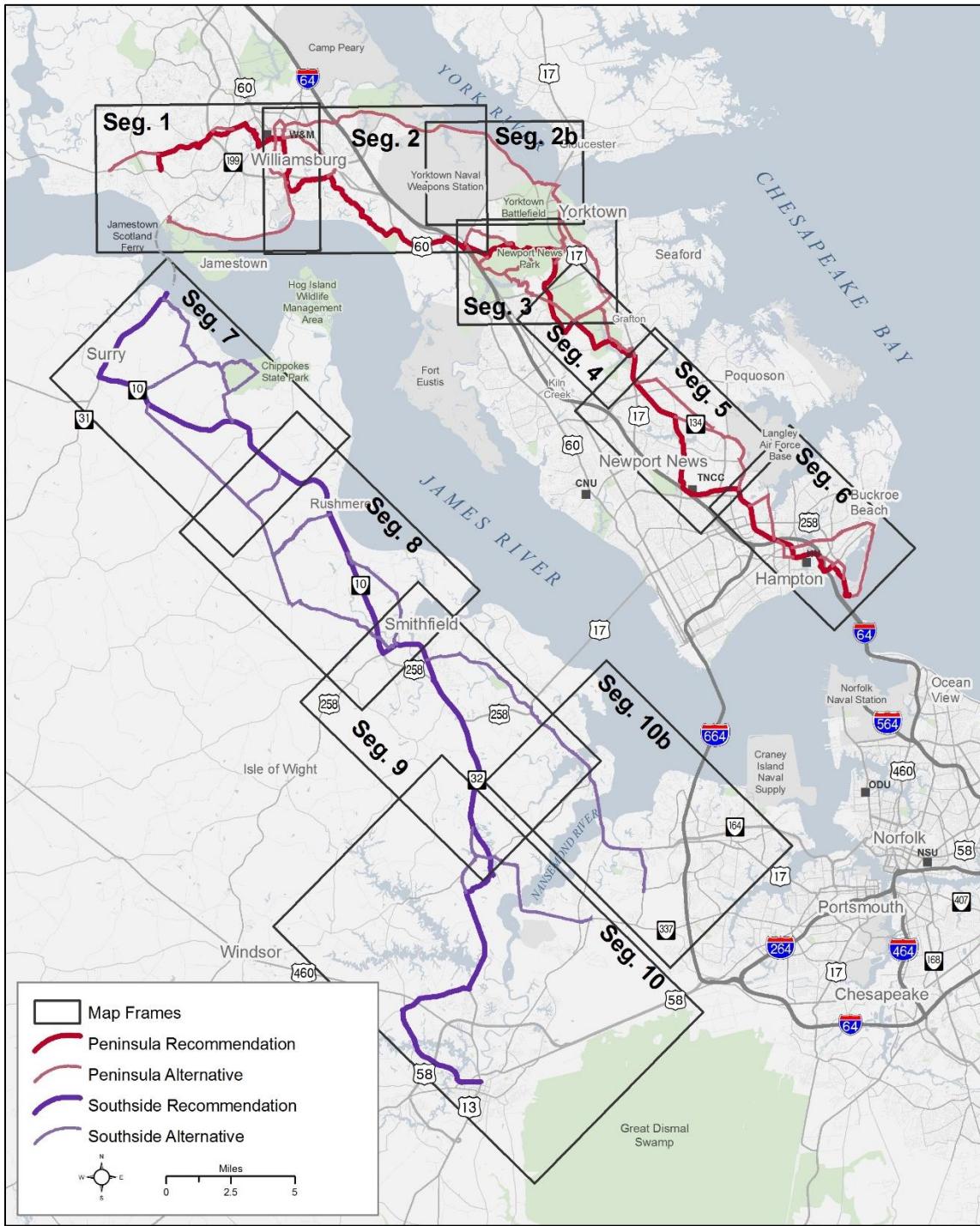
- FHWA Bicycle and Pedestrian Guidance:
http://www.fhwa.dot.gov/environment/bicycle_pedestrian/
- **Applicability of 23 U.S.C. 217(i) for Bicycle Projects:** 23 U.S.C. 217(i) requires that bicycle facilities "be principally for transportation, rather than recreation, purposes". However, sections 133(b)(6) and 133(h) list "recreational trails projects" as eligible activities under STBG. Therefore, the requirement in 23 U.S.C. 217(i) does not apply to recreational trails projects (including for bicycle use) using STBG funds. Section 217(i) continues to apply to bicycle facilities other than trail-related projects, and section 217(i) continues to apply to bicycle facilities using other Federal-aid Highway Program funds (NHPP, HSIP, CMAQ). The transportation requirement under section 217(i) is applicable only to bicycle projects; it does not apply to any other trail use or transportation mode.
- There may be occasional DOT or agency incentive grants for specific research or technical assistance purposes.
- Aspects of many DOT initiatives may be eligible as individual projects. For example, activities above may benefit Ladders of Opportunity; safe, comfortable, interconnected networks; environmental justice; equity; etc.



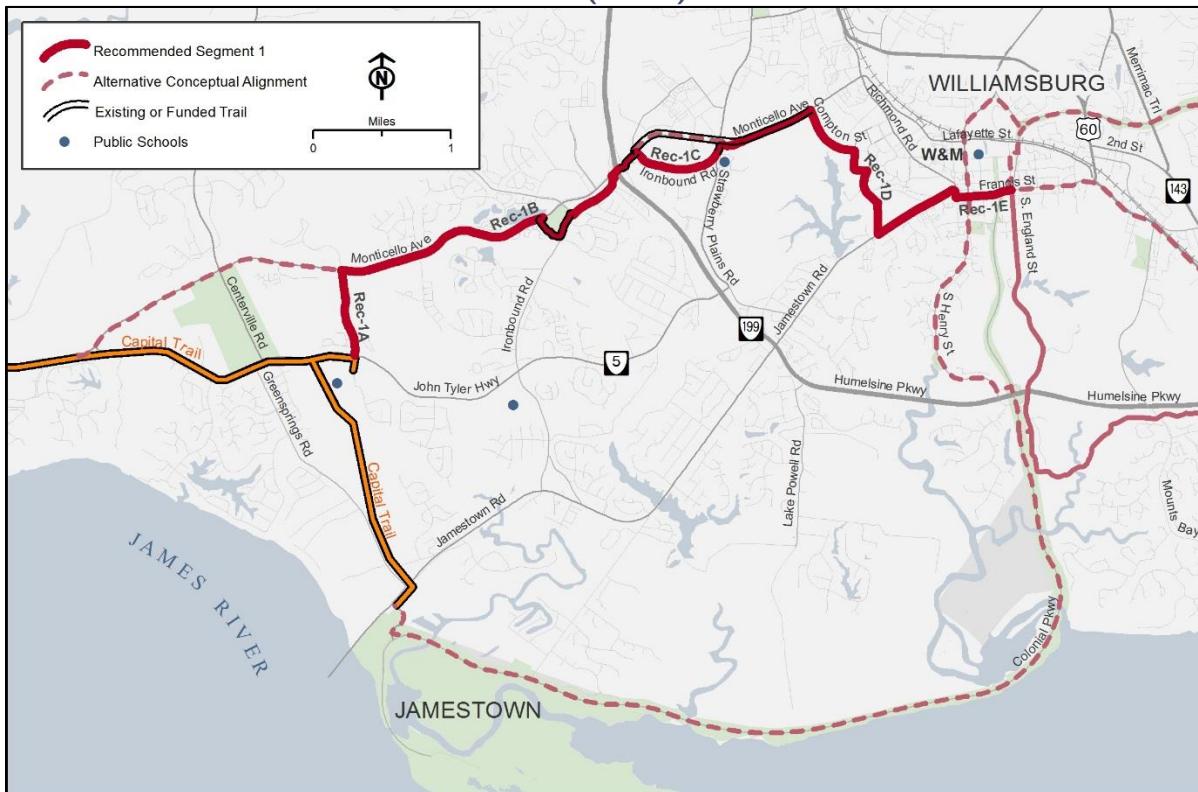
Appendix A: Review of Individual Segments

The following pages provide detailed maps and tables for the individual segment areas, which reflect the Recommended Route *and* the Alternative Routes (shown in Figure 12). In some cases, the individual tables and notes carry over to a second page. A Microsoft Excel workbook is also available to assist jurisdictions with project development.

