



**MIDDLE FORK GREENWAY
FEASIBILITY STUDY
November 2022**

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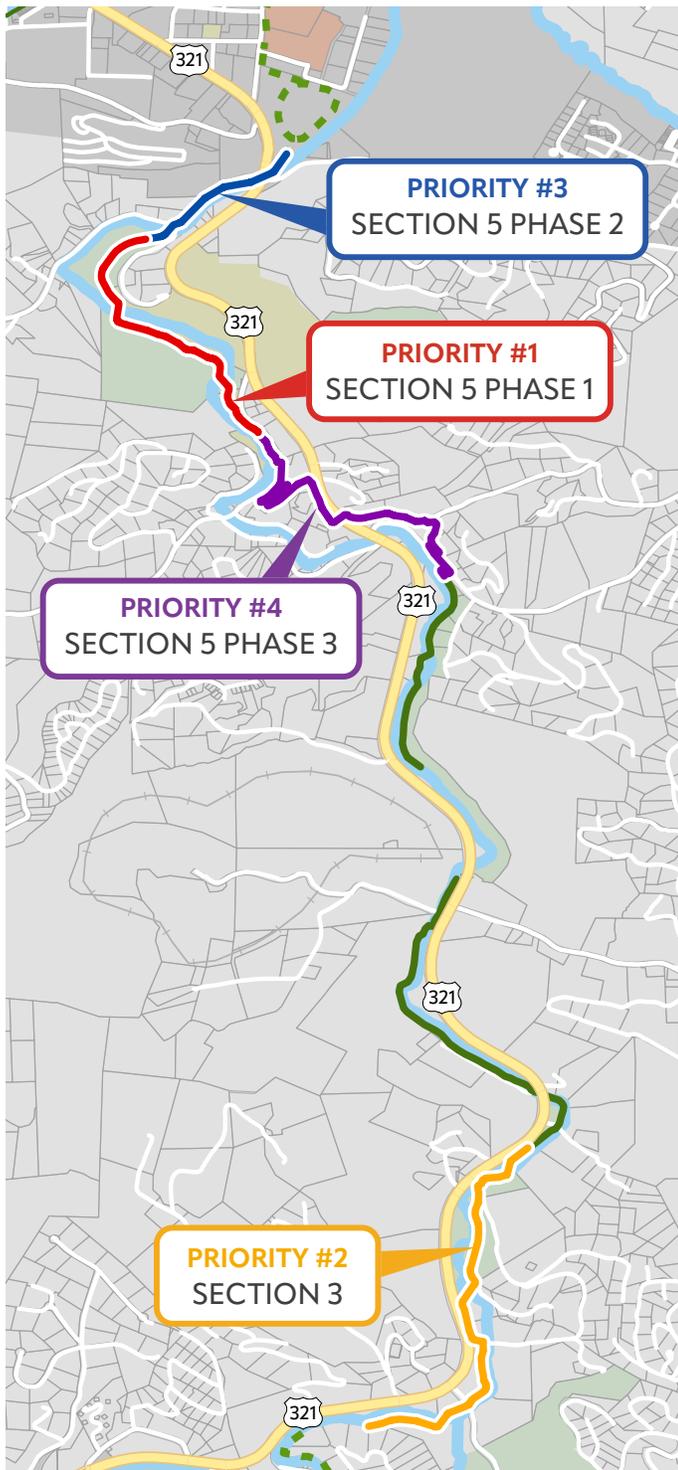
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EXECUTIVE SUMMARY

The Middle Fork Greenway (MFG) Feasibility Study assesses existing conditions, evaluates potential routes for opportunities and constraints, develops detailed cost estimates, and provides strategies for implementation for Sections 3 and 5 of the greenway as identified in the Middle Fork Greenway Master Plan. The project team developed and evaluated six route alternatives for each Section. Recommendations for preferred routes were identified through community input, technical analysis, input from the study steering committee, and landowner outreach by Blue Ridge Conservancy along the proposed trail corridor.



RECOMMENDED ROUTES

SECTION 3 (0.91 miles)

Section 3 begins on a mountain between US 321 and the Firehorn subdivision before crossing over the river via a pedestrian bridge between Faithbridge United Methodist Church and The Mustard Seed Market. The route then passes below the recently reconstructed Aho Rd bridge and continues alongside the river to Mack Hampton Rd. After crossing Mack Hampton Rd at-grade, the route turns west and follows the east side of US 321 before crossing over to the east side of the river via a second pedestrian bridge to Jennifer Ln. Utilizing the existing roadbed on Jennifer Ln, the route continues north through land owned by Blue Ridge Conservancy before crossing Dexter Dr at-grade and connecting to the existing section of the MFG at Sterling Creek Park on the west side of the river via a third pedestrian bridge. A trailhead is proposed adjacent to US 321 on the Blue Ridge Conservancy land, which will connect to the mainline MFG along Jennifer Ln via a connection trail with pedestrian bridge over the river.

SECTION 5 PHASE 1 (0.69 miles)

Section 5 Phase 1 begins at Payne Branch Park and heads north through land owned by Appalachian State University (ASU) before entering land owned by Blue Ridge Conservancy. Users will cross over the river via a pedestrian bridge and continue northwest as they descend along the side of the mountain before crossing back over to the east side of the river via a second pedestrian bridge as they enter the bottom lands of future Boone Gorge Park. The greenway then continues north through the eastern side of the future park past a potential trailhead location a potential connection trail which will create a loop trail down to the river.

SECTION 5 PHASE 2 (0.34 miles)

Section 5 Phase 2 continues north from the trailhead at future Boone Gorge Park and crosses over to the west side of the river via a pedestrian bridge adjacent to Old Blowing Rock Rd, which will require an at-grade crossing. A system of boardwalks between Jordan V Cook Rd and the river will carry users north towards Boone where the greenway will utilize the existing culvert to pass below US 321 and end at Watauga Medical Center property.

SECTION 5 PHASE 3 ALT 1 (0.85 miles)

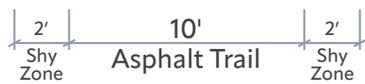
Section 5 Phase 3 Alt 1 begins at the existing trailhead at Goldmine Branch Park and crosses Niley Cook Rd at-grade. The route then climbs in elevation along the east side of Niley Cook Rd via a series of switchbacks to meet Mine Branch Rd. After crossing Mine Branch Rd at-grade, the greenway heads west and continues to climb as it crosses under a power transmission line until reaching the top of the east cut bank on US 321. Users then cross over US 321 via a pedestrian bridge and head down to roadway grade along the west side of the roadway. The route then turns west and descends north via a series of switchbacks and approaches an at-grade crossing of Payne Branch Rd into Payne Branch Park from the south.

SECTION 5 PHASE 3 ALT 2 (0.82 miles)

Section 5, Phase 3 Alt 2 begins at the existing trailhead at Goldmine Branch Park and heads north between the river and Niley Cook Rd within the power transmission easement. The route then crosses below US 321 via a pedestrian tunnel (located above the existing culvert) and climbs up to the west side of US 321 via a series of switchbacks along Riverview Ln. Users then continue north along the west side of US 321 up to the crest of the roadway. The route then turns west and descends north via a series of switchbacks and approaches an at-grade crossing of Payne Branch Rd into Payne Branch Park from the south.

GREENWAY DESIGN

A 10' wide paved trail with 2' shoulders is recommended for the mainline trail as it will require the least amount of long-term maintenance and has greater eligibility from the widest variety of funding sources. Asphalt pavement is recommended based on site conditions, anticipated trail use, and cost considerations. Limited sections of concrete pavement may be required to accommodate site conditions as necessary.



A slightly narrower 8' wide natural surface trail alternative for the mainline trail may also be considered. Although the initial cost of a natural surface trail is less than a paved trail, its overall life-cycle cost may be higher as it will likely require greater long-term maintenance (depending on use and a variety of other environmental factors). Funding sources and amounts for natural surface trails may be more limited as compared to those for paved trails.



COMMUNITY + STAKEHOLDER ENGAGEMENT

The team utilized the existing Middle Fork Greenway Executive Committee and its regularly scheduled bi-monthly meetings as the steering committee for this study. Steering committee members met three times throughout the duration of the project and provided guidance for the study by reviewing and sharing feedback on relevant data, community engagement efforts, alignment recommendations, and implementation strategies. A lunchtime public meeting was held virtually via Zoom on May 10th, 2022, to provide a study overview, review existing conditions and study considerations, present route alternatives, review the evaluation methodology and present recommendations for typical cross sections and access points/trailhead locations. Coinciding with the public meeting, the team launched an online public survey on May 10th, 2022, which was open for public comment until June 1st, 2022 and received 52 respondents. A sample of survey comments received are shown below:

"These sections are critical to connect Boone to the Greenway and Blowing Rock. I think alternatives should look at the fastest implementation time."

-Survey Respondent

"Very excited about the progression of this greenway. Having a connector from Blowing Rock to Boone would be amazing. I know I would personally use it almost daily and would consider biking to work."

-Survey Respondent

"Build it and they will come!"

-Survey Respondent

"Less surface roads and 321 that you have to cross the better. Safety for kids and people from cars should be a top priority and trying to route the greenway by the river but not close to the road when possible."

-Survey Respondent

"Completing the MFG is important for the lifestyles our area is known for. When you travel to other areas they already have these lengths in place and in use. Boone is behind. Keeping the trails in natural settings is healthy."

-Survey Respondent

IMPLEMENTATION HIGHLIGHTS

Successful implementation of the Sections 3 and 5 of the Middle Fork Greenway will require a coordinated and consistent effort with a wide range of community partners. Key agencies and partners include the Blue Ridge Conservancy, High Country RPO, NCDOT, Watauga County, Town of Boone, advocacy organizations, private partners, and members of the community.



PRIORITIZATION

Based on technical analysis, input from the steering committee and coordination with Blue Ridge Conservancy, Section 5 was broken into three phases for implementation. These phases and Section 3 were then prioritized for implementation as shown in the map to the right.

Additional implementation considerations outlined in Chapter 5 include the following:

- Identification of key partners and their associated roles to support project implementation including county and municipal partners, regional and state partners, NCDOT, private sector partners, and community partners / advocacy organizations.
- Plan detailing prioritized implementation of the project including defined actions, lead responsible for completing the action, partners to assist with completing the action, timeframe for completing the action, and defined performance measures for the action.
- Cut sheets for each implementation priority present a route description, location / limits, facility type(s), total length, structures required, road crossings (grade-separated and at-grade), trail connections, destinations served, potential real estate acquisition needs, potential permitting needs, and estimated project costs (including current year baseline construction cost, construction cost escalated to anticipated build year, design services, construction engineering and inspection services, project contingency and overall recommended project budget).
- Funding resources including a summary of funding sources used to complete previous sections of the MFG and identification of NCDOT funding opportunities, federal grant funding opportunities, public / private partnerships to leverage grant funding and volunteer support that may be used to complete Sections 3 and 5 of the MFG.
- Considerations for developing a greenway system maintenance plan including example maintenance tasks, task type and recommended frequency.



MIDDLE FORK RIVER
AT STERLING PARK



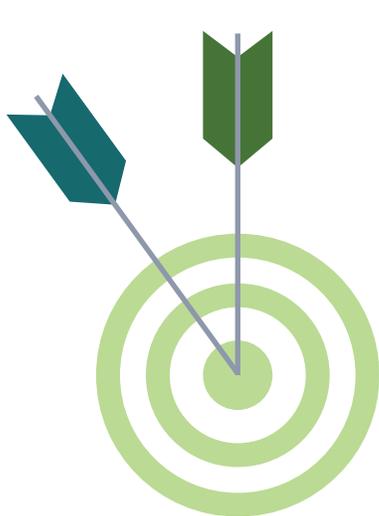
01 INTRODUCTION

INTRODUCTION

OVERVIEW + STUDY GOALS

The Middle Fork Greenway (MFG) was envisioned to provide residents and visitors alike with opportunities for recreation and active transportation, connecting people and places between the Town of Boone and the Town of Blowing Rock. The community has made great progress on the implementation of this vision in partnership with the Blue Ridge Conservancy (BRC), The Town of Boone, The Town of Blowing Rock, Watauga County, and North Carolina Department of Transportation (NCDOT). The recommendations presented in this plan were guided by a locally appointed steering committee, and driven by input from the community, landowners, and other interested parties. NCDOT funded this feasibility study for Sections 3 and 5 of the Middle Fork Greenway. Completed sections (paved and natural surface) of the Middle Fork Greenway are shown on the map on the following page.

Specific goals of this study are as follows:



1

EVALUATE GREENWAY ALIGNMENTS

Examine existing site conditions to identify opportunities and constraints and develop trail alignment alternatives for both the mainline greenway and identify any desirable connection trails.

2

EVALUATE TRAILHEAD OPPORTUNITIES

Examine existing site conditions along the study corridor to identify opportunities to include trailhead parking/amenity areas that may serve as a gateway for users to access the greenway.

3

GATHER STAKEHOLDER INPUT

Present alignment alternatives to the community/project stakeholders and gather input to help inform study recommendations.

4

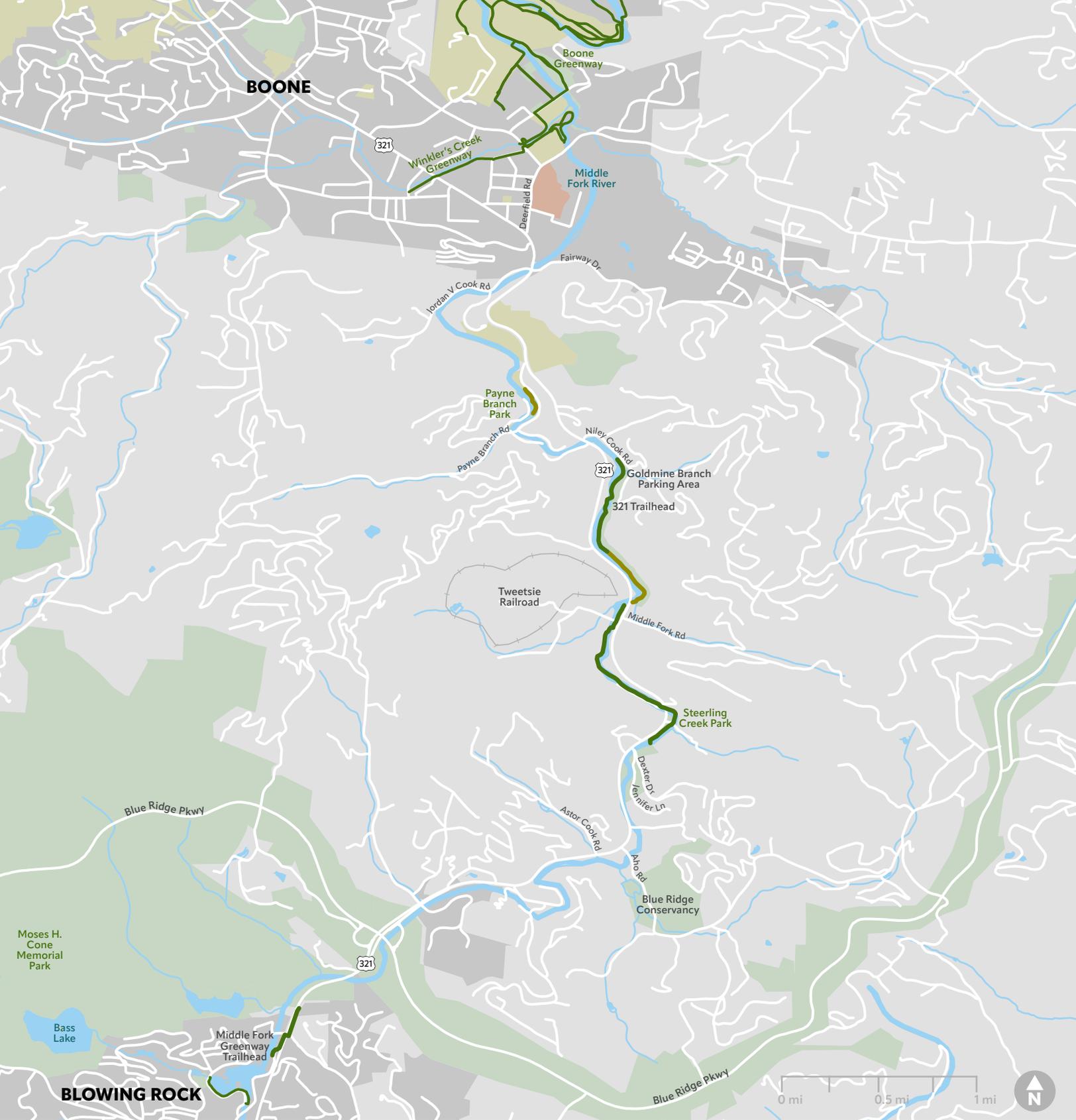
ESTIMATE COSTS

Estimate costs associated with the design and construction of Sections 3 and 5 of the Middle Fork Greenway for budget planning and project programming purposes.

5

PROVIDE RECOMMENDATIONS

Provide recommendations for the preferred greenway alignment(s), design criteria, typical sections, trailhead locations, and associated property acquisition needs. Outline the range of possible implementation scenarios, and potential funding sources.



MIDDLE FORK GREENWAY FEASIBILITY STUDY

EXISTING MIDDLE FORK GREENWAY

- LEGEND**
- MIDDLE FORK GREENWAY**
- Completed (Paved)
 - Completed (Natural Surface)
 - Existing Greenway
 - Roadway
 - Rail
 - Lake / Stream
 - Appalachian State Univ.
 - Medical Center
 - Park / Managed Lands
 - Municipality
 - County

BACKGROUND + SITE HISTORY

The Middle Fork Greenway is a Blue Ridge Conservancy project in partnership with Watauga County, the Town of Blowing Rock, the Town of Boone, and many community organizations and volunteers. This multi-use trail is broken up into six sections from Blowing Rock to Boone, each containing phases that depend on access, funding, and permitting. Overall, the entire trail will be approximately 6.5 miles long, resulting in over 15 miles of contiguous trail in the surrounding area. Major connections along the greenway will include the existing Boone Greenway, the Blue Ridge Parkway, the Mountains-to-Sea trail (MST), Shoppes on the Parkway, Tweetsie Railroad, Mystery Hill, three pocket parks and other natural areas, and Appalachian Regional Health's hospital and new acute care facility.

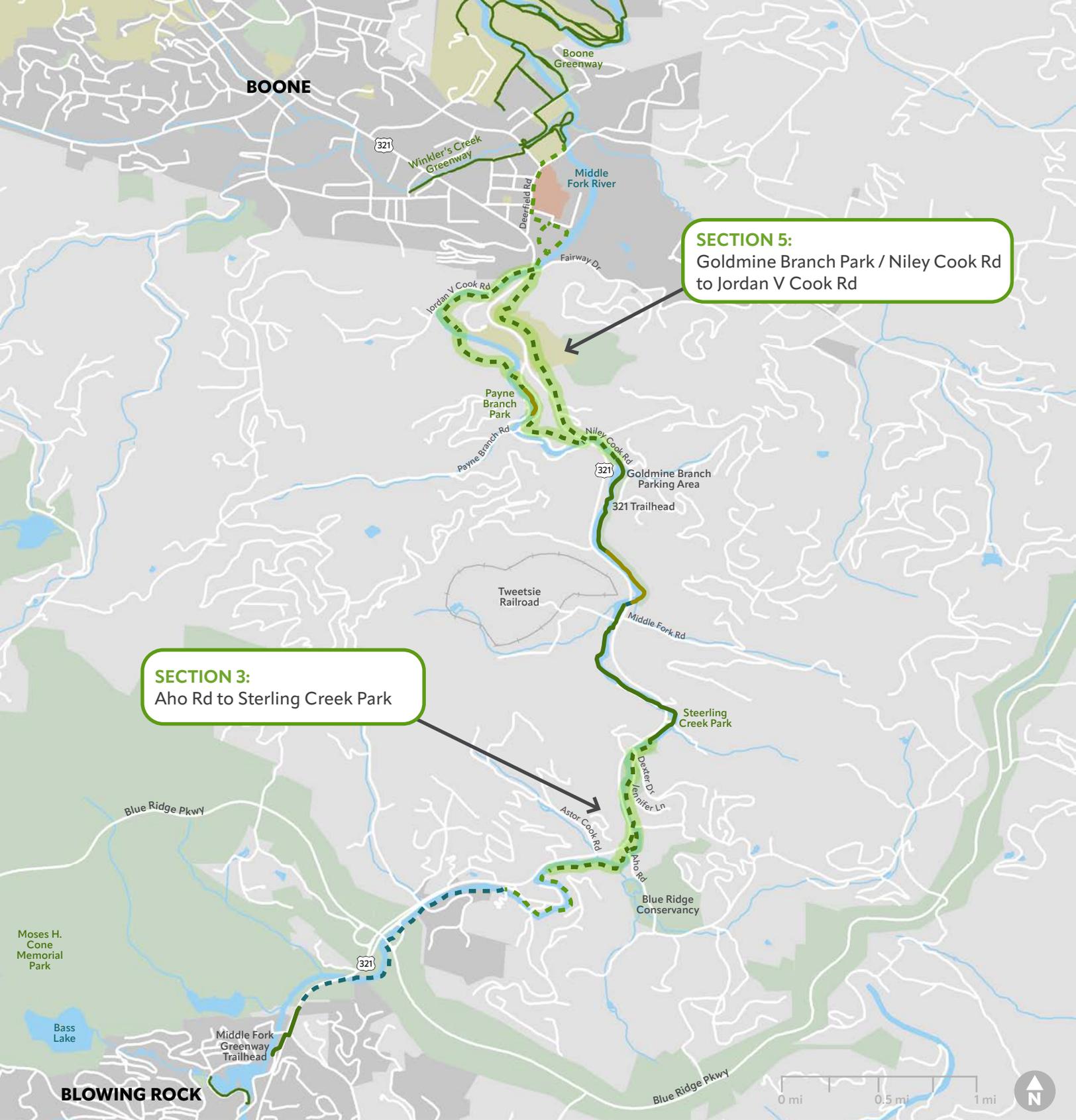
Today, roughly 1.5 miles of the greenway have been completed, with an additional 3 miles in progress. The greenway contains 10-foot-wide asphalt paths, natural surface trails, pedestrian bridges and boardwalks. Walking, jogging, cycling, rollerblading, skateboarding, and wheelchairs are permitted along the greenway.

Sections 3 and 5 as shown in the Middle Fork Greenway Master Plan are the focus of this feasibility study and are highlighted on the map (see right). Section 3 runs between Aho Road and Sterling Creek Park. Section 5 connects Jordan V Cook Road to Payne Branch Park and Niley Cook Road between Fairway Drive and the Goldmine Branch parking area.

BLUE RIDGE CONSERVANCY

Blue Ridge Conservancy partners with landowners and local communities to permanently protect natural resources with agricultural, cultural, recreational, ecological and scenic value in northwest North Carolina. The Middle Fork Greenway is a Blue Ridge Conservancy project in partnership with the Town of Blowing Rock, Town of Boone and Watauga County. With the help of many partners and driven by input from community members, the Middle Fork Greenway is coming to life segment by segment.





MIDDLE FORK GREENWAY FEASIBILITY STUDY CORRIDOR PHASES + ALIGNMENTS

LEGEND

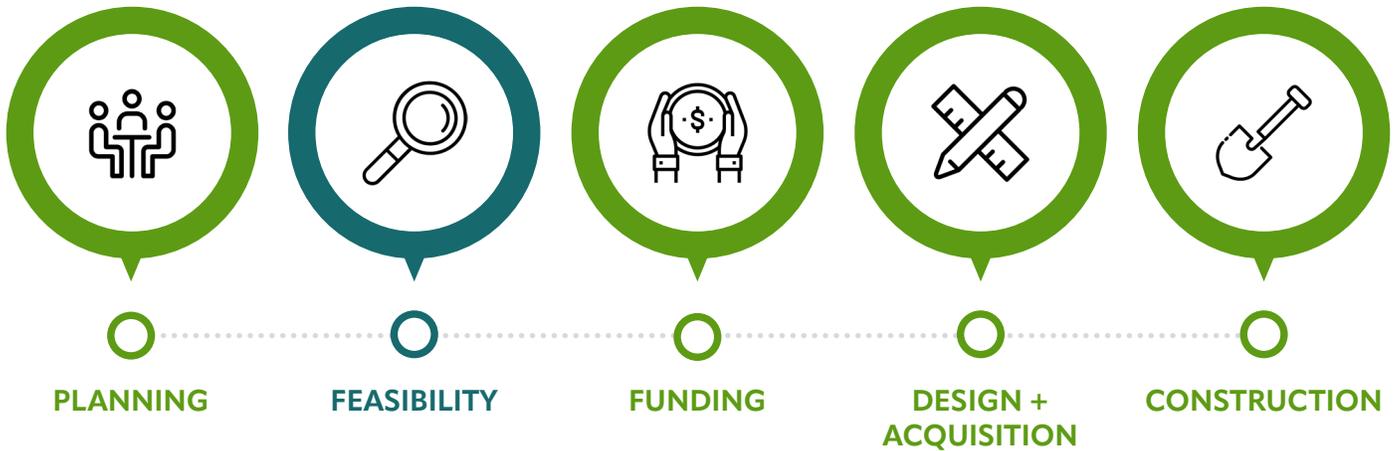
MIDDLE FORK GREENWAY

- Completed (Paved)
- Completed (Natural Surface)
- - - In Development
- - - Feasibility Study Segment
- - - Planned Segment

- Existing Greenway
- Roadway
- + + Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County

WHAT IS A FEASIBILITY STUDY?

Feasibility studies bridge the gap between conceptual planning, prioritization, and programming of projects. They build upon higher-level planning efforts and take a comprehensive look to identify possible alignment alternatives. The purpose of this type of study is to evaluate technical feasibility from a design, permitting, and constructability perspective. Input solicited from the local community and stakeholders help guide the recommended alignments. Quantity-based preliminary cost estimates are generated for the alignments to help inform further decision making, identify funding needs, and identify next steps for project implementation. It is important to note that a feasibility study does not present a final design for construction. Willing property owners and available funding will help determine the final alignment for a project.



PROCESS + SCHEDULE

The Middle Fork Greenway Feasibility Study started in November 2021 and concluded in July 2022. The study process was divided up into the following four phases:

- Existing Conditions
- Route Analysis
- Study Recommendations
- Implementation + Final Study

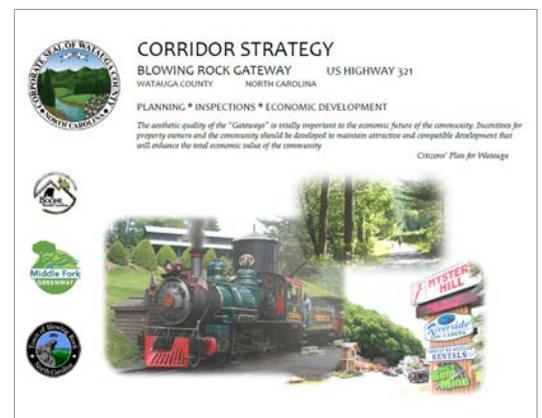
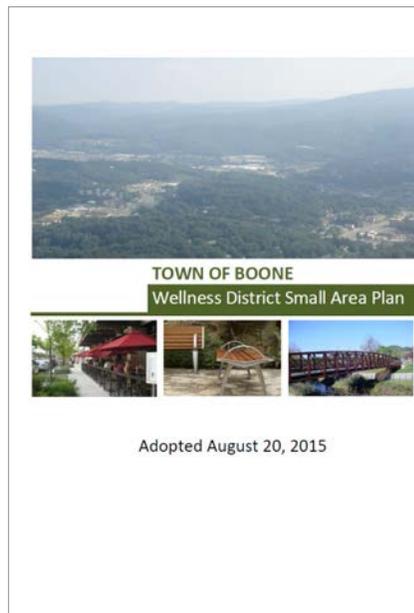
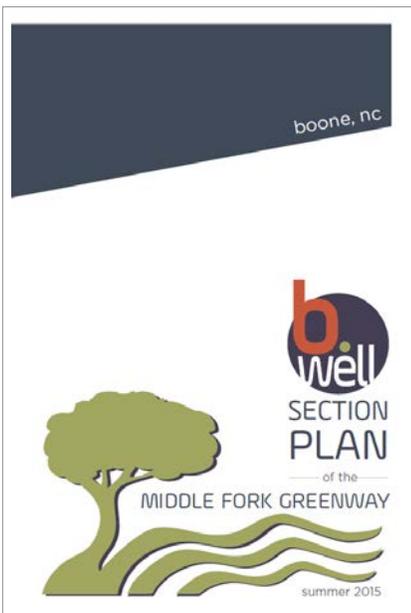
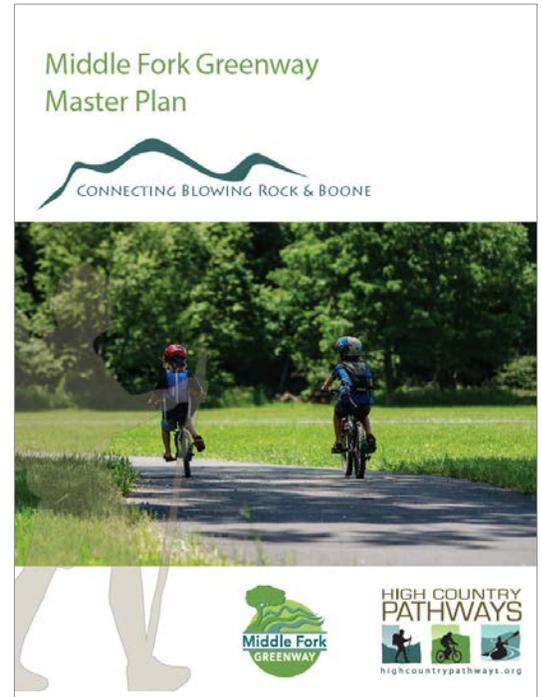
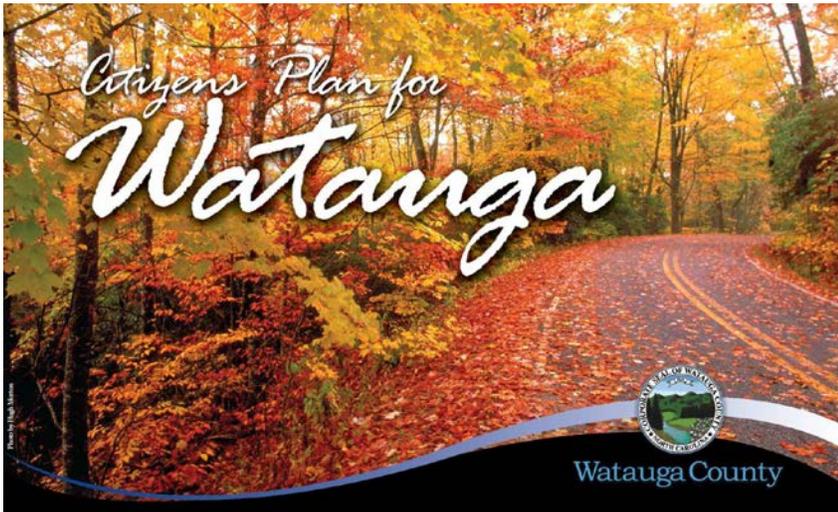
Key components for each phase are listed within the study process graphic below. Engagement efforts were integrated throughout the study process and included meetings with either a steering committee, local landowners, interjurisdictional partners, stakeholders, or the general public.



PREVIOUS PLANNING EFFORTS

The Town of Boone, the Town of Blowing Rock, Watauga County, agencies, and non-profits in the surrounding area have prioritized bicycle and pedestrian connectivity in planning efforts over the past decade. This table on the following pages provides a summary of key bicycle and pedestrian, transportation, and parks and recreation recommendations from previous plans and studies that are relevant to the Middle Fork Greenway Feasibility Study. A variety of previous planning efforts were evaluated for context and relevant information to this study including:

- Middle Fork Greenway Master Plan (2013)
- Middle Fork Greenway: An Economic Impact Study (2017)
- Blowing Rock Gateway Corridor Strategy (2019)
- Citizens' Plan for Watauga (2008)
- Watauga County Comprehensive Transportation Plan (2017)
- Watauga County Parks and Recreation Comprehensive System-wide Plan (2019)
- High Country Bike Plan (2014)
- Town of Boone Pedestrian and Bicycle Plan (2014)
- B. Well Section Plan of the Middle Fork Greenway (2015)
- Town of Boone Wellness District Small Area Plan (2015)
- Town of Blowing Rock Parks and Recreation Master Plan (2005)
- NCDOT Great Trails State Plan (2022)



EXISTING PLAN / STUDY

KEY RECOMMENDATIONS RELATED TO THE MIDDLE FORK GREENWAY FEASIBILITY STUDY

Middle Fork Greenway Master Plan (2013)

This plan outlines initiatives to establish a multi-use greenway trail to connect the Town of Blowing Rock, the Town of Boone, and the community of Todd. Collectively, this trail is called the New River Headwaters Trail (NRHT) and includes three trails: Middle Fork Greenway, Boone Greenway, and South Fork Greenway. The Middle Fork Greenway was identified as a major priority within the Boone Area Outdoor Recreation Plan that was completed in 2010. The last complete plan for the Middle Fork Greenway was developed by Appalachian State University's Planning and Geography Department in 2001.

According to this plan, the Middle Fork Greenway could potentially connect to the MST. The Watauga Medical Center officials are interested in providing a trail easement for the greenway and have even delineated the trail location in their preliminary site plans. The Master Plan's section analysis split the greenway into six sections and further into two routes (A and B). The plan found that Route A will require permission from four (supportive) landowners; Route A is more feasible and less costly, but not as aesthetically pleasing as the Alternative Route. Route B is less feasible due to the height of culvert #1 and the potential impact to the former New River Inn property.

Recommendations in the plan include the following:

- The installation of a trailhead at the newly relocated parking area for Highway 321 to Downtown Blowing Rock entrance.
- A shared-use path from the future four-car parking area to the Tanger Outlet intersection.
- Guardrails, retaining walls, and vegetation may be needed to enhance the user experience and/or promote safety throughout the corridor.

The strategic direction outlined in the plan includes the following five goals for the middle Fork Greenway:

1. Finalize the Phase I construction of Section 4: Tweetsie, which connects Tweetsie Railroad Theme Park to Sterling Creek Park.
2. Designate Planning Section I: Blowing Rock as the Official Phase II section and begin preliminary engineering.
3. Establish a Landowner Outreach Program.
4. Increase the visibility of the Middle Fork Greenway both locally and at the state level.
5. Develop a Financial Plan for implementing the Middle Fork Greenway.

