REPORT OF THE VIRGINIA DEPARTMENT OF

CONSERVATION AND RECREATION

Feasibility Study for a Linear Park in the Shenandoah Valley

TO THE CHAIRS OF THE

HOUSE APPROPRIATIONS COMMITTEE AND

SENATE FINANCE AND APPROPRIATIONS COMMITTEE

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TABLE OF CONTENTS

TABLE OF CONTENTS .....

ACKNOWLEDGEMENTS **7**

PREFACE **7**

EXECUTIVE SUMMARY **7**

PART A FEASIBILITY **11**

Introduction *11*

Location *11*

Methodology *11*

Natural Resources *14*

Topography *14*

Geology 14

Soils 15

Climate 15

Hydrology 16

Watershed 16

Floodplain 16

Ponds/Culverts 11

Groundwater 11

Aquatic Communities 11

Wetland Species 11

Terrestrial Communities 12

Invasive, Exotic, and Pest Species 13

Visual Resources 13

History of the Region *14*

Archaeological Resources 15

Interpreted Historical Sites 15

National Register Listings (as described in the listing) 15

Significant Events 17

Land use *17*

Transportation *18*

Bridge and Culverts 19

At-Grade Road Crossings 20

Corridor Description 23
Town of Broadway to Cavern Road, Shenandoah County 25
Cavern Road to Stony Creek Boulevard, Town of Edinburg 28
Stony Creek Boulevard, Town of Edinburg to Court Square, Town of Woodstock 31
Court Square, Town of Woodstock to Brook Creek Road, Town of Toms Brook 34
Brook Creek Road, Town of Toms Brook to Town Museum, Town of Strasburg 36
Town Museum, Town of Strasburg to Town of Front Royal 39
Plan Compatibility 42
The People 44
Demographics 45
Commute Profile 46
Vulnerable Populations 47
Partner Capacity and Support 49
Potential Partners 49
Federal Partners 56
The Market 59
Visitation at existing state and national parks 61
Recreational Assessment 61
Other Recreational Resources 62
Local Demand for Outdoor Recreation 65
Potential Uses for the Trail 65
Trail Connectivity 67
Connectivity Map 67
Connection to the River 68
PART B TIMELINE 69
History of the Railroad 69
Abandonment Process 70
Notice of Interim Trail Use 71
Railbanking 71
Schedule 71
Environmental Assessment 72
Property Constraints 74
PART C BENEFITS AND COSTS 74
BENEFITS 74

Potential Revenues *74*
Property Values 75
Quality of Life Improvements *75*
Active Transportation 76
Economic Development 78
COST ESTIMATES *80*
Acquisition *80*
Development *81*
Facility Cost *81*
Trail Construction 81
Alignment Challenges 82
Fencing 82
Trailheads 83
Bridge and Structures 87
Cost Estimate Template Assumptions: 87
Cost Estimate Summary 88
Management *88*
Potential Revenue for acquisition and development *89*
Framework for Success *90*
Possible ownership and maintenance scenarios *90*
Federally owned and operated 90
State owned and operated 91
Regionally owned and operated 91
Regionally sponsored non-profit 92
Locally owned but developed and managed through a regional structure 92
Hybrid *92*
Next Steps *92*
CONCLUSION 93
X. APPENDIX 95

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DCR thanks Strava Metro for providing access to their aggregated and de-identified data at no cost.

PREFACE

In accordance with Item 374 P of Chapter 56 of the 2020 Special Session 1 Acts of Assembly, which directed the Virginia Department of Conservation and Recreation (DCR) to assess "the feasibility for development of a linear park along the Shenandoah Valley rail corridor from Front Royal to Broadway, Virginia," this assessment includes "the potential timeline for abandonment of existing Norfolk Southern rail sections B51.0 to B84.0 and CW84.0 to CW99.5, anticipated annual user revenues, and all start-up and ongoing costs of operation as a satellite facility of Seven Bends and Shenandoah State Parks." The Departments of Transportation and Rail and Public Transportation were charged with providing technical assistance in developing the cost assessment.

This report, consistent with the instructions of the General Assembly, focused on the acquisition, development, and management costs and identified potential revenue sources to offset those costs to gain a comprehensive picture of project feasibility.

EXECUTIVE SUMMARY

The 2020 General Assembly of Virginia passed House Bill 1800 requiring the Virginia Department of Conservation and Recreation (DCR) to study the feasibility for the development of a linear park along the Shenandoah Valley rail corridor from Front Royal to Broadway, Virginia. The Resolution also requested that DCR include the potential timeline for abandonment of existing Norfolk Southern rail sections B51.0 to B84.0 and CW84.0 to CW99.5, anticipated annual user revenues, and all start-up and ongoing costs of operation as a satellite facility of Seven Bends and Shenandoah State Parks. This report is divided into three sections to address the resolution's three requests regarding feasibility, timing, and anticipated revenues and costs.

The 49-mile study corridor passes through three counties and eight towns within the Northern Shenandoah Valley Regional Commission and the Central Shenandoah Planning District Commission. In Toms Brook, the corridor is crossed by the 252-mile Tuscarora Trail, a spur of the Appalachian Trail that connects both sides of the Lee Ranger District of the George Washington and Jefferson National Forest. The entire study corridor is within the Shenandoah Valley Battlefields National Historic District, with potential side trail connections to Cedar Creek and Belle Grove National Historical Park, and Shenandoah National Park. The corridor passes within a mile of Seven Bends State Park in Woodstock and New Market Battlefield State Historical Park.

DCR, in coordination with the Virginia Department of Transportation (VDOT) and their consultant, Michael Baker International (MBI), led the feasibility effort. VDOT and MBI were tasked with executing a public survey, field survey, environmental review, and cost estimates for the horizontal and vertical facilities along the rail alignment.

The Shenandoah Rail Trail Exploratory Partnership, a multi-jurisdictional partnership composed of public, private, and non-profit organizations along the corridor, was formed with the vision of transforming the unused rail corridor into a multi-use trail. Partnership members representing all the towns, counties, and other entities along the rail corridor submitted resolutions of support and made them available to DCR. On behalf of the Partnership, Alliance for the Shenandoah Valley played a key role in coordinating communications and outreach efforts to both community members and elected officials, including the development of a project website, brochure, and other materials in both English and Spanish platforms. Additionally, staff from the National Park Service Rivers, Trails and Conservation Assistance Program have been involved from the start providing assistance in creating project management and strategic action plans, designing and implementing a community outreach and participation strategy; and working with DCR to facilitate the listening sessions.

With the permission of Norfolk Southern Corporation, VDOT and MBI staff performed a field survey in May 2021 to determine the requirements for a rail-trail project and to develop cost estimates. During the field visit, staff documented structure deficiencies, typical cross-section widths, and geometric and natural challenges. The project team also performed a desktop review of environmental resources, roadway crossings, and possible trailheads. The field survey and desktop review found that:

- Bridge structures have good structure capacity but require some repair
- The rail alignment, with the proper construction methods, can accommodate standard trail cross-sections
- 73 of the identified 117 roadway crossings are low-volume and can be addressed with low-cost countermeasures
- 8 of the 13 trailhead locations have been identified that either use existing facilities or can be provided or expanded on government-owned properties

Using the information from the assessment, the study team staff separated the alignment into six segments with logical termini. A 10-foot wide trail with 2-foot wide shoulders was selected as the preferred typical cross-section. MBI engineering staff developed cost estimates for a hard or soft surface trail based on the preferred typical cross-section, the required bridge and culvert repairs, trailhead requirements, and rail-removal costs. Staff found that the total cost per mile of $1.1 million to $1.3 million is slightly higher than the average rail-trail project due to the number of structures along the alignment.

Funding for the acquisition, development, and management of the rail trail will be vital to the feasibility of this project. The table below summarizes the total costs associated with each component needed to execute this effort. A state assessment valued the corridor to Heritage Park at $17.39 million, but a third-party appraisal was not completed in time for this report.

Item	Total Cost
Acquisition	$15.0-25.0M
Trail Construction	$28.0M - $36.0M
Bridge Construction/Repairs	$26.9M
Preliminary Engineering	$4.0M - $6.0M
Rail Removal	$9.0 - $11.0M
Trailheads	$7.0M - $15.0M
Operating Costs	$1.4M/YR
All costs are in 2021 dollars	

Public survey and outreach found widespread support for the project with some concerns raised by a few adjacent landowners. The public supported a 10-foot wide interpretive trail with a well-maintained, consistent, hardened surface that would provide spur connections to destinations both locally and throughout the Valley. As well, public feedback requested that trailheads provide adequate parking, restrooms, orientation kiosks, water, rest areas, bike racks/tools, and public art. In addition to the public survey, interviews with local jurisdictions indicate a willingness to support the project depending on local capacity.

Demographic research documented latent demand for bike/ped infrastructure in the study area. Walkability scores are low between towns and the existing bicycle infrastructure (shared roadways) primarily serves higher-skilled users. Bike/ped commute rates are low except in Harrisonburg and Front Royal, where more bike lanes and sidewalks connect to employment and education opportunities. The Lord Fairfax Health District has some of the state's highest levels of overweight populations with obesity, hypertension, and high cholesterol, all chronic diseases that can be treated with greater levels of physical activity. There are also higher levels of disability present, a population that would benefit from a safe, shared-use path connecting communities. There are several areas along the tracks that have linguistically isolated and low-income households, and many of these households do not have a car, another demographic benefitting from a safe, active transportation alternative.

There is a need for more park acreage in the study area. There are not enough federal, state, or local parks to meet demand in Northern Virginia. Unmet demand has resulted in people being unable to access destination parks and long wait times.

Finally, several management alternatives exist for the rail corridor. Management alternatives include a state-owned corridor managed by a partner that receives General Assembly budget allocations or sufficient donations from private sources or a state-owned and managed corridor. The unmet demand described above may provide opportunities to partner with the National Park Service or the U.S. Forest Service. If Norfolk Southern and the Surface Transportation Board approve the sale, a regional or local authority or commission could own and manage the trail.

In conclusion, a linear park from the Town of Broadway to the Town of Front Royal is feasible. While the cost of acquiring the rail corridor from the Norfolk Southern Corporation is unknown at this time, and although the initial cost for construction is estimated to be significant, the segmentation and alternatives presented in this study provide multiple strategies that make the execution of this project attainable. The challenge of ongoing maintenance should be addressed through a dedicated funding source to ensure that the project moves forward.

Although unknown at the time of this study, Norfolk Southern's willingness to sell and associated rail abandonment may affect the total cost and timing of the project. Property purchase is dependent upon willing sellers. The number of willing sellers was unknown at the time of the study.

PART A FEASIBIILTY

INTRODUCTION

The purpose of this study is to determine the feasibility of a 49.0-mile rail-trail in the Shenandoah Valley and to meet the requirements set forth by the General Assembly for the study. The southern terminus of the study area is Norfolk Southern Shenandoah Line milepost CW 99.5 in Broadway, a town in Rockingham County. The northern terminus is Milepost B 51.0 in Front Royal, a town in Warren County.

LOCATION

For the purposes of this report, "the study area" covers the rail corridor and its immediate environs in the northern end of Rockingham County, Shenandoah County, and the central part of Warren County. Figure 1 shows the rail alignment study area. Between Broadway and Front Royal, the inactive rail line passes through the towns of Timberville, Mt. Jackson, Edinburg, Woodstock, Toms Brook, and Strasburg. In the Town of Woodstock, the trail passes within a mile of Seven Bends State Park. In Edinburg, the trail passes by the Lee Ranger District of the George Washington & Jefferson National Forest. In Strasburg and Front Royal, the trail passes close to two units of the National Park Service, Cedar Creek and Belle Grove National Historical Park and Shenandoah National Park/Skyline Drive. The entire trail is within the Shenandoah Valley Battlefields National Heritage Area. A larger Study Area Map is available in Appendix A.

METHODOLOGY

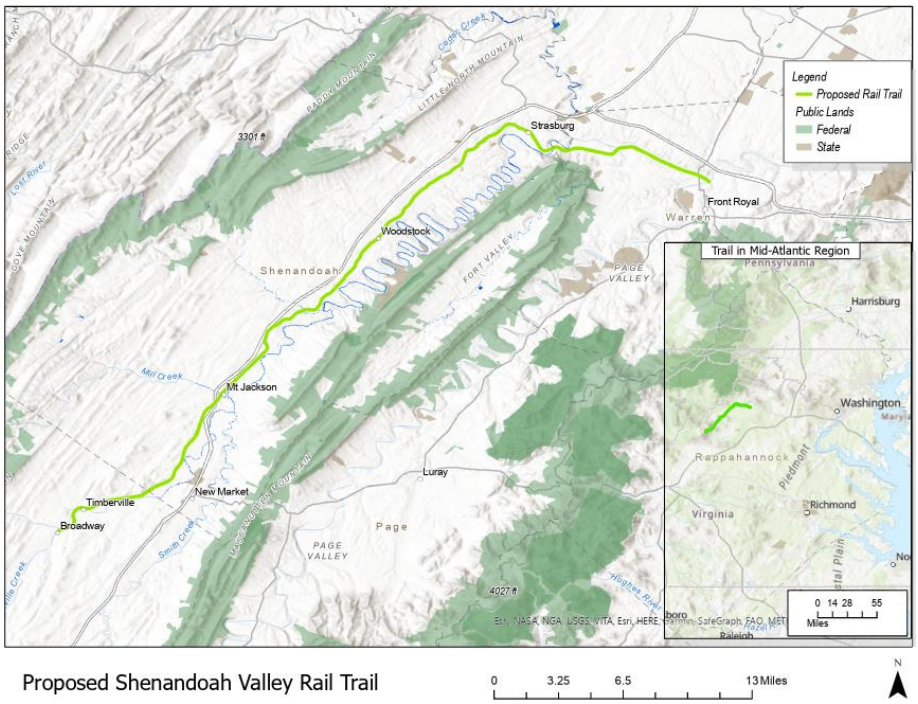
Without specific funding allocated for this study, DCR partnered early on with organizations that could assist with outreach, research, and material development. Staff worked closely with VDOT, Alliance for the Shenandoah Valley, the Shenandoah Rail Trail Exploratory Partnership, and regional and local governments, among others, to develop the study. Other Virginia state agencies provided valuable information about cultural, historic, and natural resources in the study area. Staff from the National Park Service facilitated listening sessions and helped coordinate communication between DCR staff, the planning team, and stakeholders.

In January of 2021, four virtual listening sessions were held targeting land managers, transportation providers, business/tourism interests, and non-government organizations (NGOs) to review the study process, provide initial findings, and answer questions. There was overwhelming bi-partisan support for the trail among these targeted groups. The compiled notes from those meetings are available on the agency website.[1]

Determining the level of public support was critical, as was learning how to engage new audiences in that determination. Independent of DCR's effort, the Alliance for the Shenandoah Valley trained ambassadors to educate landowners about the potential rail trail. Outreach materials in Spanish, developed by the Alliance are available on the agency website.

[1] https://www.dcr.virginia.gov/recreational-planning/shen-rail-trail

Figure 1. Rail Alignment Study Area



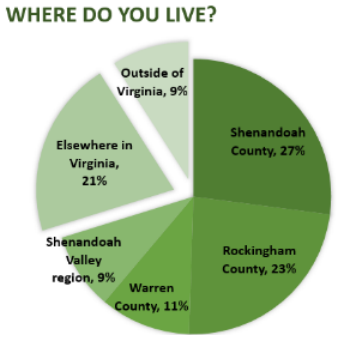
The following April, VDOT contracted with Michael Baker International for specific tasks to support the feasibility study, including structural surveys and cost estimates. VDOT also set up a project website and conducted an online survey, available in English and Spanish, using MetroQuest software patterned on a survey completed for the Eastern Shore rail-trail project. When the survey closed, there were 9,283 respondents, the highest ever response rate utilizing this software in Virginia. Figure 2 provides more information on the responders by location and residential status. All survey results are available on the agency website.

Figure 2. MetroQuest Public Survey Results

Public Survey Results

- **Live May 17 – June 25, 2021 in English & Spanish**
- 9,283 Responses
- 5,456 Typed Comments

Top 5 Zip Codes of Respondents	Locality
10%	Harrisonburg
9%	Front Royal
8%	Woodstock
6%	Strasburg
5%	Broadway



Guided by Don Hindman with the Shenandoah Rail Trail Exploratory Partnership, staff toured the corridor and visited potential trailheads along the route. Independent of DCR's efforts, tours were provided to elected officials, and significant positive press was generated in relation to the project. Links to some of these articles are included in a record of press related to the project.

Shenandoah Valley Rail-Trail -News Coverage 2020-2021

Title	Outlet	Date
Valley Rail Trail Making Progress	Daily News-Record	9.18.21
Rail trail study still accepting public comment	WHSV	8.2.21
Let The Waiting Game Begin on Proposed Rail Trail	Daily News-Record	7.24.21
94% Of Rail Trail Survey Respondents Say They'll Use It If Built	Daily News-Record	7.23.21
Learn more about proposed rail-trail project at July 21 webinar	The Northern Virginia Daily	7.13.21
Thousands Respond to Survey About Proposed Rail Trail	Daily News-Record	7.20.21
DCR to discuss Shenandoah Valley rail-trail study July 21	WHSV	7.8.21
Proposed rail-to-trail project could benefit from infrastructure bill	Harrisonburg Citizen	5.11.21
Former Shenandoah Valley railway could become 50-mile trail	Bay Journal	4.13.21
Woodstock passes resolution in support of rail trail project	The Northern Virginia Daily	4.7.21
Broadway Approves Resolution Supporting Rail Trail	Daily News-Record	3.4.21
Shenandoah eyes old rail line as trail to prosperity	Virginia Business	1.29.21
Valley legislators advocate for rail trail	The Northern Virginia Daily	10.25.20
A budget amendment is laying down the tracks for a Shenandoah Valley rail trail	Virginia Mercury	10.19.20

In May, June, and July of 2021, interviews were conducted with elected officials and staff members representing localities along the corridor to understand local preferences for trail surfacing and management and to identify preferred trailhead locations within the towns. Interviews also discussed possible funding mechanisms to support trail development and maintenance.

During this time, staff also met with the staff from the Shenandoah Valley Battlefields Foundation and Cedar Creek and Belle Grove National Historical Park to understand their priorities and explore possible management options.

On July 1, 2021, staff from DCR and Alliance for the Shenandoah Valley met with the Farm Bureau of Shenandoah County to provide background on the project and receive feedback and questions. On July 21, a virtual public meeting was held by DCR and VDOT to review the study process, provide initial findings, and gather questions and concerns for documentation. Utilizing GoToWebinar software, attendees were polled to gather additional information. Of the 231 people who registered for the webinar, 5 did not support the project, 26 were neutral, 4

supported the project but felt that users should pay for it, and 175 supported the project and the use of tax dollars to fund it.

NATURAL RESOURCES

An environmental desktop review was conducted by Michael Baker International staff to provide a preliminary inventory of resources warranting further consideration during the park development process. This document can be found in Appendix E. The following section provides additional summaries about the natural resources that can be found along the rail alignment.

Topography

The region's topography varies from steep slopes to low-level flood plains; however, the rail line follows a gentle grade, often paralleling roads or waterways. To the west, the Supin Lick and Little North mountains open to let the North Fork of the Shenandoah meander through Brocks Gap. To the east, the North Fork separates the rail line from Kerns and Massanutten mountains. US 211 enters the Valley through New Market Gap, and here the river begins winding steadily northward along Short, Powell, and Three-Top mountains until it reaches Strasburg. The rail line and river turn eastward at Strasburg, passing by the dramatic northern terminus of the Massanutten Mountain chain at Signal Knob. The proposed rail trail would cross the North Fork in Timberville and Strasburg, and cross the South Fork before ending in Front Royal.

A number of hills near the trail add to the visual and historic interest of the corridor. South of Broadway, there is Round Hill. Foley Hill, Thomas Hill, and Pine Hill are north of Timberville. Manors Hill is in New Market, and Third Hill, Turkey Knob and Rudes Hill are north of Quicksburg. Both Round Hill and Fishers Hill are north of Toms Brook, and Hupp Hill is north of Strasburg. South of Strasburg, Three Top Mountain includes Meneka Peak, Richardson Knob, and Buzzard Rock. Both Guard Hill and Edge Hill are near Front Royal.

Geology

The park is located in the Valley and Ridge Physiographic Province. Bedrock within the Valley and Ridge Province consists of generally northeast/southwest-trending carbonate and clastic sedimentary formations of Middle Cambrian through Early Mississippian age, including limestone, dolomite, and shale. Rocks in the Valley and Ridge Province have been extensively folded and faulted.

According to the 2018 Commonwealth of Virginia Hazard Mitigation Plan published by the Department of Emergency Management, the potential for landslides in most of the counties in western Virginia is high. Due to the mountainous nature of the region, development along geologic ridges or at the base of steep slopes is vulnerable.

The Valley and Ridge province is susceptible to sinkholes due to the extensive karst terrain underlain by limestone and dolomite. In April of 2000, thirty-two sinkholes were reported in the upper Shenandoah Valley when seven inches of rain fell after a long dry spell. The soluble geology also produces large aquifers used for drinking water along with many springs and caves. Shenandoah Caverns and Crystal Caverns are both within a few miles of the proposed trail.

A mile east of Edinburg, a valuable mineral deposit called the "chalk mine" had pigments used by Shenandoah Paints. A narrow-gauge railroad built from Edinburg to Columbia and Liberty Furnace in 1891 ramped up the

shipment of iron throughout the region. Iron ore was mined and smelted in the region dating back before the Revolution. These resources have been under the ownership and management of the U.S. Government through the U.S. Forest Service since 1917. There are limestone quarries in Riverton and Strasburg that are active today.

Some of these geological resources could be useful for trail development, although any work should minimize soil disturbance, apply strict use of erosion and sediment control measures, and adhere to best management practices appropriate for karst conditions. Construction should be limited in potential landslide areas.

Soils

All soil along the previously disturbed right-of-way may have at least residual levels of lead, arsenic, and polynuclear aromatic hydrocarbons (PAHs) from historic railroad operations. Best management practices should be considered for the pre-construction, construction, and post-construction phases of rail-trail development. Former industrial areas and rail switching yards may require site-specific treatments. Further investigation may be needed to determine the necessary soil conditions and treatments moving forward.

Climate

This area has a variable temperate climate but is cooler than most of the state. Temperature averages range from highs in the 80's in the summer to lows in the 20's during the winter. The warmest time of year is July, and the coldest month is January. June, August, and September are the most pleasant months, while January and February are the least comfortable.

Precipitation is fairly even throughout the year. Due to orographic uplift from the surrounding Blue Ridge and Allegheny Mountain ranges, the Shenandoah Valley is in the driest portion of Virginia and is one of the driest locations in the eastern United States. Typically, the average precipitation is between 37-41 inches a year, with most of the rainfall in May. Average snowfall is around 23 inches. On the best places comfort index, this area ranks 7.3 (10 being the best).

According to the 2018 Hazard Mitigation Plan, the probability of a severe thunderstorm or tornado occurring varies, but all three counties have a high winter weather risk and a high flood risk. Table 1 summarizes the climate risks for each region in the study area.

Table 1. Climate Risk Summary Matrix

Region	Flood Risk	Drought	Earth-quakes	Winter Weather	Wind	Tornadoes	Wildfires
Central Shenandoah	High	High	Low	High	High	Medium	Medium
Northern Shenandoah	High	Low	Low	High	High	High	Medium

Hydrology

The rail line roughly parallels the North Fork of the Shenandoah River and crosses many irrigation channels, feeder streams, and tributaries. The following list shows named stream and river crossings from Broadway north to Front Royal.

- North Fork of the Shenandoah River
- Honey Run
- Holmans Creek
- Mill Creek
- Stony Creek
- Narrow Passage Creek
- Hollow Run
- Pugh's Run
- Jordan Run
- Toms Brook
- Posey Hollow
- Snapps Run
- Tumbling Run
- Cedar Spring Run
- Town Run
- North Fork Shenandoah
- Passage Creek
- South Fork of the Shenandoah River

Watershed

Rainfall is drained out of the Valley through a series of tributaries and streams that flow into the Shenandoah River, flowing northward to the Potomac River and out to the Chesapeake Bay. The area falls within the Chesapeake Bay watershed, which drains approximately 64,000 square miles of land in six states, making it the largest watershed on the eastern seaboard of North America. The Shenandoah River Watershed drains 2,937 square miles and feeds into drinking water supplies for many metro areas, including Washington, DC. The North Fork and the South Fork of the Shenandoah meet at Front Royal to form the Shenandoah River, which joins the Potomac River in Harpers Ferry. The Potomac-Shenandoah River basin covers 13 percent of the Commonwealth.

The North Fork of the Shenandoah River is a great recreation asset, offering public water access for boating, tubing, fishing, hiking and nature observation. It is monitored by a number of different organizations, ranging from the Friends of the Shenandoah River to the National Park Service to the University of Virginia. A 2018 assessment by the Department of Environmental Quality documented that the North Fork continues to have impairments on both aquatic life and recreation uses. Bacteria and other microbes are the main issues; specific impairment includes fecal coliform levels due to agricultural land uses that dominate the Valley and study area. The river has been listed with DEQ since 2002 for the fecal coliform.

Floodplain

There is an increased risk of flooding on both ends of the rail corridor: where the railroad parallels the North Fork of the Shenandoah near Front Royal and where the railroad parallels the North Fork and Linville Creek through Timberville and Broadway. Although the line is elevated, should any part of the line fall within an identified area of flood risk, development will require coordination with DCR to obtain a permit from each of the local governments that participate in the National Flood Insurance Program.

The community is ultimately responsible for ensuring the activities are compliant, do not adversely impact the floodplain, nor invalidate the locally adopted flood data. The project could potentially improve drainage and reduce flooding. Given the scale of the project, there may be a requirement to demonstrate the impacts to the flood zone through a hydraulic and hydrologic analysis.

Ponds/Culverts

Based on a review of the National Wetlands Inventory and field reviews, there are several farm ponds adjacent to the corridor. There are 13 culverts over smaller streams and 13 drainage inlets from irrigation channels. Generally, the culverts and drainage pipes are in good shape. Most of the culverts and drainage pipes were dry at the time of inspection. Some of the drainage pipes were blocked by sediment and have limited effectiveness.