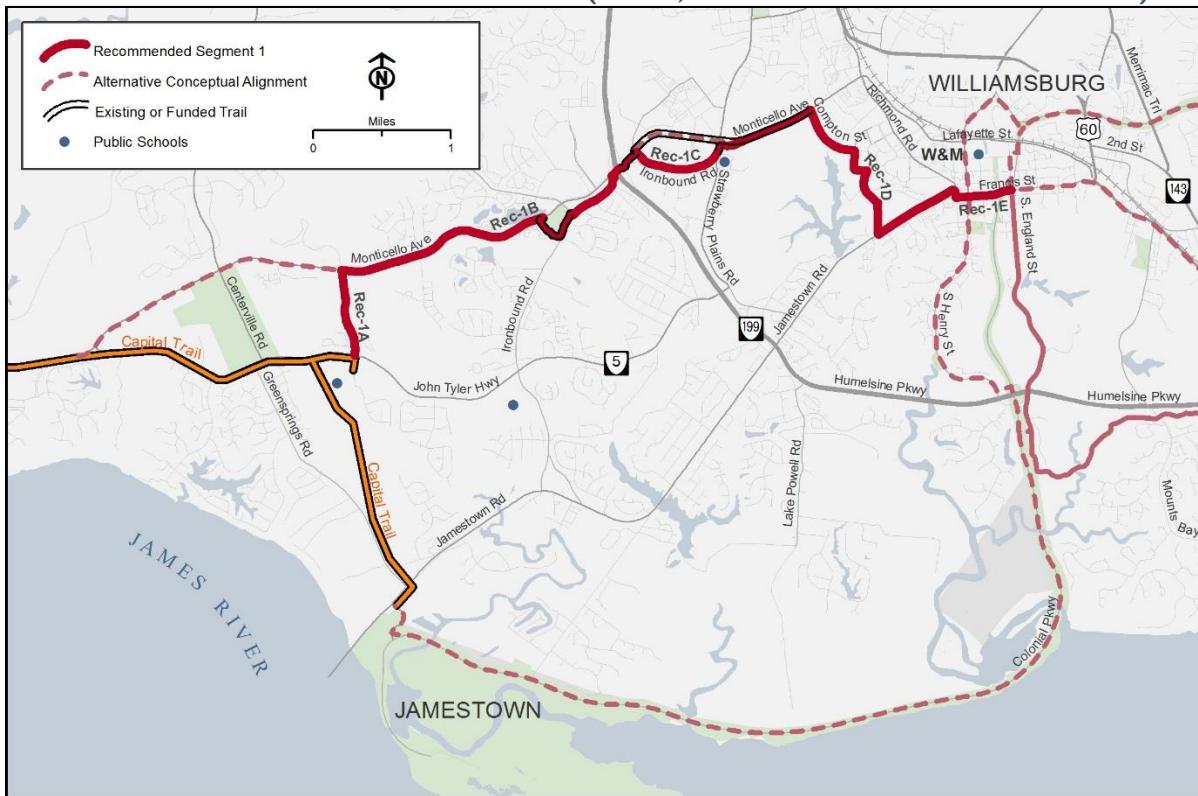
FIGURE 12: MAP SEGMENTS KEY



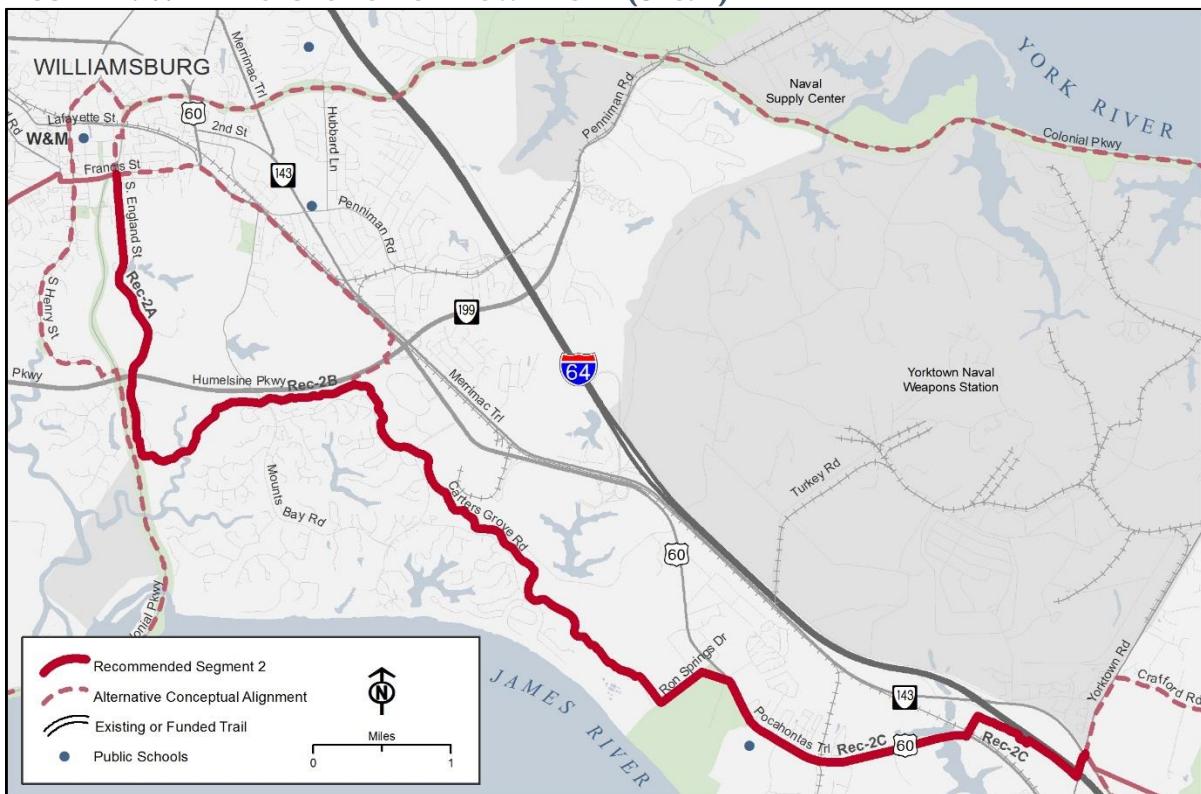
See the following pages for detail on each map area (or segment area)

FIGURE 13: CAPITAL TRAIL TO WILLIAMSBURG (SEG. 1)

Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Rec-1A	Greensprings Plantation Dr & John Tyler Mem Hwy (Rt 5)	Greensprings Plantation Dr & Monticello Ave (Rt 5000)	0.6		Local	No	Low	\$.9M
Rec-1B*	Monticello Ave (Rt 5000) & Greensprings Plantation Dr	Monticello Ave (Rt 321) & Ironbound Rd	2.7	0.4	VDOT, Local	Yes	Low	\$3.2M
Rec-1C	Monticello Ave (Rt 321) & Ironbound Rd	Monticello Ave (Rt 321) & Ironbound Rd via Ironbound Rd	0.9		VDOT	No	High	\$1.3M
Rec-1D*	Monticello Ave (Rt 321) & Ironbound Rd	W Francis St & S Henry St	2.5	0.7	VDOT, Private	No	High	\$2.5M
Rec-1E*	W Francis St & S Henry St	Francis St & S England St	0.3		VDOT	No	High	\$.4M
Alt-1A*	Colonial Pkwy & Jamestown Rd (Rt 31)	Colonial Pkwy & Pipeline	6.9		NPS	No	Low	\$9.5M
Alt-1B	Pipeline & Colonial Pkwy	Pipeline & S England St	0.1		NPS, Private	No	Low	\$.1M
Alt-1C	Monticello Ave (Rt 5000) & John Tyler Memorial Hwy (Rt 5)	Monticello Ave (Rt 5000) & Greensprings Plantation Dr	2.1		VDOT, Local	Yes	Low	\$2.9M
Alt-1D*	Monticello Ave (Rt 321) & Ironbound Rd	Monticello Ave (Rt 321) & Ironbound Rd via Monticello Ave	0.9	0.7	VDOT	No	High	\$.3M
Alt-1E	S Henry St & W Francis St	VA 132 & Colonial Parkway	1.1		VDOT	No	High	\$1.6M
Alt-1F	S Henry St & W Francis St	Colonial Pkwy & Pipeline	2.2		VDOT	No	Low	\$3.1M

FIGURE 13: CAPITAL TRAIL TO WILLIAMSBURG (SEG. I, SAME MAP SHOWN ON PREVIOUS PAGE)**Notes:**

- *Rec-1B: Existing shared-use path (0.4 miles) through the park
- *Rec-1D: Funded shared-use path for 0.7 miles. Recommended by William & Mary and Colonial Williamsburg
- *Rec-1E: Recommended by William & Mary and Colonial Williamsburg
- *Alt-1A: Four bridges appear wide enough to accommodate bikes and peds
- *Alt-1D: Existing shared-use path for 0.7 miles

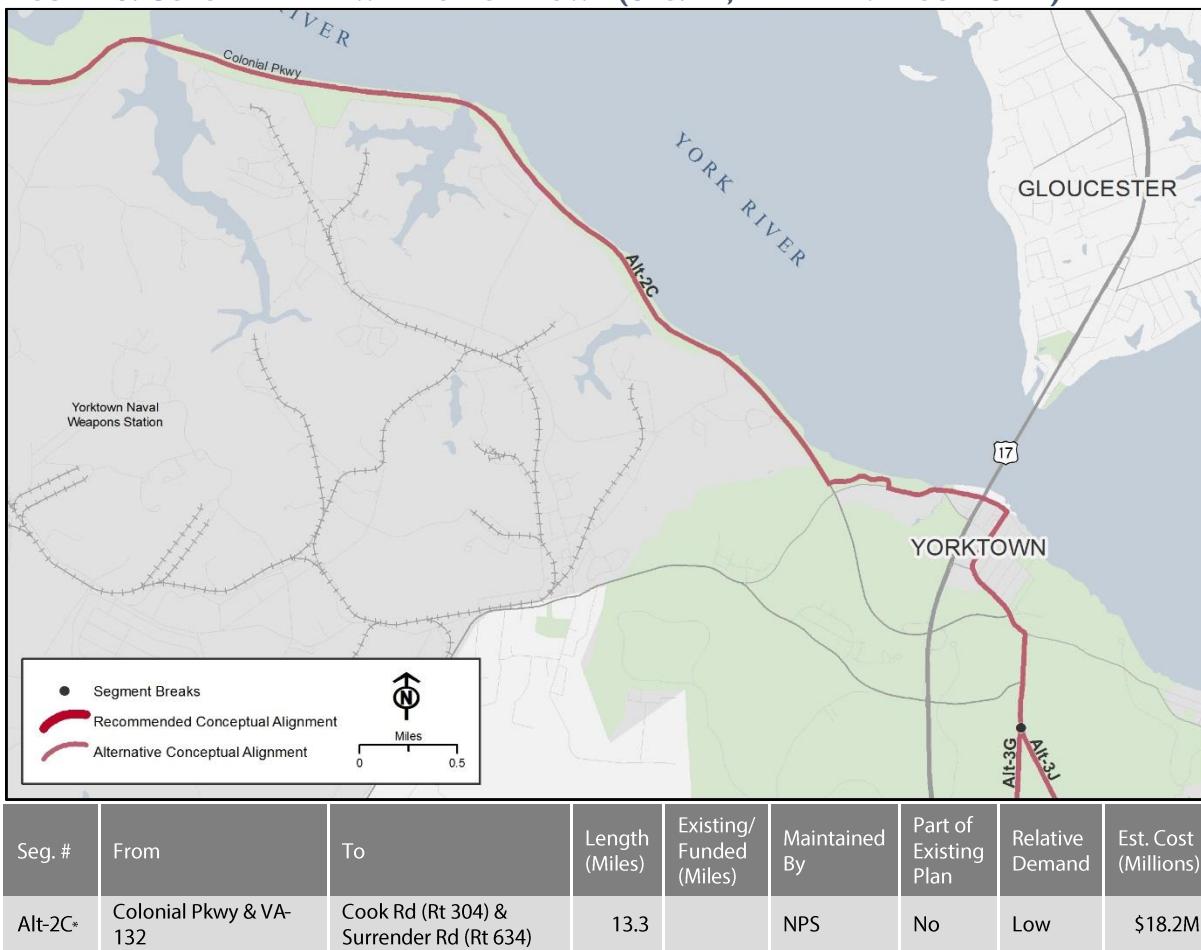
FIGURE 14: WILLIAMSBURG TO YORKTOWN ROAD (SEG. 2)

Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Rec-2A	S England St & Francis St	S England St & Pipeline	1.9		Private	No	Low	\$2.5M
Rec-2B	S England St & Pipeline	Carters Grove County Rd near Tolers Rd	2.1		Private	No	Low	\$2.9M
Rec-2C*	Carters Grove County Rd near Tolers Rd	Yorktown Rd (Rt 238) & Jefferson Ave (Rt 143)	7.5		Local, Private	Yes	Low	\$9.3M
Alt-2A*	E Francis St & S England St	Carters Grove County Rd near Tolers Rd	3.0		VDOT	No	Med	\$7.2M
Alt-2B	Colonial Pkwy & VA-132	S England St & E Francis St	0.5		VDOT, Local, Private, NPS	No	High	\$.7M