Middle Fork Greenway: An Economic Impact Study (2017)

This study was completed in 2017 by the Institute for Transportation Research and Education (ITRE) on behalf of the Blue Ridge Conservancy to determine how the Middle Fork Greenway will strengthen the economy of Watauga County, Blowing Rock, and Boone. The three types of economic impacts that were examined included user health effects, property value changes, and economic growth and tourism impacts. The evaluation found that the greenway could result in:

- \$38,000 annual trips on the greenway
- \$10 million in health benefits (value of extended life over 10 years)
- 9.5% increase in the value of properties within a half mile of the greenway
- \$296,000 increase in local property tax revenue per year
- \$947,000 annual economic output
- 12 new jobs that support \$276,300 in labor income
- 12,000 annual tourist trips on the greenway – estimated to generate \$6 million in the local economy

EXISTING PLAN / STUDY

KEY RECOMMENDATIONS RELATED TO THE MIDDLE FORK GREENWAY FEASIBILITY STUDY

Blowing Rock Gateway Corridor Strategy (2019)

This gateway corridor study represents one of three paths for managing change identified in the Citizens' Plan for Watauga. The study focuses on strategies for improvements to the US Highway 321 corridor, which the Middle Fork Greenway traverses.

The study lists STIP project EB-5924 which is to construct Section I for the greenway from Blowing Rock along US 321 to the Blue Ridge Parkway. ROW and construction are anticipated to take place in 2022.

The study outlined a series of seven goals with strategies for the corridor. The first goal for the study is to create a sense of place and its first strategy is to actively support the Middle Fork Greenway as a focal point of the corridor.

Citizens' Plan for Watauga (2008)

The purpose of this plan is to provide a balance between managing change, preserving community traditions, protecting the natural environment, and enhancing "quality of life." Some community issues identified through the planning process for this plan that may be related to the Middle Fork Greenway include the protection of natural resources, preservation of unique community identities and mountain heritage, economic development/employment/affordable housing, educational opportunities, and widespread recreational opportunities.

The plan finds that tourism and recreation are important indicators of a successful economy. It states that the community must "fully develop and promote the greenways concept such as the new greenway connector near schools, trails, parks and other eco-tourism assets." Environmental stewardship is another key item in the plan, and it states that "planning initiatives should attempt to incorporate natural assets into future preservation projects, such as greenways, parks, conservation easements and other ventures, that would serve to protect such areas from serious damage or destruction."

Watauga County Comprehensive Transportation Plan (2017)

The CTP is a long-range multi-modal transportation plan that covers transportation needs through 2040. It includes Boone, Blowing Rock, Seven Devils, and Beech Mountain. Modes of transportation evaluated as part of this plan include highway, public transportation and rail, bicycle, and pedestrian. The 2013 CTP was revised in 2017 to reflect updates such as the 2014 Town of Boone Pedestrian and Bicycle Plan that was adopted after the Watauga County CTP was adopted and recent project completions. Middle Fork Greenway, Local ID WATA0001-M, is "proposed as a new 6.5-mile multi-use path between Boone and Blowing Rock parallel to US 321. The greenway would connect the existing Boone Greenway with Shoppes on the Parkway at the intersection of US 221 and US 321 in Blowing Rock. The Middle Fork River is part of the headwaters of the New River and as such is important to watershed, trout streams, and wetlands found in the vicinity. Watauga County Pathways is a non-profit organization working towards the preservation and eventual construction of this corridor."

In addition to recommended bicycle and pedestrian improvements at both the northern (Boone) and southern (Blowing Rock) termini for the Middle Fork Greenway, bus routes are proposed to run along the US Highway 321 corridor and could help provide additional access to the greenway.

EXISTING PLAN / STUDY**KEY RECOMMENDATIONS RELATED TO THE MIDDLE FORK GREENWAY FEASIBILITY STUDY**

Watauga County Parks and Recreation Comprehensive System-wide Plan (2019)

This plan aims to identify recreational needs of the county's citizens using various methods such as household surveys, interviews with staff, stakeholder interviews, and community meetings. It mentions that Payne Branch Park was established as a feature of the planned Middle Fork Greenway. Payne Branch Park is 4 acres in size and is a linear-shaped area along the creek with picnic tables and bench. The Middle Creek Greenway is displayed on maps of the High Country Regional Trail Plan within this comprehensive plan.

High Country Bike Plan (2014)

The purpose of the High Country Regional Bike Plan is to improve regional bicycle transportation in the area. This plan highlights the Middle Fork Greenway and at the time of plan adoption, the greenway only had 1 mile of paved greenway. Route segment #20 in the plan is described as 4-foot bike lanes within Boone and Blowing Rock Town limits, and on off-road paved path (Middle Fork Greenway - 4.9 miles) between the Towns.

Town of Boone Pedestrian and Bicycle Plan (2014)

The purpose of this plan is to guide the Town of Boone, NCDOT, and other local and regional partners in improving the existing pedestrian and bicycle infrastructure, constructing new facilities for walking and bicycling in Boone, and fostering a walk-and bike-friendly culture through the development of related programs and policies. This plan provides sections on existing conditions, bicycle and pedestrian network recommendations, and implementation strategies for projects. In addition, it highlights benefits from greenway construction in communities.

This plan shows that between 2007 and 2011 there were numerous bicycle-related crashes along US 321. US 321 was also identified as a priority area for walking improvements through a public comment form. Short-term recommendations near the northern terminus of the Middle Creek Greenway included paved shoulders and sharrows as riders enter Boone. Shared-use trails on roads with high traffic volume and/or speeds are included as long-term recommendations in the plan.

B. Well Section Plan of the Middle Fork Greenway (2015)

The plan notes that in 2015 the Middle Fork Greenway Task Force received funding from the Town of Boone to further refine plans for the Middle Fork Greenway in Boone's jurisdiction. The study area includes what is referred to as "Section 6" (out of six sections) within the 2013 Middle Fork Greenway Master Plan.

The plan identified steep slopes in the southern extent of the study area and adjacent to Blowing Rock Road, there are steep slopes that extend toward the Middle Fork Greenway floodplain. The plan finds that future development could provide for fill within this area, resulting in a new opportunity for trail connectivity. The plan recommends a figure 8 alignment for the trail throughout the east section of the B-Well District.

Town of Boone Wellness District Small Area Plan (2015)

The Town developed a Small Area Plan for tis wellness district to assure that the community has the capacity to meet its future medical needs. The purpose of this plan is to support economic development and direct investment efforts of the various existing and future institutional users located within the Plan Area.

The plan notes that the proposed Middle Fork Greenway would connect to the Town's greenway trail following possible routes through the district beginning at the Town's corporate limits to the south of the district.

EXISTING PLAN / STUDY

Town of Blowing Rock Parks and Recreation Master Plan (2005)

KEY RECOMMENDATIONS RELATED TO THE MIDDLE FORK GREENWAY FEASIBILITY STUDY

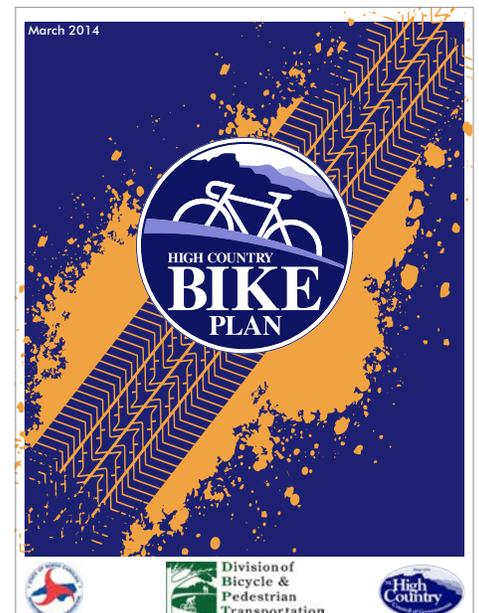
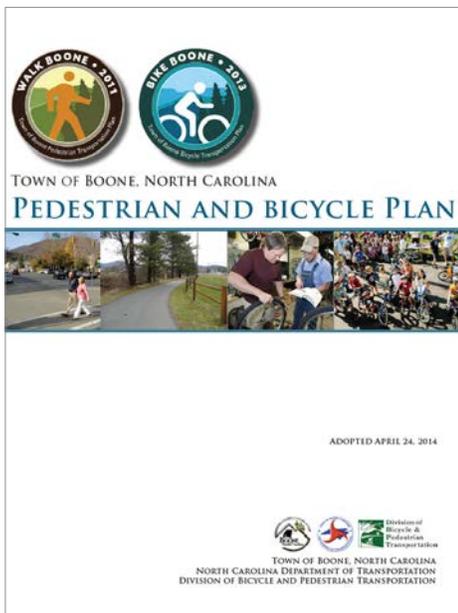
This master plan provides the Town of Blowing Rock with an accurate guide for decision-making as the Town begins to implement items such as the following:

- Park renovations, acquisitions, and developments
- Facility renovations, acquisitions, and developments
- Recreation programming strategies
- Implementation of improvements

A public needs assessment found identified the Middle Fork Greenway as an important project to connect destinations throughout the community. The plan states that the greenway will provide a bike trail which was currently absent within the Town of Blowing Rock. The plan recommended that the Town of Blowing Rock support the planning and coordination of the project.

NCDOT Great Trails State Plan (2022)

This plan is currently in progress and focuses on shared-use paths throughout the state of North Carolina. According to the plan, shared-use paths can serve transportation purposes, providing connections between where people live, work and play. This plan breaks the draft network into maps by NCDOT divisions. The map for Division 11 shows that the Middle Fork Greenway is part of a proposed shared-use path that connects to the Boone Greenway to the north and Blowing Rock to the south. Network gaps are shown between the northern terminus of the Middle Creek Greenway and NC 268 proposed shared-use paths, along with gaps at the southern terminus in Blowing Rock connecting to the Happy Valley Greenway in Caldwell County.



POLICY REVIEW

The table below provides a summary of key state, and local policies from NCDOT, Watauga County, Town of Boone, and the Town of Blowing Rock that may guide or impact the development of the Middle Fork Greenway. The following policies and guidelines were reviewed:

- Watauga County Planning and Development Ordinance
- Town of Boone Unified Development Code
- Town of Blowing Rock Land Use Code
- NCDOT Complete Streets Policy, 2019
- NCDOT Roadway Design Manual, 2021

EXISTING POLICY	KEY ORDINANCES RELATED TO THE MIDDLE FORK GREENWAY FEASIBILITY STUDY
Watauga County Planning and Development Ordinance	<p>Section 2. Specific Standards. (J) Other Development. Retaining walls, sidewalks and driveways in regulated floodways and NEAs. Retaining walls and sidewalks and driveways that involve the placement of fill in regulated floodways shall meet the limitations of Article IV, Section 6 of this ordinance.</p> <p>Section 4. Density Averaging (F). The property or portions of the properties that are not being developed will remain in a vegetated or natural state and will be managed by a homeowners' association as common area, conveyed 302 to a local government as a park or greenway, or placed under a permanent conservation or farmland preservation easement unless it can be demonstrated that the local government can ensure long-term compliance through deed restrictions and an electronic permitting mechanism.</p> <p>Section 6. Vegetated Setbacks Required (C). No new development is allowed in the buffer except for water dependent structures or other structures such as flag poles, signs, and security lights which result in only minimal increases in impervious surface, and public projects such as road crossings and greenways where no practical alternative exists. These activities should minimize built-upon surface area, direct runoff away from the surface waters and maximize the utilization of stormwater Best Management Practices.</p>
Town of Boone Unified Development Code	<p>Greenway Definition: A corridor of protected open space, usually located adjacent to natural features that is managed for conservation and/or recreation purposes.</p> <p>14.03 Intensity Standards: Unless otherwise provided in this Ordinance, development shall comply with the intensity regulations set forth for the district. Review Appendix B to view comparative tables that comprehensively list the intensity regulations set forth for the zoning districts enumerated in Section 14.01. A. Subject to the other provisions of this Ordinance, if (i) any portion of a tract lies within an area that is part of a proposed public park, sidewalk, greenway, bikeway, or other public improvement proposed by the Town and (ii) the owner of the tract, with the concurrence of the Town, dedicates to the Town that portion of the tract then, when the remainder of the tract is developed, the permissible density at which the remainder may be developed shall be calculated by regarding the dedicated portion of the original lot as if it were still part of the lot proposed for development.</p> <p>Parking Reductions: In order to promote a pedestrian-oriented, human-scale, urban form and multi-modal access, parking reductions are allowed as provided below. The permit-issuing authority may adjust the minimum/ maximum number of parking spaces required when one or more of the following is applicable: A 10% reduction in the number of required parking spaces for developments located adjacent to a public greenway system with pedestrian/ bike linkages and designated bicycle parking areas. If the number of required off-street parking spaces cannot be reasonably provided</p>

EXISTING POLICY

KEY ORDINANCES RELATED TO THE MIDDLE FORK GREENWAY FEASIBILITY STUDY

Town of Boone Unified Development Code (continued)

on the property associated with the principal use, then spaces may be provided on adjacent or nearby lots, satellite parking lots may be located up to a half-mile (0.5 mi) from the principal use building if served by a transit line, shuttle, or located along a dedicated pedestrian sidewalk or greenway trail. Written permission from the owner/person responsible for the satellite parking spaces must be provided. The applicant shall provide written acknowledgment that continuing the validity of his permit depends on his continuing ability to provide the requisite number of parking spaces.

The dedication of a greenway easement may be used to satisfy the requirements for recreational space.

23.08.02 An easement for the following items shall be conveyed to the Town where required due to insufficient right-of-way: A. Public sidewalks; and B. Any greenway or alternative method of pedestrian circulation as further described in Subsection 23.08.04; and C. In the event that circumstances may change over time, any area as to which the applicant has been permitted to pay a fee-in-lieu rather than install required sidewalks as further described in Subsection 23.08.05.

23.08.04 Alternative Methods for Pedestrian Circulation: A. When, with respect to a development parcel, a public greenway or other alternative walkway (for purposes of this section, "greenway") has been identified in a fully adopted government alternative transportation plan or other duly-adopted plan, or where a proposed public greenway will connect to an existing greenway or to a planned greenway that is expected with reasonable certainty to be constructed within the next five years or that is approved and funded by the NCDOT, the following shall be required as applicable: 1. The permit-issuing authority may allow or require the installation of a public greenway instead of sidewalk. A request to install a public greenway shall be supported by a site plan depicting the location and dimensions of the greenway, a description of the method of construction, and any other information deemed necessary by the Administrator. 2. If a public greenway is to be constructed upon the development parcel at the expense of the town or another third party, instead of constructing the greenway the developer shall pay fee-in-lieu of construction as provided at 23.08.05(D). 3. If a public greenway is already in place on the development parcel, the developer shall not be required to install the section of sidewalk that otherwise would be required to be installed along the same boundary or boundaries of the parcel.

29.08.02 No new development is allowed in the buffer except for water dependent structures and public projects such as road crossings and greenways where no practical alternative exists. These activities should minimize built upon surface area, direct runoff away from the surface waters and maximize the utilization of stormwater Best Management Practices.

31.06.03 Use of Bufferyards. Required bufferyards shall not be disturbed for any reason except for approved driveway openings, pedestrian or bicycle paths, designated greenways, utilities, drainage ways, bioretention areas, walls, fences, and other passive or minor uses compatible with the general separation of land uses and provided that the total number of required plantings are still met. Approval from the Administrator is required prior to initiating any disturbance of the buffer.

EXISTING POLICY**KEY ORDINANCES RELATED TO THE
MIDDLE FORK GREENWAY FEASIBILITY STUDY**

Town of Boone Unified
Development Code
(continued)

3.13 In cooperation with property owners within and bordering historic landscapes and ecologically sensitive areas, the Town of Boone will encourage historically appropriate tree plantings of indigenous species, especially within parks and along stream corridors; maintain appropriate recreational trails through ecologically sensitive areas and public parks in order to increase public awareness of and participation in the preservation of these areas and to discourage the misuse of these areas; and monitor the condition of trees and other plantings within natural areas, public parks, and along streetscapes to track and prevent the encroachment of diseases and pests.

The Town of Boone and its residents should observe the following standards in managing these important cultural landscapes: 11.1 Preserve historic landscape features that are critical to site identity and form, including landforms, topography, roadways, pathways, trails, trees, and other plantings (both natural and planned), fences, and other resources.

11.2 Preserve and protect significant views into, out of, and within parks and public spaces. Carefully weigh the impact on both visitors and nearby residents and businesses when adding or removing landscape features, trails, walkways, and roadways.

Town of Blowing Rock
Land Use Code

Section 16-13.3. Dedication of Open Space. If any portion of any lot proposed for residential development lies within an area designated on an officially adopted Town recreation plan as a neighborhood park or part of a greenway system, the area so designated (not exceeding five percent of the total lot area) shall be included as part of the area set aside to satisfy the requirement of Section 16-13.1. This area shall be dedicated to public use.

Section 16-16.40. Buffer Areas Required. No new development is allowed in the buffer except for water dependent structures, other structures such as flag poles, signs, and security lights that result in only diminutive increases in impervious area, and public projects such as road crossings and greenways where no practical alternative exists. These activities should minimize built-upon surface area, direct runoff away from the surface waters and maximize the utilization of stormwater Best Management Practices.

16-12.20.2 Pedestrian Amenities. Sidewalks, trails, paths, greenways, etc. that link the development of with surrounding neighborhoods and commercial developments. These links will provide connectivity and opportunities for citizens to walk or bike to commercial destinations without the reliance of vehicles.

Section 16-12.7. Density on Lots Where Portion Dedicated to Town. Subject to the other provisions of this section, if any portion of a tract lies within an area designated on any officially adopted Town plan as part of a proposed public park, greenway, or bikeway, and before the tract is developed, the owner of the tract with concurrence of the town, dedicates to the Town that portion of the tract so designate, then, when the remainder may be developed shall be calculated in accordance with the provisions of this section.

EXISTING POLICY

KEY ORDINANCES RELATED TO THE MIDDLE FORK GREENWAY FEASIBILITY STUDY

NCDOT Complete Streets Policy, 2019

The NCDOT Complete Streets Policy Update was adopted by the Board of Transportation in August 2019. This policy requires NCDOT to consider and incorporate multimodal facilities in the design and improvement of all transportation projects in North Carolina. The adopted Comprehensive Transportation Plan (CTP) is considered the controlling plan for the identification of nonmotorized facilities to be evaluated as part of a roadway project. The CTP may include and/or reference locally adopted plans for public transportation, bicycle and pedestrian facilities, and greenways. Bicycle, pedestrian, and public transportation facilities that appear in the CTP directly or by reference will be included as part of the proposed roadway project, and NCDOT is responsible for the full cost of the project. Bicycle, pedestrian, and transit facilities incidental to a roadway project where a need has been identified through the project scoping process but not identified in an adopted plan may be included in the project. Inclusion of these incidental facilities requires the local jurisdiction to share the incremental cost of constructing the improvements based on population thresholds. The policy also establishes maintenance responsibility for active transportation facilities. Bicycle, pedestrian, and transit improvements inside a municipal boundary are subject to local maintenance. For multi-modal improvements outside of a municipal boundary, separated facilities (outside of the roadway) such as sidewalks, sidepaths, and multi-use paths, will require a maintenance agreement with the county. Projects that have not completed environmental review prior to August 2019 are subject to the Complete Streets Policy.

NCDOT Roadway Design Manual, 2021

The Roadway Design manual provides general design information, design criteria, and plan preparation guidance for NCDOT roadways. Guidance on multimodal design elements can be referenced in Part 1, Chapter 4 Sections 4.14, 4.15, and 4.16. Guidance states that shared-use paths, often referred to as greenways, are paths physically separated from motor vehicle traffic and used by pedestrians, bicyclists, skaters, wheelchair users, and other non-motorized users. Most shared-use paths are designed for two-way travel. Sidepaths are shared-use paths located immediately adjacent to and parallel to the roadway, or within the right of way. Sidepaths and other shared-use paths are wider than sidewalks, accommodating both bicyclists and pedestrians, and are used for both transportation and recreational uses. The width of a shared-use path may vary, based on expected user volumes and context. Minimum widths do not include graded areas or buffers on either side of the pathway.

- Desirable width – 12 to 14 feet
- Minimum width – 10 feet; 8 feet in exceptionally constrained areas
- Vertical clearance, minimum – 8 feet

Shared-use paths follow federal requirements for accessibility per the U.S. Access Board and the U. S. Department of Justice. Refer to PROWAG Chapter 3 Section R302.5 and R302.6. Minimum requirements follow the 2010 ADA Standards for Accessible Design.

Refer to NCDOT Minimum Design Recommendations for Greenways for pavement design, when applicable.

Refer to AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, and AASHTO Guide for the Development of Bicycle Facilities 2012 Fourth Edition, Chapter 5 for more detailed information.

For Pedestrian Roadway Crossing, refer to NCDOT Roadway Standard Drawings Std. Nos. 848.05 and 848.06 for detailed dimensions for pedestrian refuge islands, crossing islands at channelized right turn lane intersections, curb extensions, and raised crossings.

PROJECT BENEFITS

The formation of greenway networks can result in positive impacts to the communities they serve. Benefits to the community significantly increase due to the expanse of benefits distributed across a large contiguous area. Benefits achievable from greenway networks include, but are not limited to the following:

- Enhance Health and Well-being
- Environmental Stewardship
- Catalyst for Economic Impacts
- Increased Mobility Options
- Enhance Cultural Awareness
- Promote Equity
- Increase Safety



Family Accessing the River. Credit: Middle Fork Greenway

ENHANCE HEALTH + WELL-BEING

Provide access to facilities for active living and connecting with nature.

For every \$1 investment in trails for physical activity led to \$2.94 in direct medical benefit.



Pressures associated with urban development often result in increased stress levels (i.e., noise and safety concerns linked to traffic). Improving access to nature through the construction of greenways helps to reduce these stressors and improve well-being for its users. Greenways and trails provide a safe and comfortable environment for physical recreation opportunities such as running, jogging, biking, or simply going for a walk. Providing communities with access to greenways or parks allows users to rest or recharge and allow residents to improve their mental and physical health.

Benefits range from short to long-term effects in both physical and mental health. Trails and parks provide a safe environment for activity and with long-term usage can improve cardiovascular health and reduce the chance of being diagnosed with cardiovascular, skeletal, and other potentially life-threatening ailments. According to a study on the cost-benefit analysis of physical activity using greenways and trails revealed that for every \$1 investment in trails for physical activity led to \$2.94 in direct medical benefit. The sensitivity analyses indicated the ratios ranged from 1.65 to 13.40. Therefore, building trails is cost beneficial from a public health perspective (Wang et al., 2005).

The American Diabetes Association cites walking as a powerful tool in the battle against diabetes. Walking can be done anywhere but when communities invest in trail networks walking becomes easier, safer, and more fun. Greenway trails are free from the cost barriers of fitness center fees and equipment costs. Research has established that a modest two hours of walking per week lowers rates of diabetes.

Other greenway-related exercises like running and cycling provide even greater health gains. When using greenway trails, users are more likely to interact with other members of the community, improving the social health of both the individual and overall community. This has been proven to reduce stress and diminish depression while also promoting overall positive health outcomes.

Greenways also provide a critical opportunity to connect children with nature. Studies have shown that regular non-structured play (also known as “nature play”) in a natural setting reduced symptoms of Attention-deficit/hyperactivity disorder (ADHD). Connecting with nature allows children and adults alike to release stress, engage in physical activity and find space for contemplation.

The High Country excels in providing access to outdoor recreational activities through its parks and newly constructed segments of the Middle Fork Greenway. Future connections between the Watauga County Medical Center, acute care facility, and the Middle Fork Greenway will provide health care providers and their patients with options for safe walking and cycling. Health care providers recognize the benefits of safe walking and cycling, and some have started prescribing trail walking regimens to their patients.

ENVIRONMENTAL STEWARDSHIP

Support clean air and rivers; preserve habitat; mitigate flooding.

Vegetation can help provide shade, filter pollution from runoff, & provide a source of food for local wildlife.



Greenways located along stream corridors, utility easements, and through natural habitats tend to coincide with the protection and enhancement of natural elements such as riparian buffers, wildlife habitats, and functional ecosystems. Where development has resulted in fragmentation of habitats, greenways allow for wildlife to traverse the landscape with minimum human interaction. Greenways also act as a “filter” between water bodies and development, filtering toxins and run-off from roads and developments to reduce the amount of toxins entering the local water systems. With the ability to reduce the velocity of water from rain events, greenways mitigate environmental degradation from erosion and sedimentation.

Greenways also directly and indirectly purify the air, reducing the amount of fossil fuel exhaust and ozone being released into the atmosphere. Vegetation is also critical for its ability to absorb pollutants and then releases oxygen back into the atmosphere. In addition, vegetation along the Middle Fork River can help shade and keep the water cool for trout, filter pollution from runoff, provide a source of food, and a corridor for migration. As the High Country urbanizes, the protection of headwater streams becomes more evident to preserve drinking water, recreational opportunities, and an overall quality of life.

Comprehensive greenway systems attract new businesses and bring economic life to communities around the world. As an example, the East Coast Greenway, a proposed trail connecting the eastern seaboard from Maine to Florida, positively impacts the Triangle by generating over \$90 million in related revenue and taxes per year and 800 temporary and permanent jobs through tourism and trail development.

Greenways benefit the surrounding area on a micro-economic scale by increasing adjacent property values and enticing tourism and economic activity near trail corridors. Not only does proximity to a greenway trail provide a strong selling-point, but adjacent home and property values are statistically higher than comparable properties further from greenways.

The High Country relies on tourism as an economic driver for the region. Existing and planned outdoor experiences in the High Country attract tourists to explore these resources. In doing so, tourists spend money on lodging, shopping, and restaurants when they visit these outdoor destinations.

CATALYST FOR ECONOMIC IMPACTS

Attract talent, tourism, and business through public investment.

Outdoor experiences in the High Country attract tourists to explore its natural resources.



INCREASED MOBILITY OPTIONS

Create active transportation options for residents between Boone and Blowing Rock.

Trips under 3 miles could be taken by bike or on foot in 20 to 30 minutes.



More than 45% of all driving trips in the US are under 3 miles, and 60% of trips are less than 5 miles. These trips, which could be taken by bike or on foot in 20 to 30 minutes, represent opportunities for mode shifts to biking and walking in communities across the United States.

Communities that are increasing their active transportation mode shares invest in well connected, multi-modal networks that allow people of all ages and abilities to bike and walk to their desired destinations. Connectivity investments that focus on active transportation make better use of existing facilities and enable more users to connect to their destinations.

The Middle Fork Greenway corridor provides people with an alternative to driving their cars by providing bike and pedestrian access between Boone and Blowing Rock.

ENHANCE CULTURAL AWARENESS

Define community identity through placemaking, public art, branding, and wayfinding along the greenway corridor.

The Middle Fork Greenway's branding communicates that a connection between people, nature, and culture is important to the community.

Residents in rural and suburban communities often desire the space around them to be maintained to ensure a certain quality of life and preserve the historic and cultural perception of the area. The protection of natural and culturally significant places allows a community to maintain a sense of place for not only local residents, but for tourism and economic purposes.

Redevelopment of underutilized community resources with active transportation infrastructure brings a new sense of identity, as observed at the American Tobacco Campus in Durham, North Carolina. Industrial uses prohibited public use along the corridor until the development of the trail activated the rail corridor and adjacent neighborhoods. As a result, greenways prove to be a catalyst for urban revitalization and restoration of economic vitality in vacant or underused areas. The incorporation of interpretive signage and public art have the potential to capture and celebrate the community, past and present and enhance cultural awareness and connection to community identity.

Paired with economic benefits and community identity, greenways add and protect aesthetically pleasing aspects of a community. Not only is the natural environment accessible to the public, but with the addition of artwork such as commissioned sculptures and murals an added aesthetic is achievable. This improves the user experience and attracts users who would otherwise not regularly use greenways and trails.

The Middle Fork Greenway's branding guidelines and wayfinding elements will help contribute to placemaking along the corridor and solidify the community's perception of the greenway as a destination. The visual identity of the greenway is natural, friendly, and inclusive thereby communicating that a connection between people, nature, and culture is important to the community.

PROMOTE EQUITY

Expand access to recreational and active transportation opportunities for all residents.

The Middle Fork Greenway will expand access to parks, the Middle Fork River, the medical center, and local communities in the surrounding area.

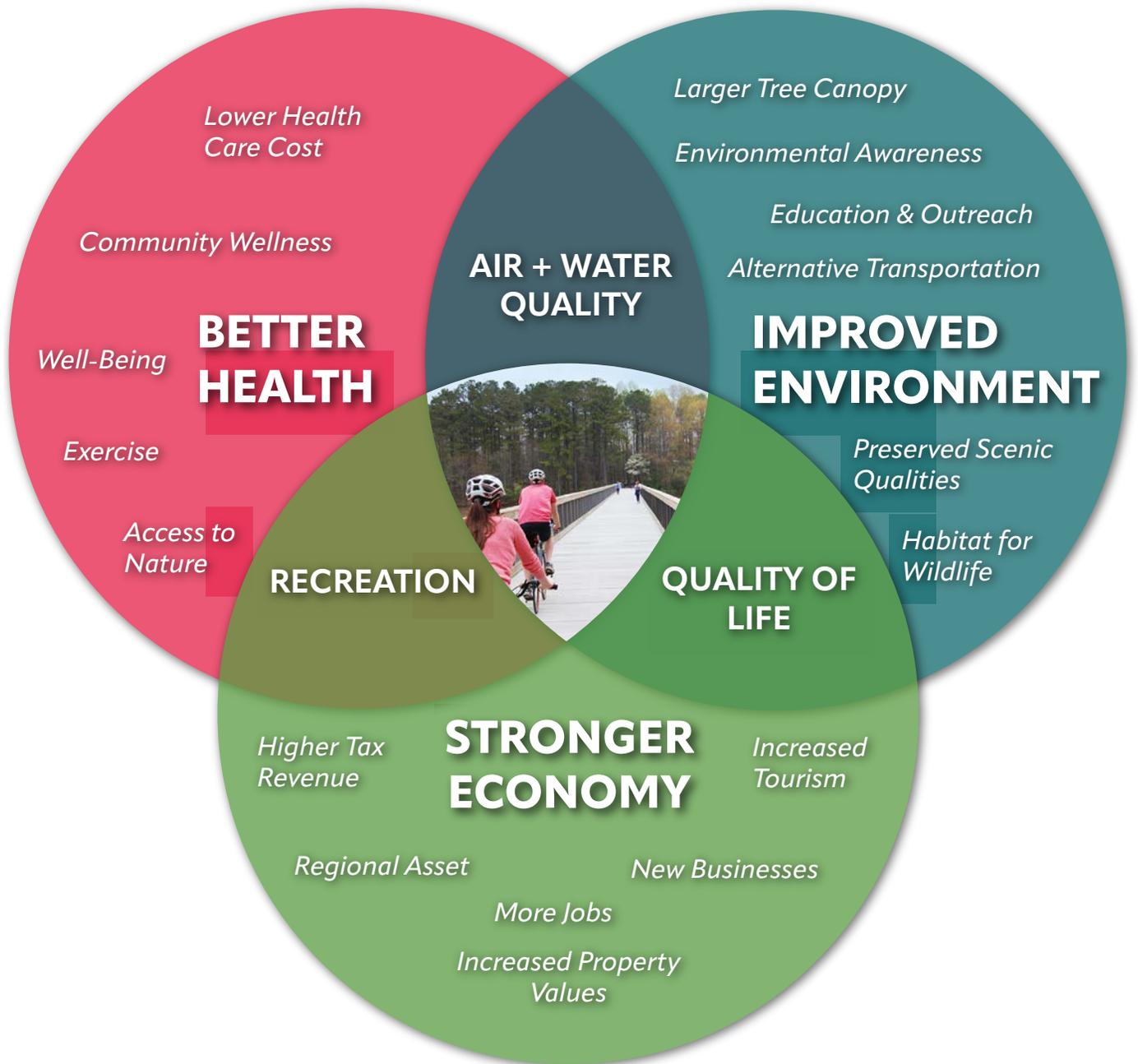
Ensuring residents have access to recreational and active transportation opportunities that are affordable and convenient is fundamental to efforts reducing income inequality. Newly constructed segments of the Middle Fork Greenway between Boone and Blowing Rock will expand access to parks, the Middle Fork River, the medical center, and communities in the High Country region. Several parking lots are distributed along the Middle Fork Greenway corridor to increase equitable public access to both the greenway and the river.

INCREASE SAFETY

Create safe access for greenway users of all ages and abilities.

The Middle Fork Greenway will serve as a safe and separated facility for outdoor enthusiasts to enjoy.

According to North Carolina's state bicycle and pedestrian plan, WalkBikeNC, almost 200 bicyclists and pedestrians are killed each year being struck by an automobile in the state. In its 2014 Benchmarking Report, the Alliance for Biking and Walking ranked North Carolina 42nd and 46th worst for pedestrian and bicyclist fatality rates per capita, respectively. Safe pedestrian and cycling infrastructure is limited near the largest populated areas in the High Country, so the Middle Fork Greenway will serve as a safe separated facility for outdoor enthusiasts to enjoy. Greenway trails serve as safe off-road transportation alternatives for users who wish to travel by bike or foot to key community destinations such as schools, shopping areas, restaurants, work, and local attractions.