Groundwater

There is plenty of groundwater in the area that could serve trail users, but securing town water at trailheads should not be difficult because public sewer and water service in the towns are not utilized to their full capacity. Pollution potential is high for wells in limestone areas where groundwater moves rapidly.

Aquatic Communities

The North Fork of the Shenandoah is home to a large number of aquatic species. Fish species found in the river include largemouth bass, smallmouth bass, channel catfish, sunfish, common shiners, and fallfish. American eel, white sucker, northern hogsucker, common carp, crappie, yellow bullhead, and muskellunge are some other fish species that anglers might encounter in the North Fork.

Mollusks associated with the river include the creeper mussel, the Florida pondhorn, and the brook floater. The North Fork Shenandoah River has been designated by the VDWR as a “Threatened and Endangered Species Water” for Green floater and Brook floater.

Threats to the significant Aquatic Natural Community and the surrounding watershed include water quality degradation related to point and non-point pollution, water withdrawal, and introduction of non-native species. To minimize adverse impacts to the aquatic ecosystem, any development should adhere to applicable state and local erosion and sediment control/storm water management laws and regulations, enhancement of riparian buffers with native plant species and maintaining natural stream flow. Coordination with Virginia's regulatory authority for the management and protection of these species, the Virginia Department of Wildlife Resources, will ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

Wetland Species

Wetland plants associated with the area include cattails and swamp loosestrife. Reptiles and amphibians that may be found in the area include numerous salamanders and frogs, such as bullfrogs, grey treefrogs, and green frogs. Snake species include the red cornsnake, eastern gartersnake, eastern kingsnake, and the black rat snake. Various waterfowl species settle in the headwaters during migration. In fall and winter, look for red-headed ducks, snow geese, swans, broad-winged hawks, and eagles. Mallards, wood ducks, herons, spotted sandpipers, woodcock,

and Baltimore orioles are abundant in spring and summer, along with cardinal flowers, hummingbirds, swallowtails, and monarch butterflies.

Tier 1 and 2 species found in this area include Cow Knob salamanders and the Wood turtle. Passage Creek is listed as a "Threatened and Endangered Species Water" for the Wood turtle. These turtles inhabit areas with clear streams with adjacent forested floodplains and nearby fields, wet meadows, and farmlands.

Terrestrial Communities

Vegetation in the northern part of the Ridge and Valley at higher elevations is dominated by dry oak/heath forests with Mountain Laurel, Black Huckleberry, blueberries, Minniebush, Evergreen Mountain Fetterbush, and other acid-loving shrubs. On sandstone cliffs and xeric ridge spurs, constant drought and frequent historical fires have fostered the development of extensive pine-oak/heath forests and woodlands composed of fire-tolerant and fire-dependent species such as Pitch Pine, Table Mountain Pine, Bear Oak, and inflammable heaths. Many ridges also contain large talus fields of deeply piled and minimally weathered sandstone boulders vegetated mostly with lichens. Where the more calcareous sandstone, shale, or siltstone formations prevail, there are species-rich montane oak-hickory forests and a great diversity of alkaline-loving shrubs and shade-tolerant plants.

Low-elevation shale ridges and knobs are prominent features of the central and northern parts of the Ridge and Valley. Although oak/heath and pine-oak/ heath types are common, acidic oak-hickory forests occupy large areas with more White Oak, Flowering Dogwood, Eastern Redbud, and herbaceous plants that thrive in lower elevations. Eastern White Pine and oaks thrive in shale districts.

Shale barrens have open woodlands of stunted trees, especially Virginia Pine and Chestnut Oak, with a sparse herb layer. Shale Barren Rock Cress, White-haired Leatherflower, Millboro Leatherflower, Shale Barren Wild Buckwheat, Shale Barren Evening-primrose, and Shale Barren Ragwort are prominent members of these natural communities.

Sandstone side slopes produce localized acidic woodlands and barrens where steeply dipping pavements of Silurian strata have been exposed through weathering. These woodlands vary from Virginia Pine and Chestnut Oak woodlands to more diverse woodlands with Post Oak, Blackjack Oak, Pignut Hickory, and Eastern Red cedar.

Many common species of wildlife are in the three-county area. Tier 1 and 2 species include American Water Shrew, Virginia Northern Flying Squirrel, Peregrine Falcon, Golden Eagle, Yellow-crowned Night Heron, Northern Saw-whet Owl, American Black Duck, Cerulean and Golden-Winged warblers, Bewick's Wren, American Woodcock, Black-billed Cuckoo, Loggerhead Shrike, and the Indiana, Virginia Big-eared, Northern Long-eared, Little Brown, Indiana, Leib's and Tri-colored bats. Tier 1 and 2 insects include the Appalachian Grizzled Skipper, Regal Fritillary and Rusty Patch Bumblebee.

Some Tier 1 and 2 species found in caves include the Cave Pseudoscorpion, the Madison Cave isopod, Petrunkevitch's Cave Beetle, and the mud-dwelling Cave Beetle.

Invasive, Exotic, and Pest Species

Highly invasive and exotic species in the mountain region include Tree-of-heaven, Garlic Mustard, Oriental Bittersweet, Spotted Knapweed, Canada Thistle, Cinnamon Vine, Autumn Olive, Winged Euonymous, Yellow Flag, Hydrilla, Chinese Lespedeza, Chinese Privet, Japanese Honeysuckle, Amur Honeysuckle, Morrow's Honeysuckle, Purple Loosestrife, Japanese Stiltgrass, Marsh Dewflower, Parrot Feather, Eurasian Water-milfoil, Mile-a-minute, Common Reed High, Kudzu, Japanese Knotweed, Multiflora Rose, Wineberry, Johnson Grass, and European Stinging Nettle. Many of these species are currently found in the rail corridor, especially Tree-of-heaven. The development and implementation of an invasive species plan, including an inventory and treating methods, should be included as part of the maintenance practices for the proposed trail. Appropriate revegetation with native species, robust monitoring and an adaptive management plan are recommended.

Visual Resources

The corridor is distinguished by numerous spectacular views, both of the North Fork of the Shenandoah River and the Massanutten and Allegheny mountains that frame the Valley. Old and new agricultural fields offer long views up to the mountains and across the river. Between the fields and the river are some forested areas.

Figure 3. Scenic Mountain view within the Region

Area localities have passed a resolution of support for congressional designation of the 73-mile-long Shenandoah Mountain National Scenic Area in the George Washington National Forest. Located about 16 miles southwest of Broadway, this 90,000-acre tract of wild land between U.S. 33 and U.S. 250 is the largest wilderness left on the East Coast. It contains four existing wilderness areas — Skidmore Fork, Little River, Lynn Hollow and Bald Ridge. If approved by Congress, the national scenic area designation would also protect six streams that are home to native brook trout.

HISTORY OF THE REGION

The Shenandoah Valley was home or hunting ground for various tribes since at least 15,000 BC. The earliest European settlers to the region were primarily trappers and traders. They first settled the region beginning about 1670. As more people moved to the area looking for more permanent settlements, farms were created that grew flax, tobacco, grain, livestock, vegetables, and fruit, with hemp being a major cash crop through the Revolutionary War. Along the Great Wagon Road (now US 11), towns gradually developed. Market towns, such as Woodstock and Front Royal that developed in the 18th century, eventually turned into the county seats of Shenandoah and Warren counties when those counties were created.

By the mid-18th century, manufacturing started at the crossroads along what came to be known as the Valley Road (now US 11). Small industries included tanneries, mills, and primitive iron smelting furnaces. As communities grew up around these industries, their resources were tapped for wars that established the United States as we know it today: The French and Indian War, the Revolutionary War, and the Civil War.

The first European settlers migrated into the Valley from Pennsylvania. They were mostly farmers, artisans, merchants, educators, and religious immigrants from the north of Ireland, as well as German-speaking persons from Central Europe. African-Americans, mostly enslaved but some free persons, were a smaller component of the Valley community since many of the religious settlers opposed slavery. An 1860 map indicates that 5.5 percent of Shenandoah's and 10.5 percent of Rockingham's population were enslaved persons, compared to areas east of the Blue Ridge with much higher percentages of enslaved persons. Although small, mostly self-sufficient family farms and industries such as milling and ironworks led to a society that developed differently than the plantation-based system east of the Blue Ridge; nonetheless, slavery was part of the Shenandoah Valley story.

Although a thriving Native American presence had existed in the Shenandoah Valley for at least 15,000 years and villages had been observed by 17thcentury Valley explorers, by the time migrants from Pennsylvania moved into and settled the Shenandoah Valley, there were no longer any permanent indigenous peoples here. The complicated reasons for the departure of the Indians included pressures from the western French fur trade as well as the movement of Virginia's English settlers as far west as the eastern foothills of the Blue Ridge Mountains. Suffice to say, however, that at the time of permanent European migration into the Valley in the 1720s, the Valley of Virginia was devoid of permanent Native settlements but remained a thoroughfare and passageway for Native travelers and hunters. That circumstance allowed for a remarkably rapid and peaceful settlement into the Valley, a peace that was shattered a few years later in the French and Indian War (1754-1763). The Native Peoples left behind a rich archaeological record that continues to be studied and explored to this day.

Incorporated in 1834, the Valley Turnpike Company improved the 68-mile Great Wagon Road between Winchester and Harrisonburg, financed largely with $25 shares sold to private citizens. The state purchased 40 percent of the stock. The work on the Valley Turnpike, one of the first roads to be macadamized in Virginia, was completed in 1840. Tolls were collected every five miles until 1918, when the road was turned over to the state since revenue from a new gas tax provided for road maintenance.

Archaeological Resources

There were three periods of settled Indigenous communities in the Valley: Late Woodland, Contact, and Colonial Period. However, migrating Native American occupation of the Shenandoah River Valley has been documented back in time for more than 15,000 years. Archaeological investigations of Middle Woodland sites at Sandy Hook in Shenandoah County and Riverton in Warren County document large communities that lived along the river in winter and moved into the mountains in the summer. Accretional burial mounds associated with the Late Woodland period (Albemarle Culture) have been found along the North and South Forks in Rockingham County and some tributary streams. These Eastern Siouan-speaking ancestors of the Monacan and Manahoac, known for their burial mounds and pottery, lived on both sides of the Blue Ridge.

A cultural shift happened during the period from A.D. 1300 - 1700 when other Indigenous groups moved into the area, possibly due to the Little Ice Age. The Page/Mason Island Culture, Iroquoian speakers who buried their dead individually, migrated into the Valley from the north, probably from the Susquehanna Valley, followed by the Keyser Culture from the Upper Potomac Valley, most likely Central Algonquian speakers. Page Culture site clusters evolved into Keyser Culture palisaded settlements near Rileyville, Front Royal, Strasburg, Woodstock, and Mount Jackson. River and tributary migration have likely buried other sites under sediment.

Trade was important to the Keyser Culture, and excavations indicate that these Native Americans were probably trading shell beads, baskets and deer hides with the Potomac Creek Culture, ancestors of the Patawomack. At least one Keyser site was still occupied during the contact period.

Early English settlers record concern regarding the growing threat of the Five Nations Iroquois, especially the Massawomeck, in the Ridge and Valley. The Five Nations traded with the French and Dutch and had conflicts with regional Indigenous communities in the Valley as early as 1608. From 1670-1710, the Five Nations came to dominate most of Virginia west of the Fall Line. Europeans were established in the Valley by 1720, and with the Treaty of Albany in 1722 and the Treaty of Lancaster in 1744, the Six Nations (Haudenosaunee) gave up their claim to the area.

Interpreted Historical Sites

Although a thorough archaeological and historical inventory has not been completed, the anecdotal evidence portrays a vast amount of history to be interpreted along the trail. The proposed trail passes through the following historic districts on the National Register, adding to the appeal of the trail as a destination and outdoor classroom.

National Register Listings (as described in the listing)

- The Timberville Historic District (NRHP Reference Number 12001137) encompasses the commercial center of this town that grew from a village that arose along the North Fork of the Shenandoah River during the latter 1700s. The arrival of a rail line in 1868 spurred the community's development, and by 1884 the town was incorporated. The advent of the automobile also fueled its expansion during the first half of the 20th century. The Timberville Historic District's 200 contributing buildings reveal a variety of commercial and residential architecture, reflecting many popular and once-common styles.

- The Mount Jackson Historic District (93000541) Originally known as Mount Pleasant, Mount Jackson was established in 1826 and later named for Andrew Jackson. The community prospered as a commercial, milling and transportation center, primarily because of the routing of the Valley Turnpike through town in the 1830s and the arrival of the Manassas Gap Railroad in 1859. Surviving from the earliest period are several log houses, a scattering of Federal-period dwellings, and the ca. 1825 Union Church. The Union Church was one of the town's several buildings to have served as a Confederate hospital; the names of presumably convalescent soldiers and their companies survive on the interior walls. The oldest dwelling on Main Street is probably the log Stoneburner house. Most of the buildings, however, date after the Civil War. Noteworthy among the latter are an 1872 frame mill, three Victorian Gothic brick churches, and several turn-of-the century residences.
- Edinburg Historic District (98000845) Spanning the period of 1787 to the late 1940s, this district includes the most historically significant area in the town. Featuring a town plan that was laid out in the 18th century, Edinburg contains buildings primarily dating to the second half of the 19th century. Settled by German and English families, the town was later an important commercial center that was accessed by the Valley Turnpike and the Manassas Gap Railroad. The Valley Pike town exhibits fine 19th-century architectural styles, as well as a highly intact early-20th-century commercial area.
- Woodstock Historic District (95001089) Woodstock's rich and varied collection of residential, commercial, and church buildings reflects the evolution of this Shenandoah Valley linear community over more than two centuries. Established in 1761, Woodstock boasts the 1795 Shenandoah County Courthouse, considered the oldest courthouse west of the Blue Ridge Mountains. Commercial development was spurred by the construction of the Valley Turnpike in the 1830s and the Manassas Gap Railroad in 1856. Although Woodstock witnessed troop movements, it was spared significant Civil War damage. The local economy was sustained into the 20th century by the establishment of several small industries and businesses. The historic district centers on a mile-long stretch of Main Street, the former Valley Turnpike, which is lined with closely-spaced buildings, most placed directly against the street. A principal institution is the Massanutten Military Academy.
- Strasburg Historic District (84003595) Strasburg was an important focus of early migration in the Valley of Virginia. Founded in 1749, Germans exclusively settled the town, most of whom came from York County, Pa. By the early 19th century, Strasburg prospered as a flour milling center. In the antebellum period it was associated with the manufacture of high-grade pottery. The town's strategic location on the former Manassas Gap Railroad and the Valley Turnpike gave Strasburg a pivotal role during the Civil War in General "Stonewall" Jackson's Valley Campaign of 1862. Strasburg was the first town in the western part of Virginia to be served by two railroads, the north-south Winchester and Strasburg Railroad, and the east-west line to Manassas. By 1890 it was an important industrial center and home to the region's largest printing and publishing establishments. The district exhibits a rare continuum of architectural styles, periods, and building types spanning two centuries of occupation.
- The Riverton Historic District (02000514) is located on the northern edge of the town of Front Royal in the community of Riverton. Situated at the convergence of the North and South Forks of the Shenandoah River, the village was known as River Station and Confluence before receiving its present name in 1869. An important transportation and industrial center for Warren County since the mid-19th century, Riverton began to prosper after the Manassas Gap Railroad arrived in 1854. The town became a strategic terminus

for rivermen floating their goods in flat-bottomed boats down the Shenandoah River and then transferring them to railroad cars. After the Civil War, several industries located at Riverton, the most important being the Carson Lime Company, which was still in business at the time of the district's listing. Established by Samuel Carson, who emigrated from Ireland to Riverton in 1868, the company constructed several buildings in the community, such as Carson's Queen Anne-style mansion, worker housing, and a company store. A duck ranch and a mill also spurred the town's growth at the turn of the 20th century.

The trail passes within sight of these other architectural resources on the National Register. Complete descriptions are available on the agency website.

- Deering Hall (SG100005530)
- Plains Mill (14000238),
- The J.W.R. Moore House (05001275)
- Edinburg Mill (79003084)
- Dr. Christian Hockman's house (84003593)
- Shenandoah County Farm (93001122)
- Toms Brook School (11000554)
- Funkhouser Farm (SG100002533)
- Stoner-Keller House and Mill (12001269)
- Strasburg Museum (79003086)
- Cedar Creek Battlefield and Belle Grove (69000243; 04000273)
- Long Meadow (95001169)
- Lackawanna (14000240)

Significant Events

Because the Shenandoah Valley is part of the Great Valley stretching from Quebec to Alabama, it has been a migration route for thousands of years. Skirmishes and battles have bloodied the landscape beyond those captured in history books. US 11 roughly follows the Great Valley Road, which in turn followed the Great Indian War and Trading Path, where the Iroquois and Catawba Nation war parties fought each other for decades in an effort to control trade. Little is known about the Native American uprisings prior to 1743 when the Iroquois skirmished with Valley settlers over ownership of land west of the Blue Ridge. The following more recent battles are documented and could be interpreted along the proposed trail.

French and Indian War
Near Bowman's Fort, 1763
Narrow Passage Creek near US 11, 1764

Civil War
Front Royal, May 23, 1862
New Market, May 15, 1864
Fishers Hill, September 22, 1864
Cedar Creek, October 19, 1864

LAND USE

The Shenandoah Valley is intensively used for industrial agriculture. Corn, hay, cattle, sheep, horses, apples, peaches, and grapes contribute to the economy. Development patterns are linear following roadways, the railroad,

and the topography of the Valley. More intensive residential and commercial development is found within the towns along these corridors, but agricultural and forested land is predominant closer to the mountains. Large parcels of National Forest land flank the Valley on both sides and core battlefield land is gradually being acquired for protection within the Shenandoah Valley Battlefields National Historic District.

Land use is expected to remain well-balanced, with centralized areas of new and in-fill development within the towns to preserve the rural character. Preserving open space is a high priority among the jurisdictions in this area.

Transportation

In addition to major thoroughfares I-66 (east/west) and I-81(north/south), primary east-west corridors in the study corridor include US 211 and VA 55. Route 185 passes through Edinburg, connecting Wolf Gap to the west with Fort Valley through Edinburg Gap along Route 675. The main north-south corridors are US 11 and VA 42. The closest public transportation in the region is provided by Virginia Breeze and Brite in Harrisonburg, ShenGo in Shenandoah County, Royal Trolley and Corridor Connector in Front Royal, and Win Tran in Winchester. The Virginia Breeze bus service connects the Shenandoah Valley to cities along Interstate 81 and 66, with several stops in the New River Valley, Shenandoah Valley and Northern Virginia. The stop at the Godwin Transit Center at James Madison University in Harrisonburg and Riverton Commons Shopping Center in Front Royal (US 340/522 & I-66) are the closest bus stops to the proposed trail. ShenGo, providing hourly service along US 11 between Strasburg and New Market, closely parallels the trail alignment, allowing the option of a one-way bike trip utilizing the bike carrier-equipped bus in the opposite direction. The bike carrier-equipped Corridor Connector passes within two blocks of the proposed trail, on North Shenandoah Avenue at Duck Street in Riverton. Park & Rides within a few miles of the proposed trail include the Crooked Run lot at US 340/522 just north of Route 637, the Oranda lot at Route 629 & US 11 and the Mauzy lot at Route 259 (Maryland Road) & US 11.There are two general aviation airports in the study area, Front Royal-Warren County Airport and New Market Airport. There are ten official VDOT maintained park and ride lots within the region. The RideSmart program promotes carpools, van pools, and commuter bus services through ride-sharing promotion, matching services, and outreach. Passenger rail service is not currently available in the region.

Using WalkScore, which measures the walkability of any address using a patented system, it is clear that walking is more attractive within towns along the rail line than between the towns. Rankings (which range from 0 to 100, with 100 being most walkable) vary widely across the studied landscape (0 to 73). In response to criticism about WalkScore's methodology, which measures the walkability of individual addresses based on proximity to nearby amenities, EPA developed the Walkability Index. This index is based on measures of the built environment that affect the probability of whether people walk as a mode of transportation, including street intersection density, proximity to transit stops, and diversity of land uses.[i] In the study area, this index only ranks Harrisonburg and Front Royal as having above-average walkability. Most of the area along the rail corridor falls into the "least walkable" category. Table 2 summarizes the WalkScore and BikeScore per locality.

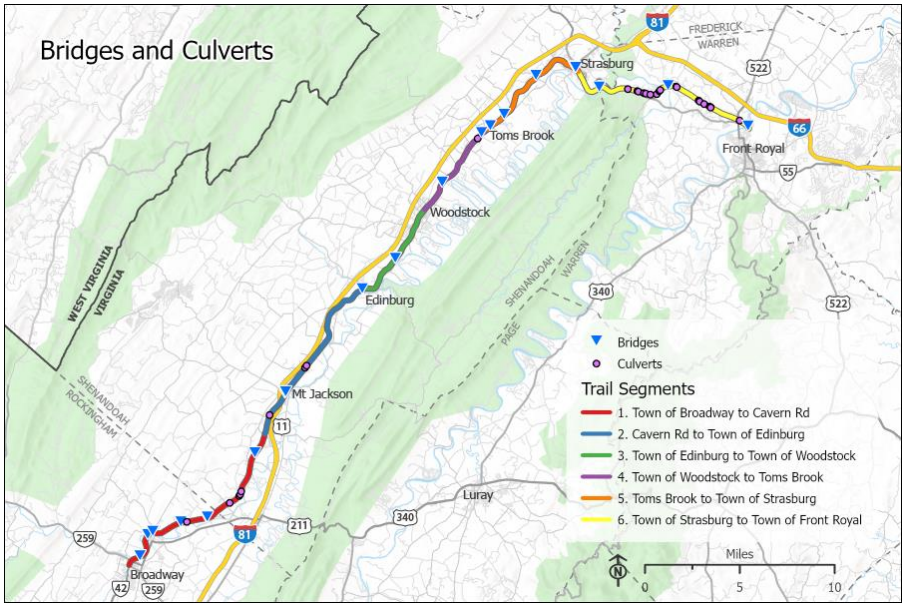
Table 2. WalkScore/BikeScore Summary

Place	Walkscore	Bikescore (if available)
Broadway	52	Not measured
Timberville	28	18
Plains Mills	0	26
New Market	52	Not measured
Quicksburg	7	20
Meems	0	23
Mount Jackson	26	26
Hawkinstown	1	20
Bowmans Crossing	4	5
Edinburg	41	16
Willow Grove	5	2
Woodstock	46	36
Maurertown	0	Not measured
Toms Brook	15	6
Fishers Hill	0	1
Strasburg	58	45
Waterlick	2	15
Riverton	18	Not measured
Riverton Junction	14	10
Front Royal	73	45

Bridge and Culverts

Michael Baker International's team of engineers and inspectors conducted site visits along the abandoned railroad corridor between May 10, 2021, and May 21, 2021, visiting 49 structures, including bridges, culverts, and drainage pipes. The team collected the following information: site access requirements and limitations, the general typical section and elevation and layout for each bridge, and the general repair items, noted for the development of the preliminary cost estimates. Each structure was given a 4-digit asset ID that was based on the integer and two decimals corresponding to mileposts along the route. Figure 4 shows the location of the bridges and culverts.

Figure 4. Location of Bridges and Culverts



Generally, the substructure and superstructure of the bridges are in good condition. The superstructures exhibit trace evidence of paint, which is no longer effective. The steel superstructures exhibit pitting and surface rust with no widespread areas of section loss. There are several locations in need of repair, but generally, these structures have good remaining capacity. The substructures look good, with a few deficiencies; however, the railroad timber ties vary from highly deteriorated to mildly deteriorated, with several missing.

Dense vegetation and/or steep slopes at the abutments limited access to many of the bridge substructures. Additionally, many of the bridges were determined to be unsafe to cross due to the poor condition of the railroad timber ties. Therefore, the substructure assessments are limited.

Based on the field assessment, the bridges will support pedestrian loads and maintenance vehicles with the proposed repairs. An in-depth, hands-on inspection and load rating would further validate these preliminary findings. Subsequent inspections should gather dimensional data for the creation of as-built plans. The as-built plans are not available, but will be required for load rating or design repair phases. Project staff created summaries of the field conditions for each bridge. These summaries are available on the agency website.

At-Grade Road Crossings

117 at-grade roadway crossings exist along the proposed trail alignment. Figure 5 shows the location of the at-grade crossings.

The study team performed a desktop and field review of the roadway crossings to inform the type of roadway crossing treatments necessary to provide a safe crossing for all users. Each crossing review included:

- Average Annual Daily Traffic (AADT)
- Posted Speed Limit
- Nearby intersection controls (stop signs, yield signs, or traffic signals)

- Location of trail crossing on roadway
- Qualitative review of sight distance
- Review of existing crash data

73 crossings can be classified as low speed with lower volumes. These crossings are located at roads with a posted speed of 25 MPH and Average Annual Daily Traffic (AADT) or less than 1,000 vehicles per day. Table 3 summarizes the volume and speeds of the roadway crossings.

