THE ECONOMIC AND FISCAL IMPACTS OF THE VIRGINIA CAPITAL TRAIL

FISCAL YEAR 2018-19[1]

Prepared for:

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Executive Director
Virginia Capital Trail Foundation

Prepared by:

Delivered:
October 2019

[1] This study is an extension of the following research:
Pilkington, L. (2018). *Capstone Report: Virginia Capital Trail Foundation Economic Impact Analysis.* University of Richmond. Richmond, Virginia (see Appendix A).

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

ACKNOWLEDGEMENTS

This study could not have been completed without trail riders, Cap2Cap event participants and local business operators who responded to the surveys administered and analyzed by Lauren Pilkington for her Capstone project in the University of Richmond's MBA program.

CITING THIS STUDY

Due to the above mentioned collaboration, the full citation of this economic impact report is as follows:

Pilkington, L., Magnini, V., and Wyatt, C. (2019). The Economic and Fiscal Impacts of the Virginia Capital Trail: Fiscal Year 2018-19. University of Richmond in collaboration with the Institute for Service Research.

EXECUTIVE SUMMARY

Recreationists attracted to the Virginia Capital Trail during Fiscal Year 2018-19 stimulated a sizable amount of economic activity in the trail region and around the Commonwealth. Listed here are some key metrics:

- In FY2018-19, visitors to the Virginia Capital Trail spent an estimated $6.1M throughout the state. More than 90 percent of this money was spent within a 50-mile radius of the trail.

- The total economic activity stimulated by the Virginia Capital Trail in the state during FY2018-19 was approximately $8.9M. Roughly 95% [$8.5M] of this economic activity occurred within a 50-mile radius of the trail.

- Regarding employment, the economic activity supported by visitation to the Virginia Capital Trail supported approximately 99.2 full-time equivalent (FTE) jobs in the state in FY2018-19.[2]

- In terms of wages and income, the economic activity spawned by the Virginia Capital Trail was responsible for roughly $3.6M in wage and salary income in the Commonwealth during FY2018-19.

- Economic activity created by the Virginia Capital Trail was associated with approximately $5.3M in value-added effects which is a measure of the trail system's contribution to the gross domestic product of the Commonwealth.

- Economic activity stimulated by the Virginia Capital Trail generated approximately $613K in state and local tax revenues in Virginia during FY2018-19.

- Between 2014-2016, properties that bordered the trail increased in assessed value and average of 3.7 percent more than similar properties not adjacent to the trail.

[2] A total of 99.2 full-time equivalent jobs may equate to many more part-time jobs.

PURPOSE OF THIS STUDY

The Virginia Capital Trail (VCT) is a 52-mile recreational trail spanning the historic Route 5 corridor between Richmond and Williamsburg. The trail was completed in 2015 and has attracted a significant volume of users since its inception.

In 2018, Lauren Pilkington, an MBA student at the University of Richmond produced a Capstone report for the Virginia Capital Trail Foundation that collected and documented important information about visitor demographics, trail-related visitor spending, estimated visitor effects noted by local businesses, and estimated property value increases associated with the trail (the report is included at the end of this work as Appendix A). However, that study noted that the economic estimates included in the report were "primary" in nature and did not include (because the author did not have access to modeling software) standard treatment of visitor spending estimates to extrapolate indirect and induced effects (see p. 8) nor did the report take into account annual amounts spent on maintenance, administration, and construction. The purpose of this extension study by the Institute for Service Research (ISR) is to make these additional calculations and to organize the resulting information into a readily usable format.

This study was commissioned by the Virginia Capital Trail Foundation (VCTF) which is a nonprofit entity with the mission to enhance, promote, and advocate for the continued development of the trail.[3] Examples of economic metrics of interest in this study include:

- Trail user spending
- Direct, indirect, and induced economic activity associated with the trail
- Jobs and labor income supported by the economic activity associated with the trail (direct, indirect, and induced jobs)
- Contributions to the gross domestic product of the Commonwealth in the form of value-added effects
- State and local tax revenues generated as a result of the trail's economic activity
- Influences on assessed property values of properties abutting the trail

[3] More information about both the trail and VCTF can be found in Appendix A.

METHODOLOGY

The general methodology of this study is to identify, estimate, and properly aggregate the various sources of activity directly associated with the use of the Virginia Capital Trail and to then apply standard economic modeling techniques to create a complete picture of the trail's economic benefits. These benefits include the dollar amounts spent by users and operators, jobs, and taxes and are the result of primary spending and the secondary effects of this spending.

Increases to property values are also an economic benefit but this value is handled differently. The Capstone project created an estimate of the percentage increase in the value of properties adjacent to the trail through a time comparison of values for a sample of properties. This property value increase percentage is repeated in this study.

Trail user spending and visitation volumes

Economic benefits are derived from a number of sources including trail user spending, construction and maintenance expenditures on the trail, and the ongoing operational activities of the Virginia Capital Trail Foundation itself, but primary among these is the user spending component. Therefore, the economic modeling in this study requires that spending profiles be built for trail users. In order to gather information regarding how much money visitors spend, an internet survey was designed during the University of Richmond's portion of this project in collaboration with VCTF staff to quantify spending patterns and habits and to measure visitor use patterns. The survey was promoted by the VCTF on its website, through social media channels, and through an email distribution of its newsletter. The survey was open for responses from August 15th until September 30th, 2018. The survey recorded 929 responses which exceeds recommended sample size quotas for this type of economic modeling.[1] In addition to spending and trail usage information, the survey also captured other data such as demographics and user feedback that could be potentially useful to the VCTF (see Appendix A for more about survey data collection and information found).

Regarding visitation volumes on the trail, the VCTF has multiple infrared trail counters installed along the VCT. The survey data was used in conjunction with counter data (the survey asked visitors how many miles they use the trail per visit) to tabulate visitation estimates (see Appendix A).

Annual operational and construction expenditures

As previously mentioned, operational expenditures can provide significant economic activity to an area. In this study, the VCTF was given a data input sheet on which they were asked to report FY2018-19 operational expenditures associated with the VCT. In order to remain conservative in the economic modeling, the City of Richmond's Department of Public Works and Henrico County's trailhead maintenance expenditures were not included in the modeling because these represent the circulation of local municipality monies.

For economic modeling purposes, expenditures were compartmentalized in the following categories which mirror standard industry coding used in many economic modeling tools:

- Personnel expenses (wages and benefits)
- Operating expenses (non-personnel)
- Trail maintenance and repair
- Maintenance and repair – non-trail

Secondary Economic Effects

In addition to assessing the direct economic effects described in the previous two sections (trail user spending and operational/construction expenditures), this study also models secondary or ripple effects which comprise economic activity from subsequent rounds of re-spending of money. As shown in Figure 1, there are two types of ripple effects: indirect and induced. Indirect effects entail the changes in sales, income, and jobs of suppliers to the operation.[2] For example, a convenience store that sells gasoline uses the money from the sale to pay employees and to buy more gasoline. Induced effects are the changes in economic activity in the region stimulated by household spending of income earned through direct and indirect effects of VCT-related monies. To continue the previous example, the employees of the convenience store then use their income to purchase goods and services.