MIDDLE FORK RIVER
NORTH OF
PAYNE BRANCH PARK

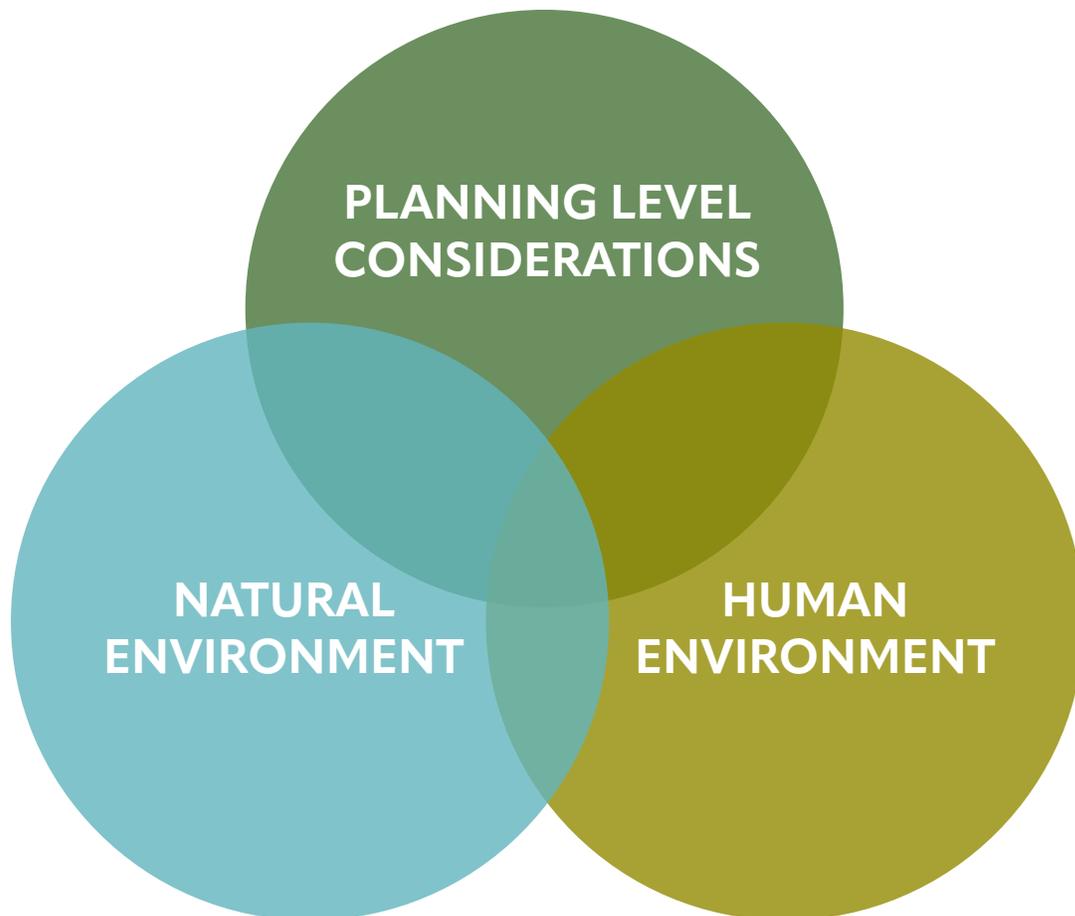


02 STUDY CONSIDERATIONS + ALTERNATIVES DEVELOPMENT

STUDY CONSIDERATIONS + ALTERNATIVES DEVELOPMENT

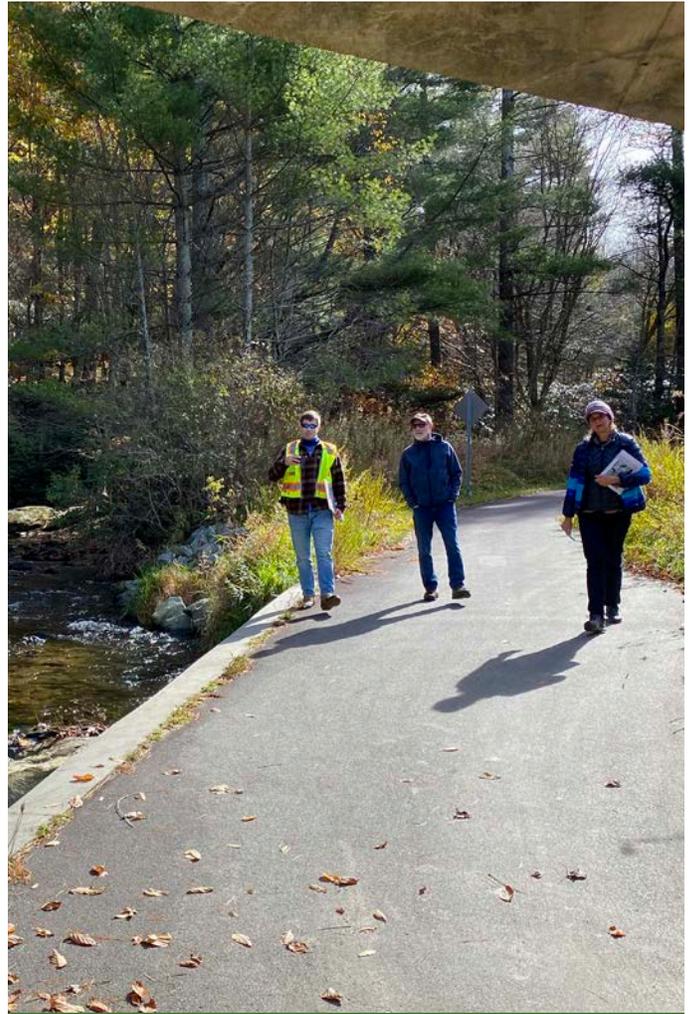
OVERVIEW

This study considers both natural and human environmental constraints, as well as planning level considerations. All recommendations detailed later in this report were informed by a thorough analysis of existing conditions, including, but not limited to, a review of existing plans and policies, an inventory of considerations for the human and natural environments, planning level considerations, a safety evaluation of greenway designs, and stakeholder input. All recommendations, approximated costs, and data presented in this study are based on publicly available Geographic Information Systems (GIS) data, aerial imagery, and LiDAR topography data. A review of GIS data and documented planning efforts were supplemented with site visits to the study area to gain a better understanding of local community needs, environmental resources.





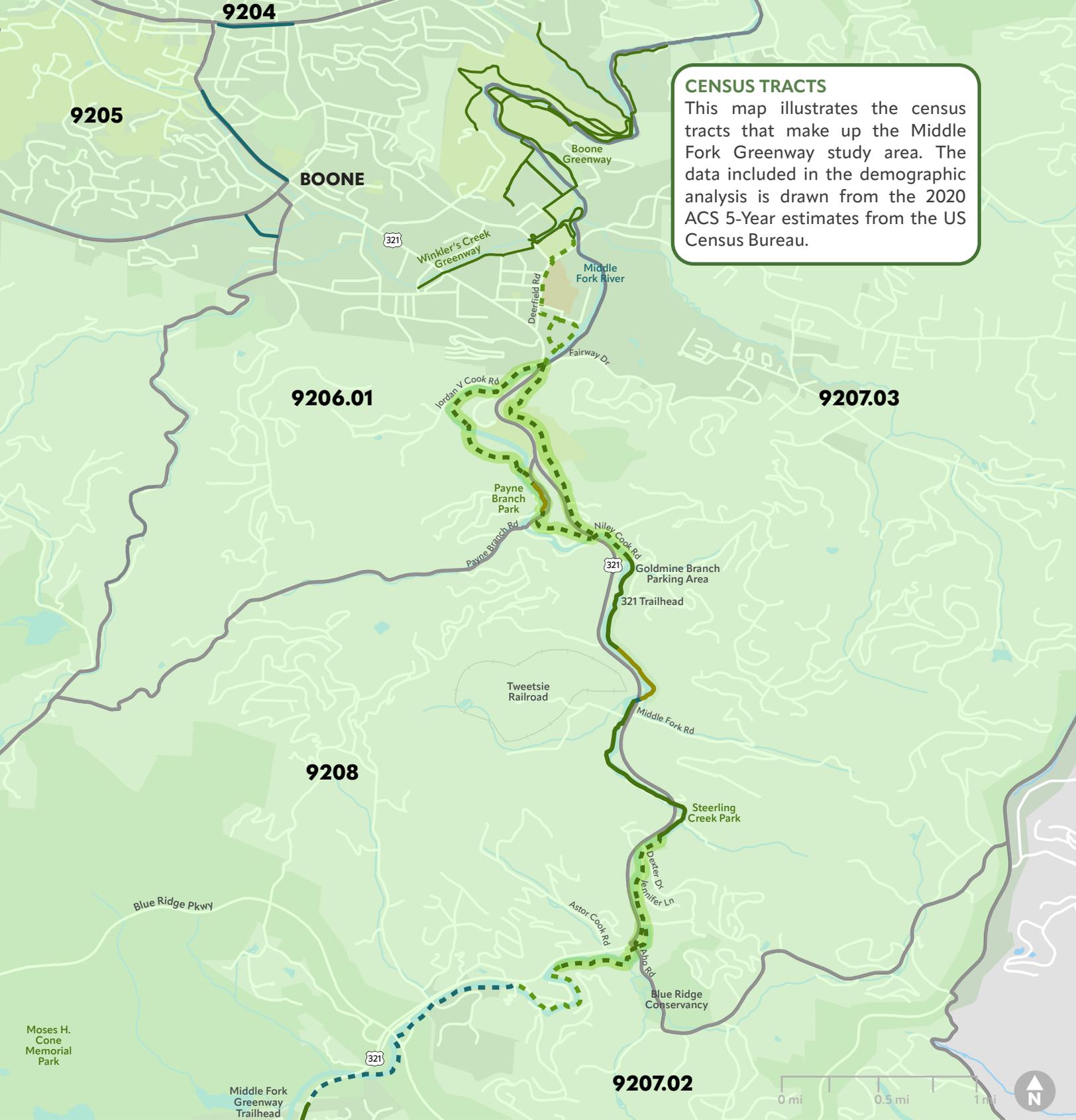
Site Visit to Section 5 Study Area



Site Visit to Existing Paved Greenway at Sterling Creek Park



Site Visit to Existing Natural Surface Greenway at Payne Branch Park



MIDDLE FORK GREENWAY FEASIBILITY STUDY STUDY AREA: CENSUS TRACTS

LEGEND

MIDDLE FORK GREENWAY

- Completed (Paved)
- Completed (Natural Surface)
- In Development
- Feasibility Study Segment
- Planned Segment

- Existing Greenway
- Roadway
- Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County
- Census Tracts



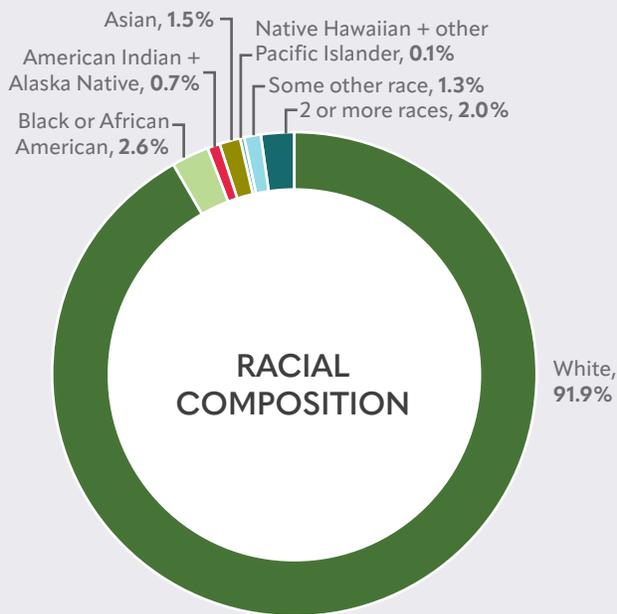
PLANNING LEVEL CONSIDERATIONS

Planning level considerations provide insight into the social and economic environments within a study area and may influence the proposed alignments for a greenway. The demographic analysis for this study helped to inform the public engagement approach and to ensure proposed recommendations met the diverse needs of people residing along the corridor.

COMMUNITY DEMOGRAPHICS

Analyzing demographic trends are essential to planning the study area’s active transportation network. This analysis helps to inform the public engagement approach and to ensure proposed recommendations meet the diverse needs of people residing in the study area. Demographic data was pulled from the 2019 American Community Survey 5-year estimates and was accessed through the US Census Bureau.

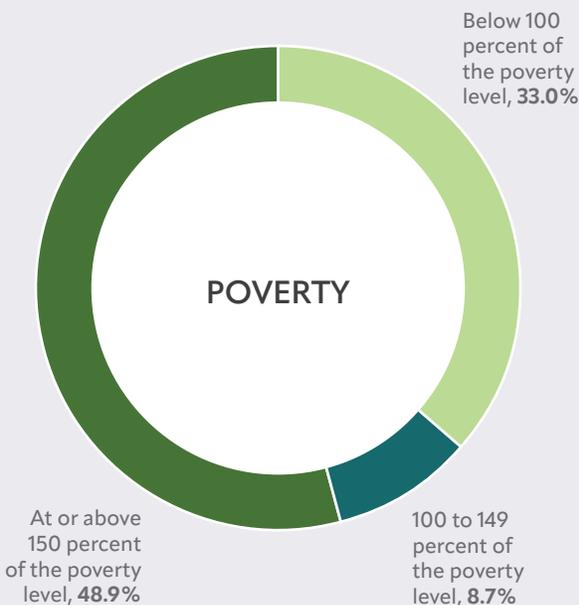
There are six census tract (CT) block groups (BG) make up the Middle Fork Greenway study area (see previous page for map). Datasets studied include the following: race and ethnicity, poverty, age, education, English proficiency, income, commuting patterns, and access to vehicles. The demographic analysis was based on the 2020 American Community Survey 5-year (2016-2020) estimates (US Census Bureau). Data was analyzed at both the place (study area) and state levels.



RACE + ETHNICITY

In North Carolina, approximately 70 percent (70.1%) of residents identify as “White alone”, and 22 percent (22.3%) of residents identify as “Black alone”. Census tracts for the Middle Fork Greenway show a different trend, with 91.9 percent of the study area identifying as “White alone” and 2.6 percent of the population identifying as “Black or African American”. Approximately 3 percent (3.4%) of the state’s population identifies as “Asian alone”, and similarly 1.5 percent of the census tracts for the study’s population identifies as “Asian alone”.

4.1 percent of the study’s census tracts identify as Hispanic or Latino origin (of any race) and 89.9 percent identify as White alone, not Hispanic or Latino.



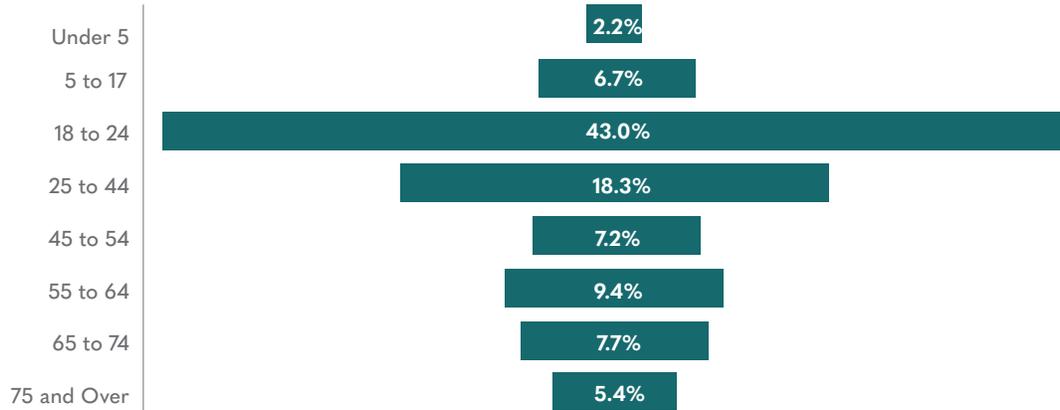
POVERTY

Exactly 33.0 percent of residents within the greenways’ census tracts fall below 100 percent of the poverty level”, while 8.7 percent of residents fall within “100 to 149 percent of the poverty level”. Almost 50 percent (48.9%) of residents are “at or above 150 percent of the poverty level”.

AGE

The census tracts that make up the study area for the Middle Fork Greenway have residents that fall primarily within the 18 to 24 years of age bracket. Almost 50 percent of residents fall within the 18 and over age range, while 8.9 percent of residents are younger than 18 years old. The median age in the study area (33.5 years old) is slightly lower than that of North Carolina which is a median age of 38.9. Good trail design accommodates users of all ages, so it is important to understand the age characteristics for a study area.

AGE RANGES

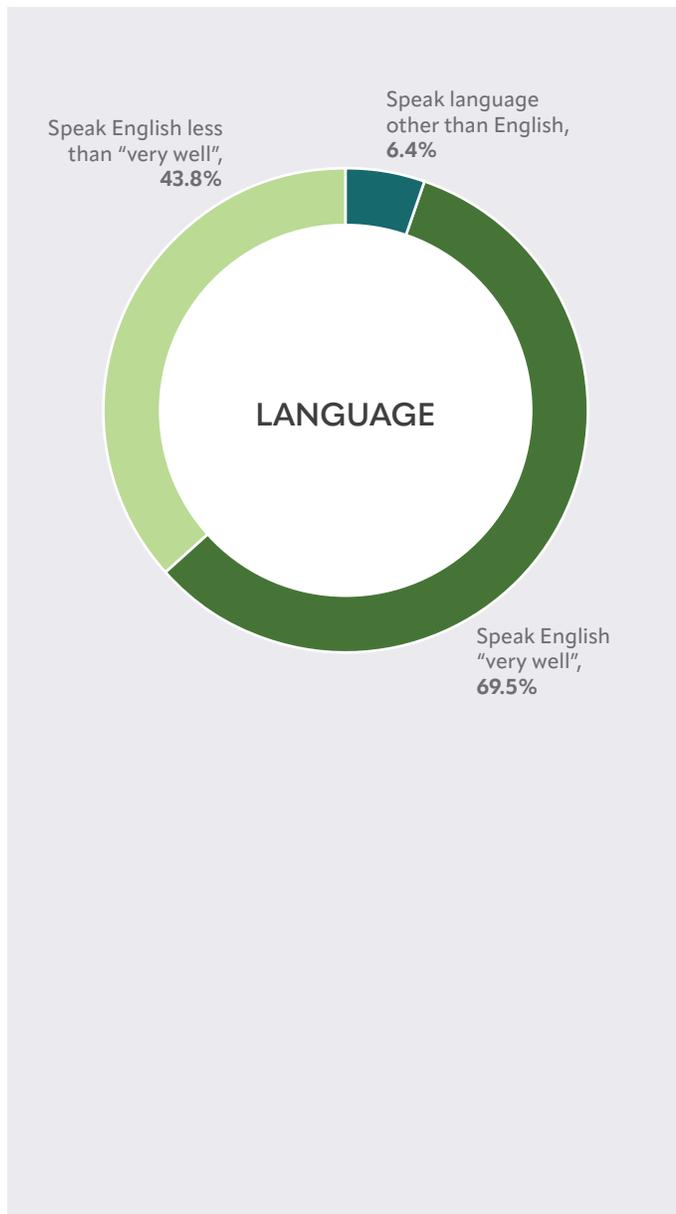
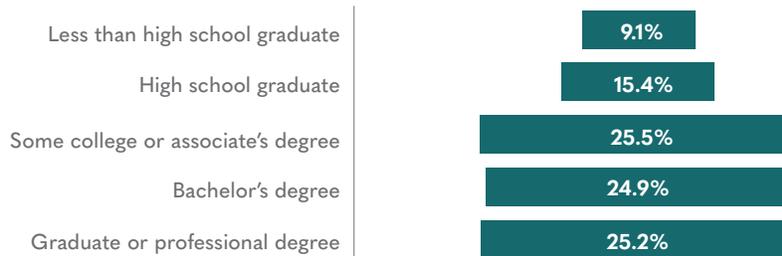


Trail Design Should Consider Users of All Ages and Abilities.

EDUCATION

Many residents living within the select census tracts around the Middle Fork Greenway either graduated with some college or obtained an associate degree or higher (75.6%), high school (25.1%) or attended some college (25.3%). Approximately 25 percent of residents have a four-year college degree, while a little over 9 percent of residents obtained less than a high school education. In North Carolina, 32.0 percent of the population obtained a bachelor's degree or higher.

EDUCATIONAL ATTAINMENT



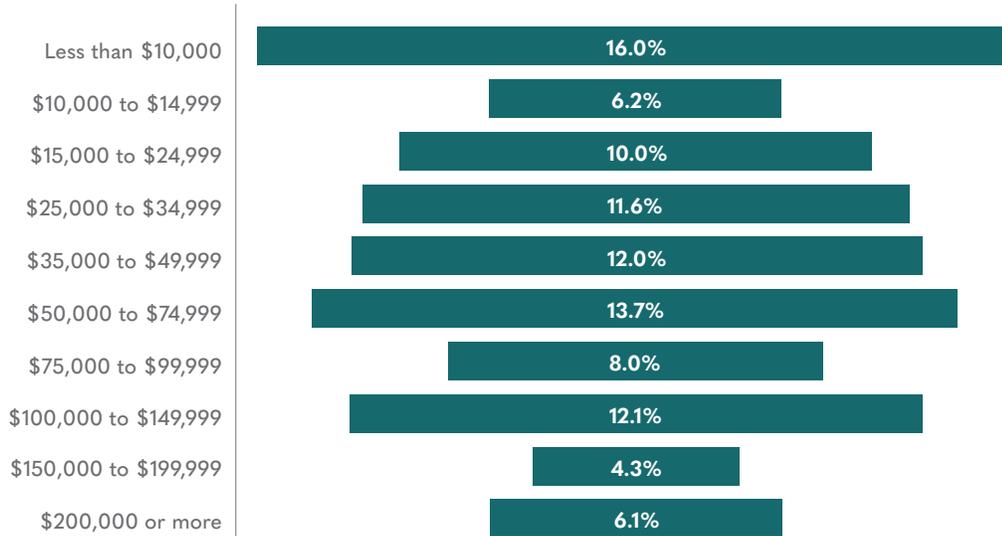
ENGLISH PROFICIENCY

While most residents in the study area speak English "very well" (69.5%), it is still important to include those who speak a different language in the planning process. Interpretive services may be offered for those who do not speak English, or have a limited ability to read, speak, or understand English so that they may participate and contribute to discussions about the project.

HOUSEHOLD INCOME

Approximately 14 percent (13.7%) of the residents in the study's select census tracts have an annual household income between \$50,000 and \$74,999. This is consistent with the median income of North Carolina households which is \$56,642. Almost 23 percent (22.5%) of residents within the select census tracts have an annual household income greater than \$75,000. Exactly 16.0 percent of residents make less than \$10,000 for their annual household income.

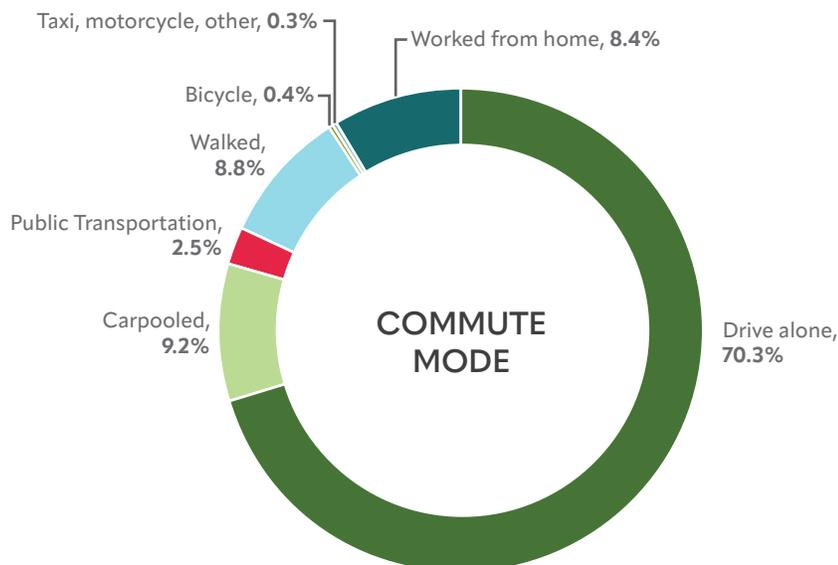
HOUSEHOLD INCOME



COMMUTE

Residents in the Middle Fork Greenway study area predominantly commute by single-occupancy vehicle, with 70.3 percent of workers driving alone to work, and of those workers, the average commute time is about 17 minutes.

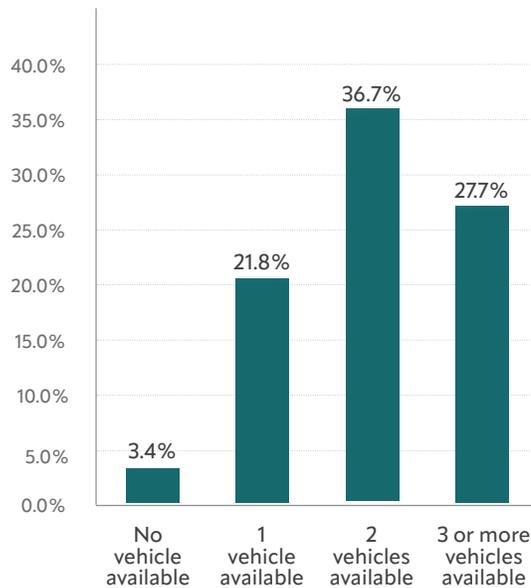
A little over 20 percent (20.9%) of workers commute by walking, bicycling, taking transit, or by carpooling. Less than 1 percent (0.3%) of residents take a taxi, ride a motorcycle, or find other means of transportation to get to work. Residents working from home in the study area make up 8.4 percent of the study area's population.



ACCESS TO VEHICLES

Approximately 37 percent (36.7%) of households within the study area have access to two vehicles and 27.7 of residents have access to 3 or more vehicles. Households in the study area who are either vehicle-less (3.4%) or have access to one vehicle (21.8%) may have limited commuting options and may benefit from using the Middle Fork Greenway to travel to and from work depending on commuting distance.

VEHICLE AVAILABILITY



NATURAL ENVIRONMENT CONSIDERATIONS

Nature plays a large role in the way humans connect with and/or shape the environment. Boone and Blowing Rock are located in the Blue Ridge Mountains, one of North Carolina's most prominent natural playgrounds. This scenic landscape holds an abundance of native flora and fauna, history, and challenging topography that attract hikers and bikers from all over the country to experience its beauty.



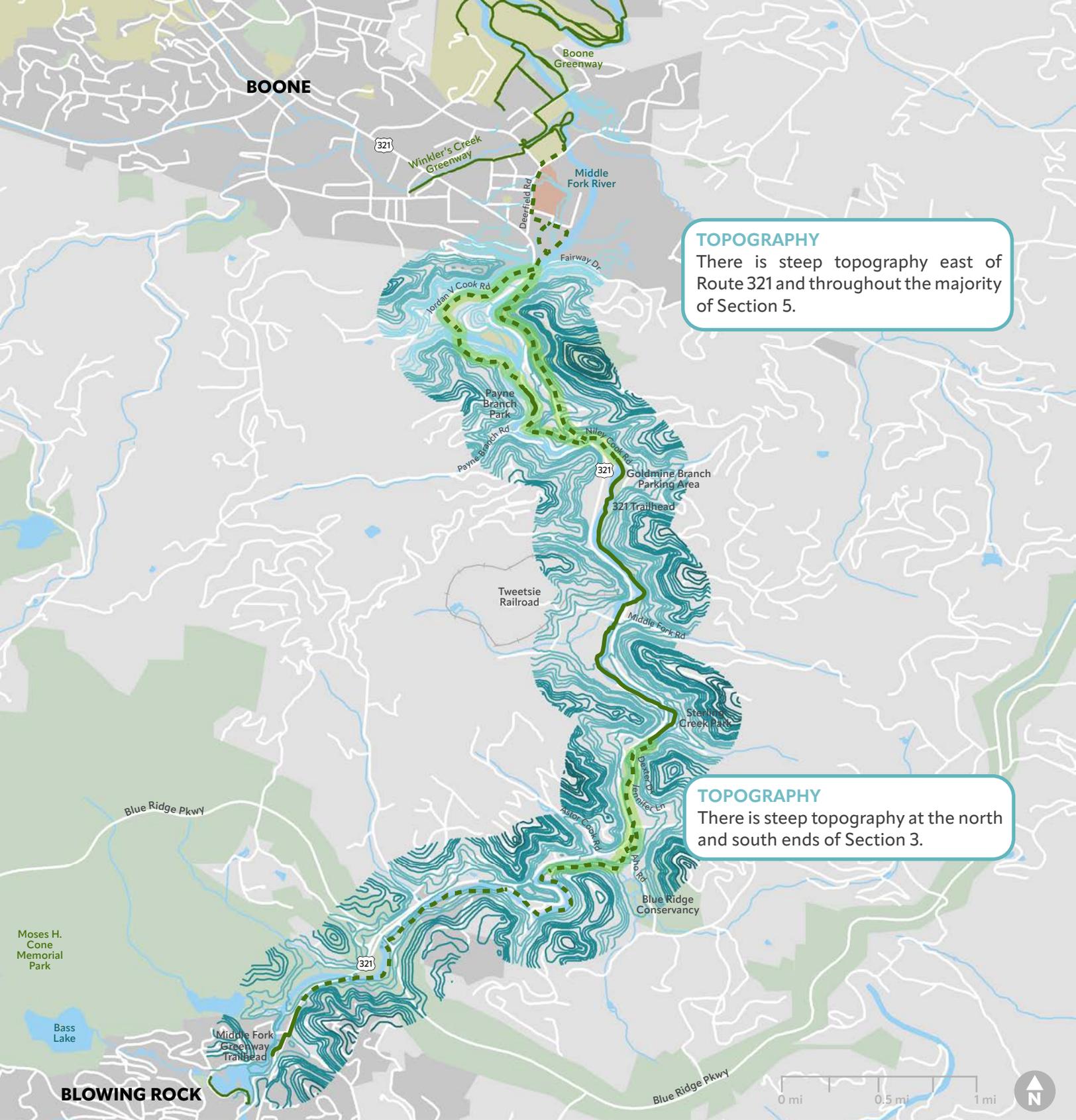
Family Riding Bikes and Enjoying the Blue Ridge Mountains *Credit: Explore Boone*

The Middle Fork Greenway will provide residents and visitors of all ages and abilities safe and healthy access to the natural world while protecting the environment. For this reason, this study closely evaluates the natural environment and natural resources within to carefully design greenway routes that balance access and conservation of natural resources.

For the purposes of this study, the following were considered as part of the natural environment:

- Topography
- Floodplains + Wetlands
- Conservation + Managed Areas

For findings specific to this feasibility study, please refer to the annotated maps on the following pages.

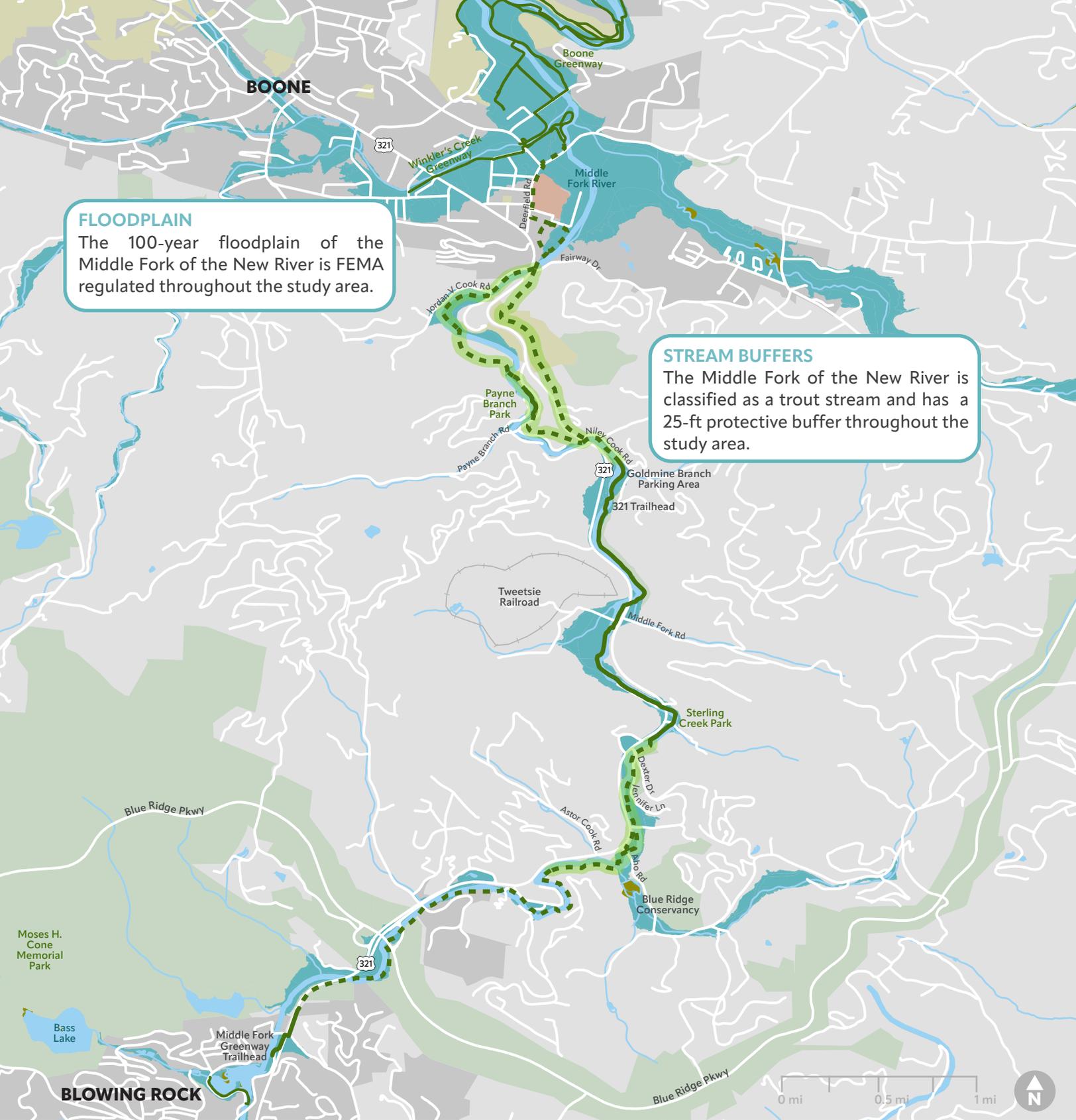


MIDDLE FORK GREENWAY FEASIBILITY STUDY TOPOGRAPHY (20 FT CONTOURS)

LEGEND

MIDDLE FORK GREENWAY

- Completed Segment
- Feasibility Study Segment
- Planned Segment
- 3,120 - 3,280 Feet
- 3,281 - 3,480 Feet
- 3,481 - 3,660 Feet
- 3,661 - 3,860 Feet
- Existing Greenway
- Roadway
- Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County

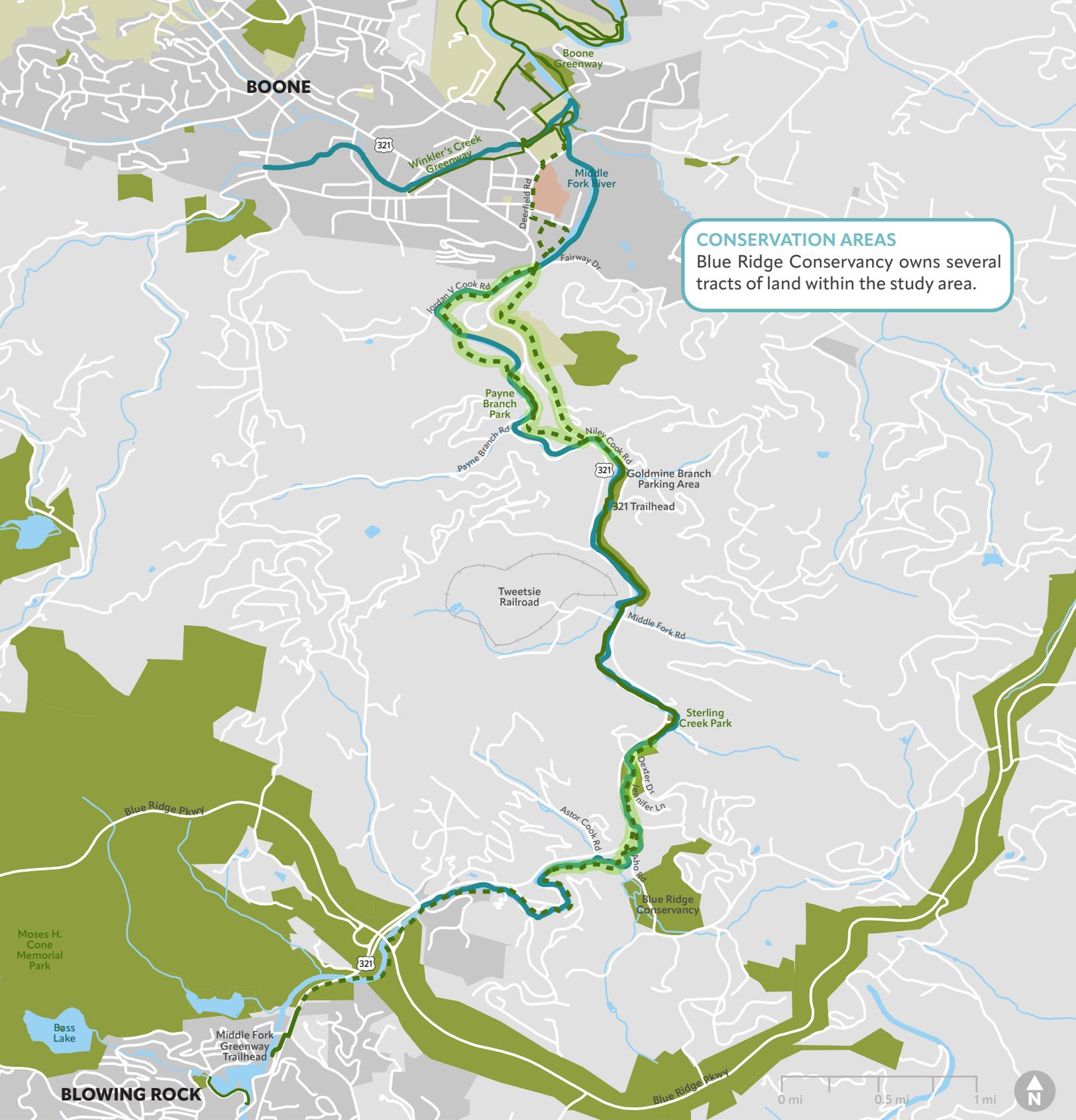


FLOODPLAIN
 The 100-year floodplain of the Middle Fork of the New River is FEMA regulated throughout the study area.