Figure 5. Location of At-Grade Roadway Crossings

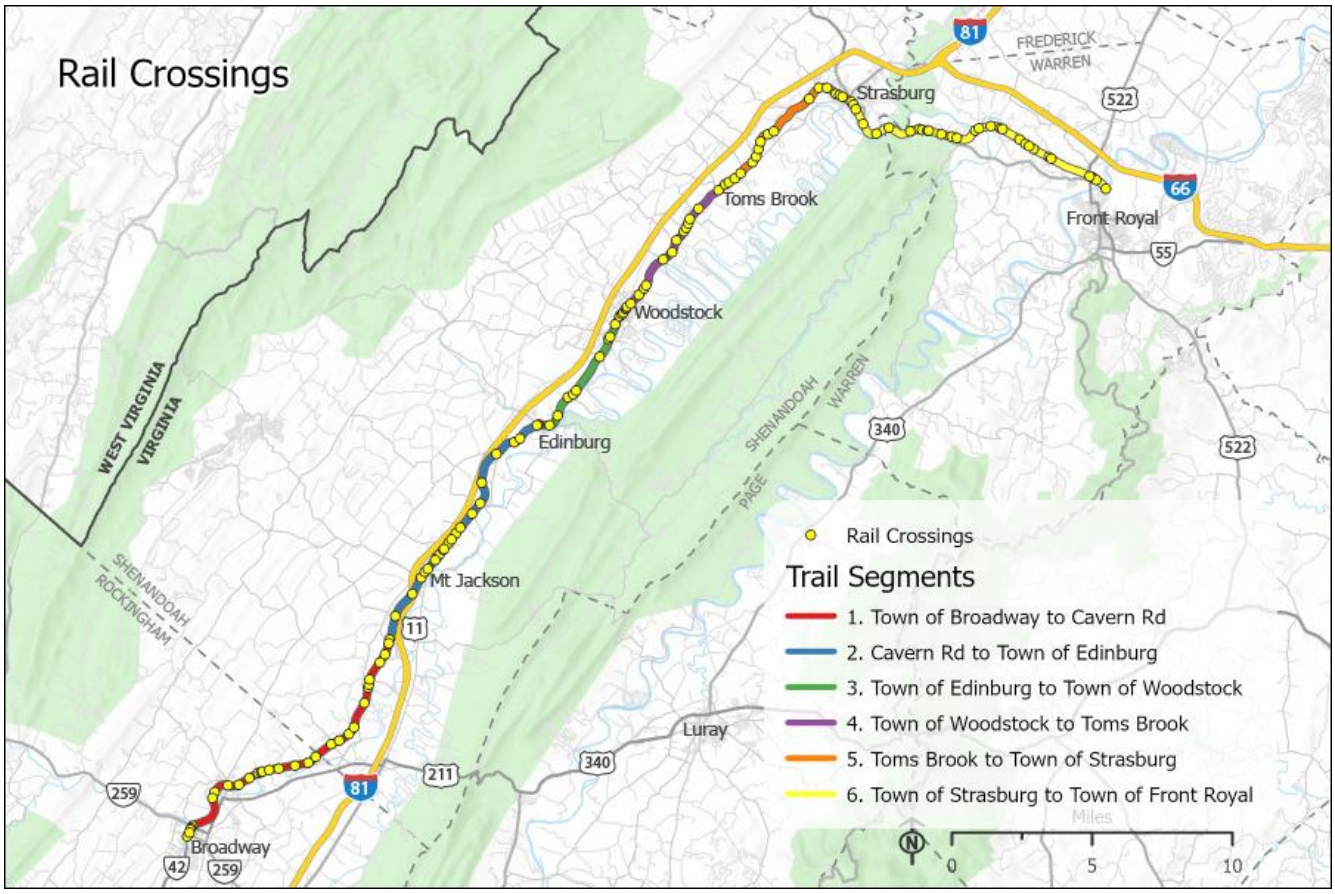


Table 3. Volume and Speed Summary at At-Grade Crossings

AADT Range	Posted Speed Limit on Intersecting Roadway			
	25 MPH	35 MPH	45 MPH	55 MPH
<1,000	73	4	2	20
1,000 - 2,000	3	1	1	1
2,000 - 3,000	4	2	0	0
3,000 - 4,000	0	0	0	0
4,000 - 5,000	0	1	0	0
>5,000	2	3	0	0
Grand Total	**82**	**11**	**3**	**21**

The higher vehicular volume sections are typically located within the towns where the alignment crosses major state roadways such as VA 42 in the Town of Woodstock, VA 259 in the Town of Broadway, or VA 55 in the Town of Strasburg, whereas higher speed areas tend to be on low volume roadways between towns.

The study team also further classified the roadway crossings to help identify treatment options based on the location of the crossing on a roadway and the available sight distance (or the unobstructed distance from a roadway user to see oncoming traffic). The roadway crossing classifications include:

- Mid-block unprotected: Alignment crosses roadway with no regulatory controls (i.e., stop or yield signs, or traffic signals) on the intersecting roadway.
- Uncontrolled intersection: Alignment crosses roadway near an intersection, but the alignment crosses the intersection with no regulatory controls (i.e., stop or yield signs, or traffic signals).
- Controlled intersection: Alignment crosses roadway near an intersection, but the alignment crosses the intersection with regulatory controls (i.e., stop or yield signs, or traffic signals).
- Direct residential or commercial access: The alignment crosses a commercial, residential entrance or driveway. This may also be a location with an entrance with 10 or fewer houses or 5 or fewer businesses.

A qualitative approach was taken to review the sight distance by reviewing field photos and Google Earth Street View images. Roadway crossings were broken into three categories:

- Adequate: Roadway and trail users should have adequate views at the roadway crossing.
- Limited: Roadway and trail users have obstructed views at the roadway crossing because of features such as vertical alignment, berms, or buildings.
- Curve: Roadway and trail users have obstructed views at the roadway crossing because of the alignment of the roadway.

Table 4. Summary of at-grade crossings properties

Intersection Type	Sight Distance		
	Adequate	Curve	Limited
1. Mid-block unprotected (high-volume) state or public roadway (>=12000 AADT)	0	0	1
2. Mid-block unprotected (low-volume) state or public roadway (<12000 AADT)	27	12	18
3. Uncontrolled Intersection (path is crossing uncontrolled side)	2	0	0
4. Controlled Intersection (path is crossing controlled side)	6	0	0
5. Direct Residential or Commercial Driveway (less than 10 houses or 5 businesses)	48	2	1

Following the review of data and classification of roadway crossings, the study team came up with typical crossing treatments that can be applied along the alignment. These typical treatments can be found on the agency website. Typical treatments may include:

- "Trail Crossing" warning signage on the intersecting roadway.
- "Stop" signs on the trail alignment.
- Crosswalk markings across the intersecting roadway.
    - High-visibility crosswalk markings at locations with limited sight distance.
- Advance warning signage on locations with limited sight distance.

Other strategies that can improve safety along the trail alignment include relocating the trail alignment perpendicular to the roadway, providing additional pavement markings to warn roadway and trail users, and clearing the vegetation within the vicinity of a roadway crossing to improve sight distance. Crossings near traffic signals shall relocate to the signalized intersection. These instances occur in the Town of Broadway on East Lee Street and in the Town of Mount Jackson on Conicville Road.

One location where a typical treatment may be inadequate is along VA 42 in the Town of Woodstock. This location is a mid-block crossing with a high traffic volume and limited sight distance due to an adjacent vertical curve. At this location, a Pedestrian Hybrid Beacon is proposed. Pedestrian Hybrid Beacons are traffic control devices similar to a traffic signal that control vehicular traffic so that trail users may cross a roadway. It should be noted that this device and similar devices do require volume and crossing distance thresholds to be met.

Corridor Description

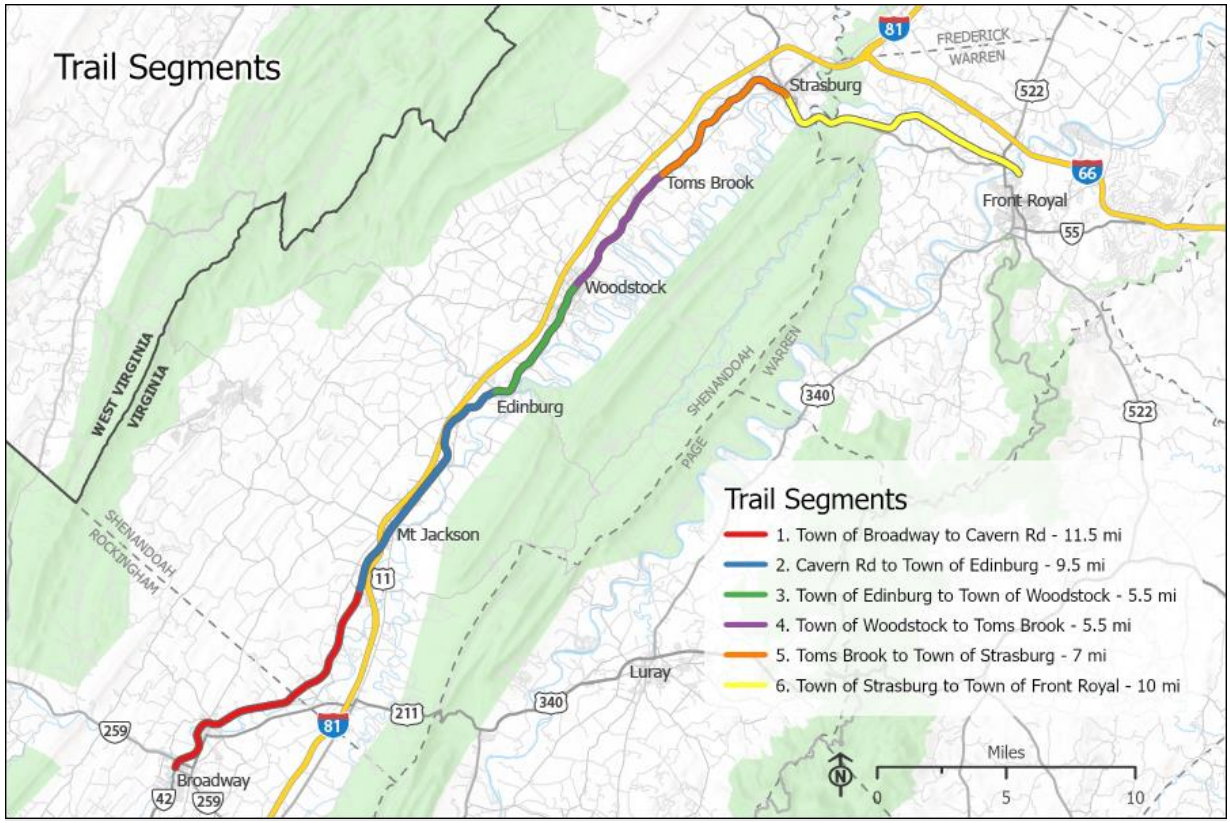
The rail alignment is 49.0 miles long, traversing through three counties, Warren, Shenandoah, and Rockingham counties, and through multiple towns and communities between the Town of Front Royal and the Town of

Broadway. In July 2021, the study team performed a field visit of the rail alignment, developed notes, and took pictures. This field summary is available on the agency website. The field visit found that the majority of the rail alignment shares the following characteristics:

- A 9'-10' wide cross-section where tracks are present with a 6:1 side slope.
- Moderate to major overgrowth between the Town of Mount Jackson and the Town of Strasburg.
- Alignment is primarily three feet or more above the existing ground.
- Agriculture and residential land-uses with dense commercial land-uses within Towns.

The alignment was broken into six segments based on site conditions, logical termini, access points, and potential trailheads. The segments and lengths of each segment are summarized in Figure 6.

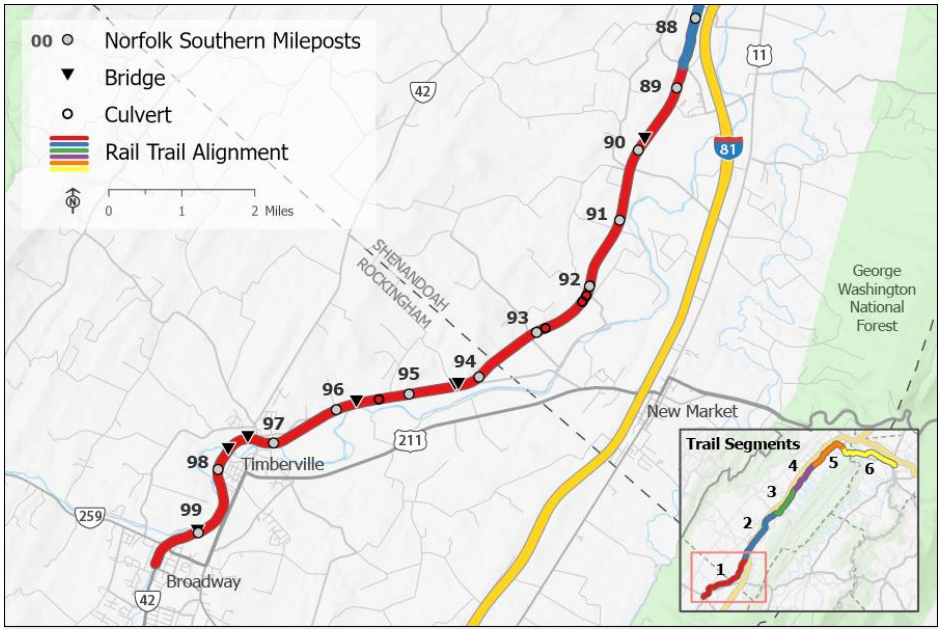
Figure 6. Segmentation of Trail Alignment



Town of Broadway to Cavern Road, Shenandoah County

Alignment Description

Figure 7. Segment 1 Trail Alignment



This 11.5 segment is located in Rockingham and Shenandoah counties and its termini are located in the Town of Broadway on Turner Avenue and at Cavern Road in Shenandoah County. The alignment is mostly elevated at or above three feet from natural grade with no overgrowth along the tracks. Two bridges are present on the alignment between the Town of Broadway and the Town of Timberville, including the 184-foot-long crossing over the North Fork of the Shenandoah River. Steep slopes and drop-offs are located on the river side of the alignment between the Town of Broadway and Town of Timberville. Figures 8 and 9 show representative views of the alignment.

Figure 8: Section between Town of Broadway and Town of Timberville near North Fork of the Shenandoah River

Figure 9: North of Town of Timberville

Points of Interest and Nearby Land Uses:

The alignment travels by large farms where soybeans, corn, alfalfa and hay are grown. Smaller clusters of winter wheat, rye, barley and apple farms provide some variety in the landscape. The railroad corridor passes very close to the North Fork of the Shenandoah River and a small portion of Linville Creek, in some places close to the 100-year floodplain.

Figure 10. Heritage Park in Broadway

In Broadway, the trail ends near Heritage Park, about a quarter-mile from John C. Myers Elementary School, a half-mile from J. Frank Hillyard Middle School, and within a mile of Broadway High School. In Timberville, the trail passes within a mile of Plains Elementary School. Plains District Memorial Park, which has picnic shelters, ballfields, and a public pool, is adjacent to the rail bed over the North Fork of the Shenandoah River. After the railroad

crosses the North Fork, it crosses Honey Run and passes over Main Street near the Plains District Memorial Museum.

Figure 4. Plains District Memorial Park in Timberville

Evergreen Road parallels the railroad between Timberville and Plains Mill. North of Plains Mill, the railroad corridor passes New Market airport.

North of New Market, the railroad follows the contours of Timber Ridge on its way to Quicksburg, an unincorporated community along the tracks near Holmans Creek.

Figure 5. Adjacent land uses in the Town of Quicksburg

Just south of Mt. Jackson, the corridor passes within a half-mile of Honey Run Elementary, North Fork Middle, and Mountain View High schools. It also passes very close to a number of attractions, including Route 11 Potato Chips, Shenandoah Caverns, American Celebration on Parade, the Yellow Barn, and George's Family Farm.

Other attractions throughout this section include the John Kline Museum in Broadway and Third Hill Winery in Quicksburg. Lodging is available at hotels in New Market and the Jacob Swartz House and River Bluff Farm bed and breakfasts.

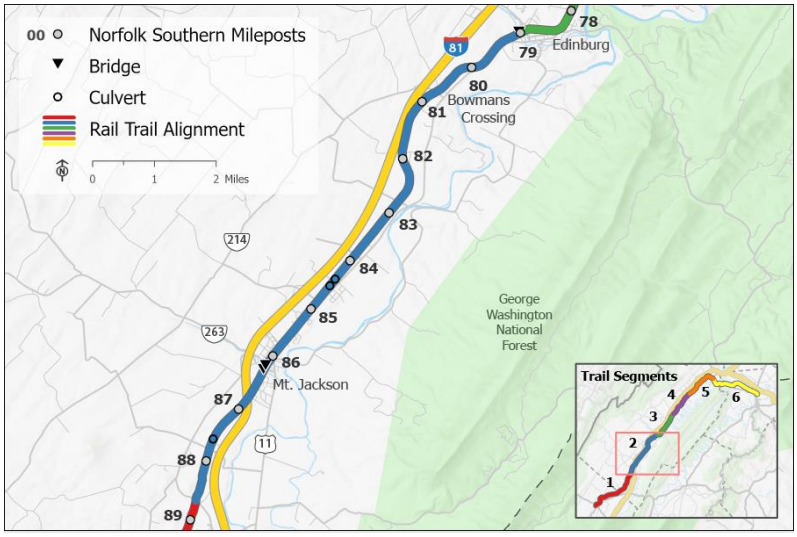
Recommended Trailheads:

- Town of Broadway: The Town owns a four-acre property on Turner Avenue adjacent to the proposed trail that is undeveloped, and it is across the street from a park. Sidewalk does exist near this property that would connect directly to the trail.
- Town of Timberville: The Town's park master plan includes a trailhead where the rail line intersects with Memorial Park Drive. The park has a dog area, baseball fields, a playground, and tennis courts. The parking area is paved and abuts the rail alignment.
- Town of Timberville: The Town's alternative location is where North Main Street intersects the rail line. There is a gas station south of the rail alignment. The trailhead would have to share the gas station's access point, but the parking area could be located parallel with the rail alignment with limited impact to the commercial property.
- New Market: There is interest in a bike-ped connection to New Market. There is ample right-of-way where the rail alignment intersects New Market Depot Road. There are two rail lines, as opposed to one, running parallel in this area that could be converted into an access point for the trail. Industrial activity is present with businesses to the south-east of New Market Depot Road and the airport to the south.
- Quicksburg: There may be an area for parking where Village Lane meets the rail corridor.

Cavern Road to Stony Creek Boulevard, Town of Edinburg

Alignment Description:

Figure 6. Segment 2 Trail Alignment



This 9.5-mile segment is located in Shenandoah County and its termini are located on Cavern Road and Stony Creek Boulevard in the Town of Edinburg. The alignment sections within the towns are at-grade and have little to no overgrowth; however, between towns, the alignment does vary between at-grade and four feet above natural grade. Two long bridges are located on the segment, one south of the Town of Mount Jackson and one in the Town of Edinburg near the Edinburg Mill. Vehicle activity does increase where the rail alignment crosses roadways.

The highest vehicle activity, 10,000 vehicles per day, occurs on Conicville Road in the Town of Mount Jackson. Figures 14 and 15 show representative views of the alignment.

Figure 7. Town of Mount Jackson

Figure 8: Segment between Conicville Road and Rolling Hills Lane

Points of Interest and Nearby Land-Uses:

The rail line travels behind Massanutten Regional Governor's School and Triplett Business & Technical Center in South Jackson and then passes over Mill Creek and several roads before entering the Mount Jackson historic district. Family Farmhouse Inn is beside Mill Creek, and there is also a motel in Mount Jackson. The Mount Jackson Town Park and Pool and Lion's Park are within a few blocks, and the corridor passes right by a museum and visitor center in the reconstructed depot. The alignment then parallels US 11, going by several unincorporated communities before reaching Edinburg.

Figure 9. Mount Jackson Museum, including the visitor center and town hall

Farms are smaller and less frequent as population density increases in this corridor between Old Valley Pike (US 11) to the east and I-81 to the west, but agricultural land still contributes to sweeping views outside of the historic towns. There are plenty of services nearby for trail users in this more developed section of the Valley.

In Edinburg, the railroad passes by the 1848 Edinburg Mill and Stony Creek. The historic mill is a museum, visitor center and restaurant.

Figure 10. Historic Mill/Visitor Center in Edinburg

Destinations include the Meems Bottom covered bridge on Wissler Road, Shenandoah Valley Campground and Route 11 Potato Chips. Lodging is available at the Strathmore House.

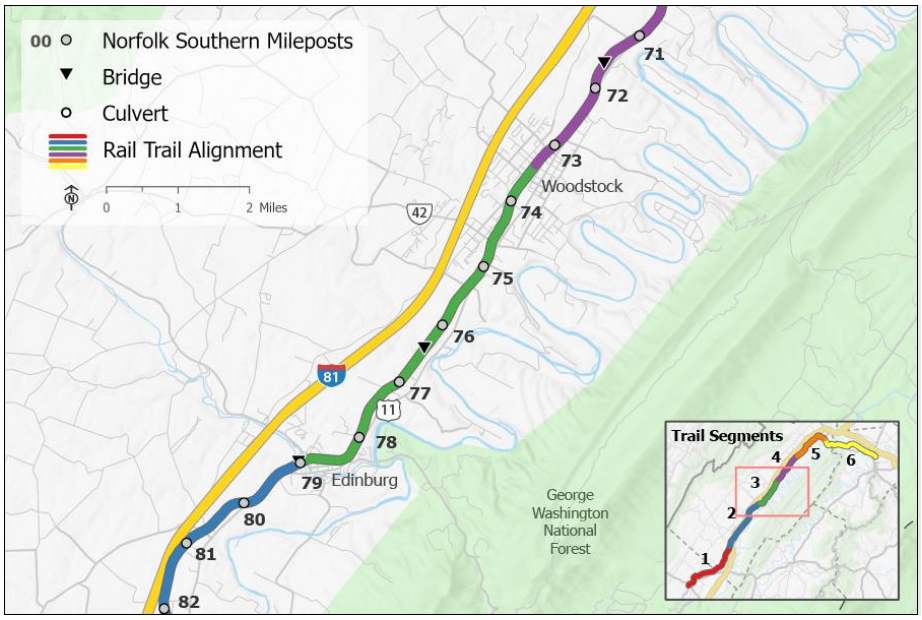
Recommended Trailheads

- Town of Mount Jackson: The Town Hall was designed and built to mimic a train station. The Town Hall has a parking lot and a visitor center right on the tracks. The parking area is adequate, but on-street parking is also available along Gospel Street within the Town. The Town Hall is located on the alignment and Gospel Street has access to the alignment via Depot Street or Orkney Drive.
- Town of Edinburg: The 1848 Edinburg Mill is located near the trail alignment; however, it is well below where the trail would be located. No immediate access would be available without the construction of a ramp or stairs. The parking area is gravel and is very large.
- Town of Edinburg: A location on Stony Creek Boulevard near the VFW is available to accommodate a small trailhead. This location abuts the rail alignment. This would be a suitable location for persons with disabilities to access the trail in Edinburg.

Stony Creek Boulevard, Town of Edinburg to Court Square, Town of Woodstock

Alignment Description:

Figure 11. Segment 3 Trail Alignment



This 5.5-mile segment is located in Shenandoah County and its termini are located on Stony Creek Boulevard in the Town of Edinburg and Court Square in the Town of Woodstock. Most of the alignment is at-grade or near grade, although the alignment within the Town of Edinburg is considerably higher than natural grade. Most of the rail alignment is heavily overgrown with bushes and trees growing between the tracks. This segment also has the highest vehicle volume crossing at VA 42 in the Town of Woodstock, with 14,000 vehicles per day. Figures 19 and 20 show representative views of the alignment.

Figure 12: Segment between Taylortown Road and Hoover Road

Figure 20: Town of Woodstock

Points of Interest and Nearby Land-Uses:

This 5.5-mile section begins in the middle of Edinburg and ends in the middle of Woodstock. In Edinburg, the U.S. Forest Service Lee Ranger District office in town stores maintenance equipment for managing the Camp Roosevelt, Elizabeth Furnace, Hawk, Trout Pond and Wolf Gap recreation areas and associated campgrounds. The corridor passes near Madison District Park, Charterhouse School and Creekside Campground.

Figure 13. U.S. Forest Service District headquarters in Edinburg

Approaching Woodstock, signs direct traffic to turn east on Reservoir Road (VA 42) for a connection to Seven Bends State Park. Heading west on Reservoir Road leads to numerous hotels, restaurants, gas stations, and other businesses located along Main Street (US 11).

The route passes over two branches of Narrow Passage Creek and past three schools (W.W. Robinson Elementary, Peter Muhlenberg Middle and Central High) before reaching Reservoir Road. It passes by Shenandoah Memorial Hospital, Indian Springs Park, and Massanutten Military Academy and passes over Hollow Run, which flows through W. O. Riley Park, before reaching West Court Street.

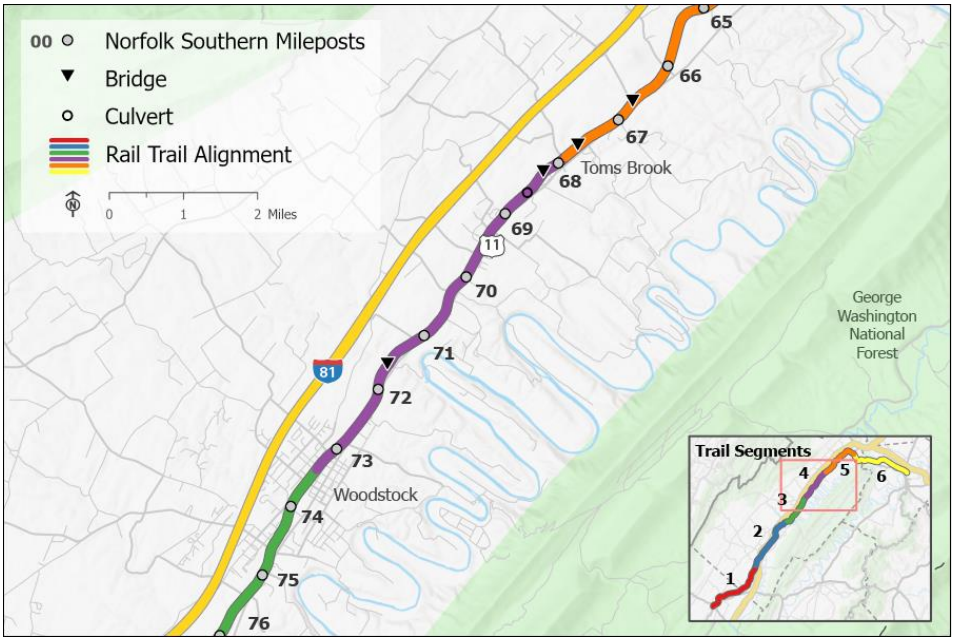
Recommended Trailhead

- Town of Woodstock: The intersection of the rail trail and Court Street, a scenic mid-point, would offer access to and from I-81 and US 11. The Town of Woodstock is adding public parking to this location and owns adjacent public land for potential expansion.