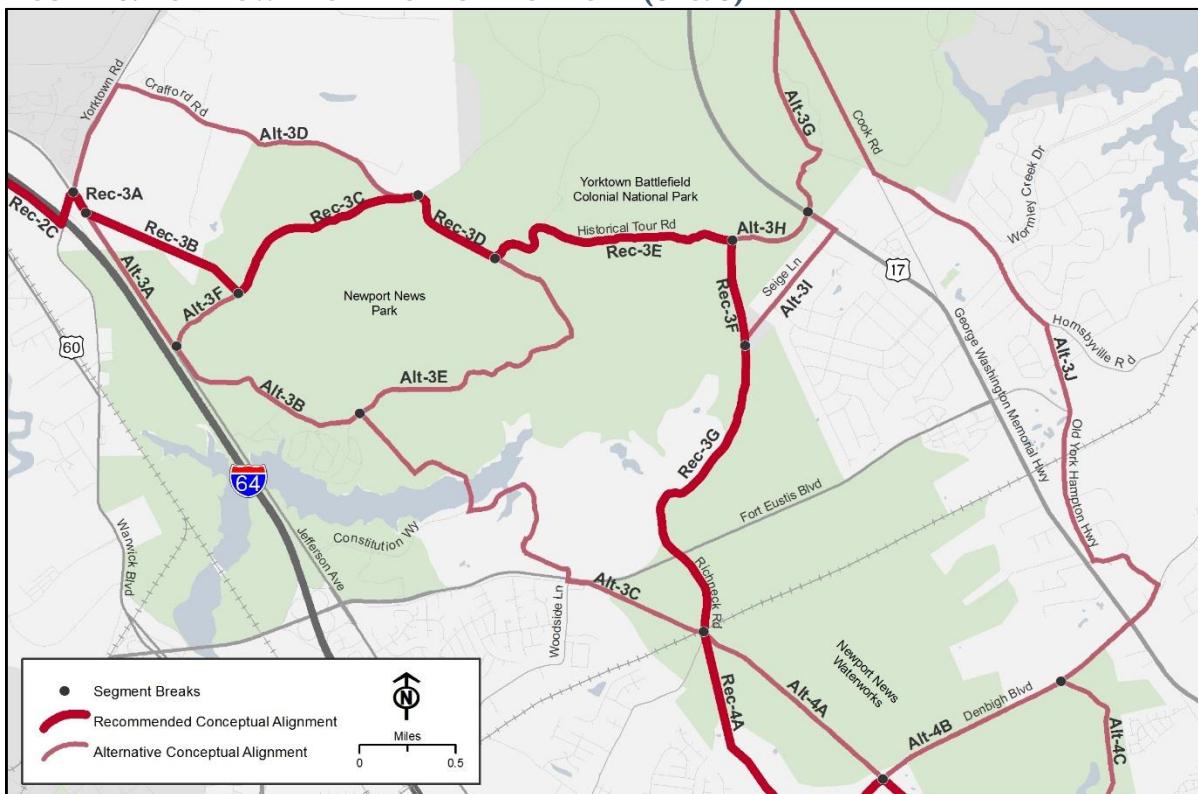
Notes:

*Rec-2C: Shared-use path overpass required over rail line and widening required for short bridge on US 60; Unknown whether two Carters Grove bridges need to be replaced; Underpass reconstruction needed for I-64

*Alt-2A: New bridge or tunnel required to cross Route 199

FIGURE 15: COLONIAL PARKWAY TO YORKTOWN (SEG. 2A, ALTERNATIVE ROUTE ONLY)**Notes:**

*Alt-2C: Three bridges appear wide enough to accommodate cyclists and pedestrians

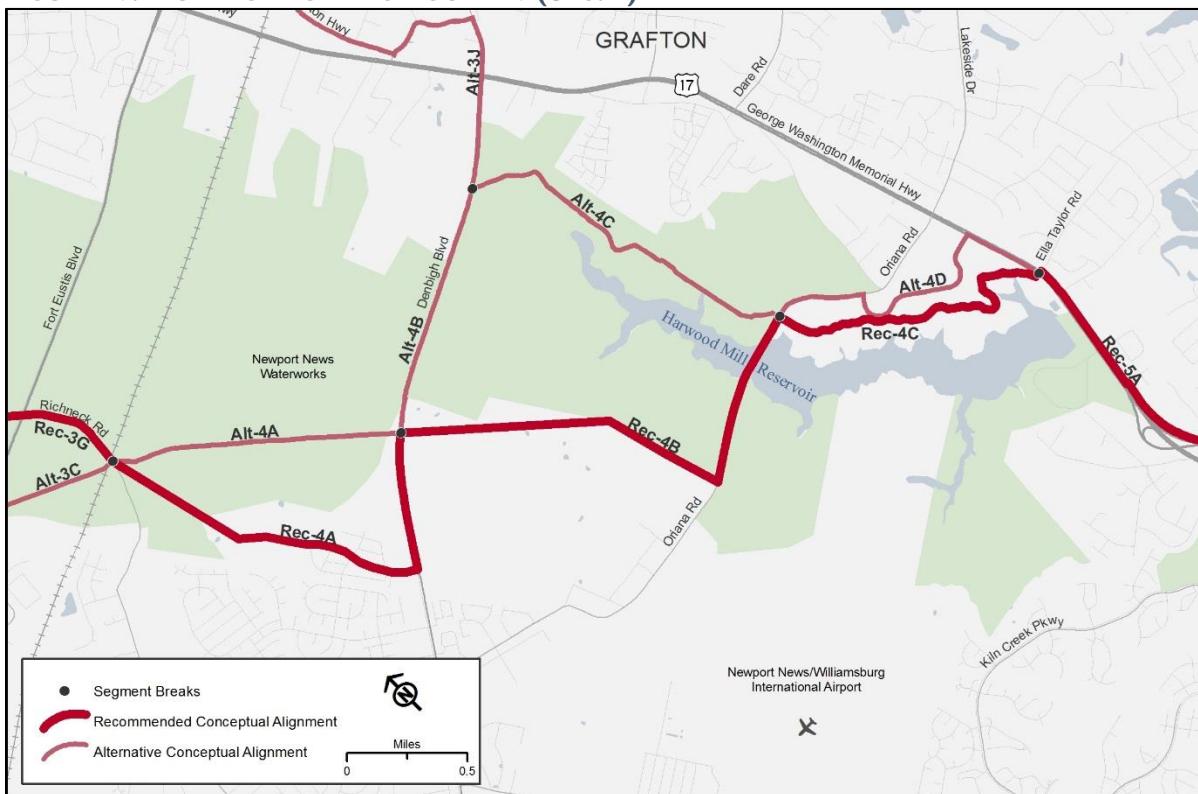
FIGURE 16: YORKTOWN ROAD TO RICHNECK ROAD (SEG. 3)

Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Rec-3A	Jefferson Ave (Rt 143) & Yorktown Rd (Rt 238)	Jefferson Ave (Rt 143) & Newport News Park Powerline	0.1		Local	No	Low	\$2M
Rec-3B	Newport News Park Powerline & Jefferson Ave (Rt 143)	Newport News Park Powerline & Newport News Park Bikeway	0.9		Local	No	Low	\$1M
Rec-3C	Newport News Park Bikeway & Newport News Park Powerline	Newport News Park Bikeway & Crawford Rd (Rt 637)	1.2	1.2	Local	No	Med	\$2M
Rec-3D	Newport News Park Bikeway & Crawford Rd (Rt 637)	Newport News Park Bikeway & Historical Tour Dr	0.6	0.6	Local, NPS	No	Med	\$1M
Rec-3E	Newport News Park Bikeway & Historical Tour Dr	Historical Tour Dr & Warwick Rd	1.4		NPS	No	Med	\$2.0M
Rec-3F	Warwick Rd & Historical Tour Dr	Warwick Rd & Siege Ln	0.6		NPS	No	Med	\$8M
Rec-3G	Warwick Rd & Siege Ln	Richneck Rd (Rt 636) & rail line	1.8		VDOT, Local, NPS	Yes	High	\$3M
Alt-3A	Jefferson Ave (Rt 143) & Powerline	Jefferson Ave (Rt 143) & Newport News Park	0.9		VDOT	No	Low	\$1.2M
Alt-3B	Jefferson Ave (Rt 143) & Newport News Park	Campsite Dr & Dam Trail	1.2		Local	No	Low	\$2M
Alt-3C*	Dam Trail & Campsite Dr	Richneck Rd (Rt 636) & rail line	2.7		VDOT, Local	No	High	\$2.5M
Alt-3D	Yorktown Rd (Rt 238) & Jefferson Ave (Rt 143)	Crawford Rd (Rt 637) & Newport News Bikeway	2.3		VDOT, Local	No	Low	\$3.2M

Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Alt-3E	Newport News Park Bikeway	Newport News Park Bikeway	1.9		Local, NPS	No	Med	\$.2M
Alt-3F	Jefferson Ave (Rt 143) & Newport News Bikeway	Newport News Park Bikeway	0.4		Local	No	Low	\$.1M
Alt-3G	Surrender Rd (Rt 634) & Cook Rd (Rt 704)	Historical Tour Dr & GW Hwy (Rt 17)	1.3		NPS	No	Low	\$1.8M
Alt-3H	Historical Tour Dr & GW Hwy (Rt 17)	Historical Tour Dr & Warwick Rd	0.5		NPS	No	Med	\$.6M
Alt-3I	GW Hwy (Rt 17) & Historical Tour Dr	Siege Ln & Warwick Rd	0.9		VDOT, Local, NPS	No	Med	\$1.3M
Alt-3J	Surrender Rd (Rt 634) & Cook Rd (Rt 704)	Denbigh Blvd (Rt 173) & Poquoson River	4.7		VDOT, Local	No	Low	\$6.5M

FIGURE 16: YORKTOWN ROAD TO RICHNECK ROAD (SEG. 3, SAME MAP SHOWN ON PREVIOUS PAGE)**Notes:**

*Alt-3C: Assumes cyclists would use Dam 1 bridge; bridge is in poor condition now and may warrant reconstruction in future

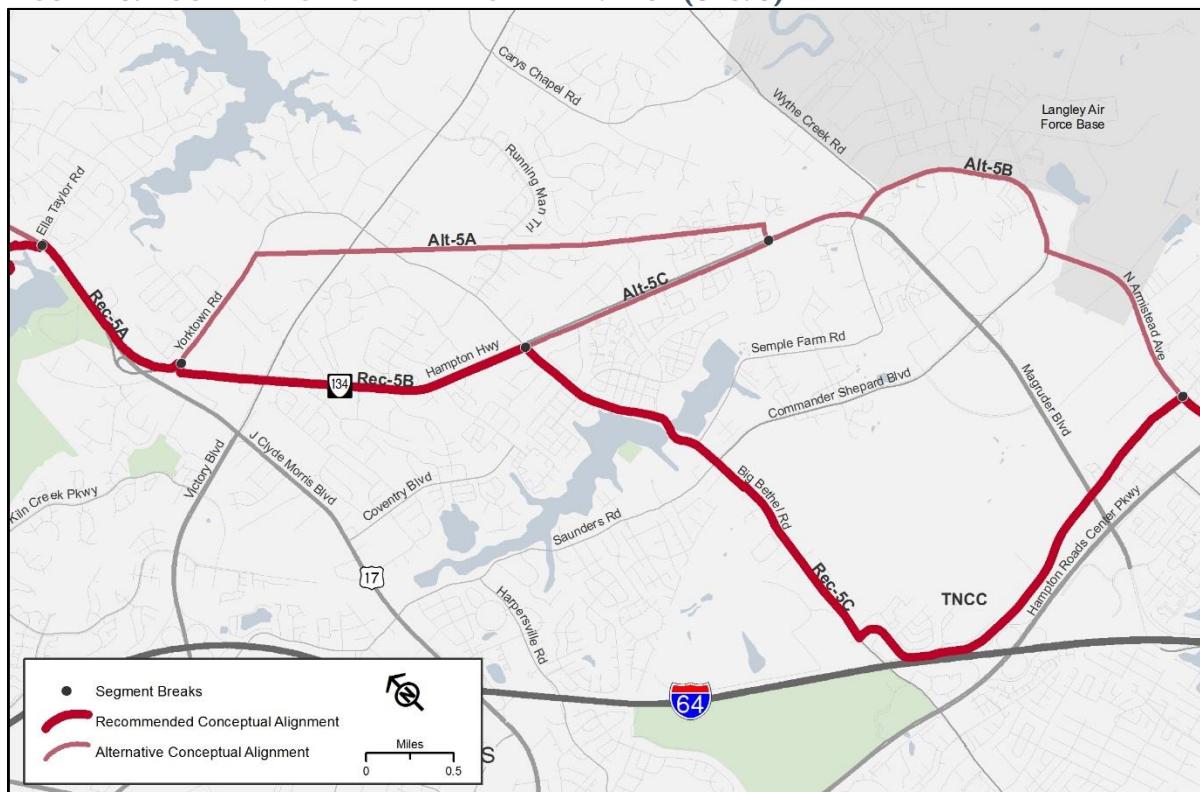
FIGURE 17: RICHNECK ROAD TO ROUTE 17 (SEG. 4)

Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Rec-4A*	Richneck Rd (Rt 636) & rail line	RC Club Rd & Denbigh Blvd (Rt 173) via Independence Blvd	2.0	1.4	VDOT, Private	No	Med	\$8M
Rec-4B*	RC Club Rd & Denbigh Blvd (Rt 173)	Oriana Rd (Rt 620) & Powerline	2.1		VDOT, Local	No	Med	\$3.1M
Rec-4C	Oriana Rd (Rt 620) & Powerline	GW Hwy (Rt 17) & Ella Taylor Rd via MAC	1.4	1.1	Local	No	High	\$0M
Alt-4A	Richneck Rd (Rt 636) & rail line	RC Club Rd & Denbigh Blvd (Rt 173) via RC Club Rd	1.2		Local	No	Med	\$2M
Alt-4B	Denbigh Blvd (Rt 173) & RC Club Rd	Denbigh Blvd (Rt 173) & Poquoson River	1.1		VDOT	No	Low	\$2M
Alt-4C	Denbigh Blvd (Rt 173) & Poquoson River	Oriana Rd (Rt 620) & Powerline	1.5		Local	No	High	\$2.1M
Alt-4D	Oriana Rd (Rt 620) & Powerline	GW Hwy (Rt 17) & Ella Taylor Rd via Sports Way	1.4		VDOT, Local	No	High	\$2.0M

Notes:

*Rec-4A: Segment is predominately funded as part of proposed development

*Rec-4B: ROW through NN Waterworks property. Assumes boardwalk bridge over reservoir, which is reflected in wetland mileage

FIGURE 18: ROUTE 17 TO NORTH ARMISTEAD AVENUE (SEG. 5)

Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Rec-5A*	GW Hwy (Rt 17) & Ella Taylor Rd	Yorktown Rd (Rt 705) & Cardinal Ln	1.1	0.4	VDOT	Yes	Med	\$1.0M
Rec-5B*	Yorktown Rd (Rt 705) & Cardinal Ln	Hampton Hwy (Rt 134) & Big Bethel Rd (Rt 600)	2.1		VDOT	No	Med	\$2.8M
Rec-5C*	Big Bethel Rd (Rt 600) & Hampton Hwy (Rt 134)	Butler Farm Rd & N Armistead Rd	5.3		VDOT, Local	No	High	\$9.4M
Alt-5A	Yorktown Rd (Rt 705) & Cardinal Ln	Hampton Hwy (Rt 134) & Tabb Smith Trl	3.8		VDOT, Private	Yes	Med	\$4.1M
Alt-5B*	Hampton Hwy (Rt 134) & Tabb Smith Trl	N Armistead Ave & Butler Farm Rd	3.2		VDOT	No	Low	\$8.3M
Alt-5C	Hampton Hwy (Rt 134) & Big Bethel Rd (Rt 600)	Hampton Hwy (Rt 134) & Tabb Smith Trl	1.5		VDOT	Yes	High	\$2.1M

Notes:

- *Rec-5A: Existing shared-use path from Showalter to Mill
- *Rec-5B: Intersection improvements needed at Victory Blvd
- *Rec-5C: Widening required for bridge over Big Bethel Reservoir
- *Alt-5B: Bike/ped bridge required on Hampton Highway through wetland area

FIGURE 19: NORTH ARMISTEAD AVENUE TO FORT MONROE (SEG. 6)

Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Rec-6A	N Armistead Ave & Butler Farm Rd	N Armistead Ave (Rt 134) & Tide Mill Ln	0.8		Local	No	Med	\$1.1M
Rec-6B*	N Armistead Ave (Rt 134) & Tide Mill Ln	N Armistead Ave (Rt 134) & Lasalle Ave (Rt 167) via Armistead Ave	1.8		Local	No	Med	\$3.6M
Rec-6C*	N Armistead Ave (Rt 134) & Lasalle Ave (Rt 167)	N Armistead Ave (Rt 134) & Patterson Ave	0.2		Local	No	Med	\$.8M
Rec-6D	N Armistead Ave (Rt 134) & Patterson Ave	N Armistead Ave (Rt 134) & W Pembroke Ave (Rt 351)	0.6		Local	No	High	\$.9M
Rec-6E	N Armistead Ave (Rt 134) & W Pembroke Ave (Rt 351)	N Armistead Ave (Rt 134) & Settlers Landing Rd	0.4		Local	No	High	\$.5M
Rec-6F*	Settlers Landing Rd & N Armistead Ave (Rt 134)	Settlers Landing Rd (Rt 143) & Tyler St	1.1		Local	No	High	\$6.0M
Rec-6G	Settlers Landing Rd (Rt 143) & Tyler St	S Mallory St & Mellen St	1.1		Local, Private	No	High	\$1.5M
Rec-6H*	E Mellen St (Rt 143) & S Mallory St (Rt 169)	Mercury Blvd (Rt 258) & Ingalls Rd (Rt 143)	0.7		Local	No	Med	\$2.8M
Rec-6I	Mercury Blvd (Rt 258) & Ingalls Rd (Rt 143)	Fort Monroe	0.9		Local, NPS	No	Low	\$1.3M
Alt-6A*	Tide Mill Ln & N Armistead Ave (Rt 134)	Lasalle Ave (Rt 167) & N Armistead Ave (Rt 134) via Lasalle Ave	2.6		Local	No	Med	\$5.1M
Alt-6B	Patterson Ave & N Armistead Ave (Rt 134)	Settlers Landing Rd & S Armistead Ave (Rt 134)	1.1		Local	No	High	\$1.6M

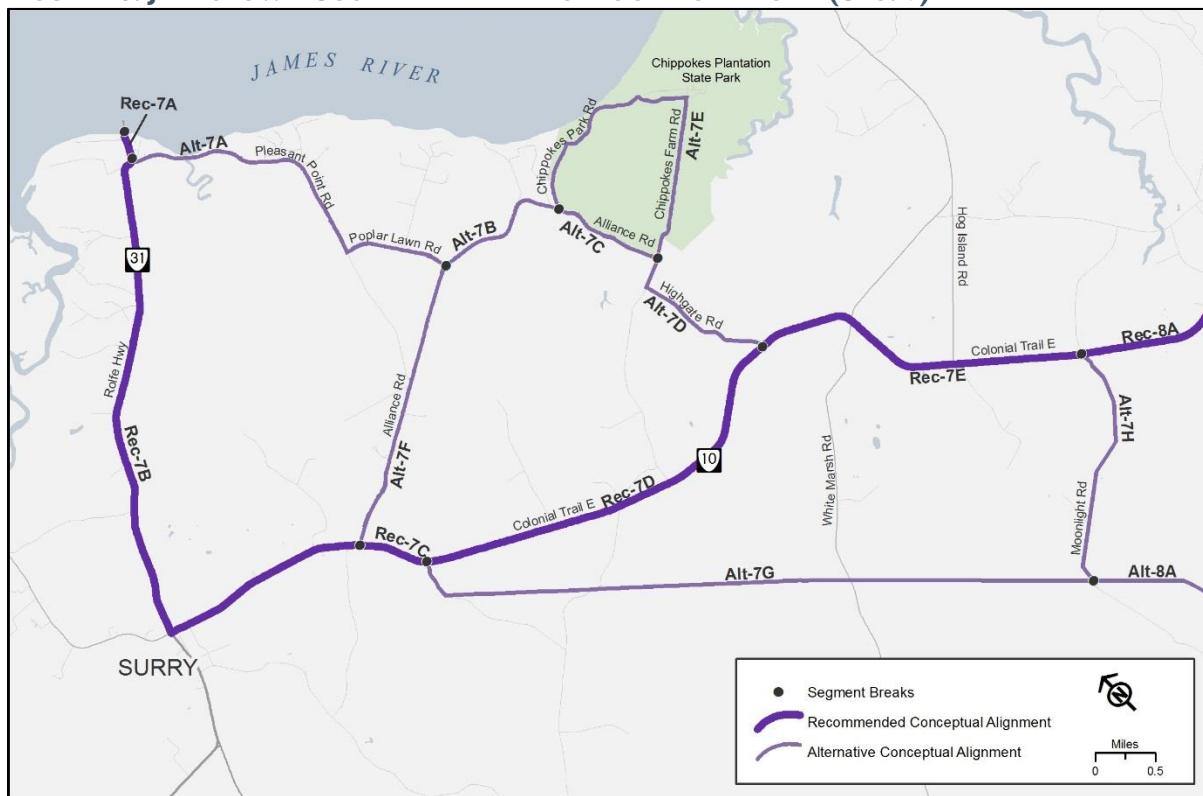
Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Alt-6C*	W Pembroke Ave (Rt 351) & N Armistead Ave (Rt 134)	Fort Monroe	6.5		Local, Private, NPS	No	Med	\$13.4M
Alt-6D*	Settlers Landing Rd (Rt 143) & Tyler St	W County St (Rt 143) & Mallory St	0.7		Local	No	High	\$1.5M
Alt-6E*	N Mallory St (Rt 169) & W County St (Rt 143)	Mercury Blvd (Rt 258) & Ingalls Rd (Rt 143)	1.0		Local	No	High	\$1.4M
Alt-6F	S Mallory St & Mellen St	S Mallory St & County St	0.1		Local	No	High	\$.1M

FIGURE 19: NORTH ARMISTEAD AVENUE TO FORT MONROE (SEG. 6, SAME MAP SHOWN ON PREVIOUS PAGE)