STREAM BUFFERS
 The Middle Fork of the New River is classified as a trout stream and has a 25-ft protective buffer throughout the study area.

**MIDDLE FORK GREENWAY
 FEASIBILITY STUDY
 FLOODPLAIN + WETLANDS**

- LEGEND**
- MIDDLE FORK GREENWAY**
- Completed Segment
 - Feasibility Study Segment
 - Planned Segment
 - 100-Yr Floodplain
 - Wetland
 - Existing Greenway
 - Roadway
 - Rail
 - Lake / Stream
 - Appalachian State Univ.
 - Medical Center
 - Park / Managed Lands
 - Municipality
 - County



MIDDLE FORK GREENWAY FEASIBILITY STUDY CONSERVATION + MANAGED AREAS

LEGEND

MIDDLE FORK GREENWAY

- Completed Segment
- Feasibility Study Segment
- Planned Segment
- Conservation/ Managed Lands
- Protected Trout Stream (25' Buffer)
- Existing Greenway
- Roadway
- Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Municipality
- County

HUMAN ENVIRONMENT CONSIDERATIONS

According to the Federal Highway Administration (FHWA), the human environment is the context in which we live, work, and play. Our livable communities encompass all situations where people are affected by transportation.

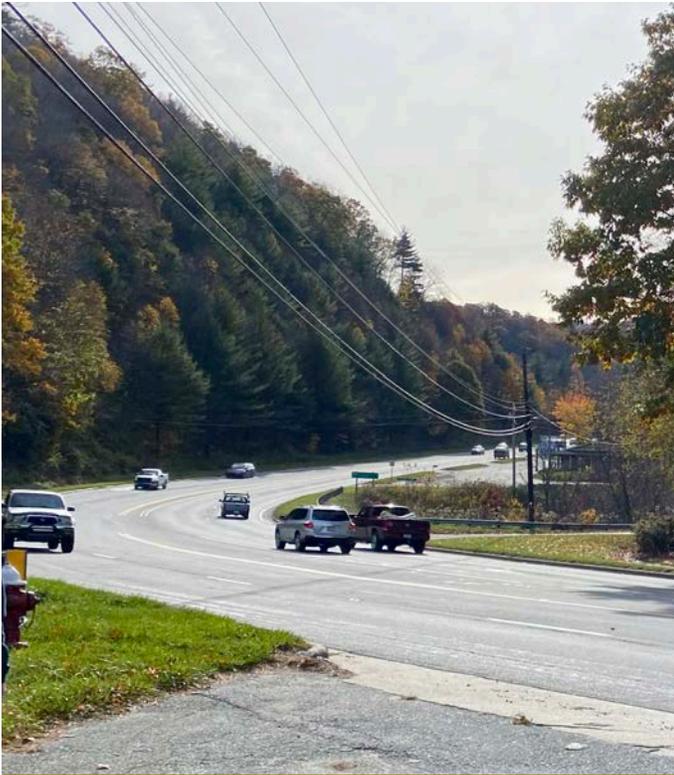
FHWA finds that the following examples are ways to take the human environment into consideration:

- Encouraging people to be more physically active in their modes of travel;
- Making changes to the transportation infrastructure;
- Improving how we plan and implement changes to transportation processes;
- Educating people about the benefits of human centered transportation;
- Using technology in creative ways; or
- More cross cutting issues.

For the purposes of this study, the following were considered as part of the human environment:

- Blue Ridge Energy transmission lines
- Adjacent parcels
- Existing and planned bicycle and pedestrian facilities
- Bicycle and pedestrian crashes
- Roadway traffic volume (AADT)
- Roadway speed limit
- Roadway right-of-way
- NCDOT STIP projects

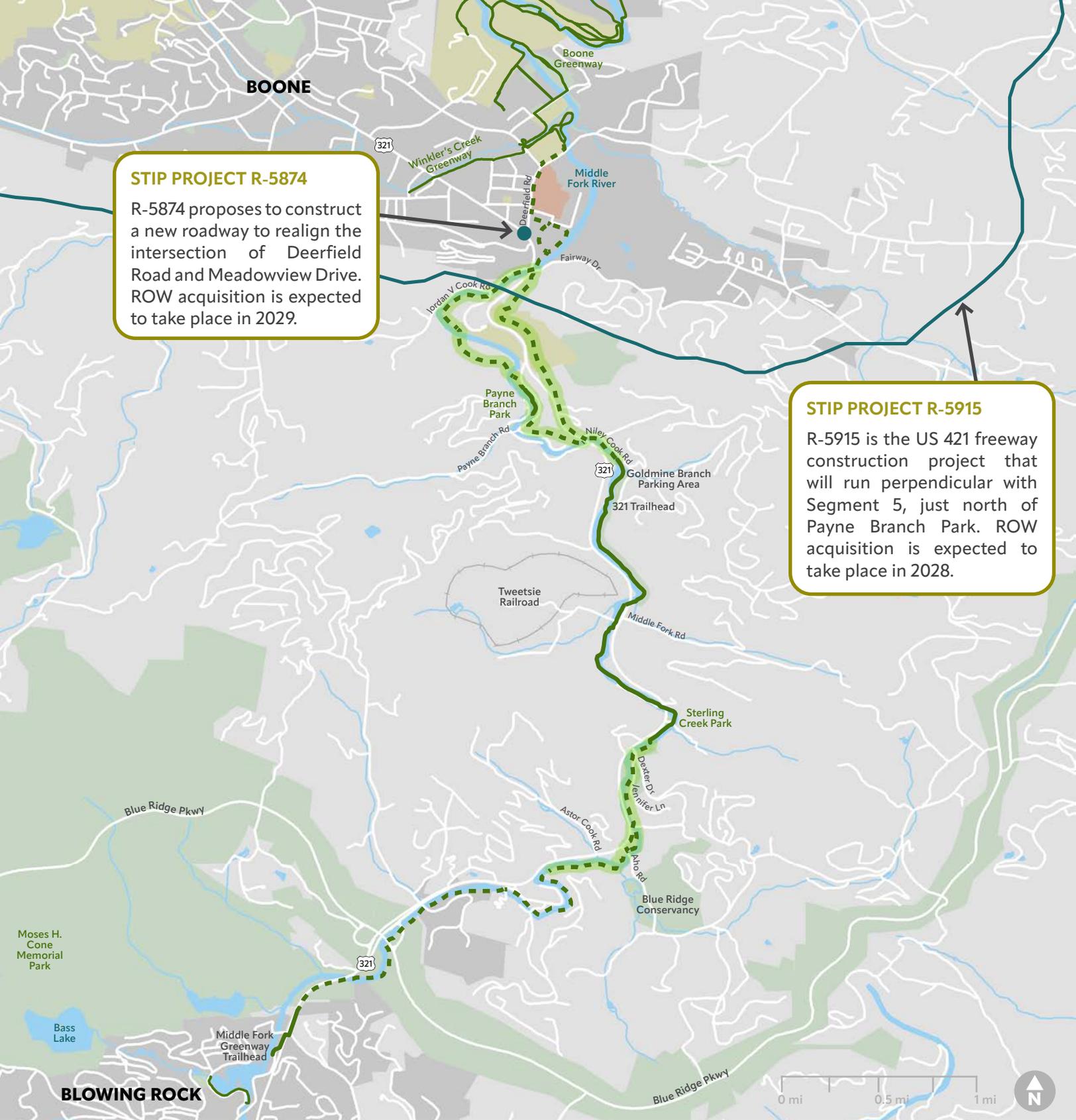
For findings specific to this feasibility study, please refer to the annotated maps on the following pages.



US 321 Traffic in Study Area

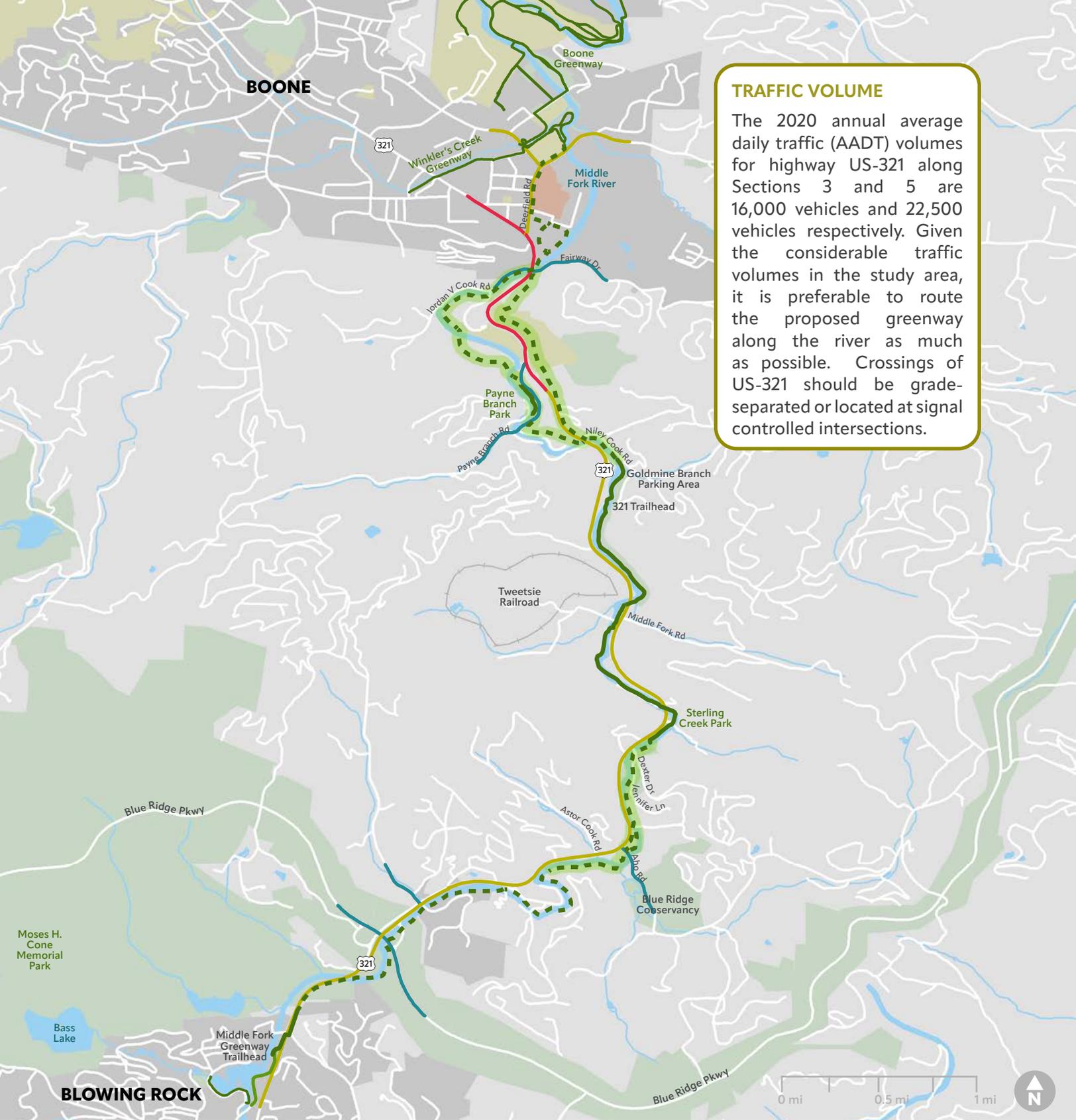


Blue Ridge Energy Transmission Lines in Study Area



**MIDDLE FORK GREENWAY
 FEASIBILITY STUDY
 NCDOT STIP PROJECTS**

- LEGEND**
- MIDDLE FORK GREENWAY**
- Completed Segment
 - - Feasibility Study Segment
 - - - Planned Segment
 - R-5915 US-421 Freeway Construction (ROW 2028)
 - R-5874 Intersection Realignment (ROW 2029)
 - Existing Greenway
 - Roadway
 - Rail
 - Lake / Stream
 - Appalachian State Univ.
 - Medical Center
 - Park / Managed Lands
 - Municipality
 - County



TRAFFIC VOLUME

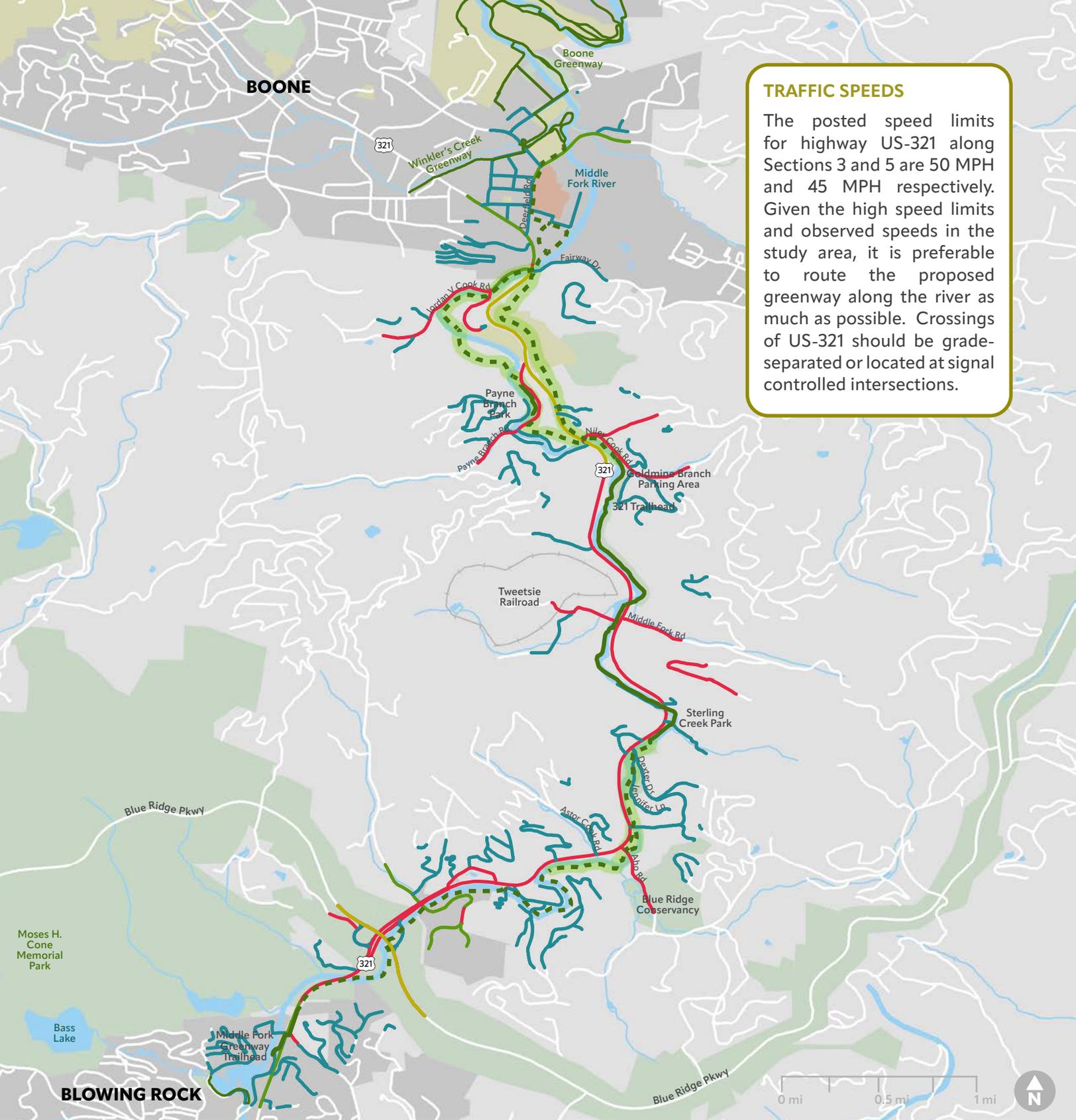
The 2020 annual average daily traffic (AADT) volumes for highway US-321 along Sections 3 and 5 are 16,000 vehicles and 22,500 vehicles respectively. Given the considerable traffic volumes in the study area, it is preferable to route the proposed greenway along the river as much as possible. Crossings of US-321 should be grade-separated or located at signal controlled intersections.

**MIDDLE FORK GREENWAY
FEASIBILITY STUDY
ROADWAY TRAFFIC VOLUME (AADT)**

LEGEND

MIDDLE FORK GREENWAY

- Completed Segment
- Feasibility Study Segment
- Planned Segment
- 400 - 3,000 Vehicles
- 3,001 - 6,000 Vehicles
- 6,001 - 18,000 Vehicles
- 18,001 - 26,000 Vehicles
- Existing Greenway
- Roadway
- Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County



TRAFFIC SPEEDS

The posted speed limits for highway US-321 along Sections 3 and 5 are 50 MPH and 45 MPH respectively. Given the high speed limits and observed speeds in the study area, it is preferable to route the proposed greenway along the river as much as possible. Crossings of US-321 should be grade-separated or located at signal controlled intersections.

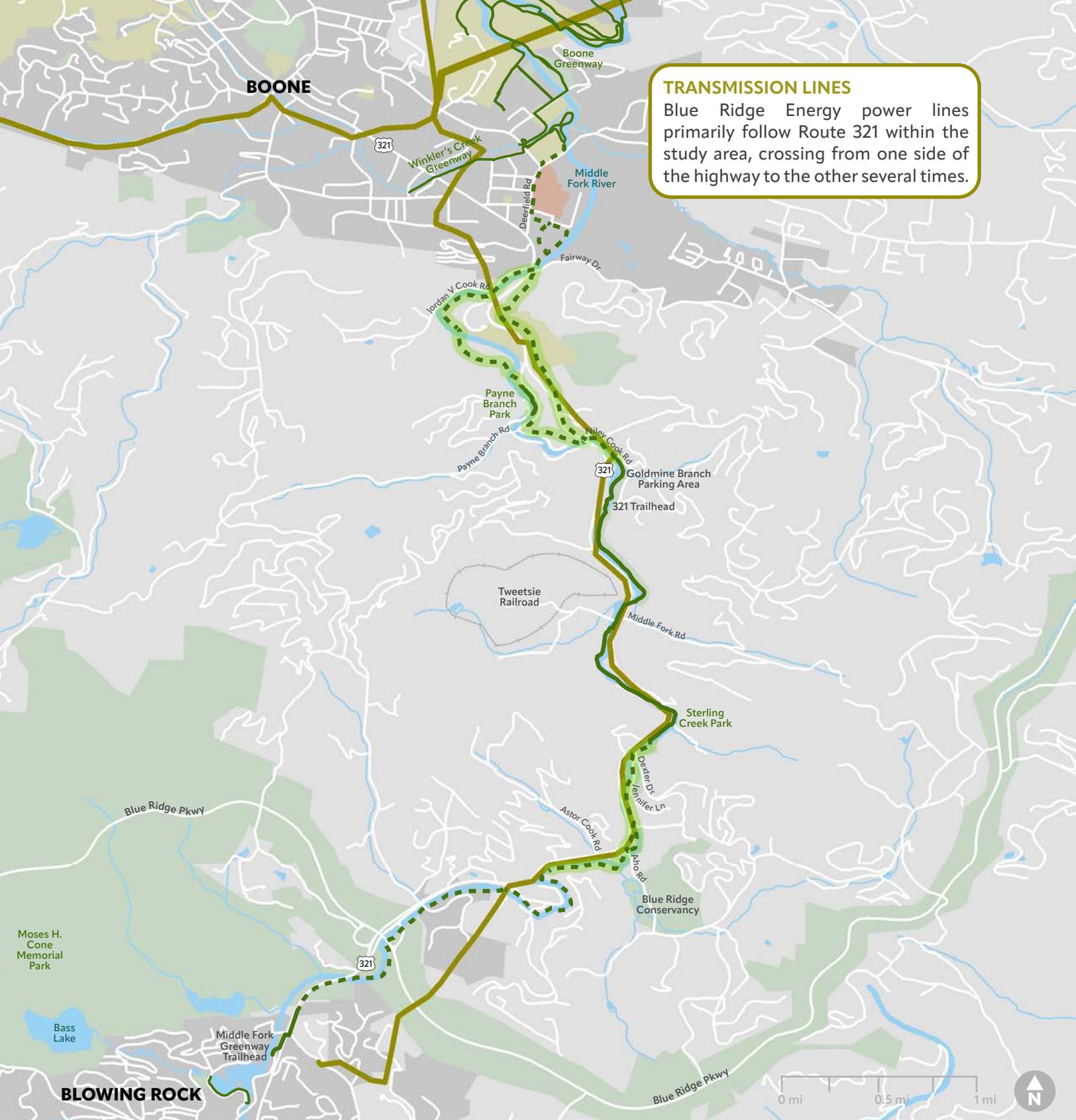
MIDDLE FORK GREENWAY FEASIBILITY STUDY ROADWAY SPEED LIMIT

LEGEND

MIDDLE FORK GREENWAY

- Completed Segment
- Feasibility Study Segment
- Planned Segment
- 25 mph
- 30 - 35 mph
- 40 - 45 mph
- 50 - 55 mph

- Existing Greenway
- Roadway
- + + Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County

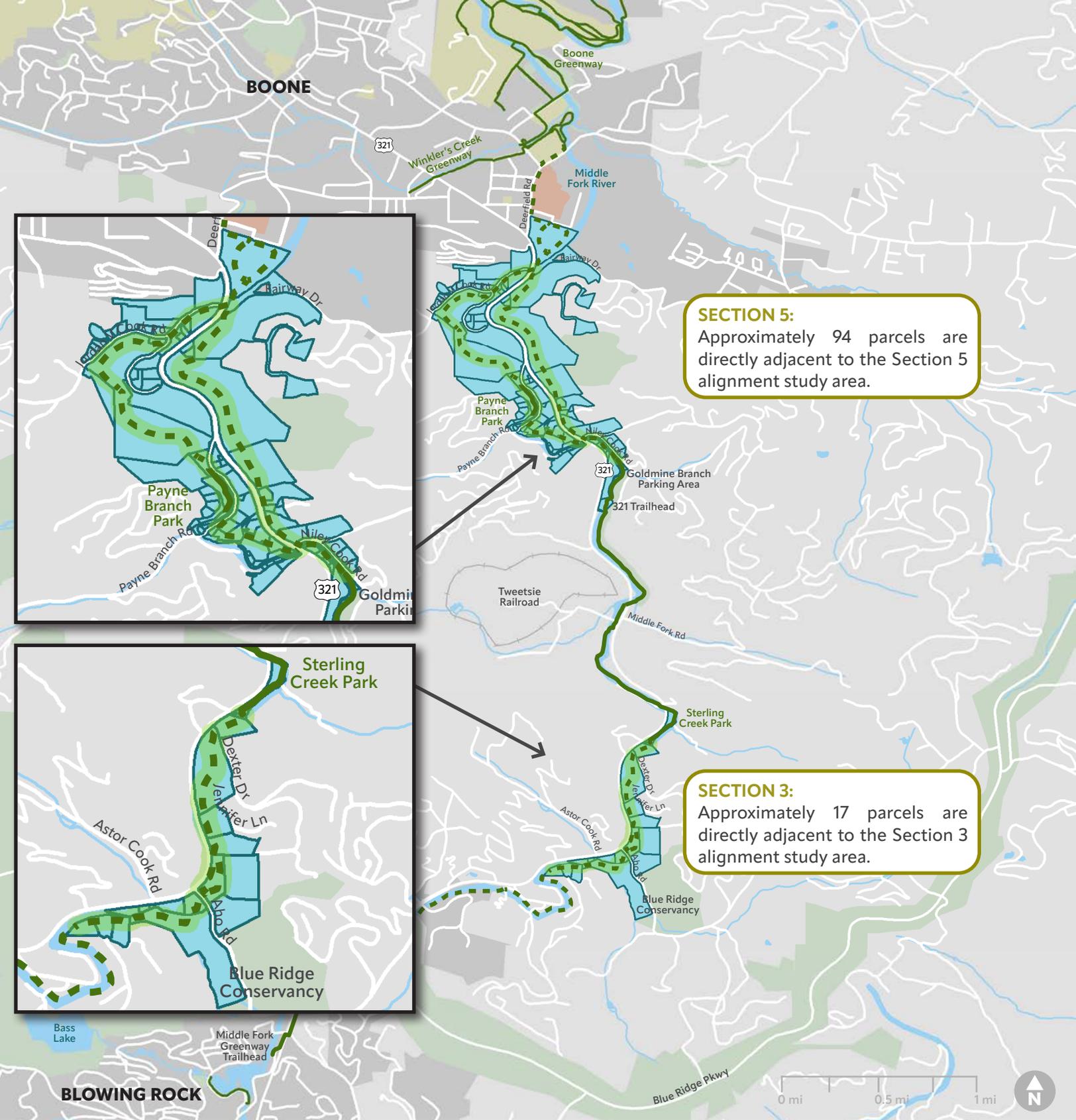


TRANSMISSION LINES
 Blue Ridge Energy power lines primarily follow Route 321 within the study area, crossing from one side of the highway to the other several times.

**MIDDLE FORK GREENWAY
 FEASIBILITY STUDY
 BLUE RIDGE ENERGY POWER LINES**

- LEGEND**
- MIDDLE FORK GREENWAY**
- Completed Segment
 - Feasibility Study Segment
 - Planned Segment
 - Electric Transmission Lines
 - Existing Greenway
 - Roadway
 - Rail
 - Lake / Stream
 - Appalachian State Univ.
 - Medical Center
 - Park / Managed Lands
 - Municipality
 - County





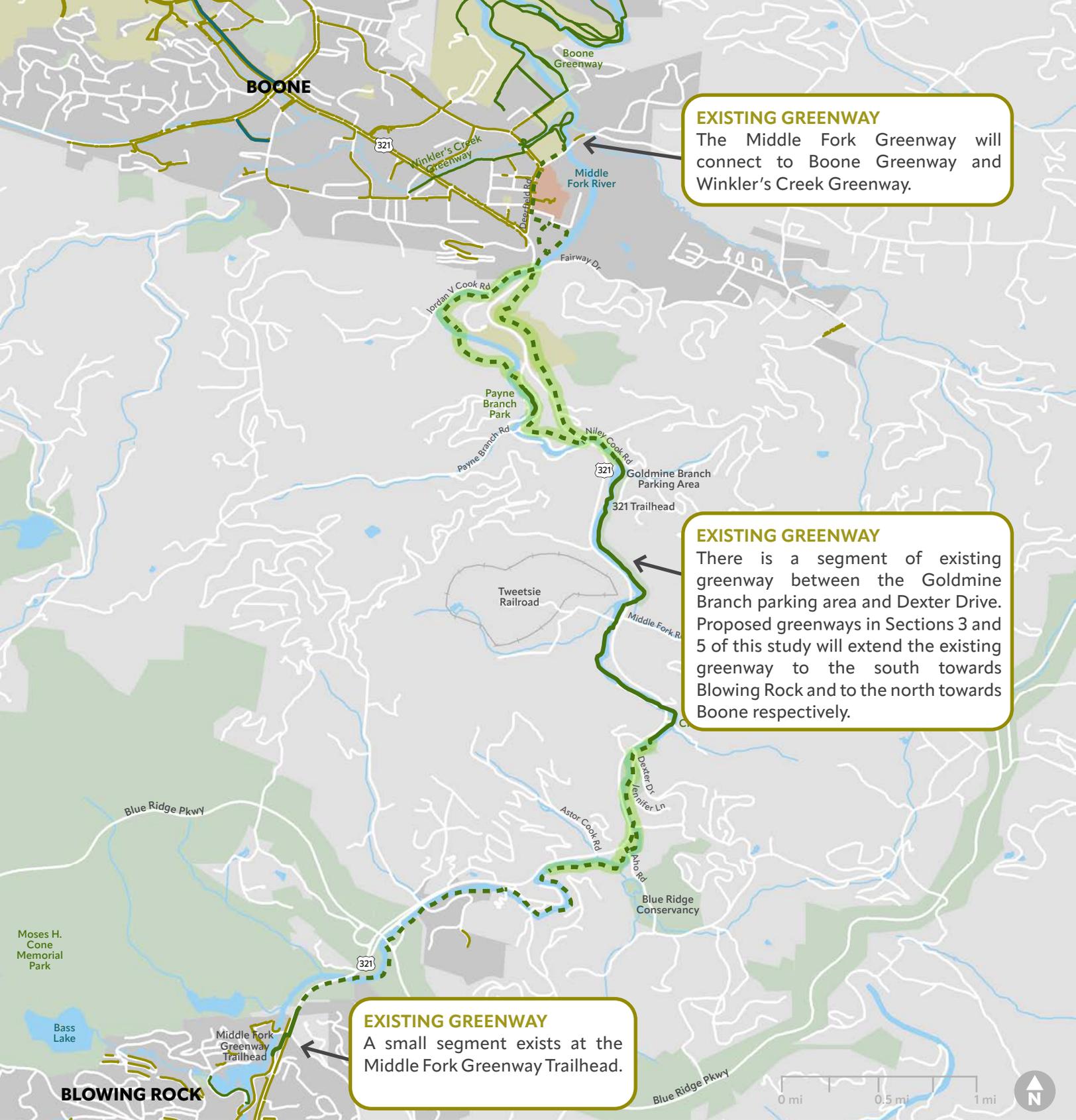
MIDDLE FORK GREENWAY FEASIBILITY STUDY ADJACENT PARCELS

LEGEND

MIDDLE FORK GREENWAY

- Completed Segment
- Feasibility Study Segment
- Planned Segment
- Adjacent Parcel

- Existing Greenway
- Roadway
- Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County



MIDDLE FORK GREENWAY FEASIBILITY STUDY

EXISTING BICYCLE + PEDESTRIAN FACILITIES

LEGEND

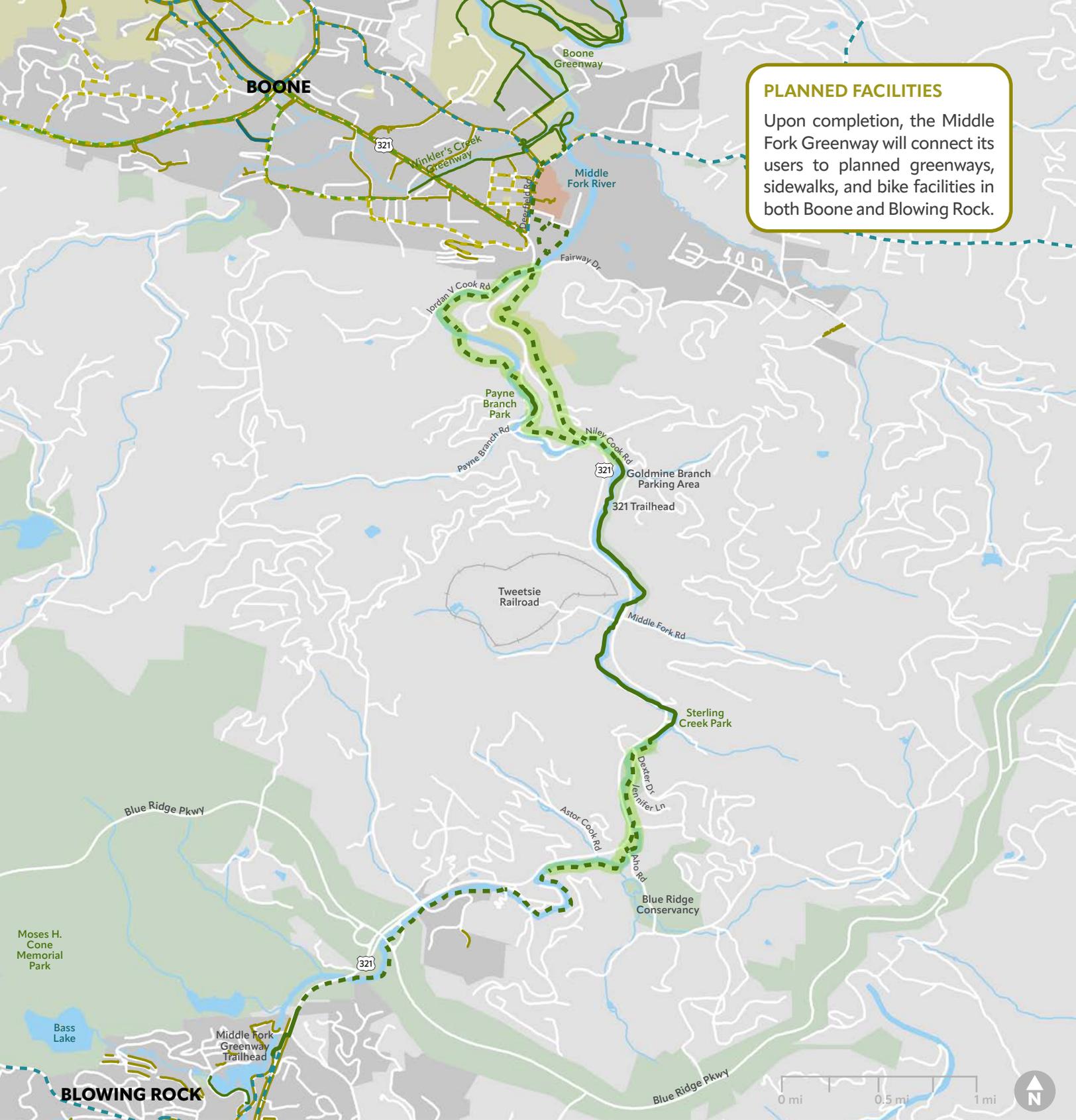
MIDDLE FORK GREENWAY

- Completed Segment
- Feasibility Study Segment
- Planned Segment
- Existing Sidewalk
- Existing Bike Lane
- Existing Greenway