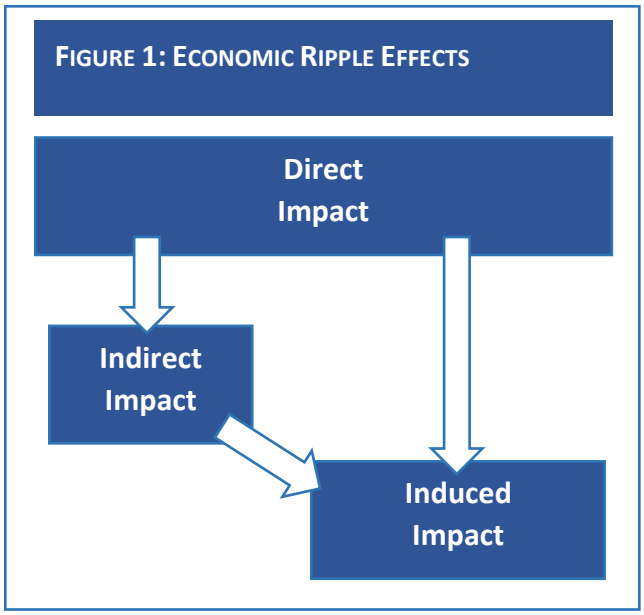


FIGURE 1: ECONOMIC RIPPLE EFFECTS

Indirect and induced effects are estimated using economic multipliers. Multipliers reflect the extent of interdependency between sectors in a region's economy and can vary significantly between regions and sectors.[3] Here is a simple example of how a multiplier can be interpreted: if the multiplier for the restaurant sector in a given region is 1.47 then it can be estimated that every dollar spent at a restaurant results in 47 cents of secondary economic activity in the region. Economic multipliers for the State of Virginia are commercially available in an economic impact estimation software titled IMPLAN commercialized by MIG, Inc. Therefore, the most recent IMPLAN multipliers were purchased and used in this study to calculate indirect and induced economic impacts. Used by more than 1,000 entities, IMPLAN is said to be the most widely adopted regional economic analysis software in the industry for estimating economic ripple effects.[4]

{Findings section begins on next page}

FINDINGS

Visitor Spending during FY2018-19

> ***"I try to visit at least one restaurant every time is use the trail."***
>
> ***~ 2018 Trail Visitor***

In FY2018-19, it is estimated that visitors to the Virginia Capital Trail spent between $6.0M and 6.2M (Mean = $6.1M) throughout the state.[5,6] More than 90 percent of this money was spent within a 50-mile radius of the trail.[7] As one might anticipate, local businesses reap benefits from this spending. While levels of spending evidently vary based upon situation and type of entity, on average, businesses report that trail riders typically spend $22 per visit at their establishments. It is also prudent to note that the annual Cap2Cap event held in May generated an estimated $127K in spending by non-locals this past year.

Economic Activity during FY2018-19

As indicated in Table 1, the economic output supported by the Virginia Capital Trail during FY2018-19 tallies to approximately $8.9M. The majority of that total ($8.5M) was through direct effects such as visitor spending at local businesses (as described in the previous section). The remainder was in the form of indirect effects (suppliers to businesses where direct spending occurs)[8] and induced effects (the increased spending power of area residents as a result of direct and indirect effects).

TABLE 1: ECONOMIC ACTIVITY ASSOCIATED WITH VCT DURING FY2018-19

Impact Type	Economic Activity (statewide)	Economic Activity (50-mile radius of trail)
Direct Effect	$4.9M	$4.7M
Indirect Effect	$1.8M	≈$1.7M*
Induced Effect	$2.2M	$2.1M
Total Effect	$8.9M	$8.5M

*While all modeling is estimated, it is particularly challenging to isolate indirect effects in a particular geographic domain.

{Tax revenue section begins on next page}

Tax Revenues Generated during FY2018-19

The $8.9M in economic activity described in the previous section stimulated approximately $613K in state and local tax revenues during FY2018-19. While IMPLAN modeling software does not partition state and local taxes, it is estimated in Virginia that this type of tourism-related economic activity produces an estimated 60-40 split between state and local tax revenues.[9] Consequently, it is estimated that local municipalities reaped a total of roughly $245K due to the economic output attributed to VCT during the year (see Table 2).

TABLE 2: TAX REVENUES GENERATED BY VCT DURING FY2018-19

Impact Type	Tax Revenues
State (approximate)	$368K
Local (approximate)	$245K
State and local (combined)	$613K

Jobs and Labor Income Supported during FY2018-19

The economic activity spawned by VCT during FY2018-19 supported 109 jobs: a combination of both full-time and part-time positions. The labor income associated with these jobs tallies to an estimated $3.6M. When these jobs figures are converted to a full-time equivalent (FTE) metric, the total effect is estimated at 99.2 FTE jobs (see Table 3).

TABLE 3: JOBS AND LABOR INCOME SUPPORTED BY VCT DURING FY2018-19

Impact Type	Employment: FTE jobs	Labor Income
Direct Effect	76.2	$2.3M
Indirect Effect	9.2	$610K
Induced Effect	13.8	$713K
Total Effect	99.2	$3.6M

{Value-added section begins on next page}

Value-Added Effects Generated during FY2018-19

As listed in Table 4, the economic output generated by the Virginia Capital Trail contributed approximately $5.3M to the gross domestic product (GDP) of Virginia through value added-effects during the focal year of study. Such value-added calculations avoid the double counting of intermediate sales and incorporate only the 'value-added' by an economic estimation model to final products.[10]

TABLE 4: ECONOMIC VALUE-ADDED EFFECTS GENERATED BY VCT DURING FY2018-19

Impact Type	Value-Added Effects
Direct Effect	$2.9M
Indirect Effect	$1.1M
Induced Effect	$1.3M
Total Effect	$5.3M

Influence on Assessed Value of Adjoining Properties

Although outside the scope of the IMPLAN modeling reported in this section, it is prudent to note that the trail has a positive impact on adjacent property values. Specifically, between 2014-2016, properties that bordered the VCT increased in assessed value an average of 3.7 percent more than similar properties not adjacent to the trail. As explained in Appendix A, this is a conservative estimate and, evidently, does not reflect data unavailable to the research team.[11]

Between 2014-2016, properties that bordered the Virginia Capital Trail increased in assessed value an average of 3.7 percent more than similar properties not adjacent to the trail.

CONCLUDING REMARKS

This 2018-19 economic impact study underscores the importance of the Virginia Capital Trail to the economy of the Commonwealth. The economic activity spawned by VCT contributed approximately $8.9M to the Commonwealth's economy during the most recent fiscal year. This economic activity supported roughly 99.2 full-time equivalent jobs and $3.6M in associated labor income. Moreover, state and local tax revenue generation is modeled at $613K.

According to Crompton (1993), the validity and reliability of an economic impact study depend on: 1) the accuracy of visitor spending estimates; 2) adherence to statistical rules applied in the study in particular pertaining to the use of the multiplier coefficients; and 3) reasonable visitation estimates.[12] First, in terms of spending estimates, customized spending profiles were developed in this study by surveying trail users (see Appendix A for details). Second, regarding the multiplier coefficients, the most recent IMPLAN multipliers were utilized. Third, in terms of attendance estimation, the Virginia Capital Trail Foundation has multiple infrared trail counters installed along the VCT.

In summary, while this study estimated numerous economic impacts of the Virginia Capital Trail such as jobs, labor income, value-added effects, and state and local taxes generated, it is prudent to note that a number of other benefits (both tangible and intangible) could not be included in the modeling. For example, because outdoor recreational assets contribute to local residents' quality of life, they are an amenity that is considered in some business expansion decisions: the Amazon corporation listed *total park acreage* as a criterion in selecting their HQ2 site during 2018.[13] Many companies realize that outdoor recreation benefits participants not only physically but also psychologically through the reduction of stress.

The Virginia Capital Trail, therefore, serves an important role in the Commonwealth.