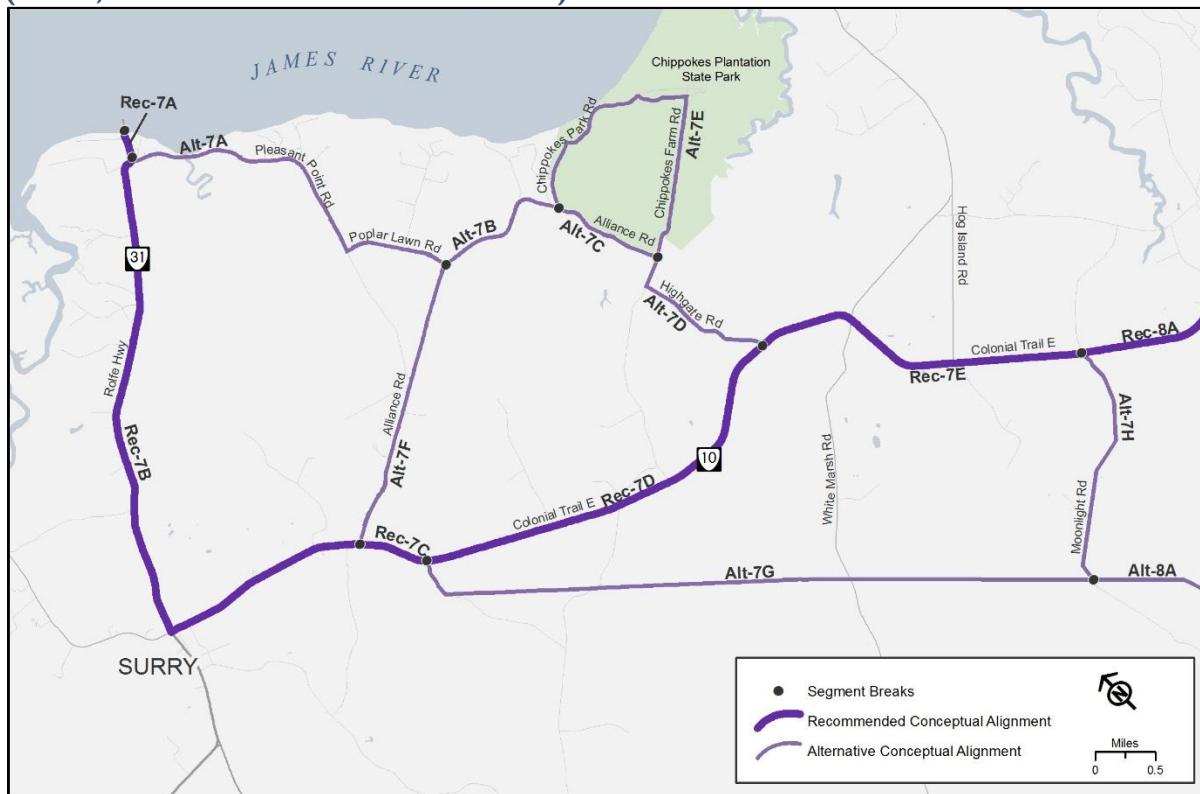
Notes:

- *Rec-6B: Widening or new bike/ped bridge required to cross SW Branch Back River
- *Rec-6C: Underpass reconstruction required under I-64
- *Rec-6F: Widening or new bike/ped bridge required over Hampton River
- *Rec-6H: Widening or new bike/ped bridge required on Mellen Street over Mill Creek
- *Alt-6A: Short bridge on Lasalle required at Lake Hampton
- *Alt-6C: ROW costs could be substantial; assumes bridge costs over Hampton River. Or could possibly reconfigure lanes, sidewalks, and create protected bike lanes
- *Alt-6D: Underpass reconstruction for I-64
- *Alt-6E: Road diet with protected bikeway could be best option to avoid widening

FIGURE 20: JAMESTOWN-SCOTLAND FERRY TO MOONLIGHT ROAD (SEG. 7)

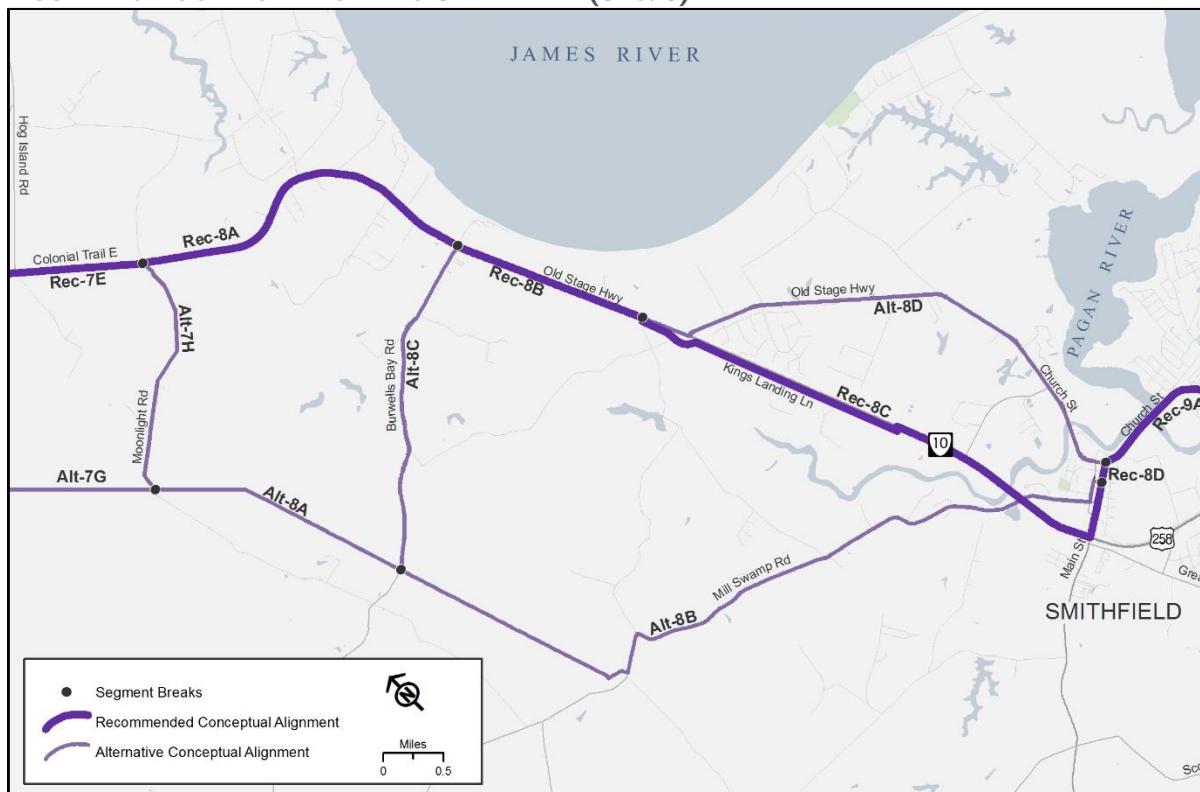
Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Rec-7A	Rolfe Hwy (Rt 31) at Ferry	Rolfe Hwy (Rt 31) & Short Dr	0.2		VDOT	No	Low	\$3M
Rec-7B	Rolfe Hwy (Rt 31) & Short Dr	Colonial Trl E (Rt 10) & Alliance Rd	5.8		VDOT	Yes	Med	\$8.0M
Rec-7C	Colonial Trl E (Rt 10) & Alliance Rd	Colonial Trl E (Rt 10) & Chapel Bottom Rd	0.6		VDOT	No	Low	\$8M
Rec-7D	Colonial Trl E (Rt 10) & Chapel Bottom Rd	Colonial Trl E (Rt 10) & Highgate Rd	3.6		VDOT	No	Low	\$4.9M
Rec-7E	Colonial Trl E (Rt 10) & Highgate Rd	Colonial Trl E (Rt 10) & Moonlight Rd	2.9		VDOT	No	Med	\$3.9M
Alt-7A*	Short Dr & Rolfe Hwy (Rt 31)	Poplar Lawn Rd & Alliance Rd	3.2		Local	No	Low	\$4.3M
Alt-7B*	Alliance Rd & Poplar Lawn Rd	Alliance Rd & Chippokes Park Rd	1.2		VDOT	No	Med	\$1.7M
Alt-7C*	Alliance Rd & Chippokes Park Rd	Alliance Rd & Chippokes Farm Rd via Alliance Rd	0.9		VDOT	No	High	\$1.3M
Alt-7D*	Chippokes Farm Rd & Alliance Rd	Highgate Rd & Colonial Trl E (Rt 10)	1.4		VDOT	No	High	\$1.9M
Alt-7E*	Alliance Rd & Chippokes Park Rd	Alliance Rd & Chippokes Farm Rd via Chippokes Park Rd	3.2		Local	No	High	\$4.3M
Alt-7F*	Alliance Rd & Colonial Trl E (Rt 10)	Alliance Rd & Poplar Lawn Rd	2.4		VDOT	No	Low	\$3.3M
Alt-7G	Chapel Bottom Rd & Colonial Trl E (Rt 10)	Surry Lumber Ln & Moonlight Rd	5.7		Local	No	Low	\$8.9M
Alt-7H	Moonlight Rd & Surry Lumber Ln	Moonlight Rd & Colonial Trl E (Rt 10)	2.1		Local	No	Low	\$2.8M

**FIGURE 20: JAMESTOWN-SCOTLAND FERRY TO MOONLIGHT ROAD
(SEG. 7, SAME MAP SHOWN ON PREVIOUS PAGE)**



Notes:

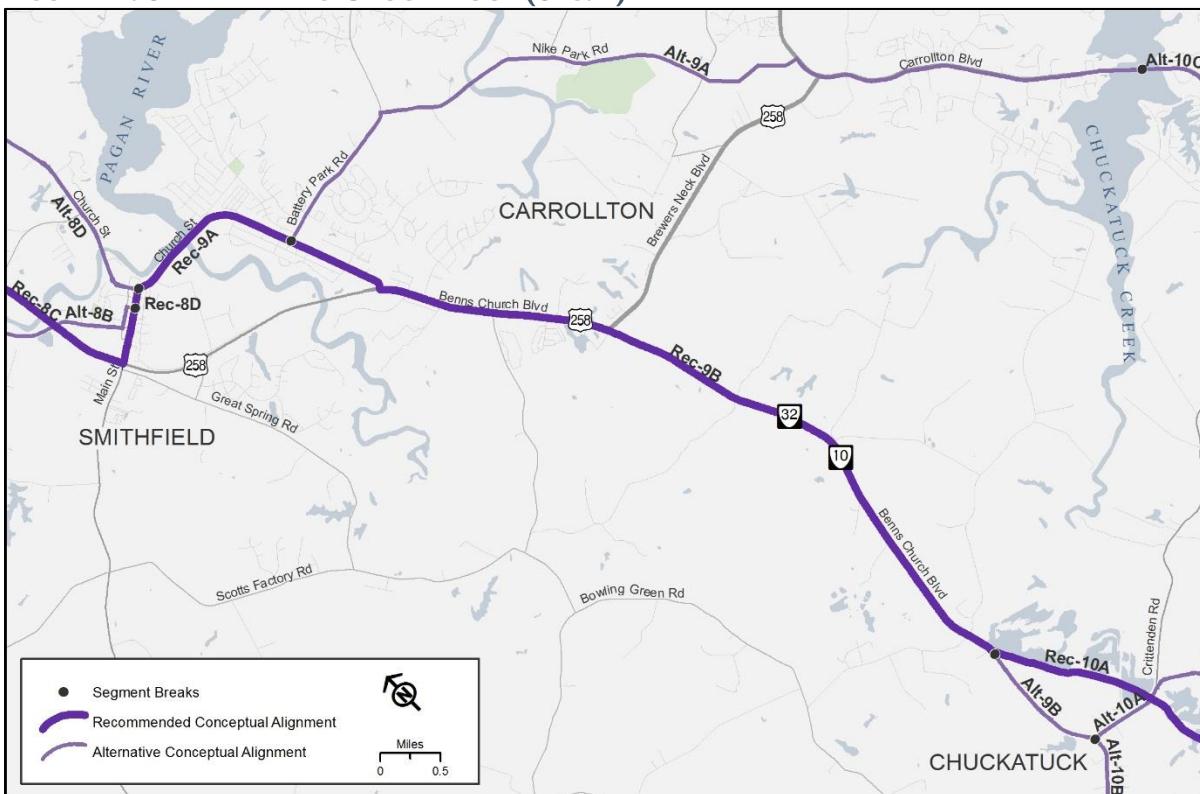
- *Alt-7A: ROW costs could be substantial; small bridge, low volumes, no space for path. Subject to high speed traffic twice per hour as motorists rush to make the Jamestown-Scotland ferry.
- *Alt-7B: ROW costs could be substantial. Subject to high speed traffic twice per hour as motorists rush to make the Jamestown-Scotland ferry
- *Alt-7C: ROW costs could be substantial. Subject to high speed traffic twice per hour as motorists rush to make the Jamestown-Scotland ferry
- *Alt-7D: ROW costs could be substantial. Subject to high speed traffic twice per hour as motorists rush to make the Jamestown-Scotland ferry
- *Alt-7E: Bridge required
- *Alt-7F: ROW costs could be substantial