- Roadway
- Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County

0 mi 0.5 mi 1 mi





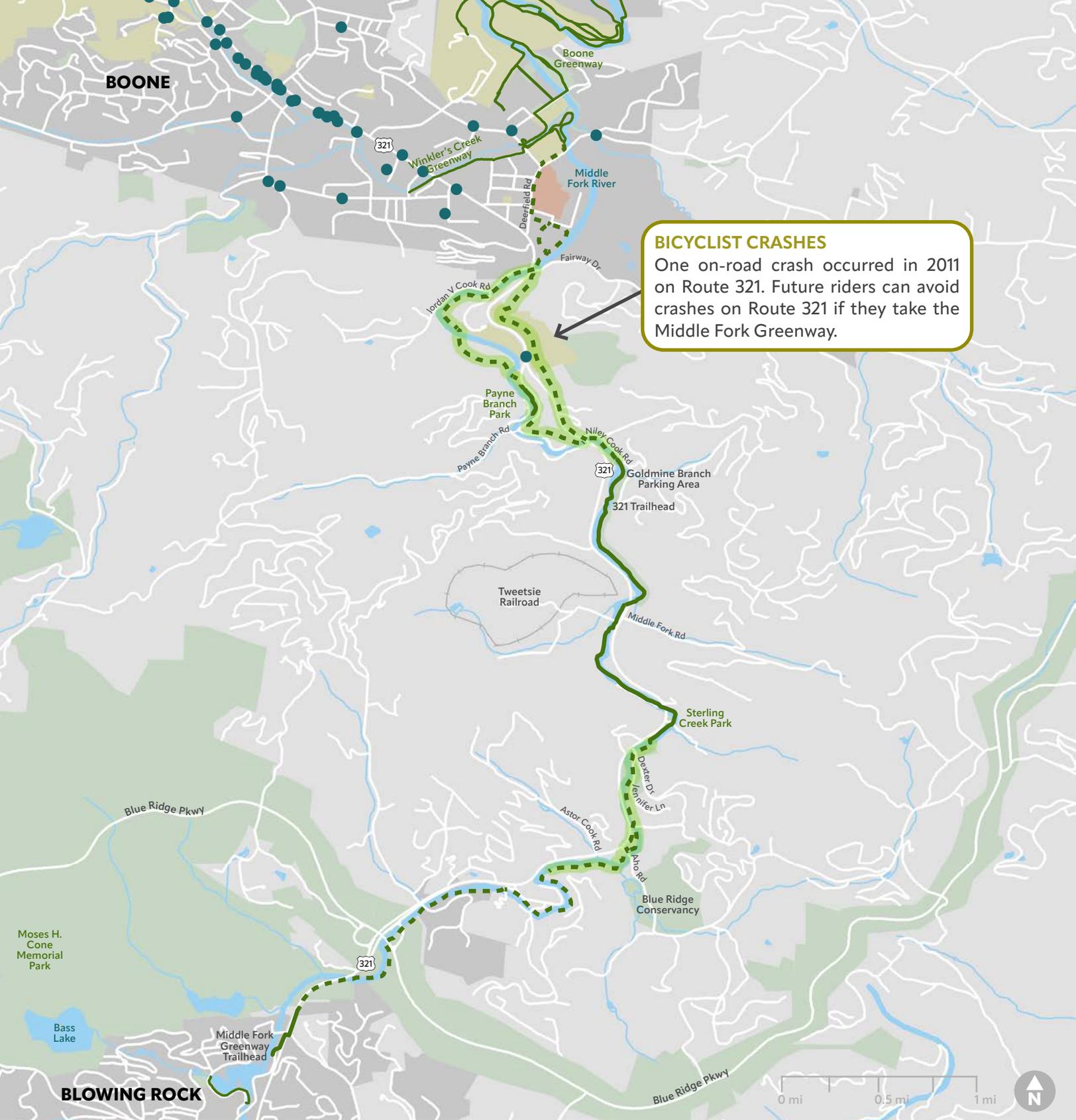
MIDDLE FORK GREENWAY FEASIBILITY STUDY

PLANNED BICYCLE + PEDESTRIAN FACILITIES

LEGEND

MIDDLE FORK GREENWAY

- Completed Segment
- Feasibility Study Segment
- Planned Segment
- Existing Sidewalk
- Existing Bike Lane
- Planned Sidewalk
- Planned Bike Facility
- Planned Greenway
- Existing Greenway
- Roadway
- Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County

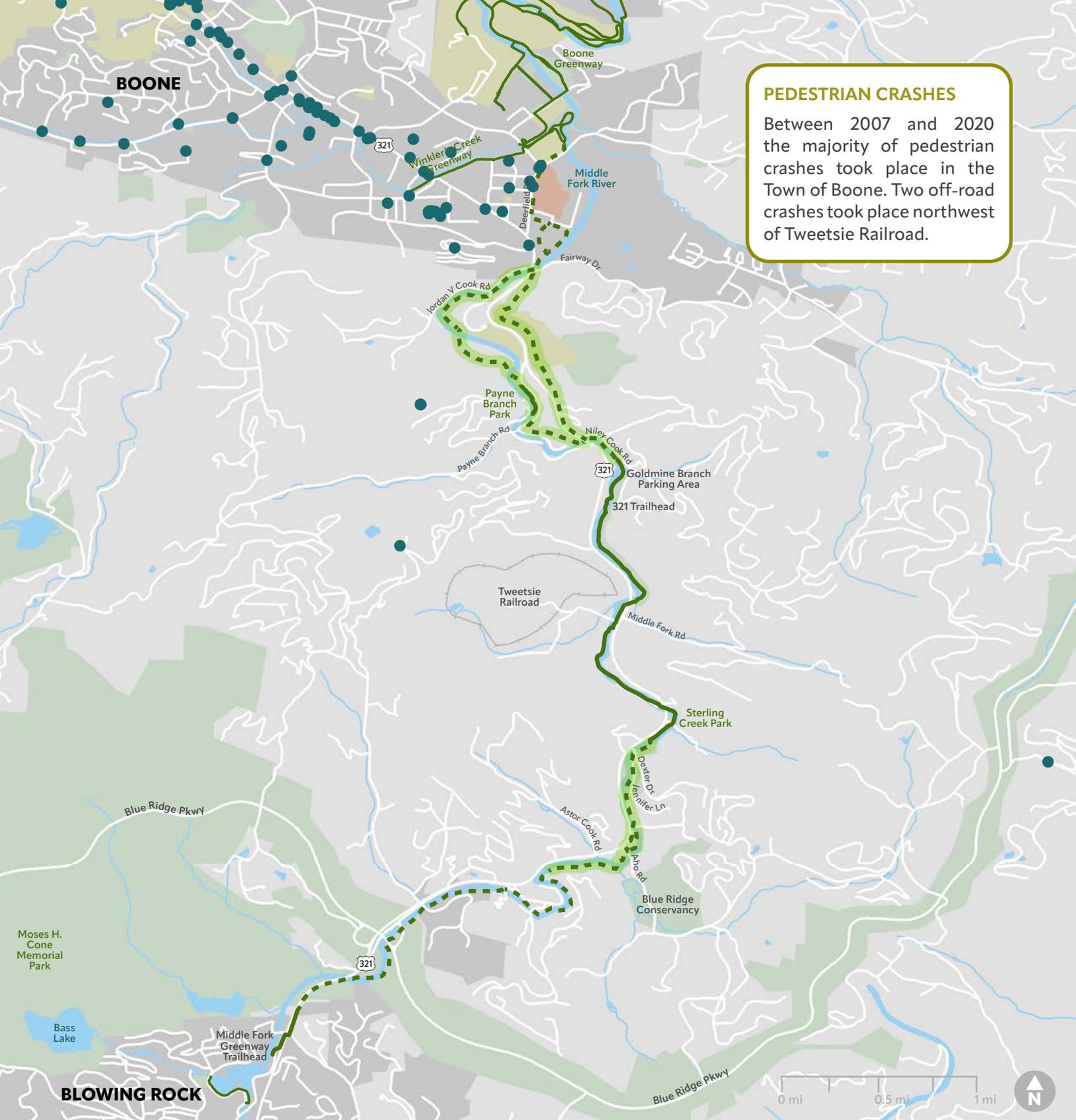


**MIDDLE FORK GREENWAY
 FEASIBILITY STUDY
 BICYCLIST CRASHES (2007 -2020)**

LEGEND

MIDDLE FORK GREENWAY

- Completed Segment
- Feasibility Study Segment
- Planned Segment
- Bicyclist Crash
- Existing Greenway
- Roadway
- Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County



PEDESTRIAN CRASHES

Between 2007 and 2020 the majority of pedestrian crashes took place in the Town of Boone. Two off-road crashes took place northwest of Tweetsie Railroad.

**MIDDLE FORK GREENWAY
FEASIBILITY STUDY
PEDESTRIAN CRASHES (2007 - 2020)**

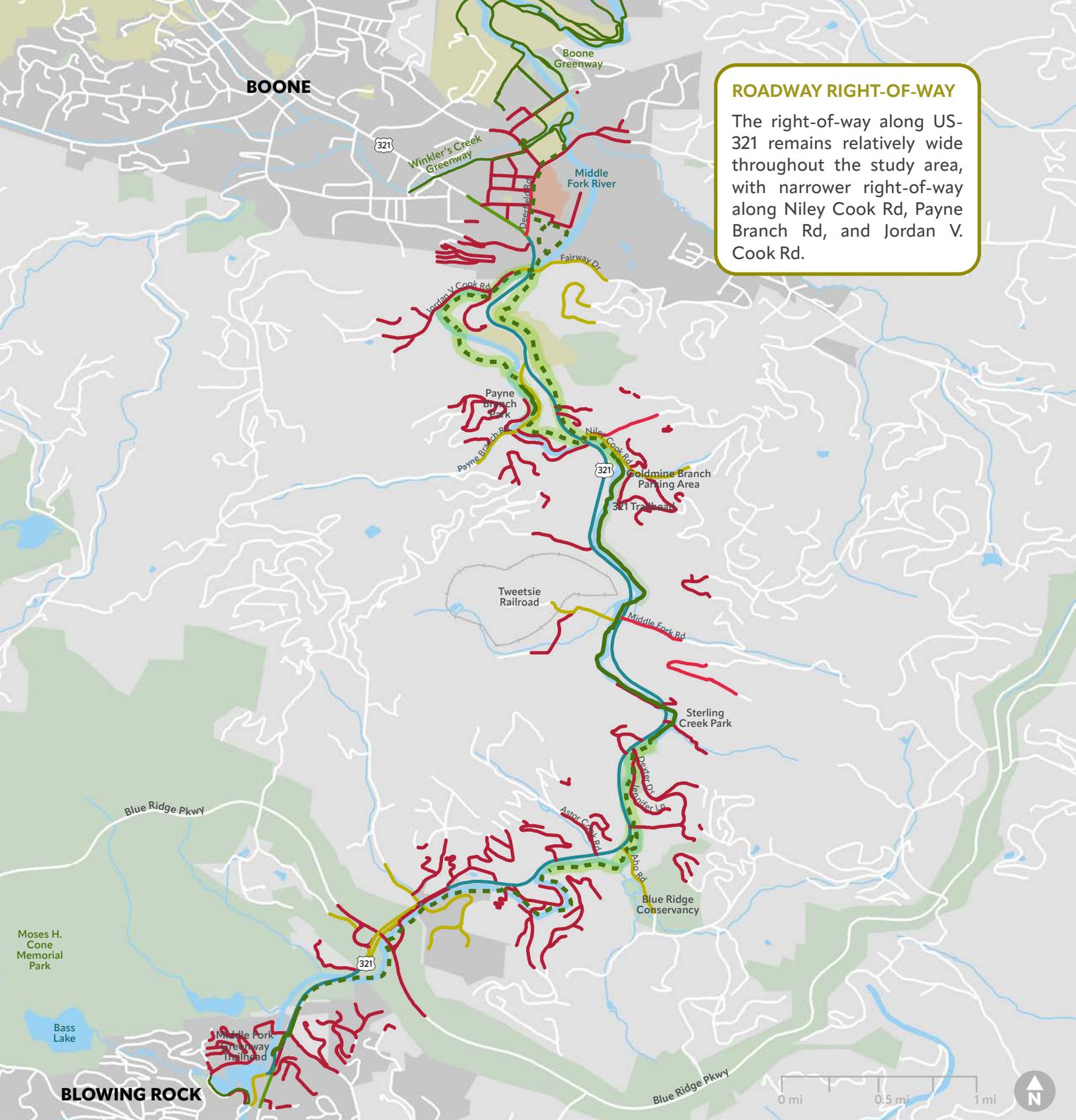
LEGEND

MIDDLE FORK GREENWAY

- Completed Segment
- - - Feasibility Study Segment
- · · Planned Segment
- Pedestrian Crash

- Existing Greenway
- Roadway
- + + Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County





ROADWAY RIGHT-OF-WAY

The right-of-way along US-321 remains relatively wide throughout the study area, with narrower right-of-way along Niley Cook Rd, Payne Branch Rd, and Jordan V. Cook Rd.

MIDDLE FORK GREENWAY FEASIBILITY STUDY ROADWAY RIGHT-OF-WAY (FEET)

LEGEND

MIDDLE FORK GREENWAY

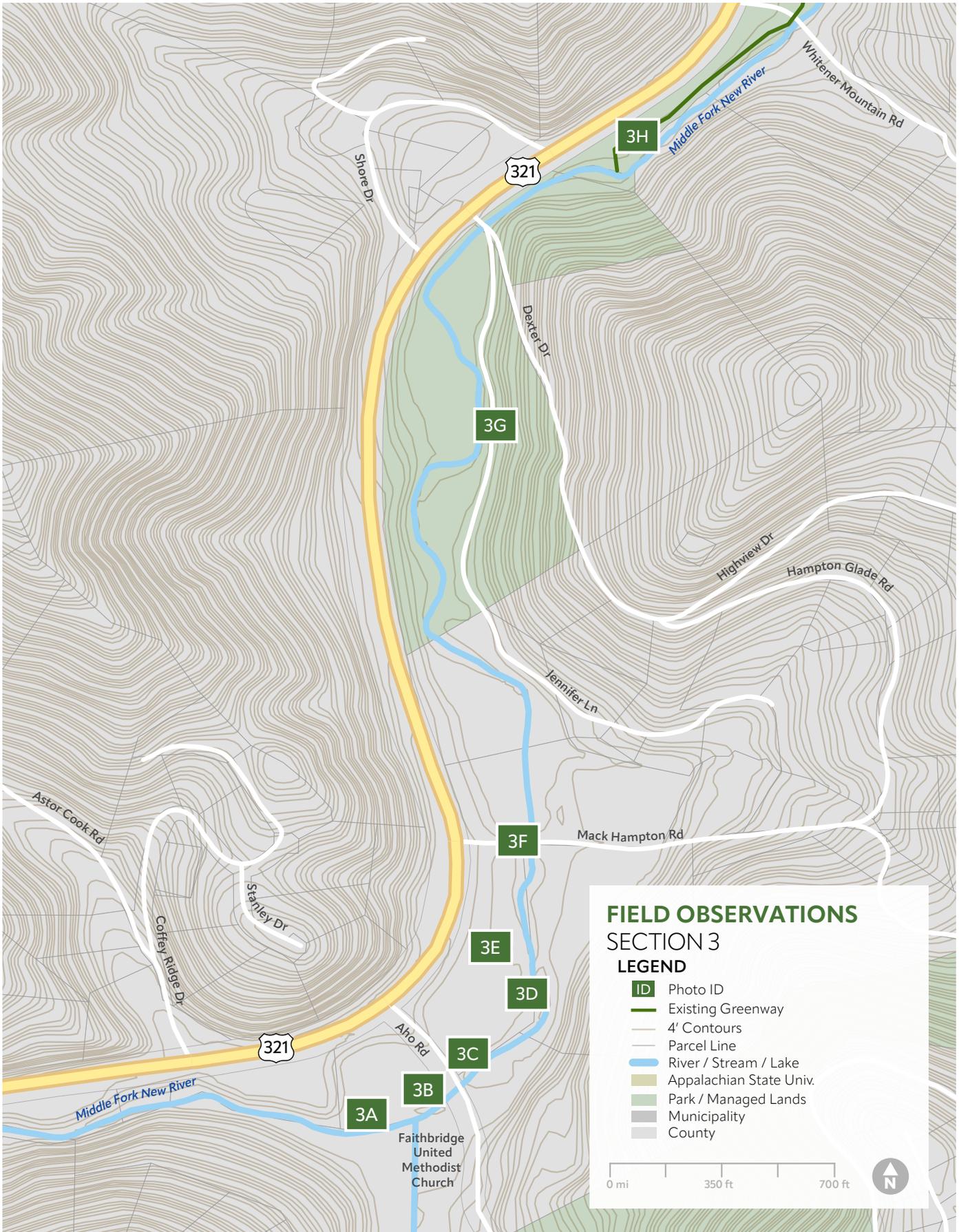
- Completed Segment
- Feasibility Study Segment
- Planned Segment
- 0 - 25 Feet
- 26 - 50 Feet
- 51 - 75 Feet
- 76 - 100 Feet
- 101 - 150 Feet

- Existing Greenway
- Roadway
- +— Rail
- Lake / Stream
- Appalachian State Univ.
- Medical Center
- Park / Managed Lands
- Municipality
- County



MIDDLE FORK GREENWAY
CREDIT: BLUE RIDGE CONSERVANCY

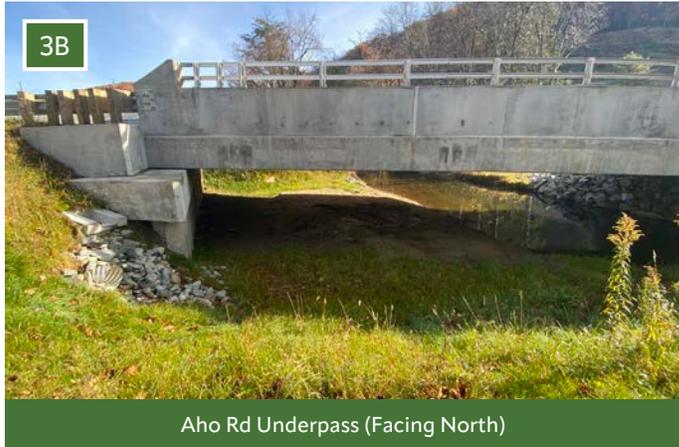
The following map and photos highlight several of the opportunities and constraints observed on the site visit which may influence alignment alternatives.





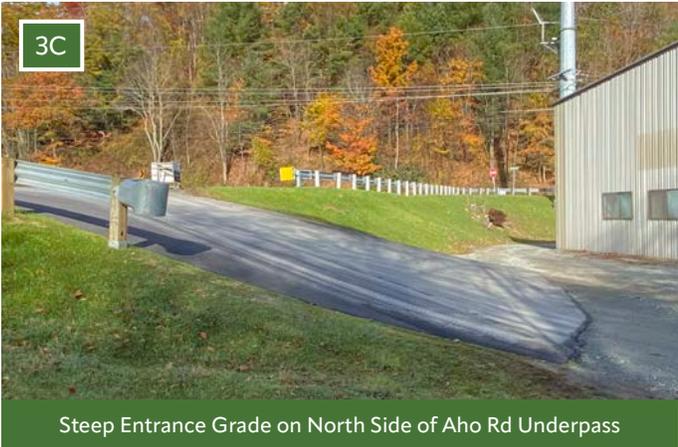
3A

Utility Lines Behind the Mustard Seed Near Proposed River Crossing



3B

Aho Rd Underpass (Facing North)



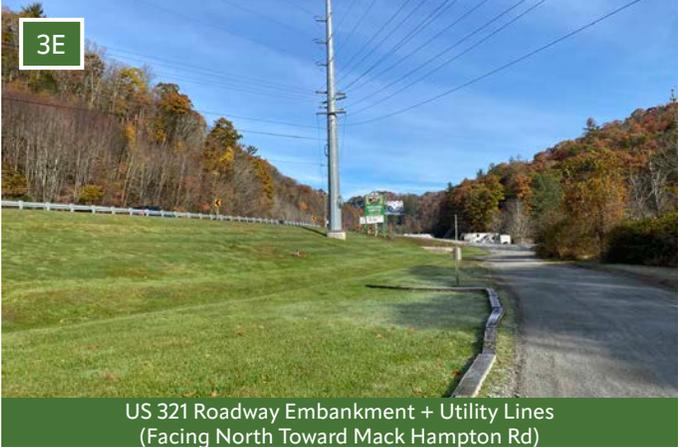
3C

Steep Entrance Grade on North Side of Aho Rd Underpass



3D

Flat Terrain Between River + Antiques Mall Building (Facing South toward Aho Rd)



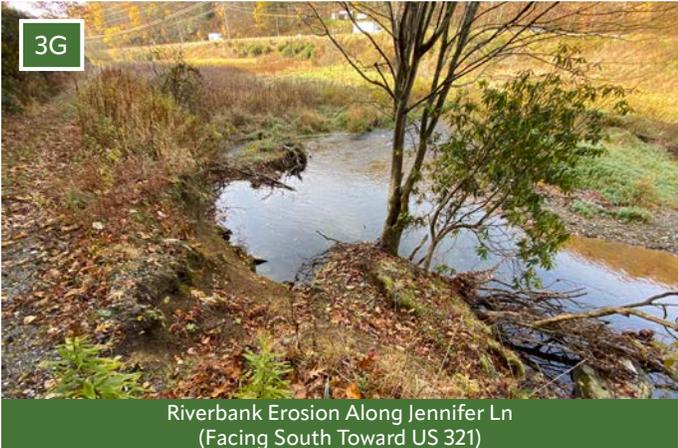
3E

US 321 Roadway Embankment + Utility Lines (Facing North Toward Mack Hampton Rd)



3F

Roadway Embankment + Utility Lines + RV Storage Site (Facing West on Mack Hampton Rd)



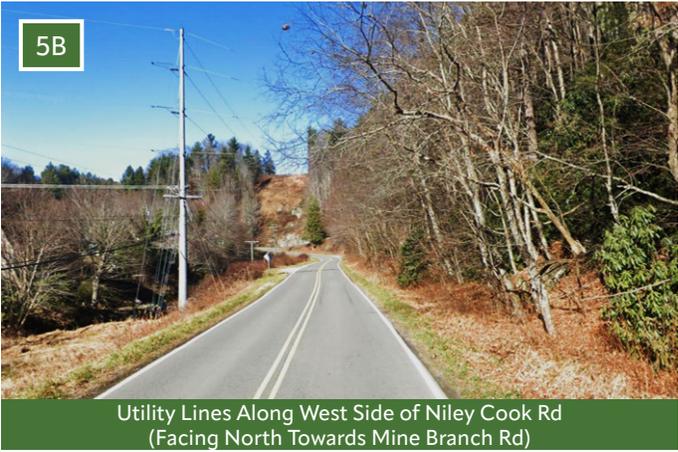
3G

Riverbank Erosion Along Jennifer Ln (Facing South Toward US 321)

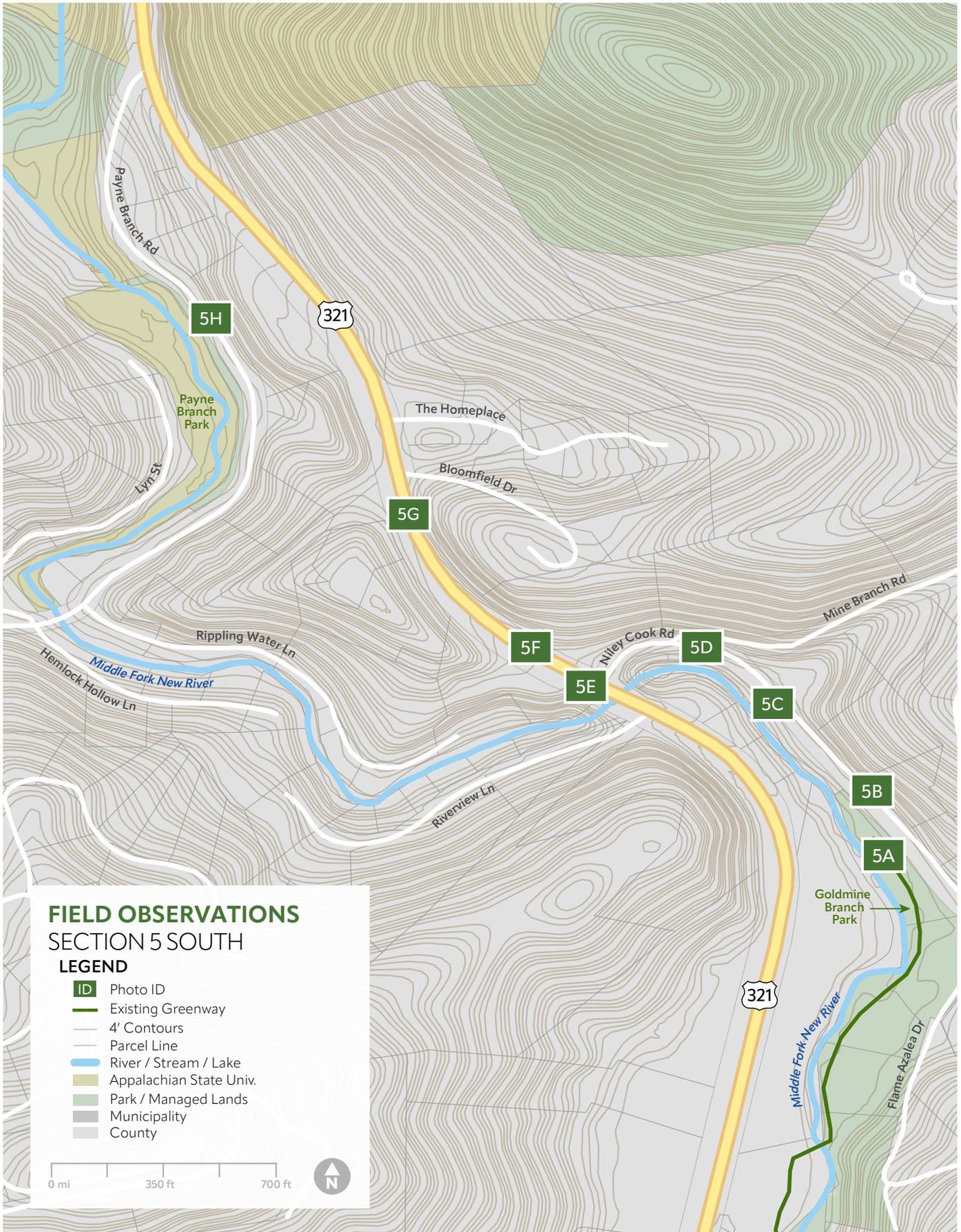


3H

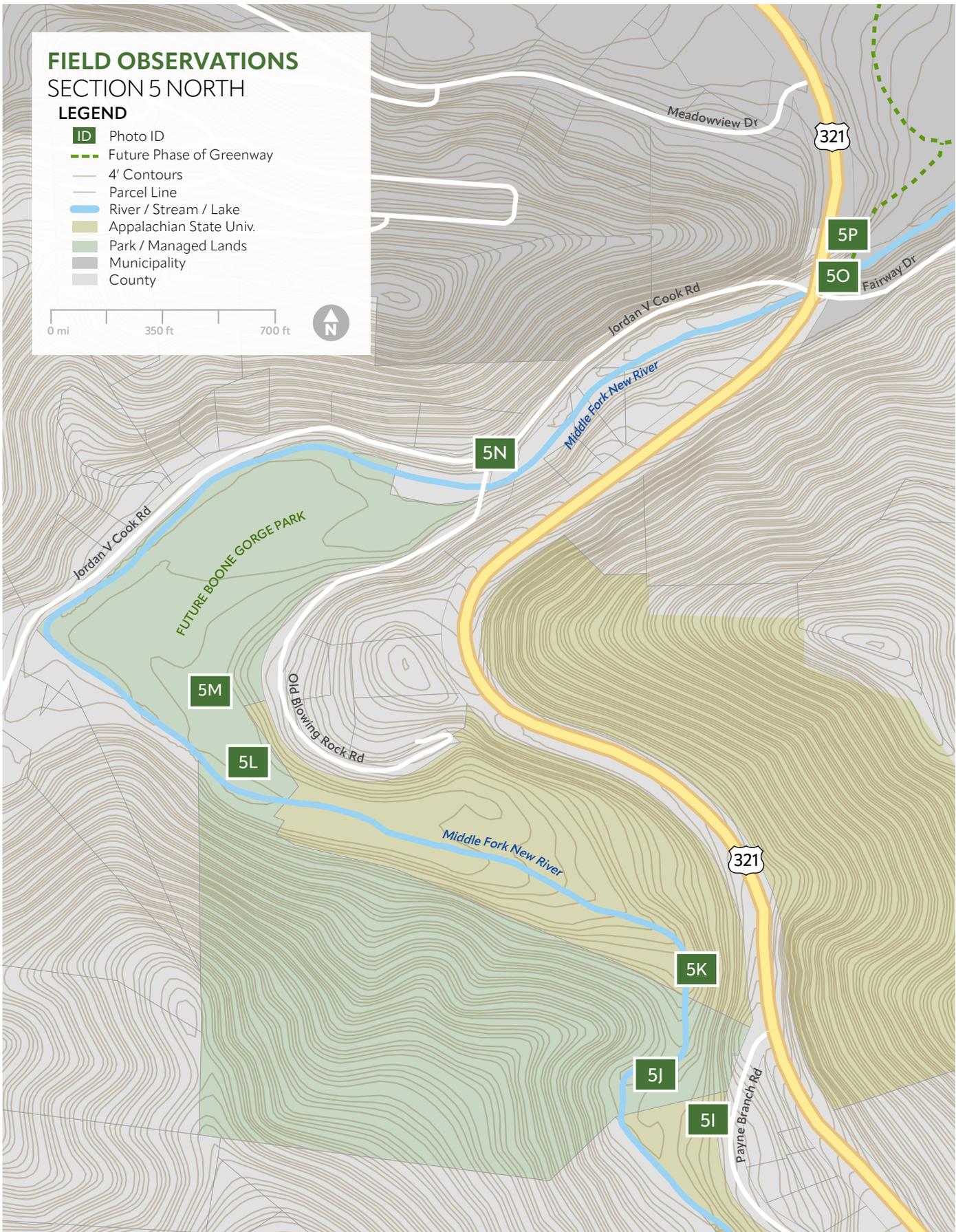
South End of Existing Greenway at Sterling Creek Park (Facing South Towards Middle Fork River / Dexter Dr)

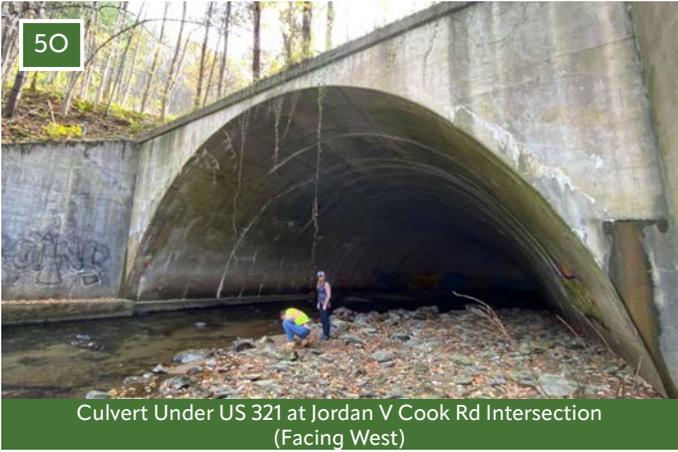
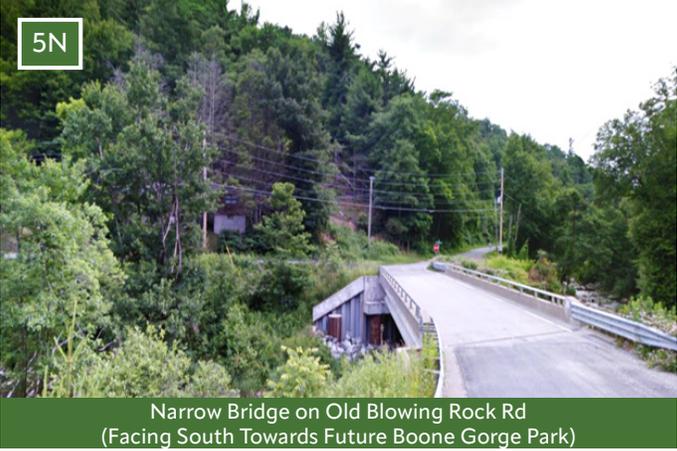
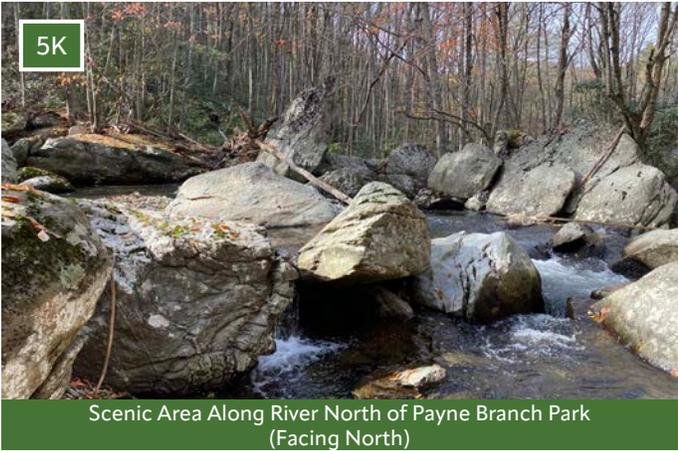
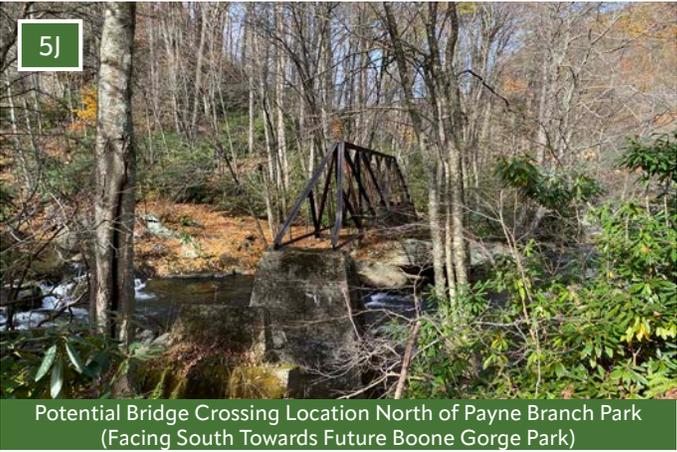
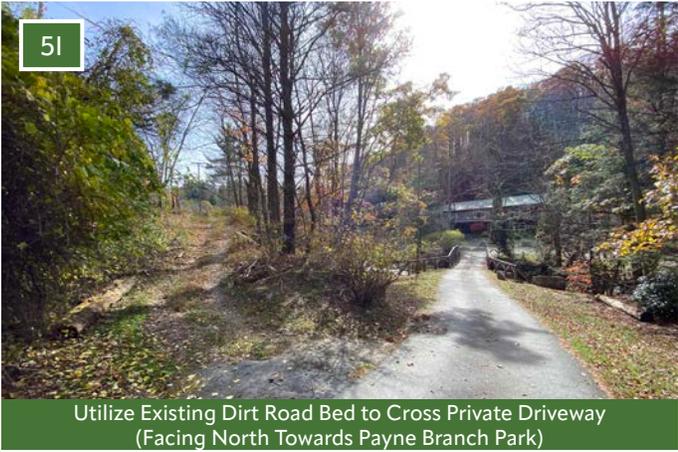


The following map and photos highlight several of the opportunities and constraints observed on the site visit which may influence alignment alternatives.