RESEARCHER BIOS

(LISTED ALPHABETICALLY)

Dr. Vincent Magnini was recently ranked as one of the top 12 most prolific hospitality researchers worldwide and holds editorial board appointments on all of the top-ranked hospitality research journals in the field. Further, he is a U.S. Fulbright Scholar. He has published six books and more than 250 articles and reports. Dr. Magnini has also been featured on National Public Radio's (NPR) *All Things Considered, With Good Reason, Pulse on the Planet* and cited in *The New York Times* and *Washington Post.*

Recent economic impact studies or outdoor recreation studies conducted by Dr. Magnini include:

- The Economic Impacts of Michigan's Ports and Harbors (with Dr. John Crotts)
- Virginia State Parks Economic Impact Study (conducted annually)
- Virginia State Parks Your Comments Count Study (conducted annually)
- Potential Economic Impacts and Factors Contributing to the Success of Rail-to-Trail Conversions (with Chuck Wyatt)
- Virginia State Parks Business Plans (conducted on a 5-year cycle per park)
- State of Florida Outdoor Recreation Participation Study (with Chuck Wyatt)
- Florida State Parks Visitor Satisfaction Study (with Dr. Muzaffer Uysal and Chuck Wyatt)
- Florida State Parks Marketing Research Study (with Dr. Muzaffer Uysal and Chuck Wyatt)
- The Economic Impacts of Spearhead Trails (with Chuck Wyatt)
- The Fiscal and Economic Impacts of Virginia's Agritourism Industry
- West Virginia State Parks Marketing Research Study (with Dr. Muzaffer Uysal)
- The Economic Significance and Impacts of West Virginia's State Parks and Forests (with Dr. Muzaffer Uysal)

Lauren Pilkington tries to lessen the gap between the world as it is and the world as it could be, recognizing both the importance of systems and the role of the individual. She holds a Master of Business Administration from the University of Richmond, and a Master of Public Administration and Bachelor of Arts from Virginia Commonwealth University. She values what little time we each have on this planet, and spends her free time enjoying nature.

Chuck Wyatt is a Senior Researcher at ISR. He holds a Master's of Urban and Regional Planning and a B.S. in Biology, both degrees from Virginia Commonwealth University. He has over 43 years of experience in all levels of public sector service delivery, operational management, and central administration. During his 32 year tenure with state parks, Chuck led a number of successful efforts in revenue growth, development of customer culture, and the expansion of the park system. In recent years, he has conducted numerous economic analyses of parks and

facilities. He has received a number of achievement awards and was named agency Employee of the Year at the Virginia Department of Conservation and Recreation.

Before his retirement from Virginia's Department of Conservation and Recreation in 2015, Chuck calculated the economic impacts of each of Virginia's State Parks on an annual basis. In addition, his role at Virginia's Department of Conservation and Recreation required him to perform specialized economic impact modeling projects on an ad-hoc basis.

CORPORATE PROFILE

The Institute for Service Research (ISR) is a full-service market research and economic modeling firm headquartered in Virginia. The firm is incorporated in Virginia and trademarked with the U.S. patent office. The firm's founder and Executive Director is Dr. Vincent Magnini who is the lead researcher on this project. Further information about ISR can be found on the company's website:

www.InstituteForServiceResearch.com

APPENDIX A:

UNIVERSITY OF RICHMOND (PILKINGTON, L): MBA CAPSTONE REPORT

CAPSTONE REPORT

University of Richmond MBA Program

2018

EXECUTIVE SUMMARY

The Virginia Capital Trail Foundation (VCTF) is a nonprofit, 501 (c)(3) organization, with a mission to enhance, promote, and advocate for the continued development of the Virginia Capital Trail (VCT), a 52-mile dedicated multi-use trail connecting Richmond and Williamsburg along the historic Route 5 corridor. The trail was first proposed in 1975, the foundation started in 2004, and the trail completed in 2015.[1] The VCT, built and maintained by the Virginia Department of Transportation (VDOT), took 12 years to be completed. The VCTF primarily exists to promote the trail and enhance it with amenities such as benches and bicycle repair stations. The VCT was completed in 2015, and the Executive Directorship of the VCTF changed hands in late 2017.

This study's primary purpose is to determine the VCT's economic benefit to the surrounding region since its completion. In addition, the study's multiple surveys uncovered a few recommendations from users and surrounding businesses to improve user experience and community engagement.

The nature of this study may be different than typical Capstone projects as it the goal was to create a publishable product for the client compiled with primary research. The client's biggest priority was completing an economic impact report for the foundation to publicly distribute. The foundation had originally received a separate proposal for an economic impact analysis that would have cost the foundation a sizeable portion of its annual budget. All other results from this study are byproducts from creating an economic impact report for the VCTF.

[1] www.vctf.org

RECOMMENDATIONS

- Short-term:
  - Marketing: This study calculates a direct annual economic impact of $6,200,578 from VCT users; however, it does not include indirect and inducted economic benefits the trail and users provide. VCTF should find a resource group that has available an economic calculator to determine the indirect and inducted economic benefits of the VCT. With the data this study has collected regarding direct economic benefits, it should be simple to enter for an input-output calculator to estimate indirect economic benefits to the region. Below are some resources, with explanations, for possible economic multiplier calculators. Before looking into any tool that requires payment, check with a local economist, Virginia Economic Development Partnership, or Greater Richmond Partnership to see if they can provide this analysis given the data already collected. All data collected for this study can be shared with a partnering agency for analysis:
    - https://www.vedp.org/partner-resources
    - https://www.grpva.com/data-reports/
    - https://shop.implan.com/projectreview: of multiple options for this tool, there is a $450 plan for a three-day professional review of a current study. Ask organization if they can use this study's numbers within this price range to create multiplier estimates. The IMPLAN economic output model is used by many economic development organizations and was used for the report "The Economic Impact of Bicycling in the Central Shenandoah Valley"[2].
    - https://www.sportscommissions.org/resources/economic-impact-calculator: included with a $795 membership to National Association of Sports Commissions. However, from the initial description, this tool may not include a multiplier effect. Check with the association.
    - https://destinationsinternational.org/event-impact-calculator: this tool captures event's effect on businesses, employment, income and taxes. This particular tool was developed by Tourism Economics, an Oxford Economics company and costs $2,200 annually for organizations with a budget of under $3 million.
  - Marketing: Advertise the VCT at Virginia State Parks, local parks, and venues where user interest is likely to overlap. One individual responder noted that a nearby state park where they camp does not have VCT brochures or marketing materials.
  - Facility: There are a number of trail repairs and improvements noted from users (see in this report: Appendix or Individual User Survey Design, Cleanup, and Future Considerations). Of note were a few repeated sections

[2] https://www.adventurecycling.org/sites/default/assets/File/USBRS/Research/Shenandoah%20Valley_Bike%20Tourism%20Econ%20Benefits%20Study.pdf

where tree roots had broken through the pathway and three suggestions to paint a line down the middle the entire length of the trail /add clear signage for users to remain on correct side of path for safety. VDOT should be notified of the trail repairs, and, if appropriate given the shared arrangement, VCTF should raise funding for a painted line and for a few of the other safety signage recommendations.

- Facility: Ensure timely replacement of trail counters for more accurate data collection.

Long-term:

- Organizational and Marketing: Better engage minority and female populations, which, anecdotally, use the VCT, but are not fully represented in the user survey and possibly via online outreach. This outreach could include hosting a booth at minority-driven events such as Richmond's Second Street Festival; presenting at civic association meetings or church neighborhood events in minority neighborhoods; and engaging known minority and female trail users in a focus group for additional recommendations on how to engage these populations.
- Organizational: Work with the Hampton Roads Transportation Planning Organization to help the completion of "The Birthplace of America Trail". The proposed trail would continue from the VCT's Williamsburg start and continue down the peninsula, and connect across two paths to the South Hampton Trail (https://www.hrtpo.org/page/birthplace-of-america-trail/). Thirty of the individual survey respondents requested either connecting other trails, or extending the VCT. Extending a trail from the eastern portion of the VCT will increase ridership. The City of Richmond is a bicycle-friendly locale (http://www.richmondgov.com/bikeped/) and enables users to access the VCT from the western side on bicycle.
- Facility: Discuss with Amtrak the possibility of supporting bicycle cars from Norfolk to Richmond. This was mentioned a few times in the user survey.