Court Square, Town of Woodstock to Brook Creek Road, Town of Toms Brook

Alignment Description:

Figure 14. Segment 4 Trail Alignment



The 5.5-mile segment is located in Shenandoah County and its termini are located at Court Square in the Town of Woodstock and Brook Creek Road in the Town of Toms Brook. The alignment sits above natural grade and has little to heavily dense vegetation on the tracks. Figure 23 shows a representative view of the alignment.

Figure 15: Maurertown

Points of Interest and Nearby Land-Uses:

The alignment passes near the Woodstock Museum and the Shenandoah County Courthouse. W.O. Riley Park is one-block north, Fairview Park is a three-block walk to the west, and Riverview Park is a three-block walk to the east.

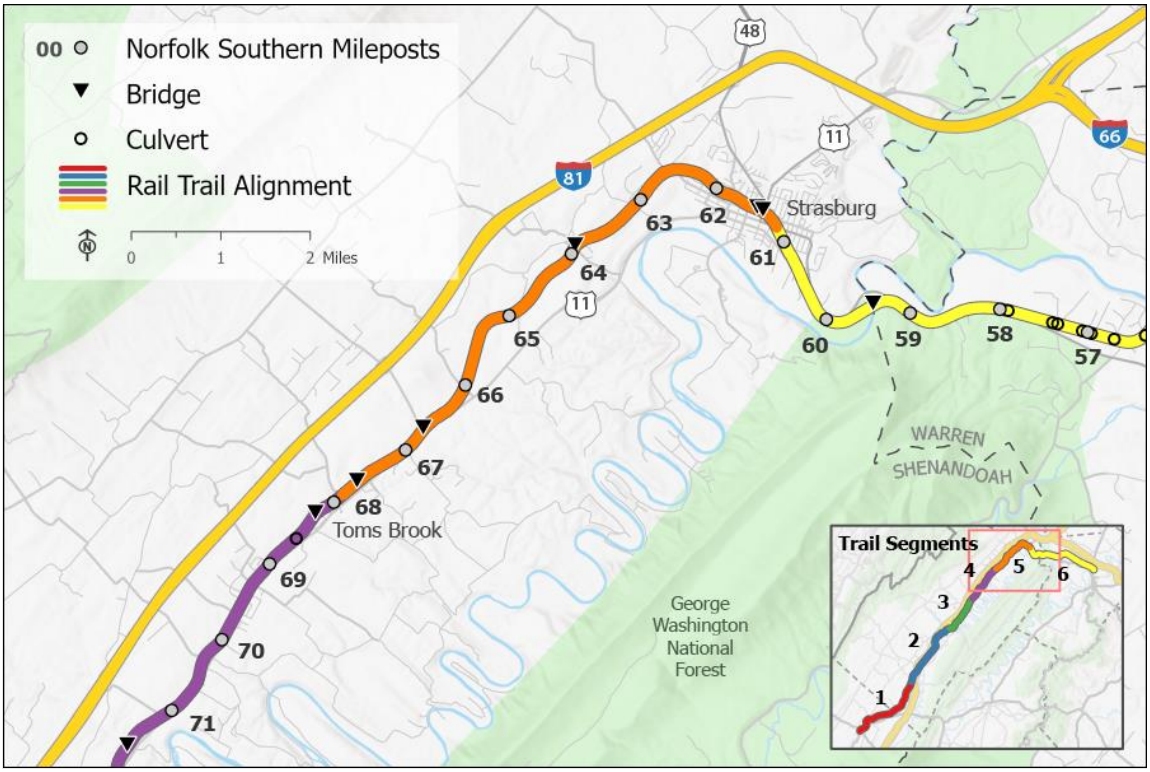
Figure 16. Court Street in Woodstock

After leaving Woodstock's historic district, the route passes over Pugh's Run before reaching Maurertown, a census-designated place along US 11. The rail line passes through the historic core of Toms Brook battlefield. Across US 11 from the rail line, Shenandoah County Park, also part of the battlefield, is adjacent to the site of the Shenandoah County Almshouse, the last poor house to operate in the United States. The rail line then crosses Jordan's Run before reaching Brook Creek Road.

Brook Creek Road, Town of Toms Brook to Town Museum, Town of Strasburg

Alignment Description:

Figure 17 Segment 5 Trail Alignment



Segment 5 is approximately 7 miles long, located in Shenandoah County with termini located on Brook Creek Road in the Town of Toms Brook and at the Town Museum in the Town of Strasburg. The alignment is above grade south of the Town of Strasburg and at-grade within the Town of Strasburg, although there are steep slopes between North Street and US 11. Overgrowth is also present south of the Town of Strasburg but clears after Ash Street. This segment, compared to the others, has the highest number of roadway crossings with limited sight-distance. This is due to the number of natural features such as rock, berms, or trees blocking roadway and trail user views between Mount Olive Road and Ash Street. As well, the roadway alignment has many horizontal and vertical curves. Figures 26 and 27 show representative views of the rail alignment.

Figure 18: Segment between Mount Oliver Road and Ash Street

Figure 19: Segment between Ash Street and US 11 in Town of Strasburg

Points of Interest and Nearby Land-Uses:

The rail alignment enters the Town of Toms Brook historic district before crossing over Toms Brook. After leaving the historic district, the line passes over Mt. Olive Road and Snapp's Run before reaching Fishers Hill battlefield. A study completed by Hill Studios in 2012 included a concept plan that identified a trailhead for the Valley Pike and Fisher's Hill Interpretive Trail Network.

Figure 20. Fishers Hill Battlefield Concept Plan

From Fisher's Hill, the rail corridor passes over Battlefield Road and Tumbling Run before turning east. It crosses over Cedar Spring Run and Town Run before crossing over US 11/522 (North Massanutten Street) in Strasburg. It crosses East King Street (VA 55) at grade before reaching the Strasburg Museum. This section meanders between I-81 and US 11, quite close to US 11 for some of the route. Visitor services are plentiful in this section. A sidewalk heading north along US 11 provides a connection to the Strasburg Visitor Center (Hupps Hill Civil War Park) and several hotels.

Figure 21. Strasburg Visitor Center at Hupps Hill Civil War Park

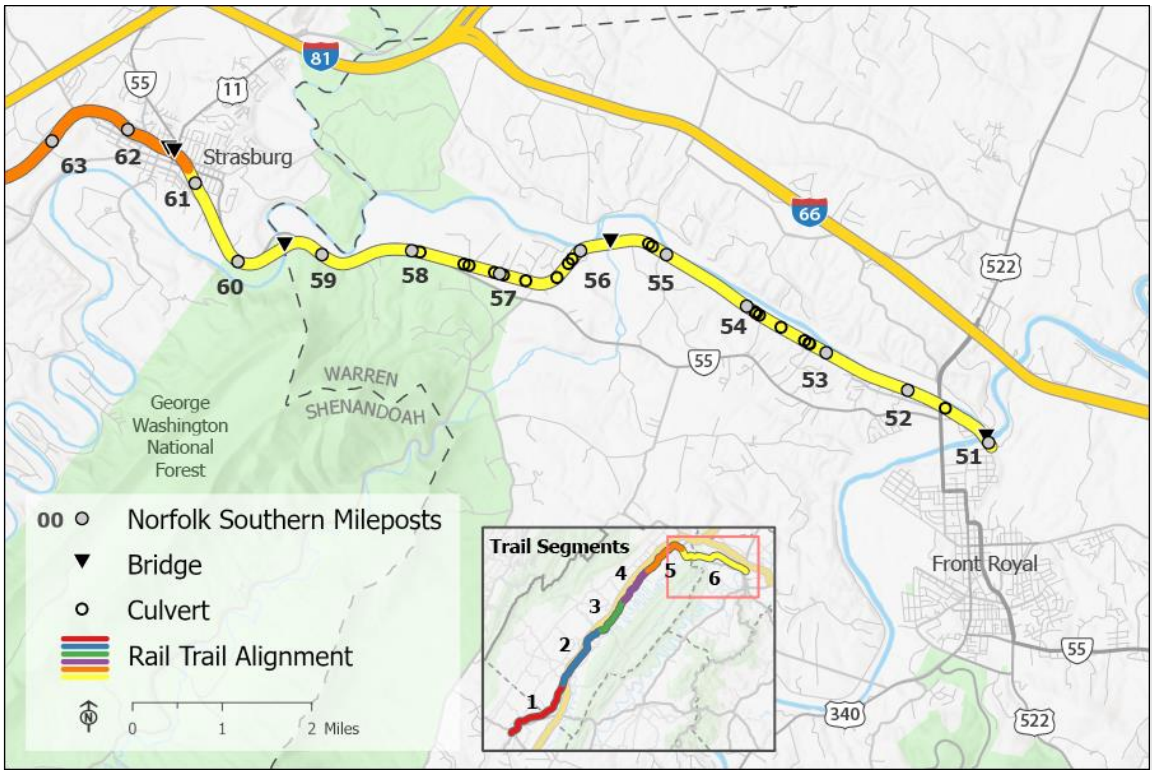
Recommended Trailhead

- Fisher's Hill: Shenandoah Valley Battlefields Foundation owns a 27-acre tract at the intersection of Valley Pike and Battlefield Road. A 1/2 –mile trail connection is needed to connect this parcel with the scenic Lyon property owned by the Foundation, which is adjacent to the proposed trail.Strasburg Museum: The museum has limited parking but there is available land near the rail alignment for a possible expansion. The downtown trailhead would complement the King Street streetscape improvements in progress. Amenities, such as a bathroom, do exist in the museum, but trail usage rates may require expansion.

Town Museum, Town of Strasburg to Town of Front Royal

Alignment Description:

Figure 30. Segment 6 Trail Alignment



This 10.0-mile segment is located in Shenandoah and Warren counties and its termini are located at the Town Museum in the Town of Strasburg and on the east side of the South Fork of the Shenandoah River in the Town of Front Royal. The alignment does sit at or near natural grade, with much of the cross-section being greater than 10 feet wide. There are areas with steep slopes where the alignment runs parallel to the North Fork of the Shenandoah River. There is no overgrowth on the rail alignment. This segment has the fewest roadway crossings, of which most are private driveways or low-volume roadways with less than 200 vehicles per day. There are also two large bridges, one located over the North Fork of the Shenandoah River near the Town of Strasburg and the

other located over the South Fork of the Shenandoah River near the termini in the Town of Front Royal. Figures 31 and 32 show representative views of the rail alignment.

Figure 22: Segment between Richardson Road and Bucks Mill Road

Figure 23: Segment between Bucks Mill Road and US 340

Points of Interest and Nearby Land-Uses:

This 10-mile section starts south of VA 55 at the Strasburg Museum. The route passes Strasburg Park on the North Fork, where the Riverwalk Trail connects to Strasburg High School. The route passes over the North Fork into

Warren County and winds between VA 55 and the southern bank of the North Fork through mostly uncultivated land to the Town of Front Royal.

Across the North Fork, the Keister tract owned by Shenandoah County, a future riverfront recreation destination, overlooks the rail corridor and serves as the southern terminus of National Park Service and partner-owned segments of Cedar Creek Battlefield. Southeast of the rail line, Signal Knob, part of the U.S. Forest Service Lee Ranger District, overlooks the rail corridor.

Figure 24. Strasburg Museum with view of Signal Knob

The line passes over Passage Creek and by North Fork Resort before entering the Riverton Historic District, passing within a quarter-mile of A.S. Rhodes Elementary School. After passing Poe's South Fork campground, the rail line crosses the South Fork of the Shenandoah into Riverton Junction and close to Front Royal's sidewalk system. Warren County Middle School, Royal Christian Academy, a community park and pool, botanical gardens, Fantasyland Playground and Warren County Lion's, Chimney Fields and Peter Lehew parks are within a mile. Three other schools, local parks and the entrance to the Skyline Drive are within three miles.

Recommended Trailhead(s)

- Town of Strasburg: Town Park could serve as an overflow parking area for the Town of Strasburg. The park entrance is located near the rail alignment at the intersection of Park Road and Queen Street. There are multiple parking lots and bathroom locations. No physical pedestrian accommodations exist from the rail alignment to the park entrance from the parking areas.

- Previous VFW Site Front Royal (Preferred): This area has a large amount of land and is at the rail alignment termini in the Town of Front Royal. This site would be able to provide a large parking area and trailhead amenities. Trail connections would need to be provided to the trail. It should be noted that the site currently remains in private hands.

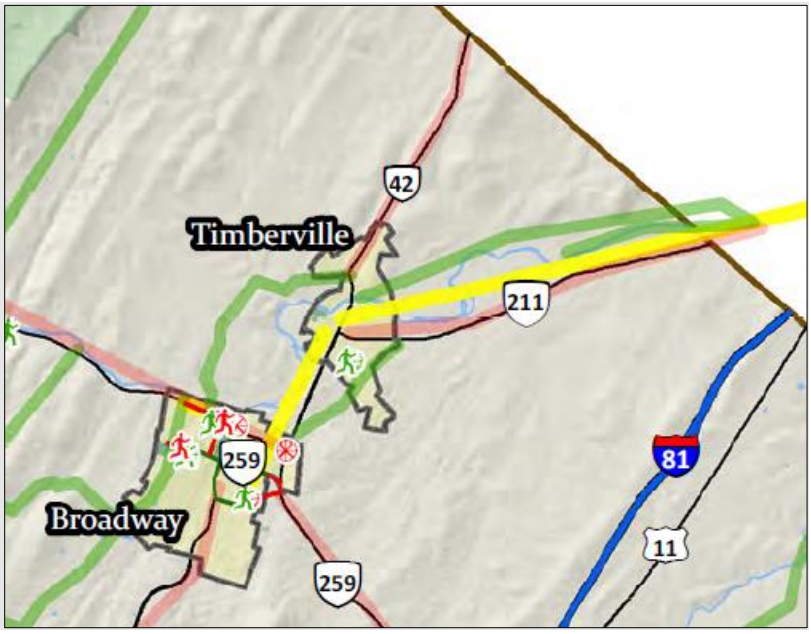
- Norfolk Southern Property between Queens Highway and Old Winchester Pike (Alternate): This property is located on the rail alignment to the southwest of Queens Highway and east of Old Winchester Pike. This is a large tract of land that would be directly adjacent to the trail. A large trailhead could be located here. However, this site is on the western side of the South Fork of the Shenandoah River, where the trail would terminate immediately to the east of the river
- VDOT Front Royal Area Headquarters (Alternate): VDOT's Front Royal Area Headquarters along Duck Street west of Riverton adjoins the rail corridor and can serve as a temporary trailhead until a larger property is secured across the South Fork. The office does sit above the rail alignment and is separated by a large ditch. Use of the land would be contingent upon agreements with VDOT to designate a portion of an unpaved parking lot for trail users and the facilitation of an access route to the trail that does not allow public entry into the secured portion of the facility.

Plan Compatibility

The concept of a rail-trail has been gaining momentum in the area since the Norfolk Southern tracks from Broadway to Strasburg were discontinued late in 2016. Although most area plans were developed prior to 2016, the general need for bike-ped network connectivity is evident in local and regional plans.

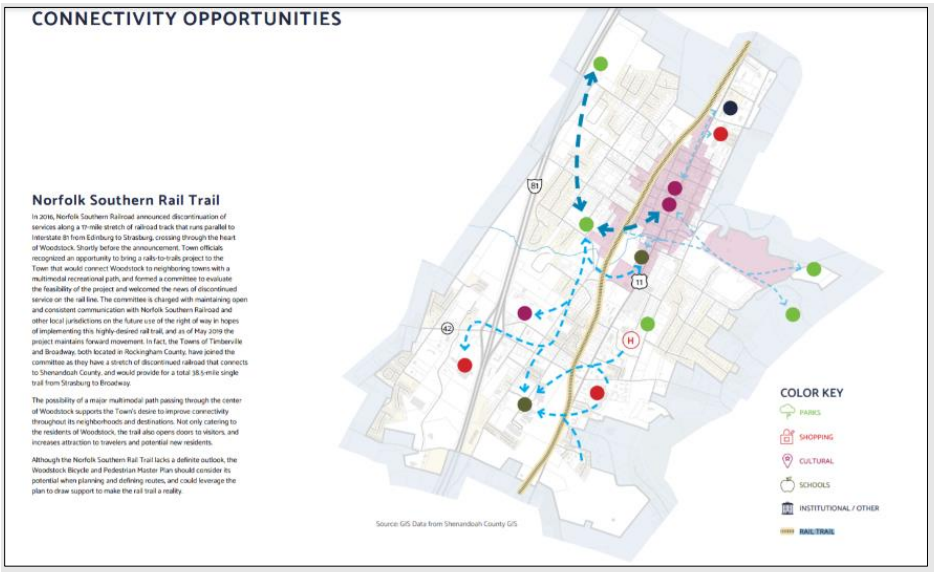
The Rockingham County Bicycle and Pedestrian Plan, adopted on October 26, 2016, includes a Wiki map of user input on desired facilities. An off-road connection following the rail corridor north of Broadway (yellow line) is a recommended improvement, as shown in Figure 34. Bike improvements along VA 42 connecting Broadway and Timberville to Harrisonburg were another need (pink line in Figure 34). VA 42 currently has bike lanes between the northern limits of Harrisonburg and the southern limits of Broadway. The plan states there is "an unmet desire for off-road facilities that provide both longer distance connections between municipalities, as well as shorter connections between local destinations, such as neighborhoods and parks."

Figure 25. Snapshot from Rockingham County Bicycle and Pedestrian Plan



The June 2019 Bicycle and Pedestrian Master Plan for Woodstock states, "Currently lacking in pedestrian and bicycle facilities, the base for a robust system exists with several attractive destinations and the potential for a regional rail trail in the works." Figure 35 shows the connectivity opportunities enabled by the Norfolk Southern Rail Trail.

Figure 26. Town of Woodstock Bicycle and Pedestrian Master Plan



The Northern Shenandoah Valley Regional Commission's 2035 Rural Long Range Transportation Plan (2011) states, "The regional plan, as well as comprehensive plans, land use plans, or bicycle plans of all the counties, endorse the concept of pedestrian and bicycle facilities." It specifically mentions "a Town to Town Project – US 11 Corridor," a recommendation from an earlier plan called Walking and Wheeling the Northern Shenandoah Valley.

The 2035 Rural Long Range Transportation Plan for the Central Shenandoah Planning District Commission, referring to recommendations from the Central Shenandoah Regional Bicycle Plan (2005), states, "Establish a regional network of on-road bicycle facilities between key destinations in the region."

As depicted on the map in Figure 36, the Town of New Market has adopted a master plan with a proposed "Town-Wide Trail" connection to and crossing of the North Fork of the Shenandoah River. The Town of New Market is interested in connecting to the rail trail if it is built, preferably by an appealing shared-use path.

Figure 27. Town of New Market Future Growth Areas

The People

The people of the Shenandoah Valley are primarily white-collar workers, with about half as many blue-collar workers and even fewer in the service sector. The largest minority group consists of the Hispanic/Latino population, many of whom serve in the agricultural sector. In Harrisonburg, Hispanics make up nearly a fifth of the population.

Demographics

Table 5. Demographic Characteristics: 2015 – 2019 ACS 5-Year Data Profile

Jurisdiction	Hispanic or Latino	White	Black	American Indian and Alaska Native	Asian	Native Hawaiian and other Pacific Islander
Harrisonburg	19.7%	66.1%	6.5%	0%	3.8%	0%
Rockingham	6.9%	88.7%	2.3%	0.3%	0.7%	0.1%
Shenandoah	7.2%	87.6%	1.8%	0.1%	0.9%	0.0%
Warren	4.6%	86.8%	4.2%	0.1%	0.0%	0.2%
Virginia	9.4%	61.8%	18.8%	0.2%	6.3%	0.1%
U.S.	18.0%	60.7%	12.3%	0.7%	5.5%	0.2%

All the jurisdictions in the study area have a higher percentage of disabled persons than the Commonwealth as a whole. In Shenandoah County, a fifth of the population is disabled. There are very few mobility options for this segment of the population.

Table 6. Mobility Characteristics: 2015 – 2019 ACS 5-Year Data Profile

Jurisdiction	Total Population	Percent with a Disability	Total with Disability	Hearing	Vision	Cognitive	Ambulatory
Harrisonburg	52,444	11.5%	6,049	1,233	791	3,135	2,293
Rockingham	81,512	14.1%	11,496	4,317	2,005	4,979	5,177
Shenandoah	43,293	20.1%	8,706	2,490	1,499	2,781	5,561
Warren	39,888	13.4%	5,361	1,153	853	1,981	2,310
Virginia	8,303,671	12.2%	1,012,352	287,640	184,978	365,141	501,211

The Valley is underserved by Internet access, particularly in Shenandoah and Rockingham counties, where nearly a quarter of the population has no Internet subscription. In Northern Virginia, the W&OD rail corridor has doubled as a utility corridor for fiber optic cables connecting data centers, with annual lease payments supporting trail maintenance.

Table 7. Social Characteristics: 2015 – 2019 ACS 5-Year Data Profile

Jurisdiction	With a computer	With a broadband Internet subscription
Harrisonburg	90.2%	78.0%
Rockingham	85.3%	76.3%
Shenandoah	84.0%	74.4%
Warren	90.4%	83.2%
Virginia	91.1%	83.9%
U.S.	90.0%	82.7%

Commute Profile

In Warren County, a large part of the workforce is commuting over 60 minutes to work, indicating that this county has become a bedroom community of metropolitan areas to the east. In Shenandoah and Rockingham counties, the majority of commutes are less than 35 minutes. The following Table indicates there is room for growth in self-powered commuting in all three counties, where nearly four-fifths of the population drive alone to work. The City of Harrisonburg, where there is more bike and pedestrian infrastructure, leads the way in getting people out of their cars.

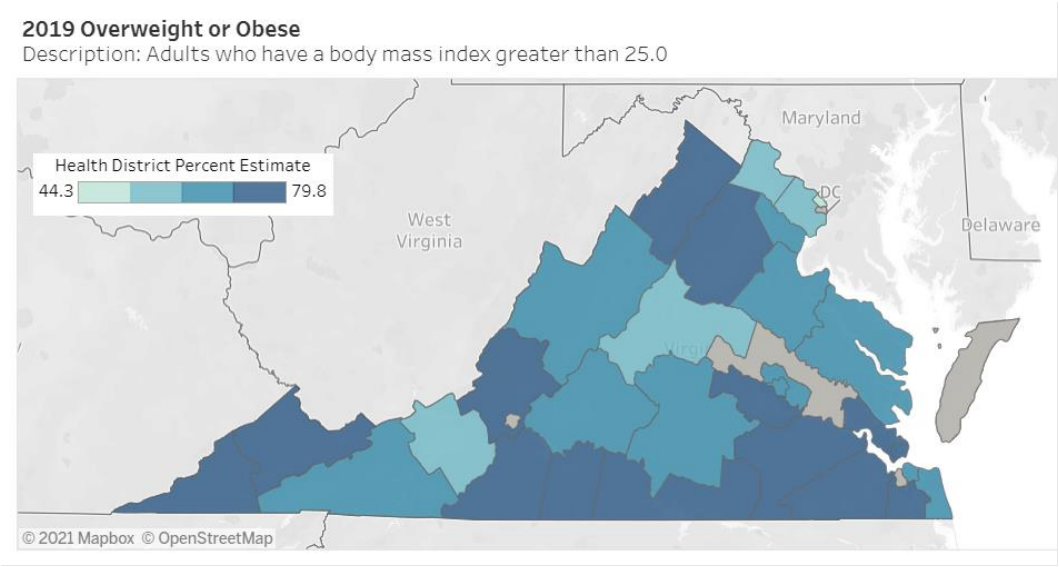
Table 8. Commuting Characteristics: 2015 – 2019 ACS 5-Year Data Profile

Jurisdiction	Drove alone	Carpooled	Used Public Transportation	Walked to work	Bicycle to Work	Worked from home
Harrisonburg	68.3%	14.2%	2.0%	7.9%	1.8%	4.3%
Rockingham	81.3%	8.7%	0.4%	4.9%	0.0%	3.1%
Shenandoah	82.3%	10.9%	0.2%	1.4%	0.5%	4.7%
Warren	75.1%	14.9%	0.2%	2.1%	0.0%	6.9%
Virginia	77.0%	9.2%	4.4%	2.4%	0.4%	5.3%
U.S.	76.3%	9.0%	5.0%	2.7%	0.5%	5.2%

Vulnerable Populations

Virginia's Health Opportunity Index displays the Behavioral Risk Factor Surveillance System's (BRFSS) chronic disease prevalence indicators for health districts in Virginia. The Lord Fairfax Health District, which includes the study area, exceeds Virginia's average for overweight, obesity, hypertension, and high cholesterol.