The following map and photos highlight several of the opportunities and constraints observed on the site visit which may influence alignment alternatives.







MIDDLE FORK GREENWAY AT MYSTERY HILL
CREDIT: MATT POWELL

ALTERNATIVES DEVELOPMENT

DESIGN CRITERIA

For the purposes of this study, trail design criteria assumptions include a preferred paved trail width of 10' for bi-directional use (8' minimum in constrained areas) and cross slopes of 2% or less. In open areas where space allows, 5' shoulders will be provided. In constrained areas, 2' shoulders may be used to limit impacts to wooded areas and areas of steep topography and to preserve the character of the environment. Any structures (bridges/boardwalks/tunnels) should provide a 10' minimum clear width. In areas where the greenway follows alongside roadways, a minimum 6' planting strip or a physical vertical separation barrier should be provided as appropriate.

Longitudinal slopes of 5% or less are desired and should be incorporated to the maximum extent practicable. In areas highly constrained by topography, steeper grades may be used but shall not exceed 10% and landings shall be provided in accordance with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) or Forest Service Trail Accessibility Guidelines (FSTAG). A minimum longitudinal grade of 0.5% should be provided per the AASHTO Guide for the Development of Bicycle Facilities.

Also in accordance with the AASHTO Guide for the Development of Bicycle Facilities, a vertical clearance of 10' should be provided above the greenway. In highly constrained areas, the absolute minimum vertical clearance above the greenway may be reduced to 8'. The minimum horizontal clear width for the greenway shall be equal to the trail width plus 2' on either side with no horizontal protrusions allowed.

For the Middle Fork Greenway to create a continuous and cohesive route it must cross multiple roadways. Grade-separated crossings, while preferred, may not be feasible within the project constraints. As such, well-designed at-grade crossings are a critical component of trail safety as users are transitioned from a separated space to a space that may contain multiple conflict points with motorists. Crossing designs will ensure high levels of visibility and awareness between trail users and motorists through a variety of available measures including pavement markings, advance warning signage, rumble strips, rectangular rapid flash beacons (RRFBs) and other signalization as appropriate.

Additional design resource information may be found in Appendix B.

SECTION 3 SEGMENT ALTERNATIVES

Route alternatives for this section of the greenway were developed based on the study considerations and field observations detailed previously in this chapter. Alternatives were broken into segments as shown on the map to the left and summarized in the table below.

ID	Description	Length Est. Cost*	Challenges / Constraints
1	Route follows mountain topography, crosses the river and runs along the west side of the river to Aho Rd	0.20 mi \$1.203M	Topography; Floodplain impacts; Stream buffer impacts; Crane access; Utility impacts
2	Route passes below existing Aho Rd bridge, parallels US 321, and crosses Mack Hampton Rd at-grade near river	0.16 mi \$130K	Property impacts; Utility impacts
3	Route passes below existing Aho Rd bridge, parallels river, and crosses Mack Hampton Rd at-grade near river	0.16 mi \$140K	Property impacts; Floodplain impacts; Stream buffer impacts
4	Route heads west around RV Storage site and parallels US 321	0.09 mi \$58K	Property impacts; Utility impacts
5	Route parallels river through RV Storage site	0.12 mi \$198K	Property impacts; Floodplain impacts; Stream buffer impacts
6	Route turns east from US 321 towards river in advance of bridge crossing	0.03 mi \$130K	Property impacts; Utility impacts
7	Route parallels US 321 and crosses over to the east side of the river north of the potential trailhead site	0.27 mi \$959K	Property impacts; Utility impacts; Topography
8	Route crosses to east side of river south of potential trailhead site and follows Jennifer Ln roadbed	0.22 mi \$568K	Property impacts; Floodplain impacts; Stream buffer impacts; Stream restoration to address erosion along section of Jennifer Ln
9	Route follows Jennifer Ln, crosses Dexter Dr at-grade, and crosses to west side of river at Sterling Creek Park	0.17 mi \$1.427M	Topography; Floodplain impacts; Crane Access

*Please see Chapters 4 and 5 for additional cost information.

ACCESS / CONNECTIONS

A potential trailhead on the parcel owned by Blue Ridge Conservancy provides access. If Segment 8 is chosen, a connection over the river between the potential trailhead and Jennifer Ln is proposed. A future natural surface trail behind Faith Bridge Methodist Church is proposed to create a trail connection to the trails at Blue Ridge Conservancy office off Aho Rd.



Potential Trailhead

Pass Below Aho Rd Bridge

SEGMENT ALTERNATIVES SECTION 3

LEGEND

- Segment Alternative ID
- Segment Alternative Route
- Proposed Bridge
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- Park / Managed Lands

0 mi

350 ft

700 ft

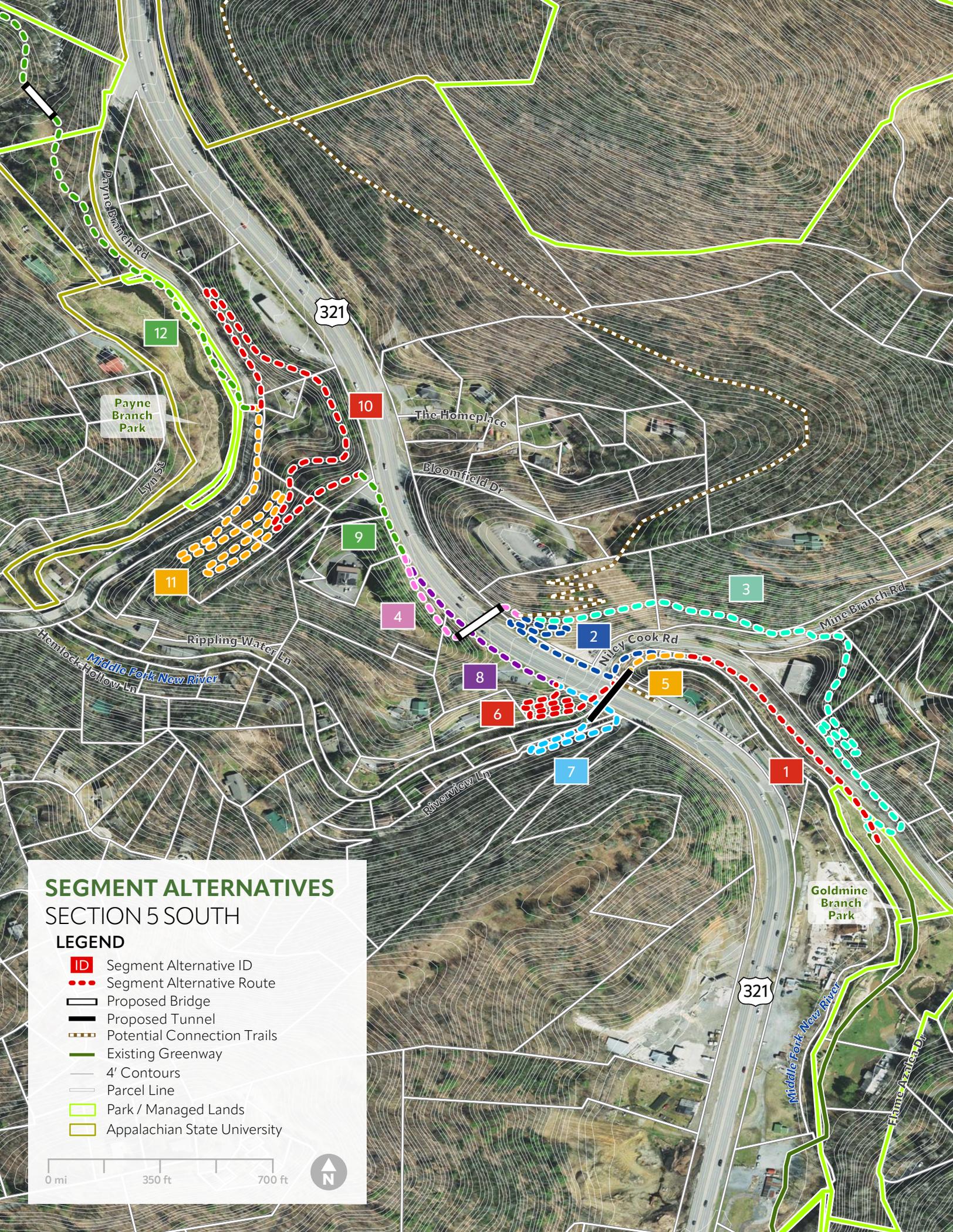
N

SEGMENT ALTERNATIVES SECTION 5 SOUTH

LEGEND

- ID Segment Alternative ID
- ⋯ Segment Alternative Route
- Proposed Bridge
- Proposed Tunnel
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- Park / Managed Lands
- Appalachian State University

0 mi 350 ft 700 ft



SECTION 5 SOUTH SEGMENT ALTERNATIVES

Route alternatives for this section of the greenway were developed based on the study considerations and field observations detailed previously in this chapter. Alternatives were broken into segments as shown on the map to the left and summarized in the table below. Routes following the river between US 321 and Payne Branch Park were not considered due to floodplain impacts on adjacent insurable structures and property impacts.

ID	Description	Length Est. Cost*	Challenges / Constraints
1	Route runs along west side of Niley Cook Rd from Goldmine Branch Park to Mine Branch Rd	0.15 mi \$456K	Utility impacts; Floodplain impacts; Stream buffer impacts; Topography; Property impacts
2	Crosses Niley Cook Rd at-grade at US 321, runs alongside US 321 and uses switchbacks to reach high ground	0.16 mi \$928K	At-grade crossing; Topography; Property impacts
3	Crosses Niley Cook Rd mid-block at-grade, climbs and crosses Mine Branch Rd at-grade, climbs to US 321	0.37 mi \$2.532M	Topography; Sight distance for at-grade crossings; Property impacts
4	Route crosses from east side to west side of US 321 on bridge and descends to roadway grade alongside US 321	0.10 mi \$975K	Highway crossing; Topography; Property impacts
5	Route descends alongside Niley Cook Rd to set up proposed tunnel under US 321 (over existing culvert)	0.03 mi \$284K	Floodplain impacts; Stream buffer impacts; Topography; Property impacts
6	Proposed tunnel under US 321 (over existing culvert) and switchbacks on north side of river to reach US 321	0.13 mi **	Maintenance of traffic during tunnel construction; Floodplain impacts; Stream buffer impacts; Topography
7	Proposed tunnel under US 321 (over existing culvert) and switchbacks on south side of river to reach US 321	0.15 mi \$2.455M	Maintenance of traffic during tunnel construction; Floodplain impacts; Stream buffer impacts; Topography
8	Route runs along west side of US 321	0.11 mi \$88K	Providing separation between US 321 and greenway; Utility impacts; Drainage impacts; Property impacts;
9	Route runs along west side of US 321 and crosses driveway	0.05 mi \$55K	Providing separation between US 321 and greenway; Utility impacts; Drainage impacts; Property impacts;
10	Route descends from US 321 via long switchbacks to cross Payne Branch Rd mid-block at-grade.	0.33 mi \$2.454M	Topography; Property impacts; Sight distance for at-grade crossing
11	Route descends from US 321 via short switchbacks to cross Payne Branch Rd mid-block at-grade.	0.33 mi \$2.154M	Topography; Property impacts; Sight distance for at-grade crossing

*Please see Chapters 4 and 5 for additional cost information.

**Costs were not calculated for segment alternatives that were removed from consideration.

SEGMENTS REMOVED FROM CONSIDERATION

Based on guidance from the Steering Committee, Segment 6 was removed from further consideration due to the number of switchbacks required as Segment 7 offered a better user experience for the tunnel option under US 321.

ACCESS / CONNECTIONS

Existing parking at Goldmine Branch Park provides access. A future natural surface trail east of US 321 is proposed to create a loop trail connection to the greenway at Fairway Dr.

SEGMENT ALTERNATIVES

SECTION 5 NORTH

LEGEND

- ID** Segment Alternative ID
- ...** Segment Alternative Route
- ▬** Proposed Bridge
- ▬** Proposed Tunnel
- ▬** Potential Connection Trails
- ▬** Existing Greenway
- 4' Contours
- ▬** Parcel Line
- ▭** Park / Managed Lands
- ▭** Appalachian State University

0 mi 350 ft 700 ft



Pass Below Highway Using Existing Culvert

FUTURE BOONE GORGE PARK

Potential Trailhead

16

17

18

15

14

13

12

321

321

SECTION 5 NORTH SEGMENT ALTERNATIVES

Route alternatives for this section of the greenway were developed based on the study considerations and field observations detailed previously in this chapter. Alternatives were broken into segments as shown on the map to the left and summarized in the table below.

ID	Description	Length Est. Cost*	Challenges / Constraints
12	Runs east of river through App State property and crosses to west side of river in future Boone Gorge Park	0.30 mi \$890K	Driveway crossing; App State property impacts; River crossing; Topography
13	Route follows high ground along mountain in future Boone Gorge Park	0.15 mi \$465K	Topography; Construction access
14	Route shifts to low ground along west bank of river in future Boone Gorge Park	0.21 mi **	Stream buffer impacts; Floodplain impacts; App State property impacts; Construction access
15	Route crosses from west side of river to east side of river within future Boone Gorge Park	0.07 mi \$664K	River crossing; Floodplain impacts
16	Route follows east bank of river through floodway at future Boone Gorge Park	0.29 mi **	Floodplain impacts; Design coordination with future Boone Gorge Park project
17	Route runs outside floodway through open field on east side of future Boone Gorge Park	0.17 mi \$113K	Design coordination with future Boone Gorge Park project
18	Route crosses over river, runs parallel to Jordan V Cook Rd, and crosses under US 321 in existing culvert	0.34 mi \$2.528M	River crossing; Utility impacts; Stream buffer impacts; Floodplain impacts; Topography; Construction access

*Please see Chapters 4 and 5 for additional cost information.

**Costs were not calculated for segment alternatives that were removed from consideration.

SEGMENTS REMOVED FROM CONSIDERATION

Based on guidance from the Steering Committee, Segment 14 was removed from further consideration to avoid stream buffer impacts and impacts to a parcel owned by Appalachian State University. Segment 16 was also removed from further consideration since Segment 17 offered a more direct route and improved access to the proposed trailhead parking area at future Boone Gorge Park.

ACCESS / CONNECTIONS

A trailhead parking area and a natural surface loop trail along the river are proposed as part of the design for the Boone Gorge Park project. A future natural surface trail east of US 321 is proposed to create a loop trail connection to the greenway between Niley Cook Rd and Fairway Dr. A grade-separated tunnel crossing of Fairway Dr should be explored further to enhance user experience and safety.



EXISTING GREENWAY
AT STERLING
CREEK PARK



03 COMMUNITY ENGAGEMENT

COMMUNITY ENGAGEMENT

OVERVIEW

Community engagement is an essential part of any planning process. The most effective plans are firmly rooted in the realities and visions of the communities that created them. This study relies on a combination of input from community members, working group members, supporting agencies, and non-profit organizations to inform the MFG Feasibility Study.

PREVIOUS ENGAGEMENT EFFORTS

The following table provides a summary of previous community engagement efforts for the MFG. The MFG project has provided the following engagement opportunities for stakeholders and the public.

ENGAGEMENT OPPORTUNITY	DESCRIPTION
MFG Executive Committee	This committee has met every other month for the last six years.
MFG Corridor Committee	This committee meets twice a year and includes Town Managers, County Managers, Planning Directors, Economic Development Planners, Chamber Directors, Tourism Development Authority (TDA) Directors, and select community members. The last meeting was held in December 2021.
MFG Task Force	This task force is a community group that met monthly before the Covid-19 pandemic. Currently, they help with volunteer workdays.
Blue Ridge Conservancy Board of Trustees	The Board meets every other month to receive an update on the MFG and provide guidance.
Ribbon Cuttings and Press Conferences	Since 2016, dozens of community events have been held, including ribbon cuttings, press conferences, and the community asked the NC Governor and Director of State Parks to provide updates to the community on recreation and the MFG. The MFG Director provides presentations regularly to town councils, county managers, TDA Boards, and other various community groups such as Rotary.
MFG Fundraiser	Since 2018, a Round-Up for the Middle Fork Greenway has included thousands of individuals and hundreds of businesses raising over \$500K for the greenway.
MFG Needs Assessment Survey	A Needs Assessment Survey was conducted by an Appalachian State University professor in 2010.
Public Meetings	Public meetings were held on November 28, 2015, and in August 2020.
Watauga County Public Hearing	A public hearing in support of the MFG took place on February 20, 2018.

2010 - Needs Assessment Survey

A Needs Assessment Survey for Watauga County Parks and Recreation Department was prepared and distributed by two professors at Appalachian State University. The Survey was distributed in October 2009 as part of the Watauga County Parks & Recreation Evaluation Project. To avoid bias, 1,647 people were randomly selected from a list of 36,227 registered voters in Watauga County to receive a survey. Since the subjects were collected through registered voters, each participant had to be 18 years of age or older. Subjects were randomly selected in order to allow more diversity and a fair opportunity to all registered voters and residents of Watauga County. Overall, the survey found that citizens were in support of the MFG project.

Key Findings:

- Respondents ranked the extension of existing and/or development of new paved trails as one of their top three priorities for the community.
- On a scale of "very unsupportive" to "very supportive," respondents marked that they were generally very supportive of extensions to existing and/or newly developed paved trails in the community.
- Out of several outdoor facility priorities, respondents ranked paved walking trails, unpaved hiking trails, biking trails, picnic shelters, and lighting on walking trails as their top five priorities.
- Out of a list of amenities, respondents desired picnic shelters, paved walking trails, unpaved hiking trails, indoor walking tracks, and biking trails within their community.

2015 - Public Outreach Meeting

A public meeting for the MFG took place on November 28, 2015. During the meeting, attendees were asked to participate in an exercise where they were asked questions related to the project and could provide responses to the questions on sticky notes.

Key Findings:

- Most respondents noted that the MFG is an important initiative for their region. Specific comments were related to general benefits that greenways provide, the expansion of outdoor recreation opportunities in the community, and how a new greenway connection would promote access to key community features and destinations in the surrounding area.
- Citizens wrote that they plan to use the MFG for exercise, to walk dogs on, to access the New River for fly fishing, and to introduce the greenway to friends, family, and locals as a new community amenity.
- When prompted for additional comments, respondents voiced an interest in speeding up the project and showed preference for an alternate route along Payne Branch Road.



2015 Public Outreach Meeting *Credit: Middle Fork Greenway*

2018 - Watauga Co. Public Hearing

The Watauga County Public Hearing for the Middle Fork Greenway took place on February 20, 2018. Forty-six citizens attend the hearing to support the Middle Fork Greenway's application to the North Carolina Parks and Recreation Trust Fund (PARTF).

2018-Present - Round Up for the Greenway

Since 2018, an annual Round-Up for the Middle Fork Greenway fundraising campaign has included thousands of individuals and hundreds of businesses raising over \$500K for the greenway.



2019 Round Up for the Greenway Donation
Credit: Middle Fork Greenway

2020 - Public Outreach Meeting

In August 2020, a second public meeting was held for the greenway. Eight public comments were collected between August 11th and 18th, 2020. The key comments are listed below. Please see Appendix D for comment responses.

Key Comments:

- Need for cooperation and access between the MFG, the MST, and the Blue Ridge Parkway (BRP).
- Need for a tunnel/culvert under the BRP specifically designed for hikers and bikers on the MFG. If possible, construct one tunnel/culvert to get under BRP and avoid second crossing on BRP access ramp.
- Need for an access or spur trail that would allow hikers to enter the MST from the MFG. Discourage bikes on the MST. Perhaps create a separate spur to the BRP for bikes. Ensure adequate funding for the spur trail(s) and adequate signage for both.
- The MST should remain open throughout construction (Friends of the MST can assist).
- The MFG should respect all wetlands while crossing all streams and aquatic habitats sustainably.
- The MFG should include educational signage throughout the trail to highlight natural resources and unique features.
- Provide a connection (trailhead) and parking access at the Foley Center site.
- Pocket parks should be added along the trail.
- Enhance the Middle Fork River as practical including restoration and native plants.
- Provide a push button and crosswalks at US 321 and Possum Hollow Road as well as secure guardrails for all US 321 highway sections.
- The MFG will have a long-standing significant impact on the physical and economic health of our community. As such, it should be a first class, integral part of the 'High Country' adding to quality of life to residents and visitors. The trail should be appealing and sensitive to our natural resources. Create an information website for users of the greenway.
- General support and praise for all working on the project: Thanks to the Town of Blowing Rock and its TDA, the Town Manager; the Planning Director, WithersRavenel, and Blue Ridge Conservancy/MFG Director for their advocacy and support for this important project.
- The Friends of the MST fully supports the MFG project and looks forward to working with its sponsors and land managers in coordinating the intersection of our two trails.

In addition to the engagement opportunities outlined above, a public input session took place in Spring 2022 for the Eastern Federal Lands Access Program (EFLAP) grant that Blue Ridge Conservancy received in Section 1 (for the NEPA, Environmental Assessment requirements).

COMMUNITY ENGAGEMENT PLAN

At the beginning of the feasibility project, the project team developed a Public Involvement Plan (PIP) to outline future outreach events and ensure equitable public involvement throughout the duration of the project. The PIP serves as a flexible document throughout the project’s lifecycle and its purpose is to:

- Inform the community on the proposed planning process for Middle Fork Greenway Feasibility Study.
- Provide an overview of prior community involvement.
- Gauge public interest in the planning process.
- Understand where the community desires connections along the Middle Fork Greenway.
- Understand how the community would like to use the Middle Fork Greenway.
- Understand how to phase and prioritize project segments for future investment and development.

Steering Committee Meetings

At the request of Blue Ridge Conservancy, the team utilized the existing Middle Fork Greenway Executive Committee and its regularly scheduled bi-monthly meetings as the steering committee for this study. Steering committee members met three times throughout the duration of the project and provided guidance for the study by reviewing and sharing feedback on relevant data, community engagement efforts, alignment recommendations, and implementation strategies. Members also supported the study by disseminating information and communication materials to the public. General information and logistics for the steering committee meetings are provided in the following table. Key findings from each of these meetings are discussed later in this chapter.

STEERING COMMITTEE MEMBERS

Joe Furstenburg, NCDOT Integrated Mobility Division
 Wendy Patoprsty, BRC MFG Greenway Director
 Ann Browning, Former BRC Board Chair
 Don Mikush, Current BRC Board Chair
 Meagan Phillips, Former BRC Trustee
 Dave Harmon, Current BRC Trustee
 Bonnie Weyher, Current BRC Trustee
 Curt Andrews, Blowing Rock Appearance Commission
 Joe Furman, Watauga County Planning and Inspections Director
 Stephen Poulos, Watauga County Recreation Director
 Zika Rea, Zap Endurance Business Owner

MEETING NUMBER	PURPOSE	DATE	LOCATION	MEETING ELEMENTS
1	Project Overview + Initial Alternatives Development	February 2022	Virtual	<ul style="list-style-type: none"> • Review project schedule with key milestones. • Review public engagement approach and prior community involvement. • Review of existing conditions and previous planning efforts. • Discuss opportunities/constraints and present site visit observations. • Conduct interactive exercise to present initial alignment alternatives and gather feedback.
2	Alternatives Evaluation + Recommendations	April 2022	Virtual	<ul style="list-style-type: none"> • Review and discussion of alternatives evaluation methodology and decision matrix. • Review and discussion of preferred route(s). • Review of design recommendations (typical cross section, intersection/crossing treatments, amenities, access points/trailheads).
3	Public Input Results, Costs + Implementation Strategies	June 2022	Virtual	<ul style="list-style-type: none"> • Review public input results. • Review cost estimates. • Discuss implementation strategies and project phasing opportunities.

Public Meeting

A lunchtime public meeting was held virtually via Zoom on Tuesday, May 10th, 2022, from 12:00 noon to 1:00 p.m. The meeting was promoted through the Middle Fork Greenway website, digital flyers, social media posts, and by Steering Committee members. The purpose of the meeting was to provide a study overview (including schedule), review existing conditions and study considerations (including field visit observations), and present the route alternatives for feedback from the public. The project team also reviewed the alternatives evaluation methodology, presented the design recommendations (including typical cross sections, intersection/crossing treatments, amenities, and potential access points/trailhead locations) and directed participants to the online survey.



JOIN THE MEETING VIA ZOOM:
<https://bit.ly/MFGmeeting>
Meeting ID:
840 9647 9984
Call In:
+1-646-876-9923



Middle Fork
GREENWAY

MIDDLE FORK GREENWAY FEASIBILITY STUDY
VIRTUAL PUBLIC MEETING - TUESDAY, MAY 10TH - NOON-1PM

The project team is seeking community input on route alternatives for two sections of the Middle Fork Greenway currently in development.

Join the public meeting to get project updates, review routes, and provide input!

For more info, visit: <https://www.middleforkgreenway.org/events>

Public Survey

Coinciding with the public meeting, the team launched an online public survey on May 10th, 2022, which was open for public comment until June 1st, 2022. The survey link was advertised on the Middle Fork Greenway's website and was also distributed through other means of communication such as digital flyers, social media posts and a QR code.

The goal of the public survey was to help accomplish the following objectives:

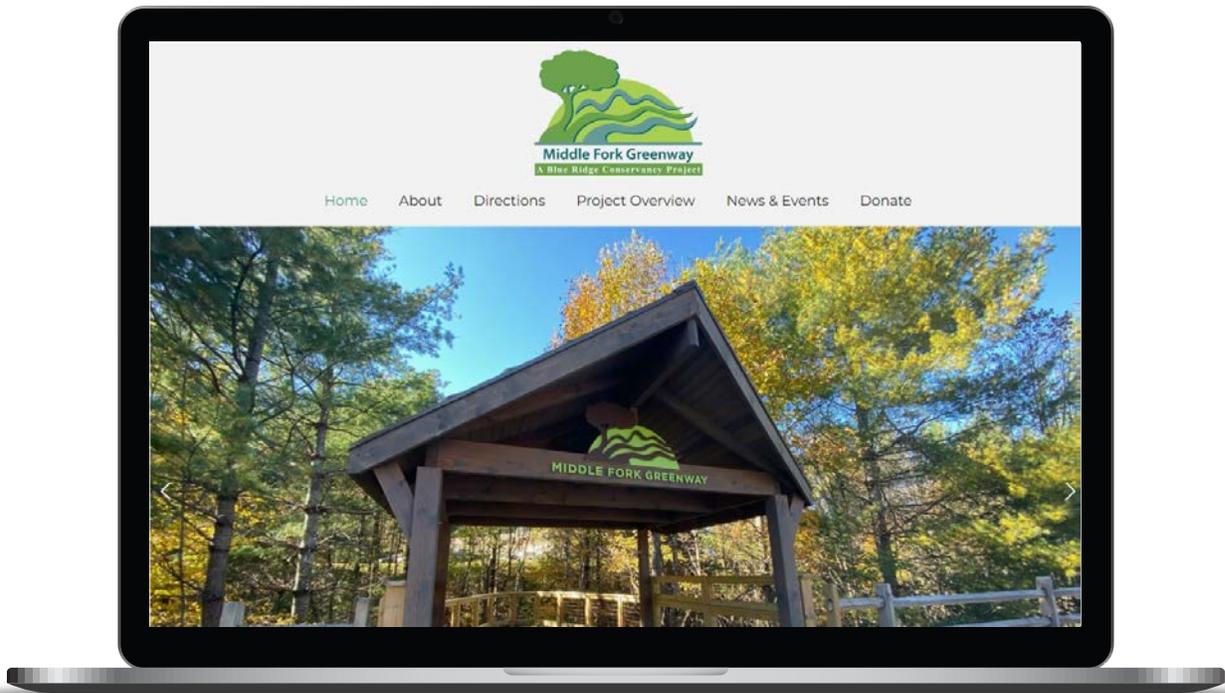
- Introduce the project and gauge public support.
- Understand how and how often the MFG is currently used.
- Solicit and compile public comment on route alternative preferences.
- Provide an opportunity for general feedback on the study.
- Develop an email contact list for interested parties.

Survey results are discussed later in this chapter and additional survey information is provided in Appendix D.

Project Webpage

Blue Ridge Conservancy hosted the following information about the study on the existing Middle Fork Greenway website (www.middleforkgreenway.org):

- Project overview and schedule
- Study area map
- Public survey link and QR code
- Embedded on-demand video of the virtual public meeting
- Team contact information for questions about the study.



Landowner Meetings

For consistency and continuity of prior landowner engagement processes on other sections of the MFG, it was determined the project team would not be conducting study-specific landowner meetings. Rather, Blue Ridge Conservancy staff will continue building relationships with willing landowners in the study corridor using route alternatives, design recommendations and other information from this study to facilitate further engagement and land/easement acquisition activities.

SUMMARY OF ENGAGEMENT RESULTS

Feedback obtained during project meetings, coupled with input collected from the public survey helped to inform the preferred alignment for the Middle Fork Greenway Feasibility Study. Key takeaways and comment themes gathered from the steering committee meetings and the public survey are presented below and on the following pages.

STEERING COMMITTEE MEETINGS

Three steering committee meetings were held throughout the duration of the project. Summaries and key findings for each meeting are described below.

Steering Committee Meeting #1

The first steering committee meeting took place on February 15th, 2022. During this meeting, the project team provided an overview of the project, including the project study area, the project schedule, and the importance of community and stakeholder engagement. In addition, the team reviewed the existing conditions and study considerations for the project, as well as potential route alternatives segments. The team facilitated a group exercise to discuss the mapping and to define what a successful project looked like to the steering committee.

Key Findings:

- Section 3 - Attendees voiced preference for stream restoration along Segment 5. They asked that the stream be pulled away from Jennifer Lane (east of US Hwy 321). Attendees supported the potential trailhead location between US Hwy 321 and Jennifer Lane.
- Section 5 South - Attendees were concerned about the practicality of the switchbacks on Segment 6. The land under Segment 7 has been for sale for a while and may be easier to acquire.
- Section 5 North - Respondents noted that the space between Jordan V Cook Road and the river is steep. The bridge proposed in Segment 15 must avoid the floodway and attendees were concerned about the proximity of Segment 14 to the river and to avoid ASU's property in this area.

Steering Committee Meeting #2

The second steering committee meeting took place on April 19th, 2022. During this meeting, the project team reviewed the project schedule and upcoming engagement opportunities. The project team also discussed design recommendations for typical cross sections as well as evaluation criteria, the decision matrix, and the updated route alternatives segments. Overall route alternatives (comprised of various combinations of the segment alternatives) for Section 3, Section 5 South, and Section 5 North were presented for feedback.

Key Findings:

- Attendees are interested in learning the evaluation criteria priority preferences from the upcoming public survey.
- Attendees appreciated the level of detail and number of alternatives studied.
- Attendees preferred routes that follow the river and avoid roadways.

Steering Committee Meeting #3

The third steering committee meeting took place on June 16th, 2022. During this meeting, the project team discussed the virtual public meeting and reviewed the online survey results. The team also presented preliminary construction cost estimates for route alternatives in Sections 3 and 5. Following the cost estimate review, the team presented potential implementations strategies including information on section priorities, partner roles, and highlights from the action plan.

Key Findings:

- Section 5 should be divided up into the following three phases for implementation (Phase 1 = Highest Priority, Phase 3 = Lowest Priority):
 - Phase 1 - Boone Gorge Park to Payne Branch Park;
 - Phase 2 - Boone Gorge Park to Jordan V Cook Rd (end at Watauga Medical Center Property east of US 321); and
 - Phase 3 - Niley Cook Rd/Gold Mine Branch Park to Payne Branch Park.
- Section 3 should be prioritized over Section 5 Phases 2 and 3.