The following report was prepared for the Virginia Capital Trail Foundation. The purpose of this study is to show the economic impact of the Virginia Capital Trail . In addition to showing actual dollars spent by trail users each year, this study also shows user profiles and how the trail is used each year. The study for this report includes information from an individual user survey, a local business survey, trail counter data, and analysis of local government property assessments.

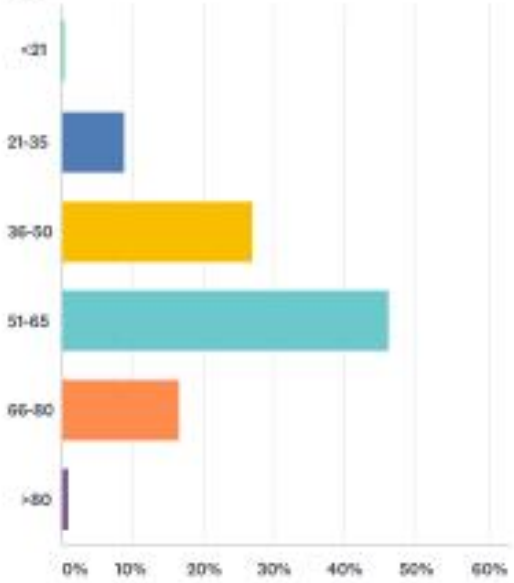
The Virginia Capital Trail Foundation (VCTF) is a nonprofit, 501 (c)(3) organization, with a mission to enhance, promote, and advocate for the continued development of the Virginia Capital Trail (VCT), a 52-mile dedicated multi-use trail connecting Richmond and Williamsburg along the historic Route 5 corridor. The trail was first proposed in 1975, the foundation started in 2004, and the trail completed in 2015.

Of our individual user survey respondents, 98% live in Virginia. Over 55% respondents are from Richmond/Tri-Cities, and over 17% are from Williamsburg/Middle Peninsula.

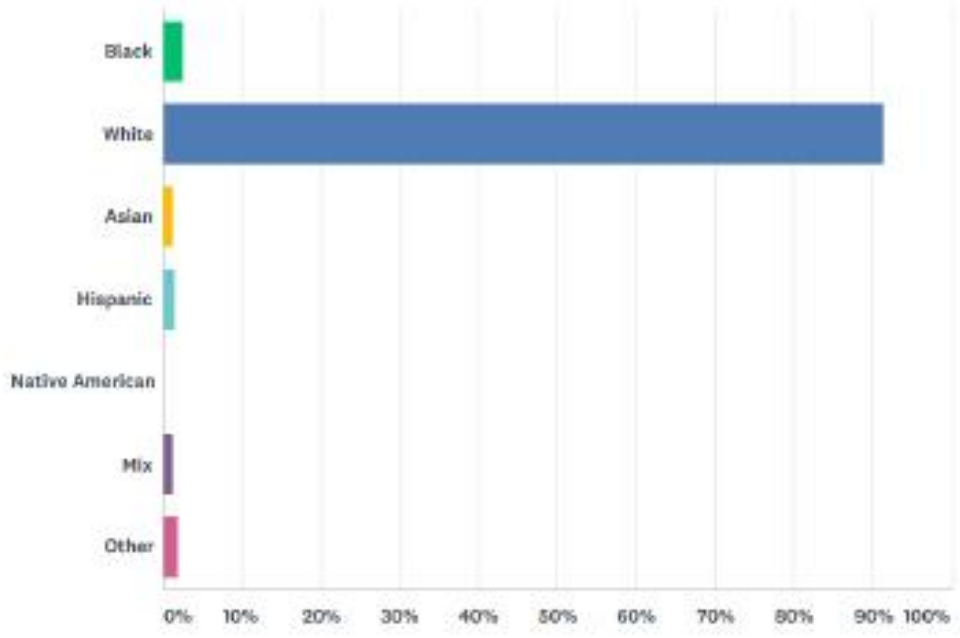
Rider Demographics

Of the survey respondents, 44.5% identified as female, 55.4% as male, and .11% as other.

Age:

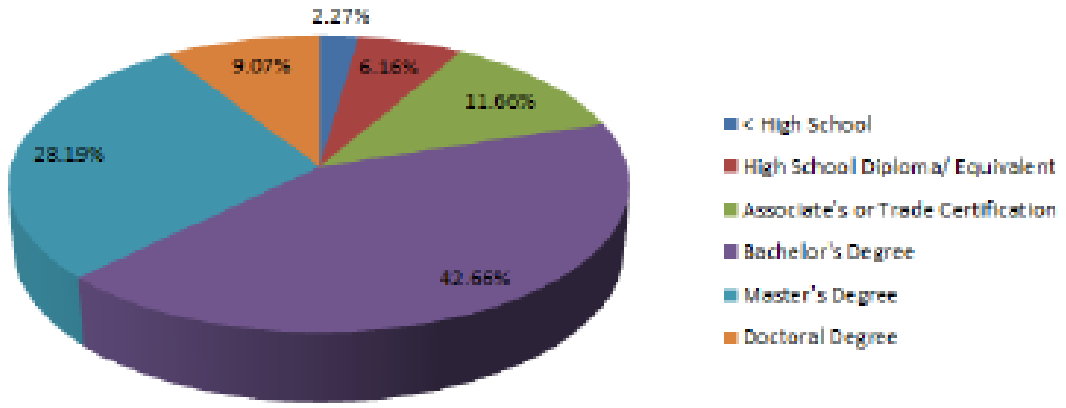


Race/Ethnicity:

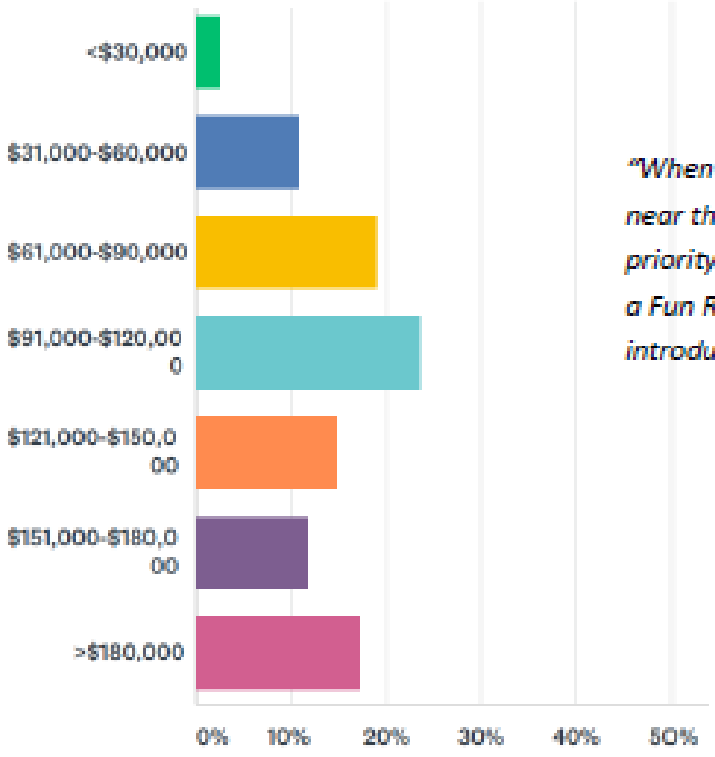


Rider Demographics

Education:



