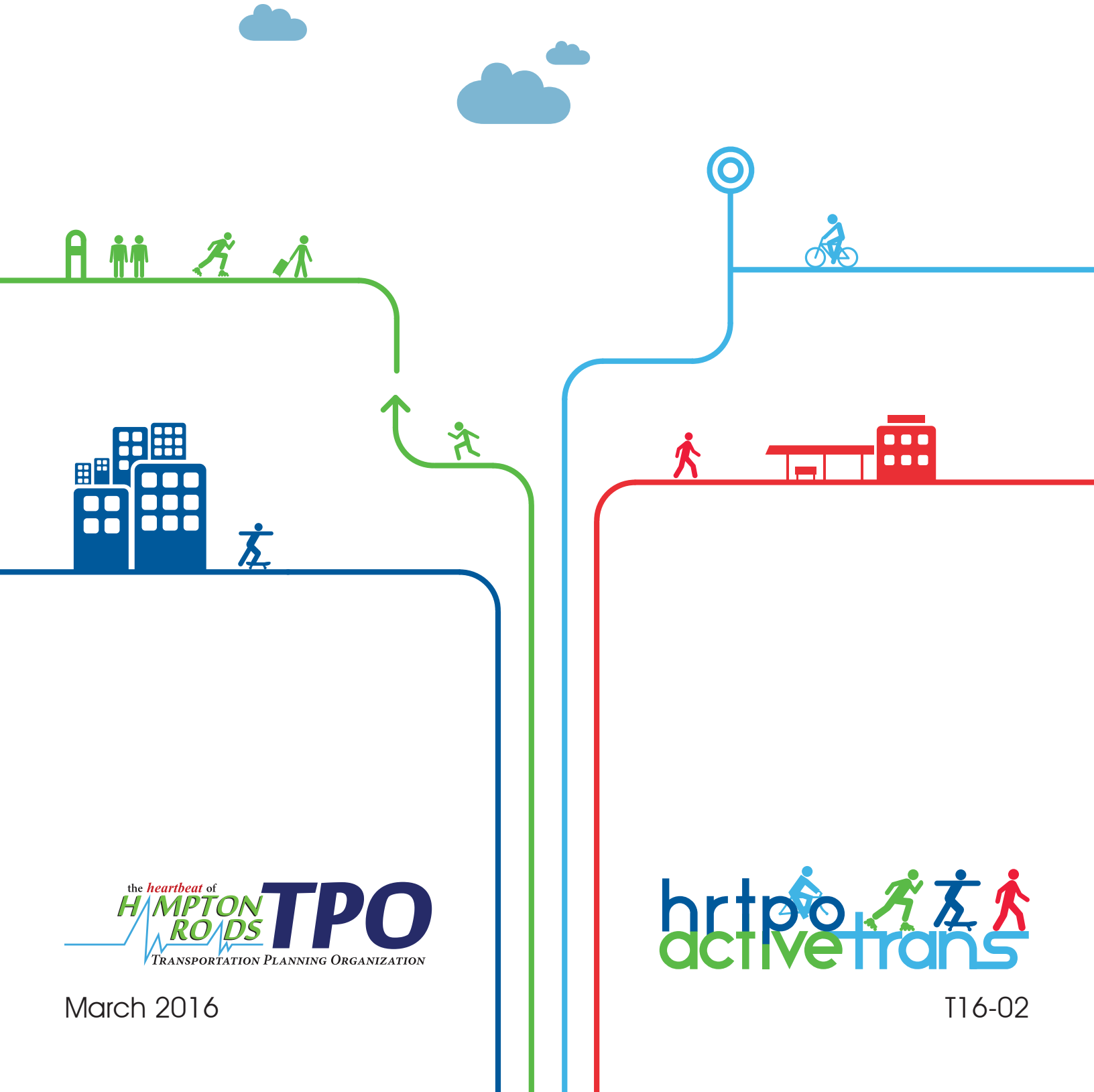
Signature Paths in Hampton Roads



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REPORT DOCUMENTATION

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Signature Paths in Hampton Roads

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ABSTRACT
The purpose of this study is to help local government improve the existing active transportation (pedestrian and bicycle) network in Hampton Roads in a cost-effective way, by locating inactive rail right-of-ways and analyzing the costs and benefits of converting them to multi-use trails. Based on original research of existing rail-trails in the U.S. (including Hampton Roads), staff has prepared both quantitative and qualitative measures of candidate rail-trails. Throughout the process, staff has sought and responded to input from state and local agencies to create a resource document for them.

ACKNOWLEDGMENTS
This document was prepared by the Hampton Roads Transportation Planning Organization (HRTPO) in cooperation with the local jurisdictions and transit agencies of Hampton Roads, Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Virginia Department of Transportation (VDOT), Virginia Department of Rail and Public Transportation (DRPT), and Virginia Port Authority (VPA). The contents of this report reflect the views of the HRTPO. The HRTPO staff is responsible for the facts and the accuracy of the data presented herein. This document does not constitute a standard, specification, or regulation. The contents do not necessarily reflect the official views or policies of the FHWA, FTA, VDOT or DRPT. This report does not constitute a standard, specification, or regulation. FHWA, FTA, VDOT or DRPT acceptance of this report as evidence of fulfillment of the objectives of this program does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

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I. Introduction

A. Study Impetus and Focus

After seeing firsthand the economic, lifestyle, and health benefits of a major multi-use trail (i.e. "signature path") in Indianapolis—the Monon Trail—staff proposed adding this study of candidate signature paths for Hampton Roads to the HRTPO work program for fiscal year 2016.

Monon Trail
funcityfinder.com

In addition to the obvious health effects, the inclusion of the word "Monon" in the names of nearby apartments, businesses, etc. compelled staff to explore the economic benefits of such facilities.

Although active transportation modes such as walking and biking are healthy and enjoyable, participation in these modes is limited by them often being slower, more dangerous, and less comfortable than the dominant mode of driving. Paths, such as the Monon—being built on inactive rail right-of-ways—are mostly straight and protected from the noise and danger of auto traffic, making their usage more rapid, safe, and pleasant. In order to increase that experience in Hampton Roads, staff focused this study on inactive rail right-of-ways.

B. General Benefit of Active Transportation: Mental and Physical Health

In September 2015, the U.S. Surgeon General issued a "Call to Action to Promote Walking and Walkable Communities":

> "Because physical activity has numerous other health benefits—such as supporting positive mental health and healthy aging—it [walking] is one of the most important actions people can take to improve their overall health."
>
> "The Call to Action includes five strategic goals to promote walking and walkable communities in the United States:
>
> [1] make walking a national priority;
> [2] design communities that make it safe and easy to walk…;
> [3] promote programs and policies to support walking…;
> [4] provide information to encourage walking and improve walkability; and
> [5] fill surveillance, research, and evaluation gaps related to walking…."[1]

Surgeon General
Vice Admiral (VADM) Vivek H. Murthy, M.D., M.B.A.

[1] http://www.surgeongeneral.gov/library/calls/walking-and-walkable-communities/exec-summary.html, accessed 18 Sept. 2015.

C. Specific Benefits of Rail-Trails

1. Connection to Open Space

"Rail-trails act as linear greenways through congested urban areas, providing much-needed recreation space while also serving as utilitarian transportation corridors between neighborhoods and workplaces and connecting congested areas to open spaces" - Ryan & Winterich

2. Quality of Life

"Trails consistently remain the number one community amenity sought by prospective homeowners." - The National Association of Homebuilders

3. Economics

Americantrails.org states many ways that trails and greenways affect the local and national economies, including:

- Tourism
- Events
- Urban redevelopment
- Community improvement
- Property value
- Health care costs
- Jobs and investment
- General consumer spending

4. Ease of Travel

Low grades and smooth surfaces are one of the reasons recreational trails built upon abandoned railroad corridors have been so successful. In a survey conducted in southeastern Missouri, 55% of trail users reported exercising more than previously due to having access to a trail. http://www.americantrails.org/resources/railtrails/MObluerail.html

5. The Trail Itself as a Destination

The BeltLine in Atlanta is "a sustainable redevelopment project that will provide a network of public parks, multi-use trails and transit along a historic 22-mile railroad corridor circling downtown and connecting many neighborhoods directly to each other."[2] Former Atlanta City

[2] http://beltline.org/about/the-atlanta-beltline-project/atlanta-beltline-overview/

Council President Cathy Woolard was one of the BeltLine's earliest champions. As Woolard, a board member for Atlanta BeltLine, Inc., points out, "Among urban dwellers, it has crystallized what additional investment in transit will do for the community, because once they've been on the BeltLine, they understand very clearly how quickly and easily you can get [to] places that were previously inaccessible. It connects all these neighborhoods and helps people envision how they would conduct their life with transit." "Whenever [I] see any news story with developers talking about something new in Atlanta, they talk about their project in relation to the BeltLine," says Ethan Davidson, director of communications for the Atlanta BeltLine, Inc. "The center of gravity has shifted. The BeltLine is the equivalent of a waterfront destination." http://www.railstotrails.org/trailblog/2015/april/21/transforming-atlanta/?category=Success+Stories

BeltLine, Atlanta
Source: HRTPO staff

D. Existing Rail-Trails in Hampton Roads

Over recent decades, some inactive railroads in Hampton Roads have been converted to trails. Staff included known rail-trails on the map that follows. Note that some trails (e.g. the Elizabeth River Trail in Norfolk) are hybrids, lying partially in former rail right-of-way and partially in other right-of-way. Only that portion which lies in former rail right-of-way is shown on the map.

The newest rail-trail opened this fall in Suffolk. According to Suffolk News-Herald (10-15-15):

> A ribbon strung across the starting point of the Seaboard Coastline Trail snapped from the pressure of two bicyclists' tires to officially open the trail at a ceremony Thursday afternoon.
>
> Dozens of bicycles and walking feet, a longboard, a high-wheeler and a kids' scooter were among the modes of transportation that followed along the path to christen the first completed segment of the trail.
>
> "It's beautiful," said Marc Tobey, the operator of the first high-wheeler to navigate the trail. He rode his high-wheeler — also called a "penny-farthing" or "ordinary," it's a bicycle with a large front wheel and a much smaller back wheel — partway along the 2.36-mile segment before turning back. "I'm just itching to go the rest of the way."
>
> The 10-foot-wide path begins in Driver and runs northeast to Shoulders Hill Road. Any non-motorized form of transportation can use it, but walkers, runners and cyclists are expected to be among the most common. The Driver end features a parking lot, bicycle service station, maps, benches, a pet waste station and other amenities.
>
> "This is an exciting day," Mayor Linda T. Johnson said during the ceremony. "I think it means we have really committed to having a healthy community."
>
> Parks and Recreation Director Lakita Watson said one of the most common requests from citizens is a more walkable community. She also said efforts are being made to extend the trail from Driver to downtown and from Shoulders Hill to the Chesapeake city line.
>
> Grander plans include the trail running all the way to the Virginia Beach oceanfront, something the Tidewater Bicyclists Association has long lobbied for, Tobey said.
>
> "Every little piece we get is a victory," he said.
>
> Many of the cyclists in attendance Thursday are members of the Chuckatuck Chainring, a cycling group with about 100 members, member Harold Heafner said.
>
> "It's just great," said Heafner, who used to ride his bike on the abandoned railroad trail when he was younger. "This is wonderful. It's safe cycling, running, walking, whatever."

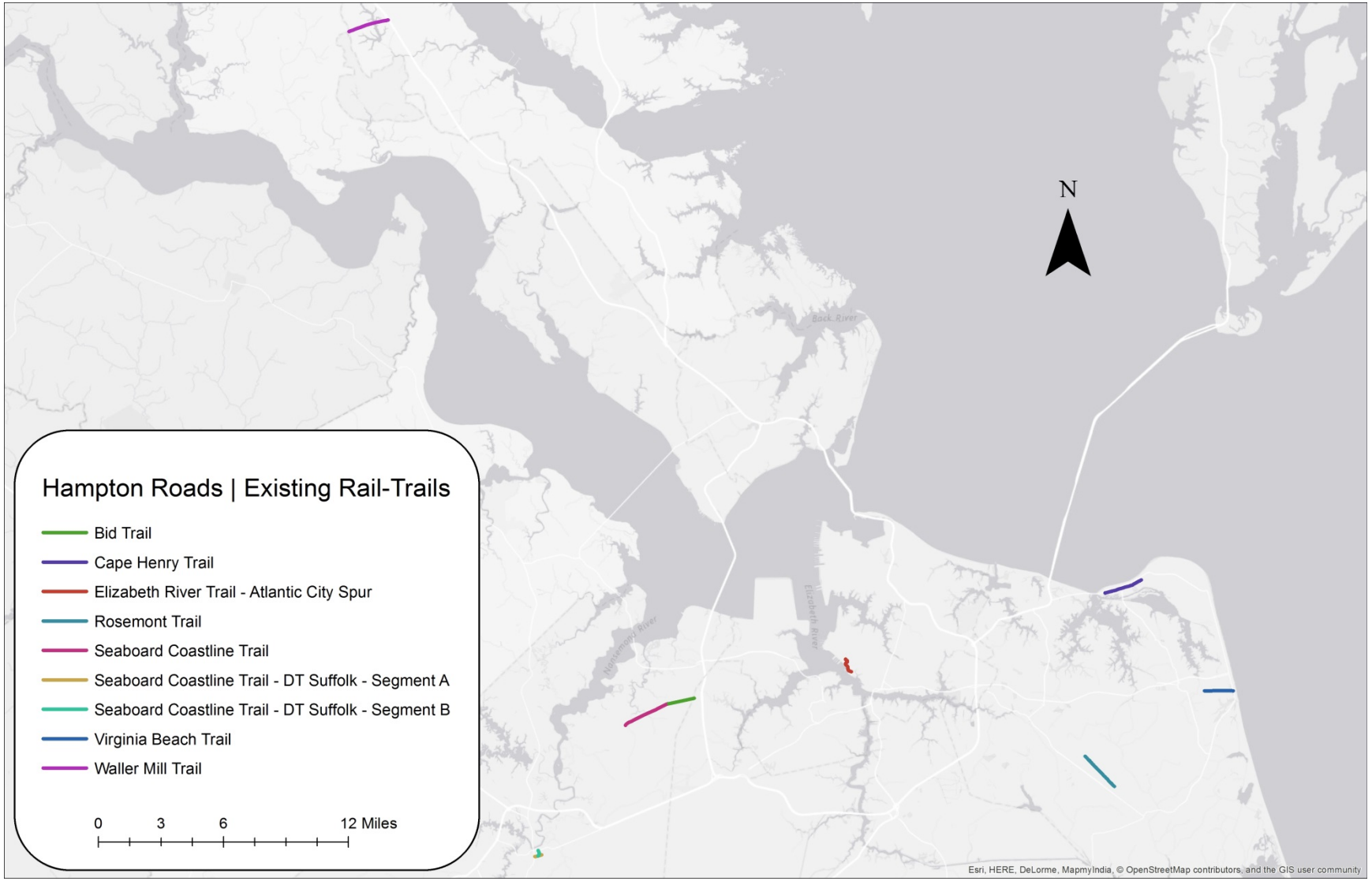


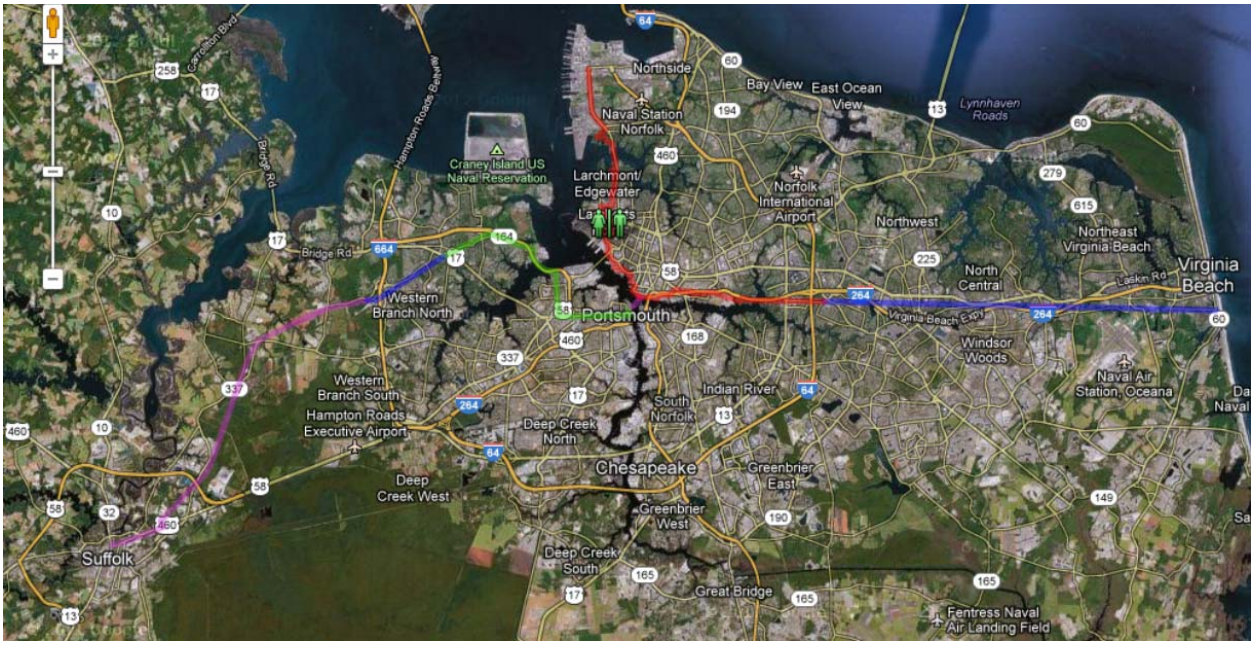
FIGURE 1 Existing Rail-Trails - Hampton Roads

Source: HRTPO research, existing trails- HR.jpg

E. Current Rail-Trail Plans for Hampton Roads

1. South Hampton Roads Trail (SHRT)

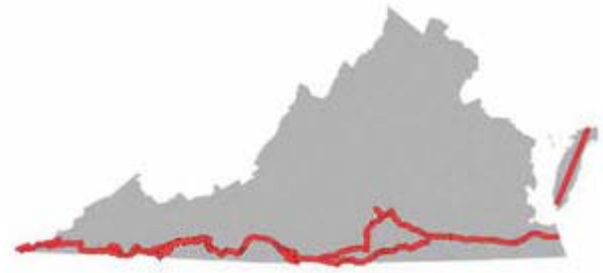
This HRTPO report is not the only document that examines future rail-trails in Hampton Roads. A group of citizens and staff of local governments formed the SHRT Committee, which meets regularly and maintains a Facebook page. Recently, SHRT celebrated the opening of a portion of the trail, the Seaboard Coastline Trail, in Suffolk. (See Appx. A for SHRT letters of support.)



South Hampton Roads Trail sections
Source: SHRT Facebook page

2. Beaches to Bluegrass Trail (B2B)

The Beaches to Bluegrass Trail, a statewide, multi-use trail which would connect Virginia Beach to the Cumberland Gap, is aligned with the South Hampton Roads Trail in most portions, and aligns with several of the proposed paths in this report. An HRPDC letter of support is included as Appendix H.



Proposed B2B Trail
Source: swvatoday.com

F. Study Purpose

The purpose of this study is to help local government improve the existing active transportation (pedestrian and bicycle) network in Hampton Roads in a cost-effective way, by locating inactive rail right-of-ways and analyzing the costs and benefits of converting them to multi-use trails.

Monon Trail, Indianapolis
Source: wikimedia.org

II. Candidate Rail-Trails in Hampton Roads

Staff located 14 inactive rail right-of-ways (ROWs) using *SPV's Comprehensive Railroad Atlas of North America- Appalachia and Piedmont* (Steam Powered Video, Upper Harbledown, UK, 2004).

A table of the candidates is included below, and a map of them is included on the following page.

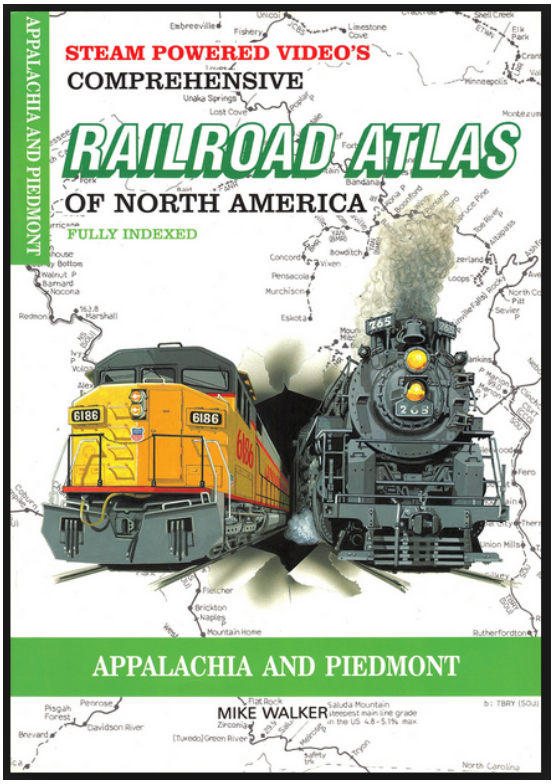


TABLE 1 Candidate Rail-Trails

Name	Localities	From	To	Length, miles
Atlantic & Danville	Chesapeake	just west of Suf/Ches line	Dock Landing Rd	2.96
Bayville	Va. Beach	just east of Northampton Blvd	First Court Rd	0.85
Bruce Rd	Chesapeake	Gum Ct	"Tyre Neck" candidate	2.24
Churchland	Chesapeake and Portsmouth	I-664	Old Coast Guard Blvd	4.25
Churchland High	Portsmouth	Western Freeway	gate of Craney Is Supply Depot	0.95
Courthouse	Va. Beach	Winterberry Ln	Nimmo Pkwy	1.52
Larkspur	Va. Beach	Baxter Rd	Independence Blvd	1.22
Norfolk Southern VB	Va. Beach	Norfolk/VB line	Birdneck Rd	10.55
Penniman	James City and York	Merrimac Trail	Leusseur Rd	3.21
Seaboard (Ph. 3)	Suffolk	Suburban Dr	Kings Hwy / existing trail	6.34
Southern	Suffolk	NC/VA line	Meadow Country Rd	10.53
Tyre Neck	Chesapeake and Portsmouth	"Bruce Rd" candidate	Suf/Ports line	3.41
Virginian- East	Suffolk and Chesapeake	Moore Ave	half mile east of I-64	11.20
Virginian- West	Suffolk and Isle of Wight	SH/IW county line	Constance Rd	16.59

Source: candidates- RBC.xlsx

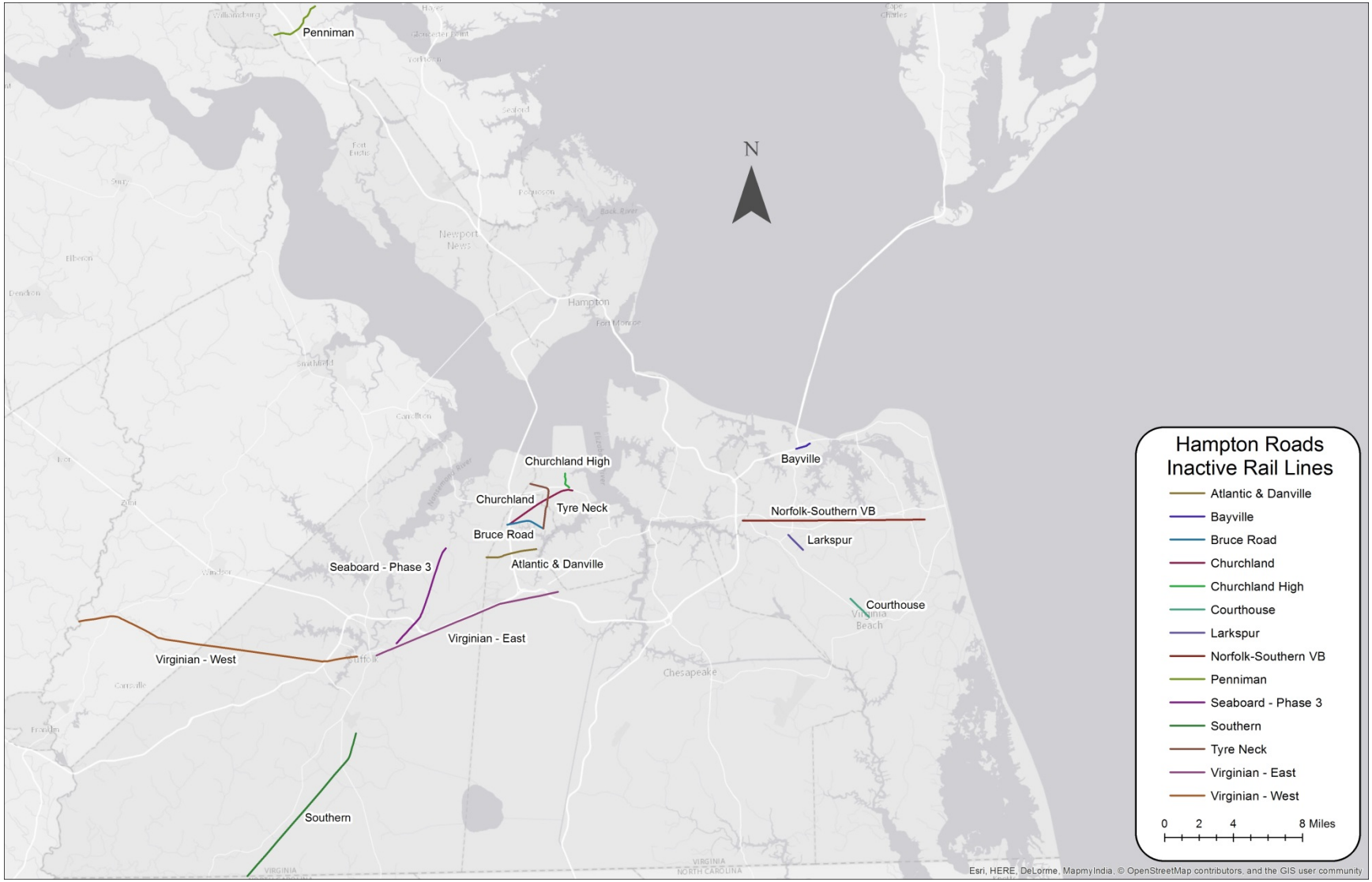


FIGURE 2 Inactive Rail Right-of-Ways- Hampton Roads

Source: HRTPO staff, RailTrails.jpg

In the report sections that follow, staff analyzed these candidates in two sections:

1) quantitative analyses (candidates presented collectively)
2) qualitative analyses and overall discussion (candidates presented individually)

Virginia Beach
Source: HRTPO staff

III. Quantitative Analysis of Candidates

Staff presents below quantitative analyses of the above candidate rail-trails in Hampton Roads.

A. Usage

In order to prioritize the candidate rail-trails in Hampton Roads, staff desired a tool for estimating the impact of each candidate rail-trail on usage of alternative transportation. Prior to preparing a tool to measure that impact, staff examined existing active transportation models.

1. Existing Techniques for Estimating Active Transportation

In "The W&OD Trail: An Assessment of User Demographics, Preferences, and Economics", Bowker et al. (2004) used data gathered from on-site questionnaires to build a regression model aimed at understanding the impact of various factors on W&OD trail usage. Explanatory variables included in the model were: round trip costs, **annual household income**, number of people in the household, and a binary variable representing if person felt another trail was substitutable for the W&OD trail.

A paper entitled "Latent Demand Score Analysis For Bike and Pedestrian Travel In the City of Decatur", prepared by the Center for Quality Growth and Regional Development of the Georgia Institute of Technology (2006), estimates active transportation using a Latent Demand Score (LDS). LDS is a GIS-based analysis that uses a gravity model to rank road segments based on their **proximity** to different types of major attractors and the probability that someone will walk or bike a certain distance to those different types of attractors. The output of the research displays an easy to understand map, shading every road segment a different tone to represent various levels of potential demand (LDS score).

A table summarizing these and other methods of estimating usage of active transportation is included on the following page.

From these studies, HRTPO staff learned to consider the following factors when forecasting the impact of candidate rail-trails on usage of active transportation:

- Socio-economics including income
- Proximity to population
- Proximity to destinations
- Safety
- Existing levels of using active transportation

TABLE 2 Existing Methods of Estimating Active Transportation

Title	Author(s)	Source	Unit of analysis of model	Dependent Variable	Basic Independent Variable(s)	Can we use this model to estimate potential usage of trails in HR?	What can we learn from this model that we may apply to our model?
Guidelines for Analysis of Investments in Bicycle Facilities	Transportation Research Board of the National Academies	http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf	Paths	Existing AND new cyclists on path	Population	No, because it doesn't include pedestrians, and it is simply based on population	Treating existing and new people separately
Cycling and the built environment, a US perspective	Anne Vernez Moudon, Chanam Lee, Allen D. Cheadle, Cheza W. Collier, Donna Johnson, Thomas L. Schmid, Robert D. Weather	http://www.researchgate.net/publication/222889659_Cycling_and_the_built_environment_a_US_perspective	People	Number of times a person bikes weekly for any reason in neighborhood	Socioeconomic and environmental factors	No, because this appears to be a person model (i.e. predicts behavior of individual persons, not groups of persons in areas)	The importance of destinations
A Contingent Trip Model for Estimating Rail-trail Demand	Carter J. Betz, John C. Bergstrom, J.M. Bowker	http://www.parks.ca.gov/pages/1324/files/ja_betz001.pdf	People	Expected/anticipated trips	Distance to trail, income, and other socioeconomic factors	Perhaps	Factors affecting usage: - round trip mileage to trail - users who have used a rail-trail before - active users of bicycles
Cycling to work in 90 large American cities: new evidence on the role of bike paths and lanes	Ralph Buehler, John Pucher	http://www.saferoutespartnership.org/sites/default/files/pdf/Lib_of_Res/SS_ST_Rutgers_impactbikepaths_bikecommutingbehavior_042012%20-%20Copy.pdf	Metro	Cycling level	Bike paths per population, temperature, etc.	No, because the unit of analysis is the metro (we want to predict behavior in a small area near a signature path).	Factors affecting usage: - land use - socioeconomics - safety
The Washington & Old Dominion Trail: An Assessment of User Demographics, Preferences, and Economics	J.M. Bowker, John C. Bergstrom, Joshua Gill, Ursula Lemanski	http://www.srs.fs.usda.gov/recreation/WOD.pdf	Household	Annual visits	Round trip costs, travel time round trip, household income, substitute trail nearby, number of people in household	Perhaps	Factors affecting usage: - round trip cost - travel time - # of people in household
Estimating Urban Trail Traffic: Methods for Existing and Proposed Trails	Greg Lindsey, Jeff Wilson, Elena Rubchinskaya, Jihui Yang, and Yuling Han	http://www.sciencedirect.com/science/article/pii/S0169204607000217	Trails	Daily traffic	Temporal, weather, socio-demographic, and urban form variables	Perhaps	The importance of urban form
Latent Demand Score Analysis For Bike and Pedestrian Travel In the City of Decatur	Georgia Tech's Center for Quality Growth and Regional Development	http://www.cqgrd.gatech.edu/sites/files/cqgrd/files/decatur_latent_demand_final_report.pdf	Road segments	Road segment demand	Bicycle trip purpose, number of generators, travel distances	Perhaps	Creation of new attractors can increase demand in particular areas, results are city specific

Source: HRTPO research (table of usage studies.xlsx)

2. Estimating Impact of Candidates on Usage of Active Transportation

Given that estimating trail usage using techniques included above a) measures trail effectiveness from the point-of-view of the *trail*, and b) conflates *new and existing users* of active transportation, staff desired a different measure—one from the point of view of the *public*, and one which distinguishes *new users from existing users*. Staff chose to measure the change in the usage of active transportation by persons living near the candidate rail-trails. Not being aware of any existing applicable models, HRTPO staff developed its own method.

a. Development of Trail Impact Model

To check the factors learned through the review of existing techniques (above), staff analyzed an existing HRTPO-prepared subset of National Household Travel Survey (NHTS) data (analysis included as Appendix B). Other travel data not being readily available from the NHTS, staff analyzed NHTS *commuting* data. The analysis confirms that **"income" is a strong factor** affecting usage of active transportation for commuting.

It should be noted, however, that rail-trails are used for many reasons in addition to commuting, such as shopping and recreation. The chart below shows this breakdown of purposes from a recent survey of Hampton Roads residents.[3]

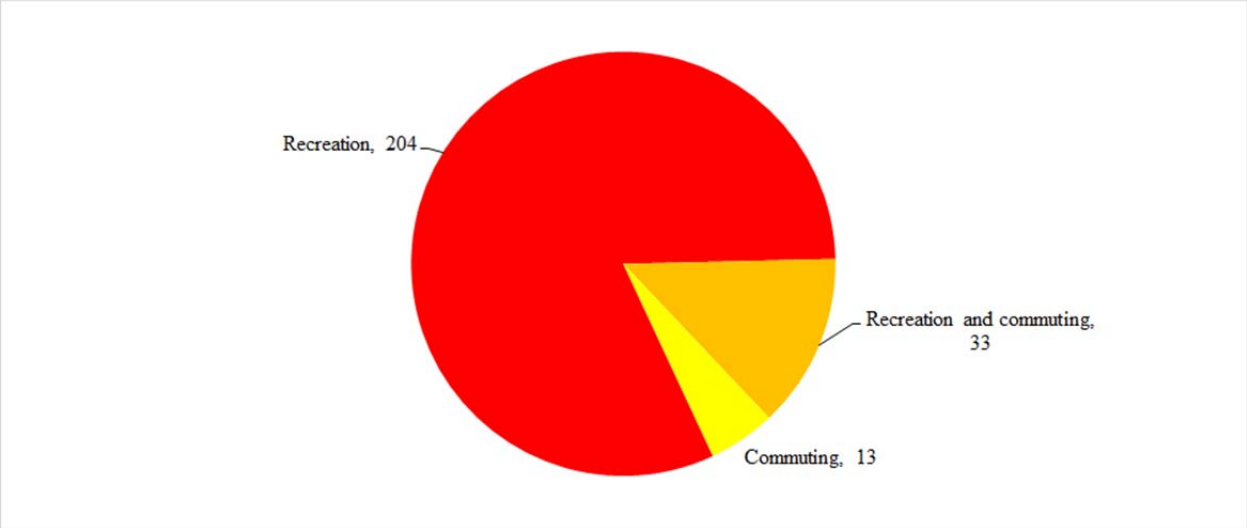


FIGURE 3 Purpose of Biking in Hampton Roads, number of respondents
Source: HRTPO charting of ODU data, piechart.xlsx

[3] "[2014]Life in Hampton Roads Survey Press Release #4, The Changing Transportation Picture: Tolls and Traffic", ODU, undated, p. 11.

Based on the review of existing methods of estimating active transportation (above) and the HRTPO analysis of NHTS data (above), staff chose "income" and "proximity" as independent variables for its trail impact model. A staff review of existing models revealed that 2 miles is an appropriate limit to use when considering the impact of a trail on the behavior of persons living nearby. HRTPO staff prepared a model which estimates "number of persons living near trail using active transportation for commute" based on inputs "income" and "proximity of persons to rail-trail".

To estimate the model, staff gathered census data for the counties of six rail-trails around the U.S. (Table 3), compiling usage of active transportation, location, and income for the 5,272 block groups in those counties.

TABLE 3 U.S. Rail-Trails Used to Develop HRTPO Active-Trans-Usage Model

	Rail Trail	Location	From	To	Length (miles)
1	Minuteman Commuter Bikeway	Boston	Alewife T Station	Depot Park	10
2	Monon Trail	Indianapolis	10th St & Massachusetts Ave	E 169th & N Meridian St	18
3	Former Mpls. & St Louis R/R (4 trail names)	Minneapolis	Mississippi River @ E 27th St.	Chaska Blvd	23
4	Porter Rockwell Trail	Salt Lake City	N Frontage Road	Pioneer Ave	13
5	Cape Henry Trail	Virginia Beach	Jade St	First Landing SP Entr / Shore Dr	2
6	Washington & Old Dominion Trail	Northern Virginia	N 21st St (Purcellville)	S Shirlington Rd (Alexandria)	45

Source: HRTPO staff (US Rail Trails DB.xlsx)

TABLE 4 U.S. Counties Used to Develop HRTPO Active-Trans-Usage Model

	County	Subject Rail-Trail in County
1	Middlesex County, MA	Minuteman Commuter Bikeway
2	Marion County, IN	Monon Trail
3	Hamilton County, IN	Monon Trail
4	Hennepin County, MN	Minneapolis Rail Trails (4 trails)
5	Carver County, MN	Minneapolis Rail Trails (4 trails)
6	Salt Lake County, UT	Porter Rockwell Trail
7	Utah County, UT	Porter Rockwell Trail
8	City of Va. Beach, VA	Cape Henry Trail
9	Loudoun County, VA	Washington & Old Dominion Trail
10	Fairfax County, VA	Washington & Old Dominion Trail
11	Arlington County, VA	Washington & Old Dominion Trail
12	City of Alexandria, VA	Washington & Old Dominion Trail
13	City of Fairfax, VA	Washington & Old Dominion Trail
14	City of Falls Church, VA	Washington & Old Dominion Trail

Source: HRTPO staff (US Rail Trails DB.xlsx)

Commuting data being the only modal data available from the Census, for "usage of active transportation", staff used "number of persons who biked or walked to work" (Table B08301,

2009-2013). Worker income not being available, staff used "persons age 16+, by earnings" (Table B20001, 2009-2013). Considering the 5,272 subject block groups, staff used GIS to distinguish the 1,212 block groups with centroids within 2 miles of one of the subject rail-trails from the 4,060 block groups located more than 2 miles from the trails.

Regression analysis of this Census data for the U.S. counties with the subject existing rail-trails (shown in Table 5) revealed the relationship between *usage of active transportation* and the following: *income* and *proximity to trail*.

TABLE 5 HRTPO Trail Impact Model, 2009-2013

Dependent Variable: ***Number of persons using active transportation to work***

Regression Statistics	
Multiple R	0.51
R Square	0.26
Adjusted R Square	**0.26**
Standard Error	55
Observations	**5,272**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	8	5,597,866	699,733	235	0
Residual	5,263	15,662,559	2,976		
Total	5,271	21,260,425			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.752	1.530	0.5	0.623	-2.248	3.753
Persons 16+ w/ earnings <$20,000, BG w/in 2mi of trail	0.203	0.008	24.3	0.000	0.186	0.219
Persons 16+ w/ earnings $20k-$50k, BG w/in 2mi of trail	-0.061	0.012	-5.2	0.000	-0.084	-0.038
Persons 16+ w/ earnings $50k-$100k, BG w/in 2mi of trail	0.060	0.014	4.3	0.000	0.033	0.087
Persons 16+ w/ earnings $100k+, BG w/in 2mi of trail	-0.034	0.013	-2.6	0.008	-0.060	-0.009
Persons 16+ w/ earnings <$20,000, BG not near trail	0.171	0.005	34.5	0.000	0.161	0.181
Persons 16+ w/ earnings $20k-$50k, BG not near trail	-0.048	0.006	-7.8	0.000	-0.061	-0.036
Persons 16+ w/ earnings $50k-$100k, BG not near trail	-0.023	0.008	-3.0	0.003	-0.038	-0.008
Persons 16+ w/ earnings $100k+, BG not near trail	-0.005	0.007	-0.7	0.490	-0.019	0.009

Source: HRTPO analysis of Census data (model based on B20001-Personal earnings.xlsx)

Even though the dependent variable's universe (workers) differs somewhat from the independent variables' universe (persons age 16+), the model shows a clear distinction between the mode choice of persons living near the trails vs. away from the trails. For example, for earnings less than $20,000 per year, the coefficient for persons near the trails (0.203) is almost 20% larger than that of persons living away from the trails (0.171).

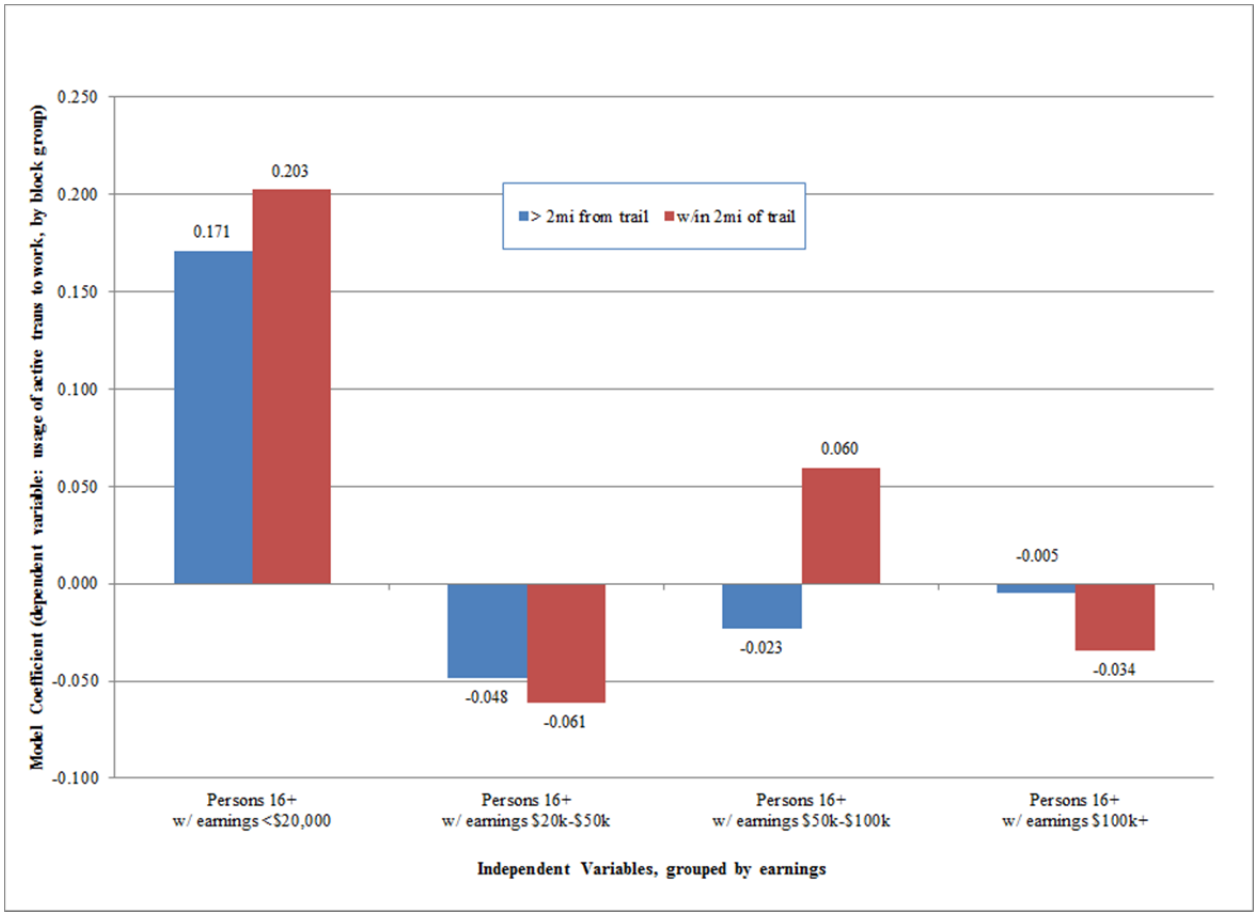


FIGURE 4 Usage of Active Transportation vs. Income and Proximity to Rail-Trail-Coefficients from the HRTPO Trail Impact Model, 2009-2013

Source: HRTPO staff (model based on B20001-Personal earnings.xlsx)

The model coefficients for the base case (not living near trail, blue bars above) indicate that low income is highly related to usage of active transportation. Comparing the coefficients for persons living away from trail (blue bars above) to the coefficients for persons living near trail (red bars above), indicates that proximity to trail increases the tendencies of both low income and mid-high income persons to use active transportation.

b. Application of Trail Impact Model to Candidates

Having developed the trail impact model described above, staff applied it to the candidate rail-trails in Hampton Roads to estimate their impact on the usage of active transportation by persons living near the proposed trails.

As the starting point for its forecast of the usage impact of the subject candidate rail-trails, staff used geographic data on the *existing* usage of active transportation in Hampton Roads, shown on the following page.