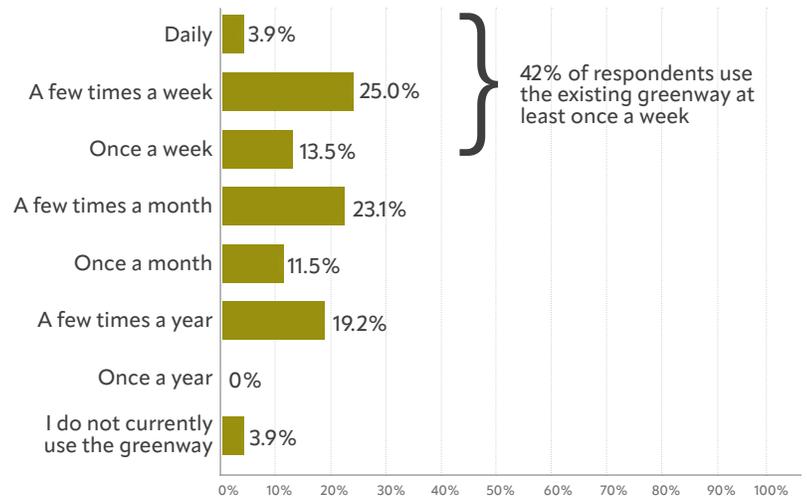
PUBLIC SURVEY

Coinciding with the public meeting, the team launched an eight question online public survey on May 10th, 2022, which was open for public comment until June 1st, 2022. Feedback from the 52 respondents is summarized by theme or specific comment. Overall, the comments collected were generally positive and include several different perspectives on the project.

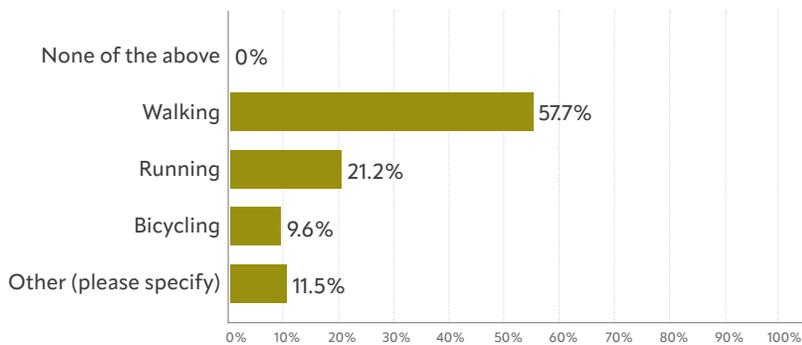
Additional survey information is provided in Appendix D.

Public Survey Summary

How Often Do You Use the Existing Sections of the Middle Fork Greenway?



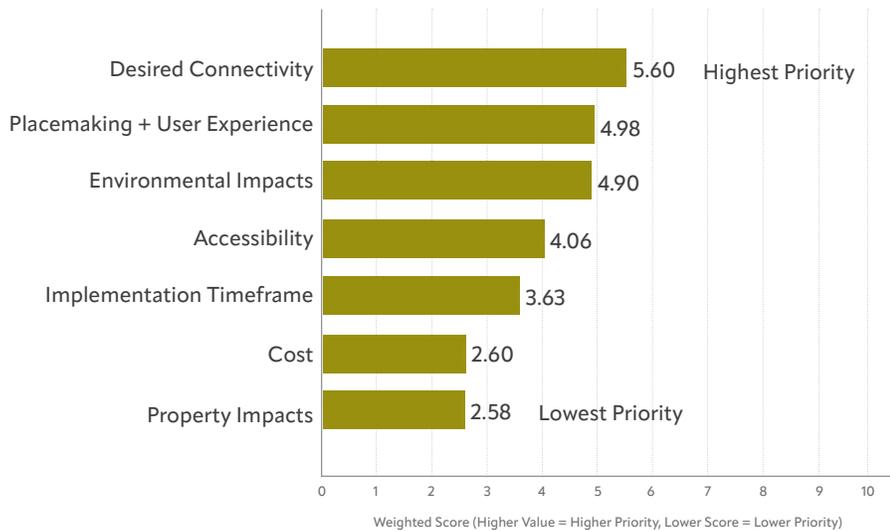
How Do You Use the Middle Fork Greenway?



"It will be used for cycling and walking once a long stretch of it is completed. But I currently use the large section of greenway multiple times a week for cycling and walking."

-Survey Respondent

Please Rank the Following Evaluation Criteria in Order From Most Important at the Top to Least Important at the Bottom



Cost

The magnitude of the total life-cycle cost for each alternative (including design, construction, and ongoing maintenance).

Property Impacts

The ability of the route alternatives to utilize publicly-owned properties, existing easements, public right-of-way, and limit impacts to privately property owners.

Implementation Timeframe

The amount of time it takes to plan, fund, design, and ultimately construct each route alternative.

Accessibility

Convenience of use and accommodation for users of all ages and abilities to ensure the ultimate route alternative is a community amenity designed for universal use.

Environmental Impacts

The ability of each alternative to minimize impacts to streams, wetlands and other jurisdictional features (including associated buffers, floodplain elevations, and other environmental factors) during construction and operation of the proposed greenway.

Placemaking + User Experience

The potential ability of the route alternatives to help drive tourism, contribute to the local economy, and brand the surrounding area by as one that promotes healthy, active lifestyles.

Desired Connectivity

In order to maximize use of the facility, determining which route alternatives connect popular origins and destinations identified by the public and other stakeholders is considered.

Respondents were asked to review and comment on the overall route alternatives for Section 3, Section 5 South and Section 5 North, as presented in Chapter 4 of this report. Key findings are presented below.

Section 3: Aho Rd to Sterling Creek Park - Key Findings:

- Many respondents stated that Alternative A was their top choice (22).
- Respondents noted that following the river is important, as is staying away from noise and other issues that come with being too close to the highway.
- Safety and enhanced user experiences are priorities.

Section 5 South: Goldmine Branch Park/Niley Cook Road to Payne Branch Park - Key Findings:

- No clear favorite, Alternative A appears to be slightly more preferred than Alternatives F, C, + D.
- Alternatives B + E appear to be least preferred (do not like crossing Niley Cook at-grade at intersection with 321)
- Prefer fewer switchbacks, but recognize topography is challenging.
- Split opinions over bridge vs. tunnel crossing of 321, understand cost may influence ultimate route.

Section 5 North: Payne Branch Park to Jordan V Cook Road - Key Findings:

- Positive feedback for recommended route and support for the potential connection trail east of 321.
- Lots of excitement for this section / future Boone Gorge Park.
- Some concern for flooding and being able to keep trail open, specifically at culvert crossing under 321.

When prompted for additional feedback at the end of the survey, the following comments were provided:

"Build it and they will come!"
-Survey Respondent

"Very excited about the progression of this greenway. Having a connector from Blowing Rock to Boone would be amazing. I know I would personally use it almost daily and would consider biking to work."
-Survey Respondent

"These sections are critical to connect Boone to the Greenway and Blowing Rock. I think alternatives should look at the fastest implementation time."
-Survey Respondent

"Less surface roads and 321 that you have to cross the better. Safety for kids and people from cars should be a top priority and trying to route the greenway by the river but not close to the road when possible."
-Survey Respondent

"Completing the MFG is important for the lifestyles our area is known for. When you travel to other areas they already have these lengths in place and in use. Boone is behind. Keeping the trails in natural settings is healthy."
-Survey Respondent



PAYNE BRANCH PARK
NATURAL SURFACE
TRAIL



04 EVALUATION + RECOMMENDATIONS

EVALUATION + RECOMMENDATIONS

OVERVIEW

The Middle Fork Greenway recommendations for Sections 3 and 5 will provide residents with safe, comfortable and direct travel choices between Boone and Blowing Rock. Recommendations were developed based on community and stakeholder input, a review of existing conditions, key destinations and connections identified through the planning process, and a prioritization process. This chapter outlines the overall route alternatives considered, discusses evaluation criteria, recommended routes, typical section recommendations and trail amenities considerations.

ROUTE ALTERNATIVES FOR EVALUATION

Overall route alternatives were developed using various combinations of the segment alternatives presented in Chapter 2. The following pages detail the six route alternatives developed for Section 3 and the six route alternatives developed for Section 5 South. After several segment alternatives were removed from consideration in Section 5 North (as described in Chapter 2) only one route for this section remains.

SECTION 3 ALTERNATIVE A

(SEGMENTS 1 > 3 > 5 > 8 > 9 + TRAILHEAD + TRAILHEAD CONNECTION)

Alternative A begins on a mountain between US 321 and the Firethorn subdivision before crossing over the river via a pedestrian bridge between Faithbridge United Methodist Church and The Mustard Seed Market. The route then passes below the recently reconstructed Aho Rd bridge and continues alongside the river to Mack Hampton Rd. After crossing Mack Hampton Rd at-grade, the route continues along the west bank of the river and crosses over to the east side of the river via a second pedestrian bridge to Jennifer Ln. Utilizing the existing roadbed on Jennifer Ln, the route continues north through land owned by Blue Ridge Conservancy before crossing Dexter Dr at-grade and connecting to the existing section of the MFG at Sterling Creek Park on the west side of the river via a third pedestrian bridge. A trailhead is proposed adjacent to US 321 on the Blue Ridge Conservancy land, which will connect to the mainline MFG along Jennifer Ln via a connection trail with pedestrian bridge over the river.

LENGTH = 0.91 miles

ESTIMATED 2022 CONSTRUCTION COST = \$4,388,000

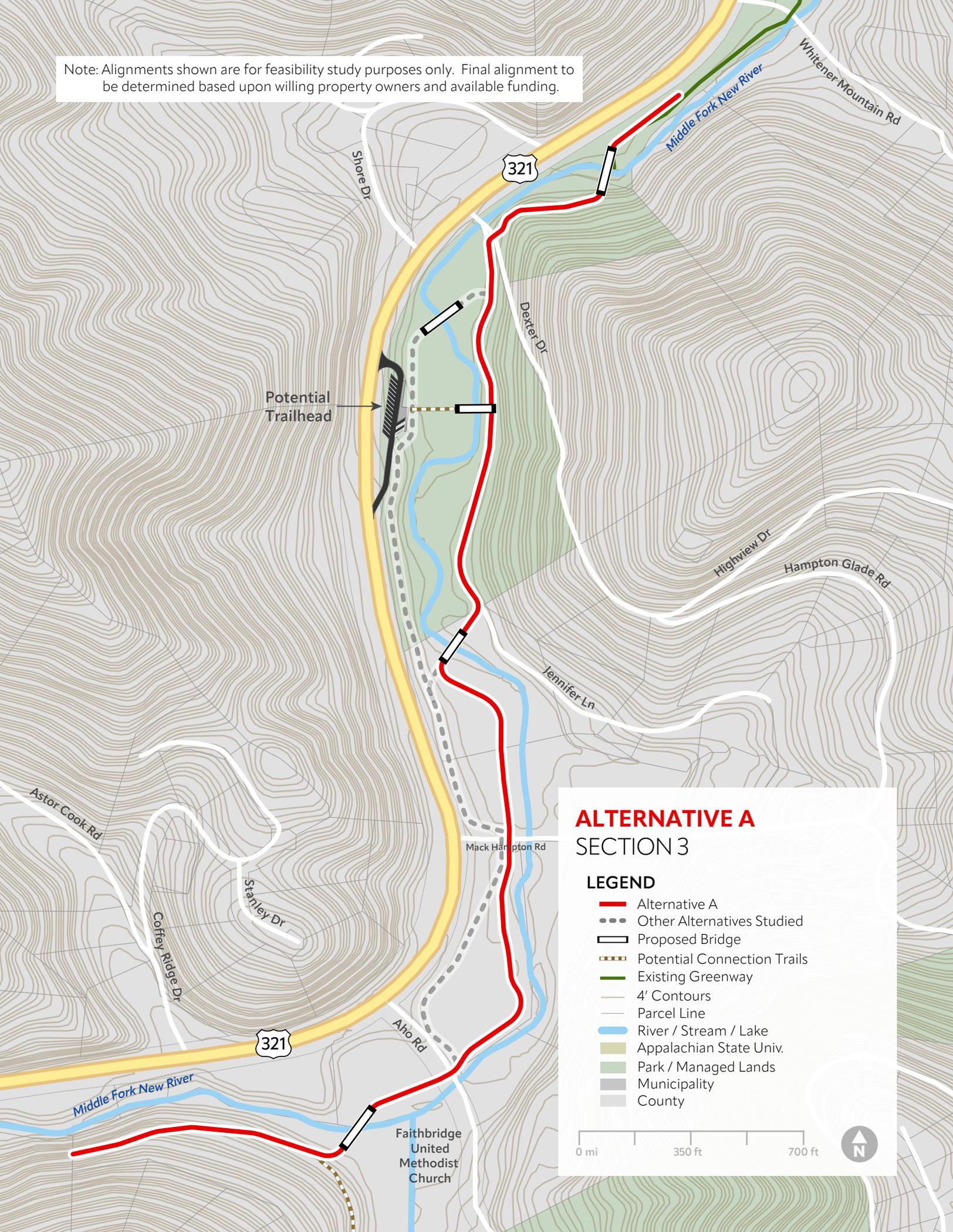
PROS:

- Most desirable user experience by following river for the entire length of the greenway.
- Provides grade-separated crossing of Aho Rd.
- Utilizes existing roadbed on Jennifer Ln, minimizing grading and reducing cost for that segment.

CONS:

- Added cost for connection trail with bridge to proposed trailhead.
- Potential impacts to RV storage site on north side of Mack Hampton Rd.
- Requires restoration / stabilization of river along a portion of Jennifer Ln where river is beginning to undercut roadbed.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



ALTERNATIVE A SECTION 3

LEGEND

- Alternative A
- Other Alternatives Studied
- Proposed Bridge
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 3

ALTERNATIVE B

(SEGMENTS 1 > 3 > 4 > 7 > 9 + TRAILHEAD)

Alternative B begins on a mountain between US 321 and the Firethorn subdivision before crossing over the river via a pedestrian bridge between Faithbridge United Methodist Church and The Mustard Seed Market. The route then passes below the recently reconstructed Aho Rd bridge and continues alongside the river to Mack Hampton Rd. After crossing Mack Hampton Rd at-grade, the route turns west and continues along the east side of US 321 to the proposed trailhead on the land owned by Blue Ridge Conservancy. The route then crosses over to the east side of the river via a second pedestrian bridge to Jennifer Ln just south of Dexter Dr. Users will cross Dexter Dr at-grade and connect to the existing section of the MFG at Sterling Creek Park on the west side of the river via a third pedestrian bridge.

LENGTH = 0.89 miles

ESTIMATED 2022 CONSTRUCTION COST = \$4,087,000

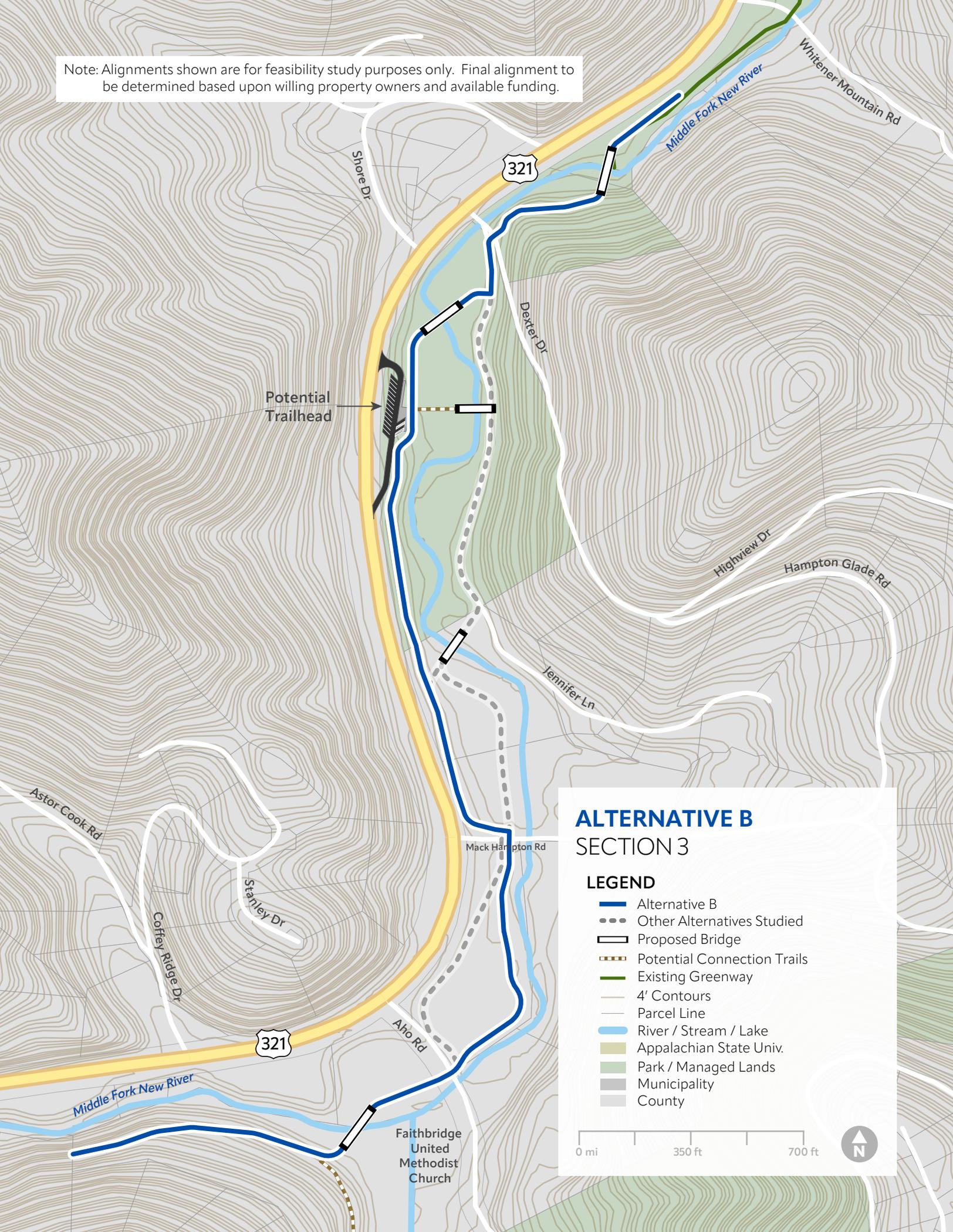
PROS:

- Desirable user experience by following river for approximately 60% of the length of the greenway.
- Provides grade-separated crossing of Aho Rd.
- Does not require restoration / stabilization of river along a portion of Jennifer Ln where river is beginning to undercut roadbed.
- Mainline MFG will tie directly to the proposed trailhead, eliminating the need for a separate connection trail over the river.
- Fewer potential impacts RV storage site on north side of Mack Hampton Rd.

CONS:

- Less desirable user experience by following US 321 for approximately 40% of the length of the greenway.
- More grading required on Blue Ridge Conservancy land compared to other alternatives utilizing the Jennifer Ln roadbed.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



Potential Trailhead

ALTERNATIVE B SECTION 3

LEGEND

- Alternative B
- Other Alternatives Studied
- Proposed Bridge
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 3

ALTERNATIVE C

(SEGMENTS 1 > 2 > 4 > 7 > 9 + TRAILHEAD)

Alternative C begins on a mountain between US 321 and the Firethorn subdivision before crossing over the river via a pedestrian bridge between Faithbridge United Methodist Church and The Mustard Seed Market. The route then passes below the recently reconstructed Aho Rd bridge and turns west to run along the east side US 321 before turning back to the river at Mack Hampton Rd. After crossing Mack Hampton Rd at-grade, the route turns west and continues along the east side of US 321 to the proposed trailhead on the land owned by Blue Ridge Conservancy. The route then crosses over to the east side of the river via a second pedestrian bridge to Jennifer Ln just south of Dexter Dr. Users will cross Dexter Dr at-grade and connect to the existing section of the MFG at Sterling Creek Park on the west side of the river via a third pedestrian bridge.

LENGTH = 0.89 miles

ESTIMATED 2022 CONSTRUCTION COST = \$4,077,000

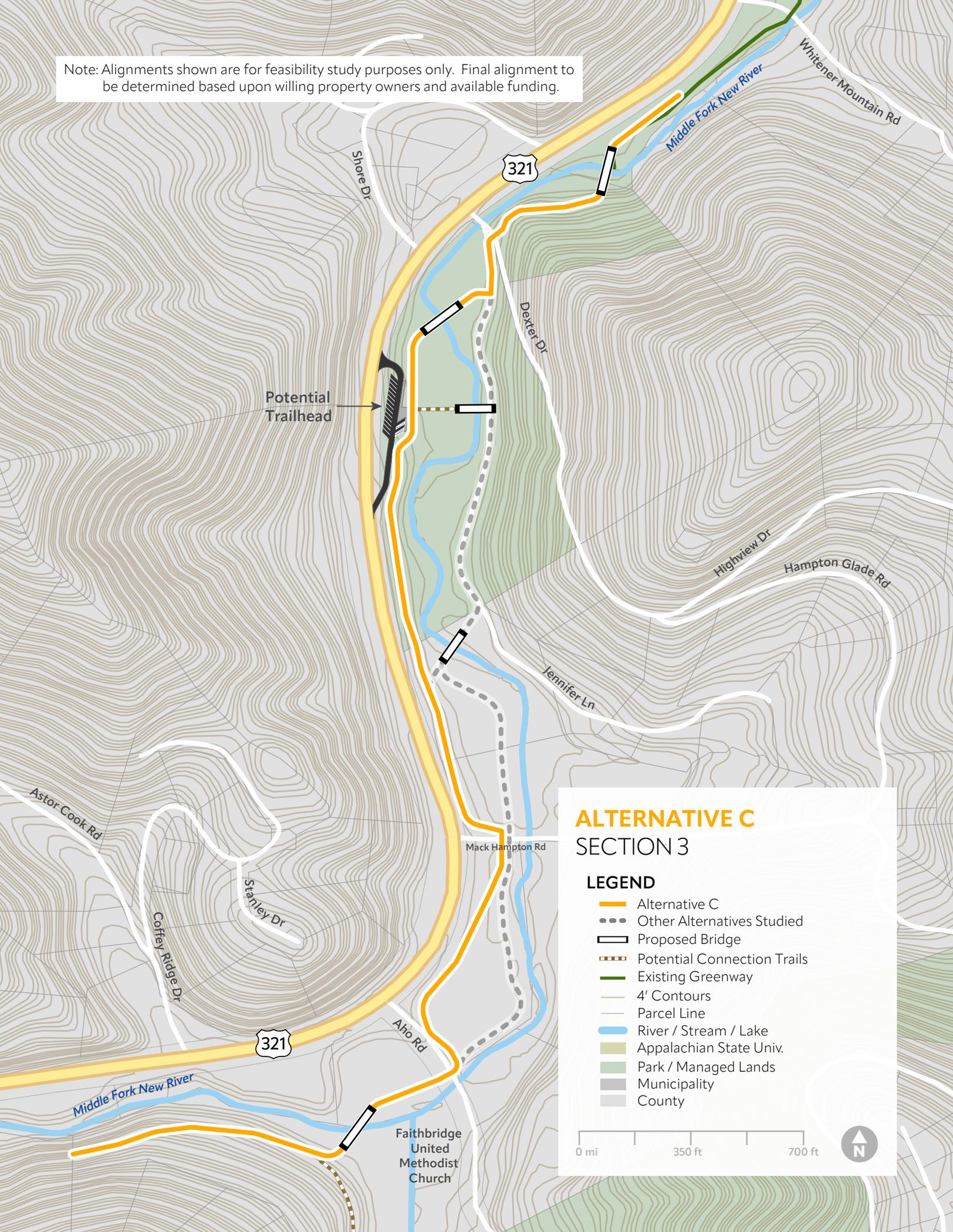
PROS:

- Desirable user experience by following river for approximately 40% of the length of the greenway.
- Provides grade-separated crossing of Aho Rd.
- Does not require restoration / stabilization of river along a portion of Jennifer Ln where river is beginning to undercut roadbed.
- Mainline MFG will tie directly to the proposed trailhead, eliminating the need for a separate connection trail over the river.
- Fewer potential impacts RV storage site on north side of Mack Hampton Rd.

CONS:

- Less desirable user experience by following US 321 for approximately 60% of the length of the greenway.
- Potential impacts to business driveway on north side of Aho Rd.
- More grading required on Blue Ridge Conservancy land compared to other alternatives utilizing the Jennifer Ln roadbed.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



ALTERNATIVE C SECTION 3

LEGEND

- Alternative C
- Other Alternatives Studied
- Proposed Bridge
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 3

ALTERNATIVE D

(SEGMENTS 1 > 2 > 5 > 8 > 9 + TRAILHEAD + TRAILHEAD CONNECTION)

Alternative D begins on a mountain between US 321 and the Firethorn subdivision before crossing over the river via a pedestrian bridge between Faithbridge United Methodist Church and The Mustard Seed Market. The route then passes below the recently reconstructed Aho Rd bridge and turns west to run along the east side US 321 before turning back to the river at Mack Hampton Rd. After crossing Mack Hampton Rd at-grade, the route continues along the west bank of the river and crosses over to the east side of the river via a second pedestrian bridge to Jennifer Ln. Utilizing the existing roadbed on Jennifer Ln, the route continues north through land owned by Blue Ridge Conservancy before crossing Dexter Dr at-grade and connecting to the existing section of the MFG at Sterling Creek Park on the west side of the river via a third pedestrian bridge. A trailhead is proposed adjacent to US 321 on the Blue Ridge Conservancy land, which will connect to the mainline MFG along Jennifer Ln via a connection trail with pedestrian bridge over the river.

LENGTH = 0.91 miles

ESTIMATED 2022 CONSTRUCTION COST = \$4,378,000

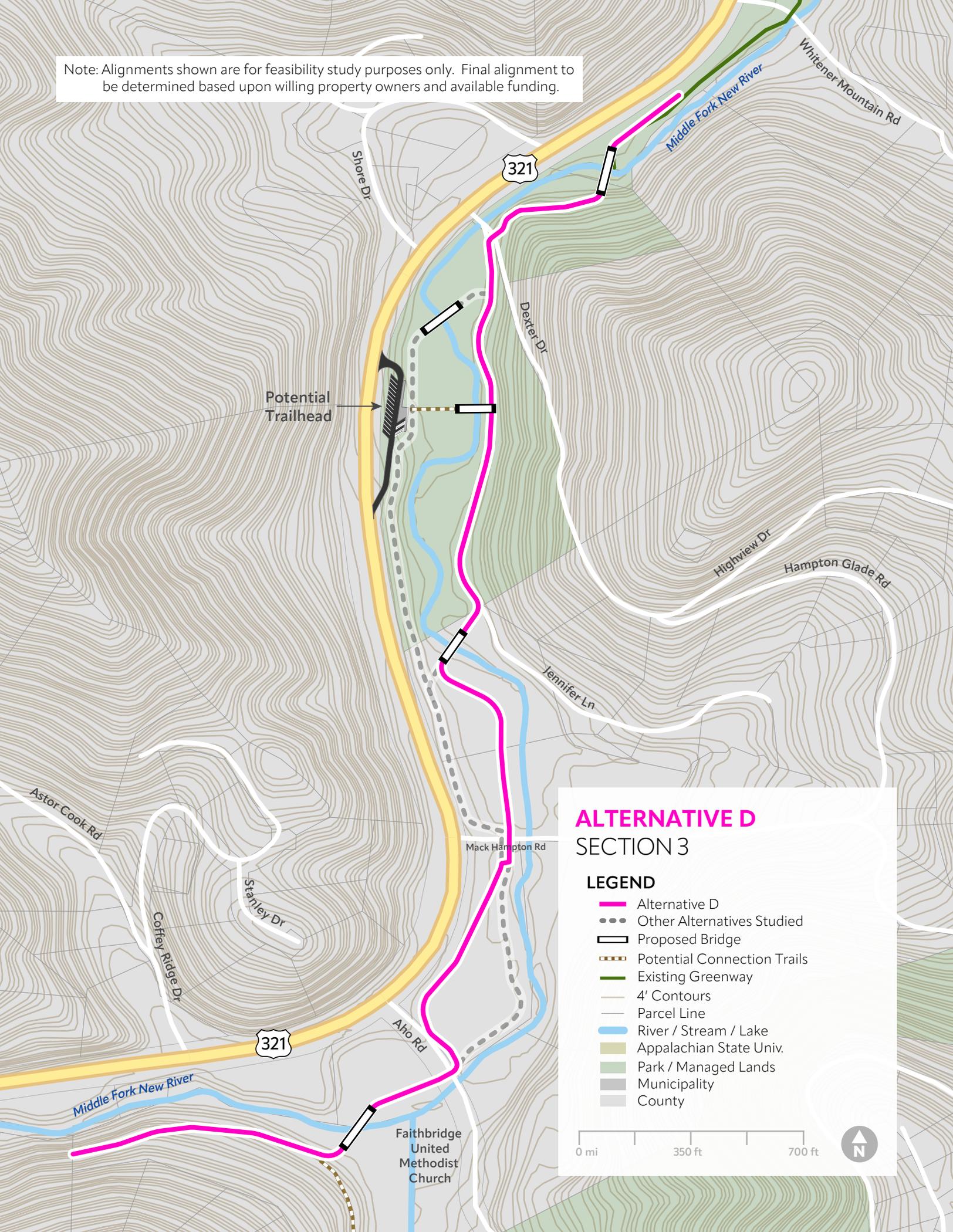
PROS:

- Desirable user experience by following river for approximately 80% of the length of the greenway.
- Provides grade-separated crossing of Aho Rd.
- Utilizes existing roadbed on Jennifer Ln, minimizing grading and reducing cost for that segment.

CONS:

- Less desirable user experience by following US 321 for approximately 20% of the length of the greenway.
- Added cost for connection trail with bridge to proposed trailhead.
- Potential impacts to business driveway on north side of Aho Rd.
- Potential impacts to RV storage site on north side of Mack Hampton Rd.
- Requires restoration / stabilization of river along a portion of Jennifer Ln where river is beginning to undercut roadbed.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



ALTERNATIVE D SECTION 3

LEGEND

- Alternative D
- Other Alternatives Studied
- Proposed Bridge
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 3

ALTERNATIVE E

(SEGMENTS 1 > 3 > 4 > 6 > 8 > 9 + TRAILHEAD + TRAILHEAD CONNECTION)

Alternative E begins on a mountain between US 321 and the Firethorn subdivision before crossing over the river via a pedestrian bridge between Faithbridge United Methodist Church and The Mustard Seed Market. The route then passes below the recently reconstructed Aho Rd bridge and continues alongside the river to Mack Hampton Rd. After crossing Mack Hampton Rd at-grade, the route turns west and follows the east side of US 321 before crossing over to the east side of the river via a second pedestrian bridge to Jennifer Ln. Utilizing the existing roadbed on Jennifer Ln, the route continues north through land owned by Blue Ridge Conservancy before crossing Dexter Dr at-grade and connecting to the existing section of the MFG at Sterling Creek Park on the west side of the river via a third pedestrian bridge. A trailhead is proposed adjacent to US 321 on the Blue Ridge Conservancy land, which will connect to the mainline MFG along Jennifer Ln via a connection trail with pedestrian bridge over the river.

LENGTH = 0.91 miles

ESTIMATED 2022 CONSTRUCTION COST = \$4,378,000

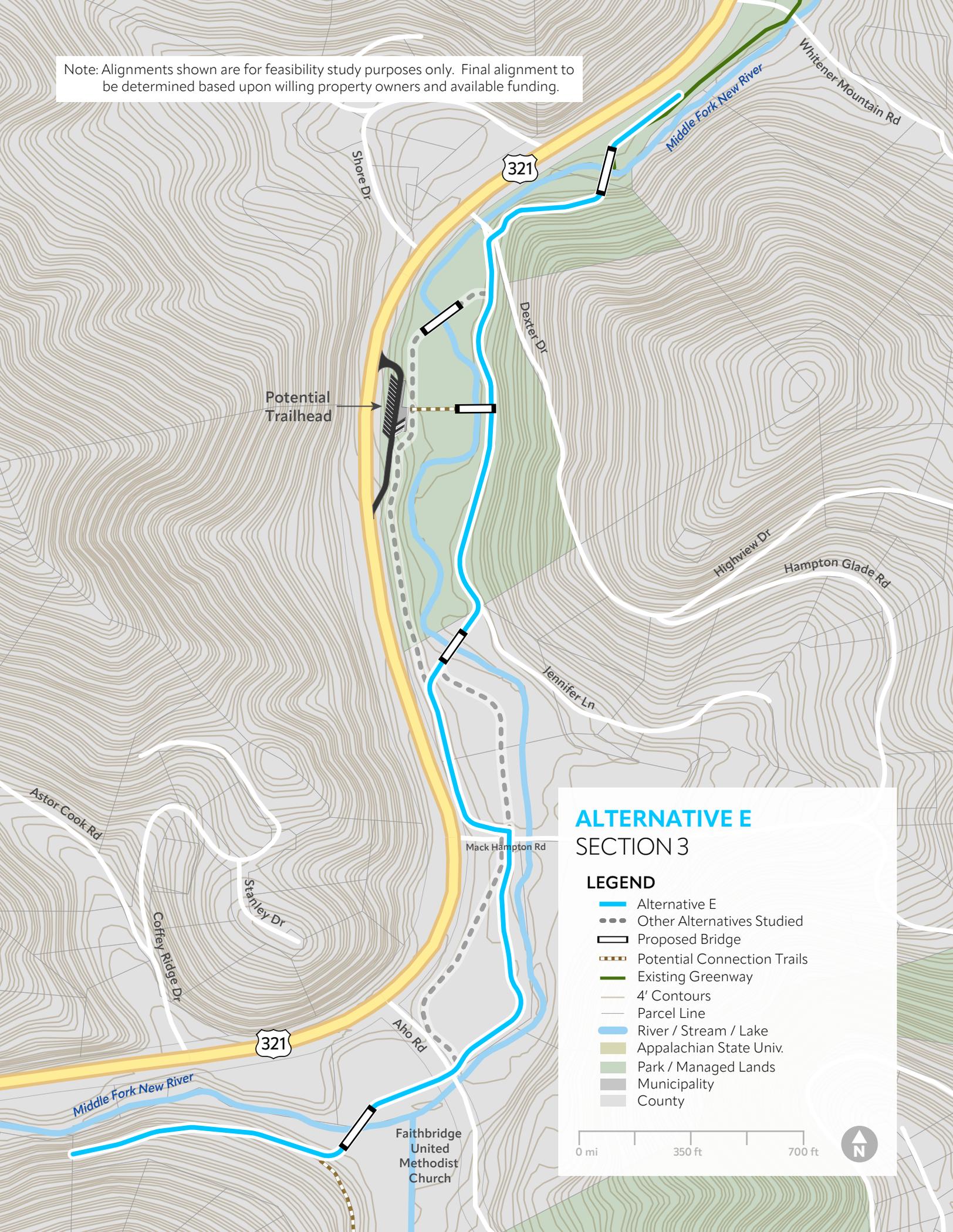
PROS:

- Desirable user experience by following river for approximately 85% of the length of the greenway.
- Provides grade-separated crossing of Aho Rd.
- Utilizes existing roadbed on Jennifer Ln, minimizing grading and reducing cost for that segment.
- Fewer potential impacts RV storage site on north side of Mack Hampton Rd.