Figure 28. Virginia's Health Opportunity Index Overweight or Obese Map

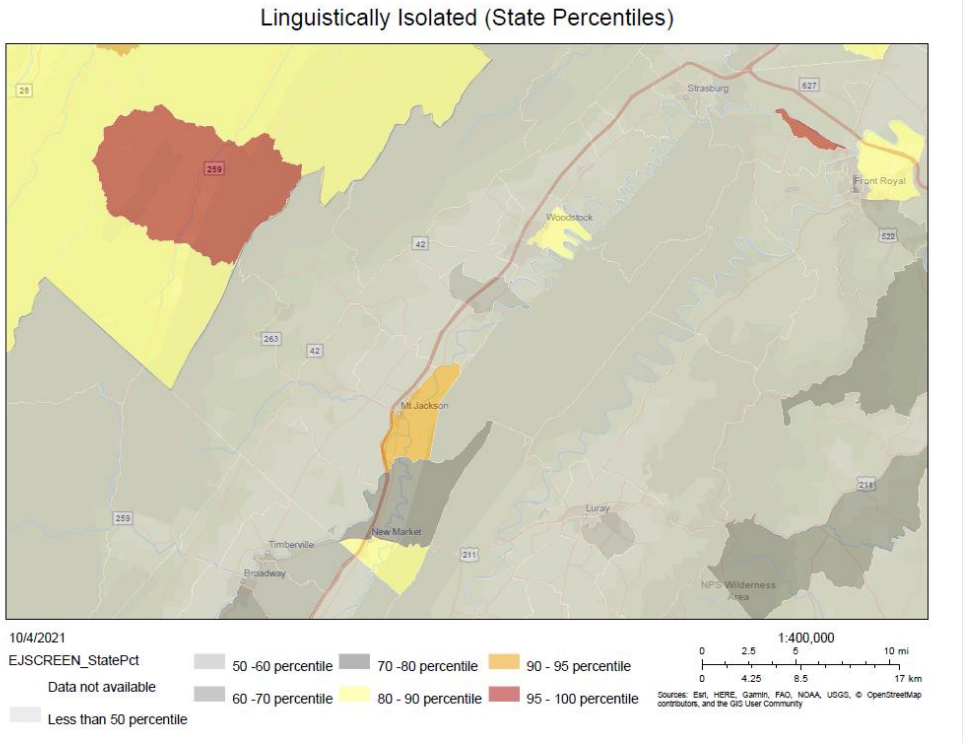


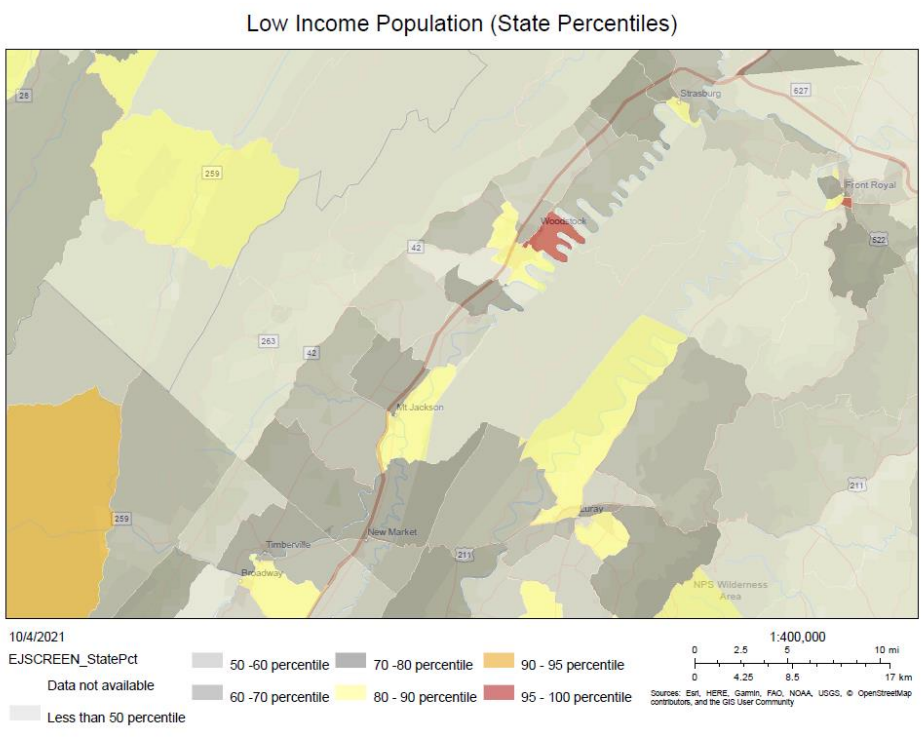
According to the Health Resources and Services Administration (HRSA) Map Tool available online at https://data.hrsa.gov/maps/map-tool/, Shenandoah County is a medically underserved area and a rural health

area. The areas around Mount Jackson (51171040700) and Front Royal (51187020601) are both qualified opportunity zones.

According to EPA's Environmental Justice Screening Tool, there are communities along the corridor with more low-income residents compared to other communities in the state. There are also linguistically isolated households, where no one older than 14 speaks English very well. See maps shown in Figure 38. Percentiles put indicators into common units. For example, a place at the 80th percentile means only 20 percent of the state population has a higher value.

Figure 29. Environmental Justice Screening Tool Study Area





Partner Capacity and Support

Potential Partners

The Shenandoah Valley has well-established organizations willing to make the rail trail a reality. In addition to three counties, nine towns, two planning districts, and the Harrisonburg-Rockingham and Shenandoah County Chambers of Commerce, the following organizations have provided letters of support for the project.

Shenandoah Rail Trail Exploratory Partnership

This partnership was formed in 2016 to develop the vision of transforming the railroad corridor into a multi-use trail re-connecting communities, businesses, schools, and many local, cultural, and historic resources. It is a multi-jurisdictional coalition of public, private, and non-profit organizations. Partners have developed bylaws and pitched in for an economic impact study in 2019.

The Governing Council is made up of the following 17 members who have provided resolutions of support for the project, except for the Shenandoah Valley Battlefield Foundation.

- Northern Shenandoah Valley Regional Commission
- Central Shenandoah Planning District Commission
- Strasburg
- Toms Brook
- Woodstock
- Edinburg
- Mount Jackson

- New Market
- Timberville
- Broadway
- Rockingham County
- Shenandoah County
- Alliance for the Shenandoah Valley
- Friends of the North Fork of the Shenandoah River
- Shenandoah Valley Bicycle Coalition
- Warren County
- Front Royal

Alliance for the Shenandoah Valley

Alliance for the Shenandoah Valley works to ensure the Valley's rural character, scenic beauty, clean water, and vibrant communities are protected by providing accurate and timely information to community members and decision-makers. Formed in 2018 from an organizational merger of five long-standing local conservation groups, the Alliance serves communities in six Valley counties (Augusta, Frederick, Page, Rockingham, Shenandoah, and Warren) and the towns and independent cities within. The Alliance is led by a volunteer 10-member Board of Directors and employs eight professional staff members.

Shenandoah Valley Bicycle Coalition

The Shenandoah Valley Bicycle Coalition was formed with the merger of the Shenandoah Valley Bicycle Club (1982) and the Shenandoah Mountain Bike Club (1996). They work to build better communities in the Valley, using the bicycle as the catalyst for change. With 11 board members and a paid executive director, the Coalition nurtures an active and organized cycling community that represents all types and levels of cyclists. The Coalition was formed so that the Central Shenandoah Valley would become known as a center of safe, sustainable, and enjoyable cycling on roads, trails, and streets. They enhance and support safe routes to school initiatives, involve youth at every level, and have dedicated programming for under-represented groups and new riders.

Winchester Wheelmen

The Winchester Wheelmen Bicycle Club was founded in 1973 and is a non-profit, volunteer-led organization that promotes bicycling by leading rides, conducting cycling classes and cycling outreach activities. They advocate for all cyclists, mountain bike riders, road bike riders and families, and secure club insurance through the League of American Bicyclists. They have been involved in numerous cycling projects over the years, including trail work, working with the local Boys and Girls Club, providing kids with bikes, and putting on organized rides utilizing roads and paths in the area.

Friends of the North Fork of the Shenandoah River

Founded in 1988, the Friends of the North Fork of the Shenandoah River's mission is to keep the river clean, healthy, and beautiful through advocacy, community action, education, and science. They serve as the community support organization for Seven Bends State Park and assist other public lands sites with programs and projects throughout the watershed. With ten board members and five paid staff, Friends works with a host of volunteers to meet mission goals.

Shenandoah Valley Runners Club

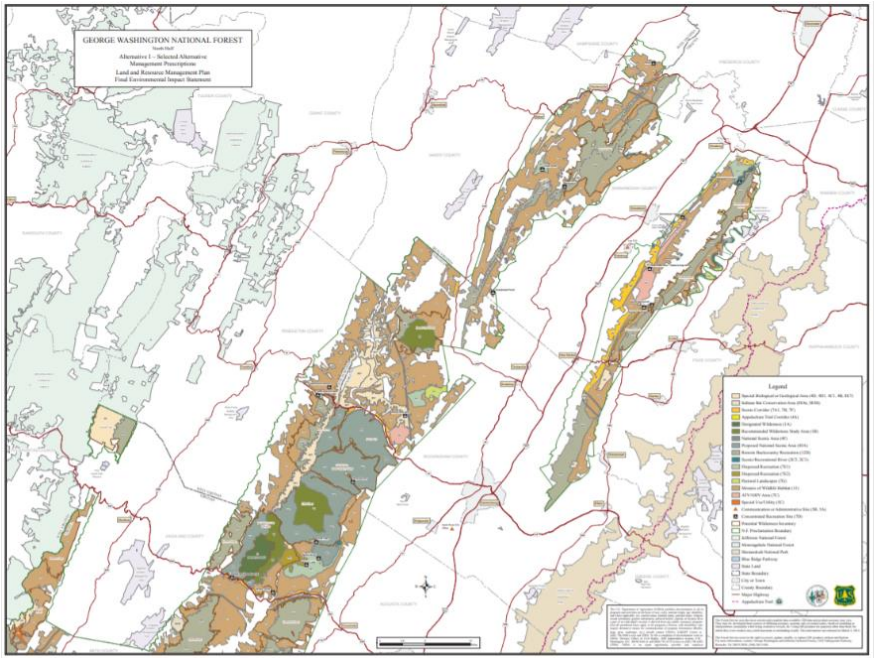
The Shenandoah Valley Runners (SVR) Club's mission is to promote and encourage running, regardless of age, gender, or physical condition. To accomplish its mission, SVR holds races and social runs, awards scholarships, sponsors speakers and coordinates with other agencies in the community advocating running and walking. SVR sponsors about 30 races a year, helping to bring outstanding community running events to Frederick, Warren, Clarke, and Shenandoah Counties and even a few in West Virginia. Although the primary club base is in Winchester, Virginia, club membership and activities cover the greater northern Shenandoah Valley. They are members of the Road Runners Club of America (RRCA). In 2020, the club had 578 families with 1047 total members.

Federal Partners

George Washington and Jefferson National Forest

The George Washington and Jefferson National Forest ownership totals over 1 million acres, with approximately 960,000 acres in Virginia and 106,000 acres in West Virginia. Of the gross 1.8 million acres within the Forest's proclamation boundaries, approximately 59% is National Forest System land. The Forest is divided into five ranger districts located in thirteen counties in Virginia and four counties in West Virginia. It contains the headwaters of the Potomac and James Rivers and contributes to the drinking water supplies of at least 30 communities, including Washington, DC, and Richmond, and provides an important component for biological diversity in the landscape of the eastern U.S. It provides scenic backdrops to the Shenandoah Valley and the railroad corridor, along with access to outstanding scenic vistas like Signal Knob.

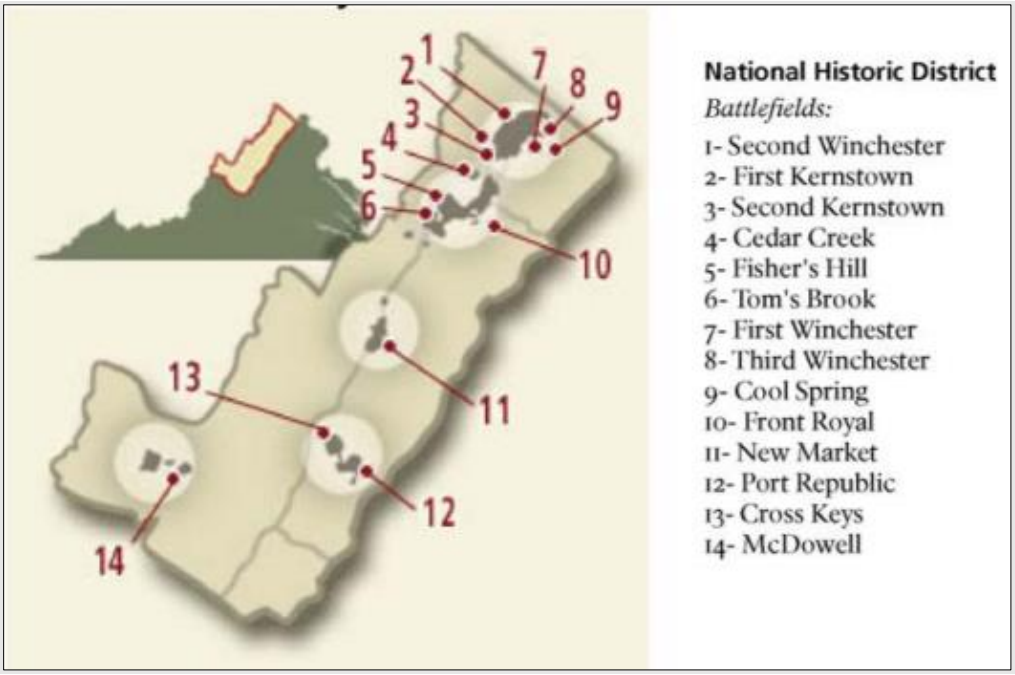
Figure 30. George Washington National Forest



Shenandoah Valley Battlefields National Historic District

The 1996 Shenandoah Valley Battlefields National Historic District and Commission Act (P.L. 104-333) established both the District and the Shenandoah Valley Battlefields National Historic District Commission. The district is comprised of Augusta, Clarke, Frederick, Highland, Page, Rockingham, Shenandoah, and Warren counties, and the independent cities of Harrisonburg, Staunton, Winchester, and Waynesboro, as well as ten battlefields and several historically important transportation routes. The purpose of the District and the Commission is to preserve, conserve, and interpret the Valley's Civil War legacy—the places, the events, and the people (soldier and civilian) before, during, and after the War. The Commission was charged with creating partnerships among federal, state, regional, and local governments and the private sector to develop a plan to manage and administer the district. The 19-member Commission represents landowners, local governments, preservation and history experts, and designees of the governor of Virginia and the director of the National Park Service (NPS). The Shenandoah Valley Battlefields Foundation oversees the district as the lead managing partner.

Figure 40. Shenandoah Valley Battlefield National Historic District

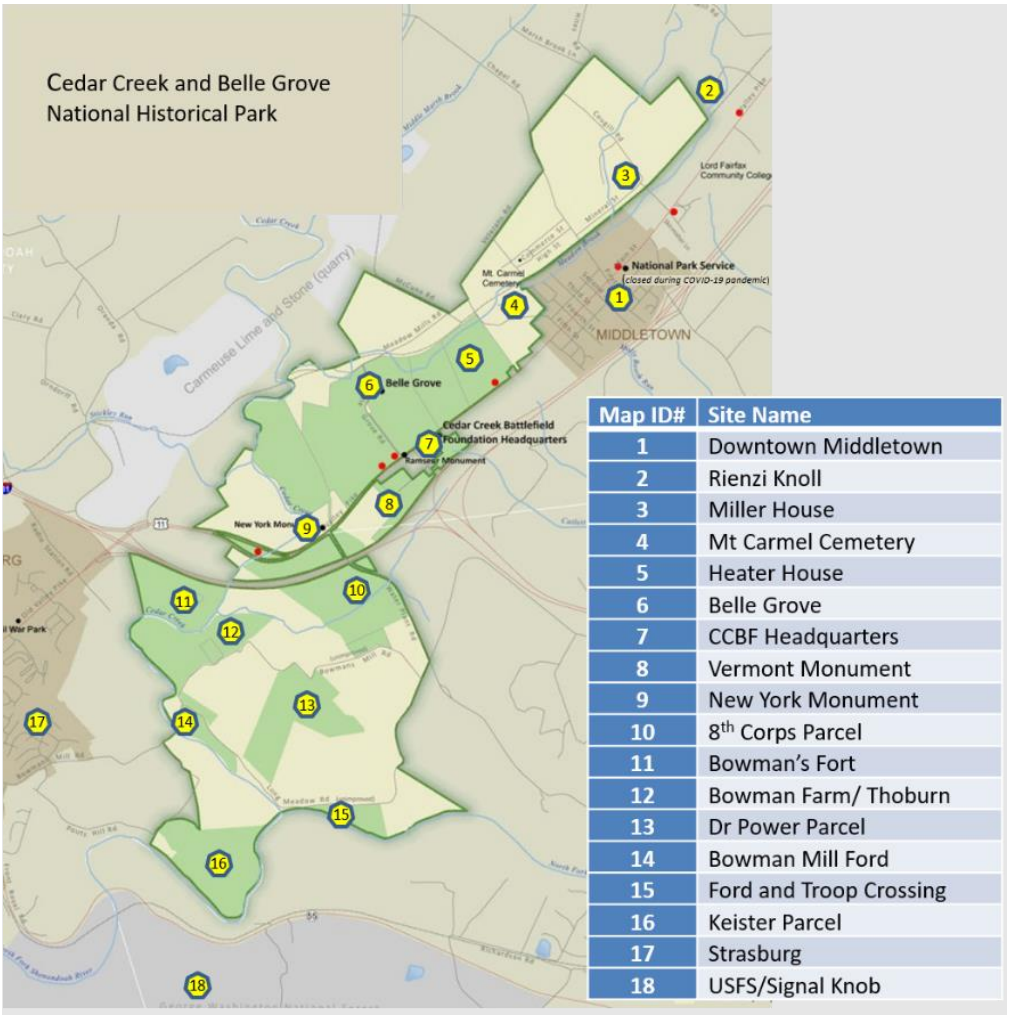


The management plan identifies clusters where preservation and protection efforts will be prioritized, two of which fall in close proximity to the railroad corridor, New Market and Cedar Creek, including Toms Brook and Fisher's Hill battlefields.

Cedar Creek and Belle Grove National Historical Park

On December 19, 2002, Congress enacted Public Law 107-373, the legislation that created Cedar Creek and Belle Grove National Historical Park. The park is located in Frederick, Shenandoah, and Warren Counties, Virginia, and operates as a "partnership" unit of the national park system. The National Park Service (NPS) and its partners manage the park to conserve its scenery, natural and historic resources, and wildlife, and to provide for its enjoyment in a manner that will leave the park unimpaired for the enjoyment of future generations. The park's Community Partners at Cedar Creek and Belle Grove NHP include the adjacent historic towns of Middletown and Strasburg as well as Frederick, Shenandoah, and Warren counties. The park's Key Partners – who collectively own or hold easements on 1,339 acres within the park – include Belle Grove, Incorporated, Cedar Creek Battlefield Foundation, National Trust for Historic Preservation, Shenandoah County, and the Shenandoah Valley Battlefields Foundation. The park's enabling legislation established a 15-member park advisory commission to be composed of representatives from the surrounding local towns and counties, the key partner organizations, private landowners and civic organizations, the Commonwealth of Virginia, the National Park Service, and the U.S. Forest Service.

Figure 31. Cedar Creek and Belle Grove National Historic Park

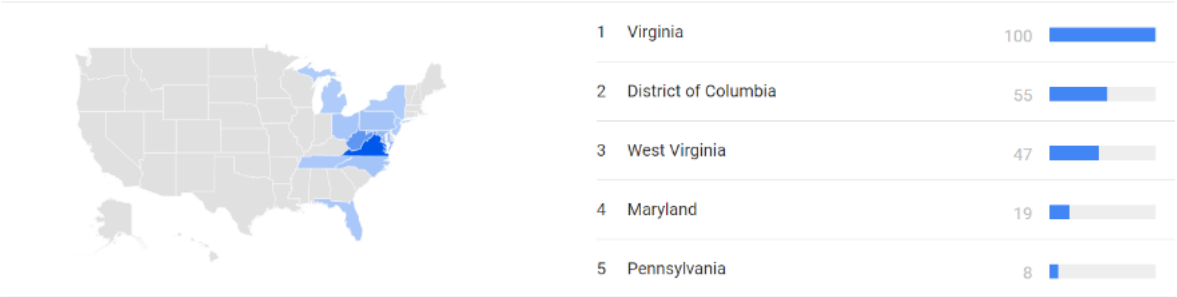


Map ID#	Site Name
1	Downtown Middletown
2	Rienzi Knoll
3	Miller House
4	Mt Carmel Cemetery
5	Heater House
6	Belle Grove
7	CCBF Headquarters
8	Vermont Monument
9	New York Monument
10	8th Corps Parcel
11	Bowman's Fort
12	Bowman Farm/ Thoburn
13	Dr Power Parcel
14	Bowman Mill Ford
15	Ford and Troop Crossing
16	Keister Parcel
17	Strasburg
18	USFS/Signal Knob

The Market

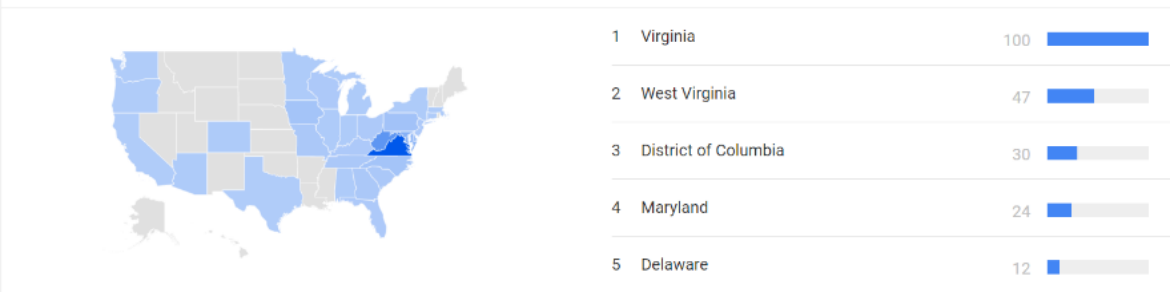
A high-level market analysis was performed using Google Trends and keyword "Virginia Trails." The trend analysis, as visualized in Figure 42, shows that most search results outside of Virginia are from Washington, DC, and West Virginia, with the potential for drawing in travelers from across the East Coast.

Figure 32. Google Trends Analysis – "Virginia Trails"



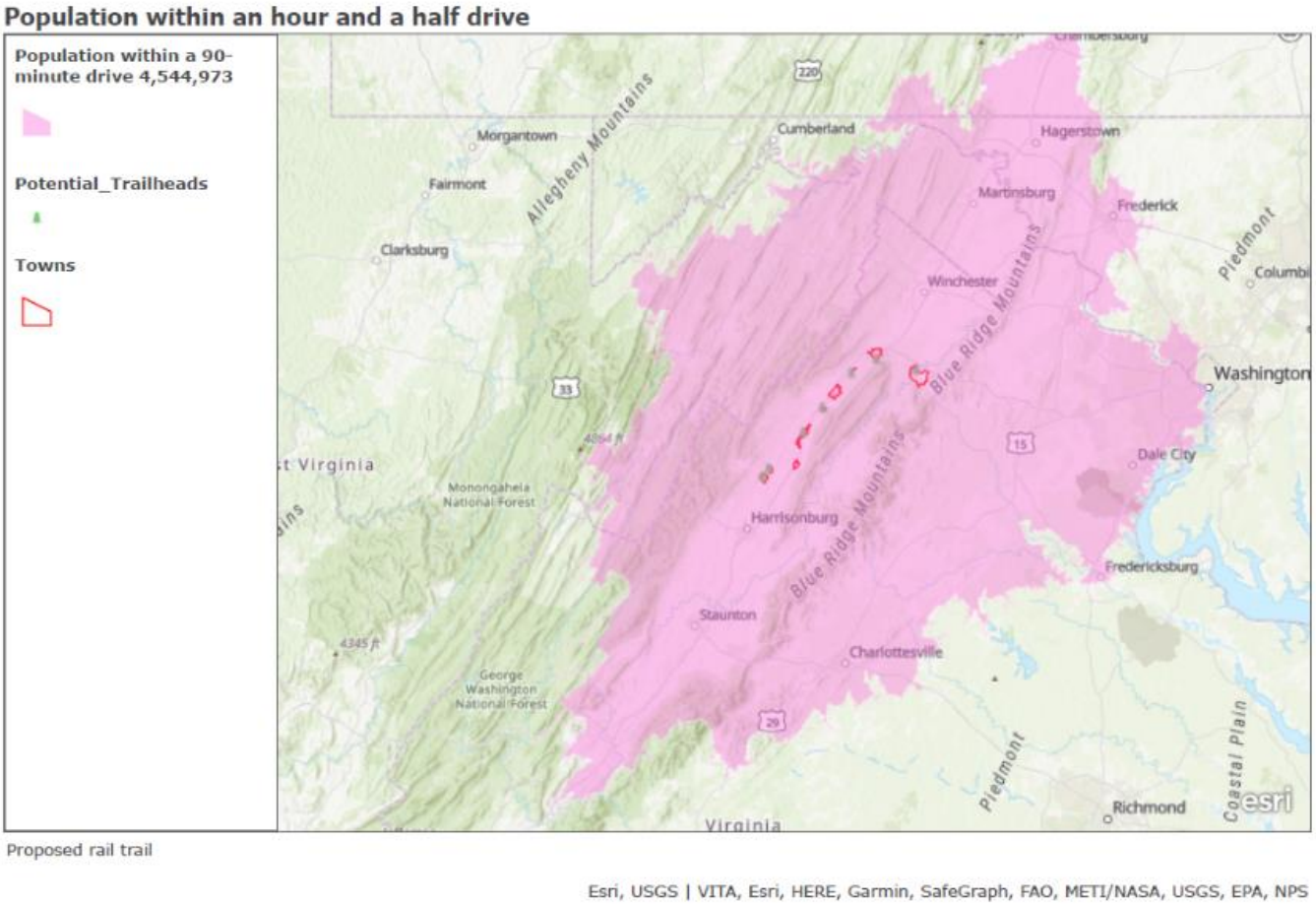
A Google Trends analysis with the keyword "Shenandoah Valley" reveals a much broader potential market, stretching nationwide shown in Figure 43, although interest from Washington, DC and West Virginia still lead the country.

Figure 33. Google Trends Analysis – "Shenandoah Valley"



A drive-time analysis by the National Park Service found there are 23.5 million people within a four-hour drive of Shenandoah National Park. Utilizing ArcGIS online analytics, there are over 4.5 million people within a 90-minute drive of the proposed trail corridor, as visualized in Figure 44.

Figure 34. Drive-time Analysis along Proposed Trail Corridor



Visitation at existing state and national parks

Located on the North Fork in Shenandoah County, Seven Bends State Park quietly opened to visitors in late 2019 and officially opened in the spring of 2020. There are no campgrounds, but you will find more than eight miles of hiking trails at this 1,066-acre day-use park. With four miles of shoreline, this park attracted 77,850 visitors in 2020.