Waterside, Norfolk
Source: HRTPO staff (waterfront 011 – small.jpg)

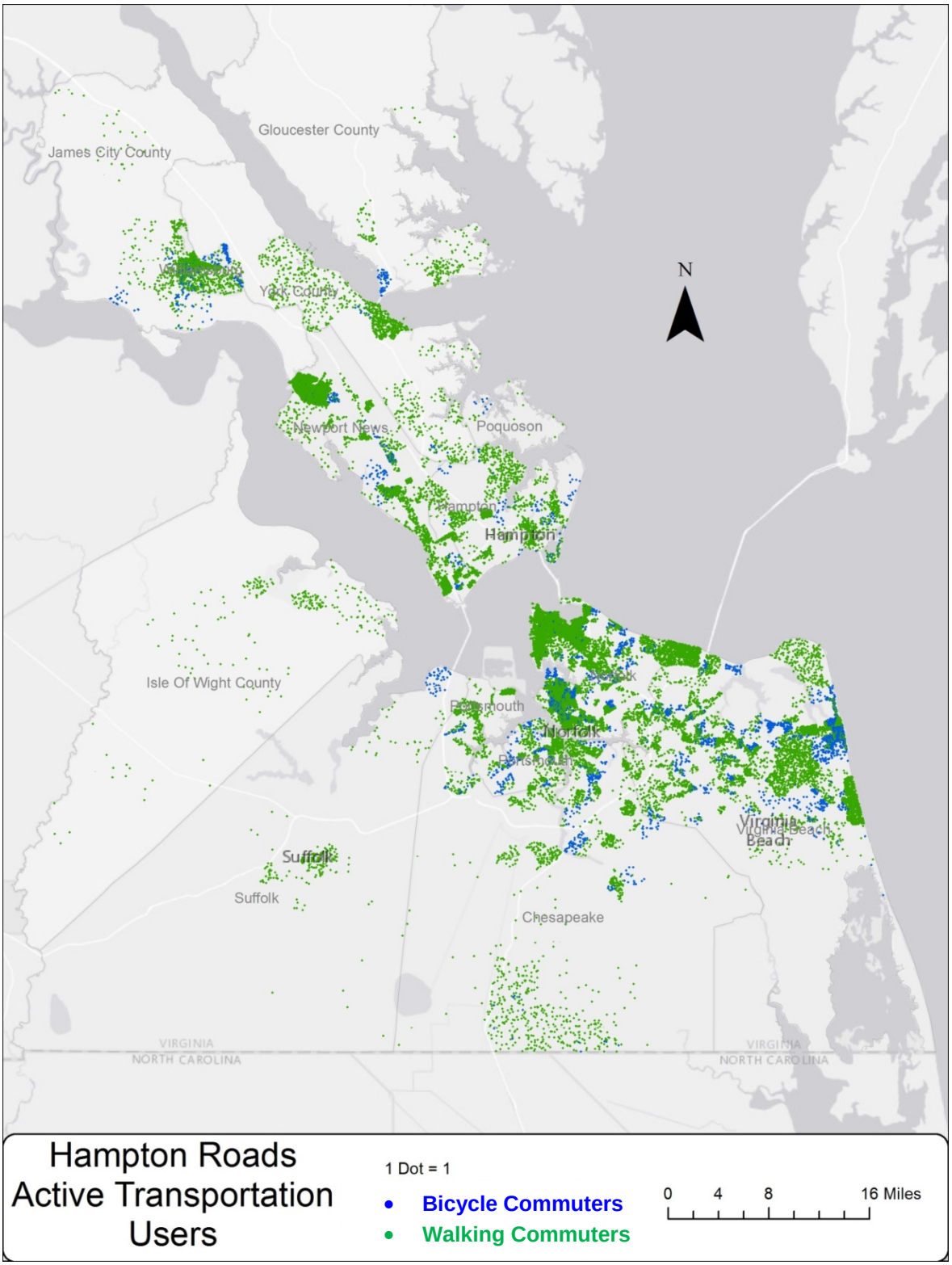


FIGURE 5 Active Transportation Commuters in Hampton Roads, 2009-2013

Source: HRTPO mapping of Census data (block group), Active Trans Usage_1.jpg

Extracting that subset of persons living within 2 miles of a subject right-of-way (R.O.W.)—from all the persons shown to be using active transportation to work on Figure 5 above—renders the numbers shown in the chart below.

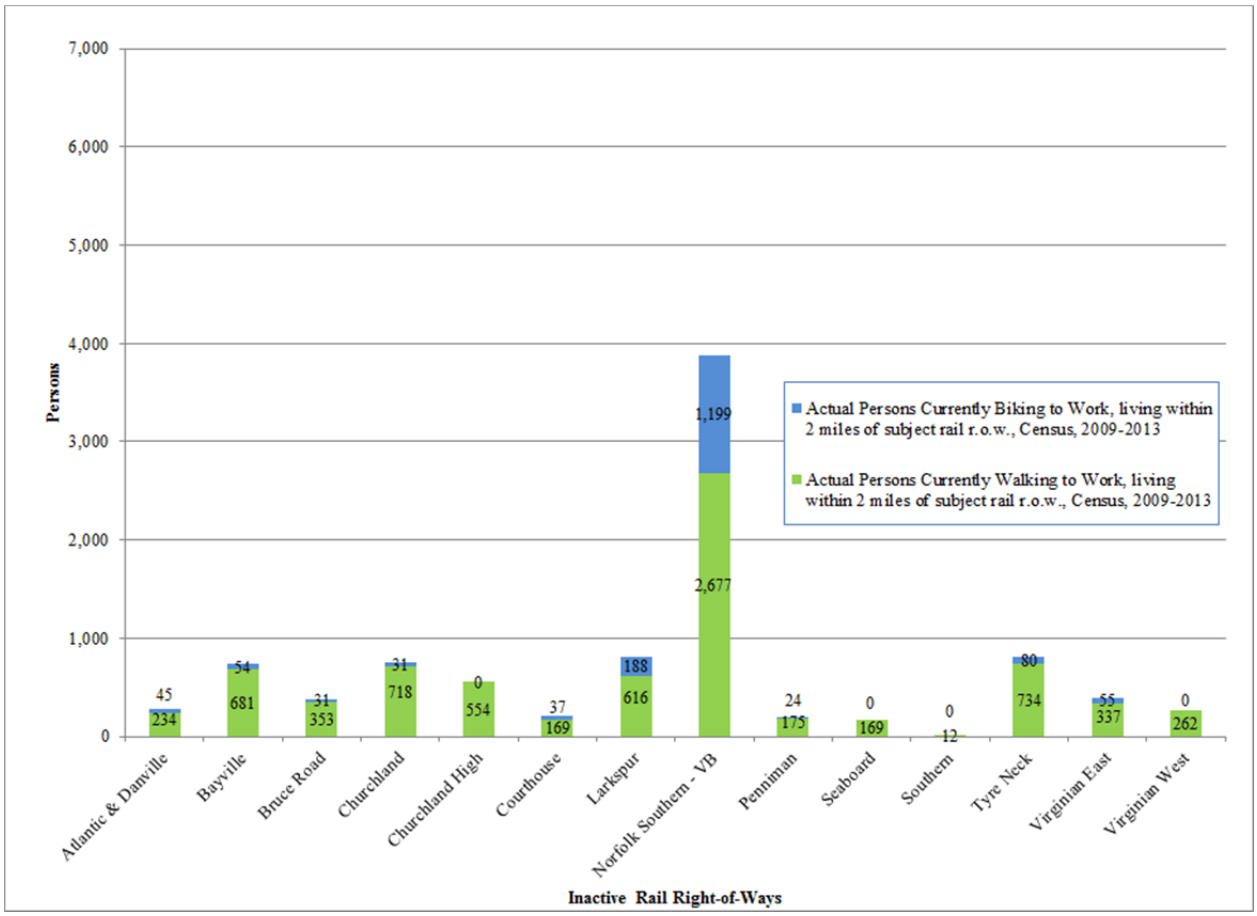


FIGURE 6 Actual Persons Currently using Active Transportation to Work, living within 2 miles of subject rail r.o.w., Census, 2009-2013

Source: HRTPO analysis of Census data by block group (Application of Model to HR CandidateTrails.xlsx)

The data shows:

- for commuting, walking is more prevalent than biking
- a large number of persons (approx. 4,000) living in the vicinity of the Norfolk Southern – VB right-of-way bike or walk to work.

Applying the trail impact model developed above, staff estimated—based on the number of persons living near each proposed trail, and their incomes—the *additional* number of persons expected to use alternative transportation if the trail is built:

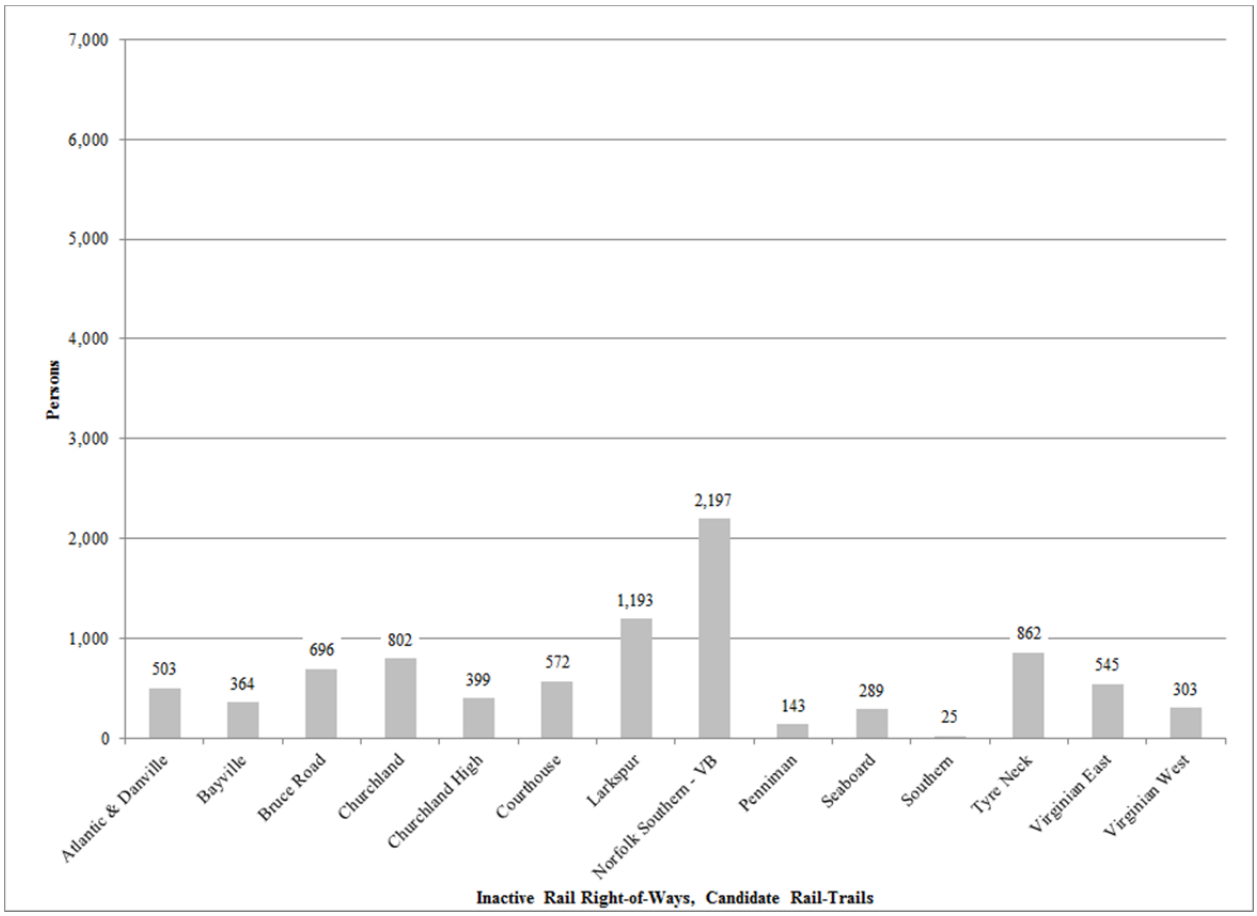


FIGURE 7 HRTPO Forecast of ADDITIONAL Active Transportation Commuters, living within 2 miles of subject rail r.o.w., Build Scenario, 2009-2013

Source: HRTPO analysis of Census data by block group (Application of Model to HR CandidateTrails.xlsx)

For example, staff estimates that approximately 2,000 persons living near the Norfolk Southern VB right-of-way—who do not currently walk or bike to work—would do so if that trail were built.

Note that—the model having been estimated with six US trails five of which are 10 miles or longer—staff expects the model to work best for those Hampton Roads candidate rail-trails which are long, and for shorter candidate rail-trail segments that are part of longer rail-trails.

By adding the *additional* active transportation commuters (from the previous page) to the *existing* active transportation commuters (from an earlier page), staff estimated the *total* number of persons living near each trail expected to use alternative transportation under the build scenario:

TABLE 6 Persons using Active Transportation to Work, living within 2 miles of R.O.W., 2009-2013

	Atlantic & Danville	Bayville	Bruce Road	Churchland	Churchland High	Courthouse	Larkspur	Norfolk Southern - VB	Penniman	Seaboard	Southern	Tyre Neck	Virginian-East	Virginian-West
Current Biking Commuters	45	54	31	31	0	37	188	1,199	24	0	0	80	55	0
Current Walking Commuters	234	681	353	718	554	169	616	2,677	175	169	12	734	337	262
Current Active Transportation Commuters	279	735	384	749	554	206	804	3,876	199	169	12	814	392	262
Forecast of Additional Active Trans Commuters, Build Scenario	503	364	696	802	399	572	1,193	2,197	143	289	25	862	545	303
Forecast of Total Active Trans Commuters, Build Scenario	782	1,099	1,080	1,551	953	778	1,997	6,073	342	458	37	1,676	937	565

Source: HRTPO analysis of Census data (Application of Model to HR CandidateTrails.xlsx)

The data from Table 6 (previous page) is displayed in Figure 7 below.

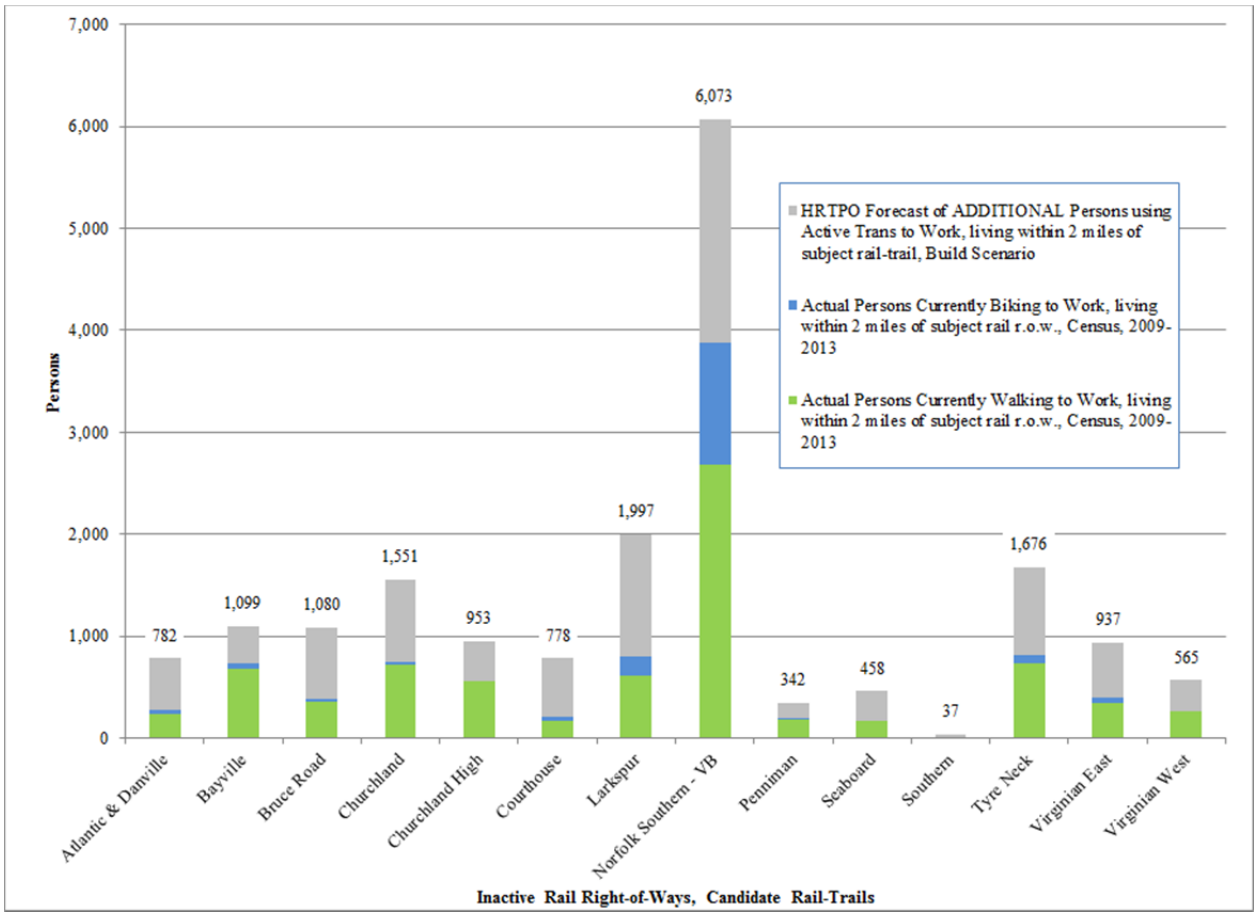


FIGURE 8 HRTPO Forecast of Total Persons using Active Transportation to Work, living within 2 miles of proposed rail-trail, Build Scenario, 2009-2013

Source: HRTPO analysis of Census data by block group (Application of Model to HR CandidateTrails.xlsx)

The data shows, for example, that staff expects—of all the workers living near the Norfolk Southern - VB right-of-way—approximately 6,000 persons (2,000 existing, 4,000 additional) to bike or walk to work if a trail were built in that right-of-way.

B. Estimating Economic Impact of Rail-Trail Candidates in Hampton Roads

1. Existing Techniques for Estimating Economic Impact of Trails

In order to prioritize the candidate rail-trails in Hampton Roads, staff desired a tool for estimating the economic impact of each candidate rail-trail.

Benefits of trails can derive from numerous sources including: local & non-local expenditures, greater access for commuting, increased home values, destinations for tourists, and many more. A variety of techniques can be implemented to estimate such benefits and the overall economic impact on the local economy.

One of the most commonly applied methods is Cost-Benefit analysis (CBA). CBA is a very resourceful technique that determines a project's worthiness and provides a benchmark for comparison of other projects. Lindsey et al. (2004) conducts a CBA of the Monon Trail, considering the benefits to be the aggregate amount people are willing to pay, based on the number of trips they make at different travel costs. Data was calculated from surveys and extrapolated to obtain an annual figure for a 10-year period. Construction and maintenance costs were also estimated for the 10-year period. Based on these estimates, a present value CB ratio (accounting for the discount rate) was calculated.

On the other hand, Bowker et al. (2004) uses an economic model to estimate consumer surplus per trail visit. This measure of individual welfare is then multiplied by the estimated total number of visits per year to obtain an aggregate level of benefits for the year. In the paper "Outdoor Recreation Net Benefits of Rail-Trails", Siderelis & Moore (1995) conduct a similar analysis for three different trails.

On the following page, Table 7 summarizes these and other methods of estimating economic impact of a trail.

TABLE 7 Existing Methods of Estimating Economic Impact of Trails

Title	Author(s)	Source	Unit of analysis of model	Dependent Variable	Basic Independent Variable(s)
Property Values, Recreation Values, and Urban Greenways	Greg Lindsey, Joyce Man, Seth Payton, Kelly Dickson	http://staff.washington.edu/kwolf/Archive/Classes/ESRM304_SocSci/304%20Soc%20Sci%20Lab%20Articles/Lindsey_2004.pdf	Structural and Neighborhood Characteristics	House price	Housing square footage, no. of bathrooms, age of house, number of stories, etc.
Estimating the economic value and impacts of recreational trails: a case study of the Virginia Creeper Rail Trail	J.M. Bowker, John C. Bergstrom, Joshua Gill	http://www.parks.ca.gov/pages/1324/files/bowker_vct_jrnl.pdf	Person	Consumer surplus	Total cost of trip
			Person	Which category person falls into	Each categories sample %, avg. annual trips, avg. visits per trip, avg. party size
The Washington & Old Dominion Trail: An Assessment of User Demographics, Preferences, and Economics	J.M. Bower, John C. Bergstrom, Joshua Gill, Ursula Lemanski	http://www.srs.fs.usda.gov/recreation/WOD.pdf	Person	Consumer surplus	Total cost of trip
The Impact of Greenways on Property Values: Evidence from Austin, Texas	Sarah Nicholls, John L. Crompton	http://www.franklin-gov.com/home/showdocument?id=2590	Structural and Neighborhood Characteristics	Home sales price from Austin Board of Realtors	Lot size, age of house, number of stories, number of bedrooms, existence of swimming pool, etc.

Source: HRTPO staff; table of economic studies.xlsx

2. Estimating Impact of Candidate Rail-Trails on Residential Real Estate Values

Of the economic techniques discussed in section 1 above, staff chose to measure the effect the candidate rail-trails might have on home prices near the subject right-of-ways.

Fortunately, research isolating the impact of trails on housing prices has been conducted using Hedonic Pricing Models. These models assume the following factors influence property value:

- Physical or structural features
- Neighborhood conditions
- Locational factors
- Community conditions
- Environmental factors
- Macroeconomic market conditions at the time of sale

Regression models have been built to estimate the magnitude and direction of these factors on home sale prices. Some commonly used independent variables included in the Hedonic Pricing Model approach are:

- Pool
- Housing size, square feet
- # of bathrooms
- A/C
- Age
- # of stories
- Lot size, acres
- # of garage spaces
- Basement
- Household income
- View of powerline
- Distance to trail, miles
- Adjacency to trail (yes, no)

A well-planned trail serves as a vital transportation facility for commuting, exercising, and leisure activity. These functions provide trails the ability to create value, which can be partly captured by property values in nearby communities. Trail experts have investigated this idea by implementing Hedonic Pricing Models. The hedonic approach attempts to capture the effect of all the characteristics that influence the value of a property and outline which qualities play what role in determining the value of a property.

In “Property Values, Recreation Values, and Urban Greenways” (Lindsey et al., 2004), the authors analyzed the effects of trails on home values in Indianapolis using properties within a 0.5 mile buffer, citing survey data indicating most users beyond this distance drive to the trails. They used a straight line approach for a variety of trails (including the Monon) via GIS to identify parcels that contain at least one boundary intersecting the 0.5 mile buffer. Most of the trails did not display statistically significant results. For the Monon Trail, however, their study shows statistically significant estimates that homes **within a half mile of the trail have 14%** of their value attributable to the trail. Furthermore, if the average Monon premium were assumed to apply to each household within the buffer, the total increase in property values associated with the presence of the Monon Trail would be $115.7 million. It is important to note, however, the authors advise the findings from this study should not be assumed to be similar at other locations.

In the paper, “The Impact of Greenways on Property Values: Evidence from Austin, Texas” (2005), Nicholls & Crompton conduct a similar analysis to Lindsey et al., although the authors build a slightly different model. In this study, distance to the trail was measured along street networks. The authors also accounted for whether a property was located adjacent to the trail. While all three of the studied trails indicated *positive* effects of adjacency to the trail on property values, one (out of three) reported statistically insignificant results. The two trails with statistical significance showed a 6% and 12% increase in home values **due to adjacency, i.e. a 9% average**. The total increase in property values attributed to being adjacent was found to be $13.64 million for the two trails. Examination of all properties within a 0.5 mile buffer rendered statistically insignificant figures.

Having reviewed the above cases, it should be restated that the effect of trails on property values depends on a number of factors including (but not limited to) accessibility, location, quality of pavement, cleanliness, scenery, connectivity, safety, and popularity. Hence, results vary from trail to trail and from metro to metro, but the effect of the subject Hampton Roads trails might be similar to the Indianapolis and Austin cases if the constructed trails in Hampton Roads have characteristics similar to the Indianapolis and Austin trails.

To analyze the potential trail effects on property values in Hampton Roads, staff applied the above two cases to local data.

TABLE 8 Characteristics of Candidate Hampton Roads Trails

Name	Localities	Length, miles	Adjacent Residential Parcel Count	Adjacent Residential Parcel Density, per mile	0.5 Mile Buffer Residential Parcel Count	0.5 Mile Buffer Parcel Density, per mile
Atlantic & Danville	Chesapeake	2.96	74	25	1,178	398
Bayville	Virginia Beach	0.85	56	66	1,386	1,631
Bruce Rd	Chesapeake	2.24	143	64	3,033	1,354
Churchland	Chesapeake, Portsmouth	4.25	192	45	5,371	1,264
Churchland High	Portsmouth	0.95	0	0	4,389	4,620
Courthouse	Virginia Beach	1.52	98	64	1,917	1,261
Larkspur	Virginia Beach	1.22	126	103	2,889	2,368
Norfolk Southern	Virginia Beach (Norfolk n/a)	10.55	200	19	8,289	786
Penniman	York (James City n/a)	3.21	52	16	665	207
Seaboard (Ph. 3)	Suffolk	6.34	78	12	1,974	311
Southern	Suffolk	10.53	30	3	384	36
Tyre Neck	Chesapeake, Portsmouth	3.41	225	66	1,625	477
Virginian - East	Suffolk, Chesapeake	11.20	91	8	2,048	183
Virginian - West	Suffolk, Isle of Wight	16.59	53	3	1,467	88

Source: HRTPO processing of 2015 HRPDC HAZMIT data (increase in property values.xlsx)

In the analysis, staff used GIS software to map the candidate rail-trails and identify adjacent residential parcels (Austin experience) and parcels within 0.5 mile buffer (Indianapolis experience). For simplicity, staff used the straight line method comparable to Lindsey et al. Maps of the trails highlighting parcels located within the 0.5 mile buffer are included as Appendix F.

Table 8 shows parcel characteristics of the studied paths. Some noteworthy numbers are that the Norfolk Southern ROW has the most residential parcels within a 0.5 mile buffer, while Tyre Neck has the most residential parcels adjacent to the rail corridor. Larkspur has the largest per-mile number of adjacent residential parcels, and Churchland High has the largest per-mile value for residential parcels contained within the 0.5 mile buffer.

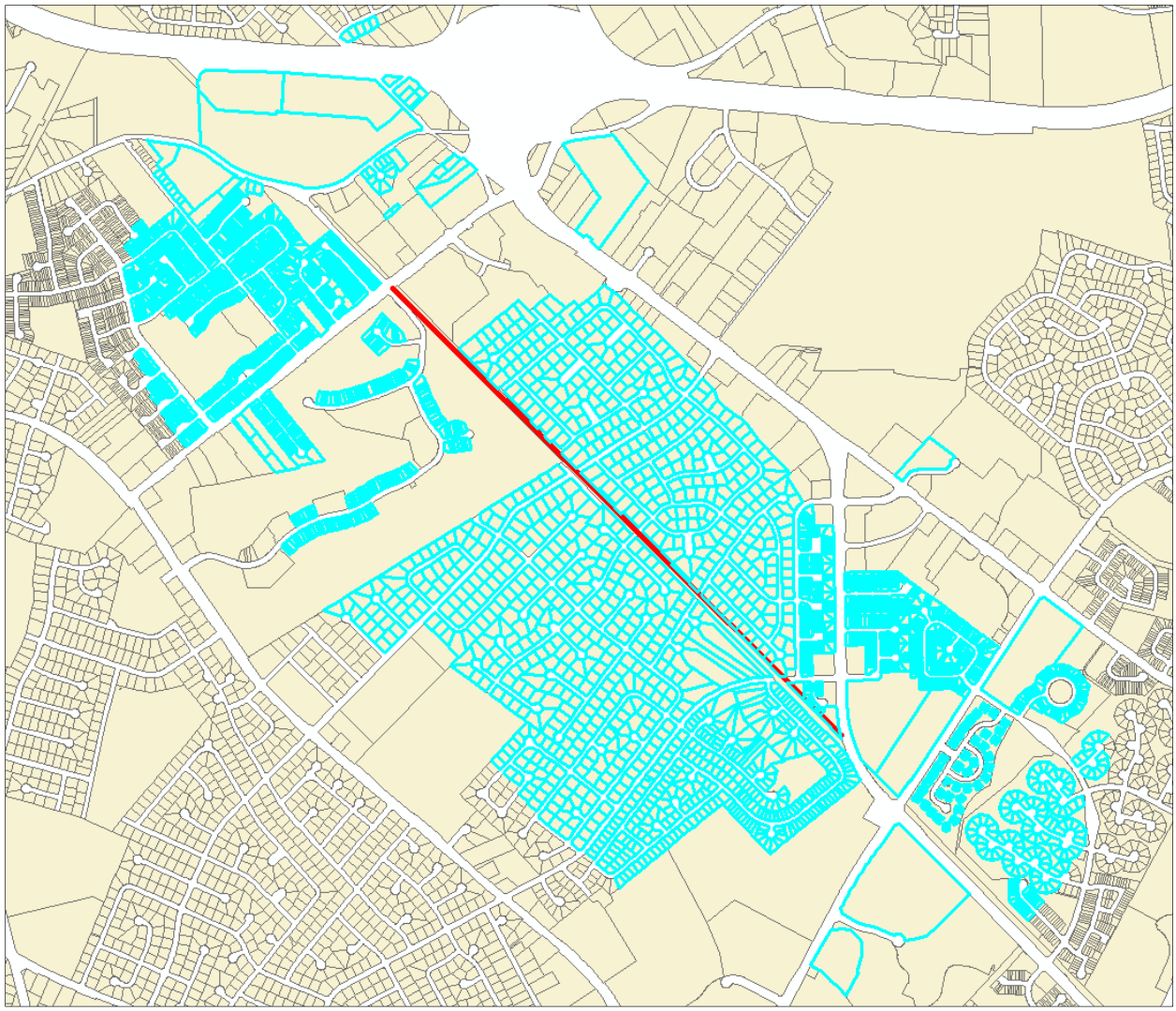


FIGURE 9 Example of Parcels within 0.5 mile- "Larkspur" Candidate Rail-Trail
Source: HRTPO GIS

Applying the results found in the aforementioned studies

- 14% increase in value of properties within 0.5 mile (Indianapolis experience)
- 9% increase in value of adjacent properties (Austin experience)

to property value data obtained via GIS as described above, staff calculated two sets of potential increases in home values near the proposed trails (see charts following page). These two sets of numbers show two possible effects one might observe given time and similarities to the studied trails.

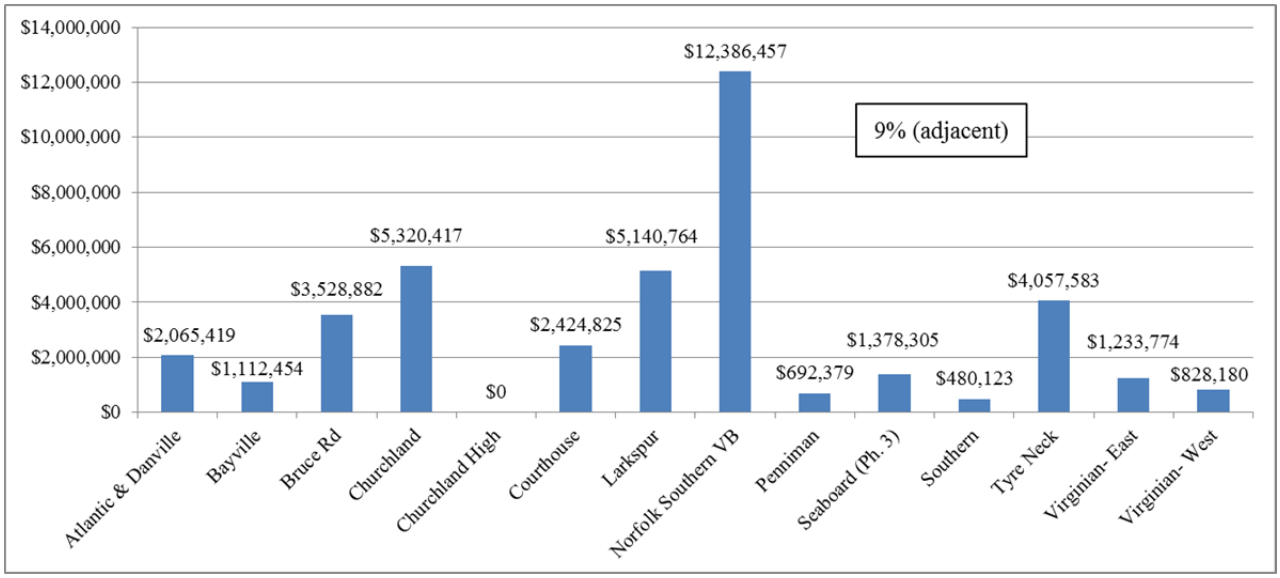


FIGURE 10 Potential Total Increase in Value of Homes Adjacent to Trail, Based on Austin Experience

Source: HRTPO processing of 2015 HRPDC HAZMIT data (increase in property values.xlsx)

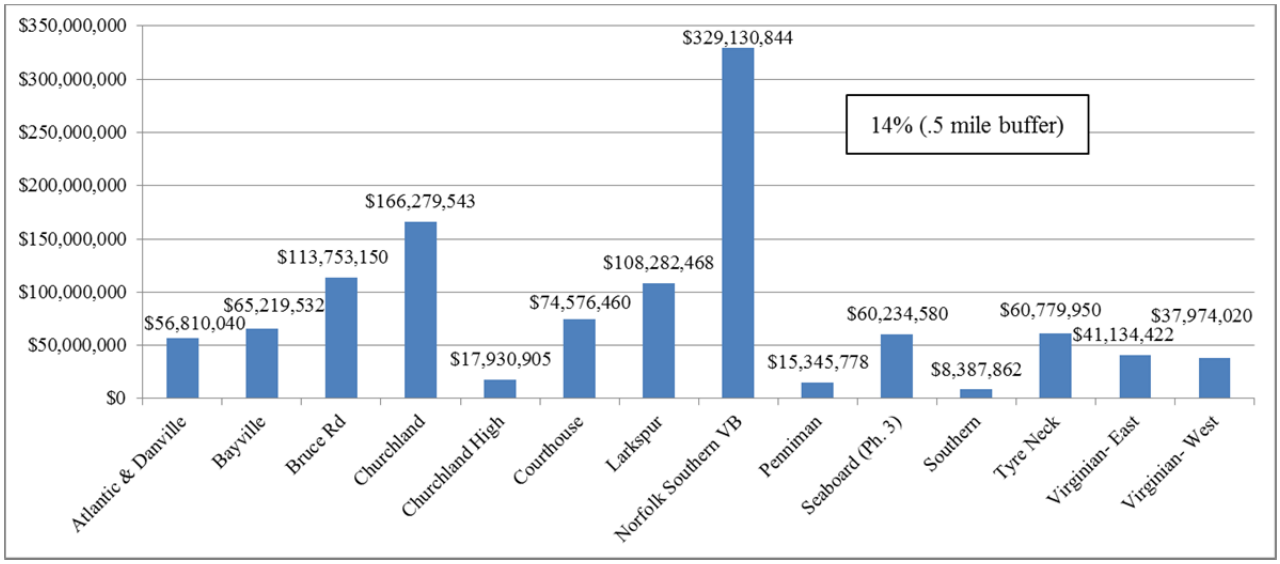


FIGURE 11 Potential Total Increase in Value of Homes within 0.5 mile of Trail, Based on Indianapolis Experience

Source: HRTPO processing of 2015 HRPDC HAZMIT data (increase in property values.xlsx)

Although the results differ greatly between the two cases, the Norfolk Southern VB trail adds the most value to the surrounding properties. This method of comparing projects is somewhat biased since longer trails would tend to show a larger effect on total property values simply because—being longer—they typically have more nearby parcels. To account for this, staff created a comparison measure: dividing the total effect on property values by the length of the trail. The results of these per-mile calculations are shown in the following charts.

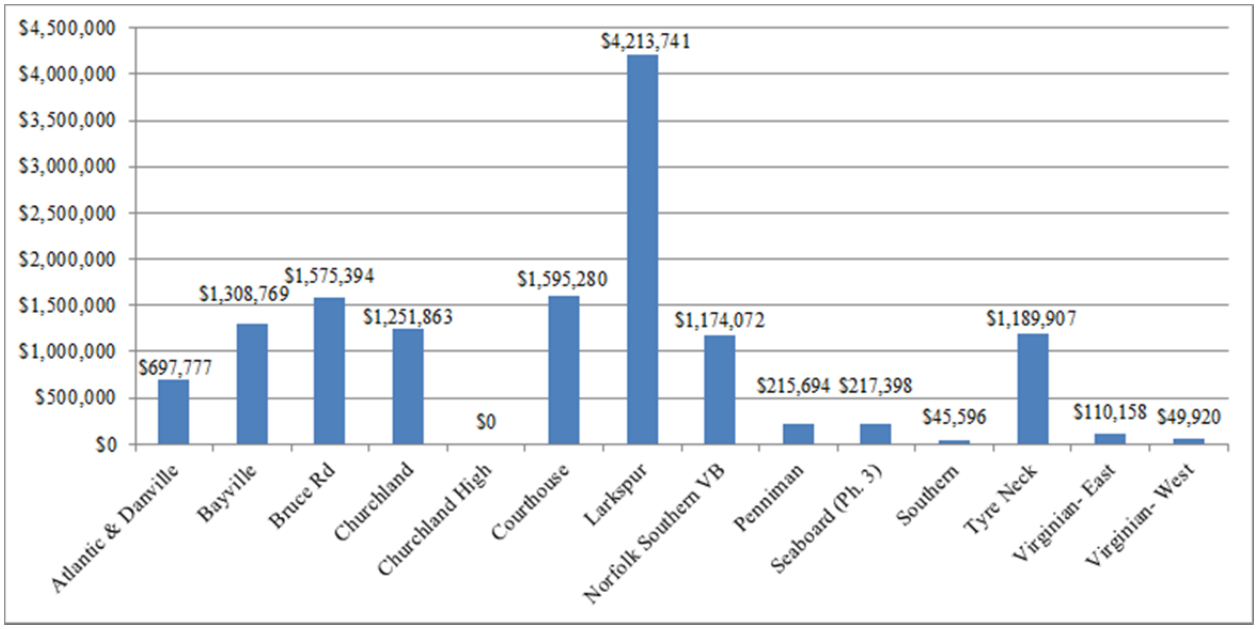


FIGURE 12 Per-Mile Potenital Increase in Value of Homes Adjacent to Trail, Based on Austin Experience

Source: HRTPO processing of 2015 HRPDC HAZMIT data (increase in property values.xlsx)

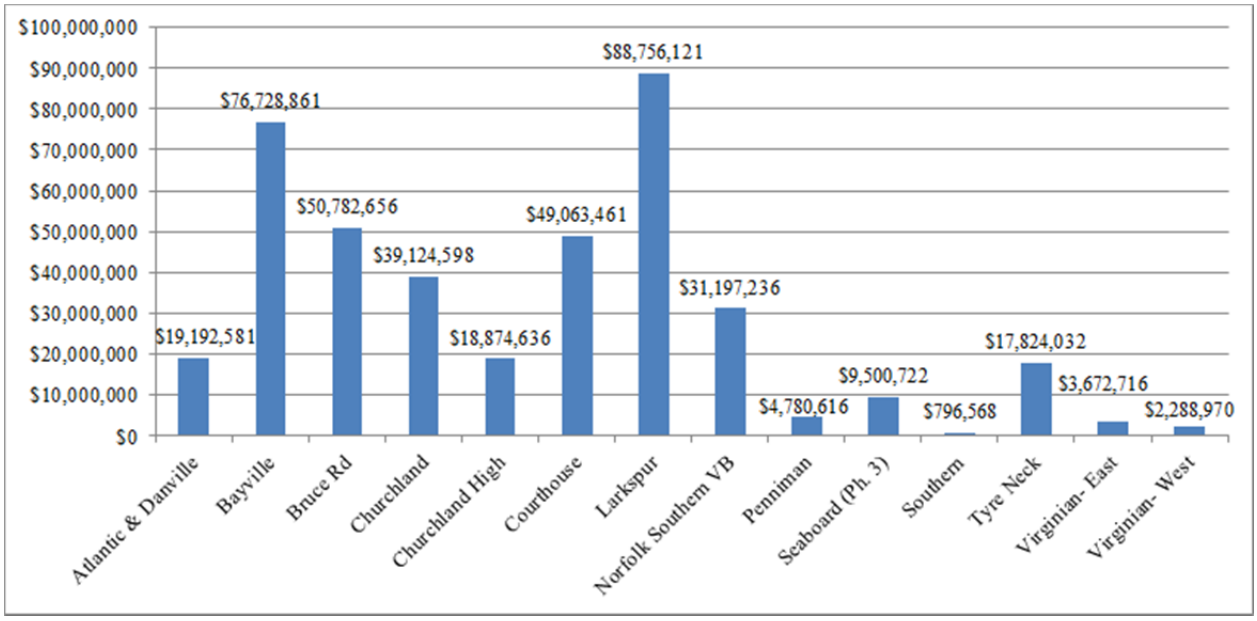


FIGURE 13 Per-Mile Potential Increase in Value of Homes within 0.5 mile of Trail, Based on Indianapolis Experience

Source: HRTPO processing of 2015 HRPDC HAZMIT data (increase in property values.xlsx)

Examining the value effect on a per-mile basis, it is evident that Larkspur performs the best. This is probably due to the density of residential parcels. Table 8 shows Larkspur is only 1.22 miles long, yet has the largest value for adjacent residential parcels per-mile (103) and the second highest value for residential parcels within the 0.5 mile buffer per-mile (2,368).

C. Estimating the Cost of Candidate Rail-Trails

Even in the initial phases, having an estimate of the cost associated with a rail-trail plays an important role in determining the viability of a project.

1. Cost per Mile of 10 foot-wide Asphalt Trails around the U.S.

In order to estimate costs, staff first researched costs observed/used around the country. Table 9 on the following page records the findings.

Pedestrian Signal
Source: HRTPO staff

TABLE 9 Costs of Existing U.S. Trails, per mile (10 feet wide)

Title	Author(s)	Source	Gravel/ Granular	Asphalt	Concrete	$ Year	What does cost include?
Construction and maintenance costs for trails	Draft Milwaukee County Trails Network Plan, 2007	http://www.americantrails.org/resources/ManageMaintain/MilwMaintcost.html	n.a.	$212,749	n.a.	2007 (assumed)	Construction of additional lane pavement added during roadway construction or reconstruction cost.
Town of Atlantic Beach Comprehensive Bicycle Plan (Draft)	Town of Atlantic Beach	http://www.atlanticbeach-nc.com/Comprehensive%20Bike%20Plan/Appendix%20F.pdf	$63,360-$79,200	$149,001	$316,800	2009	Pavement structure
2010 Ped & Pedal Plan	Northwestern Indiana Regional Planning Commission	http://www.nirpc.org/media/3539/appendix_b___trailcosts.pdf	$84,268	$136,843	$248,937	2009	Clearing, grubbing, grading, granular subbed, type of surface, seeding/mulching, 10% added for "other" costs, and 15% added for contingency.
Northern Bonneville Shoreline Trail Master Plan	BIO-WEST, Inc.	http://cachempo.org/wordpress/wp-content/uploads/2014/08/BST-whole-report.pdf	$37,000-$48,000	$125,000-$300,000	$188,000-$600,000	2002	Hiring professional trail building contractor & using mechanized equipment.
Mecklenburg County Greenway Master Plan	Haden, Stanziale from Greenways Incorporated	http://www.charmeck.org/mecklenburg/county/ParkandRec/Greenways/Documents/FinalReport.pdf	$50,000	$150,000	$300,000	1999 (assumed)	General costs for facility development (not including land acquisition costs) as well as dollar amounts that communities across the state are spending on their greenway program development and management/maintenance/ operations. Labor costs are included in facility estimates. Cost for engineering and design development are estimated @ 10-15% of construction costs.

Source: HRTPO staff (costs DP.xlsx)

2. Cost Estimates based on Virginia Capital Trail

The cost rates from U.S. trails (above) have several issues that prevent them from being directly applicable to the Hampton Roads situation.

First, these estimates are developed from a range of projects that predate 2010, and prices for labor and materials have fluctuated significantly since then.

Second, some of these estimates only cover surface construction, and exclude costs such as signage, amenities, and drainage issues. In a 2007 planning document, the County of Milwaukee, WI estimated a cost of $156,000 per mile for these omissions.

Third, it is risky to take generalized construction costs from around the country, and apply them to the Hampton Roads area without adjustment for local economic and building conditions.

Given these limitations, staff based the cost estimates in this report on cost estimates for the Virginia Capital Trail.

a. Assumptions

Unfortunately, the costs associated with transportation projects cover an enormous range, unless certain simplifying assumptions are made. This report makes several assumptions, not in an attempt to be restrictive in design choices, but rather to provide a magnitude of cost that is both easily understood, and which follows the most common design choices.

Assumption 1: The cost estimates of these projects excludes right-of-way cost.

This section's cost estimates exclude right-of-way purchases. Although these purchases play an important role in developing the cost of a potential project, the potential use of railbanking would remove the need to purchase the property for the trail. Railbanking preserves railroad right-of-ways for future use, while allowing the land to be used as a trail until the railroad is prepared to resume traffic on the line. It should be noted, however, that some of the subject inactive rail right-of-ways are owned by non-railroad entities.

Assumption 2: The trails will be constructed with asphalt.

There are a variety of trail surfaces that may be selected, and the appropriate one will be determined by proposed use, runoff/erosion concerns, and maintenance considerations. Concrete has higher upfront cost than other surfaces, but lower maintenance cost. Crushed stone is often preferred for low use trails, but periodic maintenance requirements are greater, as extreme weather events have a more significant impact on trails with this surface. Asphalt is the most common surface for trails because it offers a tradeoff between upfront and maintenance cost, and allows for the greatest variety of users.

Assumption 3: The width of the trails will be 10 feet.

A variety of different trail widths have been used and are appropriate for different types and levels of usage. While 8 feet is considered appropriate for a trail utilized mainly by pedestrians or one that only experiences light usage, the American Association of State Highway and Transportation Officials (AASHTO) recommends 10 feet for multi-use trails where exceptionally heavy usage is not anticipated. Construction cost for parallel paths (for separating user types) have also been excluded.

Assumption 4: The cost estimate for each trail does not include bridge work.

It is often appropriate for trails that pass creeks or wetlands to use a timber bridge to elevate the path above ground level, both to maintain the usability of the trail, and to minimize the impact to the watershed/wetlands. Aerial photography does not clearly indicate any sections along the trails proposed in this report where a timber bridge would be required, but determining locations where these would be necessary and appropriate would require a survey of each of the trail sites. This section includes an estimate for the cost of bridges per square foot for reference purposes.

If during further evaluations of the subject candidate rail-trails, a timber bridge is required, one could calculate its cost using the average from the Capital Trail: **$89 per square foot**. For example, a 100' bridge (10' wide) would cost $89,000.

Although efforts are often made to separate trails from roadways that have significant traffic (by bridging the trail over, or tunneling the trail under, the subject roadway), no provision has been made for those actions in these cost estimates.

b. Cost Estimates, based on per-mile rates

The portion of Virginia Capital Trail construction that was overseen by the Virginia Department of Transportation since 2013 offers estimates of construction costs that are recent and geographically relevant. Considering individual sections of the Virginia Capital Trail (typically 1-2 miles long), then the estimated *construction* costs range from **$287,000 to $331,000** per mile.

Adding overhead and related costs (including civil design, structural design, environmental permitting and mitigation, utility relocation, etc.) to the construction cost above, the Capital Trail cost estimates total **$516,250** per mile.

Given a) that the City of Suffolk "Seaboard Coastline Trail Master Plan" estimates paving cost at $337,500 per mile (2006) and total cost at $450,000 per mile (excluding trailheads), and b) that Phase 4 of the Seaboard Coastline Trail cost $500,000 per mile (from Sandon Rogers, City of Suffolk, 11-6-15 phone conversation), the $516,250 figure appears reasonable.