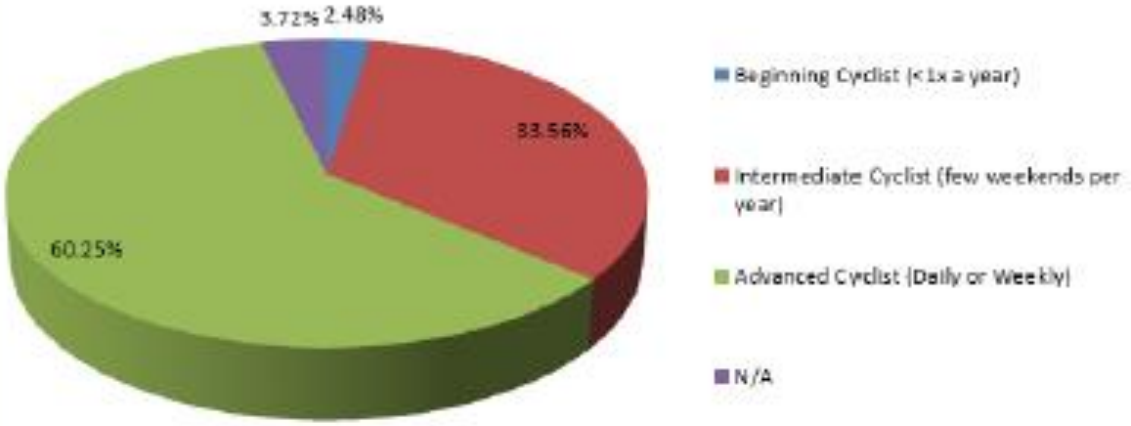
Household Income:



"When considering where to live, being near this multipurpose trail is high on priority. We love it so much, we even had a Fun Run the morning of our wedding to introduce guests to the VCT ."

Rider Demographics

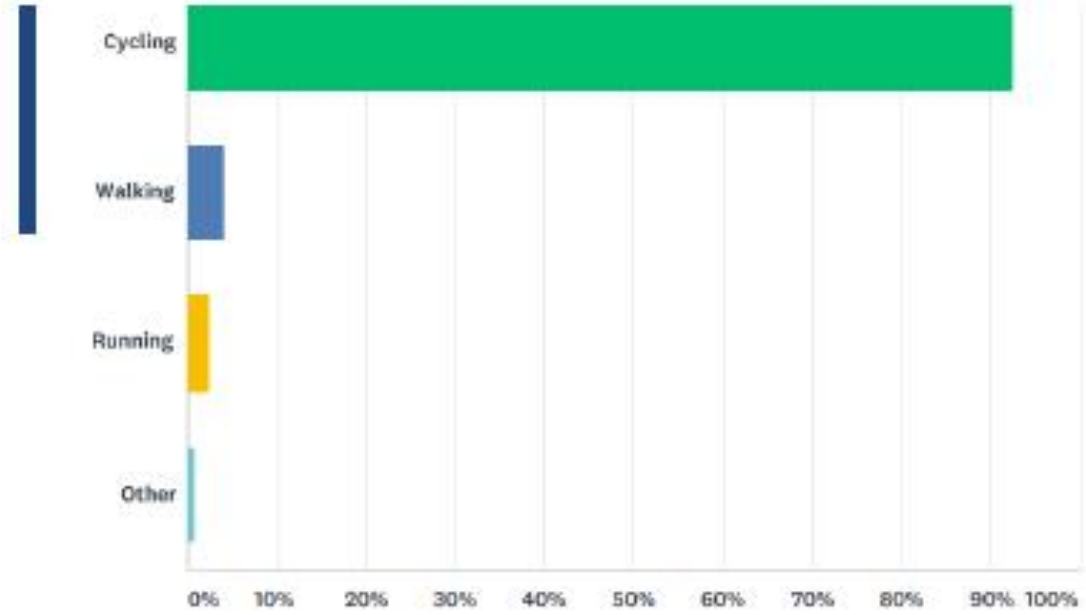
The survey respondents rated their cycling expertise as.



Trail Use

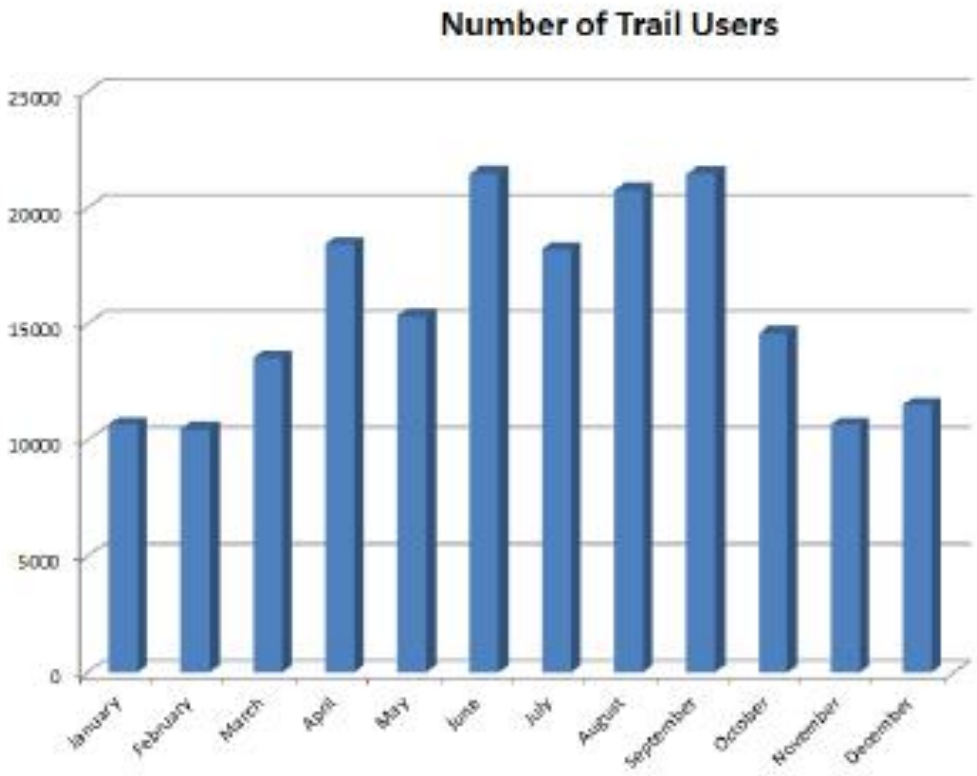
Riders typically spend **2.5 hours** and complete **25 miles** per visit on the VCT.

7,592,025 miles are completed and **759,203 hours** are spent on the VCT each year.



Trail Use

There are **303,681** unique visits to the VCT per year.



"It's been so positive! It's a pleasure seeing all of the Trail users. People being outdoors, exercising is contagious. A great motivator!"