Located on the South Fork in Page County, Andy Guest Shenandoah River State Park has more than 1,600 acres along 5.2 miles of shoreline. The park opened in June 1999 and offers campgrounds, cabins, picnicking, and 24 miles of trails in addition to water-based activities. There were 184,937 visitors in 2020, with 70 percent there for day use.

Shenandoah National Park had 1.7 million visitors in 2020. With over 200,000 acres of protected land and 500 miles of trails, the Park is a destination for hikers and those seeking scenic drives.

With the spread-out nature of sites along Cedar Creek and Belle Grove National Historical Park, visitation is hard to track. Staff estimate 50-70,000 visitors per year based on counts taken at four sites.

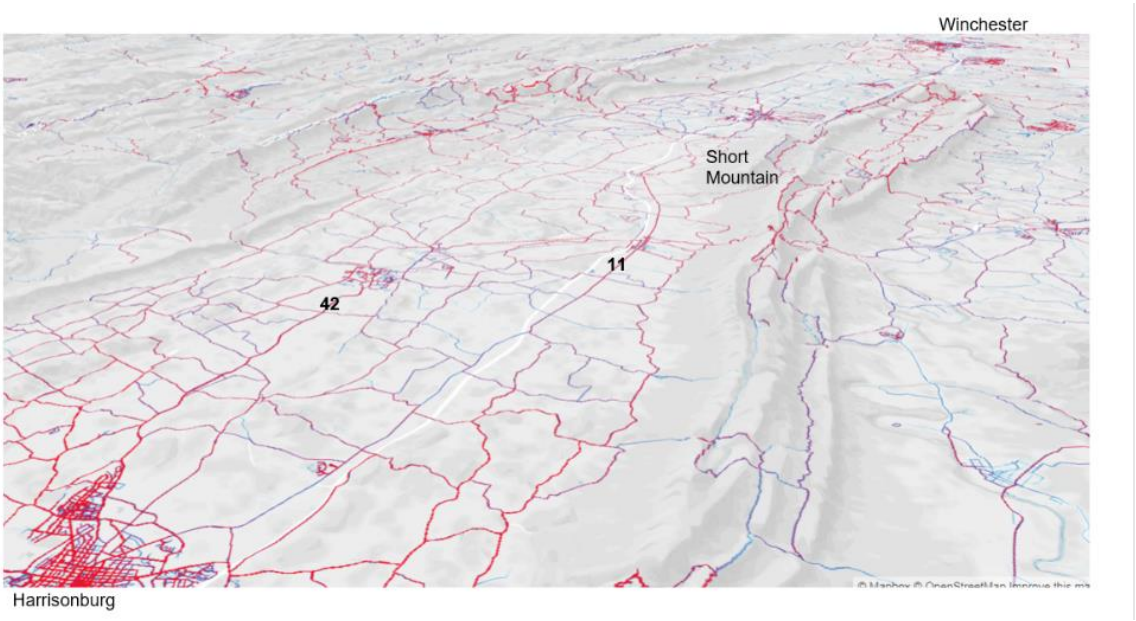
RECREATIONAL ASSESSMENT

According to the Rails-to-Trails Conservancy, there are 425 miles of rail-trail in Virginia. Nationwide, there are 24,598 miles. In Northern and Central Shenandoah Valley, there are only 7 miles of rail-trail, the Chessie Trail in Rockbridge County. With only about 14 miles of other shared-use paths throughout both regions, there is a shortage of shared-use path opportunities serving people in the Shenandoah Valley.

Strava data from 2020 in Shenandoah County documents a 111 percent increase in walk/run/jog trips and a 49 percent increase in bicycle trips over 2019. This could reflect a COVID-19 pandemic effect with more people seeking exercise and stress relief outdoors with built-in ventilation and social distancing. It also may reflect more people visiting due to the opening of Seven Bends State Park in 2020 and/or the temporary closing of Shenandoah National Park due to the pandemic. Usage peaks in May and October, but is sustained in the warm weather months in between.

Strava heat maps clearly show the latent demand for bike/ped infrastructure, with most heavily used areas in red and less frequently used areas in blue reflecting where sidewalks, bike lanes, low volume roadways, trails and other lower-stress infrastructure is currently being used by more athletic, skilled users.

Figure 35. Strava App Heat Map Reflecting Recreational Activity in the Valley



The Valley does offer a broad range of outdoor recreational opportunities from hang gliding to spelunking. Figure 46, showing an outdoor recreation guide to Shenandoah County, gives a sense of the opportunities that already attract visitors to the area.

Other Recreational Resources

Within the Shenandoah Valley region there are several existing and proposed private campgrounds. Other local businesses and public facilities provide complementary services. Private businesses range from bed and breakfasts, riding stables, museums, air rides, water liveries, caverns, golf courses, and much more. These businesses are involved in attracting tourists to the region.

The U.S. Forest Service has expansive lands that provide many outdoor recreational opportunities, including camping, hiking, horse riding and riding all-terrain vehicles. Nearby battlefields provide additional opportunities for connections to history and open space.

Figure 36. Shenandoah County Outdoor Points of Interest Guide

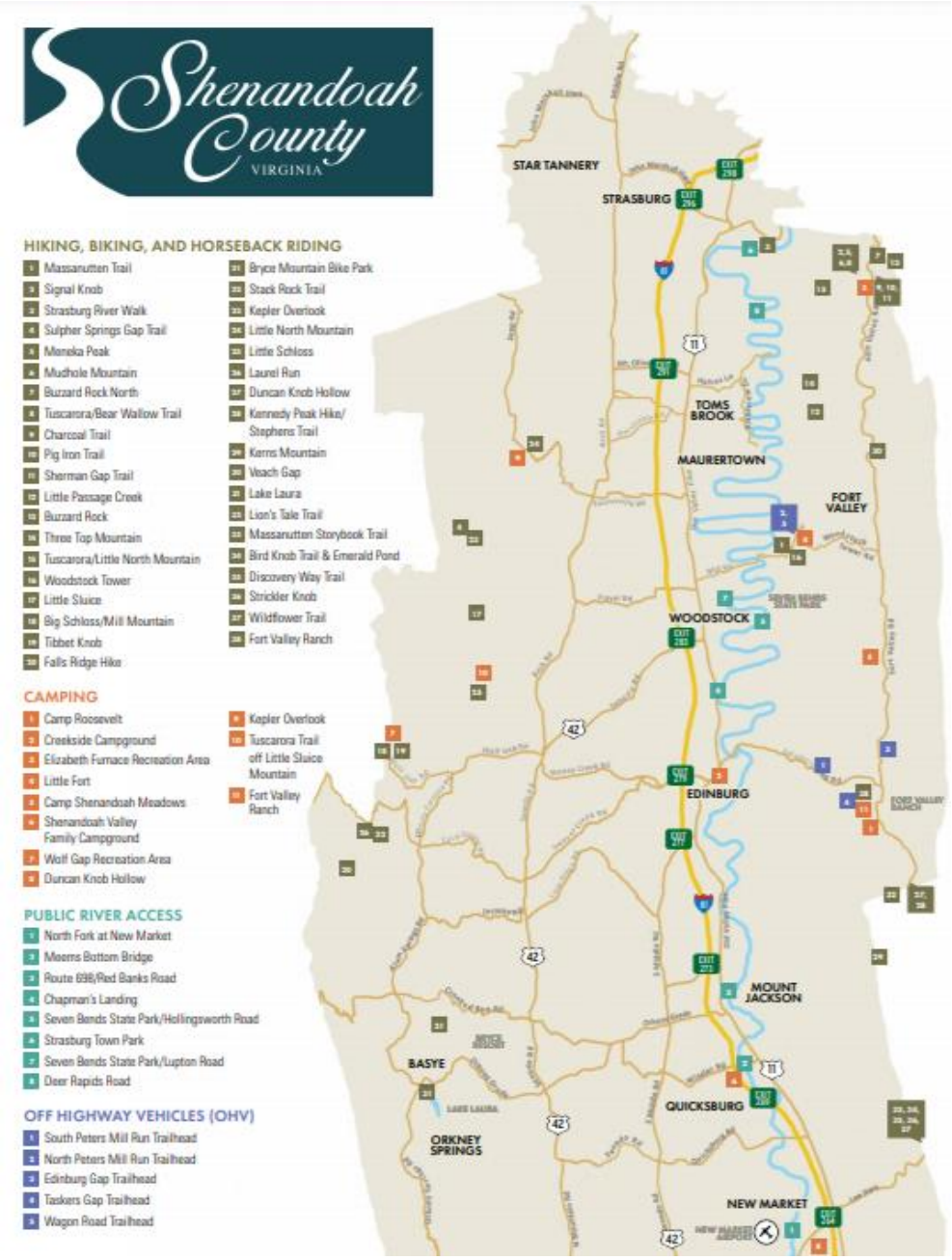


Figure 47 summarizes the Department of Wildlife Resources boat access points along the North Fork of the Shenandoah River.

Figure 37. DWR Boat Access Points

County/City	Waterbody	Access Area	Barrier Free	Type	Ramps	Coordinates	Map
Warren	N. Fork Shenandoah River	Catletts Ford Landing	No	Shoreline Access	0	38.9784, -78.2587	Map
Directions: From Front Royal,N on Rt522(.9);LonRt637 Guard Hill Rd(4.3);L onRt626,Catlett's Ford Rd							
Shenandoah	N. Fork Shenandoah River	Chapman's	No	Concrete Ramp	1	38.8454, -78.5296	Map
Directions: From Edinburgh, Rt 11 North (3.2); R on Rt 672 (2.2)							
Shenandoah	N. Fork Shenandoah River	Deer Rapids	No	Shoreline Access	0	38.9545, -78.3752	Map
Directions: Route 11 South from Strasburg to Fishers Hill; Turn left on S.R. 601 Funk Rd; Travel 2.5 miles; turn left on S.R. 744; Travel to bridge crossing.							
Shenandoah	N. Fork Shenandoah River	Meems Bottom	No	Shoreline Access	0	38.7066, -78.6508	Map
Directions: From New Market (4.5) North; Rt 730 East (3.2)							
Warren	N. Fork Shenandoah River	Riverton	No	Concrete Ramp	1	38.9496, -78.1980	Map
Directions: From Front Royal, North on Rt. 340/522 (1/4 mile), Right on Rt. 637 (250 yds), Landing on Right							
Shenandoah	N. Fork Shenandoah River	Strasburg Landing	Yes	Concrete Ramp	1	38.9732, -78.3512	Map
Directions: From Strasburg, W on Rt 55, R on Industrial Road (SSR 1201) to the Park							

The primary navigational hazards on the North Fork are six dams and several low-water bridges. The first dam is upstream of Timberville; three dams are located between Edinburg and the Route 758 Bridge east of Woodstock; and two small dams are found between Strasburg and Riverton.

A series of local parks along the corridor provide parking, visitor services and a range of outdoor recreation opportunities.

- Heritage Park in Broadway provides a place for family fun, and recreation. A small shelter can accommodate 64 people.
- Plains District Memorial Park in Timberville has river frontage, playground equipment and pavilions. There are also baseball fields and a dog park.
- The Mount Jackson Town Park and Pool is located a few blocks from the trail but offers a Kid's Cove playground, basketball courts, a walking loop, baseball fields and the Town's pool.
- The Edinburg Town Park and Pool located a few blocks from the trail offers a playground, basketball and pickleball courts, a walking loop, picnic shelters and the Town's pool.
- W.O. Riley Park in Woodstock offers shelters, trails, tennis courts, a playground, soccer field, basketball court, batting cage, pool, event space, an arboretum and nature sanctuary.

- Shenandoah County Park between Maurertown and Toms Brook provides picnicking, volleyball, tennis, trails, playground, disc golf, and ballfields. It is separated from the railroad by US 11.
- Strasburg Town Park has a large playground, tennis courts, basketball courts, baseball, softball, and soccer fields, a swimming pool, and several picnic and pavilion areas, as well as access to the Riverwalk and the Shenandoah River.

LOCAL DEMAND FOR OUTDOOR RECREATION

Demand for outdoor recreation is identified in the DCR's *2018 Virginia Outdoors Plan* (VOP) based on the Virginia Outdoors Survey (VOS). The 2017 VOS Survey results, summarized in Table 9, indicate that natural areas, trails and parks are the three most needed recreation opportunities in the region and the state.

Table 9. 2017 VOS Survey Results

Most Needed Recreation Opportunity	Central Shenandoah Valley	Northern Shenandoah Valley	Average for Shenandoah Valley	Statewide
Natural Areas	65%	61%	63%	53.8%
Trails	38%	47%	43%	43.3%
Parks	38%	43%	41%	49.2%
Historic Areas	47%	31%	39%	38.8%
Water Access	35%	34%	35%	42.9%
Scenic drives	32%	29%	31%	28.6%
Playing fields	11%	13%	12%	22.2%

Potential Uses for the Trail

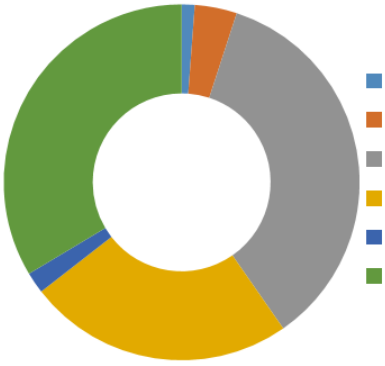
Feedback from the listening sessions and elected officials indicated the primary trail users would be bicyclists, walkers, joggers, and equestrians. MetroQuest survey results were consistent, with walking, biking, and running ranking as the most desired activities. Figure 48 summarizes the MetroQuest user interest survey.

Other potential uses include a range of micromobility options from electric skateboards to electric scooters. Uses with a wider profile, like wagons and buggies, could be programmed through special event permits and fundraisers.

Figure 38. MetroQuest – User Interests

- **94%** of respondents would use this path if built *(strongly agree or agree)*
  - 75% 'strongly agree'
- **96%** reported being interested in the project *(strongly agree or agree)*
  - 85% 'very interested'
- **86%** of respondents have used other trails in Virginia

If built, how would you use this trail?



Desired Activity	% of Responses
Walking	38%
Biking	36%
Running	14%
Horseback Riding	3%
Scooter	2%
Rollerblading	3%
Other	2%
None	1%

Daily Uses

- Commuters
- Walking
- Wheelchairs/Strollers
- Hiking/Backpacking
- Jogging
- Bicycling (and e-bikes)
- Scooters (and e-scooters)
- Horse-back riding
- Bird watching
- Nature study/research
- Outdoor classrooms

Special Event Uses

- Carriage rides
- Hay rides
- Races
- Fundraisers

- Historical reenactments
- History tours
- Scavenger hunts
- Group fitness on the trail

Trail Connectivity

The proximity of the rail trail to neighborhoods in the Shenandoah Valley depends on the strength of a network of connections that feed trail users on to the trunkline trail or add value to the trail experience. Ideal trail network connections are safe, comfortable, direct, cohesive, attractive, and unbroken. During listening sessions, the following desired network connections were identified:

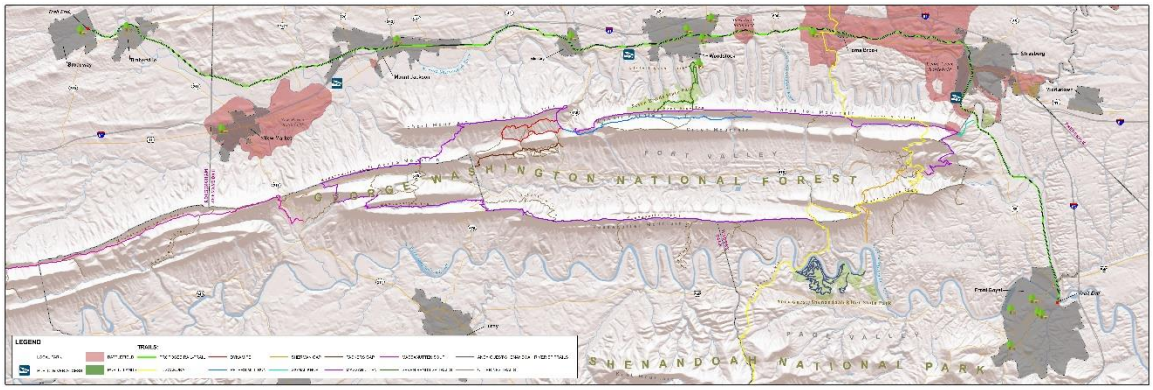
- The Town of Strasburg budgeted $4 million in 2021 for multi-modal trail and sidewalk improvements throughout the town and connecting to the rail trail.
- The Tuscarora Trail, a 252-mile spur of the Appalachian Trail, crosses the railroad corridor in Toms Brook. Formerly called the Big Blue, this trail crosses Powell Mountain just north of Shenandoah County Park and connects to the Great Eastern Trail in the Great North Mountain range.
- The Town of Woodstock developed a comprehensive, 12.4-mile Bicycle-Pedestrian trail plan linking the town, crossing the proposed rail trail several times, and connecting to Seven Bends State Park on the eastern edge of Woodstock.
- In Edinburg, the new Forest Service Civilian Conservation Corps Museum will front the rail trail.
- Mount Jackson's Town Hall and library sit on the rail corridor. Additionally, the town is planning several improvement projects for sidewalks parallel to the rail trail throughout the town.
- The Town of New Market has adopted a master plan connecting downtown to the nearby battlefield and adjacent rail corridor.
- The Town of Timberville has developed a town park adjacent to one of the bridges along the rail trail.
- At the southern end of the rail-trail, Broadway recently completed Heritage Park on the west side of the rail with an adjacent in-town greenway, plenty of parking and multiple conveniences
- Shenandoah Valley Battlefields Foundation is developing a new trail network connecting battlefields in northern Shenandoah County, several of which are adjacent to the rail-trail.
- Shenandoah County plans to develop a 151-acre park adjacent to the proposed rail trail along the North Fork of the Shenandoah River.
- The Town of Front Royal has an internal sidewalk and trail system that connects to the Appalachian Trail and Shenandoah National Park. The Appalachian National Scenic Trail goes from Maine to Florida.

Connectivity Map

The Northern Shenandoah Valley Regional Commission developed a connectivity map, shown in Figure 49, highlighting important trail connections to the rail corridor. In addition to connecting into the sidewalk systems of the towns, the Tuscarora Trail connects to the rail corridor in Toms Brook. The Tuscarora connects both sections of the Lee Ranger

District that surround the Valley. It is a spur of the Appalachian National Scenic Trail, and it connects to the Great Eastern Trail. Another potential connection to the national forest is through Seven Bends State Park.

Figure 39. Northern Shenandoah Valley Regional Commission Connectivity Map



Note: The large map is available in Appendix B:

Connection to the River

River users expressed a desire for a linkage between the proposed trail and the North Fork of the Shenandoah by providing connecting side trails to access points. This would enable a single user to shuttle between put-in and take-out points with a bicycle instead of requiring cars parked at both ends. Future planning for the trail could be linked with the river into one system plan similar to New River Trail State Park's water and land trail opportunities.

> *The creation of side trails to river access areas would also give hikers and bike riders more points of interest for focused recreational activities. These activities might include bird and other wildlife watching, fishing, wading, scenic enjoyment, relaxing, class field trips, stream ecological study, etc. The essential factor to recognize is that access to the North Fork at multiple points of access from the proposed rail trail would greatly enhance the experience of those using the trail, as well as providing a valuable service to making this reach of the North Fork more a part of the public's understanding and experience of the heritage that this iconic natural feature of the Central Valley of Virginia provides*. (Lowell Smith, Potomac Appalachian Trail Club)

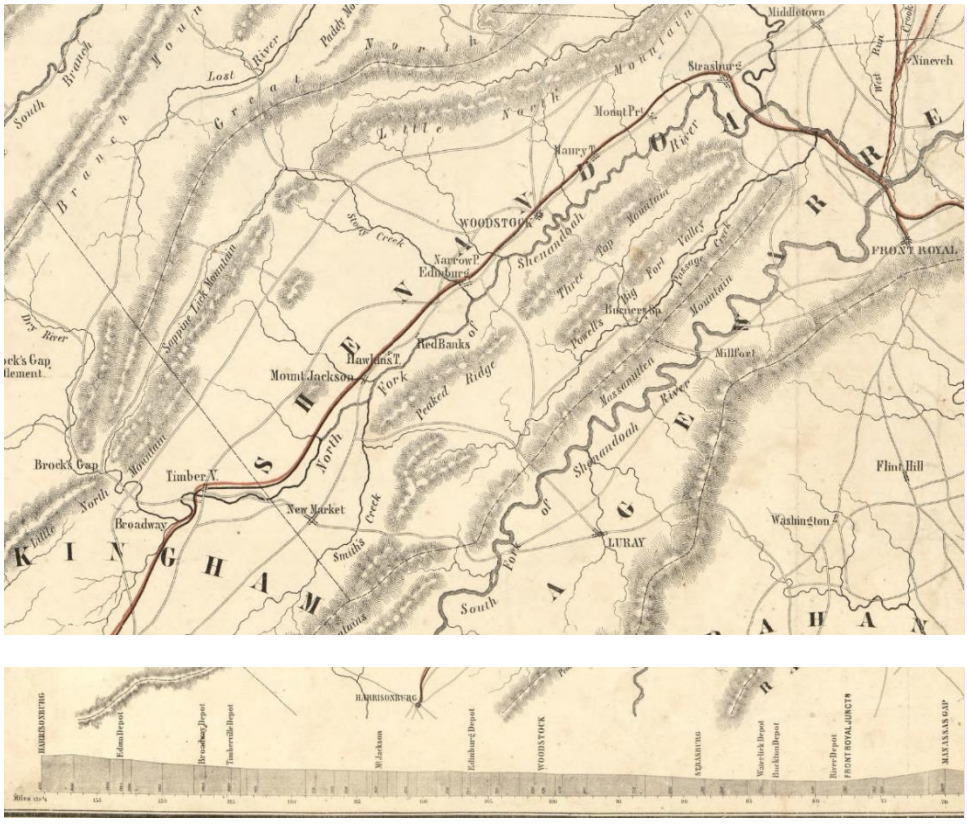
PART B TIMELINE

This section of the report provides information requested for the General Assembly regarding the timeline for abandonment of existing Norfolk Southern rail sections b51.0 to b84.0 and cw84.0 to cw99.

HISTORY OF THE RAILROAD

According to historian John Wayland, the route of the Manassas Gap Railroad was completed to Strasburg in 1854, to Woodstock in 1856, and to Mount Jackson in 1859. Heavily damaged by the Civil War, the railroad was merged with the Orange and Alexandria Railroad in 1867 and resumed operation in 1868. In December of 1868, the line opened to Harrisonburg. A devastating flood washed away both railroad bridges between Strasburg and Front Royal in 1870, with extensive damage and loss of life in other areas of the Valley. Freight continued to be shipped on the river by flatboat until the last three boats made the trip in 1888.

Figure 50. Map of the Manassas Gap Railroad and its Extensions, September 1855



Source: Library of Congress

The Orange, Alexandria and Manassas Railroad was eventually absorbed by the Southern Railway. According to Robert Smith, a former president of the Norfolk and Western Railway, the Shenandoah Valley Railroad, first organized in 1870, was built from Hagerstown, Maryland, to serve the farms and iron ore deposits which were

reported to exist in large quantities in the mountains flanking the Shenandoah Valley. The line to Waynesboro was opened early in 1881.

Norfolk Southern Corporation was created in 1982 as a holding company for Southern Railway and Norfolk and Western Railway, two lines that merged in 1980 in response to the creation of the CSX Corporation. Both corporations practice precision scheduled railroading, a shift in focus from moving trains to moving cars in an effort to streamline operations. This strategy has led to consolidated networks and the abandonment of less-efficient services and lines.

The Surface Transportation Board (STB) has jurisdiction over railroad rates, practice, and service issues and rail restructuring transactions, including mergers, line sales, line construction, and line abandonments. None of the rail line from Front Royal to Broadway has been abandoned through the federal process. The line between Front Royal and Strasburg is out-of-service (B51-B62). The section between Strasburg and Broadway was discontinued in sections from 1989 to 2016. The following docket numbers record the sections that were discontinued through the Surface Transportation Board (STB).

Docket Number AB 290 51 X

In 1989, Southern Railway Company filed a notice of exemption to discontinue service over a 5.1-mile line of railroad between milepost 8-84.0 at Mount Jackson, and milepost B-78.9 at Edinburg.

Docket Number AB 290 (Sub-No. 383X)

On July 15, 2016, Norfolk Southern Railway Company (NSR) filed a verified notice of exemption to discontinue service over an approximately 16.9-mile rail line extending from milepost B 62.0 (at Strasburg) to milepost B 78.9 (near Edinburg) in Shenandoah County (the Line).

Docket Number Docket AB 290 387X

On June 27, 2016, Chesapeake Western Railway (CW), a wholly-owned subsidiary of Norfolk Southern Railway Company (NSR), filed a notice of exemption to permit CW to discontinue rail service over an approximately 15.1-mile rail line extending from milepost CW 84.4 at Mt. Jackson to milepost CW 99.5 at Broadway.

Docket Number AB-290 (SUB-No. 391X)

On December 23, 2016, Norfolk Southern filed a notice to discontinue service on approximately 15.5 miles of rail extending from milepost B 84.0 to B 99.5 between Broadway and Mt. Jackson in Rockingham and Shenandoah Counties.

ABANDONMENT PROCESS

Once Norfolk Southern files to abandon the line, official negotiations for railbanking can begin. Abandonment procedures are set forth in the Code of Federal Regulations: Title 49, Part 1152. The procedures for abandonment or discontinuance of a rail line are complex and include rigid time limits.

Norfolk Southern could decide to abandon all out-of-service and discontinued sections in one abandonment filing. The most common form of abandonment proceeding is called the class exemption.

If no better offers are filed within 50 days of the abandonment filing, and the railroad has addressed any conditions imposed by the STB, then the railroad may consummate abandonment of the line, which removes it from STB jurisdiction. The railroad can sell or donate the property fee simple at this time. In this scenario, any deeds with reversionary clauses would most likely revert back to the property owner.