Using the per-mile rates from the Virginia Capital Trail (discussed above) and the lengths of the subject trails, staff estimated trail costs.

These estimates provide an order of magnitude of the costs, and planning using these estimates should be made knowing that a thorough survey may introduce additional costs (e.g. wetlands mitigations or timber bridge construction for a portion of the trail) that would require significant revision to these estimates.

TABLE 10 Cost Estimates for Candidate Rail-Trails- excluding ROW and Bridges

Name	Length (miles)	Construction, Low	Construction, High	Total Cost
Atlantic & Danville	2.96	$850,000	$980,000	$1,529,000
Bayville	0.85	$244,000	$282,000	$440,000
Bruce Rd	2.24	$643,000	$742,000	$1,157,000
Churchland	4.25	$1,220,000	$1,407,000	$2,196,000
Churchland High	0.95	$273,000	$315,000	$491,000
Courthouse	1.52	$437,000	$504,000	$786,000
Larkspur	1.22	$351,000	$404,000	$631,000
Norfolk Southern VB	10.55	$3,028,000	$3,493,000	$5,450,000
Penniman	3.21	$922,000	$1,063,000	$1,658,000
Seaboard (Ph. 3)	6.34	$1,820,000	$2,099,000	$3,275,000
Southern	10.53	$3,023,000	$3,486,000	$5,439,000
Tyre Neck	3.41	$979,000	$1,129,000	$1,762,000
Virginian- East	11.20	$3,215,000	$3,708,000	$5,785,000
Virginian- West	16.59	$4,762,000	$5,492,000	$8,569,000

Source: HRPDC/HRTPO staff (cost table.xlsx)

Table Legend:

Name	The name associated with the candidate trail in this report
Length (miles)	The estimated length in miles of the candidate trail
Construction, Low	The lower bound estimated cost of construction for each project based on a **$287,000** per mile cost associated with a ten foot-wide asphalt trail surface
Construction, High	The upper bound estimated cost of construction for each project based on a **$331,000** per mile cost associated with a ten foot-wide asphalt trail surface
Total Cost	The estimated cost of each candidate trail based on the **$516,250** per mile cost of construction including overhead and related costs. This cost excludes bridge and right-of-way costs.

Note: All dollar figures have been rounded.

IV. Qualitative Analysis and Discussion of All Analyses

In this section, after a brief overview section, staff analyzes each candidate individually, presenting qualitative analysis maps, status, and discussion of analyses, both quantitative (from above) and qualitative.

A. Overview

1. Qualitative Keys to the Success of Existing Trails around the U.S.

Prior to qualitatively evaluating the candidate rail-trails in Hampton Roads, staff examined the keys to the success of existing trails around the U.S. in order to determine the applicable subjects to be used for evaluating the candidates.

The success of the Monongahela River Trails (Morgantown, WV) may be attributed to having both **urban destinations and scenic beauty**:

- For Ella Belling, executive director of Mon River Trails Conservancy (MRTC), Morgantown's trail system is integral to the community. She says, "National press coverage will bring more travelers to explore our rail-trails and enjoy the communities along them, this honor verifies what locals already know, how this rail-trail is great for outdoor recreation and our trail towns are fun places to stay and enjoy the music scene, dine in unique restaurants and discover local attractions." She also stated, "Certainly it's brought in tourism dollars, it's revived the riverfronts considerably – we've seen them transition from abandoned warehouses to restaurants and ships. It's a commuter network for a lot of people, not just a place for leisure."
  http://www.uppermon.org/news/dominion%20post/DP-MRTC-8Mar15.html

- "The pathway goes through a lot of historical main street areas," says John Nemeth, planning manager for the SMART District, which oversees the effort. "It alternates between open space and downtowns, so you can get on and off, and have lunch or go shopping. It's a town and country experience."
  http://www.railstotrails.org/trailblog/2013/september/01/californias-smart-pathway/?tag=Trail+of+the+Month&page=3

The success of the George S. Mickelson trail (South Dakota) is attributed to the **partnership** formed between the state, the Black Hills National Forest, and the Black Hills Rails-to-Trails Association.
http://atfiles.org/files/pdf/rtcmanual.pdf

Scenic beauty has apparently contributed to the success of the Virginia Creeper trail (southwestern Virginia). It offers scenic wonders from dense forests, open fields, and lush waterways to railroad relics and delightful small towns. Cyclists and equestrians love the length of the Creeper, and many local walkers and joggers take advantage of the pleasant opportunity for a little exercise.
http://www.ecustatrail.org/successful-trails.html

Origins and destinations along the trail is a key to the success of the Pumpkinvine Trail (IN). "One of the great things about the Pumpkinvine trail is that it doesn't skirt around the towns," says Oberg. "In Goshen and Middlebury, it goes right through the center of town. With the trail so well-integrated, visitors can take advantage of all the amenities in town. It's not a situation where you have to drive to the trail and then drive away to eat or drive to a place to stay. Visitors stay there and spend their money, so the benefits of the trail are apparent to the community."
http://www.railstotrails.org/trailblog/2014/november/18/indiana-s-pumpkinvine-nature-trail/?tag=Trail+of+the+Month

Long-range planning laid the groundwork for the success of the Fayetteville trails (AR). "The success of the Fayetteville trails system grew from the community's vision back in the 1990s for a viable alternative transportation system," says City of Fayetteville Trails Coordinator, Matt Mihalevich. "Over the past 10 years, we have worked toward providing a connected network of trails, and are currently up to 21 miles of 10- or 12-foot-wide paved trails within the city. The primary goal of the network is to provide an alternate form of transportation. And we are seeing this goal realized, with more than 2,000 people using some of the busier trails each day." "The trail is such an integral part of the character of the site that we chose to name this project after the Frisco trail and historic rail corridor," says Specialized Real Estate Group President Seth Mims. "The people we serve love the connectivity and health benefits of the trail. There are obvious environmental benefits of choosing walking or biking over using a car, and these benefits give our developments an edge over conventional apartments built on the outskirts of town. In addition to our proximity to campus, we chose to build on the trail to give residents access to the entertainment district and greenspaces."
http://www.railstotrails.org/trailblog/2012/november/28/in-fayetteville-arkansas-business-is-booming-around-urban-trails-network/

2. Source and Definition of Map Layers used in Qualitative Analyses

Based on the success factors found above, staff studied the origins and destinations near the candidate rail-trails by mapping seven physical features. Prior to the feature maps in the following section, the source of each feature is described below:

a. Existing Public Transportation Routes

The qualitative analysis uses shapefiles created by the regional transit agencies' (Hampton Roads Transit, Williamsburg Area Transit Authority, and Suffolk Transit) staff and contains an inventory of transit routes throughout the region. These files were obtained by request from the appropriate agencies for use by HRTPO staff in transportation planning.

b. Existing Trail Facilities

The qualitative analysis uses a shapefile created by HRTPO staff that contains an inventory of trail facilities with their own rights-of-way throughout the region. This inventory may be incomplete or may include other errors as this file was created primarily from aerial imagery.

c. Schools

The qualitative analysis uses a shapefile created by HRTPO staff that contains an inventory of schools throughout the region. Schools are categorized as elementary, middle, high, combined, or other schools.

d. Parks

The qualitative analysis uses a shapefile created by HRTPO staff that contains an inventory of parks and natural areas throughout the region. These are further categorized into such areas as conservation easements, public lands, wetlands, Federal parks, local parks, and others.

e. Population

The qualitative analysis uses 2010 population data by Census Block, the base geographical unit of analysis for the U.S. Census Bureau. This data is the most recent data available from the Census Bureau.

f. Employment

The qualitative analysis uses 2009 employment data by Transportation Analysis Zone (TAZ), the base geographical unit of analysis for the travel demand model. This is the most recent validation data approved by the HRTPO Board (November 2010). Although the employment data is broken down into two categories (Retail and Non-Retail), staff mapped total employment.

g. Federal Lands and Military Bases

The qualitative analysis uses a shapefile created by HRTPO staff that contains an inventory of Federal Lands and Military Bases throughout the region.

Trail along Ohio River, Pittsburgh
Source: HRTPO staff

B. Qualitative Analysis and Discussion of All Analyses, by Candidate

In this section, staff presents the following for each candidate:

- **maps** showing the relationship between the subject candidate and seven physical features: 1) population, 2) employment, 3) schools, 4) parks, 5) existing public transportation routes, 6) existing trails, and 7) federal lands and military installations:
    - first map, “Public Facilities”:
        - transit, federal lands, schools, and parks
    - second map, “Demographics and Networks”:
        - transit, existing trails, employment, and population
- **status** of the subject candidate, including ownership and existing plans for usage
- **discussion** of each candidate summarizing *all* research—qualitative and quantitative—documented in this report

Norfolk and Portsmouth
Source: HRTPO staff

1. Atlantic & Danville

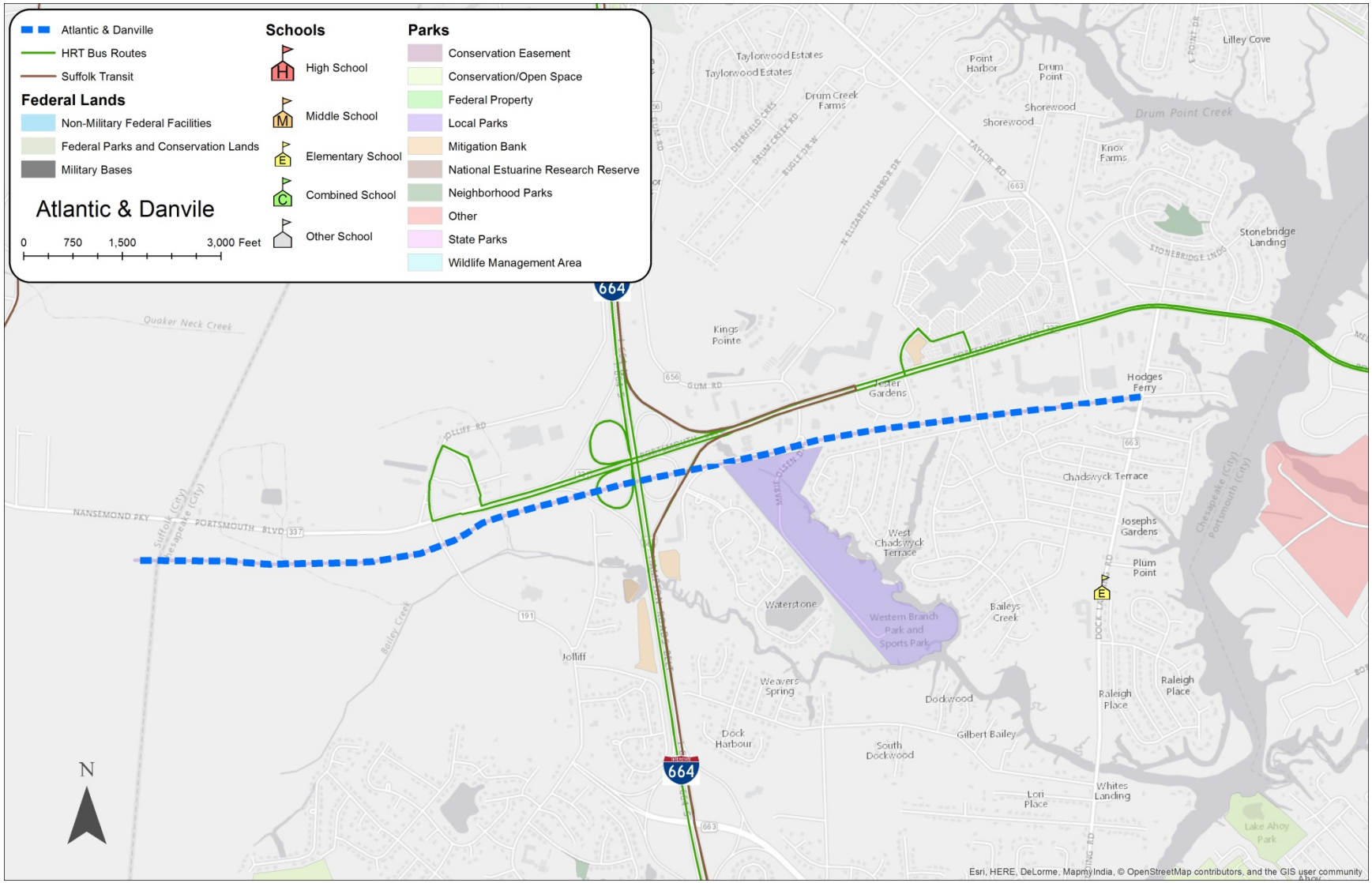


FIGURE 14 Atlantic & Danville- Public Facilities

Source: HRTPO staff (Atlantic&Danville.jpg)

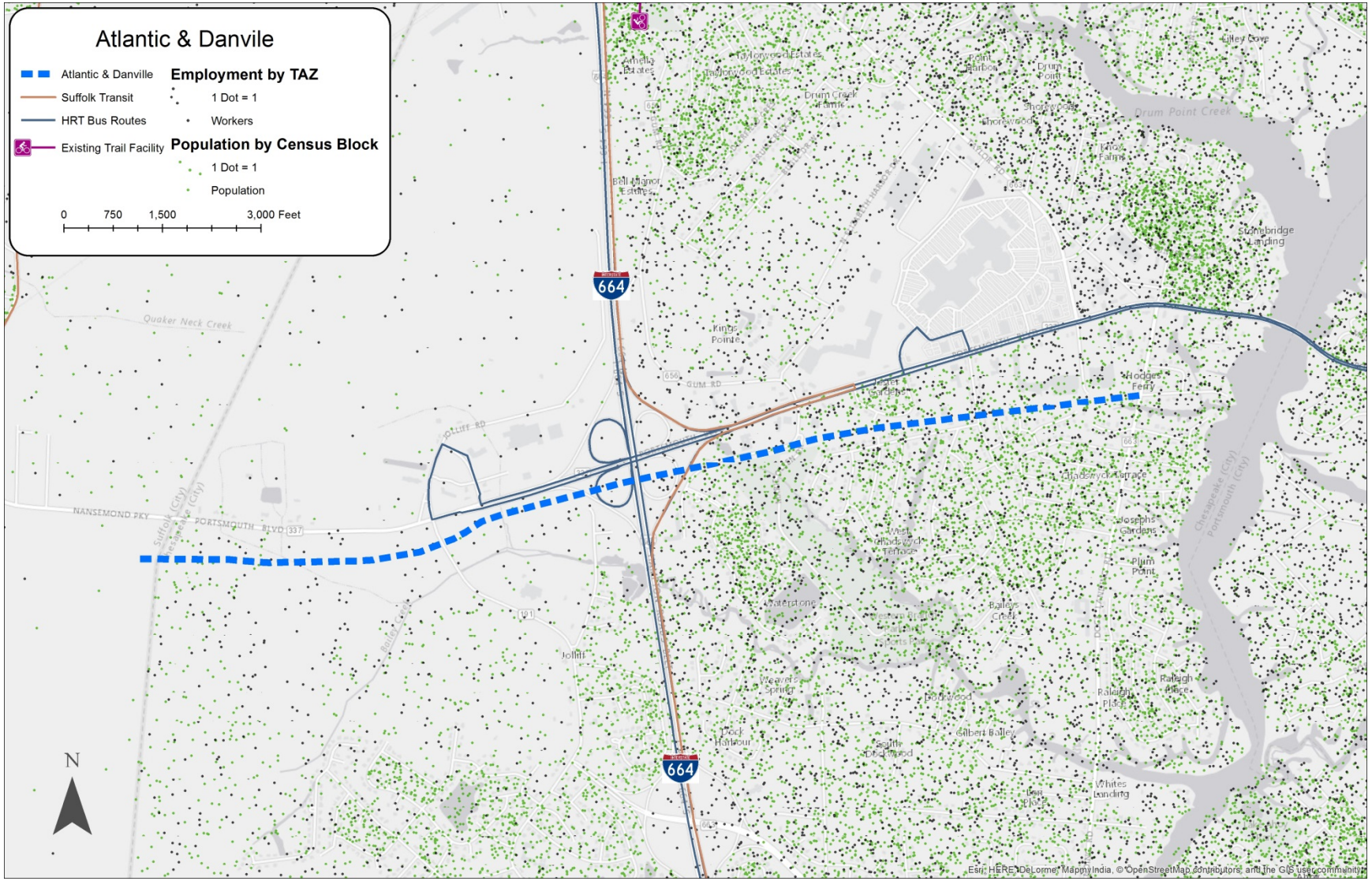


FIGURE 15 Atlantic & Danville- Demographics and Networks

Source: HRTPO staff (Atlantic&Danville_demnet.jpg)

The 2.96-mile right-of-way of this candidate located in Chesapeake, running from just west of the Suffolk/Chesapeake line to Dock Landing Road, is owned by various private individuals.

Right-of-way crosses Jolliff Rd

Right-of-way crosses Marie Olsen Dr near entrance to Western Branch Park

The Atlantic & Danville candidate rail-trail passes through areas of lower residential and employment density as shown in Figures 14 and 15 above. The area is served by transit from both Hampton Roads Transit (HRT) and Suffolk Transit and is near major highway access. Additionally, there is one school and a local park near the candidate rail-trail.

If built, HRTPO staff quantitative analysis shows that an Atlantic & Danville Trail would cause an increase of 503 active transportation users (for commuting) within two miles of the trail. This would increase usage from 279 existing to a forecasted 782 users. Additionally, under the

‘Austin Experience’ explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $2,000,000. The cost to build this trail would be approximately $1,500,000, excluding cost of ROW and bridges.

Capital Trail, Chickahominy Bridge
Source: VDOT

2. Bayville

FIGURE 16 Bayville- Public Facilities

Source: HRTPO staff (Bayville.jpg)

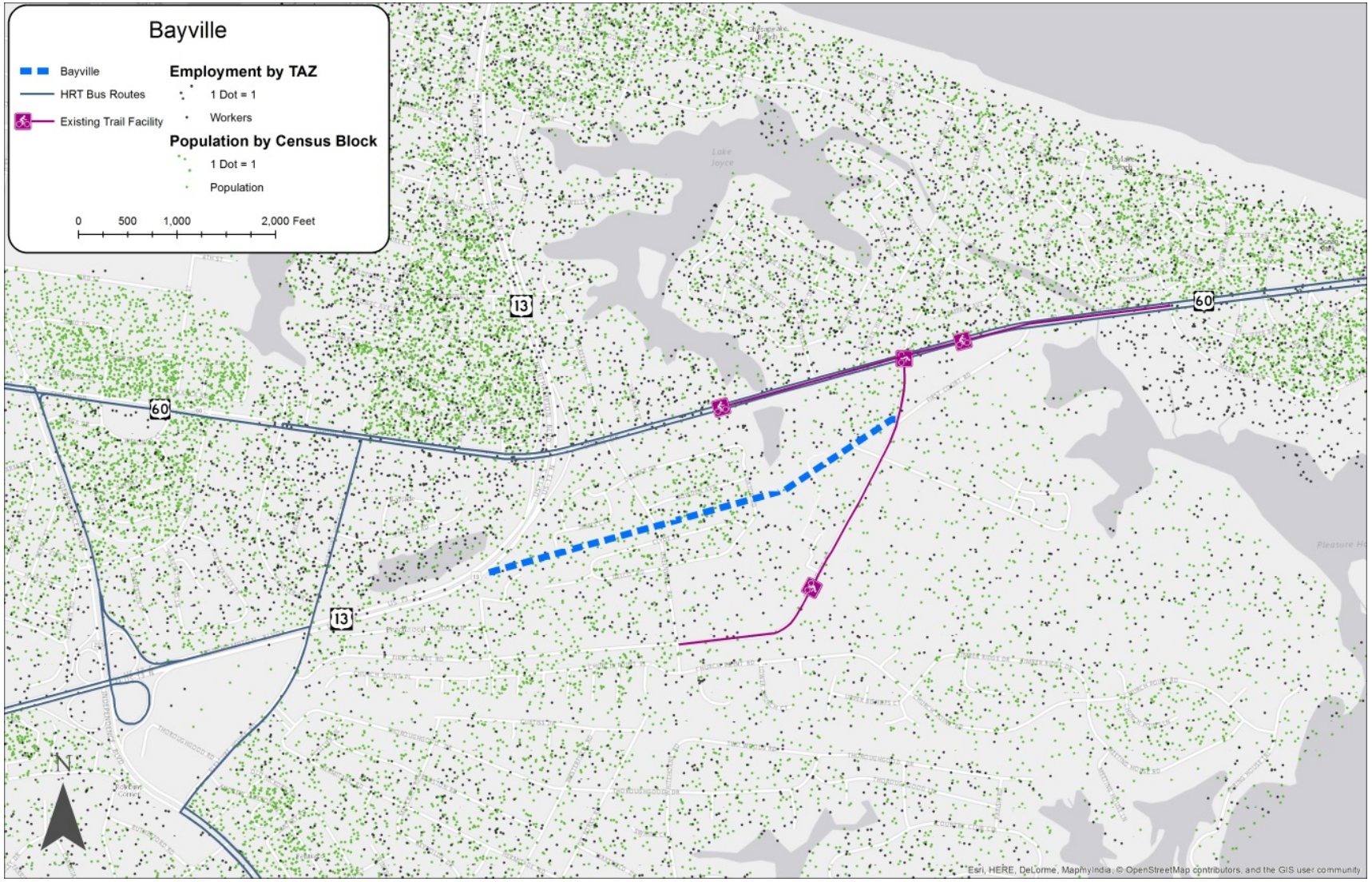


FIGURE 17 Bayville- Demographics and Networks

Source: HRTPO staff (Bayville_demnet.jpg)

The 0.85-mile right-of-way of this candidate, located in Virginia Beach, running from just east of Northampton Blvd to First Court Rd, is owned by the City of Virginia Beach.

Current unpaved path terminus at First Court Rd

Right-of-way crosses First Court Rd

The Bayville candidate rail-trail passes through areas of lower residential and employment density as shown in Figures 16 and 17 above. The area is served by transit from Hampton Roads Transit (HRT), is near major local highway access, and would connect with existing bicycle

facilities. Additionally, there are two schools, a state park, and a local conservation/open space near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Bayville Trail would cause an increase of 364 active transportation commuters within two miles of the trail. This would increase usage from 735 existing users to a forecasted 1,099 users. Additionally, under the ‘Austin Experience’ explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $1,000,000. The cost to build this trail would be approximately $400,000 excluding cost of ROW and bridges.

Virginia Capital Trail
Source: VDOT

3. Bruce Road

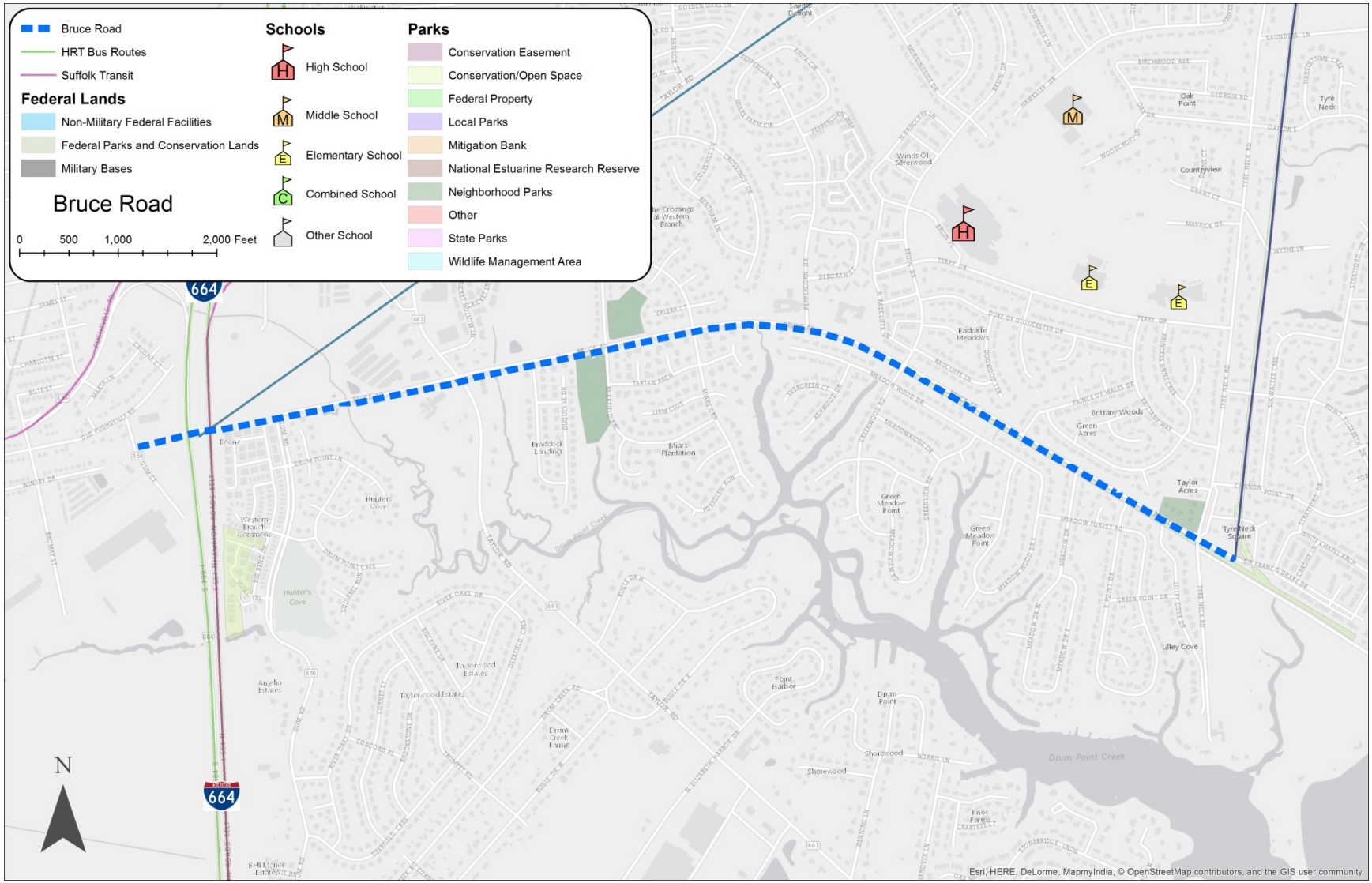


FIGURE 18 Bruce Road- Public Facilities

Source: HRTPO staff (BruceRd.jpg)

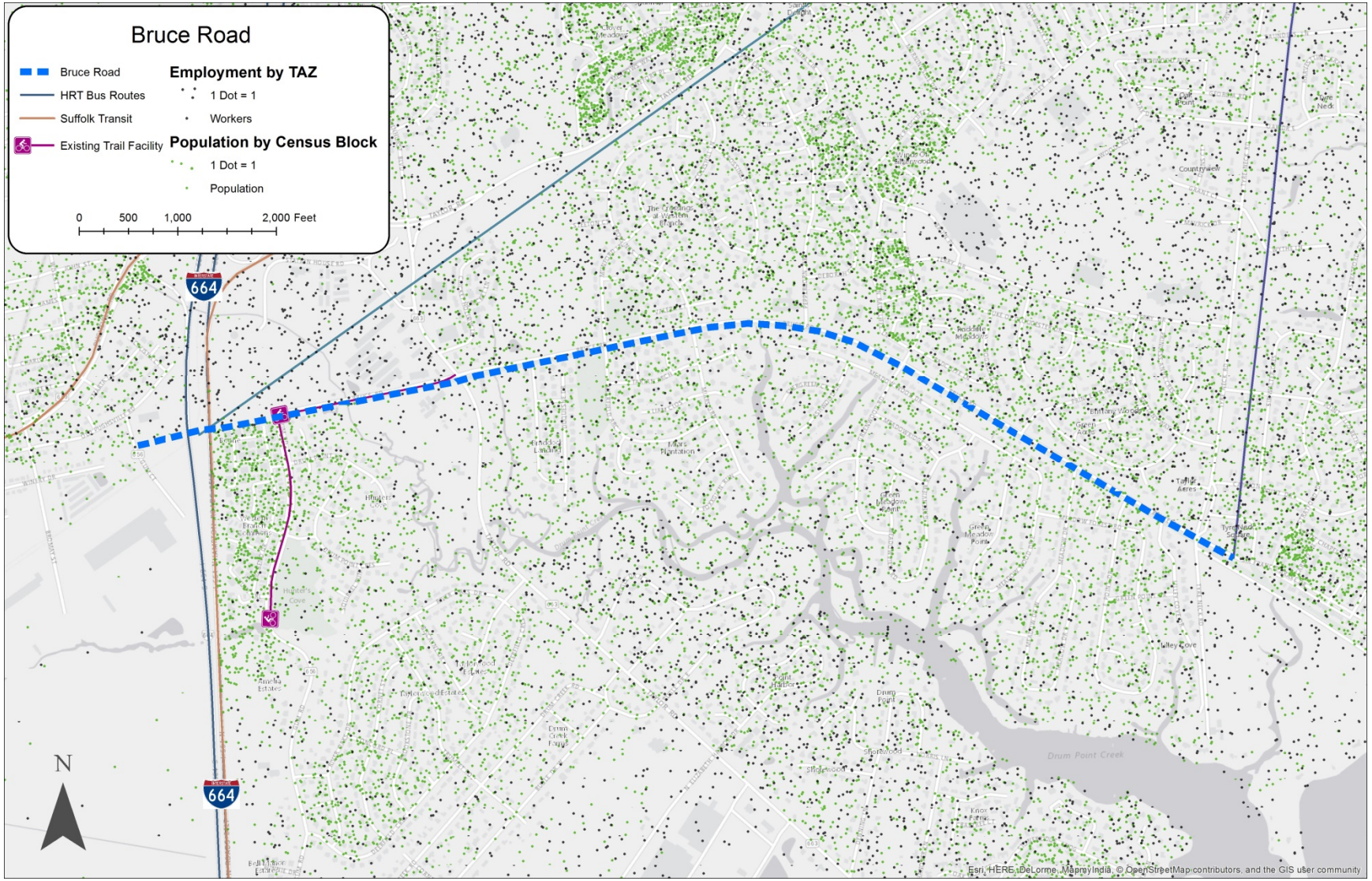


FIGURE 19 Bruce Road- Demographics and Networks

Source: HRTPO staff (BruceRd_demnet.jpg)

The 2.24-mile right-of-way of this candidate, located in Chesapeake, running from Gum Ct to the "Tyre Neck" candidate path, is owned by the City of Chesapeake. It is an existing unpaved public trail (shown on the map of the Commonwealth Railway Trail in Appendix D).

A worn path along Bruce Rd near the intersection with Greenwood Rd

Western terminus of Bruce Rd where worn path continues westward

The Bruce Road candidate rail-trail passes through areas of lower residential and employment density as shown in Figures 18 and 19 above. The area is served by transit from Hampton Roads Transit (HRT), is near major highway access, and would connect with existing bicycle facilities. Additionally, there are four schools and three neighborhood parks near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Bruce Road Trail would cause an increase of 696 active transportation commuters within two miles of the trail. This would increase usage from 384 existing users to a forecasted 1,080 users. Additionally, under the 'Austin Experience' explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $3,000,000. The cost to build this trail would be approximately $1,000,000 excluding cost of ROW and bridges.

Cape Henry Trail
Source: HRTPO

4. Churchland

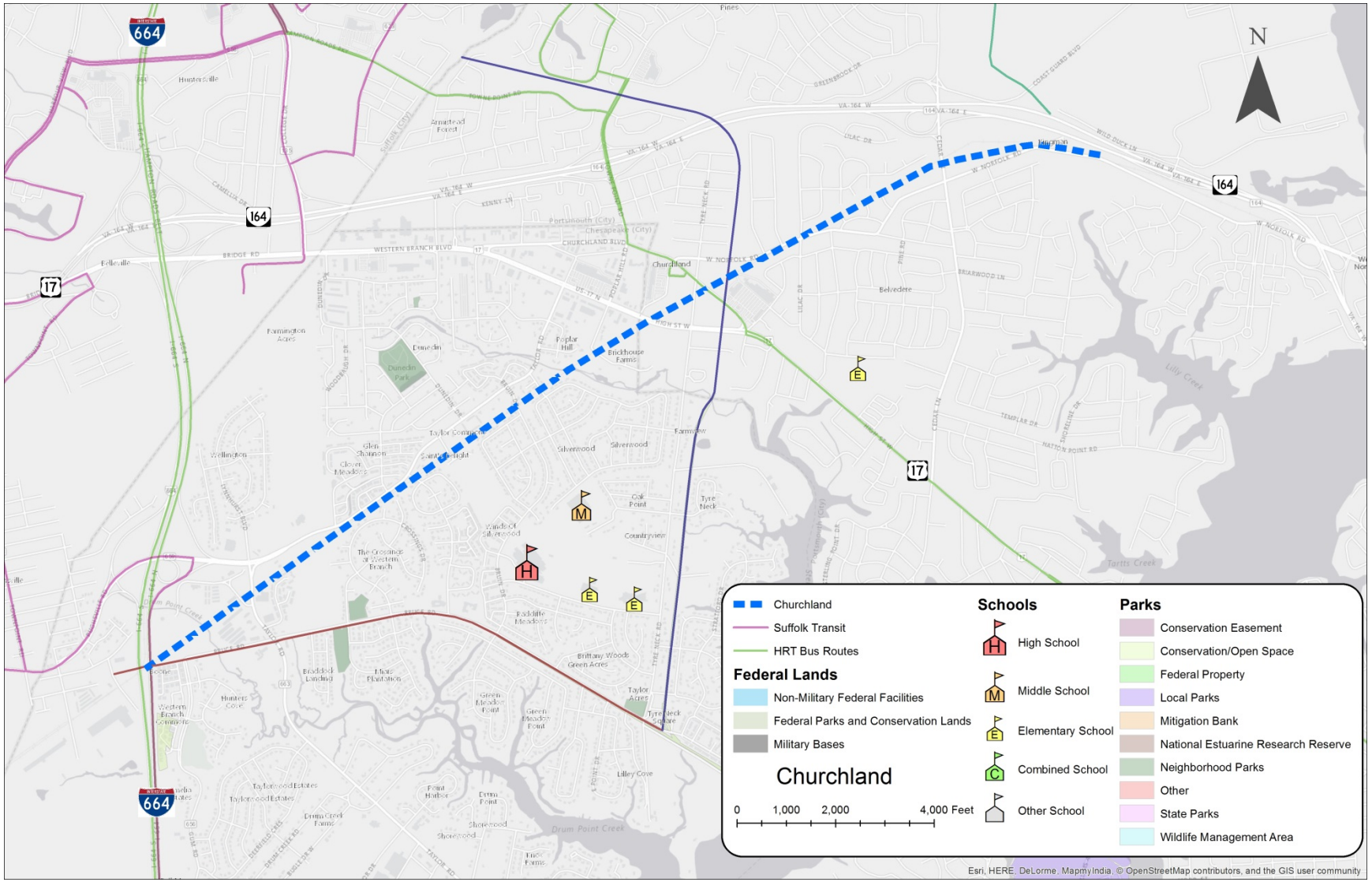


FIGURE 20 Churchland- Public Facilities

Source: HRTPO staff (Churchland.jpg)

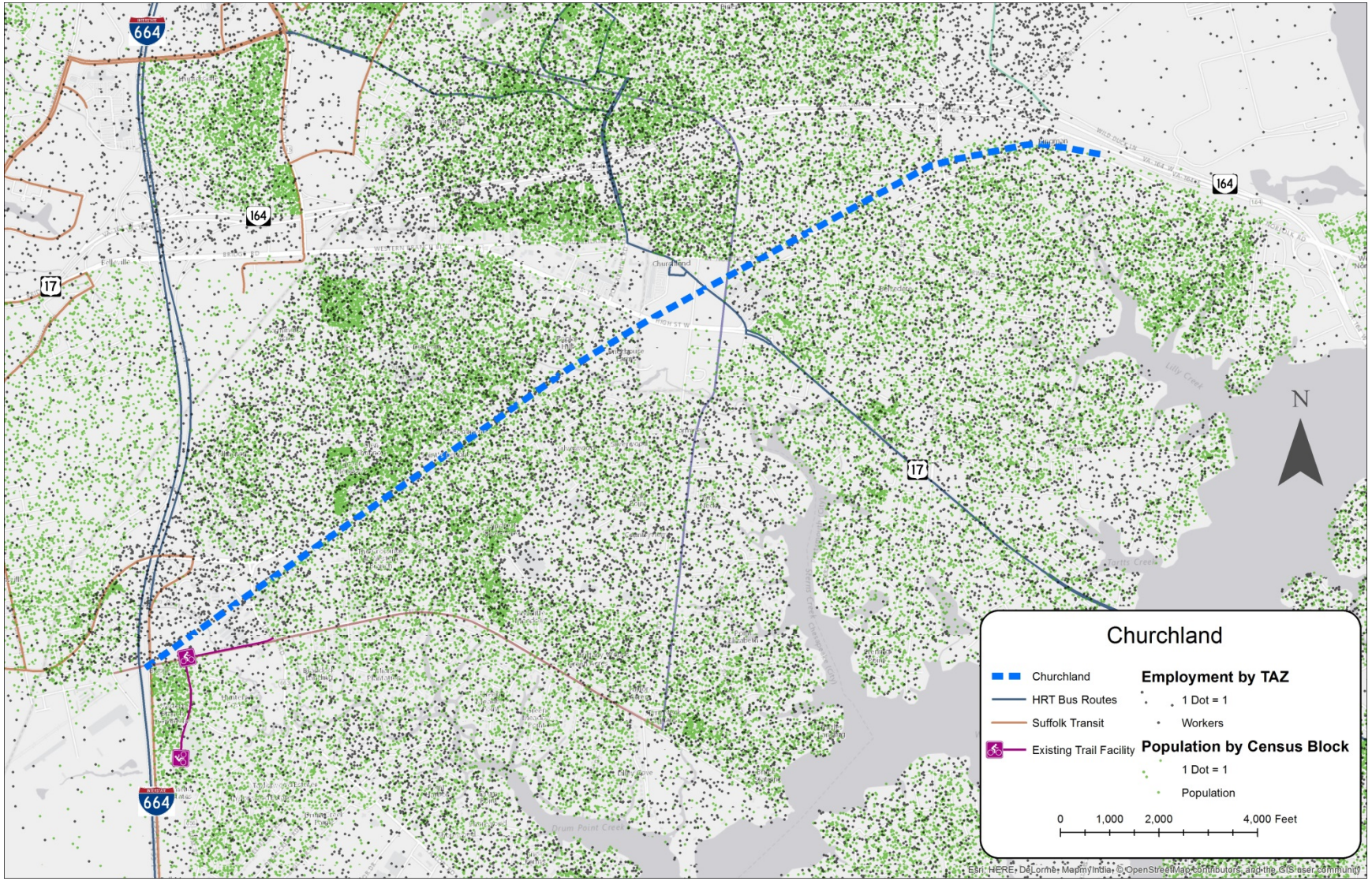


FIGURE 21 Churchland- Demographics and Networks

Source: HRTPO staff (Churchland_demnet.jpg)

The 4.25-mile right-of-way of this candidate, which runs from I-664 in Chesapeake to Old Coast Guard Blvd in Portsmouth, is owned by the Port of Virginia. It is also part of the South Hampton Roads Trail (SHRT), Seaboard Coastline Trail, and Beaches to Bluegrass Trail (B2B) plans. The City of Chesapeake's September 2013 plan for Phase 1 (approximately 2.5 miles) of the Commonwealth Railway Trail in Western Branch is the main portion of this "Churchland" right-of-way (see Appendix D for map of the Commonwealth Railway Trail).

In October 2013, the HRTPO Board endorsed two Transportation Alternatives Program (TAP) funding proposals (endorsement included as Appendix E) to convert the Chesapeake and Portsmouth sections of this right-of-way into a multi-use trail.

The construction of a portion of this candidate path was included in the DRAFT 2040 LRTP Fiscally-Constrained List of Projects (Active Transportation) presented to TTAC on January 6, 2016. The project, named "South Hampton Roads Trail: Western Branch" includes the portion of the Churchland candidate path located between Taylor and Poplar Hill Roads in Chesapeake at a cost of $4.60 million.

Path would cross U.S. 17 (High St) in Portsmouth

Right-of-way aligns with South Hampton Roads and Seaboard Coastline Trails

The Churchland candidate rail-trail passes through areas of moderate residential and employment density as shown in Figures 20 and 21 above. The area is served by transit from Hampton Roads Transit (HRT), is near major highway access, and would connect with existing bicycle facilities. Additionally, there are five schools and four neighborhood parks near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Churchland Trail would cause an increase of 802 active transportation commuters within two miles of the trail. This would increase usage from 749 existing users to a forecasted 1,551 users. Additionally, under the 'Austin Experience' explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $5,000,000. The cost to build this trail would be approximately $2,000,000 excluding cost of ROW and bridges.

5. Churchland High

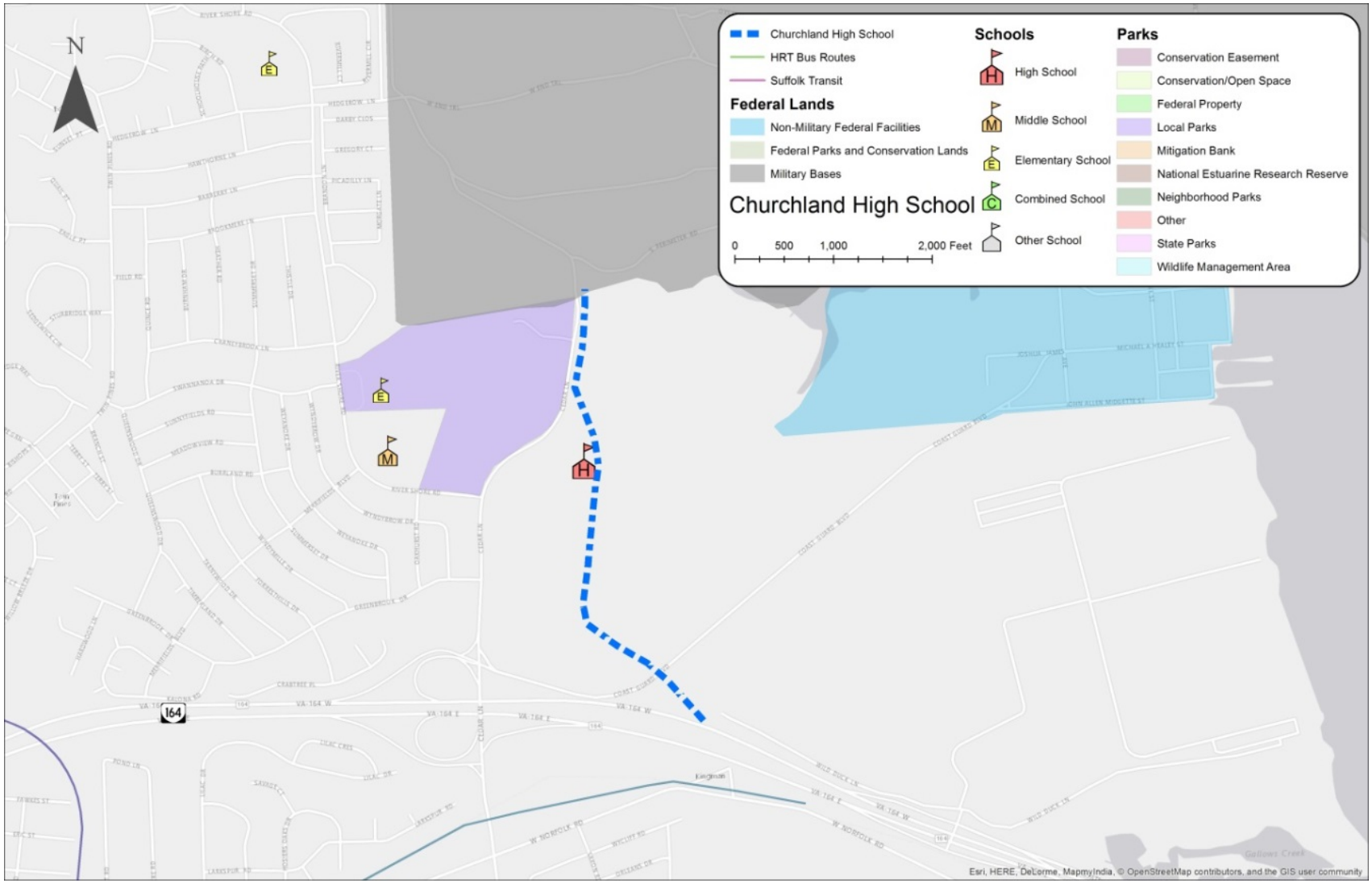


FIGURE 22 Churchland High- Public Facilities

Source: HRTPO staff (ChurchlandHigh.jpg)

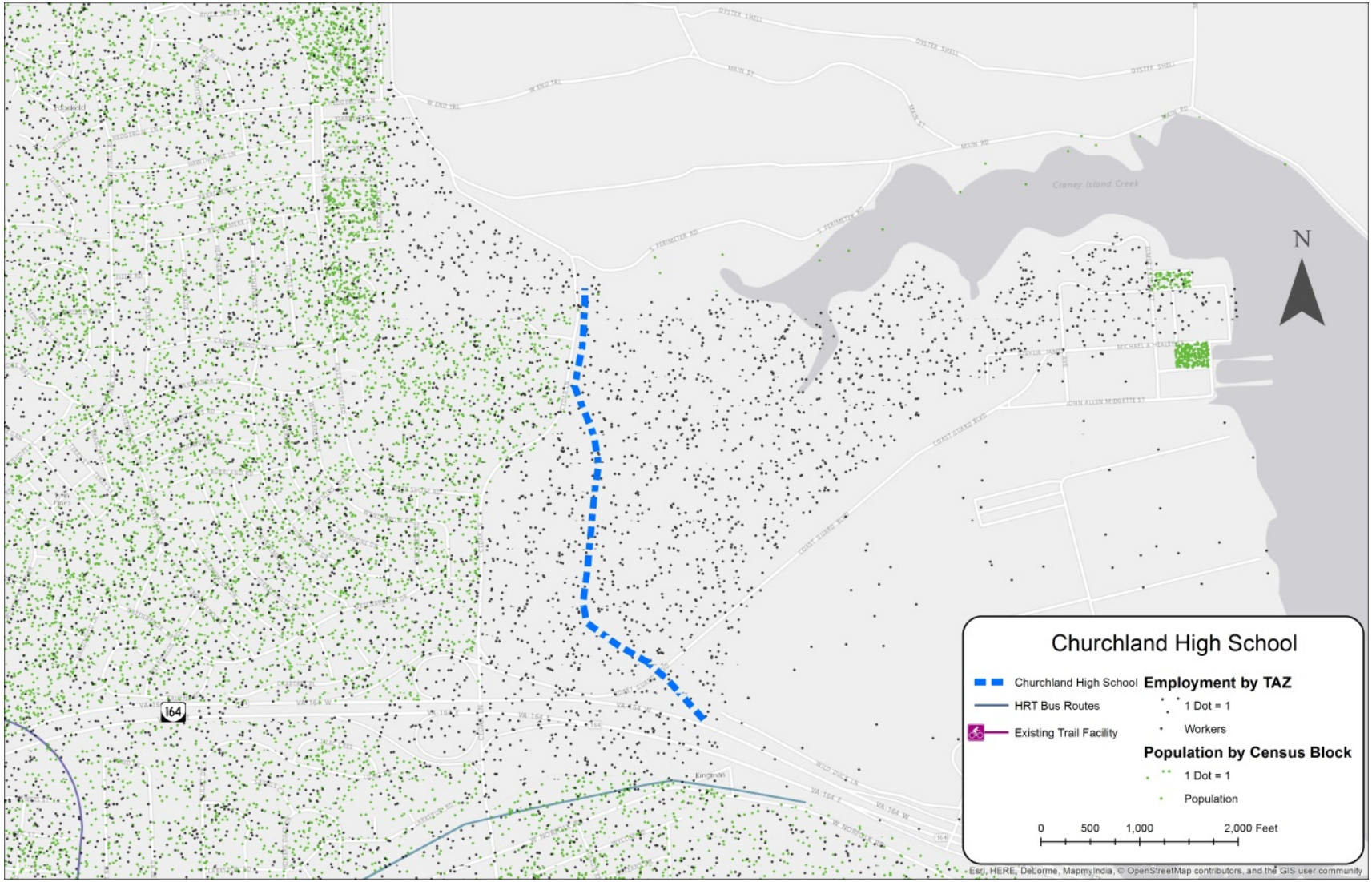


FIGURE 23 Churchland High- Demographics and Networks

Source: HRTPO staff (ChurchlandHigh_demnet.jpg)

The 0.95-mile right-of-way of this candidate, located in Portsmouth, which runs from Western Freeway to the gate of Craney Island Supply Depot, is owned by the Navy.