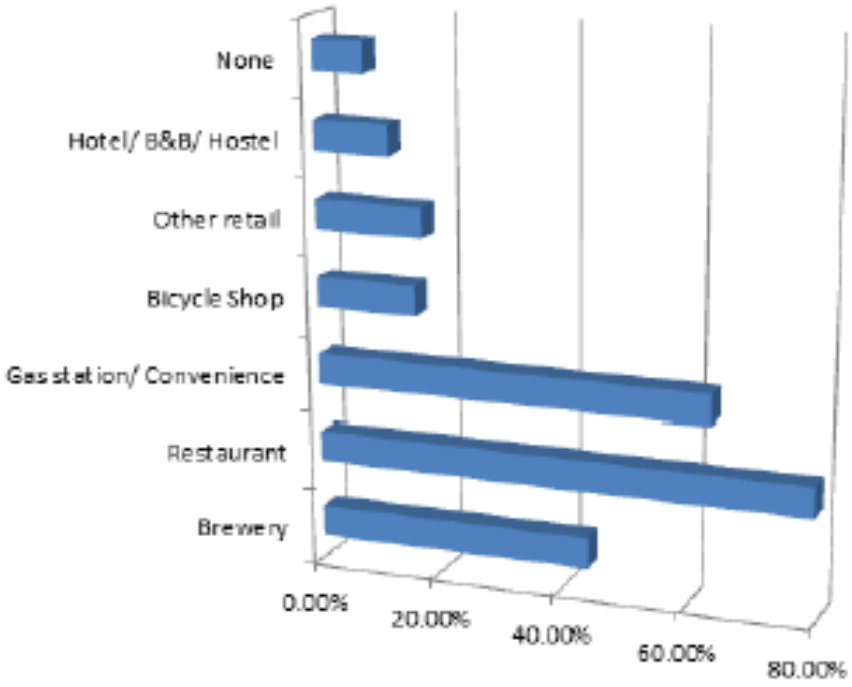
Economic Impact

"Wonderful impact on safety and health. Love cycling and then eating or getting a glass of wine during or after the ride. A wonderful addition to the Williamsburg/ Richmond area. "

Riders reported typically spending **$20** per visit to the Virginia Capital Trail.

Businesses reported trail riders typically spend **$22** per visit at each establishment.

Which businesses do trail riders frequent?



Economic Impact

$126,958 spent in the region by out of town participants in the annual Cap-to-Cap event.

VCT users spend **$6,073,620** annually in the region.

Economic Impact

Properties that bordered the trail increased in assessed value an average of **3.7%** more than similar properties not adjacent to the Virginia Capital Trail from 2014-2016. The trail was completed in 2015.

"I bought my house solely for the trail. Actually don't even like the house - I just wanted to be on the trail. As a result of the trail, I've gone from having never biked much to doing half-centuries. Also frequently walk the trail. It's my favorite thing about Williamsburg and the

"Access to the trail was a major factor in moving out of my student apartment. I cared more about moving near the cap trail than coffee shops or grocery stores."

"I absolutely love it. I live in the Shiplock Watch lofts on Pear St. and one of the highlights of living there is after dinner walks/rides and weekend cycling! The impact of the trail has been positive for the area and offers an oasis in the middle of the city! "

SWOT

Strengths of the VCT and VCTF include:

- VCT is maintained by VDOT, allowing VCTF to put energy, time, and funding into marketing the trail and adding trail amenities.
- Proximity on both ends to major populations centers, allowing quick access for residents.
- Proximity on both ends to food and beverage amenities, creating a symbiotic relationship as trail users frequent restaurants, bars, breweries, etc. and other patrons at those facilities are exposed to the trail.
- Lack of proximity in the majority of the trail to major population centers, allowing riders the ability to leave a metropolitan area and get exposed to nature and seasonal viewing.
- The VCTF has two FT employees, maintaining small overhead and allowing the majority of its time, money, and effort to be directed toward its primary goals instead of being buried in multiple administrative levels with non-core tasks.
- The VCTF has two employees, allowing each employee the opportunity to gain a broad set of skills and knowledge.

Weaknesses of the VCT and VCTF include:

- VCT is maintained by VDOT, adding a layer of administration to trail management.
- Lack of proximity to major population centers for the majority of the trail, thus causing a hindrance for beginning/casual cyclists who may be afraid to commit to either a length of the trail, or unwillingness to have to drive to an access point.
- Lack of proximity in the majority of the trail to major population centers, making it more difficult for users to be able to navigate on/off the trail throughout its length for refreshments.
- Lack of proximity in the majority of the trail as less population is directly exposed to the trail.
- The VCTF has two FT employees, limiting its ability to expand its workload and resources toward more aggressive goals.
- The VCTF has two FT employees, requiring each employee to engage in tasks that may not suit their strengths or subject matter expertise and be less efficiently completed.

Opportunities for the VCT and VCTF include:

- The VCTF can work with the Hampton Roads Transportation Planning Organization to assist in their completion of the Birthplace of America Trail. Adding this trail would open access on the VCT to more cyclists from Williamsburg, the Middle Peninsula, and Southern Hampton Roads.

- VCTF can create more local partnerships with outreach or events to encourage leisure/beginning cyclists who would not otherwise be exposed to the trail, and gain regular users.
- Continued bicycle lane development in Richmond will increase users' ability to enter/leave the VCT on bicycle.
- Continued development along the Route 5 corridor from downtown Richmond will add users to the VCT.
- The VCTF can increase ridership, participation, and funding with ongoing and new marketing campaigns.
- The VCTF could increase ridership with a shared marketing campaign with other nearby outdoor recreation venues, or by increasing marketing materials in those venues (e.g. possible collaboration with Richmond Regional Ride Center[1]).

Threats for the VCT and VCTF include:

- Continued development down the Route 5 corridor from downtown Richmond could deter users who prefer a quick route to a nature-heavy trail, and away from an urbanized area.
- Other cycling paths could detract from users of the VCT.
- Other nearby outdoor recreation venues could attract VCT users and decrease ridership on the VCT.

[1] http://www.rvaridecenter.com/

INDUSTRY TRENDS AND COMPETITIVE ANALYSIS

According to the 2017 Outdoor Industry Association study, The Outdoor Recreation Economy, the benefits generated by the outdoor recreation economy for the U.S. annually are:

- $887 billion in consumer spending,
- 7.6 million jobs,
- $65.3 billion in federal tax revenue,
- $59.2 billion in state and local tax revenue[2].

The VCT's primary appeal will be to users who are interested in outdoor recreation, thereby making other regional outdoor recreation venues competitors for users' time, but also likely collaborators in joint marketing and event ventures to recruit new and shared users. Below is a list of private and public entities where VCTF can expand its marketing and create potential collaborative efforts to include the VCT. Some of these entities already advertise the VCT or collaborate with the VCTF.

Richmond area collaborators:

- State parks and local parks and recreation departments
- Campgrounds/ RV parks
- Other outdoor oriented non-profit organizations
- Bicycle and outdoor adventure retail stores
- Richmond Rides (bike tours)
- Kul Wheels (bike tours)
- Basket and Bike
- RVA Paddlesports
- River City Adventures
- Richmond Outside
- Adventures in RVA
- Kayak Richmond
- Riverside Outfitters
- Dominion Riverrock

Williamsburg area collaborators:

- State parks and local parks and recreation departments
- Campgrounds/ RV parks
- Other outdoor oriented non-profit organizations
- Bicycle and outdoor adventure retail stores
- Bike the Burg
- Chesapeake Experiences
- Eco Discovery Park

[2] https://outdoorindustry.org/resource/2017-outdoor-recreation-economy-report/

- James City County Marina
- Greensprings Greenway Interpretive Trail
- Go Ape Treetop Adventure

STUDY METHODOLOGY

Survey Design and Analysis:

This study included two surveys: one for trail users and one for businesses surrounding the VCT. Both were completed in September 2018, and the individual user survey, originally planned to be available online for one month, was extended a couple weeks due to Hurricane Florence preparations throughout the state of Virginia.

Individual User Survey Distribution:

The individual user survey was created and made available on SurveyMonkey.com. The survey was promoted by the VCTF on its website, Facebook profile, and through an emailed distribution of its newsletter to over 13,000 email addresses. The survey was open for response from August 15, to September 30, 2018. The survey had 929 individual responses (7% response rate assuming the 13,000 email addresses are for unique individuals).