FIGURE 21: MOONLIGHT ROAD TO SMITHFIELD (SEG. 8)

Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Rec-8A	Colonial Trl E (Rt 10) & Moonlight Rd	Old Stage Hwy (Rt 10) & Burwells Bay Rd	3.1		VDOT	No	Low	\$4.3M
Rec-8B	Old Stage Hwy (Rt 10) & Burwells Bay Rd	Old Stage Hwy (Rt 10) & Wrenns Mill Rd	1.6		VDOT	No	Low	\$2.3M
Rec-8C	Old Stage Hwy (Rt 10) & Wrenns Mill Rd	Main St (Rt 258) & Institute St	4.7		VDOT, Local	No	High	\$6.5M
Rec-8D	Main St (Rt 258) & Institute St	Main St (Rt 258) & Church St (Rt 10)	0.2		Local	No	High	\$.2M
Alt-8A	Surry Lumber Ln & Moonlight Rd	Surry Lumber Ln & Burwells Bay Rd	2.2		Local, Private	No	Low	\$3.0M
Alt-8B*	Surry Lumber Ln & Burwells Bay Rd	Institute St & Main St (Rt 258)	6.8		VDOT, Local, Private	No	Med	\$10.6M
Alt-8C*	Burwells Bay Rd & Surry Lumber Ln	Burwells Bay Rd & Old Stage Hwy (Rt 10)	2.8		VDOT	No	Med	\$3.9M
Alt-8D*	Old Stage Hwy (Rt 10) & Wrenns Mill Rd	N Church St (Rt 10) & Main St (Rt 258)	4.6		VDOT, Local	No	High	\$9.1M

Notes:

- *Alt-8B: Widening required for Mill Swamp road bridge
- *Alt-8C: ROW costs could be substantial
- *Alt-8D: Widening required for Old Stage Highway bridge

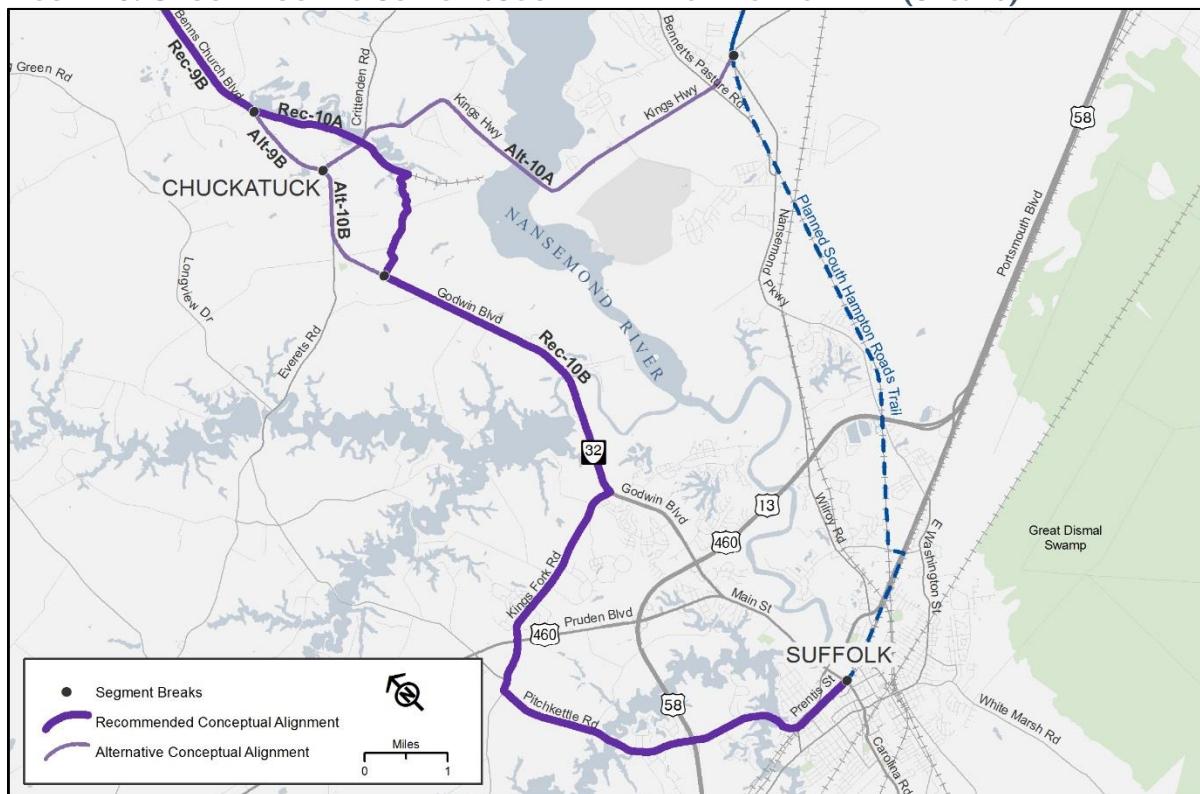
FIGURE 22: SMITHFIELD TO CHUCKATUCK (SEG. 9)

Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Rec-9A*	Church St (Rt 10) & Main St (Rt 258)	Church St S (Rt 10) & Battery Park Rd (Rt 704)	1.6		Local	No	High	\$2.1M
Rec-9B	Church St S (Rt 10) & Battery Park Rd (Rt 704)	Godwin Blvd (Rt 10) & Rolling Acres Ln	7.1		VDOT, Local	No	Med	\$9.8M
Alt-9A*	Battery Park Rd (Rt 704) & Church St S (Rt 10)	Carrolton Blvd (Rt 17) & Chuckatuck Creek	8.0	4.3	VDOT, Local	No	Med	\$5.3M
Alt-9B	Godwin Blvd (Rt 10) & Rolling Acres Ln	Godwin Blvd (Rt 10) & Kings Hwy (Rt 125)	1.1		Local	No	High	\$1.5M

Notes:

*Rec-9A: Church Street bridge has 9' shoulders; consider protected bikeway rather than new bridge

*Alt-9A: Accounts for 3.3-mile Nike Park segment and newly funded Nike Park Road extension, shown on the SMART SCALE map, which extends Nike Park Road to US 17.

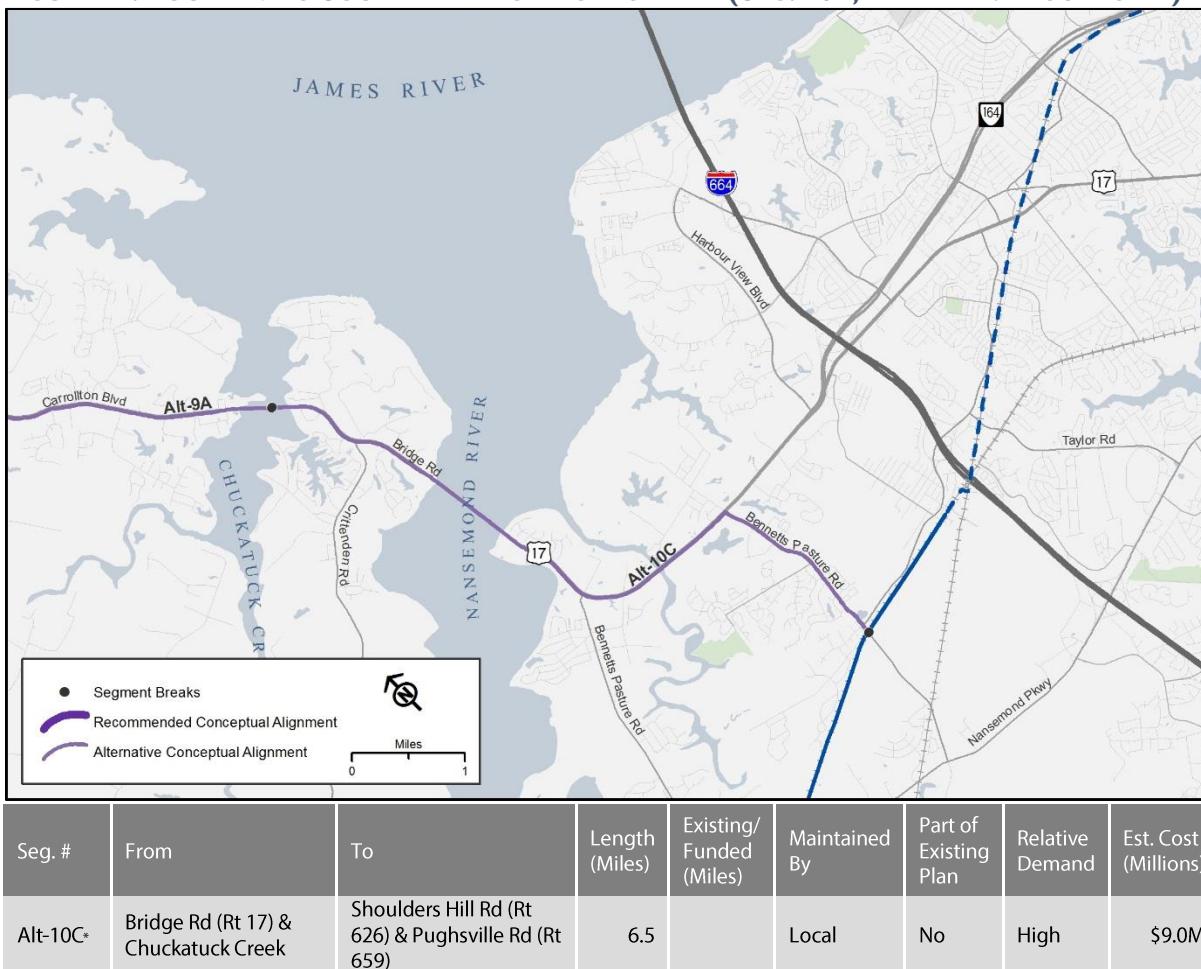
FIGURE 23: CHUCKATUCK TO SUFFOLK/SOUTH HAMPTON ROADS TRAIL (SEG. 10)

Seg. #	From	To	Length (Miles)	Existing/ Funded (Miles)	Maintained By	Part of Existing Plan	Relative Demand	Est. Cost (Millions)
Rec-10A*	Godwin Blvd (Rt 10) & Rolling Acres Ln	Godwin Blvd (Rt 10) & Dominion Power Building	3.5		Local	No	High	\$4.1M
Rec-10B*	Godwin Blvd (Rt 10) & Dominion Power Building	Suffolk	11.5	0.8	Local	No	Med	\$17.9M
Alt-10A	Kings Hwy (Rt 125) & Godwin Blvd (Rt 10)	Kings Hwy (Rt 125) & Nansemond Pkwy (Rt 337)	6.2		VDOT, Local	No	Med	\$8.6M
Alt-10B	Godwin Blvd (Rt 10) & Kings Hwy (Rt 125)	Godwin Blvd (Rt 10) & Dominion Power Bldg	1.6		Local	No	Med	\$2.2M

Notes:

*Rec-10A: Reflects reduced costs for shared-use path through city-owned parkland

*Rec-10B: Suffolk believes Route 32 has available ROW. Two small bike/ped bridges required on Pitchkettle. Existing shared-use path on Prentis Street

FIGURE 24: ROUTE 17 TO SOUTH HAMPTON ROADS TRAIL (SEG. 10A, ALTERNATIVE ROUTE ONLY)**Notes:**

*Alt-10C: US 17 bridges over Chuckatuck and Bennetts Creek have shoulders, which could potentially be restriped to allow for bike lane since bridge (re)construction is likely unfeasible. New bridge over Nansemond is not reflected in this study's costs since it is a SMART SCALE project.