Right-of-way crosses Coast Guard Blvd in Portsmouth

The Churchland High candidate rail-trail passes through areas of very low residential and low to moderate employment density as shown in Figures 22 and 23 above. The area is not served by transit from Hampton Roads Transit (HRT) but is near major highway access. Additionally, there are three schools, one local park, a non-military Federal facility, and a military base near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Churchland High Trail would cause an increase of 399 active transportation commuters within two miles of the trail. This would increase usage from 554 existing users to a forecasted 953 users. Additionally, under the 'Indianapolis Experience' explained in an earlier section, real estate values within a half-mile of the trail would increase by a total of approximately $18,000,000. The cost to build this trail would be approximately $500,000 excluding cost of ROW and bridges.

6. Courthouse

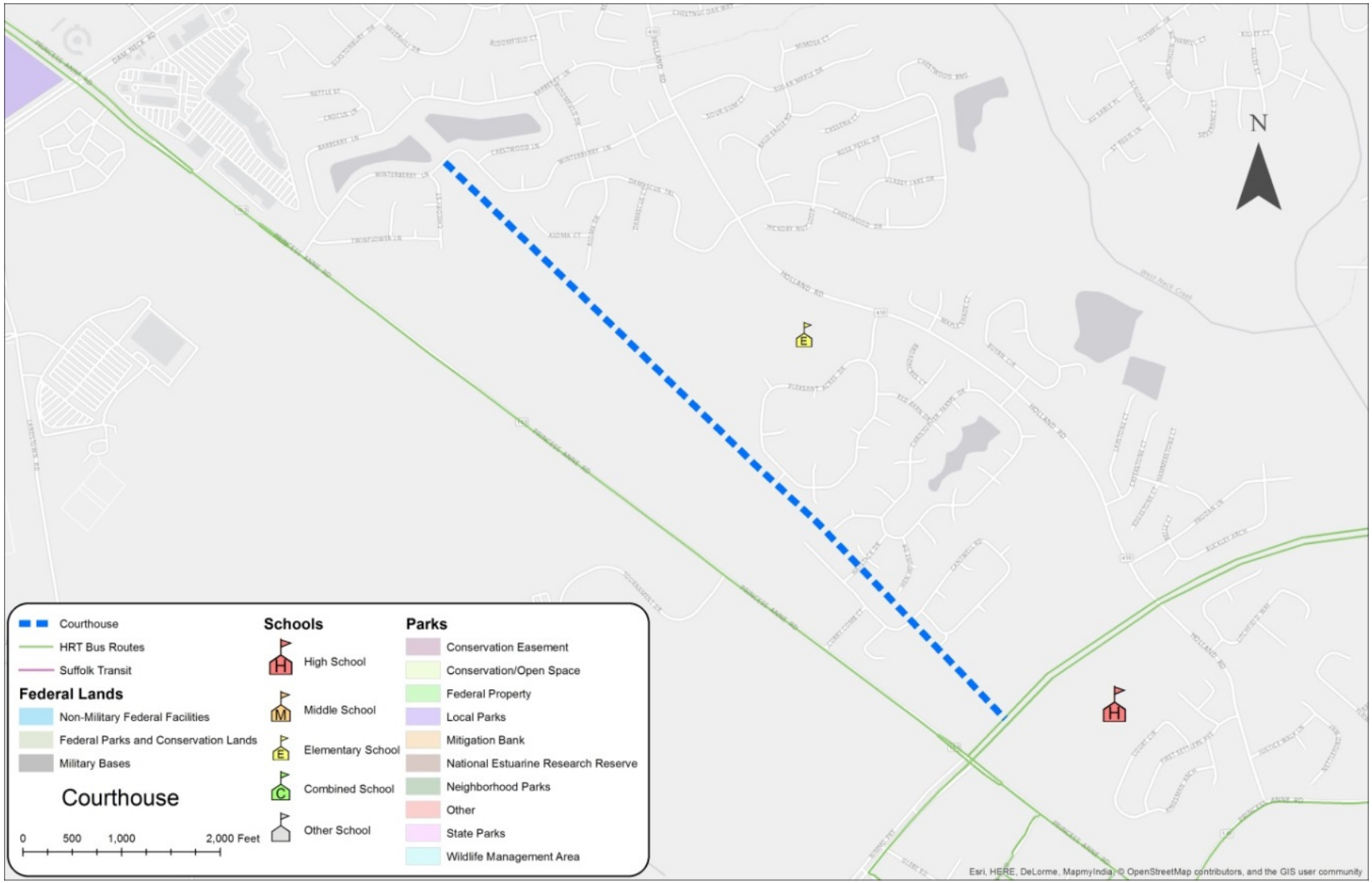


FIGURE 24 Courthouse- Public Facilities

Source: HRTPO staff (Courthouse.jpg)

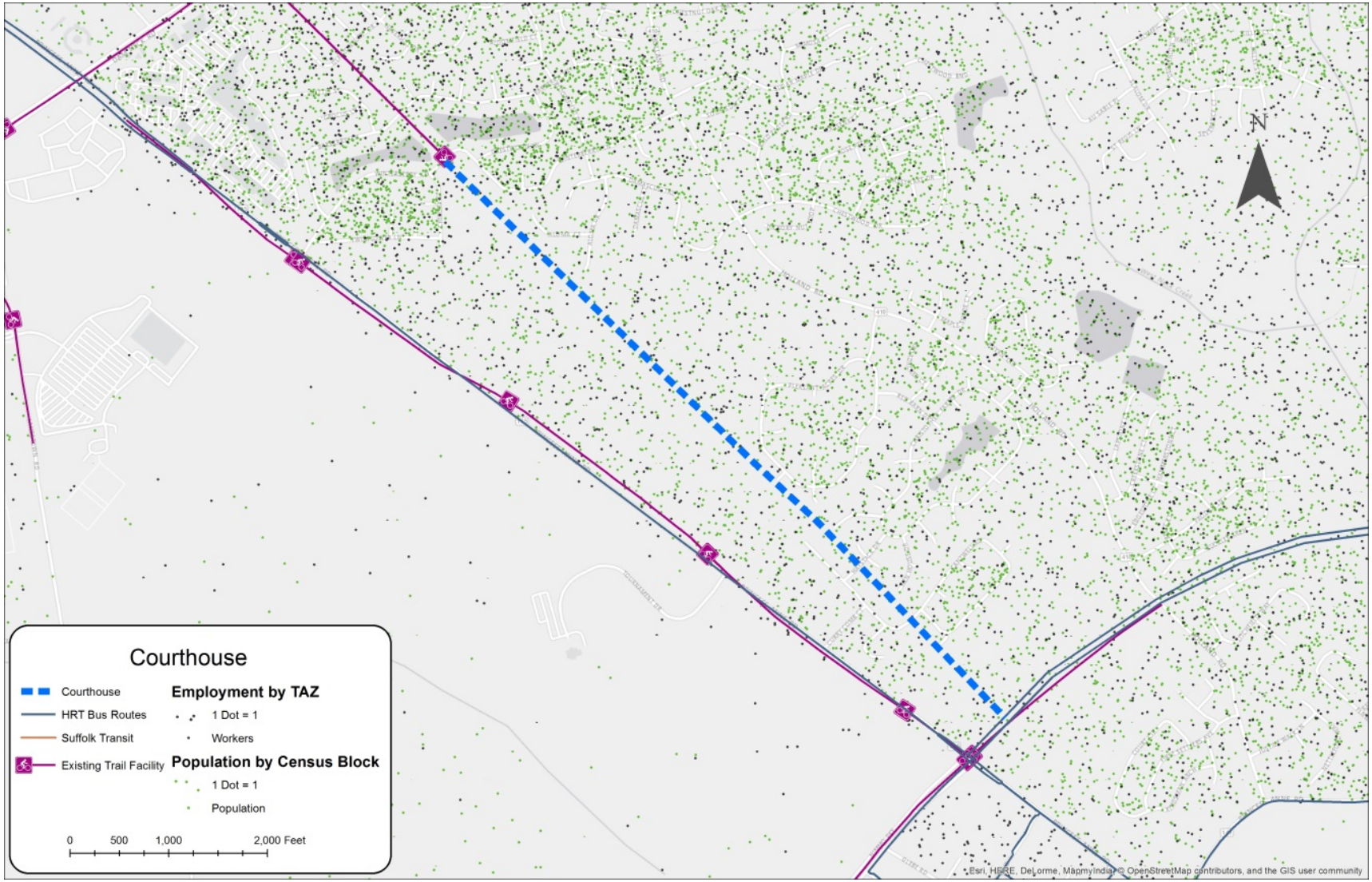


FIGURE 25 Courthouse- Demographics and Networks

Source: HRTPO staff (Courthouse_demnet.jpg)

The 1.52-mile right-of-way of this candidate, which runs from Winterberry Ln to Nimmo Pkwy in Virginia Beach, is owned by Dominion-Virginia Power.

Right-of-way crosses Haystack Dr in Virginia Beach

Path would continue south (image left) where existent path terminates at Winterberry Ln

The Courthouse candidate rail-trail passes through areas of low residential and employment density as shown in Figures 24 and 25 above. The area is served by transit from Hampton Roads Transit (HRT), is near local roadway access and would connect with existing bicycle facilities. Additionally, there are two schools near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Courthouse Trail would cause an increase of 572 active transportation commuters within two miles of the trail. This would increase usage from 206 existing users to a forecasted 778 users. Additionally, under the 'Austin Experience' explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $2,000,000. The cost to build this trail would be approximately $800,000 excluding cost of ROW and bridges.

Trail Markings
Source: HRTPO staff

7. Larkspur

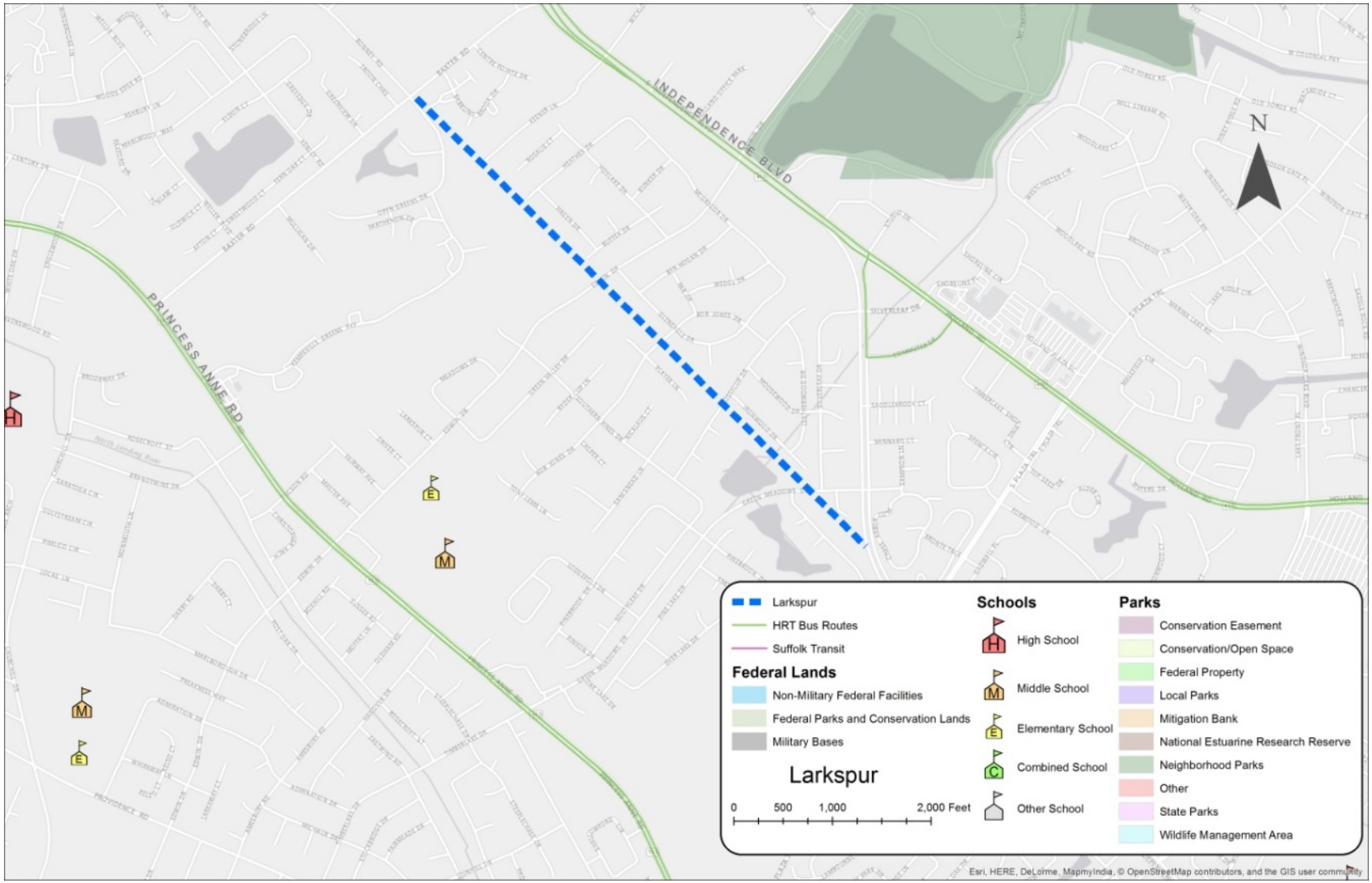


FIGURE 26 Larkspur- Public Facilities

Source: HRTPO staff (Larkspur.jpg)

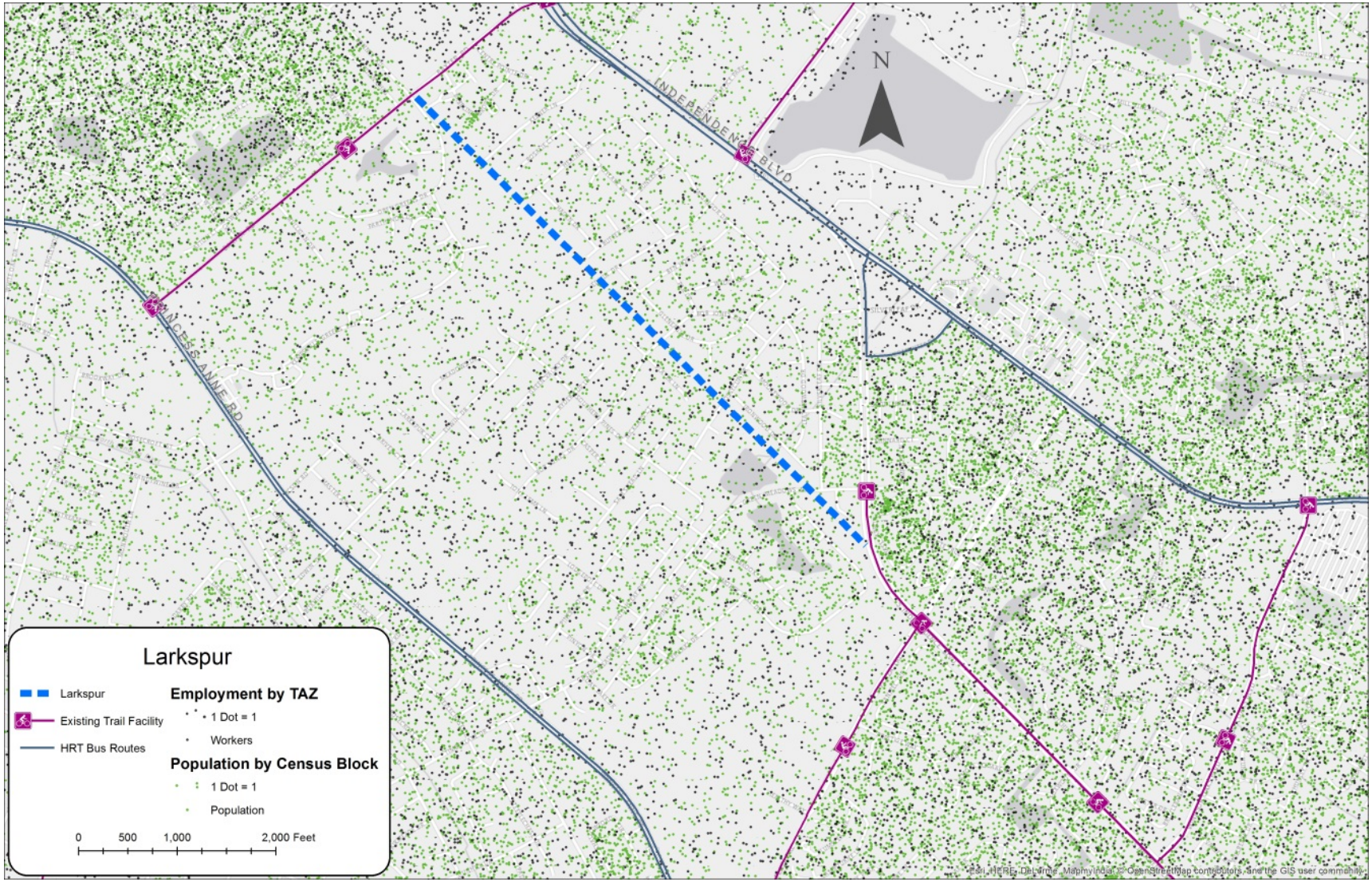


FIGURE 27 Larkspur- Demographics and Networks

Source: HRTPO staff (Larkspur_demnet.jpg)

The 1.22-mile right-of-way of this candidate, which runs from Baxter Rd to Independence Blvd in Virginia Beach, is owned by Dominion-Virginia Power.

Tall overhead power lines in the right-of-way, shown here crossing Green Meadows Dr

Tall overhead power lines in the right-of-way, shown here crossing Edwin Dr

The Larkspur candidate rail-trail passes through areas of lower residential and employment density, but connects two areas or moderate density, as shown in Figures 26 and 27 above. The area is served by transit from Hampton Roads Transit (HRT), is near local roadway access and would connect with existing bicycle facilities. Additionally, there are five schools and a large neighborhood park near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Larkspur Trail would cause an increase of 1,193 active transportation commuters within two miles of the trail. This would increase usage from 804 existing users to a forecasted 1,997 users. Additionally, under the ‘Austin Experience’ explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $5,000,000. The cost to build this trail would be approximately $600,000 excluding cost of ROW and bridges.

8. Norfolk Southern VB

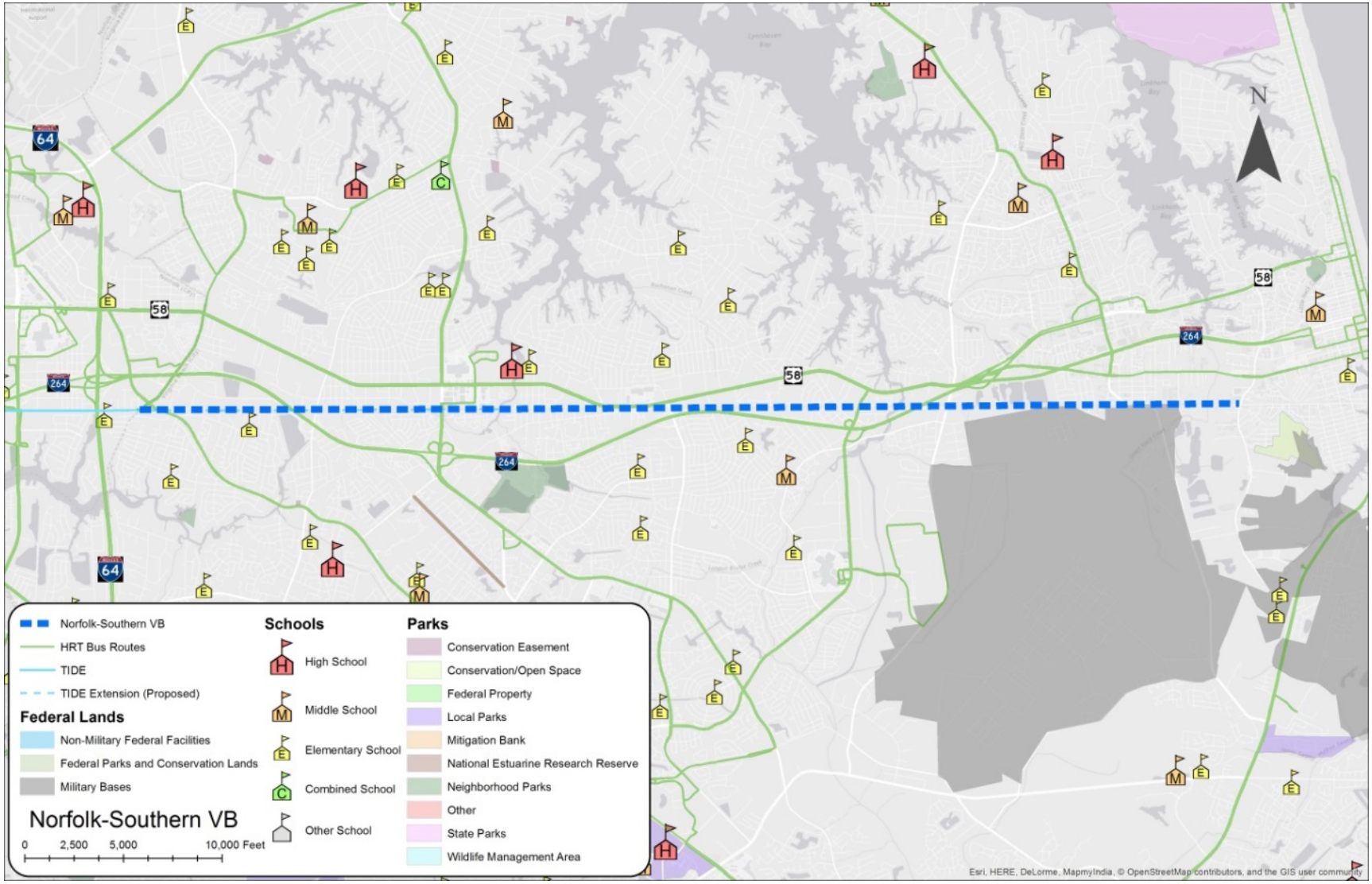


FIGURE 28 Norfolk Southern VB- Public Facilities

Source: HRTPO staff (Norfolk-Southern_VB.jpg)

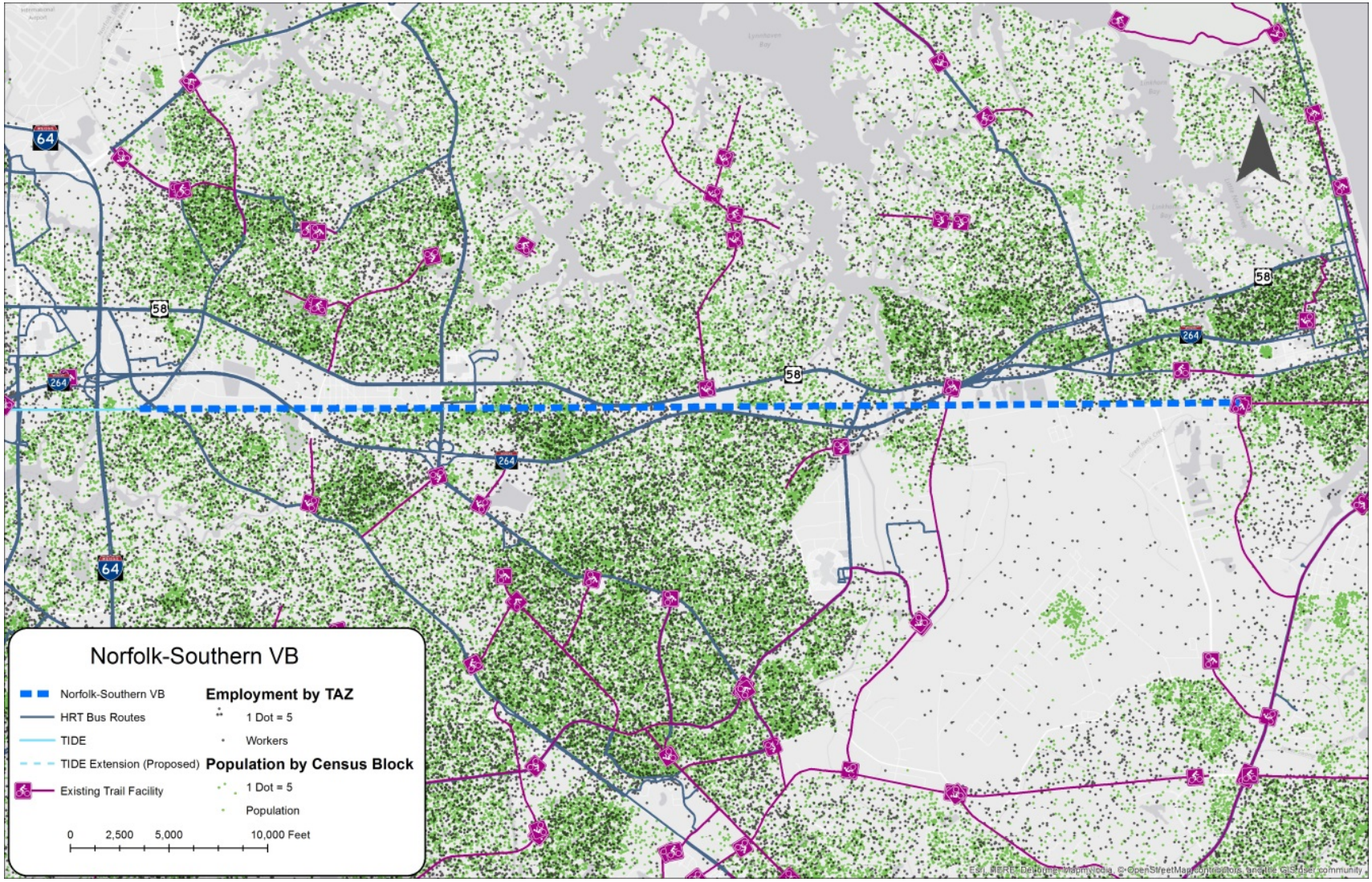


FIGURE 29 Norfolk Southern VB- Demographics and Networks

Source: HRTPO staff (Norfolk-Southern_VB_demnet.jpg)

The 10.55-mile right-of-way of this candidate, which runs between the Norfolk/Virginia Beach line and Birdneck Rd in Virginia Beach, is owned by the City of Virginia Beach. It is also part of the South Hampton Roads Trail (SHRT) and Beaches to Bluegrass Trail (B2B) plans. On December 11, 2007, the Virginia Beach City Council adopted an ordinance authorizing use of this right-of-way for "public transportation, linear park, multi-use trail, public utilities, parking and/or other public purposes to improve transportation within the City and for other related public purposes for the preservation of the safety, health, peace, good order, comfort, convenience, and for the welfare of the people in the City of Virginia Beach" (ordinance included as Appendix C).

The construction of this entire candidate path was included in the DRAFT 2040 LRTP Fiscally-Constrained List of Projects (Active Transportation) presented to TTAC on January 6, 2016. The LRTP project is named "South Hampton Roads Trail: Virginia Beach (Bike Trails/Lanes Along Light Rail Tracks" and runs from the Norfolk/VB line to the oceanfront, costing $8.62 million.

Current light rail terminus near the intersection of Newtown Rd and Curlew Dr

Right-of-way passes under I-264 near Greenwich Rd in Virginia Beach

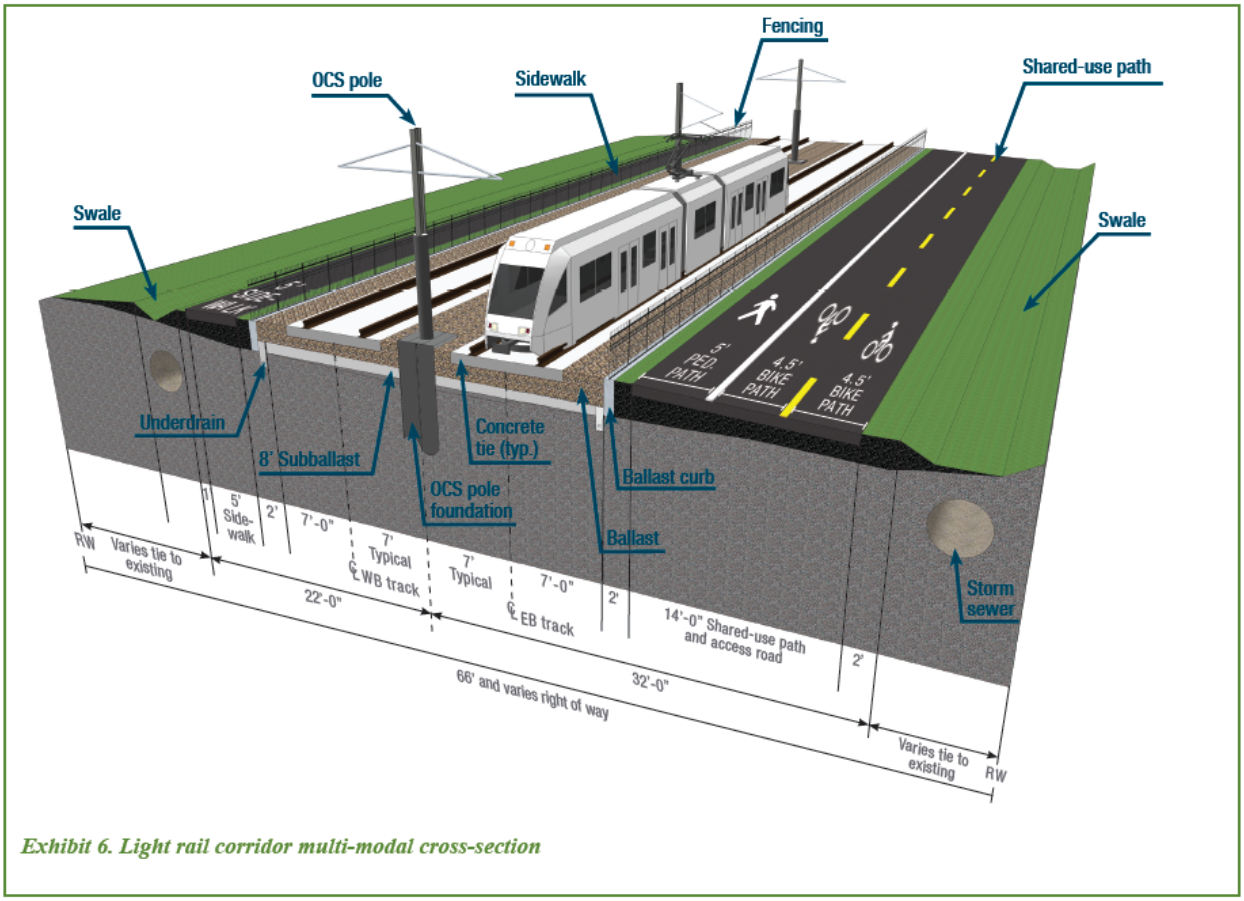


Exhibit 6. Light rail corridor multi-modal cross-section

Source: City of Virginia Beach

The Norfolk-Southern VB candidate rail-trail passes through areas of very high residential and employment density, as shown in Figures 28 and 29 above. [Note: 1 dot for Workers or Population equals five people in this example. Maps for all other candidates use one dot for one person.] The area is served by transit, including the TIDE light rail from Hampton Roads Transit (HRT), is near major highway access, and would connect with existing bicycle facilities. Additionally, there are over 15 schools, a large neighborhood park, and a military base near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Norfolk-Southern VB Trail would cause an increase of 2,197 active transportation commuters within two miles of the trail. This would increase usage from 3,876 existing users to a forecasted 6,073 users. Additionally, under the 'Austin Experience' explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $12,000,000. The cost to build this trail would be approximately $5,000,000 excluding cost of ROW and bridges.

9. Penniman

FIGURE 30 Penniman- Public Facilities

Source: HRTPO staff (Penniman.jpg)

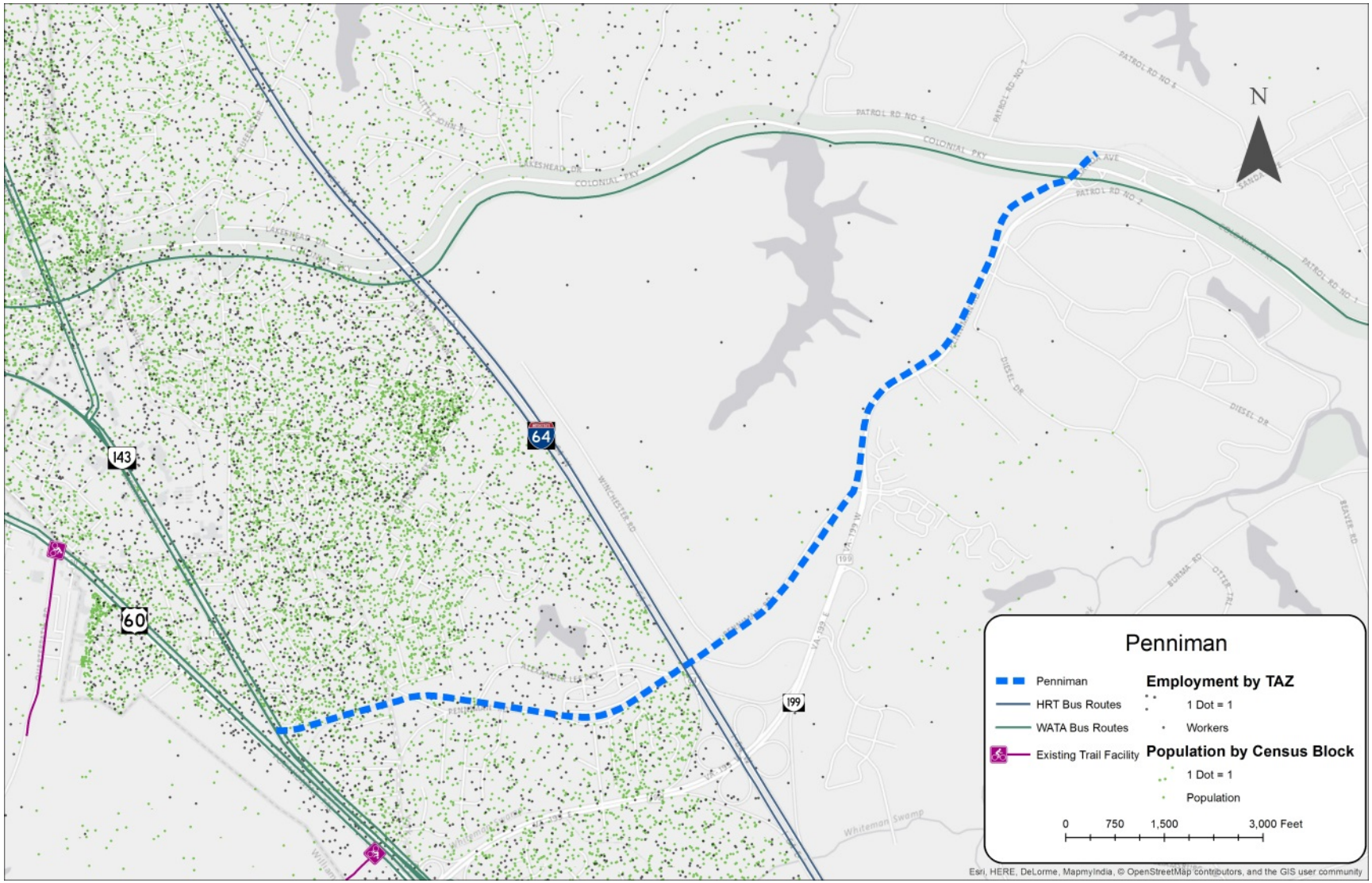


FIGURE 31 Penniman- Demographics and Networks

Source: HRTPO staff (Penniman_demnet.jpg)

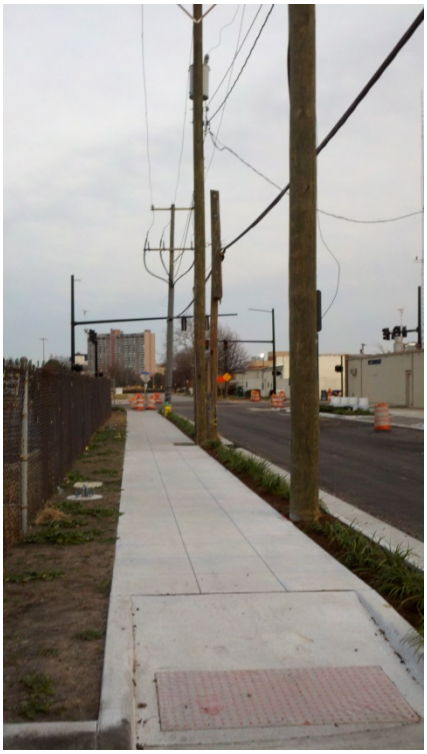
The 3.21-mile right-of-way of this candidate runs from Merrimac Trail in James City County to Leusseur Rd in York County, and is owned by the U.S. Navy. The York County planning department has discussed with Navy the possibility of using their right-of-way for the purpose of a bike and pedestrian path. The western half of this right-of-way is listed as a “Proposed Multi-Use Path” on the Historic Triangle Regional Bikeway Plan, last updated in 2013.

Inactive rails in right-of-way crossing Oak Dr in James City County

Worn path where right-of-way passes under I-64 along Penniman Rd in York County

The Penniman candidate rail-trail passes through areas of lower residential and employment density, as shown in Figures 30 and 31 above. The area is served by transit from the Williamsburg Area Transit Authority (WATA), is near major highway access, and would connect with existing bicycle facilities. Additionally, there are two schools, a large neighborhood park, local parks, and two military bases near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Penniman Trail would cause an increase of 143 active transportation commuters within two miles of the trail. This would increase usage from 199 existing users to a forecasted 342 users. Additionally, under the 'Austin Experience' explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $1,000,000. The cost to build this trail would be approximately $2,000,000 excluding cost of ROW and bridges.



Trail in Norfolk
Source: HRTPO staff

10. Seaboard – Phase 3

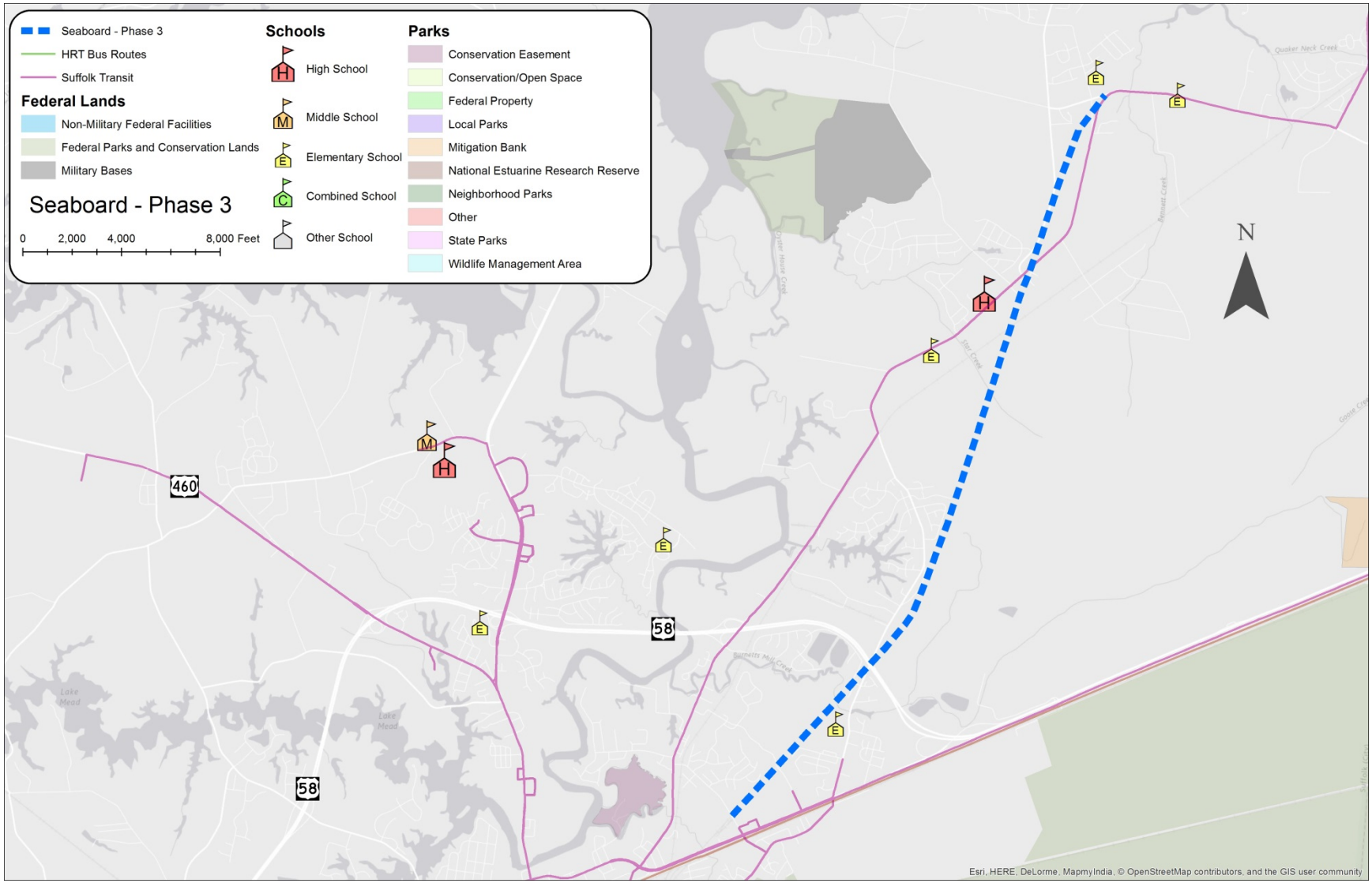


FIGURE 32 Seaboard – Phase 3- Public Facilities

Source: HRTPO staff (Seaboard.jpg)

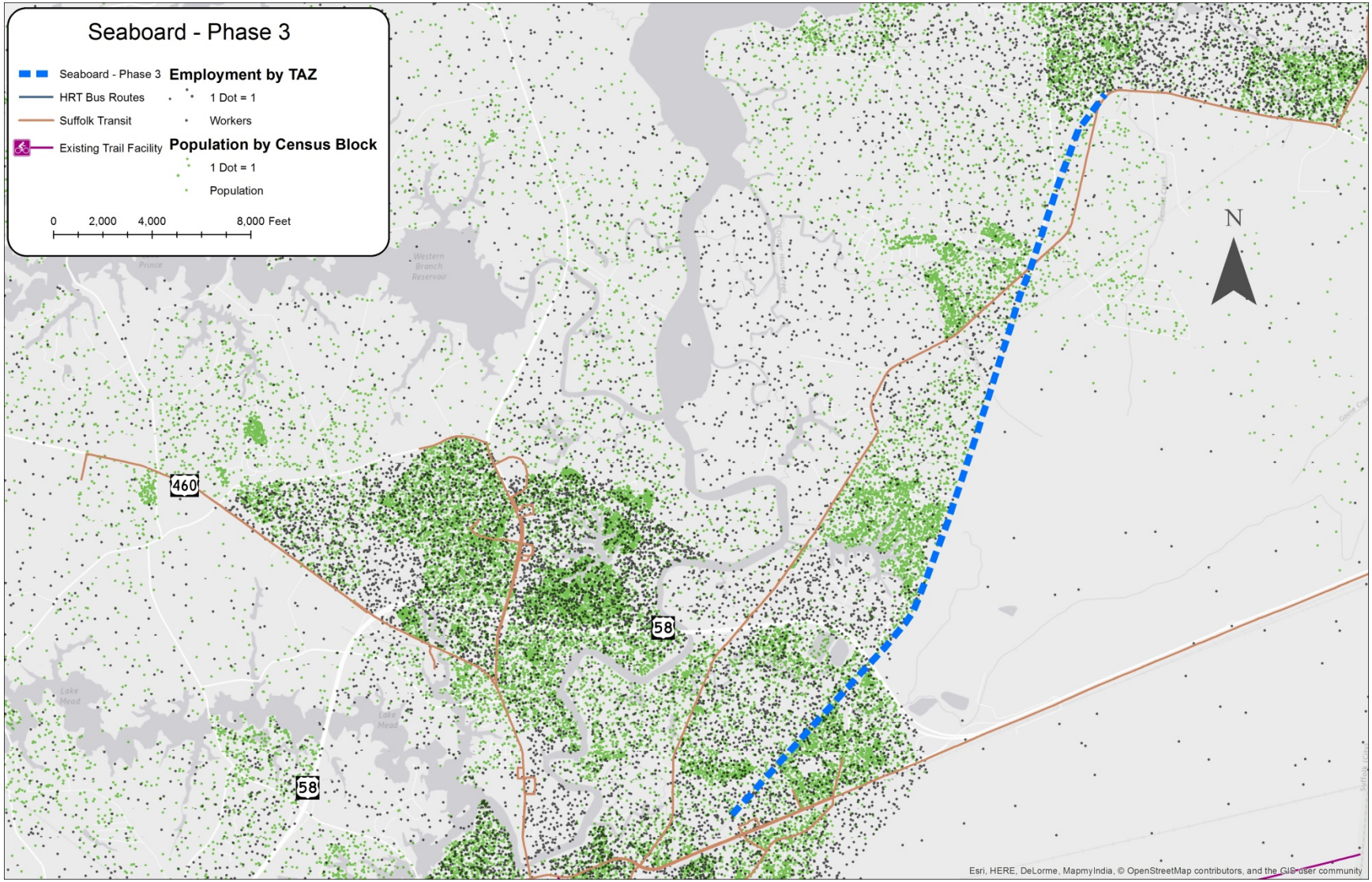


FIGURE 33 Seaboard – Phase 3- Demographics and Networks

Source: HRTPO staff (Seaboard_demnet.jpg)

The 6.34-mile right-of-way of this candidate, located in Suffolk, which runs from Suburban Dr to Kings Hwy where it adjoins the existing Phase 1 of the Seaboard Coastline Trail (depicted below), is owned by the City of Suffolk. Because this inactive right-of-way crosses an active rail line near Nansemond River High School, the City is considering redirecting the proposed path to use Sportsman Blvd (which crosses the active railroad).