Individual User Survey Design, Cleanup, and Future Considerations:

The individual user survey is fifteen questions and took a couple minutes for users to complete online. The survey was comprised of two subject areas: demographics and trail use. Only the asterisked questions were required, in case users preferred not answering demographic questions or didn't have a response for the final two questions (See appendix of this report).

In the initial send out of the survey, the VCTF was quickly notified by some respondents that they had difficulty completing the survey. Specifically, the respondents had difficulty with three questions in the trail use section that were open-response, but had been designated to only take integer answers. To accommodate the survey users, the answers were opened to text, as well. This action is a lesson learned, as allowing text and integer responses ended up with a large percentage of unusable data. For future surveys, it should be kept to integer only, and give clearer instructions so that survey respondents can understand that the answers are to be integer only. Clean up of the data was extensive and, while many of the text responses were salvageable, there were many that were not, skewing the data. For example, there were 160 responses that had to be eliminated to question #11 (How many times have you used the trail since it opened?). The majority of the eliminated responses read, "too many times to count" and was from cyclists who'd labeled themselves as "experienced cyclists" in question #10.

For question #12 (What businesses near the VCT have you used or plan to use on your next visit?), one respondent noted that the options did not include winery. In case of a future survey, the first option should be changed from "brewery" to "winery/brewery", or separated out if the VCTF wants to drill down to that level of detail.

While both the average and median figures from the survey were computed, the final report is using only the median to keep answers more reflective of general trail use population. The survey respondents tended to be high-frequency and high-mileage users (60% of respondents considered themselves advanced cyclists), which signals that lower-frequency and lower-mileage users either did not receive the survey or did not respond to the survey. It is to be expected that frequent users of the trail would be more engaged with it, therefore, more likely to respond to a survey regarding its use.

From the free response section, the following were comments that were noted multiple times:

- 15 comments requesting more facilities including adding bathrooms, park benches, picnic benches, repair stations, and one request for a misting station.
- 8 comments requesting more parking, especially at Shiplock Park.
- 12 comments regarding maintenance including debris and tree roots. Most of the comments focused on tree roots breaking through the surface in the eastern half, 4 mile creek to Charles City Courthouse, and west of Chickahominy Bridge.
- 30 comments requesting expansion of the trail in multiple directions.
- 16 comments regarding safety and signage, including one death noted on the trail while crossing Route 5. Among the suggestions:
    - 3 suggestions to place a line down the center of the entire trail to prevent pedestrians and cyclists from going side-by-side and creating safety hazards when other users approach;
    - A couple requests for better signage at Chickahominy Bridge at Route 5 (where the fatal accident occurred);
    - Request for better signage at Route 5 and Wilcox Neck Road;
    - Request for clear right-of-way signage at campground crossing;
    - Request to put up a mirror at the corner of Governors Land near Jamestown High School on Route 5 where the turn is almost 90 degrees, citing an accident at this location; and,
    - Request for light at Route 5 and Greensprings Road and across Jamestown Road.
- 4 comments noting that multiple races held on the trail negatively affects regular users of the trail.

Trail Counter Analysis:

The VCTF has multiple infrared trail counters installed along the VCT (see map in Appendix). From the user survey, the average mileage completed per trail use is 29.5 and the median is 25. The trail is 50 miles from Richmond to Williamsburg. To calculate annual unique visits using the trail counters, the trail is divided by average and median figures. The calculations are as follows:

- Average: 29.5 average miles completed/2 (to account for a user completing a loop where the user gets on and off the trail at the same location) = 14.75 mile section for the average use

- 50 mile trail/14.75 = 3.39 trail sections
- Dividing the trail into 3 sections, the trail counter data from the trail counters at Richmond, Herring Creek, and Mainland is used.
- The three locations totaled 298,576 trail counter "hits" for a year. 298,576/2 (to account for a user being counted twice on his/her loop) = 149,288 unique visits.

- Median: 25 median miles completed/2 = 12.5 mile section for the median use
- 50 mile trail/12.5 = 4 trail sections
- Dividing the trail into 4 sections, the trail counter data from the trail counters at Richmond, Four Mile Creek, Adkins Road, and Mainland Farm are used.
- The three locations totaled 607,362 trail counter "hits" for a year. 607,362/2 = 303,681 unique visits.

- Some of the trail counter data was missing/incorrect from these locations, and the following are considerations made when compiling the trail counter data:
    - If a month/week was missing, the average of the months/weeks directly prior and after to complete the missing month or week is used.
    - If a data point appeared to be an aberration, the average of the months/weeks directly prior and after to fix the bad counter data for the month or week is used.
    - Most of the locations had a year's worth of data, but not always within the same YTD window. So, while the totals do include an entire year, they do not all reflect either a calendar year or the same timeframes.

Economic Analysis:

The average and median values to estimate the direct economic impact annually from trail users is as follows:

- Average: $39.54 spent per trail visit (per individual user survey)
- 186,375 unique visits x $39.54 = $7,369,268 directly spent annually by trail users

- Median: $20 spent per trail visit (per individual user survey)
- 213,610 unique visits x $20 = $4,272,190 directly spent annually by trail users

Using the average of the median and average direct economic impact = $5,820,729

Business Survey:

Starting with a business list from the VCTF and then searching with Google Maps, 51 businesses were identified for a direct survey via phone. The list of businesses included a mix of convenience stores, bicycle shops, wineries, breweries, restaurants, retail, and hotels. Most businesses were located within a block's distance to the trail. Over a two-week period, 18 (35%) respondents were successfully interviewed. The interview included six questions, and the first and second questions either allowed the interview to continue or end, if (a) The business had not been in place prior by 2015, or (b) the business had not noticed cyclists coming into their place of business. One major issue to the business survey

was that, along most of the rural trail, local businesses could easily identify cyclists coming in from the VCT; however, in the urban Richmond area, businesses could not distinguish between urban cyclists and those making use of the trail (or cyclists using both). As of 2016, an estimated 2.2% of the City of Richmond's population commuted by bicycle[3]. That percentage has likely risen since the City of Richmond added miles of bicycle lanes and infrastructure since 2016 and RVA Bike Share started in 2017[4].

Question #5 became an unusable data point. Only 2/18 businesses had hired additional people due to the trail's opening. Without a complex economic modeling system, this isn't enough data to create an estimate of how many people have been employed because of the VCT.

Similar to the analysis from trail riders, the business survey uses the median figure instead of the average to account for one significant outlier and to account for the small survey group, making most of the respondents favorable to the trail and its effect on their businesses. Only 3/18 businesses interviewed said they had not noticed trail riders.

- On average, each surrounding business sees 14 trail riders per week
- By median, each surrounding business sees 7 trail riders per week

- On average, each patron spends $45 per business
- By median, each patron spends $19.50 per business

Local Property Assessment Analysis:

The purpose of the property assessment analysis was to determine whether proximity to the VCT impacted the % in assessed value by the local governments from 2014 - 2016. Using assessed property value rather than a private market value (e.g. Zillow) would be more conservative and less likely to be skewed by unusual nearby properties. The VCT was fully completed in 2015, while portions had been open since 2005. In order to make an accurate comparison (apples to apples), the following considerations were made:

- Compared properties must be in the same locality.
- Compared properties must be of same use, style, and value, such as comparing ranch-style houses to ranch-style houses, or large urban rehabilitated industrial-style loft buildings to large urban rehabilitated industrial-style loft buildings.
- Compared properties must be in similar areas and not have major different elevating or withdrawing external features. This meant eliminating comparative properties for features such as one comparative property being directly next to a highway, golf course, waterway, within a disparately rated school districts, etc.
- Any selected property that showed property tax aberrations were immediately eliminated. Any property where the property tax from 2015-2017 rose drastically,

[3] https://bikeleague.org/sites/default/files/LAB_Where_We_Ride_2016.pdf
[4] http://www.richmondgov.com/bikeped/

fell drastically, or had remained the same for many years, was eliminated. The reasons for these aberrations could include tax abatements/freezes (for rehabilitation or elderly), recent renovations, etc.