Route Totals:

Route	Length (Miles)	Existing/ Funded (Miles)	Est. Cost (Millions)
Peninsula	46.6	4.0	\$62.3M
Southside	46.5	0.8	\$65.1M

Appendix B: Data Sources

City of Chesapeake
City of Hampton
City of Newport News
City of Norfolk
City of Suffolk
City of Virginia Beach
City of Williamsburg
Hampton Roads Transportation Planning Organization
Isle of Wight County
James City County
National Park Service – National Register of Historic Places
Surry County
U.S. Census Bureau
U.S. Department of Agriculture – Natural Resources Conservation
U.S. Department of Transportation – Bureau of Transportation Statistics
U.S. Department of Transportation – Federal Railroad Administration
U.S. Fish & Wildlife Service – National Wetlands Inventory
York County



Appendix C: Birthplace of America Trail Subcommittee

The Birthplace of America Trail Subcommittee is a subset of the Transportation Technical Advisory Committee (TTAC), an advisory committee to the Hampton Roads Transportation Planning Organization (HRTPO) Board. The TTAC provides recommendations to the HRTPO Board on transportation planning and programming.

Co-Chairs:

Alison Alexander (HA)
Susan Wilson (PO)

Members:

Ray Amoruso (HRT)	Jamie Oliver (IW)
Frances Bailey (SY)	Amy Parker (YK)
Nick Britton (DRPT)	Bridgette Parker (NN)
Robert R. Brown (NO)	Rodney Rhodes (WM)
Dennis Carney (Windsor)	Mark Shea (VB)
Thelma Drake (NO)	Eric Stringfield (VDOT)
Helen Gabriel (SU)	Roberta Sulouff (JC)
Leroy J. Hansen (SU)	Beth Weisbrod (VA Cap. Trail Foundation)
Carl Jackson (VDOT)	Wayne Wilcox (VB)
G. Glenn Oder (FMA)	James Wright (PO)
Susan Wilson (PO)	

Staff from the HRTPO, Hampton Roads Planning District Commission (HRPDC), and Michael Baker International (the consultant on the study) helped facilitate these meetings.

The meetings included additional staff from local and federal agencies, as well as members of bicycle advocacy groups, such as the Peninsula Bicycling Association, and the general public.

Appendix D: Public Comments Report

TABLE 2: PUBLIC COMMENTS AND ASSOCIATED HRTPO RESPONSES

Date	Name	Agency	Comments	Responses
6/9/2017	Richard Rudnicki	Isle of Wight	I would recommend you come present this to our Board and try to get some sort of buy in prior to this study being final. Attempting to move a project forward as part of a plan which almost no one in the County has seen will fail. We have a vocal contingent who don't want trails to begin with and a skeptical Board due to issues with the Nike Park Trail project, adopting a study without them having seen it isn't going to help.	Email Sent June 12, 2017
			The route is inconsistent with our Bike/Ped Masterplan. Attempting to build a trail in IOW is an extremely difficult task to begin with due to political opposition but it would be impossible if you do not stay consistent with the various County planning efforts which have had citizen input. The majority of the first leg on Rt. 10 shown on page 46 is inconsistent with our plan. Additionally Rt. 10 has very heavy truck traffic which isn't ideal for a bike/ped facility, even a separated one.	I would welcome the chance to present to your board. I have actually already presented to several localities in the past few months. As a former planner from a very rural area (Northeast North Carolina), I completely understand your concerns of local skepticism with trails. During conversations with the Virginia Capital Trail Foundation's director, she offered to us to set-up a meeting with our rural area's contingents to meet with Charles City County's leaders who were very skeptical too with the VCT in the beginning. Now the leaders see the positives of the trail and can speak of the benefits of the trail to a very rural county. This offer is still on the table and we could set up a meeting in the near future if needed.
			The section on Rt. 10 is also inconsistent with the East Coast Greenway. Building a trail of this nature is a difficult enough task, duplicating efforts in close proximity to each other makes no sense. The County's plan more closely adheres to the ECG so that the efforts could potentially have a synergy of development. http://map.greenway.org/	

Date	Name	Agency	Comments	Responses
			General document comment, having the maps oriented with North to the side is hard to orient to.	As Jamie Oliver has been part of our committee since the start, all preferred routes and alternatives have been presented and reviewed at our committee meetings. After re-reviewing the route, the route from the Surry County line to Smithfield was chosen because of the Right of Way and the direct connectivity from Surry to Smithfield. I noticed that your county's recommendations in this section follows the East Coast Greenway alignment but the initial design and routing of this study was planned so that whatever final preferred route was recommended will be used as the East Coast Greenway Coastal Route (instead of just following the ECG Route). This was done so that there will not be two competing alignments. Also, we did this because the existing ECG alignment was chosen as the route most familiar to the ECG committee because it was mostly used by road bikers in the past and no existing facilities were built in this area (this is very common in rural areas. At my previous job in NE North Carolina, we actually did a regional bike plan that included updated the ECG coastal route in that area to better align with the regional plan). HRTPO, the consultants, and ECG have been working together to pick the best alignment for the ECG route and the Birthplace of America Trail Route. ECG and myself actually presented the draft study at the Virginia Greenways Conference together in April. The alignment was actually adopted by the Virginia Statewide ECG meeting in May. But any refinement to the preferred study alignment will be modified and adopted at the next statewide meeting.

Date	Name	Agency	Comments	Responses
				<p>Also, when analyzing the route at a 30,000 foot level, we had to review routes not just on a local level but also at a higher level so that the route was consistent and connected the major destinations that were recommended. We also wanted to make sure the preferred route followed the existing plans with as many localities as possible.</p> <p>We also hope that when this trail comes to fruition, that connectors and spurs will shoot off the trail system to build a more complete system for the region and the localities.</p>
6/13/2017	Alison Alexander	City of Hampton	Do we want some type of subtitle to help clarify what it is or that it connects to the Capital Trail, which is now pretty well known?	A subtitle will be included in the final version.
6/13/2017	Lindsay Hoolehan	HRT	<ul style="list-style-type: none"> • Pg 20: ◦ Elizabeth river ferry is bicycle friendly and connects Portsmouth to Norfolk., providing a possible connection between the two Peninsula and Southside Trails. Ferry also provides convenient access to Downtown Norfolk Transit Center and the Tide Light Rail. ◦ Bike racks are available on all modes. ◦ MAX Routes provide a connection on the HRBT between Hampton Transit Center, Newport News Transit Center, and Downtown Norfolk Transit Center. • Pages 25+ missing transit icons from WATA • Page 40- missing transit icon from Hampton Transit Center, and local bus stops • Page 46 missing transit icon from HRT bus stop in Smithfield • Page 49 missing transit icon from HRT bus stop in Smithfield • Page 52- no icon to indicate Suffolk transit (unknown if they allow bikes) 	Comments received and modifications to the document noting multiple HRT options with connections to the Trail are possible.

Date	Name	Agency	Comments	Responses
			<ul style="list-style-type: none"> For more information regarding HRT stop locations and MAX routes: http://gohrt.com/wp-content/uploads/2009/11/Southside-SystemMapInt-Oct16-FINAL.pdf 	
6/15/2017	Tim Cross	York County	<ul style="list-style-type: none"> Page 11 refers to the McReynolds Sports (rather than <i>Athletic</i>) Complex, whereas the correct name is used elsewhere in the document. I know this seems pretty trivial, and the only reason it matters is that the complex is named after our former County Administrator, James McReynolds, who died unexpectedly a few years ago. Although his name was James, he went by "Mac", so in renaming the former Sports Complex, they came up with an appropriate acronym to honor him by name by calling it the MAC. Page 29 has an apparent typo – <i>narrows</i> instead of <i>narrow</i>. Richneck Road is in Newport News, not York County (pp. 33-35) The name of the reservoir is Harwoods Mill, not Harwood Mill or Harwood Mills (pp. 34-36) Route 17 is George Washington Memorial Highway in York County and does not become J. Clyde Morris Boulevard until it enters Newport News. Some of the Route 17 maps are incorrectly labeled. 	Comments received and forwarded to consultants. Edits will be modified for final version.



Date	Name	Agency	Comments	Responses
6/21/2017	Tony Opperman	VDOT	<p>While the Introduction (page 5) clearly states that the "... Recommended routes are preliminary in nature ...", I recommend a stronger statement recognizing that "the Recommended routes are preliminary in nature, likely will be subject to additional analysis as required by the National Environmental Policy Act and related environmental statutes and regulations, and do not constitute a location decision by VDOT, the HRTPO, or the Federal Highway Administration (FHWA)." It's very important to state what the study <i>is not</i> with regard to environmental requirements.</p> <p>· For my own curiosity, the study states on page 10 that the VCT was funded in part by "Smithsonian" funds. I know that there was a creative approach to assembling construction funding, but I'm not aware that the Smithsonian Institution was ever involved and would be surprised if it provided money. Perhaps you mean funding from the National Scenic Byways program (FHWA)? We certainly used Byways funds for the acquisition of property at the corner of Route 5 and Greensprings Road. If the Smithsonian actually gave money, we need to get more of that!</p> <p>· For Map Segment 3 (page 31), was there any coordination with the Colonial National Historical Park? If so, it would be useful to state that. If not, consider adding a general constraint for this segment indicating that any improvements are subject to the consent of the National Park Service.</p>	<p>Comments received and forwarded to consultants. Modifications to the wording will be edited with these recommendations.</p>

Date	Name	Agency	Comments	Responses
			<ul style="list-style-type: none"> Similarly, for Map Segment 6 (page 41), was there any coordination with Hampton University? Note that Hampton University has been an important stakeholder for the Hampton Roads Crossing Study (HRCS) and the Secretary of Transportation has made a commitment that no ROW will be acquired from the University for that project. Hampton University would be particularly concerned about any BOAT concept that would require any ROW. If no coordination has occurred, consider adding a constraint for this segment indicating that any improvement would need close coordination with Hampton University. Also for Map Segment 6 (page 41), consider adding a constraint Rec-6H that recognizes that any crossing under I-64 will require close coordination (and very soon) with the proposed improvements to I-64 arising from the HRCS. This project was subject to an Environmental Impact Statement, Record of Decision, and is advancing to construction. It would be prudent to reach-out to the HRCS project manager as soon as possible so that any needed improvements to Mallory Street can be incorporated into project design (subject to any project constraints). General observation: The southside alternative route in Surry using Pleasant Point, Poplar Lawn, Alliance, and Heritage Roads is subject to high speed traffic twice an hour by folks trying to make the ferry (8 minutes from Bacons Castle to the ferry can be done). This is something I have experienced and is a good reason for using Route 10 as the recommended concept, despite the scenic character of the alternative concept. 	