This candidate path is part of the South Hampton Roads Trail (SHRT) and Beaches to Bluegrass Trail (B2B) plans. This path also lies within a project listed on the DRAFT 2040 LRTP Fiscally-Constrained List of Projects (Active Transportation) presented to TTAC on January 6, 2016. The project, named "Rail-to-Trail (Suffolk Seaboard Coastline Trail, part of the South Hampton Roads Trail)," would be entirely in Suffolk and stretch from Pughsville Rd to Downtown Suffolk at a cost of $6.75 million.

Entrance to the Suffolk Seaboard Coastline Trail
Source: Joe Tennis photo, Suffolk News-Herald (Nov. 13, 2014)

Right-of-way along Nansemond Pkwy as it approaches Suffolk Bypass overpass in Suffolk

The Seaboard – Phase 3 candidate rail-trail passes through areas of moderate residential and employment density, as shown in Figures 32 and 33 above. The area is served by transit from Suffolk Transit and is near highway access. Additionally, there are five schools, a large neighborhood park, and a military facility near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Seaboard – Phase 3 Trail would cause an increase of 289 active transportation commuters within two miles of the trail. This would increase usage from 169 existing users to a forecasted 458 users. Additionally, under the 'Austin Experience' explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $1,000,000. The cost to build this trail would be approximately $3,000,000 excluding cost of ROW and bridges.

11. Southern

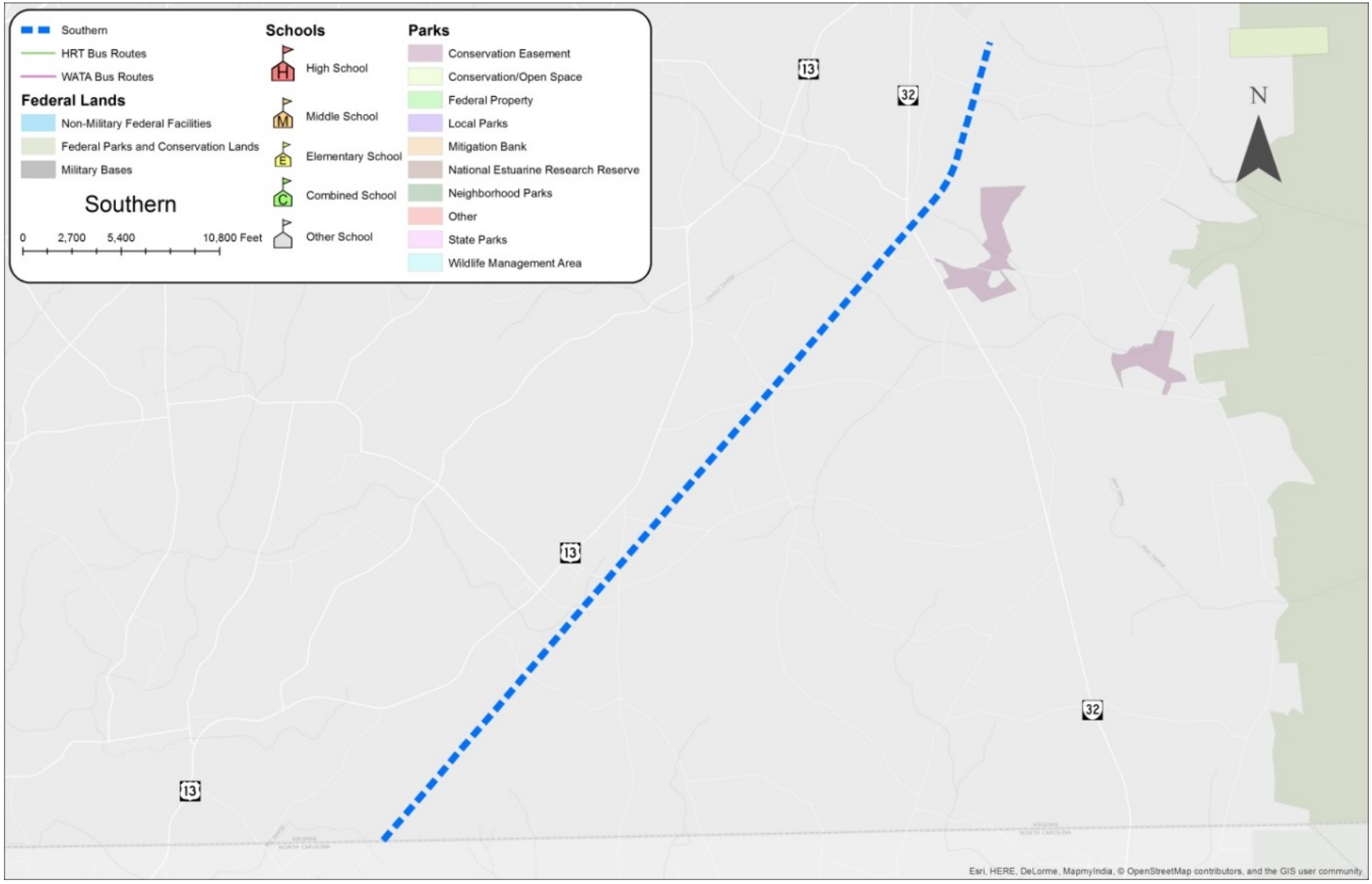


FIGURE 34 Southern- Public Facilities

Source: HRTPO staff (Southern.jpg)

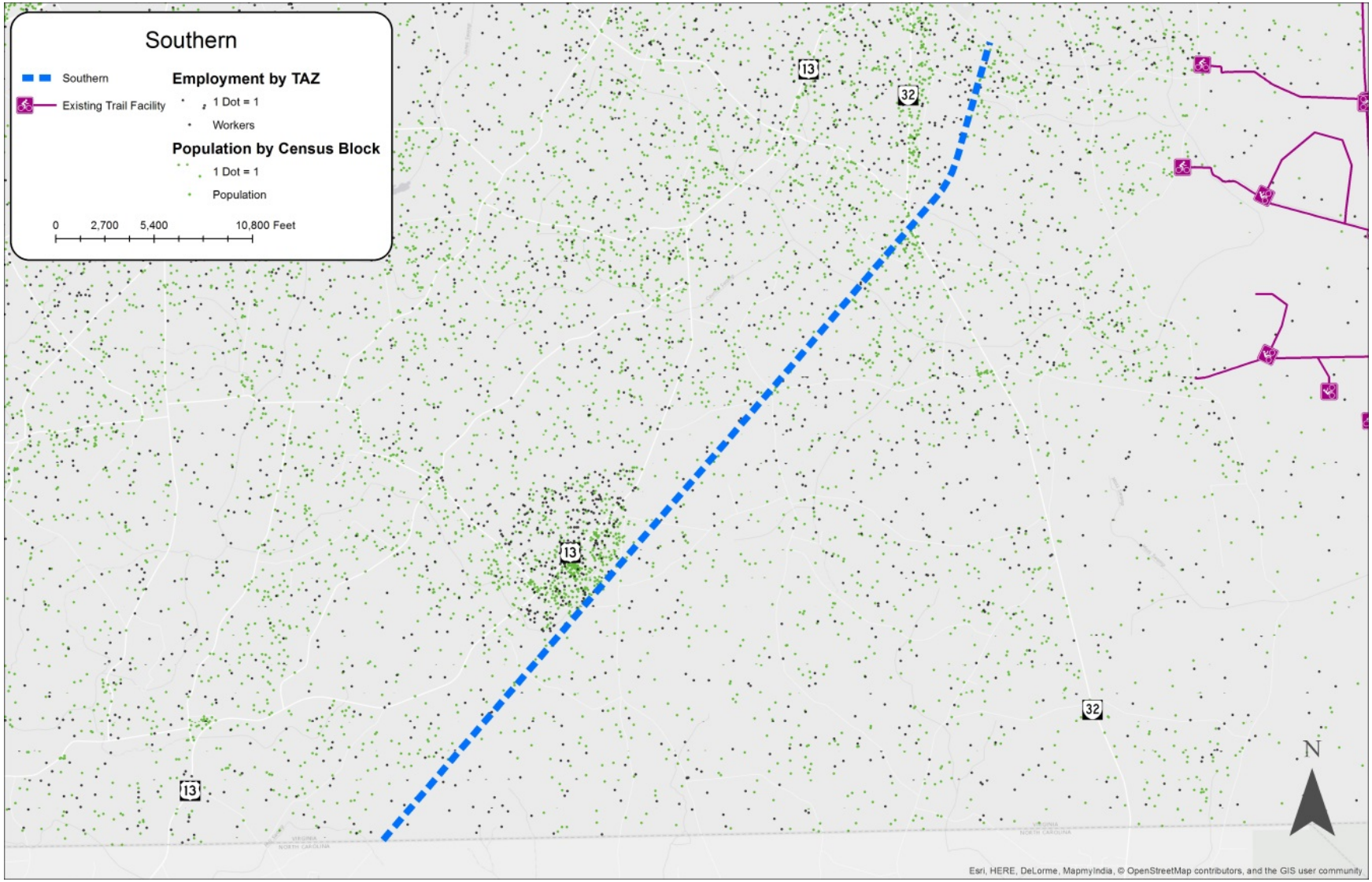


FIGURE 35 Southern- Demographics and Networks

Source: HRTPO staff (Southern_demnet.jpg)

The 10.53-mile right-of-way of this candidate, located in Suffolk, which runs from Meadow Country Rd to the NC/VA line, is owned by CSX in some portions, and by various private individuals in others. According to CSX, “there would be some significant connectivity issues to other trails” due to the presence of Cameron Chemicals along the active portion of this track, which is located near the northern end of this potential path.

Gravel right-of-way crossing Meadow Country Rd near terminus of potential path

Right-of-way heavily wooded as it crosses Carolina Rd in Suffolk

The Southern candidate rail-trail passes through areas of very low residential and employment density, as shown in Figures 34 and 35 above. The area is not served by transit, but is near local highway access. There is one conservation easement near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Southern Trail would cause an increase of 25 active transportation commuters within two miles of the trail. This would increase usage from 12 existing users to a forecasted 37 users. Additionally, under the 'Austin Experience' explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $500,000. The cost to build this trail would be approximately $5,000,000 excluding cost of ROW and bridges.

12. Tyre Neck

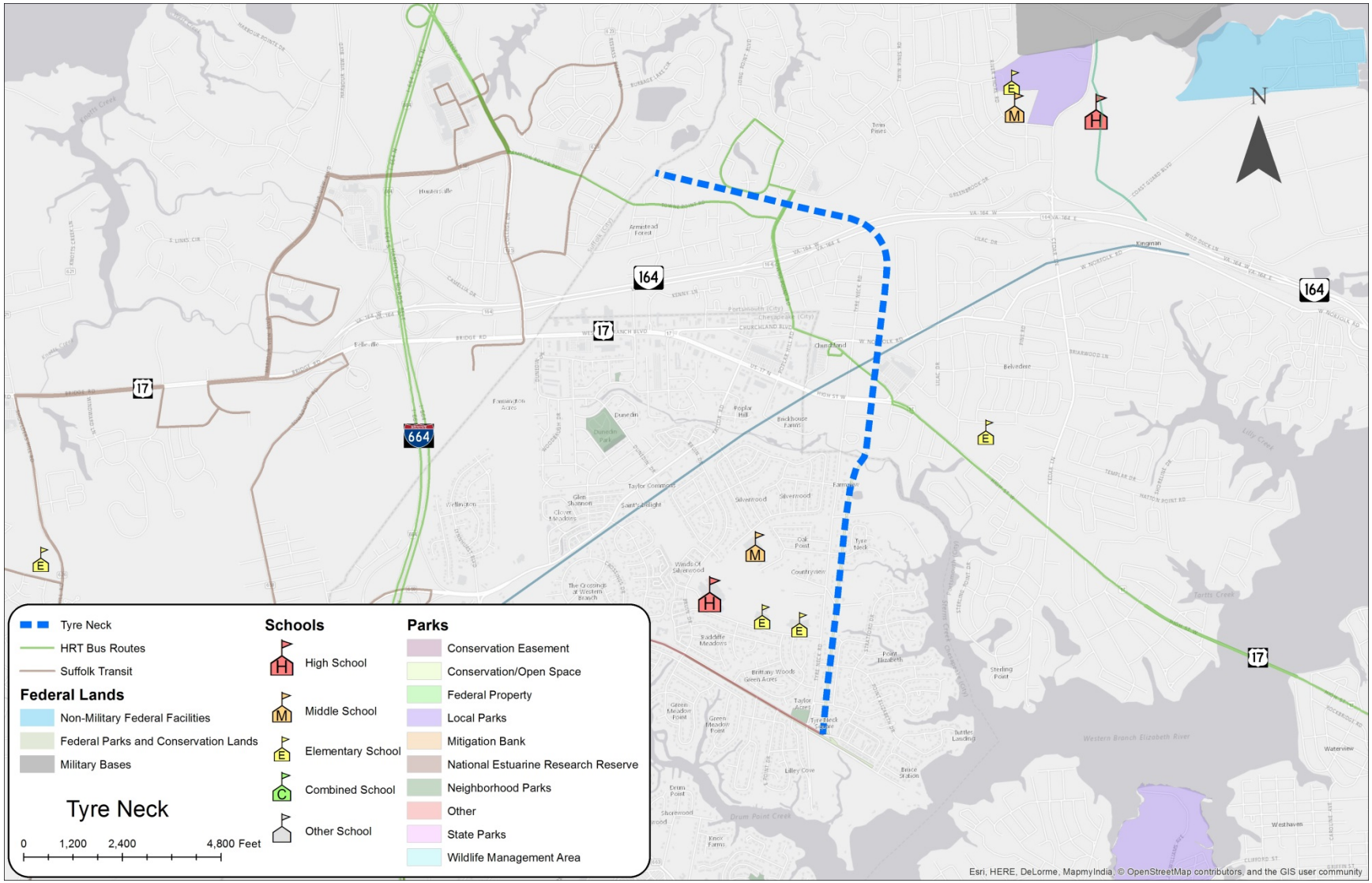


FIGURE 36 Tyre Neck- Public Facilities

Source: HRTPO staff (TyreNeck.jpg)

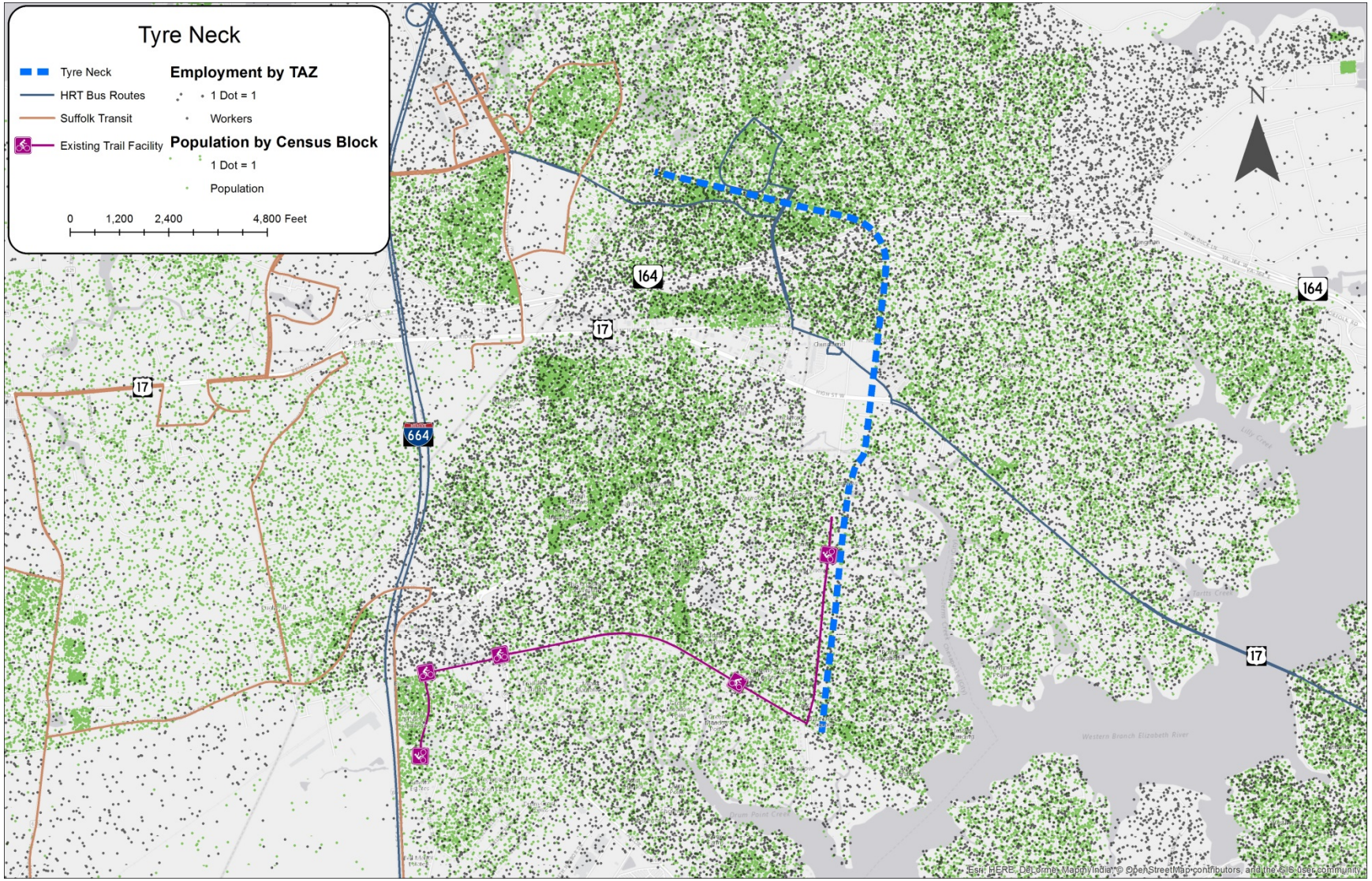
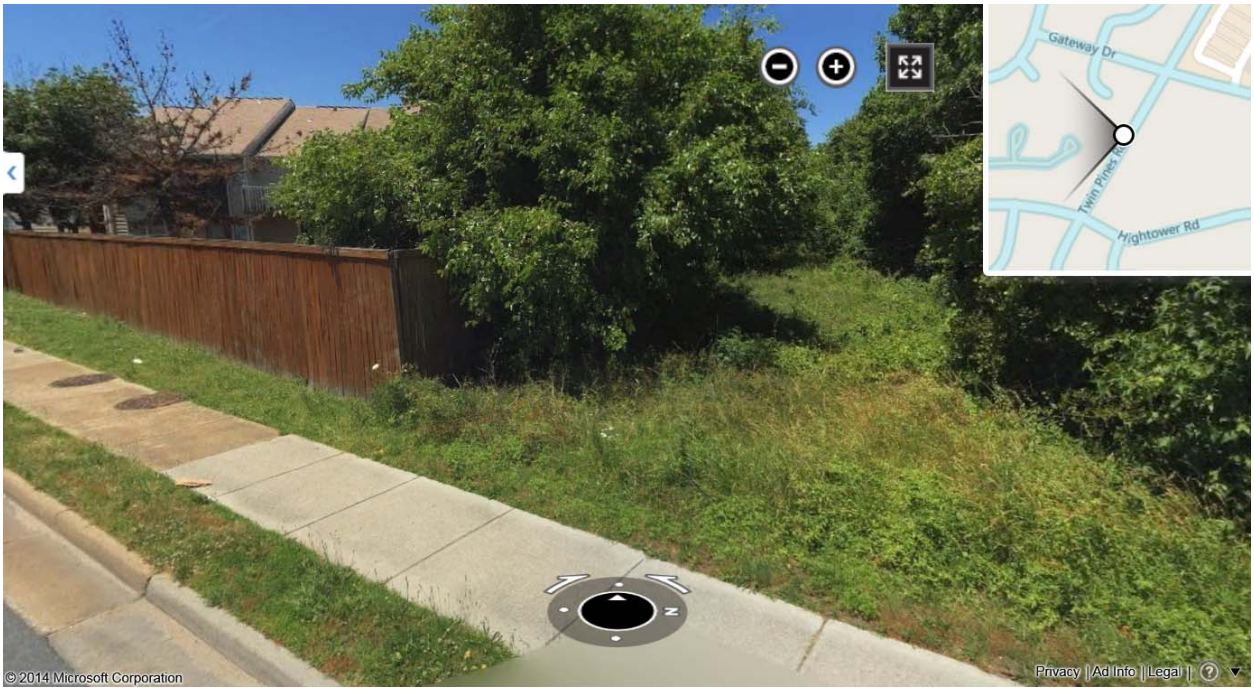


FIGURE 37 Tyre Neck- Demographics and Networks

Source: HRTPO staff (TyreNeck_demnet.jpg)

The 3.41-mile right-of-way of this candidate, which runs from the “Bruce Rd” candidate path in Chesapeake to the Suffolk/Portsmouth line, is owned by each respective city in which it lies. In Chesapeake, it is an existing unpaved public trail (shown on the map of the Commonwealth Railway Trail in Appendix D).



Heavily wooded right-of-way crossing Twin Pines Rd in Portsmouth

Right-of-way crosses Churchland Blvd in Portsmouth

The Tyre Neck candidate rail-trail passes through areas of moderate residential and employment density, as shown in Figures 36 and 37 above. The area is served by transit from Hampton Roads Transit (HRT), is near major highway access, and would connect with existing bicycle facilities. Additionally, there are four schools and a neighborhood park near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Tyre Neck Trail would cause an increase of 862 active transportation commuters within two miles of the trail. This would increase usage from 814 existing users to a forecasted 1,676 users. Additionally, under the 'Austin Experience' explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $4,000,000. The cost to build this trail would be approximately $2,000,000 excluding cost of ROW and bridges.

Trail, Virginia Beach
Source: HRTPO staff

13. Virginian-East

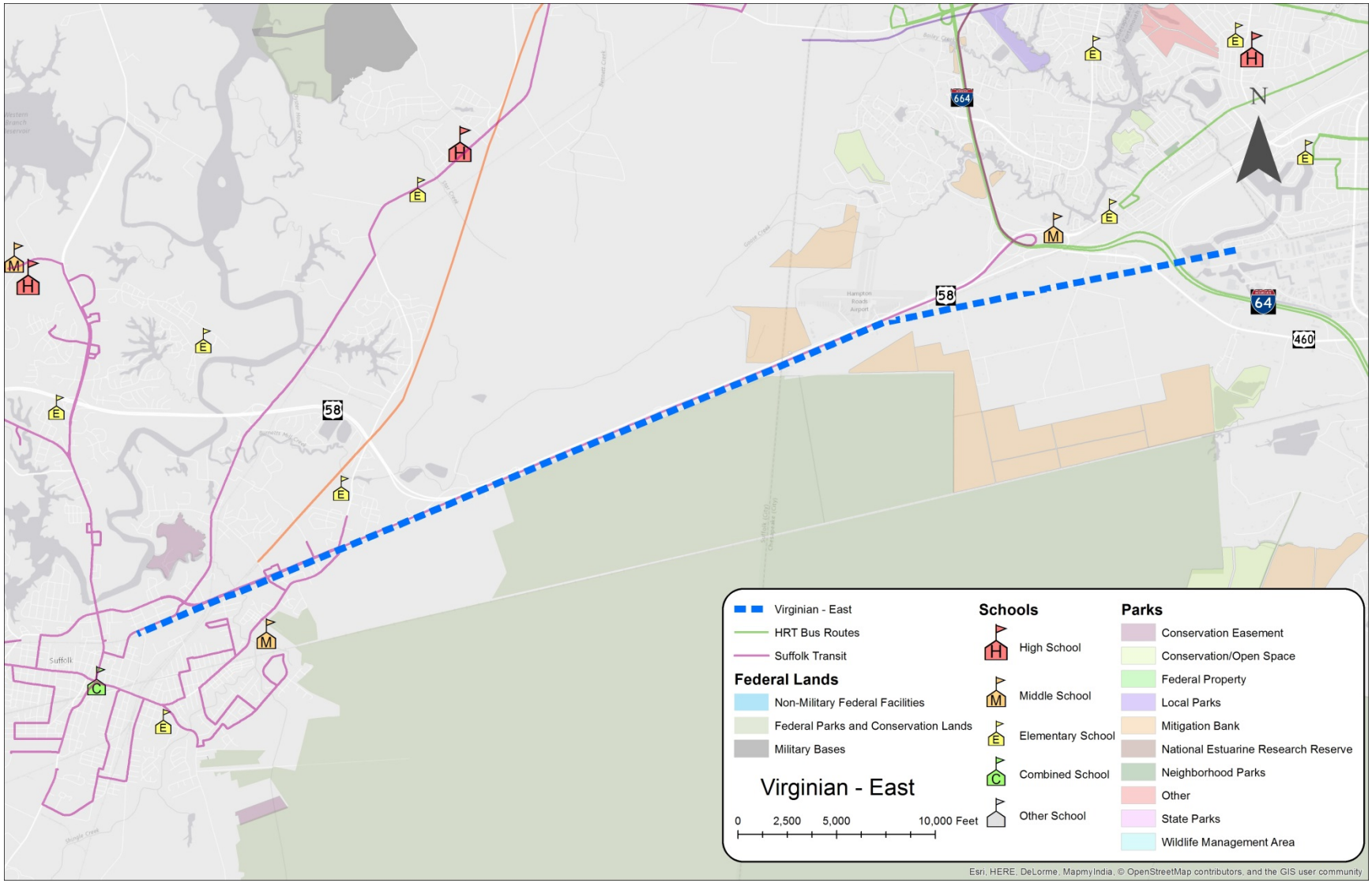


FIGURE 38 Virginian-East- Public Facilities

Source: HRTPO staff (Virginian-East.jpg)

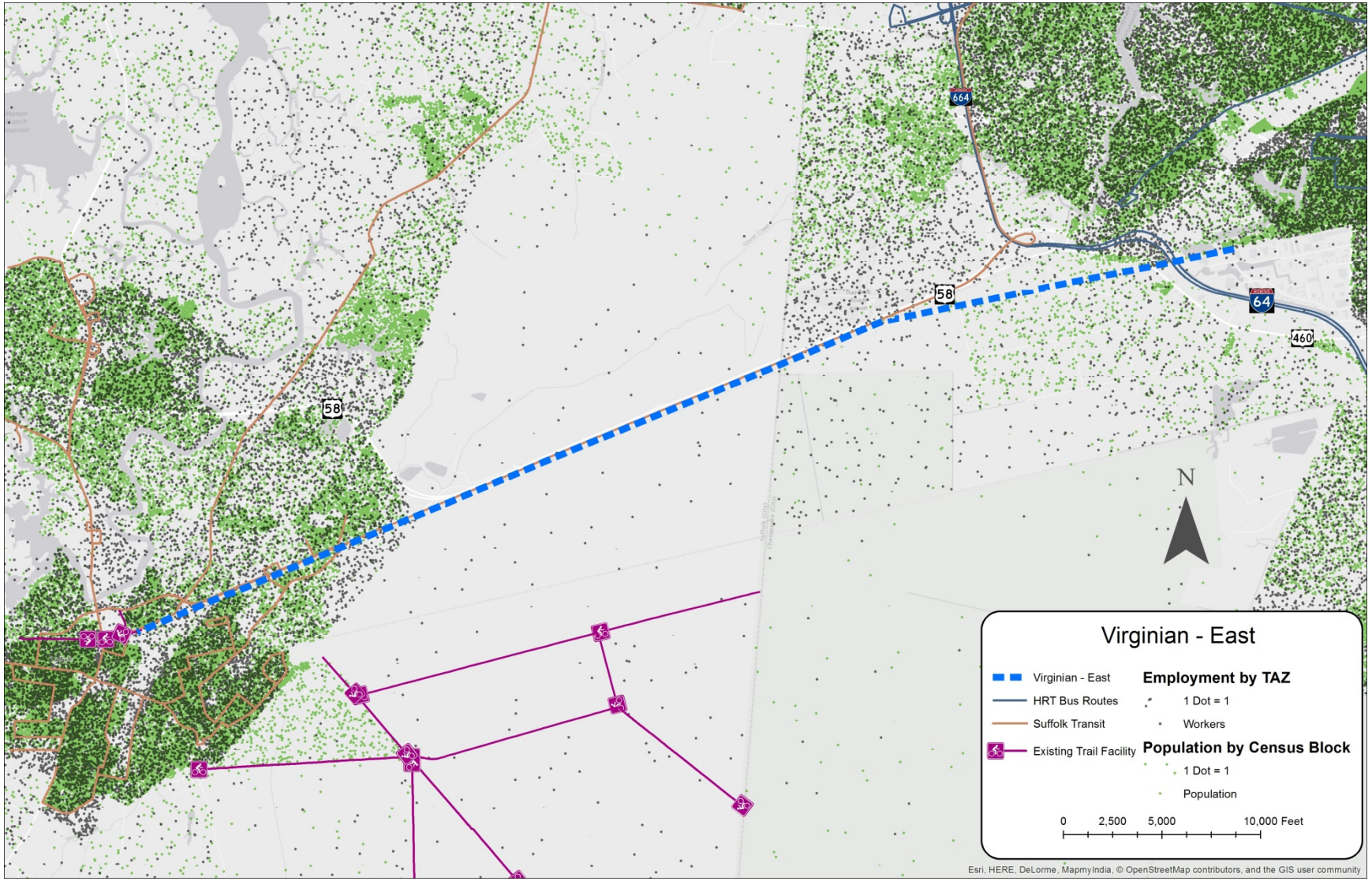


FIGURE 39 Virginian-East- Demographics and Networks

Source: HRTPO staff (Virginian-East_demnet.jpg)

The 11.20-mile right-of-way of this candidate, which straddles the cities of Suffolk and Chesapeake, is owned by Norfolk Southern, and is a potential high-speed rail (HSR) corridor. According to the Tidewater Bicycle Association, “there is a pipeline corridor on the opposite (north) side of US58/460 which could potentially host a trail should something on the southern edge not be feasible.” (1-21-16 email)

The eastern terminus of the existing Seaboard Coastline Trail near subject candidate

Heavily wooded right-of-way crossing Homestead Rd in Suffolk

The Virginian-East candidate rail-trail passes through areas of lower residential and employment density, but connects two areas of much higher density, as shown in Figures 38 and 39 above. The area is served by transit from Hampton Roads Transit (HRT) and Suffolk Transit, is near major highway access, and would connect with existing bicycle facilities. Additionally, there are six schools and a Federal park near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Virginian-East Trail would cause an increase of 545 active transportation commuters within two miles of the trail. This would increase usage from 392 existing users to a forecasted 937 users. Additionally, under the 'Austin Experience' explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $1,000,000. The cost to build this trail would be approximately $6,000,000 excluding cost of ROW and bridges.

Portsmouth International Terminals
Source: HRTPO staff

14. Virginian-West

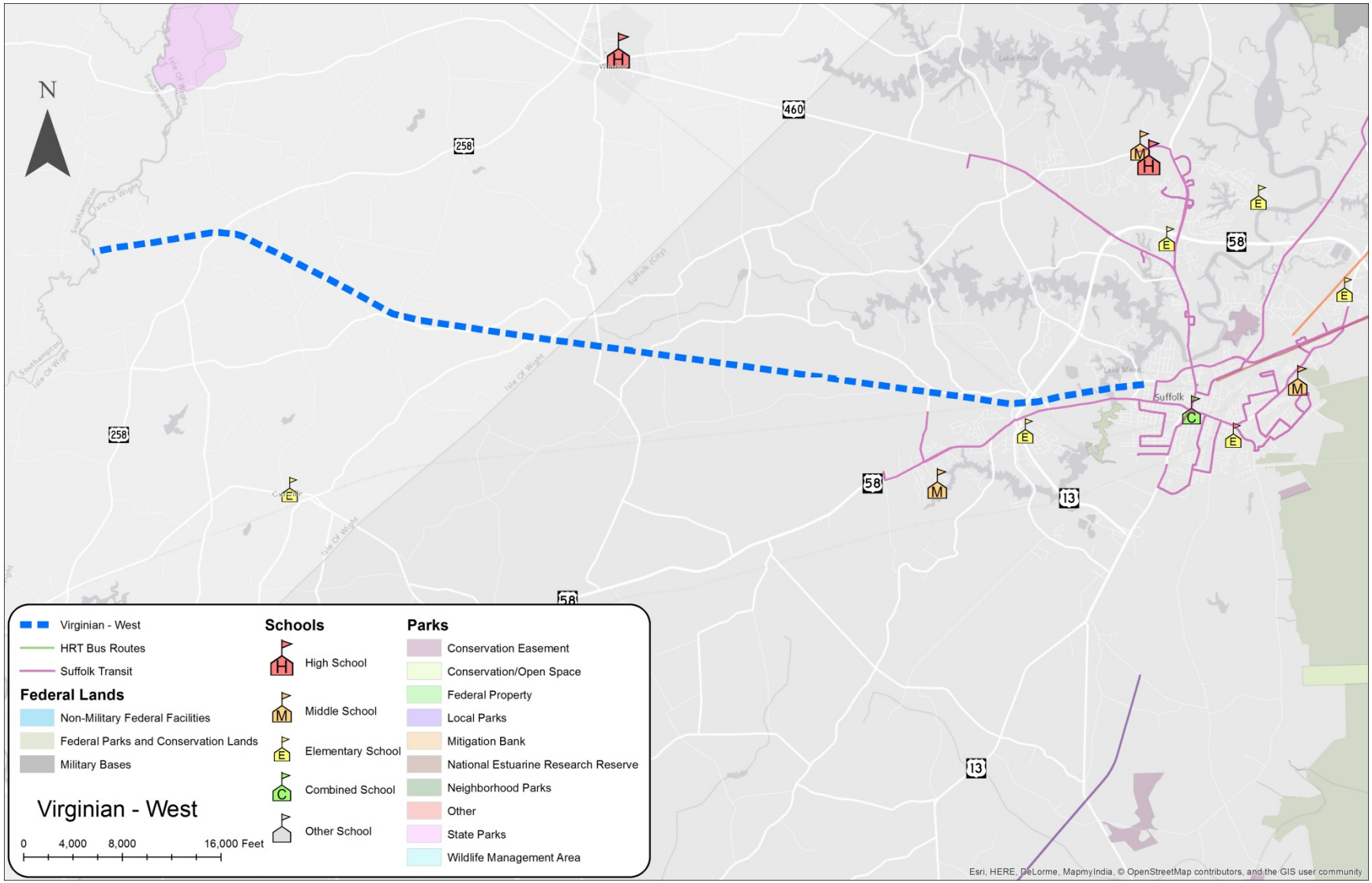


FIGURE 40 Virginian-West- Public Facilities

Source: HRTPO staff (Virginian-West.jpg)

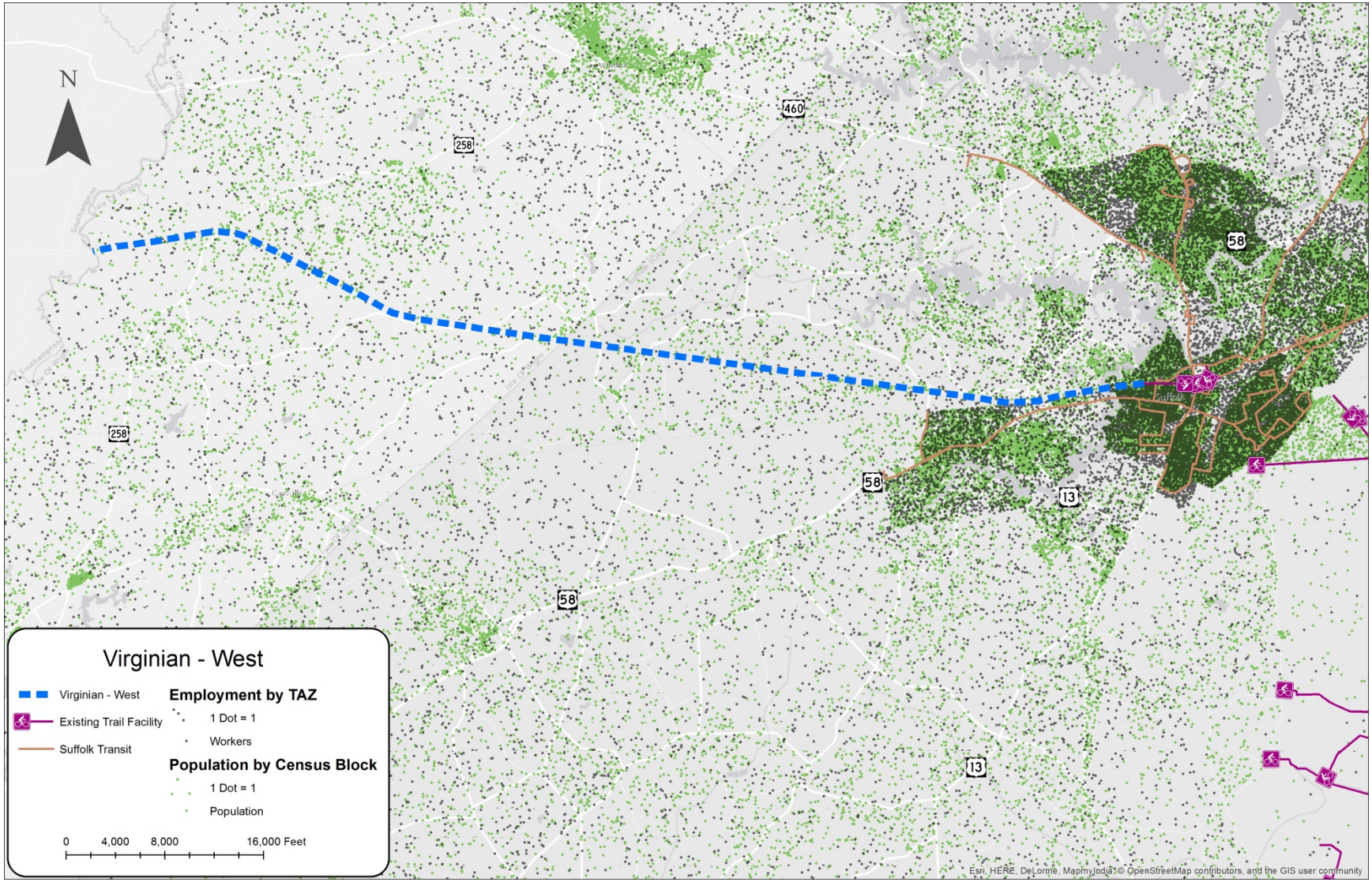


FIGURE 41 Virginian-West- Demographics and Networks

Source: HRTPO staff (Virginian-West_demnet.jpg)

The 16.59-mile right-of-way of this candidate, which straddles Suffolk and Isle of Wight, is owned by the City of Virginia Beach in some portions, and by the City of Suffolk in others. The Lake Gaston Pipeline, which supplies water to Virginia Beach, is contained within the portion of this right-of-way that lies to the west of US-258 (Walters Hwy). The candidate is part of the Beaches to Bluegrass Trail (B2B) plan.

West of US-258, this right-of-way is used by the Lake Gaston pipeline

Single inactive track running under US-58 in Suffolk

The Virginian-West candidate rail-trail passes through areas of lower residential and employment density, but connect with an area of much higher density, as shown in Figures 40 and 41 above. The area is served by transit from Suffolk Transit, is near local highway access, and would connect with existing bicycle facilities. Additionally, there are four schools near the candidate rail-trail.

If built, HRTPO quantitative analysis shows that a Virginian-West Trail would cause an increase of 303 active transportation commuters within two miles of the trail. This would increase usage from 262 existing users to a forecasted 565 users. Additionally, under the ‘Austin Experience’ explained in an earlier section, real estate values adjacent to the trail would increase by a total of approximately $1,000,000. The cost to build this trail would be approximately $9,000,000 excluding cost of ROW and bridges.

Country Scene in Hampton Roads
Source: HRTPO staff

V. Implementing Rail-Trails

A. DRPT Guide

As a guide for trail implementation, Kevin Page (HRTAC) directed HRTPO to DRPT's *Rail with Trails/Pedestrian Crossing Project Initiation, Coordination and Review*. This is a How-To Guide to aid in developing rail-with-trails projects. The report was written to fulfill requirements of HB 2088: "Department of Game and Inland Fisheries, Department of Rail and Public Transportation, and the Department of Conservation and Recreation shall develop a process to coordinate and evaluate public recreational access and safety issues directly related to new railroad projects…". The report presents a course of action for rails-with-trails development:

- project feasibility study
- stakeholder identification
- railroad coordination/involvement
- public involvement
- legal issues and agreements between stakeholders
- master planning
- implementation and construction plans
- maintenance plans and identification of responsible parties
- funding sources

Water Scene in Hampton Roads
Source: HRTPO staff

B. Recent Litigation

According to the Rails-to-Trails Conservancy:

> On March 10, 2014, the U.S. Supreme Court handed down a decision in the case involving a rail corridor formerly on federal land that is now privately owned (Marvin M. Brandt Revocable Trust et al. v. United States).
>
> The ruling does not affect trails that have been "railbanked" (the federal process of preserving former railway corridors for potential future railway service by converting them to multi-use trails in the interim). Potentially affected corridors are predominantly west of the Mississippi and were originally acquired by railroads after 1875 through federal land [grants] to aid in westward expansion.
>
> Existing rail-trails or trail projects ARE NOT affected by this decision if ANY of the following conditions are met:
>
> 1. The rail corridor is "railbanked."
> 2. The rail corridor was originally acquired by the railroad by a federally granted right-of-way (FGROW) through federal lands before 1875.
> 3. The railroad originally acquired the corridor from a private land owner.
> 4. The trail manager owns the land adjacent to the rail corridor.
> 5. The trail manager owns full title (fee simple) to the corridor.
> 6. The railroad corridor falls within the original 13 colonies.

http://www.railstotrails.org/trailblog/2014/march/11/the-supreme-court-decision-how-does-it-affect-rail-trails/

Based on the Conservancy's report, it appears that this recent litigation does not present a problem for the implementation of rail-trails in Hampton Roads.

VI. Public and Agency Involvement

HRTPO staff met with regional active transportation stakeholders on two occasions during the development of the *Signature Paths Study*. At the first meeting, held on September 2, 2015, the stakeholders shared suggestions regarding the direction of the study. This included developing a system of the signature paths that connect to the existing bicycle and pedestrian network, referring to Kevin Page for rail right-of-ways guidance, and researching possible methods of implementation for signature paths such as the right-of-way underneath utility/power lines.

In response to this meeting, staff 1) solicited the help of Kevin Page (Executive Director, HRTAC), formerly a staff member of the Virginia Department of Rail and Public Transportation (DRPT), for identifying inactive rail right-of-ways; 2) included the South Hampton Roads Trail in this report; and 3) gathered existing transit and path geography for qualitative analysis of proximity to candidate rail-trails.

HRTPO staff met with stakeholders and interested citizens on November 13, 2015 to provide updates on study progress. Staff informed those present that—due to their safety and speed—inactive rail rights-of-way would be the focus of the study. Staff also provided information regarding the quantitative and qualitative analyses being conducted for the project.

At the November 13, 2015 meeting, a main topic of discussion pertained to the buffer employed by staff in its usage impact analysis for the signature paths. Staff had gathered data from any Census block group whose boundary was touching the 2-mile buffer around the subject rail right-of-way. Some stakeholders thought this buffer was too large especially for walking. Since there would be variance among the block group sizes, the area covered by the buffer would lack uniformity. A uniform, smaller buffer was suggested. In response to this suggestion, staff re-did its usage impact analysis, selecting only those block groups with *centroids* within the 2-mile buffer suggested by the literature review.