Due to these restrictions, a number of prime properties were eliminated from the analysis. For example, the Village at Rockett's Landing was eliminated due to lack of comparable properties in Henrico County. Along the 50-mile stretch, the majority is rural and, therefore, offers a limited selection of properties that have "matches" within that locality to compare. Because of aberrations, a number of apartment complexes in Richmond had to be eliminated as part of the comparison group. Unfortunately, this meant cutting out a few apartment complexes that would have been more similar in assessed value.

In the property assessment research, we are also missing all data for Charles City County, and 2014 data for James City County. Charles City County only provides current year tax information (no historical records), and James City County only provides up to three years' history of property tax information.

Cap2Cap Analysis:

The Cap2Cap event is the VCTF's annual fundraising event that is held in May. Involvement includes registering as a participant tiered cycling distances, volunteering for the event, and sponsoring the event. The 2018 Cap2Cap survey was designed and administered by the VCTF prior to the start of this study, and the subsequent data was included as part of this study.

Of the 1,539 registered participants in 2018, 494 (n) participated in the VCTF's event survey (32% response rate). 68.1% were from Richmond or Tidewater, leaving 31.9% as non-regional participants. For those who were traveling from out of town, each participant spent an average of $258.57. Applying the percentages from the survey group (n) to all Cap2Cap participants (N), given that such a high % of participants surveyed, the following is determined:

- 31.9% of 1,539 (N) = 491 participants were from other regions
- 491*$258.57 = $126,958 spent in the region by out of town Cap2Cap participants

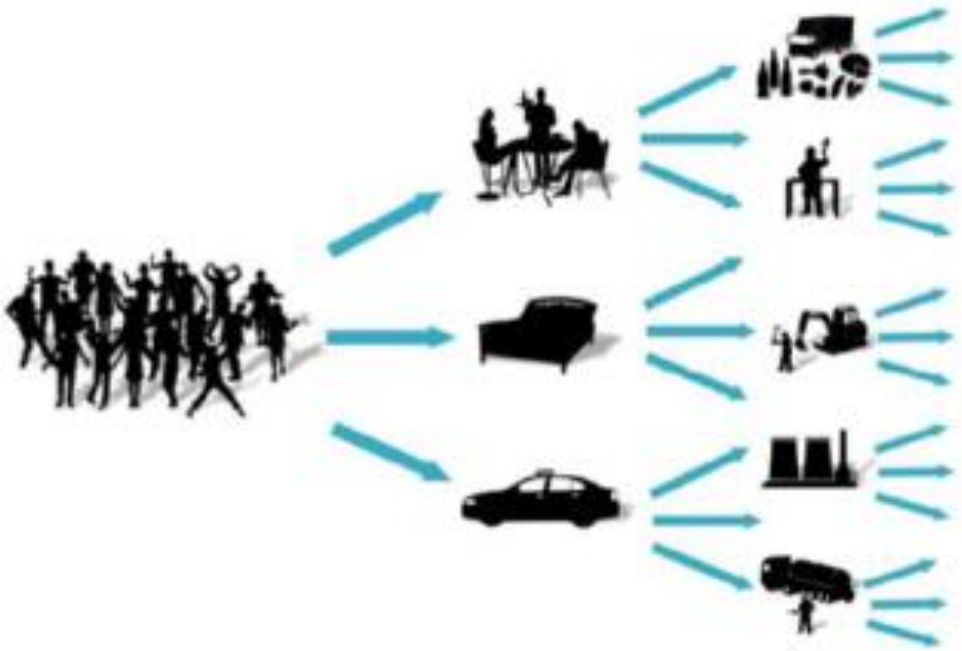
Strength of study: In comparing this study to the two similar studies linked here, the direct economic impact is much smaller than the other studies' estimates; however, both studies don't have trail counters and definitive numbers of cyclists. Both use estimates of number of users.

https://www.adventurecycling.org/sites/default/assets/File/USBRS/Research/Shenandoah%20Valley_Bike%20Tourism%20Econ%20Benefits%20Study.pdf

https://altaplanning.com/wp-content/uploads/Health-and-Economic-Benefits-of-East-Coast-Greenway-to-North-Carolina's-Triangle-Region.pdf

Limitations of study:

- Economics: This is a primary study only. This study did not include an economic modeling system for determining indirect economic benefits to the region (See figure, below). In addition to actual dollars filtering indirectly to the region, this study does not have a tool to determine jobs created or estimate of healthcare savings from health benefits.
- Participants successfully surveyed: Because the population surveyed (n) is a highly engaged group with the VCT and the VCTF, and likely not representative of all VCT participants (N), the study stopped short of estimating the number of individuals that use the trail each year. In urban areas, there are likely uncountable users that either don't pass a trail counter and/or complete a very small portion of the trail.



END APPENDIX A

REFERENCES AND NOTES

[1] Stynes, D. J., Propst, D. B., Chang, W., and Sun, Y. (2000). Estimating national park visitor spending and economic impacts: The MGM2 model. *Report to the National Park Service. East Lansing, MI: Department of Park, Recreation and Tourism Resources, Michigan State University*.

[2] Stynes, D. J., Propst, D. B., Chang, W., and Sun, Y. (2000). Estimating national park visitor spending and economic impacts: The MGM2 model. *Report to the National Park Service. East Lansing, MI: Department of Park, Recreation and Tourism Resources, Michigan State University*.

[3] Stynes, D. J., Propst, D. B., Chang, W., and Sun, Y. (2000). ibid.

[4] Dougherty, R. (2011). *2010 Maryland State Parks Economic Impact and Visitor Study*. Maryland Office of Tourism Development: Department of Business and Economic Development; in collaboration with the Maryland Department of Natural Resources; Cecil County Tourism, Office of Economic Development; Maryland Association of Destination Marketing Organizations; Governor's State Park Advisory Commission.

[5] These figures include $127K spent by non-local visitors to the Cap2Cap event. These spending figures are slighter higher than those reported in Appendix A because ISR computed visitor volumes by dividing trail counts by 1.95 assuming that some trail users get picked up on one end (not all trail users pass the same point twice).

[6] The low end of the range in spending is calculated using survey means; the high end of the range is calculated using survey medians. All IMPLAN results reported in this study are the average of these two estimations.

[7] The University of Richmond survey did not ask patrons where their spending occurred. As such, the proportion of local spending is estimated by benchmarking other studies:
Magnini, V. (2019). Virginia State Parks Economic Impact Report 2018. Virginia Tech; Pamplin College of Business: Blacksburg, VA.
Magnini, V. and Wyatt, C. (2019). The Economic and Fiscal Impacts of Spearhead Trails. Institute for Service Research, Virginia Beach, VA.

[8] It is not possible to isolate these indirect effects inside an area with 100 percent accuracy.

[9] For evidence of 60-40 split between state and local tax revenues:
https://www.vatc.org/research/travel-data-and-profiles/

[10] More about value-added effects can be found here:
Stynes, D. J., Propst, D. B., Chang, W., and Sun, Y. (2000). ibid.

[11] As detailed in Appendix A, Charles City County only provides current year tax information (no historical records), and James City County only provides up to three years of historical values. Moreover, some types of properties could not be included in the analyses due to lack of comparable properties that do not abut the trail.

[12] Crompton, J. L. (1993). Economic impact analysis: Myths and misapplication. *Trends*, 30(4), 9-14.

[13] Ohnesorge, L. (2018). "Amazon will split HQ2 between two cities, report says." Triangle Business Journal (Nov 5, 2018).