Date	Name	Agency	Comments	Responses
6/21/2017	Liz Schleeper	Bike Norfolk	Letter of Support	Received and forwarded to consultants.
6/21/2017	Michael Seek	ODU Engineering	Email of Support	Received and forwarded to consultants.
6/21/2017	Mark Perreault	Elizabeth River Trail	1. I think the documents could be made clearer that the goal is an off-road trail throughout. As you know, communities too often throw up their hands on choke points and issues (we had to fight back against that mentality constantly during development of the Elizabeth River Trail in Norfolk, mostly successfully), and the "trail" ends up being a sign in the street. The stronger the call for off road throughout, the more likely we end up with something like the Capital Trail, where the only on-road segment is a short piece in Charles City CH.	Comments received and forwarded to consultants.
			2. Re the Peninsula BOAT, I urge the preferred alternative to Fort Monroe, via Downtown Phoebus, be pursued, and that an early item to be pushed, be a new 10' wide, separated multi-use trail bridge over Mill Creek, parallel to the very narrow existing Mugler Bridge. The City of Hampton, Fort Monroe Authority and Fort Monroe National Monument should be formidable partners in seeking a TAP grant for construction, and should be able to cobble together the 20% match needed.	1. Will revise the vision to stress "off road" = "To connect the Virginia Capital Trail to Fort Monroe and the South Hampton Roads Trail via two off-road shared-use paths, designed for non-motorized traffic". We'll look to emphasize this in other paragraphs, too.
			3. Also on Peninsula BOAT, I hope you yet can make the Jamestown-Williamsburg route via Colonial Parkway the preferred alternative. I know Colonial NHP can be bureaucratic, but the scenic quality of this route (maybe the best in Va.) justifies a hard fight to get it. The Monticello Avenue route is no substitute.	2. Study assumes construction of new bike/ped bridge and the anticipated costs reflect this. And, a separate bridge may be warranted once Fort Monroe is redeveloped.
6/21/2017	Harry Smith	Resident	Email of Support	Received
6/21/2017	Gordan Evans Van Hook	Rogue Velo Racing	Email of Support	Received

Date	Name	Agency	Comments	Responses
6/21/2017	Barbara Bishop	Resident	Email of Support	Received
6/21/2017	Keith Bennett	Resident	Email of Support	Received
6/21/2017	Roberta Soulouff	James City County	<ul style="list-style-type: none"> On Page 28, the "Segment Constraints" subsection refers to "Xanterra"; the new owner is Escalante. Please update to avoid confusion. 	<ul style="list-style-type: none"> Received and forwarded to consultants. Modifications on page 28 will be made in final version.
			<ul style="list-style-type: none"> While we understand that "The Birthplace of America Trail" is a temporary name, staff at James City County suggests that an alternative name be used as "Birthplace of America" may be culturally insensitive for several reasons. 	<ul style="list-style-type: none"> The name of the Birthplace of America Trail is currently just a name for the study and in the future once a foundation is initiated, a marketing, wayfinding, and naming study will probably be one of the first priorities.

Appendix E: Case Studies

Ridgeland Multi-Use Path and Natchez Trace Multi-Use Trail, Ridgeland, MS

Year of Study: 2016

Trail Length: 10.8 miles (8.2 additional miles proposed)

Estimated Project Cost: \$8.0 million for 2.2 miles, \$14.0 million for 4.8 miles

Project Description: The Natchez Trace Parkway extends 444 miles and is popular across a wide variety of users. Some segments go through higher density areas where automobile traffic can be excessive, especially during peak hours.

Key Study Components:

- Evaluation of Constraints: Information not available
- Segment Prioritization: Congress directed the NPS to investigate feasibility of trail along the Parkway, which recommended three sections due to traffic volumes and crash data
- Public Involvement: Information not available
- Design Components: Information not available
- Implementation Steps: Information not available
- Funding Discussion: Community funds in Clinton and Ridgeland, and FLTP

Lessons Learned:

- Very similar to Colonial Parkway segment in study area
 - Parkway maintained by the National Park Service that receives heavy commuter use
 - Already popular with non-motorized users
- Funding and construction has come from a variety of sources, including cities and the FLTP.



Constructed segment of the Natchez Trace Multi-Use Trail

The Sioux Falls MPO Multi-Use Trail Study, Sioux Falls, SD

Year of Study: 2011

Trail Length: 17.4 miles (initial phase), 22.5 miles (subsequent phases)

Estimated Project Cost: \$4.2 million (initial phase), \$4.8 million (subsequent phases)

Project Description: Sioux Falls has experienced massive growth in the recent years rendering its current trail infrastructure insufficient. This plan seeks to link some of the fastest-growing areas to the trail and park system.

Key Study Components:

- Evaluation of Constraints: Directness, trail experience, time frame, multiple funding sources, safety and security, neighborhood service, ease of acquisition, cost and constructability, connectivity, and responsiveness to user groups
- Segment Prioritization: Trail priorities should be based both on safety issues and the need to establish initial, serviceable inter-urban connections
- Public Involvement: Multiple workshops and public open houses with short presentations and small group discussions were held, with property owners receiving notifications of them. Written and online comments were collected
- Design Components: Planning-level assessment; examples of various trail types shown
- Implementation Steps: The study realizes that this will be a gradual process and outlines principles for its gradual development, funding, and maintenance
- Funding Discussion: The study lays out funding strategies for individual segments in the following categories: major transportation investments, paths on public right-of-way, paths within development projects, and street adaptations

Lessons Learned:

- Have multiple alternatives for each alignment, with detailed descriptions, mileages, and costs
- Consider combining trail with another project to more easily secure funding
- Have a gradual implementation plan, with temporary routing and surfaces
- Connect rapidly growing areas to existing recreation facilities

Niles Canyon Trail Options, Alameda County, CA

Year of Study: 2015

Trail Length: Three segments: 6-mile segment, a bridge, and 3-mile segment

Estimated Project Cost: \$57-69 million, \$3 million, and \$4.8 million respectively

Project Description: This study evaluates three trail segments in Niles Canyon: one is for a six-mile path along the entire length of the canyon and three options are presented for it including a rail-with-trail. Another segment studies how to cross an existing railroad, with at-grade, undercrossing, and overcrossing options examined. Finally, a three-mile trail is studied, which would be unpaved and follow existing roads.

Key Study Components:

- Evaluation of Constraints: Topographic, land use, cultural, biological
- Segment Prioritization: Yes, based on user experience, environmental and historical resource protection, and cost
- Public Involvement: The public was invited to five meetings where the concepts were presented and feedback was received, along with an event on the trail where users could give comments
- Design Components: Planning, preliminary engineering
- Implementation Steps: Yes for each segment. Recommendations include engineering work and retaining legal counsel
- Funding Discussion: No, but brief mention of applying for federal and state grant opportunities

Lessons Learned:

- Give background on history of region and its cultural resources
- Consider phasing of the project
- Provide several options and give strengths and weaknesses of each, along with cost
- Consider parking and restrooms
- Provide ample pictures, maps, and drawings to inform reader



*Proposed Restroom Locations along the Trail,
Alameda County, CA*

Lake to Sound Trail, King County, WA

Year of Study: 2009

Trail Length: 16.0 miles

Estimated Project Cost: \$12.2-18.6 million

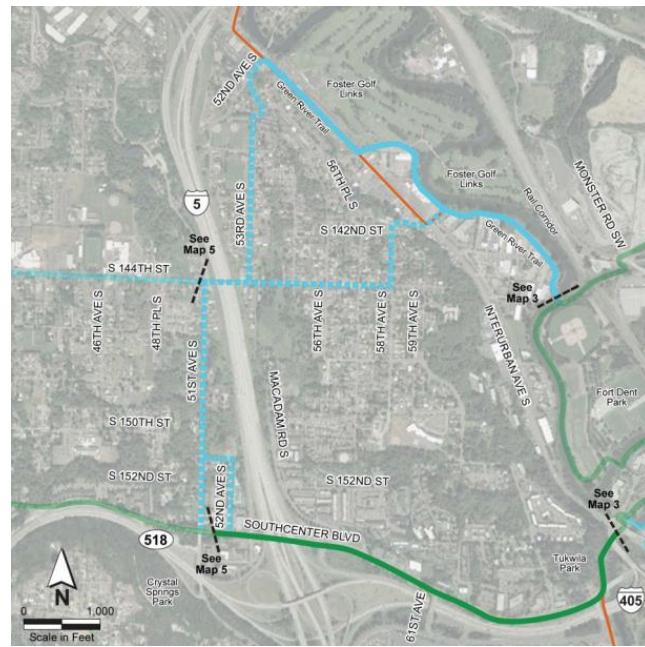
Project Description: The trail proposes to connect the southern end of Lake Washington to Puget Sound, near Seattle. The study is segmented into 8 maps, with preferred/alternative alignments and cost estimates for each.

Key Study Components:

- Evaluation of Constraints: Continuous route and right of way, safety, environmental considerations, grades, structures, and cost-benefit
- Segment Prioritization: Two segments are most ready for preliminary design and environmental review, and should be pursued first
- Public Involvement: Not mentioned, but team met with jurisdictions
- Design Components: Conceptual, no engineering work has been undertaken
- Implementation Steps: The plan suggests immediately pursuing the two most-ready segments
- Funding Discussion: None

Lessons Learned:

- Break down into small segments and show alignments and cost estimates for each
- This is a very preliminary study—does not address implementation
- Route proceeds through dense areas to attract casual users
- Develop priority segments to be pursued first and create backup alignments in case of substantial delay



Map 4, Preferred Alignment. King County, WA.

The Bay Trail-Vine Trail Feasibility and Preliminary Engineering Study, Vallejo, CA

Year of Study: 2014

Trail Length: 4.5 miles

Estimated Project Cost: \$5.29 million (near-term), \$2-10 million (long-term)

Project Description: The Bay Trail, a planned 500-mile trail, and the proposed 47-mile Napa Valley Vine Trail are located in the Bay Area, but two gaps exist in the City of Vallejo. The purpose of the study is to identify preferred alignments to connect the trail and provide recreational opportunities for residents.

Key Study Components:

- Evaluation of Constraints: Environmental, traffic, limited ROW, cost, high-speed crossings
- Segment Prioritization: The regional transportation plans all call for improving safety and completing the Bay Trail as highest priorities. A long-term alignment is also included.
- Public Involvement: Two public workshops were held and feedback recorded
- Design Components: Planning and engineering—detailed construction and cost estimates
- Implementation Steps: the plan discusses funding, environmental, base data, design, permitting, contracting, and construction processes for moving forward
- Funding Discussion: Includes a very detailed discussion of federal, state, local, private, and other sources

Lessons Learned:

- Good discussion of how to work with multiple stakeholders involved
- Detailed analysis of total costs and funding sources, including maintenance costs
- Similar to the Capital Trail—connecting existing trails and similar environment
- Good background on cycling facilities/plan in the region, as well as demographics



Bay Trail – Vine Trail Study (STA.Gov)