Attendees suggested the inclusion of the existing bicycle/pedestrian facilities in the signature paths maps to showcase connectivity. Staff informed the group that it intends to lead the region in preparing a regional active transportation plan, starting the effort in 2016. The stakeholders also suggested the inclusion of the South Hampton Roads Trail (SHRT) in the study. In response to these two suggestions, staff included “existing trail facilities” on the study maps, and wrote a section on the SHRT, including an SHRT map.

On January 6, 2016 staff presented a summary of this study to TTAC and made a draft version of this report available to that body for review. Comments were incorporated in the final version.

See Appendix I for details, including meeting attendance, minutes, comments, and responses.

VII. Conclusion

Having their own right-of-way, rail-trails provide a safe, direct route for users, i.e. a signature active transportation experience. Rail-trails exist in Hampton Roads today, as do plans for extensive routes, such as the SHRT.

This study identifies and evaluates (both quantitatively and qualitatively) inactive rail right-of-ways potentially available for conversion to rail-trails. Staff provides this information to local governments to aid them in improving Hampton Road's active transportation network in a cost-effective manner.

As next steps, HRTPO staff plans to begin a multi-year development of a regional active transportation plan in January 2016.

Dismal Swamp Trail, Chesapeake
Source: HRTPO staff

TABLE 11 Quantitative Analysis Summary

	Atlantic & Danville	Churchland High	Churchland	Virginian-West	Virginian-East	Norfolk Southern - VB	Seaboard	Southern	Penniman	Bruce Road	Tyre Neck	Larkspur	Courthouse	Bayville
Length (miles)	2.96	0.95	4.25	16.59	11.20	10.55	6.34	10.53	3.21	2.24	3.41	1.22	1.52	0.85
Active Trans Commuters, living within 2 miles of ROW, 2009-2013														
Current Biking Commuters	45	0	31	0	55	1199	0	0	24	31	80	188	37	54
Current Walking Commuters	234	554	718	262	337	2677	169	12	175	353	734	616	169	681
Current Active Transportation Commuters	279	554	749	262	392	3876	169	12	199	384	814	804	206	735
Forecast of Additional Active Trans Commuters, Build Scenario	503	399	802	303	545	2197	289	25	143	696	862	1193	572	364
Forecast of Total Active Trans Commuters, Build Scenario	782	953	1551	565	937	6073	458	37	342	1080	1676	1997	778	1099
Potential Increase in Residential Property Values Near Trail														
---Based on Austin Experience														
9% increase in adjacent residential parcels	$2,065,419	$0	$5,320,417	$828,180	$1,233,774	$12,386,457	$1,378,305	$480,123	$692,379	$3,528,882	$4,057,583	$5,140,764	$2,424,825	$1,112,454
per mile	$697,777	$0	$1,251,863	$49,920	$110,158	$1,174,072	$217,398	$45,596	$215,694	$1,575,394	$1,189,907	$4,213,741	$1,595,280	$1,308,769
---Based on Indianapolis Experience														
14% increase in residential parcels within 0.5 mi buffer	$56,810,040	$17,930,905	$166,279,543	$37,974,020	$41,134,422	$329,130,844	$60,234,580	$8,387,862	$15,345,778	$113,753,150	$60,779,950	$108,282,468	$74,576,460	$65,219,532
per mile	$19,192,581	$18,874,636	$39,124,598	$2,288,970	$3,672,716	$31,197,236	$9,500,722	$796,568	$4,780,616	$50,782,656	$17,824,032	$88,756,121	$49,063,461	$76,728,861
Cost Estimates (excluding right-of-way and bridges)														
Construction, Low	$850,000	$273,000	$1,220,000	$4,762,000	$3,215,000	$3,028,000	$1,820,000	$3,023,000	$922,000	$643,000	$979,000	$351,000	$437,000	$244,000
Construction, High	$980,000	$315,000	$1,407,000	$5,492,000	$3,708,000	$3,493,000	$2,099,000	$3,486,000	$1,063,000	$742,000	$1,129,000	$404,000	$504,000	$282,000
Total Cost (design, construction, etc., excluding ROW and bridges)	$1,529,000	$491,000	$2,196,000	$8,569,000	$5,785,000	$5,450,000	$3,275,000	$5,439,000	$1,658,000	$1,157,000	$1,762,000	$631,000	$786,000	$440,000

Source: HRTPO staff (overall table.xlsx)

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Appendix A- South Hampton Roads Trail, Letters of Support

NORFOLK

Bicycling & Pedestrian Trails Commission

December 3, 2015

Mr. Brian Solis, AICP, LEED Green Associate
Transportation and Transit Planning Manager
City of Virginia Beach
4525 Main Street Suite 710
Virginia Beach, VA 23462

Dear Mr. Solis:

The City of Norfolk Bicycling and Pedestrian Trails Commission would like to express its full support for the TIGER Grant Proposal submitted by The City of Virginia Beach. The proposed trail facility is a key component of the forty mile long South Hampton Roads Regional Trail (SHRT) being developed by Suffolk, Chesapeake, Portsmouth, Norfolk and Virginia Beach. This collection of trails will serve as a tourism destination, alternative transportation corridor, neighborhood connector and intercity recreation resource. The Completion of the proposed section of trail can be anticipated to greatly accelerate development of other sections of the SHRT now under planning and design.

This project reflects the best intentions of the TIGER program by not only increasing the attractiveness of a growing light rail system with multimodal access but through its regional impacts tourism and economic development. Please include this letter in your application as documentation of the endorsement of the Norfolk Bicycling and Trails Commission.

Sincerely,

Markus Wegener
Chairman, Norfolk Bicycling & Pedestrian Trails Commission

cc: Ron Williams, Jr., Deputy City Manager
Darrell R. Crittendon, Director of Recreation, Parks & Open Space
David L. Ricks, P.E., Director of Public Works

Markus Wegener, **Chairman**
Steven Johnson, M.D., **Vice-Chairman**
Catherine McCoy
Elizabeth Schleeper
Matt Paddock
Marc Hoecker
Renee Losapio
Hudnall Croasdale
Andrew Hund

NORFOLK

Office of the City Manager

June 2, 2015

Secretary Anthony R. Foxx
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Subject: **South Hampton Roads Regional Trail**
Virginia Beach Light Rail Corridor Multi-modal Connector

Dear Secretary Foxx:

The City of Norfolk is pleased to participate in this request for funding for the South Hampton Roads Regional Trail – Virginia Beach Light Rail Corridor Multi-modal Connector. This project is a logical and integral component of extending the TIDE light rail line from Norfolk into Virginia Beach, as has been in various stages of planning since 2008.

We also look forward to extending these paths farther west into Norfolk as part of the growing regional South Hampton Roads Trail from the oceanfront in Virginia Beach, through Norfolk to join our Elizabeth River Trail to our Waterside area, and then through Portsmouth and Chesapeake to downtown Suffolk, for a total of 41 miles. Further, we are pleased that these two portions of the South Hampton Roads Trail will be part of both Virginia's Beaches to Bluegrass Trail to Cumberland Gap and a spur of the national Transcontinental Bike Route 76 to Astoria, Oregon.

This project fits perfectly into the spirit of the TIGER program, enhancing the multi-modalism of the light rail project and the transit-oriented development which is envisioned to reinvigorate the entire corridor.

Thank you for your kind consideration of this request. If you need additional information about Norfolk's partnership in this project, please contact Paul Forehand at 757.441.2140 or Paul.Forehand@norfolk.gov.

Sincerely,

Marcus D. Jones
City Manager

810 Union Street, #1101 • Norfolk, VA 23510
Phone: 757-664-4242 • Fax: 757-664-4239

HAMPTON ROADS TRANSIT

May 26, 2015

Mr. Brian Solis, AICP, LEED Green Associate
Transportation and Transit Planning Manager
City of Virginia Beach
4525 Main Street, Suite 710
Virginia Beach, VA 23462

Subject: South Hampton Roads Regional Trail – Virginia Beach Shared-Use Path TIGER Discretionary Grants Program (2015)

Dear Mr. Solis: Brian

As the largest public transit provider in Hampton Roads including the City of Virginia Beach, Hampton Roads Transit (HRT) has been in close coordination with the City regarding the development of the proposed shared-use path in the preserved corridor for fixed-guideway transit. Hampton Roads Transit is a firm supporter of integrated multi-modal solutions for this corridor and for such connectivity across the region. As such, Hampton Roads Transit endorses the continuing study and ultimate construction of the shared-use path defined in the City's Tiger Grant application entitled "South Hampton Roads Regional Trail – Virginia Beach Light Rail Corridor Multi-modal Connector".

Please include this letter in your application as documentation of Hampton Roads Transit's endorsement. Should you need additional information in support of this effort, please contact me at 757-222-6000.

Respectfully,

William E. Harrell
President and Chief Executive Officer
Hampton Roads Transit

c: The Honorable Aubrey L. Layne, Virigina Secretary of Transportation
Charles Kilpatrick, Commissioner of Highways
James S. Utterback, VDOT District Administrator
Ray Amoruso, Chief Planning & Development Officer, HRT
Julie Timm, Transportation, Transit Development Officer, HRT
Brandon Singleton, CFO, HRT

Document Control: F1160-GS-2 10164

3400 Victoria Boulevard, Hampton, VA 23661 • 509 East 18th Street, Norfolk, VA 23504
757-222-6000 • gohrt.com

the heartbeat of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

May 21, 2015

Mr. Brian Solis, AICP, LEED Green Associate
Transportation and Transit Planning Manager
City of Virginia Beach
4525 Main Street
Suite 710
Virginia Beach, VA 23462

Re: South Hampton Roads Regional Trail – Virginia Beach Light Rail Corridor Multi-modal Connector
TIGER Discretionary Grants Program (2015)

Dear Mr. Solis:

As the Metropolitan Planning Organization for the Hampton Roads region of Virginia, the Hampton Roads Transportation Planning Organization (HRTPO) Board, at its meeting held on May 21, 2015, endorsed the South Hampton Roads Regional Trail – Virginia Beach Light Rail Corridor Multi-modal Connector project to be submitted for consideration under the TIGER 2015 Discretionary Grants Program in the amount of $12.7 million.

The HRTPO understands that the project will provide paths for walking and biking along the sides of the planned light rail extension project across the City of Virginia Beach, from Newtown Road to the vicinity of Constitution Drive near Virginia Beach's Town Center. The HRTPO also understands that these paths will accommodate non-motorized access to the light rail stations and will be an important addition to the City's top priority pathway and an east phase of thee regional South Hampton Roads trail.

The HRTPO certifies that this project is included in the relevant metropolitan planning documents.

Please include this letter in your application as documentation of the action taken on May 21, 2015 by the HRTPO Board endorsing the South Hampton Roads Regional Trail – Virginia Beach Light Rail Corridor Multi-modal Connector project. Should you need any additional information in support of this project, please contact me at (757) 420-8300.

Sincerely,

C. Ravanbakht

Camelia Ravanbakht
Interim Executive Director

JDP/kg

Copy: The Honorable Aubrey L. Layne, Jr., Virginia Secretary of Transportation
Charles Kilpatrick, Commissioner of Highways
James S. Utterback, VDOT District Administrator

THE REGIONAL BUILDING · 723 WOODLAKE DRIVE · CHESAPEAKE, VIRGINIA 23320 · 757.420.8300 · FAX 757.523.4881

Item V-J.7.

ORDINANCES/RESOLUTIONS ITEM # 60854

Upon motion by Vice Mayor Jones, seconded by Councilman Dyer, City Council ***ADOPTED, BY CONSENT:***

Resolution to ***SUPPORT*** *the Regional multi-use* ***South Hampton Roads Trail*** *consisting of forty-one (41) miles of connective links in the Cities of Chesapeake, Portsmouth, Norfolk, Suffolk and Virginia Beach*

*Voting: 11-0 (**By Consent**)*

Council Members Voting Aye:

Rita Sweet Bellitto, Glenn R. Davis, William R. "Bill" DeSteph, Harry E. Diezel, Robert M. Dyer, Barbara M. Henley, Vice Mayor Louis R. Jones, Mayor William D. Sessoms, Jr., John E. Uhrin, Rosemary Wilson and James L. Wood

Council Members Voting Nay:

None

Council Members Absent:

None

April 26, 2011

A RESOLUTION IN SUPPORT OF A REGIONAL MULTI-USE TRAIL CONSISTING OF APPROXIMATELY FORTY-ONE MILES OF CONNECTIVE LINKS IN THE CITIES OF CHESAPEAKE, PORTSMOUTH, SUFFOLK, NORFOLK AND VIRGINIA BEACH

WHEREAS, the Cities of Chesapeake, Portsmouth, Suffolk, Norfolk and Virginia Beach are in the process of determining regional support for a multi-use trail designed to pass through the five Southside jurisdictions; and

WHEREAS, the proposed multi-use trail ("South Hampton Roads Trail" or SHRT) would consist of approximately forty-one miles of trails, allowing users to travel from downtown Suffolk to the Virginia Beach Oceanfront, as shown on the attached map; and

WHEREAS, the SHRT would offer recreational, health and fitness opportunities to a large number of Hampton Roads citizens and visitors; and

WHEREAS, the SHRT would provide an alternative method of transportation, thereby reducing traffic congestion and improving the environment; and

WHEREAS, the SHRT would help facilitate increased opportunities for children to walk or bicycle safely to school; and

WHEREAS, the SHRT would help promote tourism by providing visitors with a safe and attractive venue for visiting the many scenic and historic points of interest within Hampton Roads; and

WHEREAS, all or a part of the SHRT could become a component of the "Beaches to Bluegrass Trail" as is currently planned by the Virginia Department of Conservation and Recreation, as described in the 2007 Virginia Outdoors Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF VIRGINIA BEACH, VIRGINIA:

That the City of Virginia Beach fully supports the further consideration and development of a plan for a South Hampton Roads Trail, including discussions by staff with other regional participants and a willingness to join a regional coalition, if one develops, among the Southside municipalities.

Adopted by the Council of the City of Virginia Beach, Virginia on the 26th day of April 2011.

APPROVED AS TO CONTENT

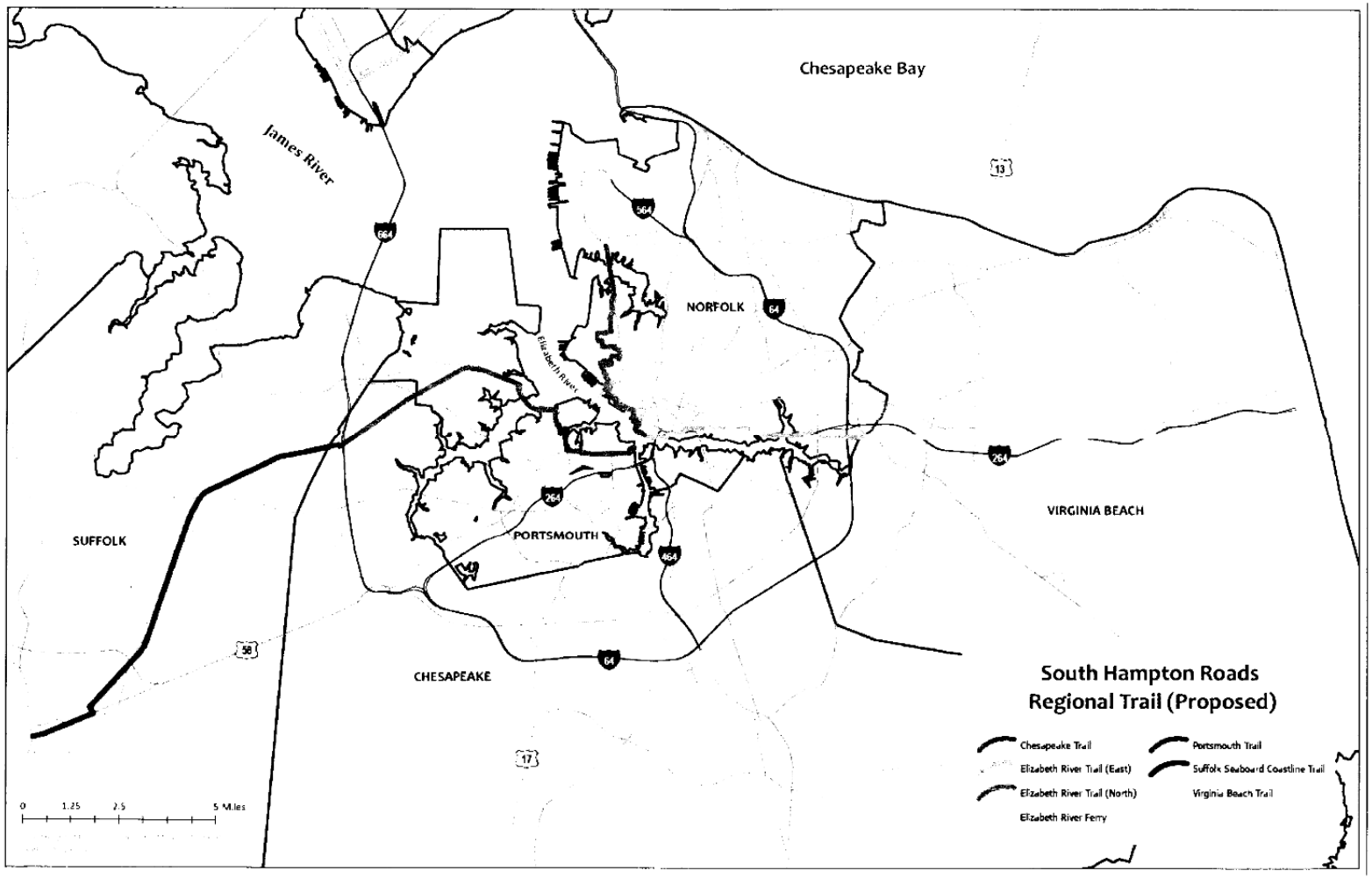
Dept. of Parks and Recreation

APPROVED AS TO LEGAL SUFFICIENCY

City Attorney's Office

CA11842
R-2
April 13, 2011

[this map was attached to the above letter]



Appendix B- Learning Active Transportation Factors from NHTS Data

Given that trail usage estimates a) measure trail effectiveness from the point-of-view of the trail, and b) reflect both new and existing users of active transportation, a measure of the impact of proposed trails from the point of view of the public was desired—i.e. a measure of the change in the public's usage of active transportation induced by the trail—in order to highlight the most promising of the candidate rail-trails. Not being aware of any existing models estimating trail impact on usage of alternative transportation, staff developed such a model.

Anticipating developing the model using census data for block groups (BGs) in the vicinity of the candidate rail-trails, staff needed to know what type of variables to use in a BG-based model. Staff learned these variable types in two ways: 1) from the existing literature (report body), and 2) from National Household Travel Survey (NHTS) data (below).

For "Mode Choices of Millennials" (HRTPO, Sept. 2015), staff compiled a database of NHTS survey records from 1983, 1995, and 2009. The total number of records in these combined datasets is 170,947. Of these, there were 893 commuters who biked to work (0.5%), and 3,916 who walked (2.3%), meaning 4,809 total "active transportation" commuters (2.8%). Each mode is analyzed separately below.

Binary logistic regression was used to analyze each dependent variable (commuting via walking, biking, and [the combination] active transportation) against seven (7) key commuter characteristics, i.e. seven sets of independent variables believed to impact commuters' mode choice. These factors are 1) age, 2) era, 3) generation, 4) income, 5) gender, 6) urbanized area status, and 7) MSA size.

A basis variable in each set of independent variables being needed for the calculation of odds factors, basis variables were selected as summarized in Table 1 below.

TABLE 1 Basis Variables

Variable Set	**Basis Variable** (to which other variables are compared)
Era	Reagan Era (1983)
Age	16-17
Generation	Baby Boomer Generation
Gender	Female
Total Annual Household Income	$40,000-59,999
MSA Population	Household not in MSA
Urbanized Area	Household not in Urbanized Area

Source: HRTPO staff (Word table)

The regression results begin on the following page.

TABLE 2 Regression Results, HRTPO Model, Walking to Work in the U.S.

Logistic regression **Observations** (commuters) **170,947**

DV: Walked to Work		Signif.	Coeff.	Std. Error	Odds Factor	95% Conf. Interval Lower	Upper
Independent Variables-Regressors							
Era							
Reagan Era (1983) (basis)					1.000		
Clinton Era (1995)		.001++	-.239	.072	.787	.684	.907
Bush/Obama Era (2008/2009)		.000++	-.607	.083	.545	.463	.641
Age							
16-17 (basis)					1.000		
18-34		.000++	-1.090	.078	.336	.288	.392
35-54		.000++	-1.360	.094	.257	.213	.309
55-74		.000++	-1.170	.114	.311	.248	.388
75+		.000++	-1.063	.183	.345	.241	.495
Generation	Years born						
Lost Generation	1883-1900	.335	1.109	1.150	3.030	.318	28.844
G.I. Generation	1901-1924	.296	.176	.169	1.193	.857	1.662
Silent Generation	1925-1945	.032++	.123	.058	1.131	1.011	1.267
Baby Boomer (basis)	1946-1964				1.000		
Generation X	1965-1981	.143	.077	.053	1.080	.974	1.197
Millennial Generation	1982-2000	.038++	.188	.091	1.207	1.010	1.442
Gender							
Male		.163	.046	.033	1.047	.982	1.116
Female (basis)					1.000		
Total Annual Household Income							
<$20,000		.000++	1.111	.057	3.037	2.716	3.395
$20,000-$39,999		.000++	.440	.052	1.552	1.401	1.720
$40,000-$59,999 (basis)					1.000		
$60,000-$99,999		.001++	-.164	.050	.849	.769	.936
$100,000+		.000++	-.347	.058	.707	.631	.792
Metro Area Population							
<1 million		.000++	-.530	.048	.589	.536	.647
1 million-3 million		.000++	-.812	.057	.444	.397	.497
>3 million		.000++	-.277	.049	.758	.689	.834
Household not in MSA (basis)					1.000		
MSA size not identified		.007++	-.787	.292	.455	.257	.807
Urbanized Area Status							
Household in Urbanized Area		.000++	.465	.041	1.592	1.469	1.725
Household not in Urbanized Area (basis)					1.000		
Urbanized area status unknown		.106	.466	.288	1.594	.906	2.804
Constant		.000++	-2.202	0.109	.111		

Source: HRTPO staff (All NHTS records output.pdf)

+Significant at the 0.10 level, ++Significant at the 0.05 level

TABLE 3 Regression Results, HRTPO Model, Biking to Work in the U.S.

Logistic regression **Observations** (commuters) **170,947**

DV: Biked to Work		**Signif.**	**Coeff.**	**Std. Error**	**Odds Factor**	**95% Conf. Interval** Lower	Upper
Independent Variables-Regressors							
Era							
Reagan Era (1983) (basis)					1.000		
Clinton Era (1995)		.545	-.118	.195	.889	.607	1.302
Bush/Obama Era (2008/2009)		.367	.186	.206	1.205	.804	1.806
Age							
16-17 (basis)					1.000		
18-34		.000++	-.714	.167	.490	.353	.679
35-54		.000++	-1.147	.197	.317	.216	.467
55-74		.000++	-1.434	.237	.238	.150	.379
75+		.011++	-1.496	.587	.224	.071	.708
Generation	Years born						
Lost Generation	1883-1900	.999	-15.060	17783.359	.000	.000	.
G.I. Generation	1901-1924	.160	-1.442	1.027	.236	.032	1.768
Silent Generation	1925-1945	.000++	-.790	.183	.454	.317	.650
Baby Boomer (basis)	1946-1964				1.000		
Generation X	1965-1981	.118	.153	.098	1.165	.962	1.412
Millennial Generation	1982-2000	.956	.009	.169	1.009	.725	1.404
Gender							
Male		.000++	1.130	.078	3.097	2.657	3.610
Female (basis)					1.000		
Total Annual Household Income							
<$20,000		.000++	1.043	.130	2.839	2.201	3.661
$20,000-$39,999		.001++	.406	.121	1.501	1.184	1.902
$40,000-$59,999 (basis)					1.000		
$60,000-$99,999		.447	.083	.109	1.086	.877	1.345
$100,000+		.087+	.196	.114	1.217	.972	1.523
Metro Area Population							
<1 million		.000++	-.386	.105	.680	.553	.835
1 million-3 million		.000++	-.448	.114	.639	.511	.799
>3 million		.000++	-.389	.107	.677	.549	.835
Household not in MSA (basis)					1.000		
MSA size not identified		.804	-.152	.613	.859	.258	2.856
Urbanized Area Status							
Household in Urbanized Area		.000++	1.111	.101	3.039	2.493	3.704
Household not in Urbanized Area (basis)					1.000		
Urbanized area status unknown		.754	.317	1.009	1.373	.190	9.912
Constant		.000++	-5.770	.267	.003		

Source: HRTPO staff (All NHTS records output.pdf)

+Significant at the 0.10 level, ++Significant at the 0.05 level

TABLE 4 Regression Results, HRTPO Model, Active Transportation (Walking or Biking) to Work in the U.S.

Logistic regression **Observations** (commuters) **170,947**

DV: Active Trans. to Work		Signif.	Coeff.	Std. Error	Odds Factor	95% Conf. Interval Lower	Upper
Independent Variables-Regressors							
Era							
Reagan Era (1983) (basis)					1.000		
Clinton Era (1995)		.001++	-.226	.068	.798	.698	.911
Bush/Obama Era (2008/2009)		.000++	-.473	.077	.623	.536	.724
Age							
16-17 (basis)					1.000		
18-34		.000++	-1.034	.072	.356	.309	.409
35-54		.000++	-1.328	.086	.265	.224	.313
55-74		.000++	-1.229	.104	.293	.239	.358
75+		.000++	-1.169	.173	.311	.221	.436
Generation	Years born						
Lost Generation	1883-1900	.276	1.249	1.147	3.488	.368	33.025
G.I. Generation	1901-1924	.405	.137	.164	1.147	.831	1.583
Silent Generation	1925-1945	.416	.044	.054	1.045	.940	1.162
Baby Boomer (basis)	1946-1964				1.000		
Generation X	1965-1981	.023++	.106	.047	1.112	1.015	1.218
Millennial Generation	1982-2000	.039++	.166	.081	1.181	1.008	1.383
Gender							
Male		.000++	.235	.030	1.265	1.193	1.341
Female (basis)					1.000		
Total Annual Household Income							
<$20,000		.000++	1.122	.053	3.070	2.769	3.403
$20,000-$39,999		.000++	.442	.048	1.556	1.416	1.710
$40,000-$59,999 (basis)					1.000		
$60,000-$99,999		.009++	-.120	.046	.887	.811	.970
$100,000+		.000++	-.230	.051	.795	.719	.879
Metro Area Population							
<1 million		.000++	-.512	.044	.599	.550	.653
1 million-3 million		.000++	-.745	.051	.475	.429	.525
>3 million		.000++	-.306	.045	.736	.675	.804
Household not in MSA (basis)					1.000		
MSA size not identified		.008++	-.709	.266	.492	.292	.828
Urbanized Area Status							
Household in Urbanized Area		.000++	.574	.038	1.775	1.648	1.911
Household not in Urbanized Area (basis)					1.000		
Urbanized area status unknown		.084+	.482	.278	1.619	.938	2.793
Constant		.000++	-2.300	.102	.100		

Source: HRTPO staff (All NHTS records output.pdf)

+Significant at the 0.10 level, ++Significant at the 0.05 level

Era

With respect to the three eras analyzed (Reagan, Clinton, and Bush/Obama), these results show that the odds factors for walking to work have decreased over time. There was no significant era effect on biking to work.

Age

With respect to age, all other things being equal, being aged 16-17 gives commuters the highest odds of walking or biking to work. While the odds factors for biking to work decrease steadily for each subsequent age, the odds factors for walking vary little between the 18+ age ranges.

Generation

Being a member of the Millennial and Silent Generations meant slightly higher odds of walking to work versus Baby Boomers, all other things being equal. The Millennial odds factor for walking to work is 1.207 (vs. Boomer). Similarly, the walking-to-work odds factor for being a member of the Silent Generation is 1.131 (vs. Boomer). For biking to work, only the Silent Generation odds factor was found to be significantly different versus Baby Boomers.

Gender

Being a male gives a commuter 3.097 times the odds of biking to work as being female. There was no significant difference between being male and female for odds of walking to work.

Income

A clear trend was demonstrated when household income category was analyzed against walking to work. The odds of walking to work decreased steadily for each income category, beginning with the lowest. In other words, living in a household with an income of less than $20,000/yr would give a commuter 3.037 times the odds of walking to work (vs. middle income), all other things being equal. A similar trend was discovered for biking to work, but only until the household income reaches $60,000/yr. Beyond this income category, the only significant finding (at the 0.10 level) was that having an annual household income of greater than $100,000/yr would give a commuter higher odds (1.217) of biking to work when compared to the basis category of $40k-60k/yr.

MSA Status and Urbanization

Surprisingly, living in any size MSA gives a commuter lower odds of biking or walking to work (odds factors 0.475-0.736) vs. not living in an MSA at all. However, living in an urbanized area, regardless of MSA status, gives commuters significantly higher odds of using walking or biking for work (1.592 times and 3.039 times, respectively) versus living outside of an urbanized area.

Given the impact of income on using alternative transportation to work (as shown above), staff developed an Active-Trans-Usage Model for this study based on income. See study body for the development and application of that model.

Appendix C- Va. Beach Ordinance Authorizing Acquisition of Norfolk-Southern ROW

ORD-3005E

AN ORDINANCE TO AUTHORIZE ACQUISITION OF PROPERTY IN FEE SIMPLE FOR PUBLIC TRANSPORTATION, LINEAR PARK, MULTI-USE TRAIL, PUBLIC UTILITIES, PARKING AND/OR OTHER FUTURE PUBLIC PURPOSES OF APPROXIMATELY 10.58 MILES OF ABANDONED NORFOLK SOUTHERN RAILROAD RIGHT OF WAY FROM NEWTOWN ROAD TO BIRDNECK ROAD IN THE CITY OF VIRGINIA BEACH, THE ACQUISITION OF THE PROPERTY TO BE EITHER BY AGREEMENT OR BY CONDEMNATION.

WHEREAS, in the opinion of the Council of the City of Virginia Beach, Virginia, a public necessity exists for acquisition of this abandoned railroad right-of-way for public transportation, linear park, multi-use trail, public utilities, parking and/or other public purposes to improve transportation within the City and for other related public purposes for the preservation of the safety, health, peace, good order, comfort, convenience, and for the welfare of the people in the City of Virginia Beach.

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF VIRGINIA BEACH, VIRGINIA:

Section 1. That the City Council authorizes the acquisition by purchase or condemnation pursuant to Sections 1-219.1; 15.2-1901, et seq., Sections 33.1-91, et seq., and Title 25.1 of the Code of Virginia of 1950, as amended, of all that certain real property in fee simple (the "Property"), being described as all of that certain real property and improvements thereon, now or formerly owned by Norfolk Southern Corporation, constituting the length of the rail line abandoned in the City of Virginia Beach, Virginia, identified in the abandonment proceedings filed with the Surface Transportation Board as Case No.: AB-290-293-X and extending from the Norfolk/Virginia Beach City Line at Newtown Road on the west to the terminus of the abandoned rail line at Birdneck Road on the east. The Property is also described as approximately station 256+19 eastward to approximate station 815+07 in the centerline of what is shown on the Railroad Right of Way and Track Map as Seatack Road.

Section 2. That the City Manager is hereby authorized to make or cause to be made on behalf of the City of Virginia Beach, to the extent that funds are available, a reasonable offer to the owners or persons having an interest in said Property. If refused, the City Attorney is hereby authorized and directed to institute proceedings to condemn said Property.

Adopted by the Council of the City of Virginia Beach, Virginia, on the 11TH day of DECEMBER, 2007.

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R-1
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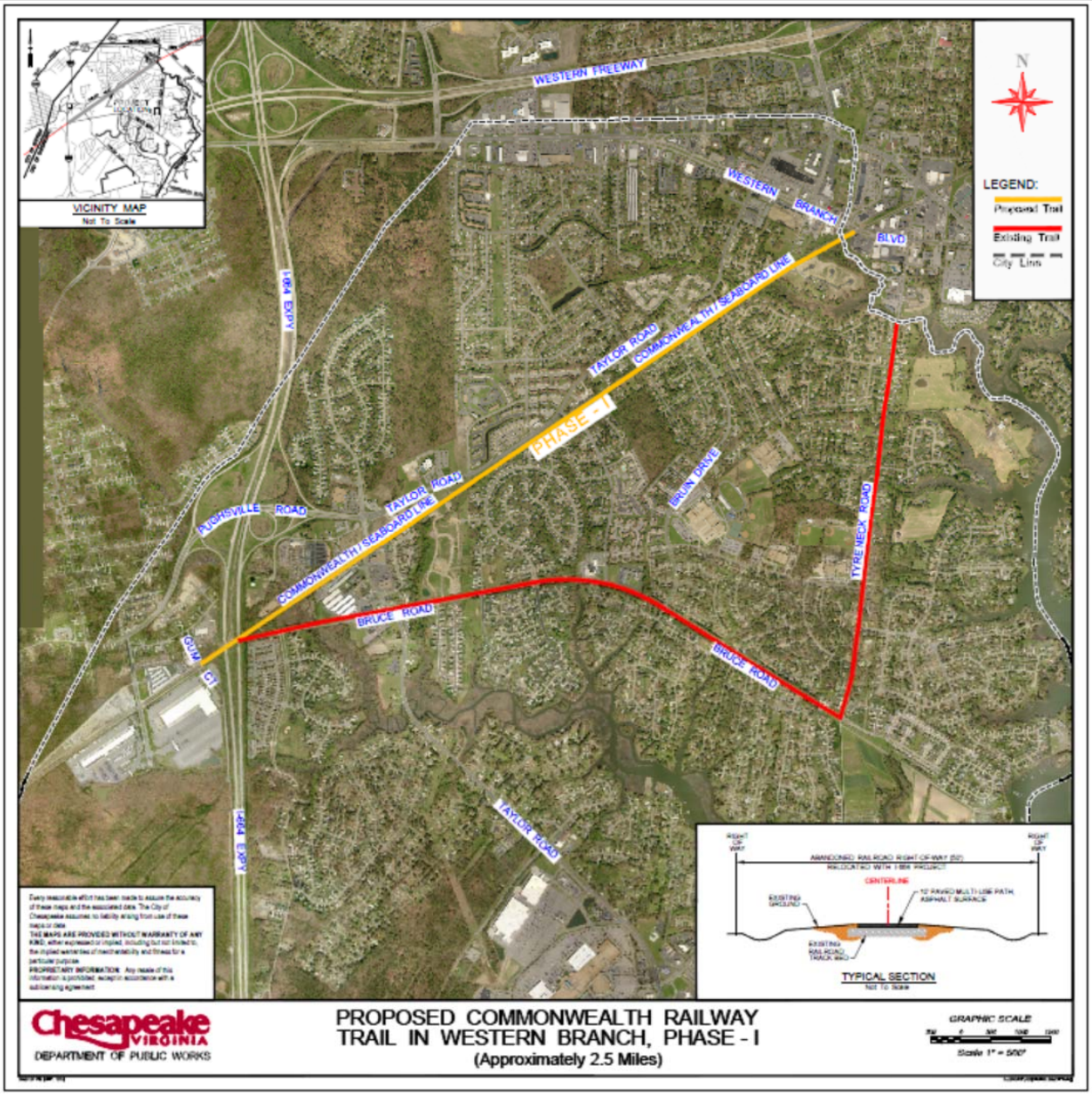
PREPARED: 11/26/07

Appendix D- Commonwealth Railway Trail (Ph. 1) Sept. 2013



Appendix E- TAP (Transportation Alternatives Program) **Applications for Commonwealth Railway Trail**

Chesapeake VIRGINIA

City of Chesapeake
Department of Public Works
Post Office Box 15225
Chesapeake, Virginia 23328
(757) 382-6101
(757) 382-6310 FAX
(757) 382-8537 FAX

September 23, 2013

Camelia Ravanbakht, Ph.D., Deputy Executive Director
Hampton Roads Metropolitan Planning Organization
The Regional Building
723 Woodlake Drive
Chesapeake, Virginia 23320

RE: Transportation Alternatives Program Application

Dear Camelia:

The City of Chesapeake is requesting the HRTPO's endorsement of our Transportation Alternatives Program (TAP) application for Chesapeake's portion of the "Multi-City" Trail System. The total project cost is estimated to be $600,000 for design and construction of a 3 mile off-road trail system (Phase 1) along the abandoned Commonwealth Railroad right-of-way from Gum Court to the Portsmouth City line. We are therefore requesting TAP funding in the amount of $480,000, with the right-of-way necessary to construct the trail serving as the City's required 20% match.

By way of background, the referenced rail line is now abandoned as the Commonwealth Rail Line has been relocated to the medians of State Route 164 and Interstate 664. The Virginia Port Authority, as imminent owner of the Commonwealth Rail Line, has expressed the desire to transfer the property to the City of Chesapeake. As such, Chesapeake proposes to construct a 10-foot recreational off-road trail to accommodate bicyclists and pedestrians. This trail would become a critical component of the larger "Multi-City" Trail that would eventually run from Suffolk to Ocean View, a distance of over 30 miles.

The trail project described above has been endorsed by the Chesapeake Parks and Recreation Advisory Committee, the Chesapeake Transportation Safety Commission, and the Chesapeake Bike and Trails Advisory Committee.

I will be in attendance at the TTAC meeting to answer any questions the committee members may have.

Thank you in advance for your consideration.

Sincerely,

Earl Sorey, P.E.
City Engineer

Attachment

c: Eric J. Martin, P.E., Director of Public Works
Michael Barber, Director of Parks and Recreation
Jaleh Shea, Director of Planning

FACT SHEET
Proposed Commonwealth Railway Trail in Western Branch
September 10, 2013

Project Scope:

- The abandoned Commonwealth and Seaboard rail lines provide an opportunity to develop a paved multi-use trail in Western Branch, which will add to the area's existing trail system.
- The first phase of the trail would extend from the Portsmouth City line to I-664 near Gum Road (Commonwealth Rail Line).
- The second phase of the trail would extend from I-664 to the Suffolk City line (Seaboard Rail line).
- With both phases of the trail, approximately 3.2 miles would be added to Western Branch's existing trail system.
- This trail would connect the existing off-street trails along Bruce and Tyre Neck Roads and create a "loop."
- Eventually, this proposed trail would be part of a multi-city project that follows the abandoned Commonwealth and Seaboard Railroad Line for 31 miles, from the Suffolk train station to Ocean View in Norfolk.

Project Details:

- The railroad right-of-ways are 50 feet in width; 10 feet of which would be a paved, asphalt trail.
- The trail would be used for biking and walking and would be off-road; motorized vehicles would not be permitted.
- The property would be maintained by the Department of Parks and Recreation.
- Traffic bollards would be placed at the 6 at grade crossings of the trail to promote safety.
- Trail amenities could be provided in addition to required trail signage.
- No lighting or landscaping is proposed at this time.

Project Funding:

- Funding exists through the Moving Ahead for Progress in the 21st Century (MAP-21) Transportation Alternatives Program, a competitive grant program.
- The grant request amount is $600,000 for the first phase of the project. The City is required to contribute 20% ($120,000). The donation of the railroad right-of-way is expected to cover the City's required match.
- The deadline for application is November 1, 2013.

THE CITY OF
PORTSMOUTH

September 30, 2013

Dwight L. Farmer, P.E.
Executive Director
Hampton Roads Regional Transportation Planning Organization
The Regional Building
723 Woodlake Drive
Chesapeake, Virginia 23320

RE: Transportation Alternatives Program – City of Portsmouth Project Proposal

Dear Mr. Farmer:

The City of Portsmouth requests HRTPO support for the application to the Virginia Department of Transportation's Transportation Alternatives Program (TAP) for a rail to trail project on the former Commonwealth right-of-way in the Churchland area of Portsmouth.

Portsmouth will be submitting an application November 1, 2013 for TAP funding for a 1.8 mile section of former rail right-of-way extending from the Chesapeake city line on High Street West northeast to the intersection of West Norfolk Road with Old Coast Guard Boulevard. Our application request will include paving a 12 foot cross section the length of the corridor, safe crossings of five intersections, signage, and amenities. We are requesting $900,000 in TAP funding and anticipate the total project cost to be $1,250,000.

Thank you in advance for your consideration in placing this item on the upcoming agendas. If you have any questions or require additional information, please feel free to contact me at wilsons@portsmouthva.gov.