Notice of Interim Trail Use

Within 10 days of the Federal Register publication of the abandonment filing, a request for a Notice of Interim Trail Use (NITU) has to be filed with the STB and the railroad's legal department. This request should also include a statement of willingness to assume financial responsibility and a request to establish a public use condition. If a request for Interim Trail Use is approved by both the railroad and the STB, the railroad remains under STB jurisdiction. Negotiations can proceed for up to a year until a formal agreement is reached. During this time, the railroad can salvage track and materials. If negotiations are successful and a deed is transferred, the railroad files their consummation notice with STB and railbanking becomes official.

Railbanking

The Rails to Trails Conservancy provides a detailed description of the railbanking timeline and process at https://www.railstotrails.org/build-trails/trail-building-toolbox/acquisition/how-to-railbank/. If a rail line is railbanked, deeds with reversionary clauses do not revert back to the property owner and the rail line remains intact for possible future freight/passenger uses. Railbanking allows for the interim use to be reversed if it is later determined that the line should be returned to rail use.

Schedule

The following schedule governs the process for Board consideration and decisions in abandonment and discontinuance application proceedings from the time the application is filed until the time of the Board's decision on the merits:

- 10 days before filing: Notice must be provided to the State Service Board
- Day 0 Application for abandonment or discontinuance is filed with STB, including applicant's case in chief. (*Note: The line must be in Category 1 (abandonment is anticipated by the carrier within three years) for at least 60 days before an application may be filed. A Notice of Intent must also be filed between 15 and 30 days before the application is filed*.)
- Day 10 Due date for oral hearing requests.
- Day 15 Due date for STB decision on oral hearing requests.

- Day 20 Due date for Notice of Application to be published in the Federal Register. (*This is the only notice that STB will publish in the Federal Register during an abandonment proceeding*.)
- Day 30 Due date for notice of intent to file an offer of financial assistance (OFA). If accepted, an OFA trumps railbanking.
- Day 45 Due date for comments and protests, including opposition case in chief. **Also, due date for public use condition (PUC) and interim trail use requests**. Any request for a public use condition under 49 U.S.C. 10905 (§ 1152.28 of the Board's rules) and any request for a trail use condition under 16 U.S.C. 1247(d) (§ 1152.29 of the Board's rules) must also be filed within 45 days from the date of filing of the application. Written comments and protests, including all requests for public use and trail use conditions, should indicate the proceeding designation STB No. AB ___ (Sub-No. ___) and must be filed with the Chief, Section of Administration, Office of Proceedings, Surface Transportation Board, Washington, DC 20423-0001.
- Day 60 Due date for applicant's reply or rebuttal to opposition case, and **for applicant's response to trail use requests.**
- Day 110 Due date for service of STB's decision on the merits. (Note: A decision may be served sooner.)
- Day 120 Due date for offers of financial assistance. If the application has been granted by a decision issued sooner than Day 110, the offer of financial assistance shall be due 10 days after service of that decision.

Note: If the interim use is accepted, the STB will file a Notice of Interim Trail Use (NITU) within the year. In February of 2020, the STB extended the initial railbanking negotiation period from 180 days to one year and limited the number of one-year extensions to three, unless there are extraordinary circumstances.

Environmental Assessment

As part of this process, an environmental assessment (EA) (or environmental impact statement (EIS), if necessary) prepared by the Office of Environmental Analysis will be served upon all parties of record and upon any agencies or other persons who commented during its preparation. Any other persons who would like to obtain a copy of the EA (or EIS) may contact the Office of Environmental Analysis. EAs in these abandonment proceedings normally will be made available within 33 days of the filing of the application. The deadline for submission of comments on the EA will generally be within 30 days of its service. The comments received will be addressed in the Board's decision. A supplemental EA or EIS may be issued where appropriate.

Figure 40. Section 1152.29 Excerpt

§ 1152.29 Prospective use of rights-of-way for interim trail use and rail banking.

(a) *Contents of request for interim trail use.* If any state, political subdivision, or qualified private organization is interested in acquiring or using a right-of-way of a rail line proposed to be abandoned for interim trail use and rail banking pursuant to 16 U.S.C. 1247(d), it must file a comment or otherwise include a request in its filing (in a regulated abandonment proceeding) or a petition (in an exemption proceeding) indicating that it would like to do so. The comment/request or petition must include:

(1) A map depicting, and an accurate description of, the right-of-way, or portion thereof (including mileposts), proposed to be acquired or used;

(2) A statement indicating the trail sponsor's willingness to assume full responsibility for:

(i) Managing the right-of-way;

(ii) Any legal liability arising out of the transfer or use of the right-of-way (unless the user is immune from liability, in which case it need only indemnify the railroad against any potential liability); and

(iii) The payment of any and all taxes that may be levied or assessed against the right-of-way; and

(3) An acknowledgment that interim trail use is subject to the sponsor's continuing to meet its responsibilities described in paragraph (a)(2) of this section, and subject to possible future reconstruction and reactivation of the right-of-way for rail service. The statement must be in the following form:

> ### Statement of Willingness To Assume Financial Responsibility
>
> In order to establish interim trail use and rail banking under 16 U.S.C. 1247(d) and 49 CFR 1152.29 with respect to the right-of-way owned by _____ (Railroad) and operated by _____ (Railroad), _____ (Interim Trail Sponsor) is willing to assume full responsibility for: (1) Managing the right-of-way, (2) any legal liability arising out of the transfer or use of the right-of-way (unless the sponsor is immune from liability, in which case it need only indemnify the railroad against any potential liability), and (3) the payment of any and all taxes that may be levied or assessed against the right of way. The property, known as _____ (Name of Branch Line), extends from railroad milepost _____ near _____ (Station Name), to railroad milepost _____, near _____ (Station name), a distance of _____ miles in [County(ies), (State(s)]. The right-of-way is part of a line of railroad proposed for abandonment in Docket No. STB AB _____ (Sub-No. _____). A map of the property depicting the right-of-way is attached.
>
> _____ (Interim Trail Sponsor) acknowledges that use of the right-of-way is subject to the sponsor's continuing to meet its responsibilities described above and subject to possible future reconstruction and reactivation of the right-of-way for rail service. A copy of this statement is being served on the railroad(s) on the same date it is being served on the Board.

PROPERTY CONSTRAINTS

Due to the age of the corridor owned by Norfolk Southern, some of the parcels may include easements with reversionary clauses. For a fee simple purchase, extensive deed and title research will be needed to identify segments where clear title can be obtained. A railbanked line remains intact and under STB jurisdiction and will not require the same level of deed and title research. No funding associated with title research was provided for this study. A third-party appraisal is underway.

A point layer was developed using Google Earth to identify informal railroad crossings. This was superimposed over the parcel layer to identify obvious areas that will need additional research to maintain the integrity of the corridor. This research indicates a handful of easements, closed streets, and paper streets along with a dozen or more potential encroachments and several divided parcels that will need further review if fee simple acquisition is pursued.

Regarding environmental property constraints, several wrecks have been reported along the line. In March of 1876, the wooden Narrow Passage railway bridge crashed under the weight of cattle cars, killing eleven people and wounding seven. In August of 1892, cars derailed in Woodstock west of Massanutten Cemetery. A wreck at Pugh's Run occurred on Nov. 9, 1908. In 1922, the railroad bridge in Mount Jackson burned. In March of 2021, cars derailed in Riverton. Wrecks and spills are considered during environmental reviews to establish any remediation that will be necessary to address contamination.

PART C BENEFITS AND COSTS

This section records the range of benefits that could accrue from trail development, from potential revenue generation to health, wellness, and quality of life factors. It also itemizes known costs for trail development, including acquisition, design, construction, operation, and maintenance.

BENEFITS

The benefits of linear parks are widespread, accruing to residents, visitors, organizations, businesses, and governments. Revenues benefit the trail provider and local governments and can help offset costs. Other benefits can be categorized as quality-of-life improvements that benefit the communities surrounding the trail.

POTENTIAL REVENUES

Based on revenues from other known trails, there may be potential for offsetting some trail operational costs based on the following revenue sources:

- Right-of-way leasing
- Parking fees at trailheads

- Special permit or entrance fees for special events using the corridor (i.e., hayrides, marathons and other races, concerts, moonlight bike tours)
- Special permit fees for concessions within the right-of-way (i.e., food carts, equipment rentals)
- Merchandise sales
- Picnic shelter rentals
- Camping fees
- Recycling fees
- Equipment rentals (boat and bike livery)
- Donations (rung up at point of sale as a donation)
- Timber sales
- Interpretive programs fees
- A membership organization or friends' group could collect revenue from a range of membership levels and solicit and accept donations on behalf of the trail (i.e., Friends of the W&OD Trail).

In addition to the income listed above, local governments could anticipate revenue from these sources:

- Increase in revenue from the transient occupancy/short term rental tax
- Increase in revenue from the meals tax
- Increase in local taxes due to increased land value throughout the corridor

Property Values

Based on VDOT Staunton District's review and summary of existing literature, it is conceivable that the proposed Shenandoah Rail Trail, through successful planning and design, could have the potential to provide modest increases in residential property values of 3% to 4% within the more developed towns along the corridor. It is also plausible that the rail trail's influence may diminish in the more rural areas between population centers with a negligible to no impact on property values.

QUALITY OF LIFE IMPROVEMENTS

Linear parks are now recognized as an important part of modernized transportation systems, but they also perform important recreational and ecosystem functions. Healthy parks are safe, visually appealing, accessible, and inviting. They also:

- preserve and protect flourishing biodiversity
- provide for sustainable ecosystems
- deliver climate positive outcomes
- provide green infrastructure for integrated water management
- express culture and heritage
- define a sense of place
- help create a sense of belonging

- provide gathering spaces and increase social interaction
- provide resilient and multi-functional spaces for wide-ranging recreational outcomes
- offer opportunities for people to exercise
- connect people with nature

Other specific environmental benefits of linear parks are based on their ability to

- buffer industrial, commercial, and residential land uses
- reduce air and noise pollution
- buffer waterfront areas
- provide a carbon sink
- mitigate urban heat islands
- provide corridors for wildlife migration

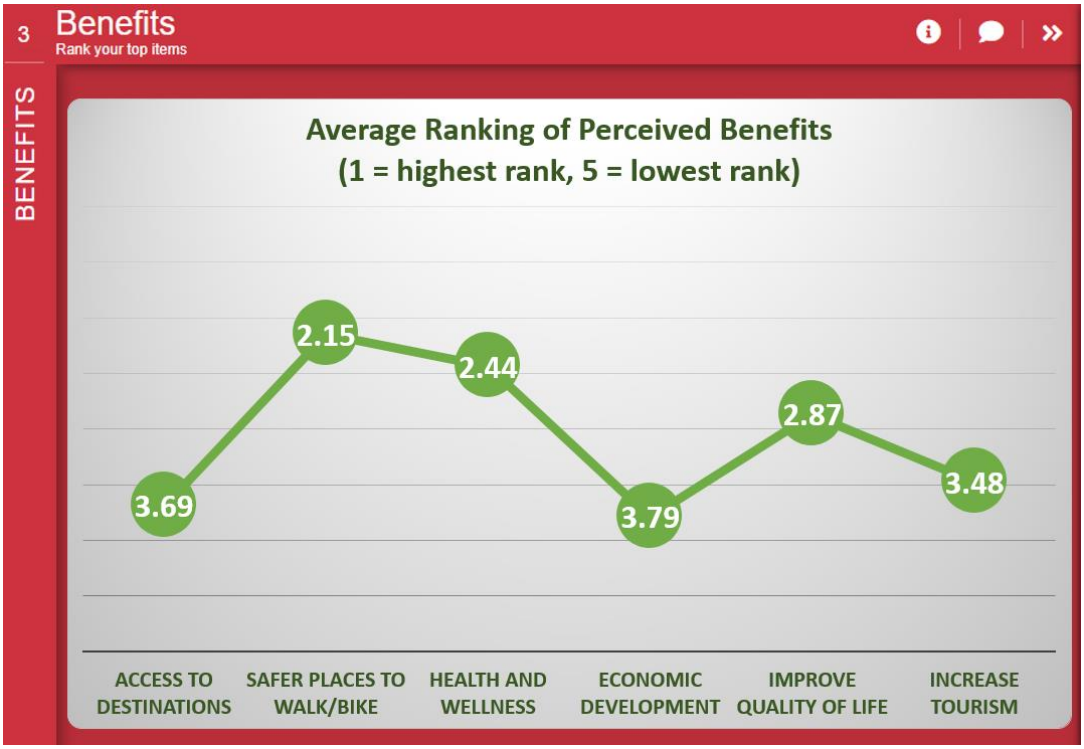
Active Transportation

Linear parks support active transportation, and can meet level of service requirements for recreation, non-motorized transportation, and public health infrastructure. The pandemic has increased our understanding of the importance of these facilities. In addition to increasing physical activity, improving mental health, and reducing stress, linear parks

- expand commuting options to shopping areas, employment centers
- reduce air pollution and congestion
- provide access to transit
- support mass evacuations
- eliminate physical barriers to bicycling
- provide key links in trail networks
- remove existing hazards
- improve the health and quality of life for groups that historically have been marginalized
- connect schools, neighborhoods, parks, playgrounds, historic sites

Survey respondents ranked safety and health and wellness as the most important benefits offered by the proposed rail trail in the Shenandoah Valley.

Figure 41. MetroQuest - Benefits



A recent study in the American Journal of Preventive Medicine concluded: "Evidence indicates that interventions that improve infrastructure and enhance the safety and ease of active travel to school generate societal economic benefits that exceed the cost to implement these interventions."[ii]

The World Health Organization has developed a Health economic assessment tool (HEAT) to provide guidance and practical tools for economic assessments of the health effects from cycling and walking. These tools consider the avoided health care costs and reduced mortality and morbidity from interventions that promote physical activity. They conclude: "Promoting cycling and walking is a promising route to getting more physical activity, since it can be more readily integrated into people's busy schedules than, for example, leisure-time exercise. It is also a win-win approach: it not only promotes health but can also lead to positive environmental effects, especially if cycling and walking replace short car trips. These forms of physical activity are also more practical for population groups for which sport is either not feasible because of physical limitations or is not an accessible leisure activity for economic, social or cultural reasons."[iii]

A 2021 survey conducted by the National Recreation and Park Association found that 93 percent of U.S. adults say their mental health is improved by services offered by park and recreation professionals and agencies. The top three mental health opportunities include socializing with friends and family, spending time in nature and exercising.[iv]

In a June 2021 Op-Ed in the Richmond Times Dispatch, Governor Northam's Chief of Staff, Clark Mercer, said "For every $1 invested in building trails, there is a direct correlation of $3 to saved medical costs."

The PATHS Initiative (Prioritizing Active Transportation, Health and Safety) is a collaboration between the Virginia departments of health and transportation. A key goal of this initiative is to illuminate the pathways to health in which transportation agencies play a role, including current practices, research needs, and collaboration efforts. Slides from a PATHS webinar on Improving Walkability in Virginia demonstrate the values of this initiative.

Figure 42. PATHS Initiative

Another PATHS goal is to create places where specifically historically marginalized communities have improved access via foot to reach jobs, health grocery stores, reliable health clinics, and social pillars of the community (i.e., places of prayer and parks).

Economic Development

Linear parks can contribute to economic success in many ways beyond the improved health of residents. Trail users patronize restaurants, general stores, gas stations, hotels, campgrounds, B&Bs, and boutiques, and support businesses that sell, rent and repair equipment. The increased tourism creates jobs and puts money into the economy. The taxes generated from sales and increased property taxes enable local governments to provide more services. Other less well-known benefits include:

- The wealth from retirees and investors attracted by quality of life
- The retained impact from single-day community events
- The attraction and retention of skilled employees attracted by quality of life and the businesses seeking those employees
- The attraction of companies that manufacture outdoor gear and equipment (bicycle sales were up 121 percent during the pandemic)

In 2019, Chmura completed an economic impact analysis of the Shenandoah Rail Trail that included only two counties and 38 miles from Broadway to Strasburg for the Northern Shenandoah Valley Regional Commission. The additional rail line between Strasburg and Front Royal was added to the study corridor following the completion of the Chmura study. In the optimistic scenario, the proposed trail would attract 280,334 visitors per year from 2030 onward. Visitor spending would generate an estimated $15.5 million economic impact per year from 2030 onward, supporting 140 new jobs in the region. The combined tax revenues for Shenandoah and Rockingham counties and the towns along the trail were estimated to be $351,443 per year from 2030 onward.

Chmura estimated the cost of the trail to be $11.7 million in 2019 dollars. The cumulative economic impact (direct, indirect, and induced) of trail construction was estimated to be $14.4 million (in nominal dollars) in the region from 2020-30, supporting 80 cumulative jobs. With an estimated annual maintenance cost of $52,400 in 2027 dollars, the total economic impact (direct, indirect, and induced) of trail maintenance could be $75,173 per year after 2030. See the full report on the agency website.

Chmura's conservative estimate for High Bridge Trail was that the trail could attract nearly 68,000 visits a year, with a total annual economic impact close to $1 million. In spite of closures due to the pandemic, High Bridge still generated $9.3 million in economic activity in 2020 ($5.9 million in adjusted economic impact). Tourism revenue for Prince Edward County reached $27.7 million in 2019, a 7.1 percent increase over 2018. The Farmville Area Chamber of Commerce reported 261 tourism-supported jobs and $516,109 in tourism-related taxes.

In 2021, public finance economist Dr. Robert Cline prepared an economic impact analysis for the Shenandoah Rail Trail Exploratory Partnership based on the three-county, 49-mile proposed trail from Broadway to Front Royal. Key findings from his report, which projected attendance figures based on the 57-mile New River Trail State Park are as follows:

- The new annual spending in the region due to visitors to the Shenandoah Rail Trail is projected to be $32.3 million (in 2030 dollars) a year when the trail is fully opened. This is a measure of the increased sales of retailers, restaurants, hotels and motels and other businesses located in the region.
- The new regional spending is expected to generate 319 new jobs in 2030. The largest number of jobs will be in tourist-related businesses including restaurants, hotels and motels, and retail stores.
- The expanded economy will generate substantial new income for business employees, the self-employed and unincorporated businesses. This additional annual "labor income" is estimated to be $10 million in 2030.
- The expanded economy in the region will generate higher tax revenue each year for state and local governments: $1.7 million for counties, $0.2 million for towns, and $0.6 million for the state.
- In addition to the above, on-going annual economic impacts, the construction of the rail trail is expected to generate a cumulative total of $18.7 million in spending and 104 jobs over the construction period.

In his analysis[2], Dr. Cline asserts

> *The Shenandoah Rail Trail will be a destination trail, using the terminology of the Rails-to-Trails Conservancy, the national organization advocating for rail trails. A destination trail is described as a rural rail trail that has expansive views and passes through woods, farmland and smaller, picturesque towns. These trails are longer than urban and suburban rail trails, have fewer road crossings, and generate higher economic impacts for local communities. Like the proposed Shenandoah Rail Trail, destination trails often run through the center of smaller towns on old railroad rights-of-way. This proximity to downtown retail businesses makes it easier for trail users to support local businesses.*

Other studies support larger impacts. An economic impact report for the New River Trail completed by the Virginia Tech Pamplin College of Business in 2020 estimated an overall impact of $28.3 million. An impact report for the Virginia Capital Trail utilizing the Pamplin College of Business mathematics model estimated $38.9 million of impact in 2019.

Given the location, popularity, and proximity to the Washington metro area, the proposed rail trail will likely operate at a level at least comparable to the Virginia Capital Trail, with attendance approaching a million visits per year. For a conservative attendance estimate, figures from New River Trail State Park could be used, which varied from 645,595 visits in 2019 to 725,862 in 2020.

COST ESTIMATES

The General Assembly asked DCR to estimate all start-up and ongoing costs of the proposed rail trail operation as a satellite facility of Seven Bends and Shenandoah River State Parks. The tax office has prepared an appraisal of the property, which is used to identify acquisition costs. With VDOT's assistance, Michael Baker International was tasked with itemizing development costs. Management costs are provided based on a comparison with similar facilities in Virginia; specifically, New River Trail State Park.

ACQUISITION

The Virginia Department of Taxation has prepared an assessment of the specified length of the proposed corridor as it would be valued for taxation by the Commonwealth of Virginia in 2021. This assessment reflects the value of the land as well as of the railbed and tracks, which contribute substantially to the cost to construct, and therefore the retained taxable value. This assertion of value is for all of the property, in its current use as an operational, although inactive, railway, and does not necessarily reflect or suggest any ultimate sale price. As a basis for contemplation of a purchase offer, sale or donation, the 2021 taxable value is a useful and factual amount from which a reasonable value in exchange can be pursued. The 2021 taxable value for the land, railbed and track, as it

[2] https://www.dcr.virginia.gov/recreational-planning/shen-rail-trail

will be published in the 2021 Statement of Assessed Values, is $17,357,290 for the studied corridor (CW 51-B99.5), plus $35,000 for an additional 1.12 acres of land in Broadway (CW 51A1-(A)-L8.

DEVELOPMENT

VDOT contracted with Michael Baker International to complete the following tasks for the study:

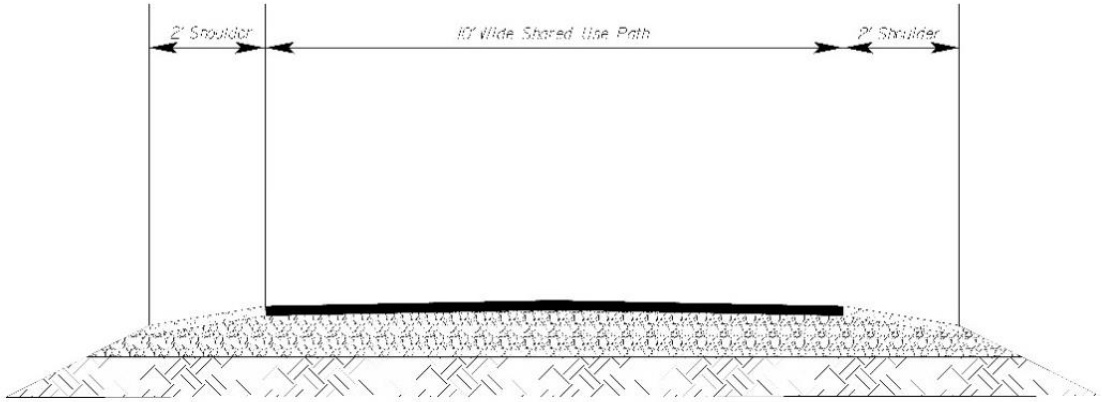
- Project management and coordination
- Field survey documentation
- Structure survey
- Existing data review
- Environmental desktop review
- At-grade crossing review
- Trailhead and parking review
- Alignment review and identification
- Cost estimates
- Draft report

Facility Cost

Trail Construction

Individual cost estimates were developed for each segment along the proposed Shenandoah Rail-to-Trail alignment (see Appendix D). The preferred cross-section of the trail is a 10’ wide path with 2’ shoulders on either side. An alternative cross-section was also determined and may be applied in areas with limited space or challenging site conditions. The alternative cross-section is an 8’ wide path with 2’ shoulders on either side. Figure 54 shows the preferred typical cross-section along the trail alignment. The study also evaluated two trail surface options, a hard surface and a soft surface path. The hard surface path assumes a 2” asphalt surface course, whereas the soft surface assumes a 4” crusher coarse aggregate. Both surface types include a minimum of 2” new 21 A/B stone aggregate to be mixed in with the existing rail ballast. Trail estimates do include bridge and structure costs and typical roadway crossings. Trailheads and rail and equipment removal for each section is not included in the trail estimates but provided as a separate item.

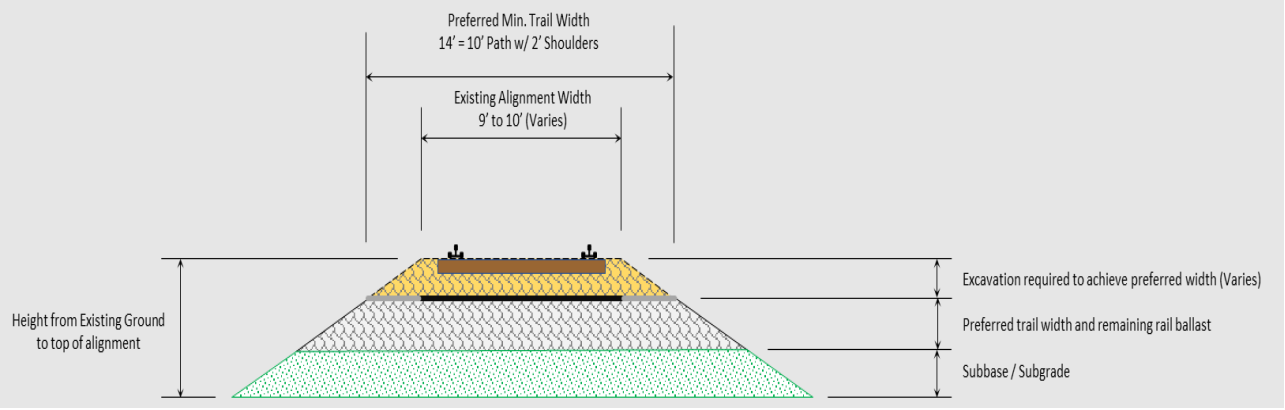
Figure 43. Preferred Trail Cross-Section



Alignment Challenges

Removal of vegetation and possibly the removal of the rail and ties will disturb compaction and the quality of rail ballast. There are many instances between the Town of Mount Jackson and the Town of Strasburg where heavy vegetation exists on the rail. In these instances, it was assumed that full-depth reconstruction would be required. As well, the existing vertical alignment and narrow cross-section, approximately 9 to 10 feet wide, present a challenge in accommodating the proposed typical cross-section without chasing slopes (i.e., large amounts of borrow material). Therefore, in areas where the alignment was typically three feet or more above existing grade, the study assumed additional excavation would be required to lower the alignment to accommodate the preferred width. Figure 55 further illustrates this method.

Figure 44. Excavation Method to Achieve Preferred Trail Width



Fencing

Providing barriers to prevent trail users from traveling into hazards or abutting properties has been assumed where applicable. Fencing was assumed to be the preferred treatment and was assumed to be applied along steep slopes, near off-trail obstacles, and abutting land-uses. Fencing can help trail-users stay on a path but also prevent

encroachment from nearby properties. The study team did evaluate opportunities to minimize the fencing where steep slopes were present by lowering the alignment. Fencing was assumed to be a chain link fence with a minimum height of 42 inches.