Sincerely,

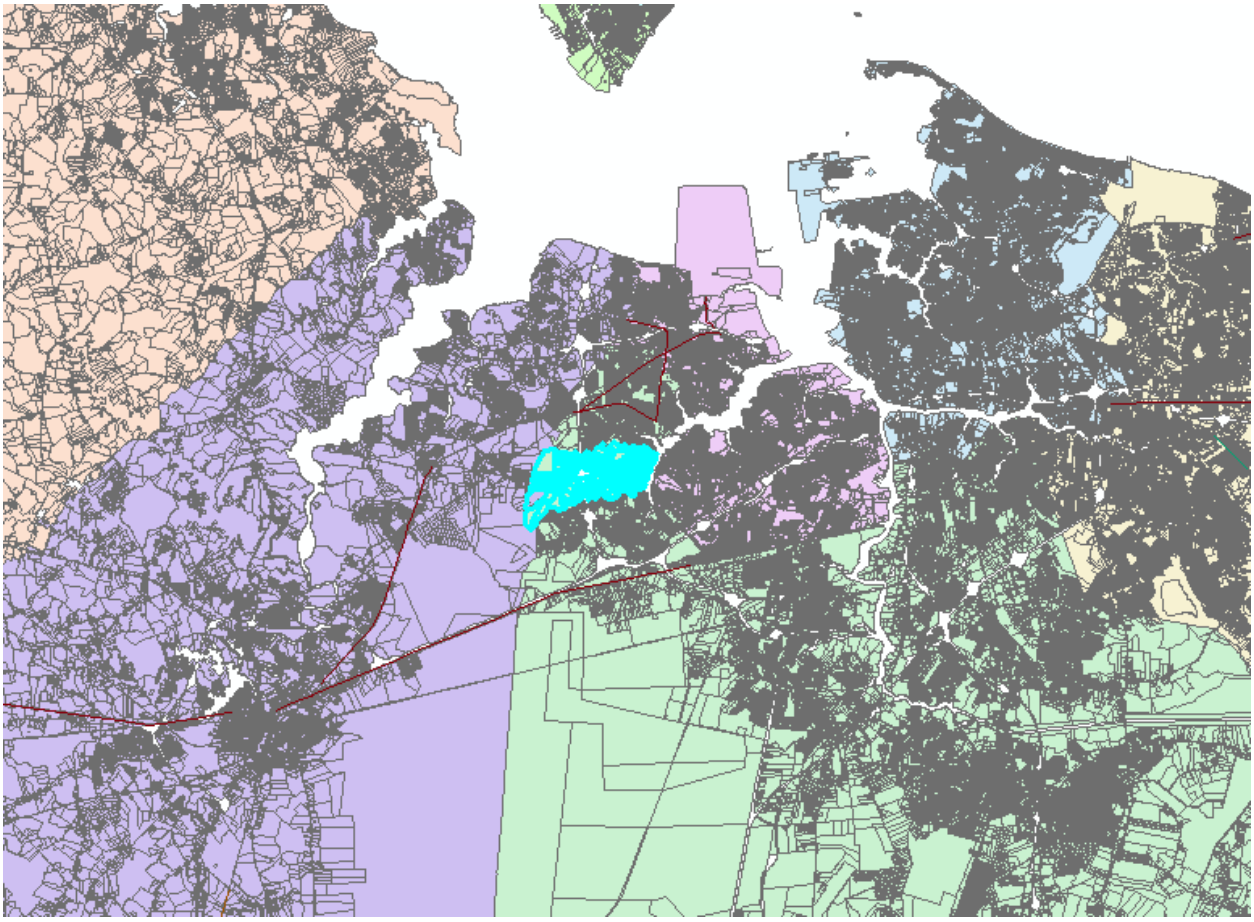
Susan L. Wilson

Susan L. Wilson, AICP
Manager of Transportation & Maritime Planning

Cc: James E. Wright, Jr., P.E., City Engineer, City of Portsmouth
Bob Baldwin, AICP, Director of Planning, City of Portsmouth
Brannon Godfrey, Deputy City Manager, City of Portsmouth
Mike Kimbrel, Principal Transportation Engineer, HRTPO

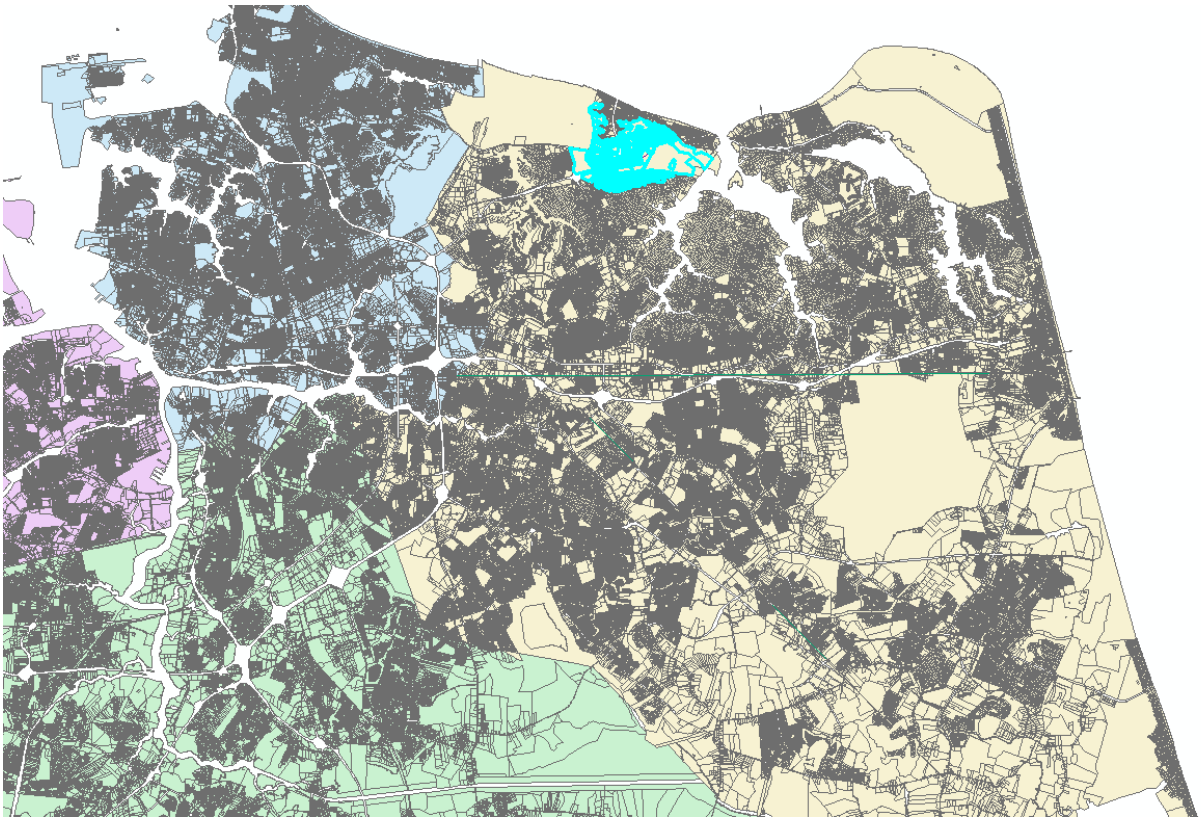
Department of Planning
801 Crawford Street • Portsmouth, VA 23704-3822 • (757) 393-8836 • Fax: (757) 393-5223

Appendix F- Real Estate Parcels used in Calculation of Trail Impact on Residential Values based on Indianapolis Experience (parcels within 0.5 mile of subject trails)



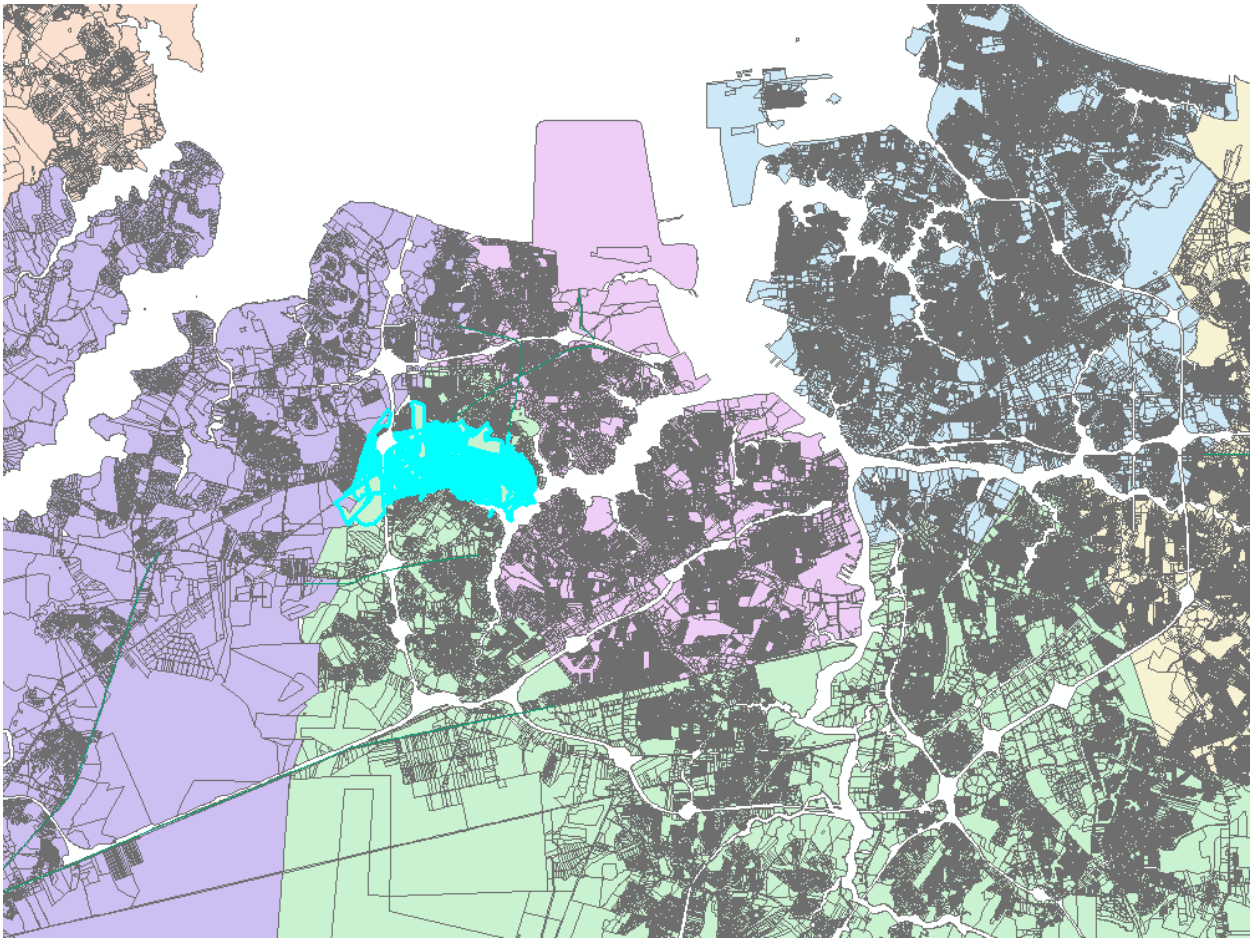
Atlantic & Danville

Source: HRTPO analysis of HRPDC parcel data



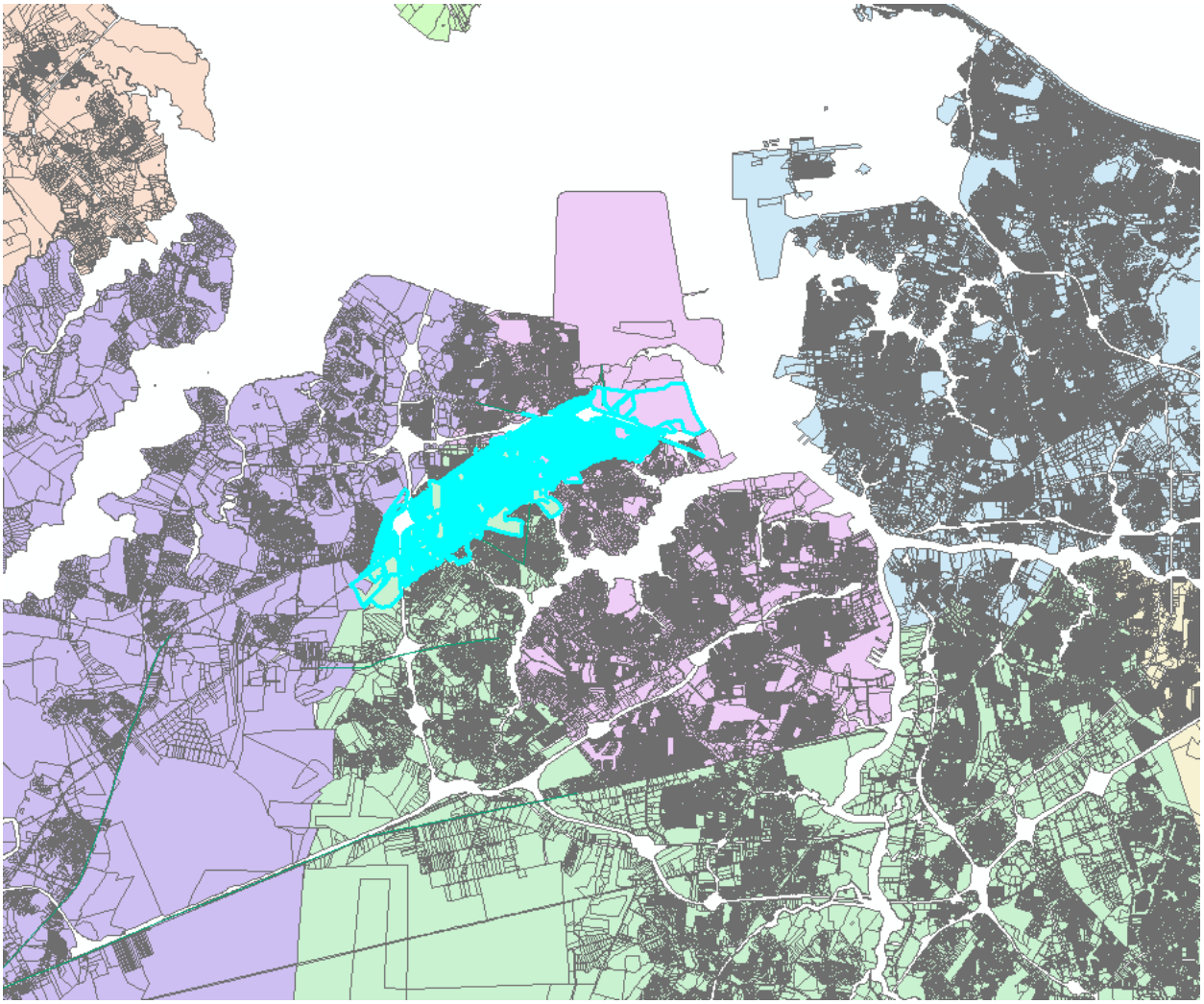
Bayville

Source: HRTPO analysis of HRPDC parcel data



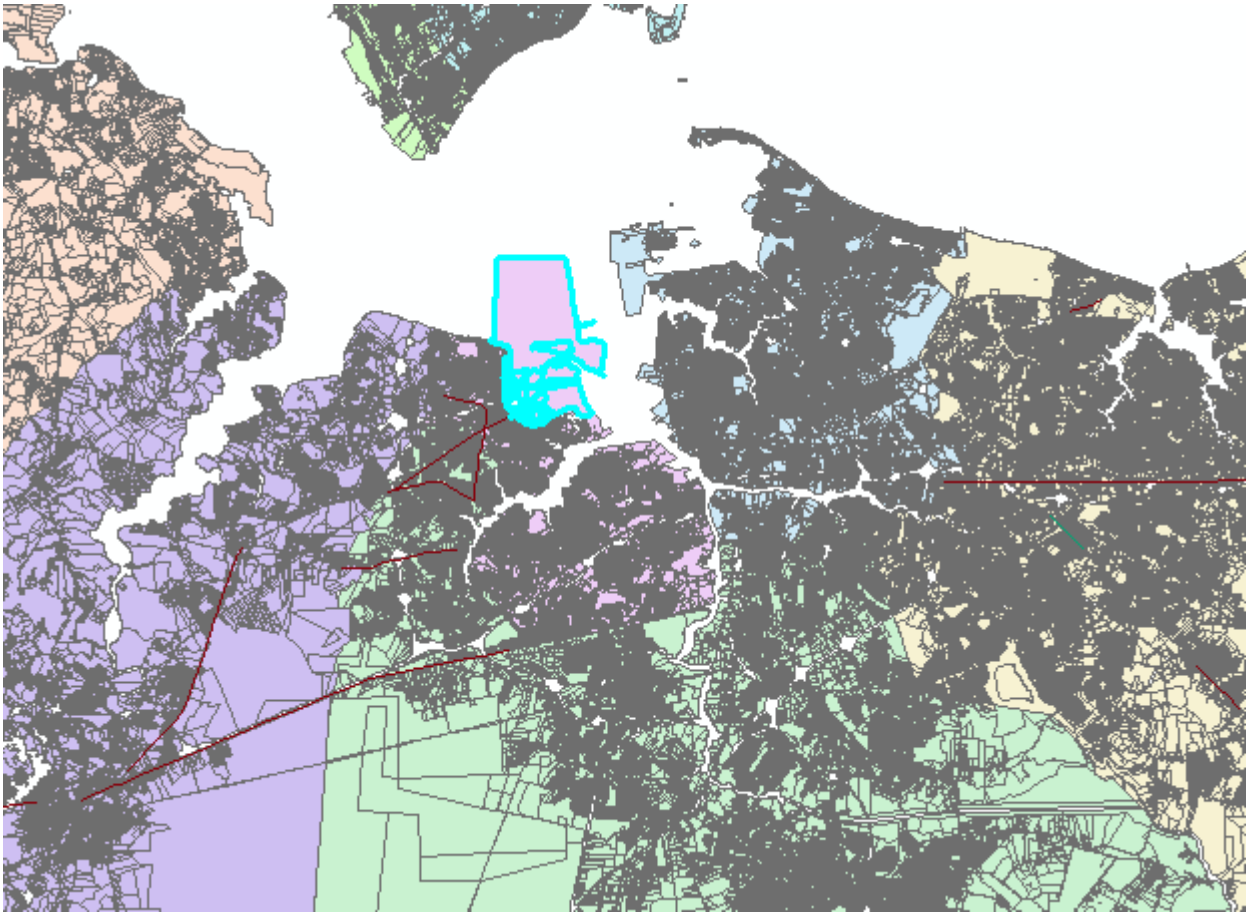
Bruce Road

Source: HRTPO analysis of HRPDC parcel data



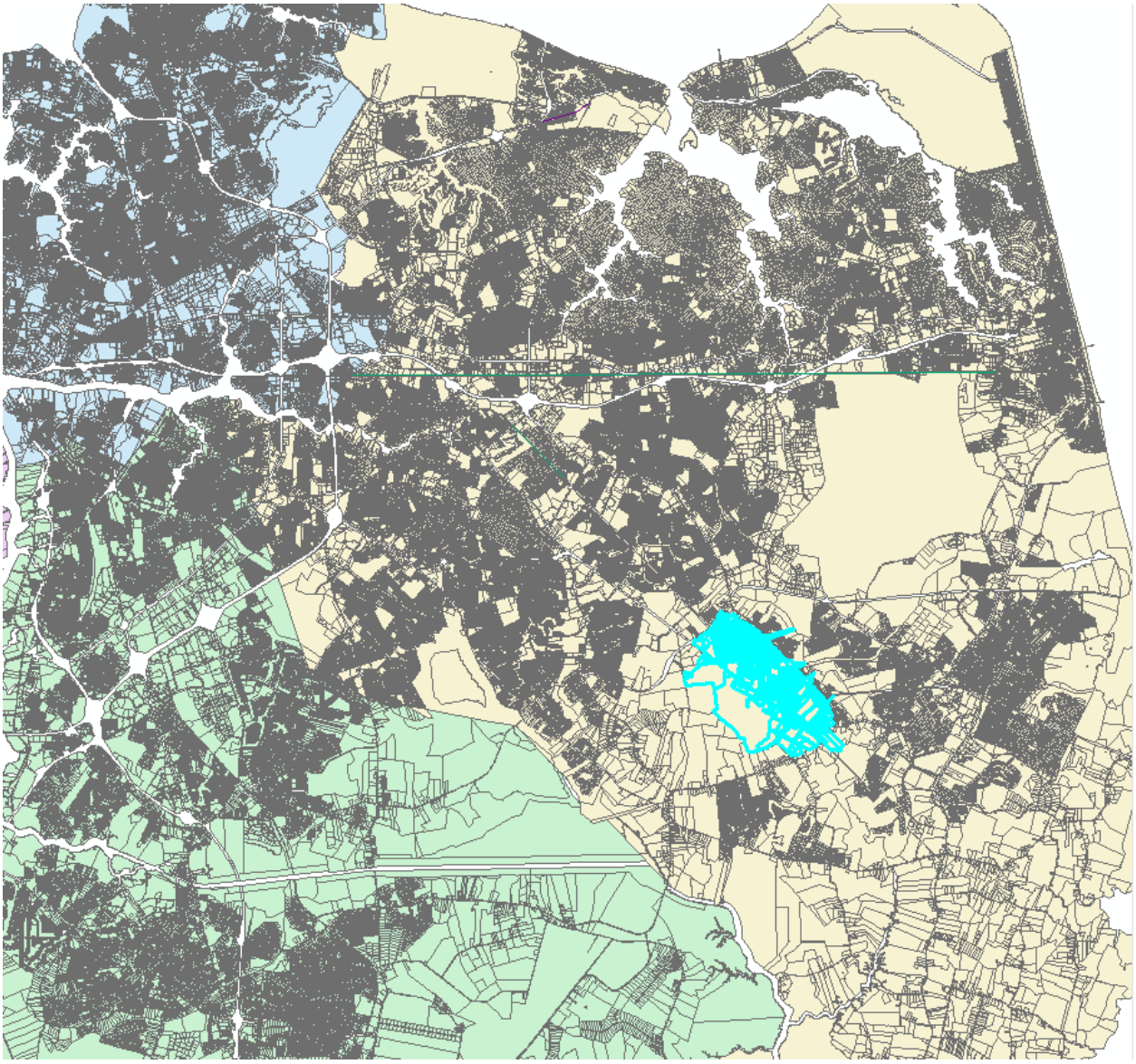
Churchland

Source: HRTPO analysis of HRPDC parcel data



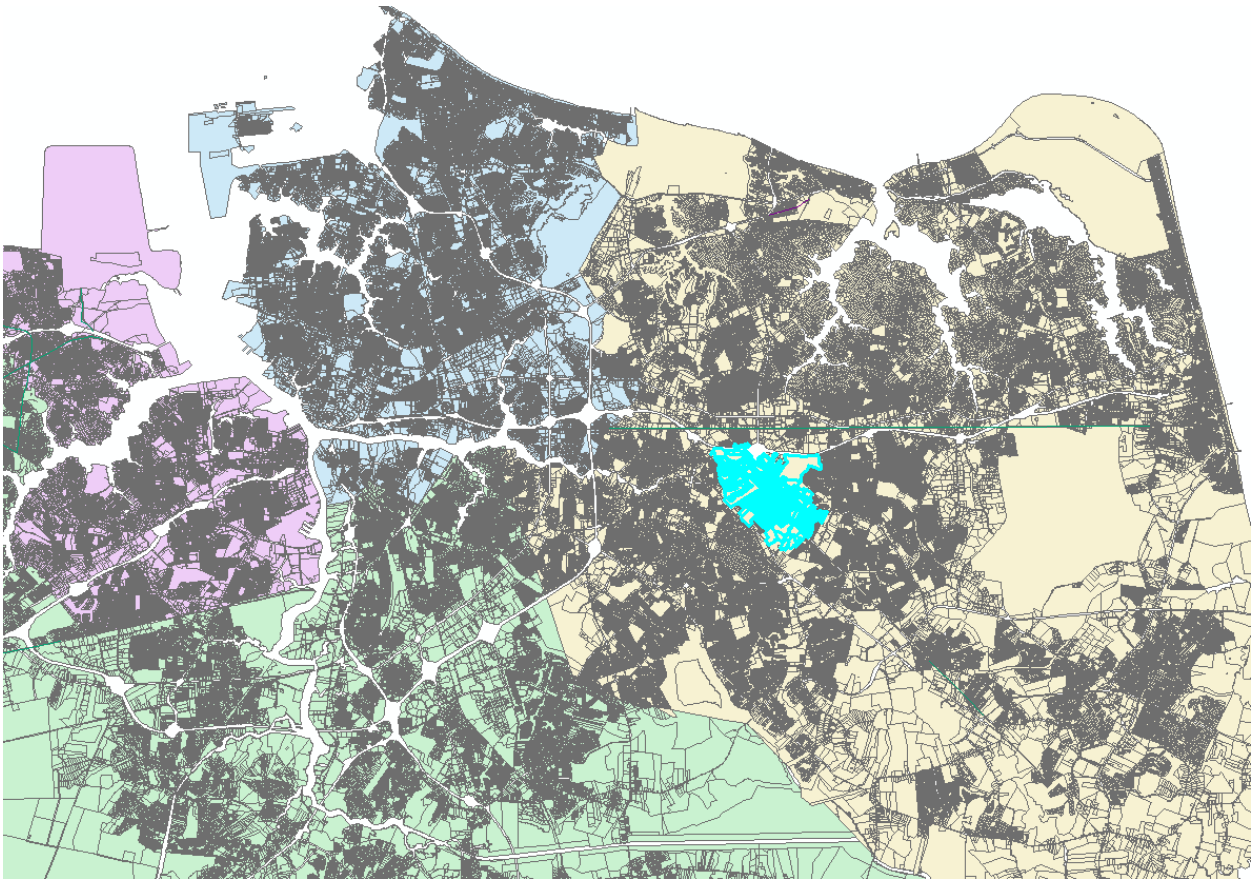
Churchland High

Source: HRTPO analysis of HRPDC parcel data



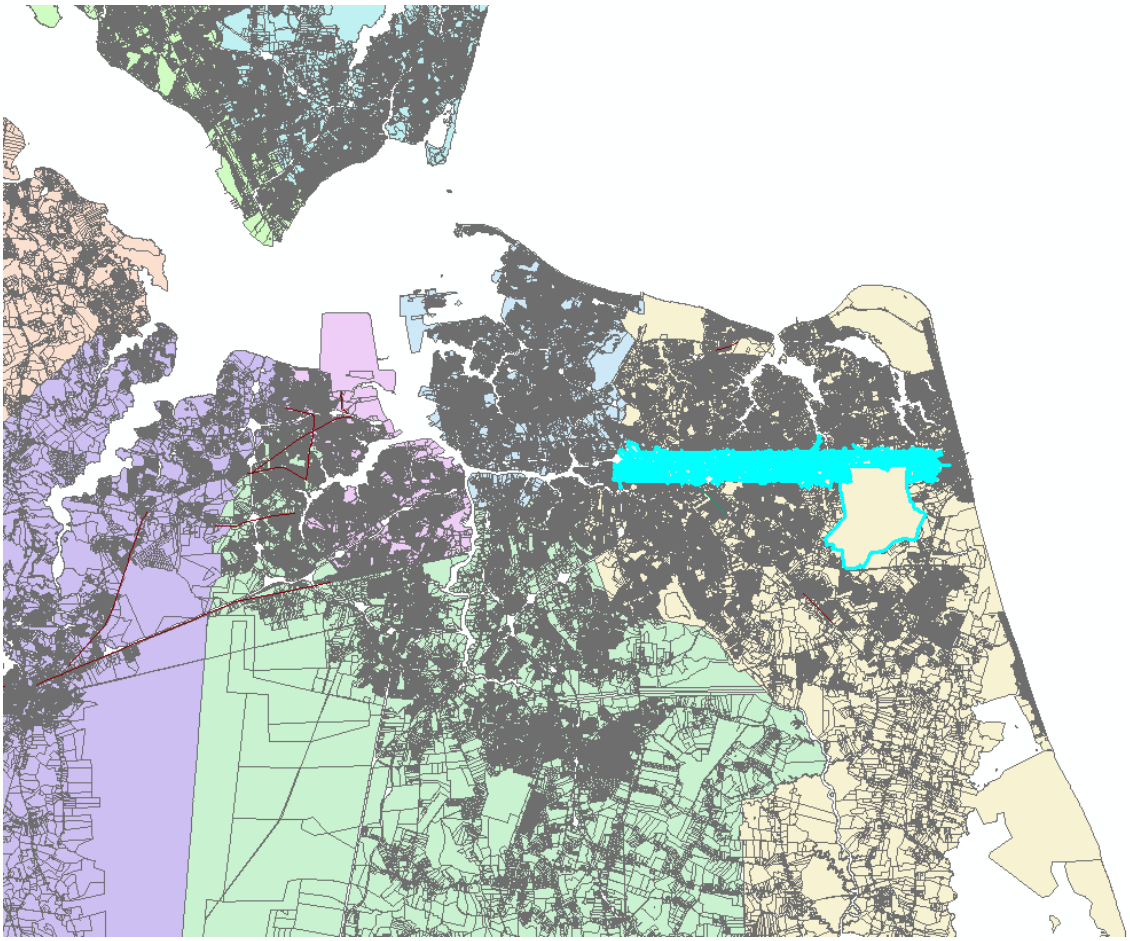
Courthouse

Source: HRTPO analysis of HRPDC parcel data



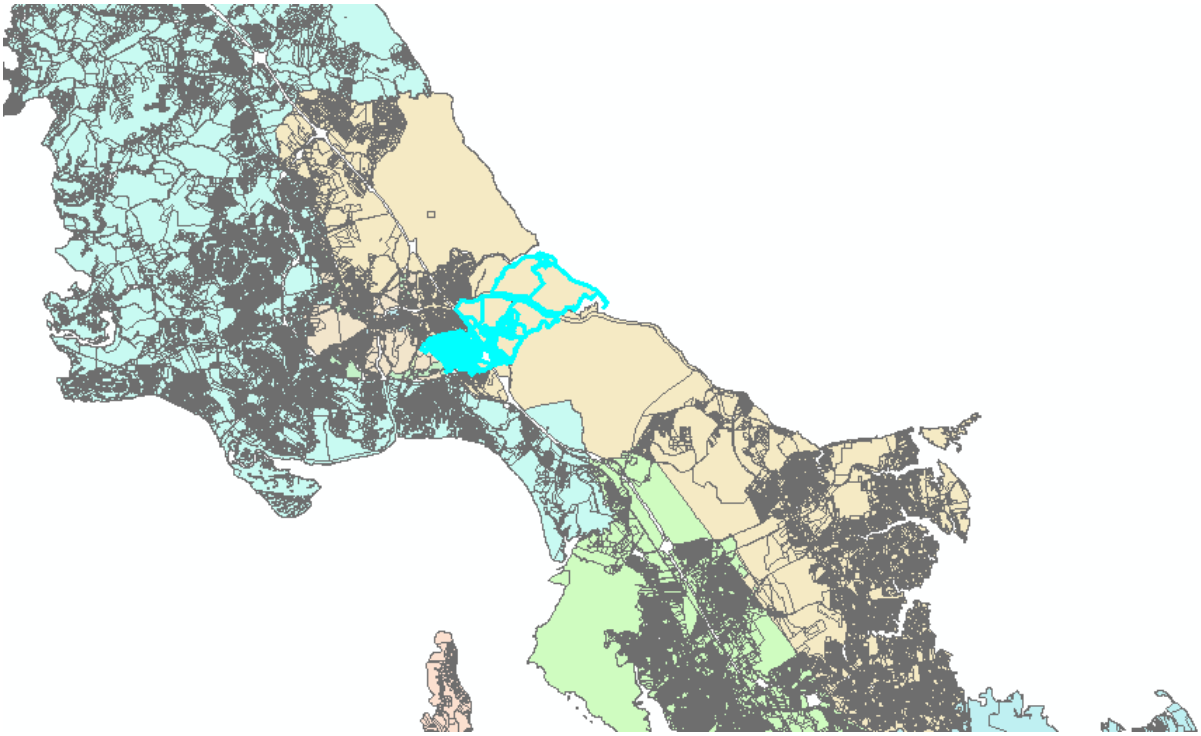
Larkspur

Source: HRTPO analysis of HRPDC parcel data



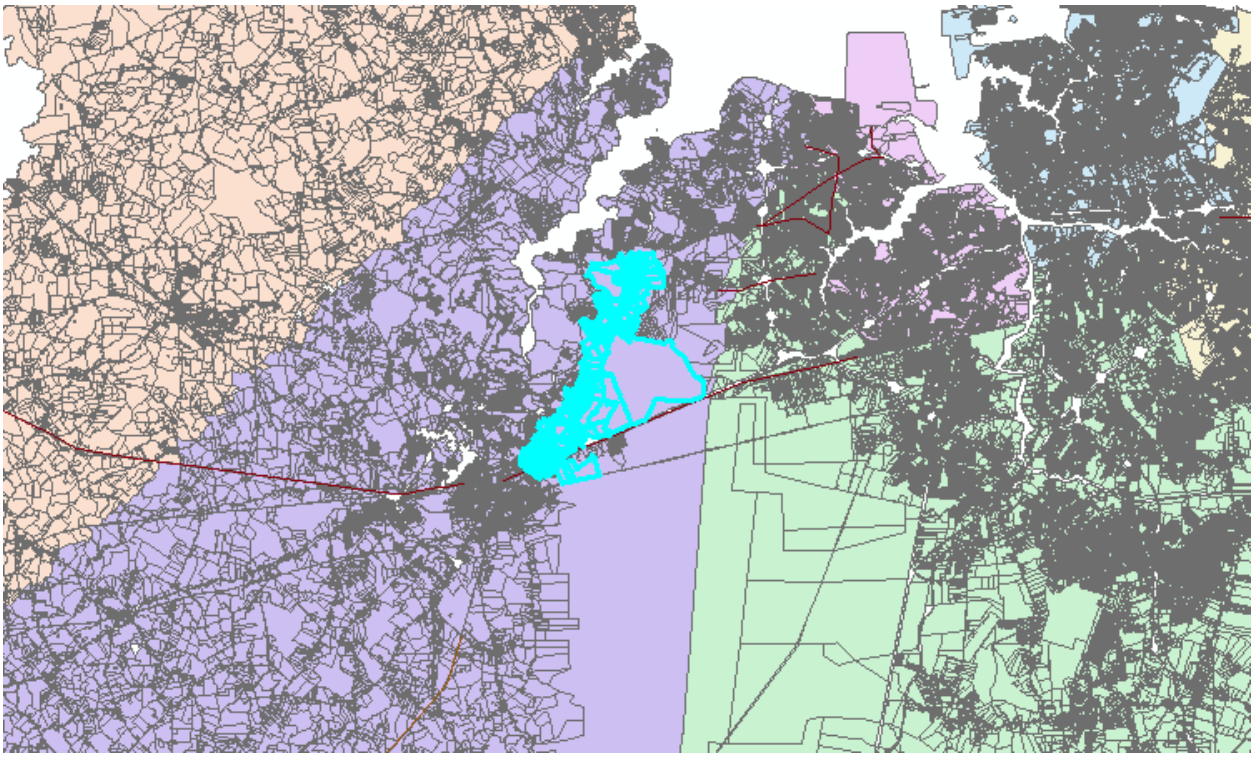
Norfolk Southern (Norfolk data n/a)

Source: HRTPO analysis of HRPDC parcel data



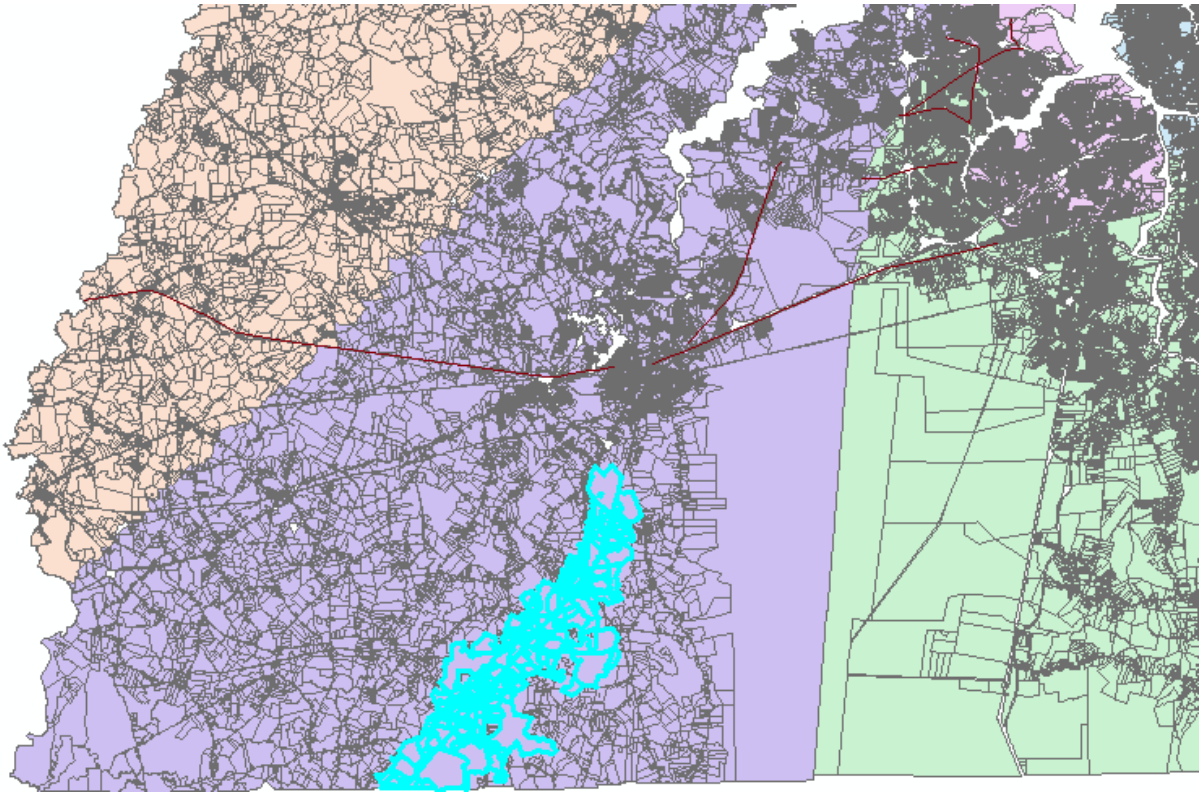
Penniman (James City data n/a)

Source: HRTPO analysis of HRPDC parcel data



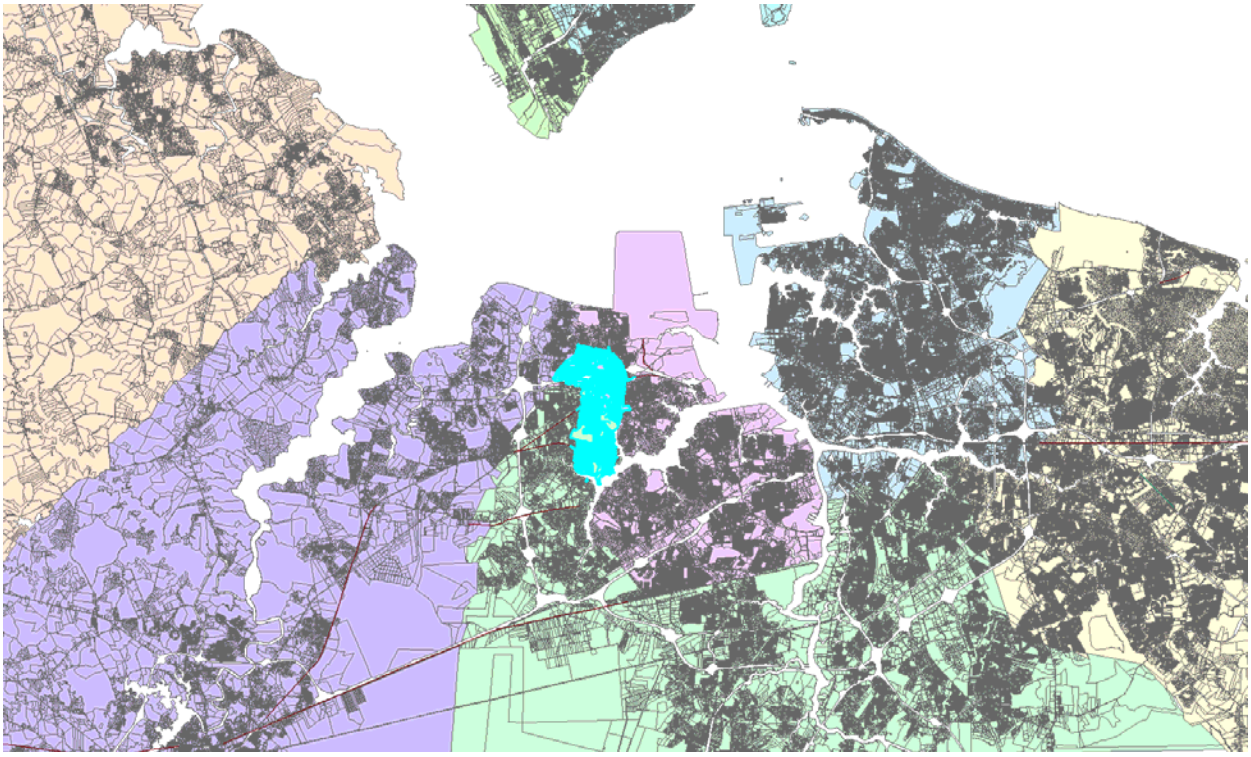
Seaboard

Source: HRTPO analysis of HRPDC parcel data



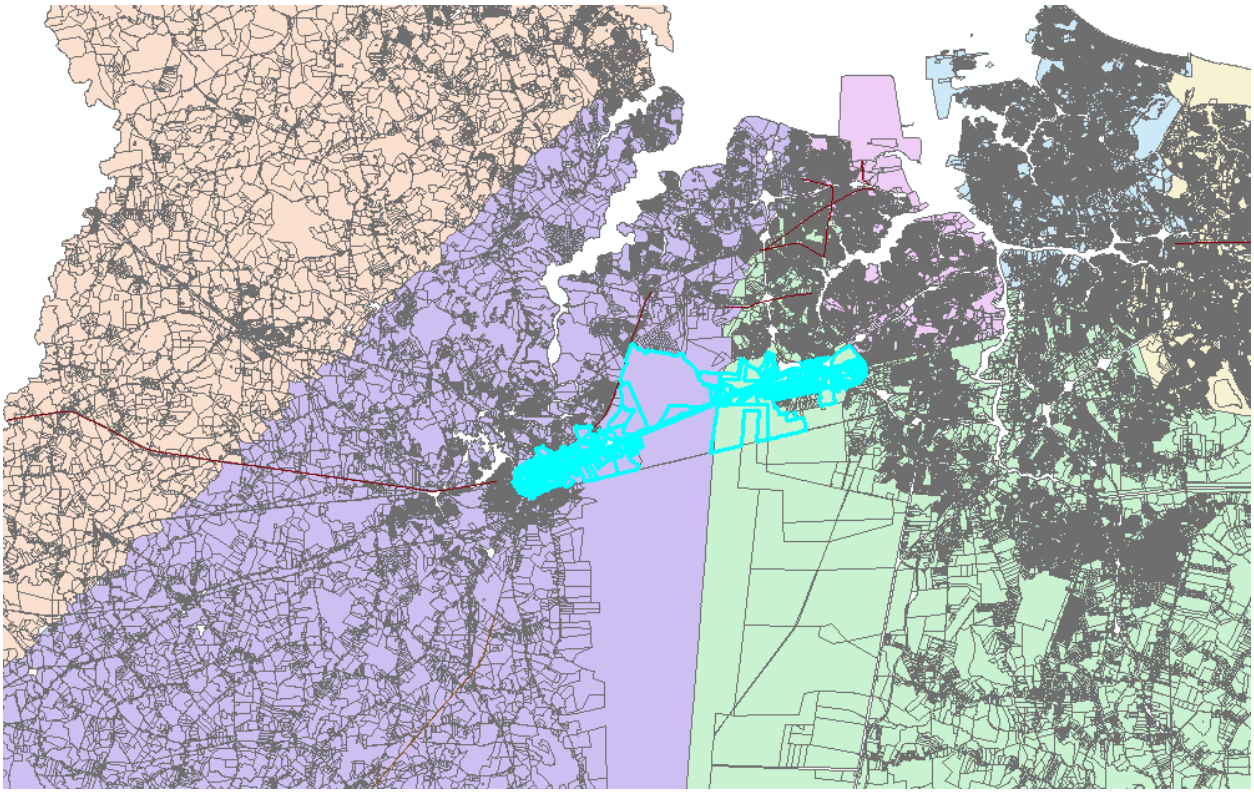
Southern

Source: HRTPO analysis of HRPDC parcel data



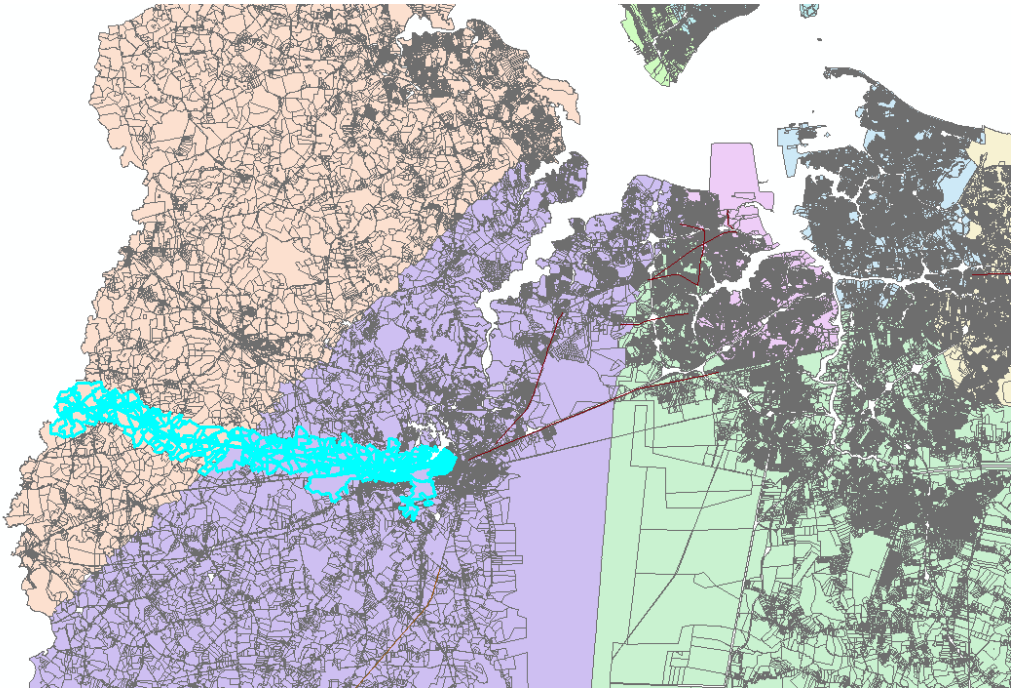
Tyre Neck

Source: HRTPO analysis of HRPDC parcel data



Virginian-East

Source: HRTPO analysis of HRPDC parcel data



Virginian-West

Source: HRTPO analysis of HRPDC parcel data

Appendix G- Background Research on Existing Trails Around U.S.

Midtown Greenway (Minneapolis)

Length: **5.5 Miles**

Ridership/usage/popularity:
http://midtowngreenway.org/news-and-developments/greenway-wins-2014-great-places-award/

"We are pleased to announce that the Midtown Greenway has received a 2014 Great Places Award from the Sensible Land Use Coalition! The award jurors said the Greenway:

- "Is a great connector and unparalleled in stimulating development and investment."
- "Is not just a trail but a space to garden, see art and experience community events."
- "Has transformed MANY people's ways of being in the city, and has MADE places, significantly and sensibly, for the widest range of people."
- "Embodies one of the most significance features of a great place - the Midtown Greenway is still BECOMING."

Environs:
http://midtowngreenway.org/news-and-developments/midtown-greenway-named-best-urban-bike-trail-in-the-nation/ "a 5.5-mile bicycle highway **through the center of town.** Following a sunken rail corridor with no major breaks in traffic, this path is almost entirely separate from pedestrian traffic and is busy with commuters year-round. That's right: it's plowed in the winter. The Greenway is also lit at night, so it's functional 24/7, and has emergency call boxes, police patrolling on bike, and even its own suspension bridge."

Description

http://www.traillink.com/trail/midtown-greenway-%28mn%29.aspx:

The 5.5-mile Midtown Greenway follows a former railroad corridor through south Minneapolis, heading due west from the Mississippi River to the neighborhood of West Calhoun in the scenic Chain of Lakes Area. The paved pathway is only 1 block north of the improving Lake Street corridor and runs parallel to the road for most of its route, thus providing a safe alternative for cyclists and pedestrians to travel on the busy street.

Much of the trail is below-grade as a direct result of a 1912 mandate by the Minneapolis City Council for the Milwaukee Road to dig a trench for their rail line. In the present day, the decision ensures that trail users have minimal contact with vehicular traffic. East of State Route 55/Hiawatha Avenue, the Minnesota Commercial Railway operates trains on the corridor to this day. This section of the Midtown Greenway is an example of a successful rail-with-trail project. Busy Hiawatha Avenue is crossed via the stunning Martin Olav Sabo Bridge, which is open

exclusively for bicycle and pedestrian use. Just east of the bridge, trail users can pick up the Hiawatha Trail to travel north to downtown Minneapolis or south to Minnehaha.

On its western end, the Midtown Greenway connects directly to the Cedar Lake LRT Regional Trail, which links Minneapolis to the suburbs of St. Louis Park, Hopkins and beyond via other connecting trails. Traveling north on the Kenilworth Trail—also located at the Midtown Greenway's western end—leads trail users to the longer North Cedar Lake Regional Trail/Cedar Lake Trail.

In the east, bicyclists and pedestrians can seamlessly join the West River Parkway for a longer ride, run or walk along the Mississippi River. In the future, a streetcar line may be installed in the Midtown Greenway corridor, although a separated trail would still be maintained. There has also been local interest in extending the trail east over the Mississippi River into the Prospect Park neighborhood of Minneapolis and onward into St. Paul, but there are no concrete plans at this time.

Parking and Trail Access

The Midtown Greenway can be accessed from the following locations: Kenilworth Trail, Calhoun Village Shopping Area, Dean Parkway, Lake of the Isles Parkway, James Avenue S., Irving Avenue S., Humboldt Avenue S., Bryant Avenue S., Nicollet Avenue, 5th Avenue S., Park Avenue S., 10th Avenue S., 11th Avenue S., 13th Avenue S., 18th Avenue S., E. 28th Street, Hiawatha Avenue, Minnehaha Avenue, 26th Avenue S., 27th Avenue S., 29th Avenue S., 30th Avenue S., and West River Parkway. Street parking can be found within two blocks of most of these access points.

Burke-Gilman Trail (Seattle)

Length: **27 miles**

Ridership/usage/popularity:
http://www.burkegilmantrail.org/
Built in the 1970s
https://www.broward.org/Greenways/Documents/burkegilman.pdf
The trail also passes through an industrial area, several neighborhood commercial areas, the University of Washington, and links six parks. **The trail was constructed in 1978 and currently has an estimated three quarters of a million users per year. As many as 4,000 to 5,000 users (80 percent bicyclists) enjoy the trail on a busy day.**

Environs:
http://www.traillink.com/trail/burke-gilman-trail.aspx
Golden Gardens Park and the Sammamish River Trail mark the boundaries of the Burke-Gilman Trail, a multi-use recreational trail that runs **through the heart of Seattle.** The trail is jointly maintained by Seattle Department of Transportation and Seattle Parks and Recreation

Description

The Burke-Gilman Trail is as much a thoroughfare for commuting to work and the University of Washington as it is a staple for social recreation and fitness. Built in the 1970s, the trail was among the first rail-trails in the country and helped inspire dozens of similar projects around the nation.