Trailheads

For trailheads, the planning study developed a cost per parking space estimate and any associated accessibility requirements to the trail. Trailhead associated costs cover new or existing parking lot expansions, stormwater facilities, lighting, and amenities, such as trash receptacles, benches, or guide signage. Two lot sizes were assumed: a 10-parking stall lot for small trailheads and a 30-parking stall lot for large trailheads. Larger trailheads were also assumed to include bathroom facilities. All parking lots were assumed to be paved. Table 10 summarizes the estimated cost per space range by lot type.

Table 10. Estimated Trailhead Construction Cost per Space

Lot Type	Average Cost per Space	LOW Cost per Space	HIGH Cost per Space
Large	$ 36,000.00	$ 32,000.00	$ 40,000.00
Small	$ 25,000.00	$ 23,000.00	$ 30,000.00
Large lot is based on a 30 space lot with amenities such as a bathroom, water fountains, and lighting. Small lot is based on a 10 space lot with no amenities. Both lot types are assumed to be paved for a conservative estimate			

Trailhead estimates do not include right-of-way cost estimates as it is not within the scope of this effort; however, most trailhead improvements are within a jurisdiction's right-of-way or immediately within the railroad alignment right-of-way. A qualitative assessment of additional right-of-way has been included in the trailhead summary.

The study team did also include accessibility requirements to and from the trailhead. Most trailheads are directly connecting to the proposed alignment and therefore minimal accommodations are required.

A summary of trailhead recommendations follows:

- New Large Lot Trailhead located on Turner Avenue – Town of Broadway
  - Summary: Large lot with at least 100 parking spaces and amenities.
  - Accessibility: Sidewalk exists to the trail but a crosswalk and upgraded ADA facilities will be required
  - Right-of-Way Assessment: Property is owned by Town of Broadway

- Existing Memorial Park Lot – Town of Timberville
  - Summary: No additional spaces are needed based on the available spaces in the existing park and proximity to the Town of Broadway's proposed trailhead.

  - Accessibility: A short trail connection is required to connect the park to the trail.
  - Right-of-Way Assessment: The trail connection would be within the right-of-way of the trail alignment.

- New Small Lot located along Evergreen Valley Road – Town of Timberville Alternative
  - Summary: Small lot (less than 10 spaces) that will immediately abut the trail alignment.
  - Accessibility: Trailhead would be on trail alignment and no connection is required.
  - Right-of-Way Assessment: The trail connection would be within the right-of-way of the trail alignment; however temporary easements may be required during construction.

- New Market Deport Road – Shenandoah County
  - Summary: Small lot (10 spaces) that will immediately abut the trail alignment. Parallel parking would be required.
  - Accessibility: Trailhead would be on trail alignment and no connection is required.
  - Right-of-Way Assessment: The trail connection would be within the right-of-way of the trail alignment; however temporary easements may be required during construction.

- Village Lane – Town of Quicksburg
  - Summary: Low volume road and amount of shoulder would permit for on-road parking.
  - Accessibility: A short trail connection is required to connect Village Lane to trail.
  - Right-of-Way Assessment: The trail connection would be within the right-of-way of the trail alignment.

- Town Hall – Town of Mount Jackson
  - Summary: Town Hall, visitor center, and available space within those parking lots and on Gospel Street provides adequate parking. Depot Street should be signed with “No Parking” signage to discourage trail users.
  - Accessibility: Multiple connections would be available to connect to the trail.
  - Right-of-Way Assessment: No additional improvements are recommended.

- Edinburg Mill – Town of Edinburg
  - Summary: The Edinburg Mill has a large gravel parking area that can accommodate trail and Edinburg Mill users. No additional parking spaces or amenities are recommended.
  - Accessibility: The Edinburg Mill is below the trail alignment and has no direct connection. A trail connection behind the cemetery with a set of stairs would need to be constructed to the Mill. However, this alignment would not be ADA accessible (See Stony Creek Boulevard).
  - Right-of-Way Assessment: Right-of-way will be required where the trail connection travels behind the cemetery.

- Stony Creek Boulevard – Town of Edinburg

  - Summary: This trailhead would immediately abut the trail alignment to the north of the rail bridge. Parking spaces would be required and are recommended to be mostly ADA accessible.
  - Accessibility: Trailhead would be on trail alignment and no connection is required.
  - Right-of-Way Assessment: The trail connection would be within the right-of-way of the trail alignment; however temporary easements may be required during construction.

- Court Street – Town of Woodstock
  - Summary: The Town of Woodstock is providing parking at this location prior to the trail construction; however, it is recommended to accommodate more parking with amenities.
  - Accessibility: Multiple connections would be available to connect to the trail.
  - Right-of-Way Assessment: Property is owned by the Town of Woodstock.

- Strasburg Museum – Town of Strasburg
  - Summary: The museum currently has limited parking and is recommended to expand to provide additional spaces.
  - Accessibility: The museum is located directly on the trail alignment and will have a direct connection.
  - Right-of-Way Assessment: Any parking expansion or trail connection would be within the right-of-way of the museum or rail alignment.

- Strasburg Town Park – Town of Strasburg – Alternative
  - Summary: The town park is located off of Queen Street and Park Road. The site has ample parking and amenities.
  - Accessibility: The park is located on lower volume roadways and the trail can be accessed via Queen Street.
  - Right-of-Way Assessment: No additional improvements are recommended.

- VDOT Area Headquarters – Town of Front Royal - Alternative
  - Summary: This site is expected to serve as a temporary location and no additional spaces are recommended.
  - Accessibility: The office location is near the trail alignment but is above and across a large ditch. This area also requires clearing of vegetation to access the trail. A short trail connection is recommended along with a foot bridge.
  - Right-of-Way Assessment: Trail connection would be within the right-of-way of the VDOT office and rail alignment.

- Queens Highway Site – Town of Front Royal – Alternative
  - Summary: This site is owned by Norfolk Southern and directly abuts the rail alignment. It is located between Queens Highway and Old Winchester Pike.
  - Accessibility: The office location is on the trail alignment and would require no additional connection to access the trail.

- Right-of-Way Assessment: Trail connection would be within the right-of-way of rail alignment, assuming all Norfolk Southern properties are included as part of the acquisition.

- Previous VFW Site – Town of Front Royal - Preferred
  - Summary: New large lot with at least 100 parking spaces and amenities.
  - Accessibility: The location is below and near the trail alignment. A connection to the parking area and trail will be required. Since the area has active rail activity, warning signs and fencing will be required to ensure trail users do not encroach onto active rails.
  - Right-of-Way Assessment: The property was recently transferred to a different owner and right-of-way acquisition would be required.

Table 11 provides a summary of the anticipated construction cost associated for each location. Right-of-way costs are not included and may increase the total cost for the trailhead. Further breakdowns can be found on the study resource page on the agency website.

Table 11. Trailhead Cost Summary

Trailhead	Location	Estimate Cost Range
Turner Avenue	Town of Broadway	$3.6M - $5.0M
Memorial Park	Town of Timberville	$24K - $26K
North Main Street	Town of Timberville	$0.2M - $0.3M
Depot Road	Shenandoah County	$0.3M - $0.5M
Village Lane	Town of Quicksburg	$26K - $30K
Town Hall	Town of Mount Jackson	-
Edinburg Mill	Town of Edinburg	$0.4M-$0.6M
Stony Creek Boulevard	Town of Edinburg	$0.4M-$0.6M
Court Street	Town of Woodstock	$1.3M - $1.8M
Strasburg Muesuem	Town of Strasburg	$0.4M - $0.6M
Town Park	Town of Strasburg	-
VDOT District Office	Town of Front Royal	$0.7M - $1.0M
Queens Highway	Town of Front Royal	$3.0M - $3.8M
Previous VFW Site	Town of Front Royal	$4.0M - $5.1M
Does not include right-of-way costs		

Bridge and Structures

Michael Baker International estimates a total cost of $25.6M for development of the bridges and culverts along the Shenandoah Valley rail corridor. The cost includes performing restorative and corrective maintenance actions to bring all structures back to as-built condition as required using a 10'-wide bridge section. It is recommended that the steel superstructures be recoated. Re-decking the bridges will be required based on the condition of the existing railroad ties. Pedestrian rail and fence were assumed for all bridges while the need for pedestrian rail and fence on culverts was based on the culvert geometry at each location. All instances of concrete spall include a minimum of 10' of crack repair if the length was not specified in the field notes. Estimates include a 15% Remote Location Factor, or a factor that accounts for accessing and bringing materials to a difficult to reach bridge sites because of proximity to roadways. Michael Baker International created detailed cost estimates for each bridge. These summaries can be found in Appendix D.

Cost Estimate Template Assumptions:

All construction cost estimates were developed using the VDOT Staunton District and Statewide Unit Cost Averages, Statewide Planning Level Estimates, and the DCR Greenways and Trails Toolbox. Construction cost estimates include:

- Maintenance of Traffic: Temporary traffic control required in areas that have a high chance of impacting normal traffic flow.
- 5% Erosion & Sediment Control Measures: Lump sum item that accounts for any erosion & sediment control measures as part of construction.
- 20% Unaccounted Items: Planning level estimates generally account for between 60-80% of all line items anticipated for a given project. Therefore, an "unaccounted items" line item is applied to the estimate to account for items not quantified in the other line items that are needed in the project. These items may include, on-path amenities, access areas, construction cleanup, maintenance requirements, or other items typically further determined as part of a design or detailed conceptual effort.
- 30% Construction Contingency: The contingency accounts for price fluctuation, project adjustments and other items that may not be anticipated during the planning or design phases of the project.
- 5% Contract Requirement: Accounts for administration and specification, bid, and proposal packages.
- 20% Construction Engineering Inspection Services: In the event that VDOT manages the construction of the project, this cost would be necessary; therefore, it was assumed in the overall estimate. This accounts for the coordination, negotiation, monitoring, and management related to the construction effort.

Right-of-way estimates were not included as part of this planning study; however, the immediate rail alignment has little to no impact on permanent right-of-way acquisition. Trailheads may require additional right-of-way and temporary easements may be required where the path travels near adjacent properties. Preliminary Engineering is included and estimated based on the following assumptions:

- Construction Cost < $2.4M: 50% of Base Construction Cost and Not to Exceed $600K
- $2.4M < Construction Cost < $5M: 25% of Base Construction Cost
- $5M < Construction Cost < $8M: 20% of Base Construction Cost
- Construction Cost > $8M: 15% of Base Construction Cost

Cost Estimate Summary

A summary for each trail segment can be found in Table 12. The Table breaks down the construction cost of the trail, bridge and structures, preliminary engineering and rail removal. Detailed cost estimates can be found in Appendix F.

Table 12. Cost Summary for the Trail Alignment

Segment	Miles	Trail Construction Cost		Bridge Construction Costs		Preliminary Engineering Costs		Rail Removal Costs	Total	
		Hard Surface (Asphalt)	Hard Surface (Gravel)	Total Number	Total Cost	Trail	Bridge		Hard Surface (Asphalt)	Soft Surface (Gravel)
1	12	$ 9,510,000	$ 8,307,000	12	$ 4,740,000	$ 985,700	$ 241,300	$ 2,450,000	$ 17,927,000	$ 16,724,000
2	10	$ 7,269,000	$ 6,146,000	6	$ 4,110,000	$ 963,450	$ 208,800	$ 2,030,000	$ 14,581,250	$ 13,458,250
3	6	$ 4,134,000	$ 3,440,000	1	$ 3,020,000	$ 513,400	$ 153,100	$ 1,170,000	$ 8,990,500	$ 8,296,500
4	6	$ 3,748,000	$ 3,105,000	3	$ 1,970,000	$ 500,900	$ 99,100	$ 1,170,000	$ 7,488,000	$ 6,845,000
5	7	$ 4,695,000	$ 3,914,000	5	$ 5,370,000	$ 483,400	$ 273,600	$ 1,490,000	$ 12,312,000	$ 11,531,000
6	10	$ 6,344,000	$ 5,105,000	22	$ 7,710,000	$ 629,500	$ 393,500	$ 2,130,000	$ 17,207,000	$ 15,968,000
TOTAL	**49**	**$ 35,700,000**	**$ 30,017,000**	**49**	**$26,920,000**	**$ 4,076,000**	**$ 1,369,000**	**$10,440,000**	**$ 78,506,000**	**$ 72,823,000**

Note: The rail removal costs are a per linear foot cost item calculated from previous Rail Trail studies.

The average construction cost per mile is about $720,000 for hard or asphalt surfaces and average construction cost per mile for soft or gravel surfaces is about $600,000 per mile. The bridge and structure costs will increase this value to about $1.1 million to $1.3 million per mile. Removing rail is included in the total summary, however responsibility for removing the rail and equipment has not been determined at the time of this study. The amount of bridge and structure requirements and alignment challenges does result in an estimate that is above average for a Rail-to-Trail project.

MANAGEMENT

Management is dependent on ownership. There could be several methods of management, discussed later in this report, which could affect the cost assumptions in this section. If DCR takes on management of the proposed rail trail, it will be handled like other linear parks in the state park system. New River Trail State Park is a 57-mile trail traversing four counties and the City of Galax in Southwestern Virginia. The corridor includes 31 bridges, 2 tunnels and 424 culverts and culvert headwalls.

DCR's revenues from New River Trail State Park in FY2020 equaled $569,117, whereas management costs equaled $1,406,220. Management costs include staffing, operations, and maintenance. Costs based on DCR's ownership and management experience are itemized below.

New River Trail Budget

- FY21 - $691,317 (operational budget)
- FY21 - $714,903 (FTE budget)

New River Trail Staffing (FTE's)

- Park Manager
- Assistant Park Manager (2)
- Chief Ranger - LE (2)
- Park Ranger - Maintenance (3)
- Office Manager

POTENTIAL REVENUE FOR ACQUISITION AND DEVELOPMENT

One way to offset the high cost of corridor acquisition and development is to utilize funding through state and federal grants and partnerships. The following funding sources could be considered for trail acquisition and development.

- Federal Infrastructure –this Congressional bill adds nearly 70% more funding for Transportation Alternatives and authorizes the Connecting America's Active Transportation System Act (H.R.2991/S.684), now listed as the Active Transportation Infrastructure Investment Program, to receive $200 million per year. The bill also creates new competitive grant programs to increase safety for all road users and reconnect communities that face barriers to mobility.
- EDA ARPA Grants (also see interim final rule for ARPA)
- RAISE Discretionary Grants
- Transportation Alternatives Set-Aside
- VDOT Access Roads Programs
- VDOT Revenue Sharing
- SMART SCALE
- Land and Water Conservation Fund (both state and federal side)
- Recreational Trails Program
- Federal Lands Access Program
- American Battlefield Protection Program Grants

Also see FHWA's Pedestrian and Bicycle Funding Opportunities matrix.

If the corridor will be used for utilities or another value-added service, other funding sources may apply, like the Broadband Infrastructure Program through the U.S. Department of Commerce.

At this time, there are very few funding sources available to offset maintenance costs. Annual lease fees from utilities have supported the maintenance of long-distance rail trails outside of the state park system (i.e., W&OD Trail/NOVA Parks). In Massachusetts, a February 2021 amicus brief filed on behalf of trail interests described a unique and forward looking partnership between private industry and a state agency for trail development that was supported by the Court. For more information, see Notice of Intent filing submitted by Eversource and the Massachusetts Department of Conservation and Recreation for the installation of a new 115 kV underground electrical transmission line and the construction of a portion of the Mass Central Rail Trail.

FRAMEWORK FOR SUCCESS

Below are several possible scenarios for trail ownership and long-term maintenance. In all scenarios, trail acquisition and development will be expensive and long-term trail management an even bigger lift for government agencies owning the trail. Since it is not anticipated that direct trail revenues will cover the costs, it is critical to consider the best model for this particular trail and region. Norfolk Southern still retains the corridor right-of-way, so there is an opportunity for them to indicate their preference for future ownership.

Potential alternatives for the management of the corridor include:

- Federally owned and operated
- State owned and operated
- Regionally owned and operated
- Regionally sponsored non-profit
- Locally owned and regionally managed
- Hybrid

Possible ownership and maintenance scenarios

Federally owned and operated

Congressional action would be needed for the proposed linear park to be a federally owned and operated facility. Although it is located entirely within the Shenandoah Valley Battlefields National Historic District (SVBNHD), it is outside of the prescribed boundaries of the National Forest or any National Park unit. The trail has the potential to connect the New Market and Toms Brook clusters of the SVBNHD with the Cedar Creek and Belle Grove National Historic Park, the U.S. Forest Service Lee Ranger District office in Edinburg and the U.S.F.S. trail system via the Tuscarora Trail at Toms Brook. Future connections to the Shenandoah National Park may be possible through the Royal Shenandoah Greenway in Front Royal.

If ownership is assumed by the NPS or USFS, it is possible the lands would be included as part of the annual Payment in lieu of taxes (PILT) data call. This means the acreage would be used to calculate annual payments to each county. Acreage amounts are determined by the federal agency that owns the corridor.

SVBNHD Board approval would be needed for federal management of a state-owned facility. A unique arrangement of this type may require an annual appropriation from the General Assembly, with law enforcement support by the localities.

State owned and operated

The proposed linear park could be a state-owned and operated facility. If DCR owns and operates the trail, it would likely be an aggregate surface facility similar to High Bridge Trail State Park. Day use facilities (i.e., trailheads, picnic areas, orientation kiosks, interpretive signs) and any overnight facilities would be located with citizen input through a master planning process. Towns could also provide these amenities. There may be some flexibility to pave the trail through towns where there are multiple road crossings.

VDOT maintains shared-use paths that fall within their right-of-way if certain standards are met. Supporting facilities would have to be provided and maintained by jurisdictions. The Virginia Capital Trail is an example of a facility owned by VDOT with maintenance and operation agreements in place with local governments and the Virginia Capital Trail Foundation. While the Foundation oversees volunteer recruitment and development, marketing, donor solicitation, contact with stakeholders, and general administration of the Trail as their core functions, maintenance is provided by VDOT and the localities along the trail. VDOT has three maintenance area headquarters that serve different portions of the 51-mile trail that is entirely within their right-of-way, providing litter removal, mowing, tree removal, debris removal, patching of asphalt, signage replacement, bridge and crossing inspection, and drainage inspection over the course of the year.[v] Localities provide law enforcement and own and manage trailheads. Due to the creation of the Central Virginia Transportation Authority (CVTA) by the 2020 General Assembly for priority transportation investments in the Richmond Region, localities in Planning District 15 now have a dedicated funding source that is eligible for use for trail maintenance, among other activities. The two main sources of revenue for the CVTA are regional sales and use tax (0.7%) and wholesale gas and diesel tax (7.6 cents and 7.7 cents). [vi]

The Virginia Passenger Rail Authority (VPRA), established by Chapter 1230 of the 2020 Acts of Assembly, is responsible for promoting, sustaining, and expanding the availability of passenger and commuter rail service in the Commonwealth. If the state rail authority takes ownership of this corridor, a rail with trail is a possibility if a rail with trail policy is defined in the 2022 State Rail Plan. Because of limited width in some constrained areas along the corridor, this option would require right-of-way acquisition or stacked corridors, where one use is routed over another (like sections of the Low Line along the Virginia Capital Trail).

> *Several public transportation agencies and rail authorities have developed guidelines for rails-with-trails to provide consistent standards along their routes. As interest in trail development along rail transit corridors increases, public transportation agencies are establishing policies to create a standardized approach to rail-with-trail development.* Rails with Trails: Best Practices and Lessons Learned

Regionally owned and operated

Legislation could authorize a regional authority to operate or own and operate the proposed trail. An authority could also operate other attractions that generate revenue, like campgrounds and cabins, similar to the Northern Virginia Regional Park Authority (NOVA Parks). The authority could be authorized to issue bonds, accept local government contributions on a per-capita basis and accept donations, grants, and state budget allocations. In 1959, when the Northern Virginia Regional Park Authority was created, operations were 100 percent funded by tax dollars. By 2009, only 16 percent of operational expenses were supported by appropriations.[vii]

Another possibility is the expansion of NOVA Parks into Warren, Shenandoah and Rockingham counties. Due to a requirement for contiguous boundaries, Clarke County would have to become part of the authority for this option to be considered.

Regionally sponsored non-profit

The planning districts could sponsor a non-profit citizen organization to lead trail development similar to the Friends of the Lower Appomattox River (FOLAR). In this example, the Board of Directors is composed of 18 representatives, including one appointed and one elected representative from each of the six jurisdictions that adjoin the Lower Appomattox River as well as the Crater Planning District Commission and Virginia State University. FOLAR represents community leaders and citizens interested in promoting and enhancing the Appomattox River and the Appomattox River Trail. FOLAR began through the sponsorship of the Crater Planning District Commission (CPDC). The CPDC continues to partner with FOLAR on special projects and provides office space and equipment to staff members. FOLAR also partners with PlanRVA on special regional projects.

Locally owned but developed and managed through a regional structure

> *Roanoke River Rails-to-Trails, Inc., a 501(c)(3) tax-exempt Virginia corporation, was formed for the purpose of acquiring abandoned railroad rights-of-way for the development of the Tobacco Heritage Trail system. As a nonprofit, Roanoke River Rails-to-Trails is able to accept donations and apply for funding. The corporate bylaws call for representation from each county and each town desiring to join. Currently fifteen localities have joined the Rails-to-Trails Board. The corporation is coordinating the development of the Tobacco Heritage Trail project.* Halifax County

Although feedback has indicated a preference for a single entity to manage the corridor, local ownership with regional cooperation for development and management is always an option. To ensure consistency along the route, localities could form a non-profit, like Roanoke River Rails to Trails referenced above, or an advisory board, like the Roanoke Valley Greenways Commission, which coordinates trail development and maintenance among five member jurisdictions and several partner organizations.

Hybrid

Along with the models mentioned above, there is an opportunity to explore a creative hybrid scenario, particularly with the partnership capacity available in the Valley.

NEXT STEPS

Should a decision to acquire and develop the proposed trail be made, trail management must be considered. Responsibility and funding should be assigned to a managing entity/agency. The managing entity/agency will have to secure agreements from any managing partners. Some of the next steps needed for the acquisition include:

- Meet with Norfolk Southern to resolve technical matters, including deed and color of title issues, legal encumbrances, pending sales or legal claims.
- Research deeds (confirm legal ownership through a title search by a qualified title examiner with experience in historical railroad deeds, surveys, and legal descriptions)

- Assess risk
- Negotiate separate qualified appraisals and agree upon a sale price
- Initiate the abandonment process (Norfolk Southern)
- Follow the timelines defined by the Surface Transportation Board to acquire the rail line through railbanking or fee-simple purchase.
- Fundraising
- Secure the right-of-way in tandem with a survey to determine historic vs. current alignments, bridges, crossings, encroachments, exceptions, etc.

CONCLUSION

The alignment of the rail corridor is intact and there are no major issues with structures that would indicate this project is not feasible. If the corridor is purchased in fee simple, there may be deeds with reversionary clauses that impact the alignment. If the corridor is railbanked, it remains intact for potential passenger or freight use. Funding for acquisition, development and management of the rail trail will be vital to the feasibility of this project. A state assessment valued the corridor to Heritage Park at $17.39 million, but a third-party appraisal was not completed in time for this report.

The challenge of ongoing maintenance should be addressed through a dedicated funding source to ensure that the project moves forward. Table 13 summarizes the total costs associated with each component to execute this effort.

Table 13: Associated estimate costs for the Shenandoah Rail-to-Trail

Item	Total Cost
Acquisition	$15.0-25.0M
Trail Construction	$28.0M - $36.0M
Bridge Construction/Repairs	$26.9M
Preliminary Engineering	$4.0M - $6.0M
Rail Removal	$9.0 - $11.0M
Trailheads	$7.0M - $15.0M
Operating Costs	$1.4M/YR

All costs are in 2021 dollars

X. APPENDIX

A. Study Area Map

B. NSVRC Trail Map

C. Summary of Findings – Bridge and Culverts

D. Cost Estimates – Structures

E. Environment Desktop Review

F. Cost Estimates

The following supporting documents are available on the Feasibility Study resource page on the Department of Conservation and Recreation website: https://www.dcr.virginia.gov/recreational-planning/shen-rail-trail.

- **SD1 Resolutions** (PDF)
- **SD2 Notes from Listening Sessions** (PDF)
- **SD3 Spanish Outreach** (PDF)
- **SD4 MetroQuest Survey Results** (PDF)
- **SD5 Public comment** (PDF)
- **SD6 Architectural Resources** (PDF)
- **SD7 VDOT Property Valuation** (PDF)
- **SD8 2019 Chmura Economic Impact Study** (PDF)
- **SD9 2021 Cline Economic Impact Study**
- **SD10 At-Grade Crossing Review** (PDF)
- **SD11 Typical At-Grade Crossing** (PDF)
- **SD12 At-Grade Field Review** (PDF)
- **SD13 Trailheads Review** (PDF)

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[i] National Walkability Index Methodology and User Guide, available online at www.epa.gov/sites/default/files/2021-06/documents/national_walkability_index_methodology_and_user_guide_june2021.pdf.

[ii] Economics of Interventions to Increase Active Travel to School: A Community Guide Systematic Review, American Journal of Preventive Medicine, 2021;60(1):e27–e40

[iii] World Health Organization, Health economic assessment tool (HEAT) for walking and for cycling, available online at https://www.euro.who.int/__data/assets/pdf_file/0010/352963/Heat.pdf

[iv] Mental Health Benefits of Parks and Recreation, available online at https://www.nrpa.org/publications-research/park-pulse/mental-health-benefits-of-parks-and-recreation/

[v] Virginia Capital Trail Sponsorship and Maintenance Report, available online at https://rga.lis.virginia.gov/Published/2020/RD86

[vi] Regional Public Transportation Plan, available online at http://ridegrtc.com/statistics-reports/projects-plans/regional-transit-plan

[vii] Northern Virginia Regional Park Authority Agency Overview, available online at https://www.novaparks.com/sites/default/files/small%20online%20version.pdf