Golden Gardens Park and the Sammamish River Trail mark the boundaries of the Burke-Gilman Trail, once a line of the Seattle, Lake Shore and Eastern Railway (SLS&E). Created in 1885 by two prominent Seattle residents, Thomas Burke and Daniel Gilman, the SLS&E was purchased by the Northern Pacific Railroad in 1901. Heavy traffic by the logging industry sustained the line through 1963, and the corridor became inactive in 1971. The heavy traffic continues as trail users make their way from Puget Sound to Lake Union and Lake Washington.

You can start your journey at Puget Sound at the Golden Gardens Park entrance, on the east side of Seaview Avenue NW. Reach the NW 60th Street Viewpoint by traversing the waterfront and marina for just over a mile. Signs direct you to cross Seaview Avenue and head 0.7 mile to the Ballard Locks. The sidewalk along Seaview Avenue, now NW 54th Street, connects to NW Market Street in downtown Ballard.

To reach the 1-mile on-road portion of the missing trail link, turn right at Shilshole Avenue NW. Turn left onto NW Vernon Place, and then turn right onto Ballard Avenue NW. A right onto 17th Avenue NW returns you to Shilshole Avenue, where the road is painted for cyclists and becomes NW 45th Street after crossing under the Ballard Bridge. Return to the sidewalk and trail at 11th Avenue NW and 45th.

Leaving Puget Sound, you will find yourself in a park beside the Fremont Canal that connects the sound to Lake Union. Past the steps waits Fremont, a great area for food, gelato, a glimpse of the famous Fremont Rocket, a Vladimir Lenin statue, and an infamous troll statue. This brings you to Lake Union, 5 miles from Golden Gardens Park. The trail turns right onto N. Northlake Way at N. 34th Street, guiding you to the historic waterfront of a former coal gasification plant, Gas Works Park, where kite flying and kayaking are popular. Next stop:

University of Washington, but not before the orange Wall of Death (an art installation representing a motorcycle velodrome).

Circling around the U District (so named for the University of Washington) and retail area at mile 7 will put you on a secluded path of maples, dogwoods, and occasional firs. You'll then pass above the waterfront Magnuson Park at NE 70th Street, a former naval station next to the National Oceanic Atmospheric Administration. At mile 13, a bridge crosses Sand Point Way NE. To your right lies Seattle's largest freshwater swimming beach, Matthews Beach Park.

Lakeside homes on tiny streets line the trail beyond. The city of Lake Forest Park welcomes you at mile 16, where you'll pass a serpent fountain and a mural as you parallel Bothell Way NE/State Route 522. Two lakefront parks provide a respite from this 3-mile commercial district. At Ballinger Way NE/SR 104, look toward the lake for the tiny Lyon Creek Waterfront Preserve. Tracy Owen Station, also known as Log Boom Park, is the last lakefront stop, offering restrooms, a water fountain, a play area, and history.

Leave the roadside at the north end of Lake Washington for the riverfront. At mile 20, you can head straight over a bridge into Blyth Park or fork left to continue onto the Sammamish River Trail. Buses will return you to Ballard, or you can continue to the east side of Lake Washington and onto Snoqualmie Valley or to the Columbia River.

Parking and Trail Access

To reach Golden Gardens Park from Interstate 5, take Exit 172 to N. 85th Street, and head west 3.4 miles to 32nd Avenue NW. Turn right onto 32nd Avenue NW, and continue on Golden Gardens Drive NW for 0.8 mile. Turn left onto Seaview Place NW, which meets Seaview Avenue NW and a parking lot in 0.2 mile. Disability parking is available.

To reach Blyth Park from I-405, take Exit 23 to SR 522 west toward Seattle. After 0.2 mile, bear right onto Kaysner Way. Turn left onto Main Street. After 0.1 mile, turn left onto 102nd Avenue NE. When the road ends at 0.3 mile, turn right onto W. Riverside Drive. Blyth Park is 0.5 mile ahead.

Minuteman Commuter Bikeway (Boston)

http://www.traillink.com/trail/minuteman-bikeway.aspx

Draft report:
http://www.minutemanbikeway.org/Media/NavigatingtheMinutemanCommuterBikeway_Toole-DRAFT.pdf

Length: **10 miles**

Ridership/usage/popularity:
Common trip purposes include transportation to and from **work and school**, and **natural, cultural and historic sites; running errands; shopping; visiting friends; attending events; and gaining access to entertainment venues**. **Intermodal trips** are enabled by the trail's access to the Alewife MBTA station and many MBTA bus routes/ stops.

Environs:
The 11-mile rail-trail through **suburban Boston** is one of New England's most popular trails. Warm summer weekends in particular bring folks of all ages and abilities elbow to elbow along the asphalt bikeway.

Built by the Commonwealth of Massachusetts on an inactive railroad right-of-way, the Minuteman Bikeway has become a treasured regional resource, used by local residents and visitors from near and far.

Connecting to the Alewife "T" Station in Cambridge, the bikeway provides an easy way for bicyclists and pedestrians to travel to and from subway and bus lines, serving to reduce automobile traffic in the area.

Description

http://www.traillink.com/trail/minuteman-bikeway.aspx

You won't get lonely on the Minuteman Bikeway. The 11-mile rail-trail through suburban Boston is one of New England's most popular trails. Warm summer weekends in particular bring folks of all ages and abilities elbow to elbow along the asphalt bikeway.

The corridor boasts more than a vibrant present. It has a storied past that includes, as the name implies, a role in Revolutionary War times. The trail travels through the area where the Revolutionary War began in April 1775. In 1846, the Lexington & West Cambridge Railroad built and started service on the line. The blizzard of 1977 halted passenger service for good, and the demise of freight service followed in 1981.

In 1991, the line was railbanked by federal law, making it possible to transform the line into a rail-trail, while preserving future railroad opportunities. Just a year later, Rails-to-Trails Conservancy and the communities along the route celebrated the opening of the Minuteman Bikeway as the country's 500th rail-trail. By 1998, the Minuteman Bikeway was extended from downtown Arlington to the Alewife T-station in Cambridge. In 2000, the White House recognized the trail as a Millennium Trail (a program of the Clinton administration that noted

outstanding trails in honor of the millennium), solidifying its reputation as a premier recreation and transportation route.

Although most users know the entire route as simply the Minuteman Bikeway, there are actually several connecting trails that can lead you from Somerville to downtown Concord. From Boston you have the option to hop the Red Line subway to Alewife T-station, where the Minuteman begins. To add 1.5 miles to your route, jump off at Davis Square Station and take the Alewife Linear Park to the Minuteman.

Traveling north into Arlington, you'll begin to understand why this trail is popular with pleasure-seekers and commuters alike. Heading northeast from Cambridge, the bikeway connects Arlington, Lexington and Bedford, easing access to neighborhoods, schools and such natural areas as Spy Pond and Great Meadows.

At Mile 1.5 the trail seems to dead-end at Swan Place in Arlington. Here, you'll take a short on-road jog; sidewalks are available for those uneasy with road cycling. Turn right on Swan Place, proceed to Massachusetts Avenue then turn left and look for the Cyrus E. Dallin Art Museum on your right. A set of old train tracks crosses in front of the museum. Follow these tracks with your eyes and you'll spot the onward bikeway across Mystic Street.

Back on the trail, you'll soon reach the Lexington visitor center, which provides information about local attractions and historical sites. Farther north, the wooded corridor grows more peaceful before reaching the trail's end at Bedford Depot Park. You can end your journey here or push on to the Reformatory Branch Trail by following Loomis Street to where it curves and the 4.5-mile trail picks up. The Reformatory Branch Trail will lead you on a natural surface path through several protected wetlands to its western trailhead in Concord.

Parking and Trail Access

Cambridge trailhead by subway: Take the Red Line to the Alewife T-station. Bicycles are permitted on subways during off-peak hours on weekdays or all day on weekends.

Cambridge trailhead by car: Take I-95 to Exit 29A and head east on the Concord Turnpike/SR 2 toward Arlington and Cambridge. At the end of the turnpike, bear right on Alewife Brook Parkway, then turn right on Cambridge Park Drive to the station. The trailhead is west of the station; park in the adjacent garage. For more information visit the Massachusetts Bay Transit Authority's website (http://mbta.com).

Bedford trailhead: Take I-95 to Exit 31B and head north toward Bedford on SR 4/225. Drive 1.1 miles, then turn left on Loomis Street. The trailhead is at the South Road intersection, beside Bedford Depot Park

http://www.bedforddepot.org/railtrails/:

The Minuteman Bikeway is paved with asphalt and is 12 feet wide. Permitted uses include walking, cycling and inline skating. During winter months, the corridor is often traversed by cross-country skiers.

Ann and Roy Butler Hike and Bike Trail (Austin)

Length: **10 mile loop**

Ridership/usage/popularity:
http://www.thetrailfoundation.org/explore/about-the-butler-trail/:
Developed in 1970s
"With more than **1.5 million visits a year**, the 10-mile hike-and-bike trail is Austin's most recognized and popular recreational area."

Environs:
trails border Lady Bird Lake in **downtown Austin** and serve as a social hub for runners, walkers and cyclists. A Memorial at Auditorium Shores honors the late bluesman Stevie Ray Vaughan.
Contains boardwalk

Description

http://www.traillink.com/trail/ann-and-roy-butler-hike-and-bike-trail.aspx:

The Ann and Roy Butler Hike and Bike Trail, named for a former Austin mayor and his wife, is a natural gem in the heart of the Texas capital. The scenic trail forms a 10-mile loop along the banks of Lady Bird Lake, a reservoir on the Colorado River, and is bookended by two major recreational areas: Zilker Park on its western end and Guerrero Park on its eastern tip.

The lush, tree-lined path also provides access to Lamar and Waller Beaches. A unique highlight of the trail is its passage under the Congress Avenue Bridge, home to thousands of bats that canvas the sky at sundown during the summer months.

In June 2014, a lakefront boardwalk, including a series of bridges directly over the water, was completed, closing a short gap on the trail's south side and uniting its east and west halves.

Appendix H- Beaches to Bluegrass Trail (B2B) Letter of Support

HAMPTON ROADS PDC
PLANNING DISTRICT COMMISSION

KENNETH I. WRIGHT, CHAIRMAN • CLYDE HAULMAN, VICE-CHAIR • JAMES D. McREYNOLDS - TREASURER
DWIGHT L. FARMER, EXECUTIVE DIRECTOR/SECRETARY

MEMBER JURISDICTIONS

CHESAPEAKE

FRANKLIN

GLOUCESTER

HAMPTON

ISLE OF WIGHT

JAMES CITY

NEWPORT NEWS

NORFOLK

POQUOSON

PORTSMOUTH

SOUTHAMPTON

SUFFOLK

SURRY

VIRGINIA BEACH

WILLIAMSBURG

YORK

March 20, 2014

Ms. Jennifer Wampler
Trails Coordinator
Virginia Department of Conservation & Recreation
600 E. Main St, 24th Floor
Richmond, VA 23219

RE: Beaches to Bluegrass Trail support

Dear Ms. Wampler:

The Beaches to Bluegrass Trail is a proposed Statewide, multi-use trail which will connect the Cumberland Gap to Virginia Beach through southern Virginia and several localities of the Hampton Roads Planning District Commission (HRPDC). The HRPDC supports the proposed Beaches to Bluegrass Trail as it will promote recreation, tourism, healthy lifestyles, and connectivity between areas of natural resources throughout the State as well as our region.

The HRPDC also supports the dual alignment of the proposed South Hampton Roads Trail route as the Beaches to Bluegrass Trail through portions of Hampton Roads. The proposed South Hampton Roads Trail, a regional trail currently in various stages of planning and development, will connect downtown Suffolk to the Virginia Beach oceanfront.

The HRPDC will also continue to work with local, regional, and state partners to refine the preferred Beaches to Bluegrass route through south Hampton Roads which will connect with the planned trail segments to the west of the region.

Sincerely,

Dwight L. Farmer
Executive Director/Secretary

SJK/jc

Attachment 9-H

HEADQUARTERS - THE REGIONAL BUILDING - 723 WOODLAKE DRIVE - CHESAPEAKE, VIRGINIA 23320 - (757) 420-8300

Appendix I- Public Involvement Details

A. Kickoff Meeting Minutes

Immediately following the 2 September 2015 TTAC meeting at which the signature paths project was introduced, staff held a project kickoff meeting, having invited members of the LRTP Subcommittee, plus other interested active transportation government professionals. Professionals from many localities attended:

Alison Alexander (HA)
Keith Cannady (HA)
Thelma Drake (NO)
Jeff Raliski (NO)
Sherry Earley (SU)
Helen Gabriel (SU)
LJ Hansen (SU)
Carl Jackson (VDOT)
Eric Stringfield (VDOT)
Reed Nester (WM)
Steve Froncillo (CH)
Bridjette Parker (NN)
Britta Ayers (NN)
Julie Navarrete (HRT)
Sam Sink (HRT)
Roberta Sulouff (JCC)
Wayne Wilcox (VB)
Susan Wilson (PO)
Garrey Curry (GL)
Frank Papcin (Citizen)

At this meeting, TPO staff received several comments regarding the direction of the Signature Paths study, including:

- Creating an inventory of existing bicycle and pedestrian facilities.
- Referring to Kevin Page as a resource for inactive rail and identifying rail ROW constraints.
- Researching whether it is possible to add trails/paths directly underneath high power/utility lines. May want to bring Dominion Power into discussion.
- Possible signature paths in Hampton Roads include the Elizabeth River Trail and the South Hampton Roads Trail (SHRT).
- If focusing on SHRT, give it a more regional identity.
- Researching the connectivity of signature paths to other paths/trails within cities/counties as well as transit.
- The idea of developing a system of paths/trails was shared among the meeting attendees. Developing a plan may be a starting point (Capital to Capital Trail was successful because of this). Developing regional design standards to connect paths/trails across localities.
    - DRPT has design standards guidebook
    - VDOT has established design standards

B. Stakeholder Group Mid-Project Meeting

1. Invitees

Staff formed a Stakeholder Group by adding interested citizens to the list of active transportation professionals used for the kickoff meeting (above). The following stakeholders (plus members of the Citizens Technical Advisory Committee (CTAC) were invited to a mid-project meeting held 13 November 2015:

Government Transportation Professionals

- Alison Alexander Hampton
- Chris Arabia DRPT
- Britta Ayers Newport News
- Keith Cannady Hampton
- Tim Cross York
- Garrey Curry Gloucester
- Thelma Drake Norfolk
- Barbara Duke Va. Beach
- Sherry Earley Suffolk
- Jeffrey Florin Virginia Port Authority
- Paul Forehand Norfolk
- Steve Froncillo Chesapeake
- Helen Gabriel Suffolk
- Robert Gey Va. Beach
- Andre Greene Sussex
- LJ Hansen Suffolk
- Paul Holt James City
- Carl Jackson VDOT
- Jamie Jackson Williamsburg Area Transport
- Benjamin Kane Norfolk
- Jackie Kassel Newport News
- Steve Lambert Chesapeake
- Lennie Luke Chesapeake
- Rhonda Murray Navy
- Julie Navarrete HRT
- Reed Nester Williamsburg
- Jamie Oliver Isle of Wight

- Bridjette Parker Newport News
- Jeff Raliski Norfolk
- Ellen Roberts Poquoson
- Ivan Rucker FHWA
- Richard Rudnicki Isle of Wight
- Mark Shea Va. Beach
- Sam Sink HRT
- Brian Solis Va. Beach
- Earl Sorey Chesapeake
- Eric Stringfield VDOT
- Roberta Sulouff James City
- Chris Voigt VDOT
- Beverly Walkup Isle of Wight
- Jennifer Wampler DCR
- Wayne Wilcox Va. Beach

[see Interested Citizens on following page]

Interested Citizens

Devin Aherne
Bob Austin
belowthejames
Diane Berard
Barbara Boslego
Tom Bowden
David Brickley
Alan Brinkley
Camilla Buchanan
Champe Burnley
Nancy Carter
John Carvalho
Bill Cashman
Wes Cheney
Don Cherry
cojordan
Bill Collins
Shirley Confino-Rehder
David Conte
Scott Cramer
Travis Davidson
Michael DiPace
Bruce Doyle
Bruce Drees
Debbie Drees
Barbara Duerk
Mike Evans
Blair Fackler
Sheryl Finucane
Polly Frease
Gordon Freedman
Fat Frogs
Ken Gill
Sam Gillette
Duane Gillette
Norman Goldin
Beverly Goodman
Ron Hafer
Jonathan Hammond
Beth Haywood
Paul Hebert
Steve Hetrick
Kelly Hitchcock
Elizabeth Hokanson
Cameron Holland
Pierce Homer
Keith Johnson
Steve Johnson
Adam Karhl
Ben Kennedy
Ned Kuhns
Jay Leach
Brent Lehew
Deborah Lenceski
Jack Liike
ljc1870
Michael Lucarelli
Amanda Lutke
John Maher
John McCaw
Cate McCoy
John McKee
Katie Mencarini
Mary Miller
Ted Moreland
Brian Mowry
Allen Muchnick
William Newton
Ben Nippert
North End Cyclery
Johnathan Nye
Amy Paulson
Peninsula Bicycling Assoc
Performance Bikes VB
Mark Perreault
Kimberly Perry
Don Peterson
TBA President
Carol Rizzio
Bob Samuel
Mike Sarros
Liz Schleeper
Kurt Schueler
Chris Scott
Michael Shipp
Philip Shucet
Sal Sibilia
Kathy Sievert
Todd Solomon
Barry Stiffler
Elgin Suiter
Larry Summers
Sandra Tanner
Christina Teeuwen
Peter Tempest
Rom Thomas
Mike Thompson
Rich Thompson
Allen Turnbull
Joe Verdirame
Virginia Beach Wheelmen
Joe Vizi
Lloyd Vye
Jewell Walston
Stephanie Weber
Markus Wegener
Eric Weiss
Kim Whitley
Lee Wilkins
Brian Wilson
Cindy Wong
Rick Young
Ray Young
Rex Zerby
Lui Zukosky

Source: master non govt.xls

After the meeting, HRTPO staff sent representatives from Norfolk Southern, CSX Railroad, and Dominion Power the meeting information.

2. Minutes

The second Signature Paths Stakeholder Meeting was called to order at 9:35 am in Regional Board B, with the following in attendance:

Julie Navarrete (HRT)
Sam Sink (HRT)
Lindsay Hoolehan (HRT)
Roberta Sulouff (JCC)
LJ Hansen (SU)
Alison Alexander (HA)
Wayne Wilcox (VB)
Mark Shea (VB)
Steve Froncillo (CH)
Steve Lambert (CH)
Amy Parker (YC)
Ben Kane (NO)
Paul Forehand (NO)
Amanda Lutke (HDR)
Carl Jackson (VDOT)
Jordan Pascale (The Virginian-Pilot)

HRTPO staff updated the stakeholders on work completed since the September 2, 2015 Kickoff Meeting. This includes the identification of existing inactive rail Right-Of-Way (ROW) in Hampton Roads, development of quantitative and qualitative rail-trail analyses, and development of economic impacts evaluation.

The stakeholders entered into a group discussion throughout the update. One of the topics discussed pertained to the buffer used in the quantitative analysis of the signature paths. HRTPO staff informed the stakeholders that the potential usability analysis (quantitative) was based on Census block groups within 2 miles of the signature paths. Some stakeholders thought this 2-mile buffer was too large especially for walking. The size of block groups vary, thereby affecting the area coverage of the buffer. A uniform, smaller buffer (ex. 0.5 mile in width) was suggested. The stakeholders also suggested the inclusion of the existing bicycle/pedestrian facilities in the signature paths maps to display connectivity.

As next steps, HRTPO staff plans to complete the findings in the study and present the draft signature paths report at the January 6, 2016 Technical Transportation Advisory Committee (TTAC) meeting.

C. Review Comments

The following comments were received during (and shortly after) the 6 January 2016 thru 22 January 2016 comment period. Note staff response following each comment.

Sent: Wed 1/13/2016 4:28 PM
To: Rob Case

Rob,

I suggest this change in the language below. Basically the state will update the B2B routing to fit wherever the Hampton roads regions wants it or is building a continuous shared use path. We have two routing systems. Shown below:

- **Interactive map of proposed trail**. The orange line indicates interim on-road segments, the green line shows planned off-road route and the dark green line shows completed off-road segments. The plan covers an ideal off-road alignment and an interim on-road route. The interim trail is a braided system intended for transportation and recreation by non-motorized users.

D. Beaches to Bluegrass Trail (B2B)
The Beaches to Bluegrass Trail, a statewide, multi-use trail which would connect Virginia Beach to the Cumberland Gap, is aligned with the South Hampton Roads Trail in most portions, and aligns with several of the proposed paths in this report. An HRPDC letter of support is included as Appendix H.

John Bolecek
Statewide Bicycle and Pedestrian Planner
Virginia Department of Transportation

Response: Staff made the suggested edit.

Sent: Thu 1/21/2016 10:57 AM
To: Rob Case

Dr. Case,
Thank you for the opportunity to comment on the HRTPO Signature Trails study. After having bicycled from Bar Harbor, ME to Bemidji, MN last summer, I feel eminently qualified to comment on this study. I rode many rail to trail routes including the Paul Bunyan Trail and the Pere Marquette Rail Trail. Impressive all. There are part of the Adventure Cycling Association's Northern Tier route that traverses the northern section of the USA and in some options, part of Canada. I plan to complete my cross country journey next summer.

The report does a good job in identifying rail trail opportunities in Hampton Roads and quantifying the transportation benefits.

Examining each rail trail opportunity in isolation misses the larger opportunities (multiplier effects) of inter-connection with other active transportation facility types. In particular, the South Hampton Roads Trail (SHRT) will eventually form the Southside's "signature trail." While given honorable comment the TBA feels that the report's limited mention of the SHRT in unifying several rail-trail opportunities misses out on further transportation benefits that a fully developed regional trail will bring.

Regarding the Virginian East rail trail opportunity: even if this r.o.w. is utilized for high speed rail, a rail with/trail opportunity may be present. In addition, there is a pipeline corridor on the opposite (north) side of US58/460 which could potentially host a trail should something on the southern edge not be feasible.

Thank you for your time and consideration.

im Whitley
Advocacy Director, Tidewater Bicycle Association
www.tbarides.org

Response: Staff intends to help the region prepare an active transportation plan for Hampton Roads over the next year or two. In addition, text from this email concerning Virginian East has been added to the discussion of that candidate in this document.

HRTPO responses have been placed (in red) below each comment (see following pages).

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
HAMPTON ROADS DISTRICT
1700 NORTH MAIN STREET
SUFFOLK, VIRGINIA 23434

Charles A. Kilpatrick, P.E.
Commissioner

January 22, 2016

Robert B. Case, P.E., Ph.D.
Hampton Roads Transportation Planning Organization
723 Woodlake Drive
Chesapeake, Virginia 23320

Re: Signature Paths in Hampton Roads

Dear Dr. Case,

The Hampton Roads District Transportation Planning Office has completed a courtesy review of the *Signature Paths in Hampton Roads* plan. The primary focus of this review is to ensure consistency with planned state transportation projects identify in VDOT's Six-Year Improvement Program and any other major transportation issues that should be included or further explored in the document. As such, the comments identified below are preliminary in nature and provided for your review or revision as deemed appropriate.

The Hampton Roads Transportation Planning Organization (HRTPO) is seeking to improve active transportation networks in Hampton Roads in a cost effective way, by locating inactive rail right-of-ways and analyzing the cost and benefits of converting them to multi-use trails. The *Signature Paths in Hampton Roads* plan analyses 14 candidate rail-trails across the region which based on demographic research have the best potential for active use and development. Several segments of the proposed South Hampton Roads Trail alignment have been included as candidate rail-trails.

The Hampton Roads District has reviewed and acknowledged the recommendations, and as the recommendations do not impact state maintained roadways, we defer to the localities for general acceptance and implementation. We do however have the following comments regarding the document:

General Comments:

- This document appears to overlap with existing work that has already been done with the South Hampton Roads Trail (SHRT), which has a continuous alignment and signed resolutions from member localities. Can the South Hampton Roads Trail be discussed early on in the document (not only in the appendix) with a map of the proposed SHRT alignment and how it compares with the candidate signature trails?
  Staff made the suggested change.
- There appears to be no safety analysis of the selected rail trails, have you accounted for adequate lighting in wooded areas and pedestrian crossings near major roadways?
  No safety analysis was done.
- The study may need to include a connectivity analysis showing how the candidate trails will be linked to existing sidewalks and other active trails and bike lanes within the vicinity.
  Connectivity will be addressed in the upcoming HR Regional Active Transportation Plan.

Other Comments

- Page 2: Permission may be required to use a picture of the U.S. Surgeon General
  Noted.
- Page 3: You may also want to make reference to the *VDOT State Bicycle Plan*, *Virginia Outdoors Plan* and *VTRANS 2040*.
  This will be appropriate for the HR Regional Active Transportation Plan.
- Page 4, Figure 1: The red line in Suffolk labeled "Seaboard Coastline Trail" is not active yet. The green line labeled "Bid Trail" is actually the most recently opened, active segment of the Seaboard Coastline Trail between Driver and Shoulders Hill Road.
  Our labelling matches http://www.suffolknewsherald.com/2015/02/02/bike-trail-under-way/.
- Page 9: This map does not include the Cape Henry Line in Norfolk, the Pembroke Avenue Line in Hampton/Newport News or the Navy Line on the Yorktown Naval Weapons Depot in York County.
  Staff will make note of these for the HR Regional Active Transportation Plan.
- Page 13, Figure 3: Why does the pie chart total 29.3% and not 100%?
  Fixed.
- Page 14: Please include the Virginia Capital Trail and East Coast Greenway in your analysis.
  Staff will consider these for the HR Regional Active Transportation Plan.
- Page 18, Figure 5: It's difficult to see the color of the dot representing the Bicycle and Walker Commuters. Please increase the size for the legend. Also, the '1 Dot = 1' isn't very descriptive. Would recommend changing to '1 Dot = 1 Commuter'.
  Done.
- Page 33: There are no cost estimates for maintenance and repair.
  Correct.
- Page 42, Figure 14: The routing shown for Suffolk Transit is incorrect, this bus proceeds north on I-664 to the Pughsville Road Exit.
  Modified to reflect current map on Suffolk Transit website.

- Page 79-80: This picture is from the Phase IV (not Phase 1) opening of the Suffolk Seaboard Coastline Trail from June 2015.
  Photo replaced.

The comments identified are preliminary in nature and provided for your review or revision as deemed appropriate. Please notify Mr. Carl Jackson at 757-925-2596, should you have any questions.

Sincerely,

Eric L. Stringfield
Hampton Roads Transportation Planning Director

ELS/cej

Sent: Thu 1/21/2016 11:48 PM
To: Rob Case
Cc: Paul Forehand; Lee; carl.jackson@vdot.virginia.gov; belowthejames@yahoo.com; Eric Stringfield; Bruce

Mr. Case,
Please consider below comments on the above draft report:

1. It is terrific that the HRTPO has prepared a study that recognizes the value of a multi-use off-road trail network to the economy, the livability, including health, the functionality and appeal of the region. It is also important that the TPO has taken official note of what is occurring in competing regions around the country, and informs our leaders of this reality.

2. At the same time, this draft report takes a very narrow and limited approach, choosing to focus only on inactive rail right of ways. This limitation severely limits the value and benefits of the report.

3. While the draft acknowledges, in a couple places, the importance of a network of trails to achieving the full benefits of trails (e.g., Page 36), its vision for Hampton Roads in the end appears limited to the 14 mostly short and disconnected disused rail right-of-ways identified in the draft. I strongly urge the approach be modified to envision a connected off-road multi-use path system connecting as much of Hampton Roads and adjoining regions as possible, to achieve the recreational, commuting, health and tourism benefits that only a network can achieve. Ironically, Indianapolis's Monon Trail, which is apparently intended as a spine for a region-wide trail and greenway network, is cited as the inspiration for the limited disused and mostly disconnected Hampton Roads rail corridor approach.

4. Disused rail corridors can be ideal for multi-use trails, away from roads, scenic, and often cheaper to construct than any other alternatives. The emerging South Hampton Roads Regional Trail (SHRT), too lightly treated in the draft report, makes use of rail right-of-ways for much of its length, and could serve as a spine akin to the Monon Trail, perhaps with a rural link west of downtown Suffolk utilizing the Virginian-West rail corridor. But Hampton Roads will need to find a way to build a lot of connecting and other off-road trails other than in disused rail right-of-ways if it is to be successful in building an extensive network of off-road trails. The Elizabeth River Trail in Norfolk, which is correctly referred to as a hybrid trail in the draft, has shown the way to achieving a continuous off-road trail in an urban area without extensive disused rail corridors in a modest but significant way.

[email continues on following page]

5. Two major opportunities, beyond a greater focus on the SHRT, appear that deserve mention in the draft report. The real successful trail networks, such as in Denver, link the urban core to rural areas, covering broad areas while allowing urban residents to cycle, walk or run to the countryside -- they also link to trail systems outside the metro area. One such opportunity has already been mentioned, the SHRT, linking to the Virginia West rail corridor. But another is a link from downtown Norfolk to the fabulous Dismal Swamp Canal Trail (DSCT), pictured but not discussed in the draft report. Such a link could use the existing separated multi-use path on the Berkley Bridge, then follow I-464 corridor using buffering land along Bainbridge Blvd. to Chesapeake. This segment could ultimately be connected by sidepaths to the north end of the new Dominion Bridge multi-use path, and then southwest to connect to the DSCT, thereby linking the Hampton Roads urban core to the Great Dismal Swamp and North Carolina, while creating an off-road link in the Colonial Coast segment of the East Coast Greenway.

6. The other major opportunity would be an extension of the recently completed Richmond - Jamestown Capital Trail east to downtown Norfolk and Portsmouth. From its current Jamestown terminus, this extension could use the Jamestown-Scotland ferry across the James River, and then, following the Capital Trail sidepath format, connect to Surry CH, then to Chippokes State Park, Bacon's Castle, Historic Smithfield, then to Nike Park (using an under development multi-use path0, and then to downtown Suffolk to connect with the SHRT. IN conjunction with the SHRT to Downtown Norfolk, and the Norfolk-DSCT link proposed above, this extension would allow completing a continuous off-road Colonial Coast segment of the East Coast Greenway from Richmond to the North Carolina line through downtown Norfolk and Portsmouth with the commensurate benefits to our tourism economy.

Thank you,
Mark Perreault
Elizabeth River Trail Committee
Norfolk

Response: Staff intends to help the region prepare an active transportation plan for Hampton Roads over the next year or two. In addition, staff moved the SHRT section from near the end to near the beginning.

HRTPO responses have been placed (in red) below each comment (see following pages).

HAMPTON ROADS TRANSIT

January 22, 2016

Dr. Robert Case
Principal Transportation Engineer
723 Woodlake Drive
Chesapeake, VA 23320

Dear Dr. Case:

Thank you for providing Hampton Roads Transit the opportunity to provide comments on the draft Signature Paths in Hampton Roads Report. We view the kind of first-mile/last-mile bike and pedestrian connections that potential signature paths offer as integral to a successful regional transit network. HRT would like to offer the following feedback to your draft report:

- The introduction jumps around a lot with no transitions. It could be rewritten to provide a more coherent narrative that better explains your impetus. Noted.
- On page 2. "In addition to the obvious health effects…"
  - The health benefits of walking and active lifestyles may not be obvious to all readers. Behaviors aside, there is compelling research available suggesting that the *proximity* of dedicated walking paths has a positive impact on reducing obesity rates. A recent study completed by the Norfolk Dept. of Health (Healthy Norfolk Action Plan) revealed that 67% of Norfolk adults are either obese or overweight, and obesity is the leading cause of death. While I do not have knowledge about the other Hampton Roads cities, I imagine many cities are experiencing similar health crises. In that context, the "obvious health effects" take on a life-or-death importance and are certainly worth mentioning.
  - http://www.norfolk.gov/DocumentCenter/View/4528 Yes it's a crisis, and yes the
  - http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4380517/ benefits of exercise are known.
- Although your focus is on "rail-trails" it would make sense to show other kinds of off-road multi-use trails on your page 6 map. Rail trails do not exist in a vacuum; they are part of a larger network of pedestrian and bicycle infrastructure that the region should be striving toward in order to create mobility options. Put other existing trails on the map, such as the rest of the Elizabeth River Trail to show how your proposed rail-trails can tie into the existing fabric of bike/ped trails. We put several trail types on the maps for the individual candidates.
- The layout of the report could be better. For instance, pages 7 and 8 seem like they could be combined. Condensing the report and making it seem less like a Microsoft Word multilevel list would improve readability. We started each of the seven sections on a new page, and used photos to improve white space.
- Many of the photos throughout the report do not align with the text. On 52 there is a photo of the Cape Henry Trail with no reference in the text above for the Bruce Road Trail. This also occurs on page 63, 76, 88, 96. It would improve the report to include photos in each chapter that are relevant to the information presented. Noted.
- A possible other resource to consider in your evaluation of existing methods of estimating active transportation:
  - Lindsey, Greg, Jeff Wilson, Elena Rubchinskaya, Jihui Yang, and Yuling Han. "*Estimating Urban Trail Traffic: Methods for Existing and Proposed Trails*." Landscape and Urban Planning: 299-315. Print. Thank you. We added this to our table.

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HAMPTON ROADS TRANSIT

- Why did you choose the six rail-trails used to develop your model in table 2? Why were only six chosen? We chose trails from around country; six was adequate for statistical significance.
- Please explain the staff review of existing models that yielded the 2-mile limit for impacts. What literature was consulted?
    - Can you justify using a 2-mile limit for both cyclists and pedestrians? If so, please explain. The statistical significance of the 2mi-based variables (p. 16) shows the importance of the 2mi distance.
    - Have you considered using distance decay in your model to more accurately reflect potential usage? Distance decay may add to the already-effective model.
    - Krizek, Kevin J., Ahmed El-Geneidy, and Kristin Thompson. "*A Detailed Analysis of How an Urban Trail System Affects Cyclists' Travel*."*Transportation* (2007): 611-24. Print
- The map on Page 18 does not convey the data in a clear, easily readable way. Have you considered using separate maps for biking and walking to improve readability? Have you considered making 1 dot equal to 2 commuters or 5 commuters? Have you considered insets for more densely populated areas such as Norfolk & Vir The map is simply the basis of our forecasts.
- The consistent use of, and reliance on, commuter data contradicts the study purpose and impetus. It is unclear why the commuter data and maps are used to support a "signature path" aiming for cultural, health, and economic benefits. The inclusion of schools in the maps presumably highlights safe connectivity for children traveling to school; however, children and family populations are inexplicably excluded from the data. Including children and households as opposed to just workers/commuters would make the report more logical and compelling.

The census contains only commuting data. We may try locating recreational walkers and bikers in FY17.

- On page 26 you state that "While all of the studied trails indicated *positive* effects of adjacency to the trail on property values, one (out of three) reported statistically insignificant results. The two trails with statistical significance showed a 6% and 12% increase in home values due to adjacency, i.e. a 9% average". Does one trail have statistically significant effects, or do two trails? The way you phrased this does not make it clear. Two trails. We have reworded.

Why do you use parcel density and count instead of unit density and count in Table 7?

Although we *reported* parcel density and count in the table, we based the value increase on the existing value.

You may add to your assumptions on pages 33-34 a caveat about utility relocation costs. These could be a significant cost driver for at least one of the proposed trails and do not appear to be well-reflected in the cost estimates. We revised the text to indicate that the "total" cost includes utility relocation.

Were you unable to find any scholarly literature on qualitative keys to success for rail-trails? Quotes by trail boosters pulled from news articles do not seem noteworthy enough to warrant citation in your otherwise technical analysis. We simply reported what we found.

In section III, both Indy and Austin are presented. We have reworded this section. In section IV the lower (Austin) numbers are repeated.

"Under the Austin Experience.../Under the Indianapolis Experience explained earlier..."
This phrase is used frequently throughout the report. It would be helpful to describe what the "experience" is quantitatively, or where is can be found "earlier" in the report. It appears to be referring to the economic benefits to Austin and Indianapolis that are attributable to a nearby walking or biking trail. These comparisons are used at random throughout the candidate trail evaluation- in the one section the candidate trails are compared to Austin, but in Appendix F they are compared to Indianapolis. It is unclear why "the Austin experience" or "the Indianapolis experience" were specifically selected for comparison, and why that comparison is helpful to this analysis. Are the trail sizes similar? Population or land values? More details would make the comparison more relevant.

- Maps in Appendix F are difficult to read. Give the rail ROWs a higher line weight, remove parcel boundaries, export the selected parcels as a new layer and dissolve the boundaries of the parcels in that new layer. These changes will improve readability and comprehension.

The purpose of the maps in Appendix F being to show the extent of the 0.5 mile residential impact, the current presentation appears to be adequate.

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HAMPTON ROADS TRANSIT

I hope that these comments are constructive and I look forward to seeing the final report.

Sincerely,

Samantha A. Sink
Transit Development Planner

Cc: Ray Amoruso, HRT - Chief Planning & Development Officer
Julie Navarrete, HRT – Transit Development Officer

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Sent: Fri 1/22/2016 3:23 PM
To: Rob Case
Cc: Meitz, Joel E.

Good Afternoon Robert,

Below are comments from the City of Newport News.

- The City recommends that coordination should be made with the Safe Routes To School (SRTS) Coordinators in Norfolk, Portsmouth, and Chesapeake Public Schools for their input on how the trails specified in the report would impact the student population. For example, how would the trails increase the likelihood of students' use to and from schools?
- For cities that do not have abandon railways that are looking to enhance pedestrian and bicycle activity, could staff research areas throughout the City that are not developed with commercial infrastructure where installation of trails would be a great asset.

Regards,

Bridjette Parker

Engineer I
Department of Engineering
City of Newport News
2400 Washington Avenue, 8th Floor
Newport News, Virginia 23607

Response: When we help the region develop an active transportation plan (over the next one or two years), SRTS would be appropriate to consider. In addition, this future planning effort will examine many types of active transportation facilities (not just rail-trails), helping those localities without inactive rail lines.

Sent: Fri 1/22/2016 4:46 PM
To: Rob Case

Rob –
With regrets, I must comment without a thorough reading of the Signature Paths report.

Hampton Roads has several signature paths already:

- South Hampton Roads Trail (regional)
- Dismal Swamp Canal Trail (Chesapeake)
- Elizabeth River Trail (Norfolk)
- Norfolk Avenue Trail (VB)
- Cape Henry Trail (VB)

Some of these are all or partially rail-trails. I wish that this study could have formulated to focus on these and on projects already envisioned by each of the HR cities, rather than on an assortment of disconnected abandoned railroad lines.

I will try to give it a good reading next week and get better comments to you.

Wayne T. Wilcox, PLA
Senior Planner
Virginia Beach Parks & Recreation

2408 Courthouse Drive | Building 21 | Virginia Beach, VA 23456

Response: Hopefully our work—over the next year or two—on a regional active transportation plan will have the effect you desire.

FROM: Tom Howard

Citizen of Hampton Road, Hampton, VA

757-449-9817 / fullcount.tom@gmail.com

TO: Robert B. Case

Hampton Roads Transportation Planning Organization

723 Woodlake Drive Chesapeake, Virginia 23320

Robert, I recently had the opportunity to review the draft copy of the report mentioned above. I received the report on the date that comments were due, but did not finish reading it until the following Sunday. I respectfully submit these comments for inclusion should you find them of value to your study.

Before I go into the comments, I wanted to give you a little background on myself so you will understand my perspective on this report.

I am 55 years old, married and our family has a median household income of $150K / year. I am a hiker and cyclist. My wife is not. My wife would cycle more if she had secure areas to cycle that are close by. I am comfortable cycling on the highway, but also realize the importance of safe lanes for cyclist. Our family presents a good representation of the average citizen in Hampton Roads.

I have always enjoyed backpacking since I was a teen ager and have hopes to backpack all of the Appalachian Trail someday when I retire. Three years ago, I took up cycling as a way to maintain my health and to increase the strength of my knees. My love for cycling has grown immensely as I find it something I can do on a regular basis for physical fitness. Last year, I cycled just at 2000 miles in the local area. I have developed an interest for the promotion of the Beaches to Bluegrass Trail and the East Coast Greenway in the Commonwealth.

I consider cyclist to come from one of three different cloths:

- **Citizen Cyclist** – Normal cyclist that may get outdoors monthly for a trip with family or friends. They may have a bicycle in the garage that is older or of medium value to their possessions. These cyclists may be inexperienced in rules of the road or just learning. (75% of cyclists)
- **Experienced or Commuting Cyclist** – This cyclist is familiar with the rules of the road, may be a member of a local cycling club and places value on the equipment they ride. (20% of cyclists)
- **Touring Cyclist or Long Distance Cyclists** – This class of cyclist enjoys riding long distances for pleasure and vacations. They may be a member of a Randonnuers Club or apt to ride long distances months at a time. (5% of cyclists – but one that spends a lot of money).

I consider myself to be a cross between an experienced cyclist and a touring cyclist. This only comes natural as it is an extension of my backpacking background.

As I looked at the draft report, I found the information put together well. There was a lot of thought & research that went into this report. I commend the team and their effort. I also realized the report took a concentrated look at the potential rail trails that could be converted into greenspace for a dedicated pedestrian / cycling venue. I agree that rail trails are a natural starting point to develop pathways, but I must also suggest that the effort be broadened to options outside of rail trails.

When I look at dedicated cycling or pedestrian paths, I think about my wife. What would she feel comfortable riding on? What would she find attractive to motivate her to dedicate some time outdoors? The same things could be said of a grandfather taking his grand kids out on a weekend.

- Safety
- Things to look at or take pictures of.
- Places that are "connected" that will bring us to a destination. This means having a complete pathway *and not a series of broken trails*.
- Routes that are next to schools, libraries, work or recreational destinations.

Completion of trails is the primary need I see in the efforts of the planning of pathways. Resources are constantly being strained in order to accomplish goals. It is my hope that the report would prioritize the trails that get funded for completion. It is disheartening to see a series of incomplete trails wherever one may travel.

As such, after looking at the report and taking into consideration of the return on investment for the public good, I see the following trails that should be prioritized respectively:

1. Completion of the Seaboard Coastline Trail in Suffolk (all phases)
2. Start and completion of the SHRT / Churchland Extension in Chesapeake
3. Finally, paving of the Bruce Road and Tye Road sections.

These trails will create a groundswell of support as they are completed that will impact other cycling projects in the region. Much like the completion of the Virginia Capital Trail, this "connected" trail system will accomplish the goals of the South Hampton Roads Trail and Beaches to Blue Grass Trail as well as provide an off road approach for the East Coast Greenway as it needs to bypass the industrial area long Nansemond Hwy.

As far as other areas of interest and need that was not addressed in this report:

- Consider plans to "connect" the ECG route between Jamestown and Suffolk (off road).
- Explore the extension of a connected pathway from downtown Norfolk to the Dismal Swamp Trail
- Develop a trail system on the peninsula that connects Ft. Monroe with the TransAm in Yorktown.

Items to place on the back burner until funding or feasibility improves:

- Efforts to promote the rails with trails concept of Light Rail to Virginia Beach. It is my thought that this effort is at least 10 years away from completion. The resources to build all the way to VB and the efforts to retrofit the existing HRT system in place to downtown Norfolk are costly and time consuming.

- The Virginian East corridor – Since it is still on the drawing board for High Speed Rail consideration and the return on investment is upside down, it does not make sense to have this on any priority board.

Summary:

I believe it is imperative to secure "safe" paths for cycling and walking. Our region is behind in their effort to develop alternate transportation options. As a result, business will take head of this condition and may opt to select a region that is showing more progress in these areas. The draft report already has seen the benefits of a robust greenways program in other areas of our nation.

Development of safe cycling lanes and paths will encourage Citizen Cyclists to improve their health and understanding of the true value of cycling. This is the primary target group to address in our efforts to promote a healthy and safe community. With this in mind, it is imperative that we promote an effective plan to address these concerns. Having a PRIORITY LIST will go a long way to foster momentum in our region.

Thank you for taking time to consider these thoughts. If I can be of any assistance in answering any questions, please feel free to call me or email me.

Linwood Tom Howard.

Response: We intend "that the effort be broadened to options outside of rail trails" when we help the region prepare an active transportation plan over the next year or two. In that effort we will consider ideas like yours of:

- a Jamestown-Suffolk connection
- a Norfolk-and-Dismal-Swamp connection
- a Ft-Monroe-and-TransAm connection

After a plan is developed, it may be appropriate to prioritize needed improvements.

Sent: Wed 1/27/2016 1:12 PM
To: Rob Case
Cc: Tom Bowden

Mr. Case:

On behalf of the Virginia Bicycling Federation, I would like to commend you on your report, "Signature Paths in Hampton Roads". I would ask that the attached comments be included as part of the public record.

Though I am not, personally familiar with a number of the specific corridors in the report, I do know that converting existing rail corridors into trails is a cost effective and creative way to build greenways. As noted in your report, creating rail trails benefits the communities by, among other things:

- reducing vehicle congestion;
- reducing CO2 emissions;
- providing health benefits to users;
- decrease car / bike conflicts on roads;
- increase adjacent property values;
- frequently generates additional tourism opportunities in the region;
- attract businesses and improves quality of life.

The Virginia Bicycling Federation supports these efforts.

In addition to what has already been elaborated in the report, we also encourage you to consider:

-prioritize linking these rail trail segments with on road or separated bike facilities to link them to schools, neighborhoods, business centers and other natural gravity points within the communities;
- prioritize connections to existing trails in the region such as the East Coast Greenway, US Bike Route 76 and the Virginia Capital Trail;
- require new and existing utility corridors and easements to include trails and greenways. This would include gas, water and sewage pipelines, electric corridors, etc;
- utilize active rail corridors (rails-with-trails) when appropriate;
- encourage DRPT and Amtrak to enhance bike/ train connections through facilities such as, secure bike parking, roll-on bike service (and station baggage service to facilitate this) at the Newport News, Williamsburg and Norfolk facilities.

We commend you on this effort and look forward to working with you to move these plans forward.

Regards,

Champe
Champe Burnley
President,
Virginia Bicycling Federation
PO Box 7282
Richmond, VA 23221
804.358.5801
vabike.org
railswithtrails.com

Response: We intend to build on the Signature Paths via an HR Active Transportation Plan.