CONS:

- Less desirable user experience by following US 321 for approximately 15% of the length of the greenway.
- Added cost for connection trail with bridge to proposed trailhead.
- Requires restoration / stabilization of river along a portion of Jennifer Ln where river is beginning to undercut roadbed.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



Potential Trailhead

ALTERNATIVE E SECTION 3

LEGEND

- Alternative E
- Other Alternatives Studied
- Proposed Bridge
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 3

ALTERNATIVE F

(SEGMENTS 1 > 2 > 4 > 6 > 8 > 9 + TRAILHEAD + TRAILHEAD CONNECTION)

Alternative F begins on a mountain between US 321 and the Firethorn subdivision before crossing over the river via a pedestrian bridge between Faithbridge United Methodist Church and The Mustard Seed Market. The route then passes below the recently reconstructed Aho Rd bridge and turns west to run along the east side US 321 before turning back to the river at Mack Hampton Rd. After crossing Mack Hampton Rd at-grade, the route turns west and follows the east side of US 321 before crossing over to the east side of the river via a second pedestrian bridge to Jennifer Ln. Utilizing the existing roadbed on Jennifer Ln, the route continues north through land owned by Blue Ridge Conservancy before crossing Dexter Dr at-grade and connecting to the existing section of the MFG at Sterling Creek Park on the west side of the river via a third pedestrian bridge. A trailhead is proposed adjacent to US 321 on the Blue Ridge Conservancy land, which will connect to the mainline MFG along Jennifer Ln via a connection trail with pedestrian bridge over the river.

LENGTH = 0.91 miles

ESTIMATED 2022 CONSTRUCTION COST = \$4,368,000

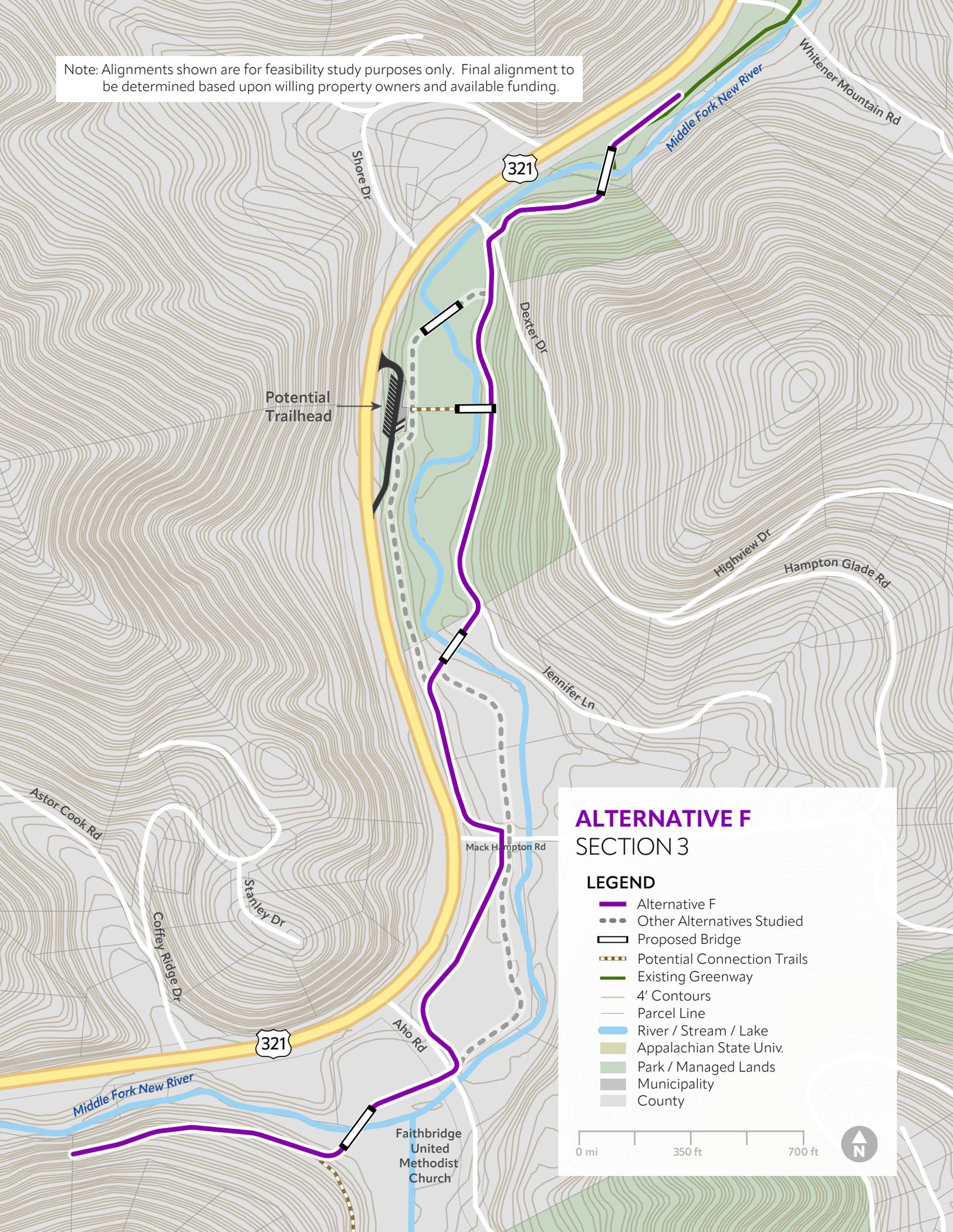
PROS:

- Desirable user experience by following river for approximately 70% of the length of the greenway.
- Provides grade-separated crossing of Aho Rd.
- Utilizes existing roadbed on Jennifer Ln, minimizing grading and reducing cost for that segment.
- Fewer potential impacts RV storage site on north side of Mack Hampton Rd.

CONS:

- Less desirable user experience by following US 321 for approximately 30% of the length of the greenway.
- Added cost for connection trail with bridge to proposed trailhead.
- Potential impacts to business driveway on north side of Aho Rd.
- Requires restoration / stabilization of river along a portion of Jennifer Ln where river is beginning to undercut roadbed.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



Potential Trailhead

321

321

ALTERNATIVE F SECTION 3

LEGEND

- Alternative F
- Other Alternatives Studied
- Proposed Bridge
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



ALTERNATIVE A SECTION 5 SOUTH

LEGEND

- Alternative A
- Other Alternatives Studied
- Proposed Bridge
- Proposed Tunnel
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 5 SOUTH ALTERNATIVE A

(SEGMENTS 3 > 4 > 9 > 11)

Alternative A begins at the existing trailhead at Goldmine Branch Park and crosses Niley Cook Rd at-grade. The route then climbs in elevation along the east side of Niley Cook Rd via a series of switchbacks to meet Mine Branch Rd. After crossing Mine Branch Rd at-grade, the greenway heads west and continues to climb as it crosses under a power transmission line until reaching the top of the east cut bank on US 321. Users then cross over US 321 via a pedestrian bridge and head down to roadway grade along the west side of the roadway. The route then turns west and descends north via a series of switchbacks and approaches an at-grade crossing of Payne Branch Rd into Payne Branch Park from the south.

LENGTH = 0.85 miles

ESTIMATED 2022 CONSTRUCTION COST = \$5,716,000

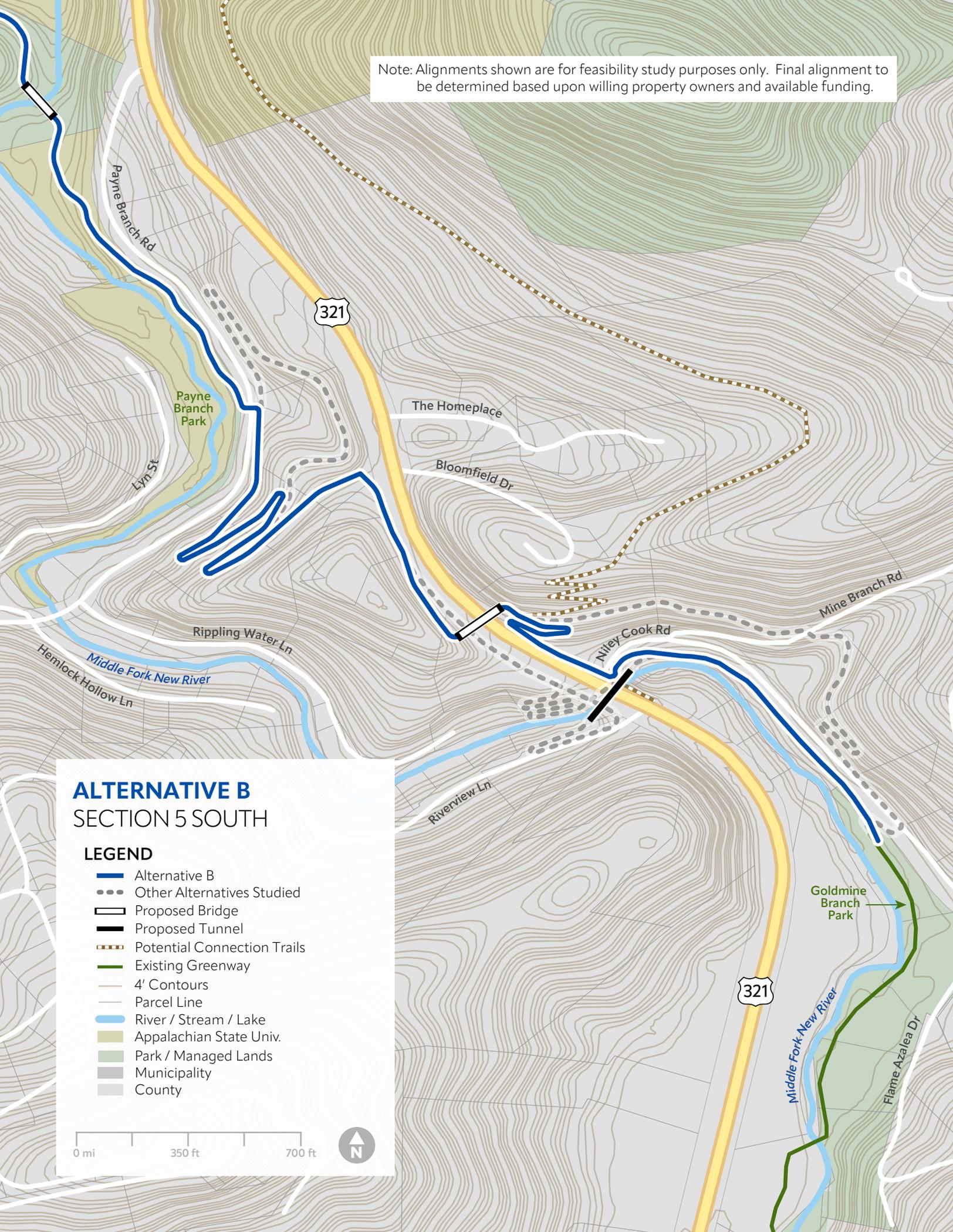
PROS:

- Provides grade-separated crossing of US 321.
- Fewer potential impacts to traffic during construction compared to tunnel alternatives.
- Bridge over US 321 provides highly visible branding opportunity for the MFG.
- Minimizes impacts to trout stream buffers.
- Minimizes impacts to floodway.
- Minimizes impacts to utilities.
- "High and dry" routing minimizes trail flooding, keeping the trail open and reducing flood-related maintenance activities.
- Provides connection to potential hiking trail on east side of US 321, giving users an alternate route into Boone.

CONS:

- Greater number of privately-owned properties requiring trail easements.
- Three at-grade road crossings required.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



ALTERNATIVE B SECTION 5 SOUTH

LEGEND

- Alternative B
- Other Alternatives Studied
- Proposed Bridge
- Proposed Tunnel
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 5 SOUTH ALTERNATIVE B

(SEGMENTS 1 > 2 > 4 > 9 > 11)

Alternative B begins at the existing trailhead at Goldmine Branch Park and heads north between the river and Niley Cook Rd within the power transmission easement. The route then crosses Niley Cook Rd at-grade at its intersection with US 321 and climbs in elevation along the east side of US 321 via a series of switchbacks until reaching the top of the east cut bank on US 321. Users then cross over US 321 via a pedestrian bridge and head down to roadway grade along the west side of the roadway. The route then turns west and descends north via a series of switchbacks and approaches an at-grade crossing of Payne Branch Rd into Payne Branch Park from the south.

LENGTH = 0.79 miles

ESTIMATED 2022 CONSTRUCTION COST = \$4,568,000

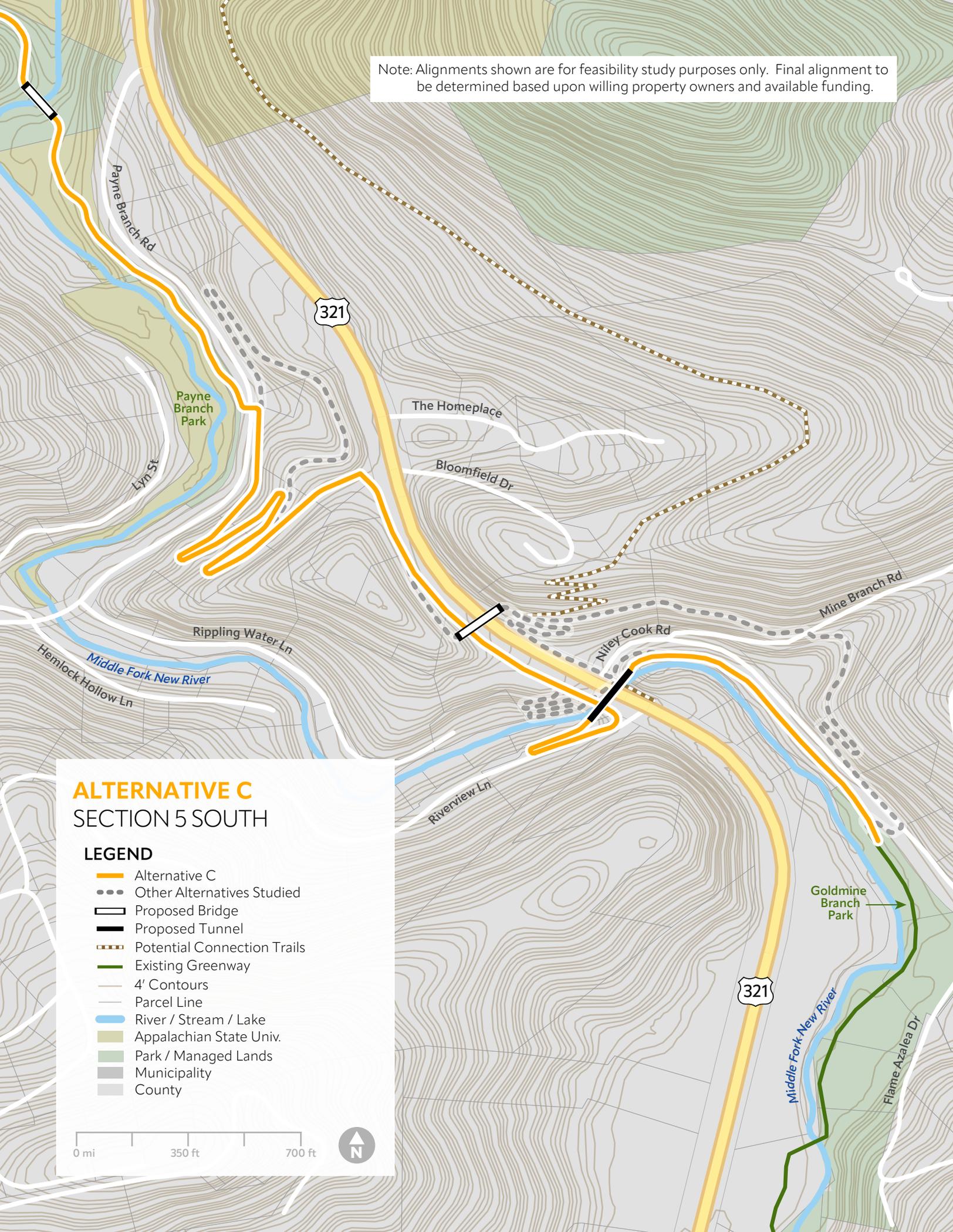
PROS:

- Provides grade-separated crossing of US 321.
- Fewer potential impacts to traffic during construction compared to tunnel alternatives.
- Bridge over US 321 provides highly visible branding opportunity for the MFG.
- Fewer number of privately-owned properties requiring trail easements.
- Provides connection to potential hiking trail on east side of US 321, giving users an alternate route into Boone.
- Provides potential connection trail to commercial destinations on east side of US 321 just south of Niley Cook Rd intersection.

CONS:

- Greater impacts to floodway.
- Potential impacts to utilities.
- Significant impacts to trout stream buffers, likely requiring variance for permit.
- Potential trail closures due to flooding and increased flood-related maintenance activities.
- Two at-grade road crossings required, including one directly adjacent to US 321.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



ALTERNATIVE C SECTION 5 SOUTH

LEGEND

- Alternative C
- Other Alternatives Studied
- Proposed Bridge
- Proposed Tunnel
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 5 SOUTH ALTERNATIVE C

(SEGMENTS 1 > 5 > 7 > 8 > 9 > 11)

Alternative C begins at the existing trailhead at Goldmine Branch Park and heads north between the river and Niley Cook Rd within the power transmission easement. The route then crosses below US 321 via a pedestrian tunnel (located above the existing culvert) and climbs up to the west side of US 321 via a series of switchbacks along Riverview Ln. Users then continue north along the west side of US 321 up to the crest of the roadway. The route then turns west and descends north via a series of switchbacks and approaches an at-grade crossing of Payne Branch Rd into Payne Branch Park from the south.

LENGTH = 0.82 miles

ESTIMATED 2022 CONSTRUCTION COST = \$5,492,000

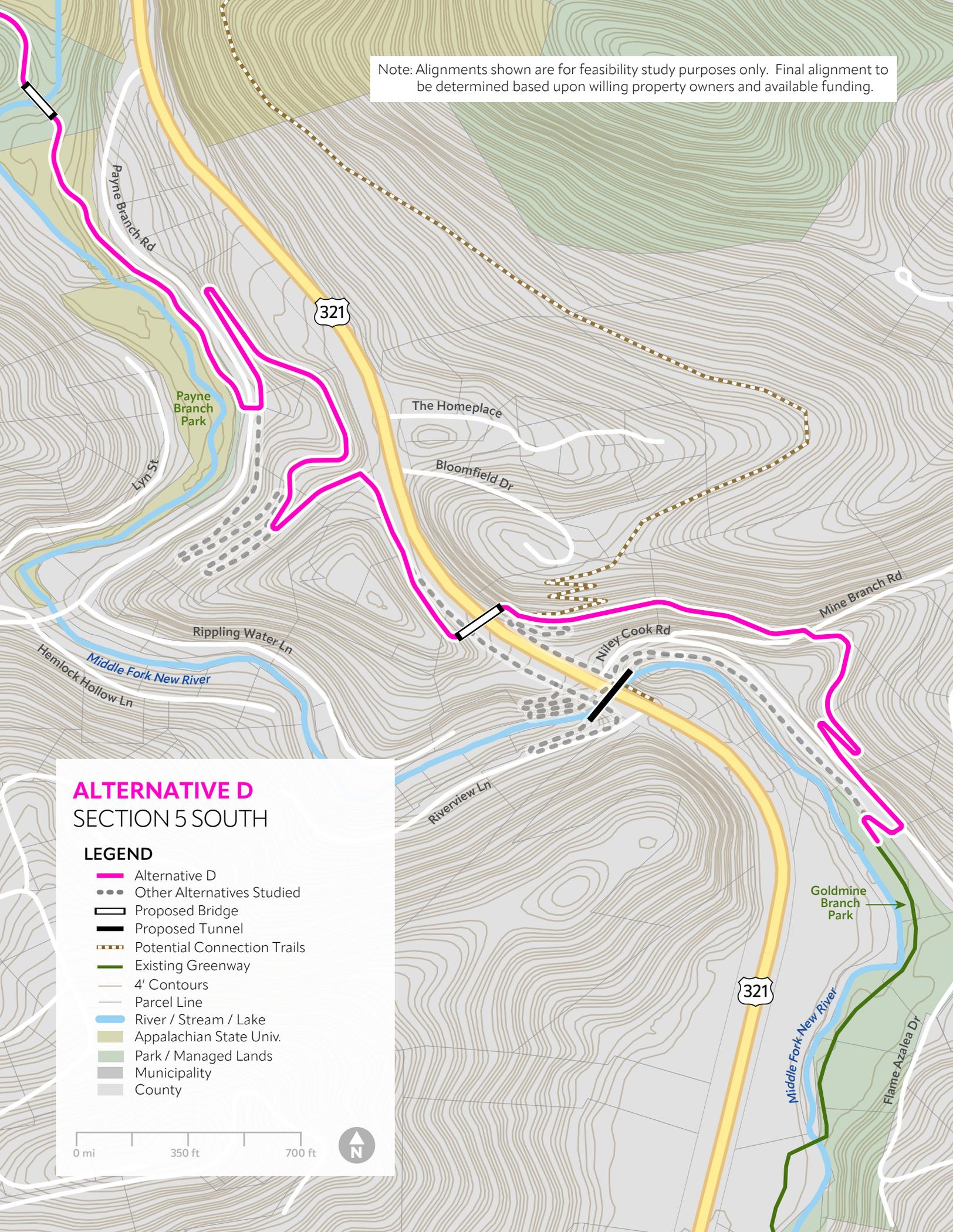
PROS:

- Provides grade-separated crossing of US 321.
- Fewer number of privately-owned properties requiring trail easements.
- Only one at-grade road crossing required.

CONS:

- Greater impacts to traffic during tunnel construction compared to bridge alternatives.
- Tunnel under US 321 does not provide the highly visible branding opportunity for the MFG compared to the bridge alternatives.
- Greatest impacts to floodway.
- Potential impacts to utilities.
- Significant impacts to trout stream buffers, likely requiring variance for permit.
- Potential trail closures due to flooding and increased flood-related maintenance activities.
- Does not provide connection to potential hiking trail on east side of US 321.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



ALTERNATIVE D SECTION 5 SOUTH

LEGEND

- █ Alternative D
- ⋯ Other Alternatives Studied
- Proposed Bridge
- Proposed Tunnel
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- █ River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 5 SOUTH ALTERNATIVE D

(SEGMENTS 3 > 4 > 9 > 10)

Alternative D begins at the existing trailhead at Goldmine Branch Park and crosses Niley Cook Rd at-grade. The route then climbs in elevation along the east side of Niley Cook Rd via a series of switchbacks to meet Mine Branch Rd. After crossing Mine Branch Rd at-grade, the greenway heads west and continues to climb as it crosses under a power transmission line until reaching the top of the east cut bank on US 321. Users then cross over US 321 via a pedestrian bridge and head down to roadway grade along the west side of the roadway. The route then turns west and descends north via a series of switchbacks and approaches an at-grade crossing of Payne Branch Rd into Payne Branch Park from the north.

LENGTH = 0.85 miles

ESTIMATED 2022 CONSTRUCTION COST = \$6,016,000

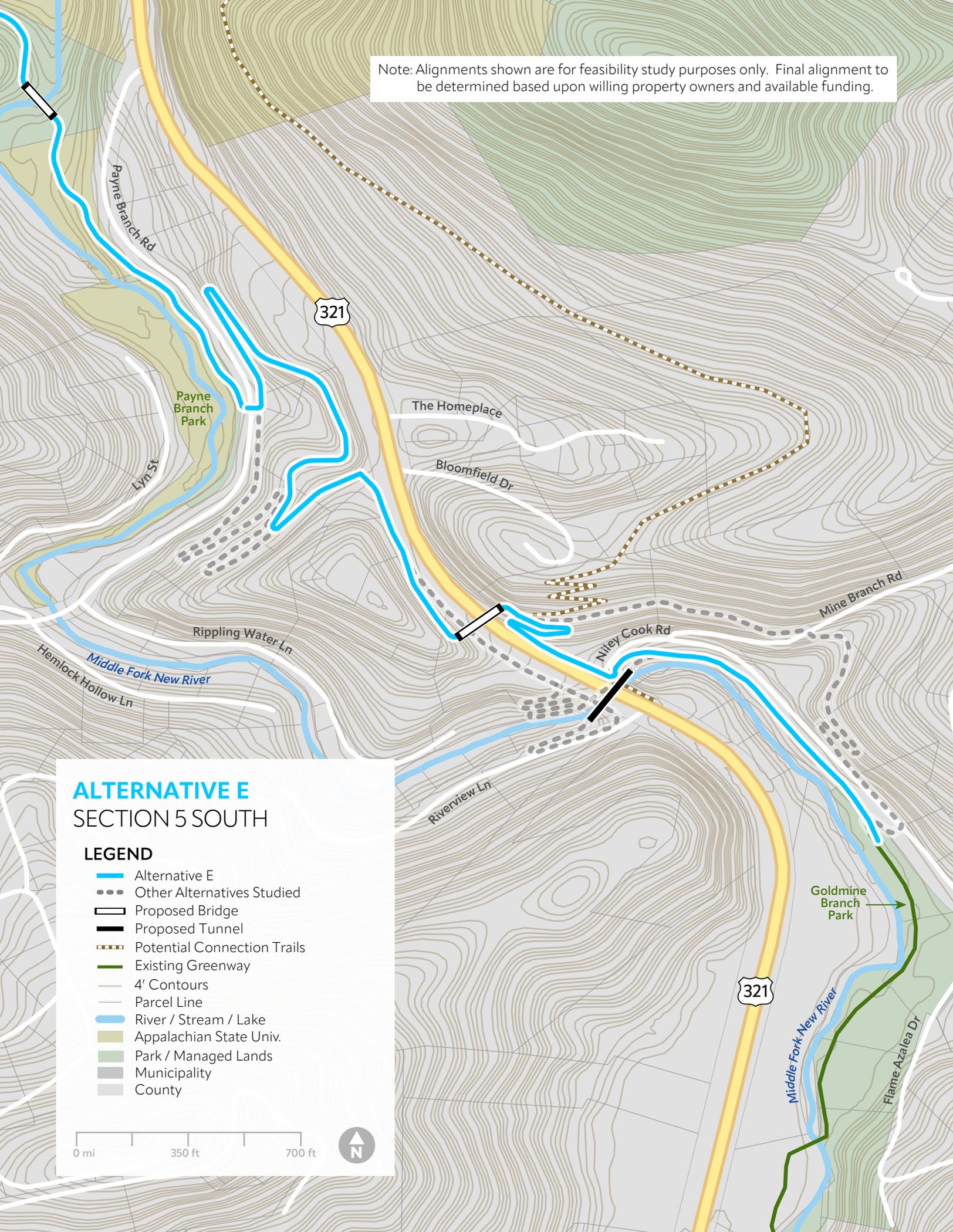
PROS:

- Provides grade-separated crossing of US 321.
- Fewer potential impacts to traffic during construction compared to tunnel alternatives.
- Bridge over US 321 provides highly visible branding opportunity for the MFG.
- Minimizes impacts to trout stream buffers.
- Minimizes impacts to floodway.
- Minimizes impacts to utilities.
- "High and dry" routing minimizes trail flooding, keeping the trail open and reducing flood-related maintenance activities.
- Provides connection to potential hiking trail on east side of US 321, giving users an alternate route into Boone.

CONS:

- Greater number of privately-owned properties requiring trail easements.
- Three at-grade road crossings required.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



ALTERNATIVE E SECTION 5 SOUTH

LEGEND

- Alternative E
- Other Alternatives Studied
- Proposed Bridge
- Proposed Tunnel
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 5 SOUTH ALTERNATIVE E

(SEGMENTS 1 > 2 > 4 > 9 > 10)

Alternative E begins at the existing trailhead at Goldmine Branch Park and heads north between the river and Niley Cook Rd within the power transmission easement. The route then crosses Niley Cook Rd at-grade at its intersection with US 321 and climbs in elevation along the east side of US 321 via a series of switchbacks until reaching the top of the east cut bank on US 321. Users then cross over US 321 via a pedestrian bridge and head down to roadway grade along the west side of the roadway. The route then turns west and descends north via a series of switchbacks and approaches an at-grade crossing of Payne Branch Rd into Payne Branch Park from the north.

LENGTH = 0.78 miles

ESTIMATED 2022 CONSTRUCTION COST = \$4,868,000

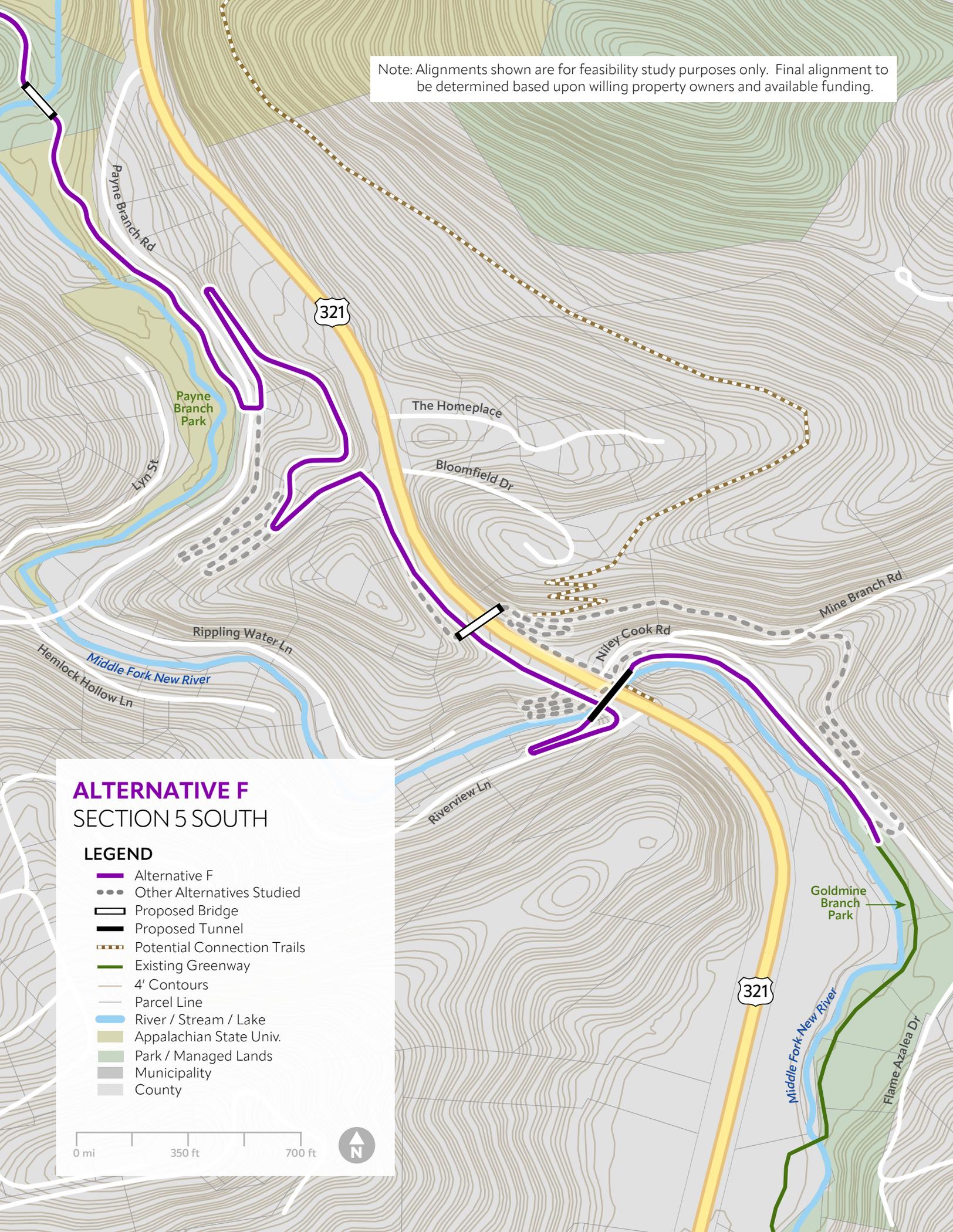
PROS:

- Provides grade-separated crossing of US 321.
- Fewer potential impacts to traffic during construction compared to tunnel alternatives.
- Bridge over US 321 provides highly visible branding opportunity for the MFG.
- Fewer number of privately-owned properties requiring trail easements.
- Provides connection to potential hiking trail on east side of US 321, giving users an alternate route into Boone.
- Provides potential connection trail to commercial destinations on east side of US 321 just south of Niley Cook Rd intersection.

CONS:

- Greater impacts to floodway.
- Potential impacts to utilities.
- Significant impacts to trout stream buffers, likely requiring variance for permit.
- Potential trail closures due to flooding and increased flood-related maintenance activities.
- Two at-grade road crossings required, including one directly adjacent to US 321.

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



ALTERNATIVE F SECTION 5 SOUTH

LEGEND

- Alternative F
- Other Alternatives Studied
- Proposed Bridge
- Proposed Tunnel
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



SECTION 5 SOUTH ALTERNATIVE F

(SEGMENTS 1 > 5 > 7 > 8 > 9 > 10)

Alternative F begins at the existing trailhead at Goldmine Branch Park and heads north between the river and Niley Cook Rd within the power transmission easement. The route then crosses below US 321 via a pedestrian tunnel (located above the existing culvert) and climbs up to the west side of US 321 via a series of switchbacks along Riverview Ln. Users then continue north along the west side of US 321 up to the crest of the roadway. The route then turns west and descends north via a series of switchbacks and approaches an at-grade crossing of Payne Branch Rd into Payne Branch Park from the north.

LENGTH = 0.82 miles

ESTIMATED 2022 CONSTRUCTION COST = \$5,792,000

PROS:

- Provides grade-separated crossing of US 321.
- Fewer number of privately-owned properties requiring trail easements.
- Only one at-grade road crossing required.

CONS:

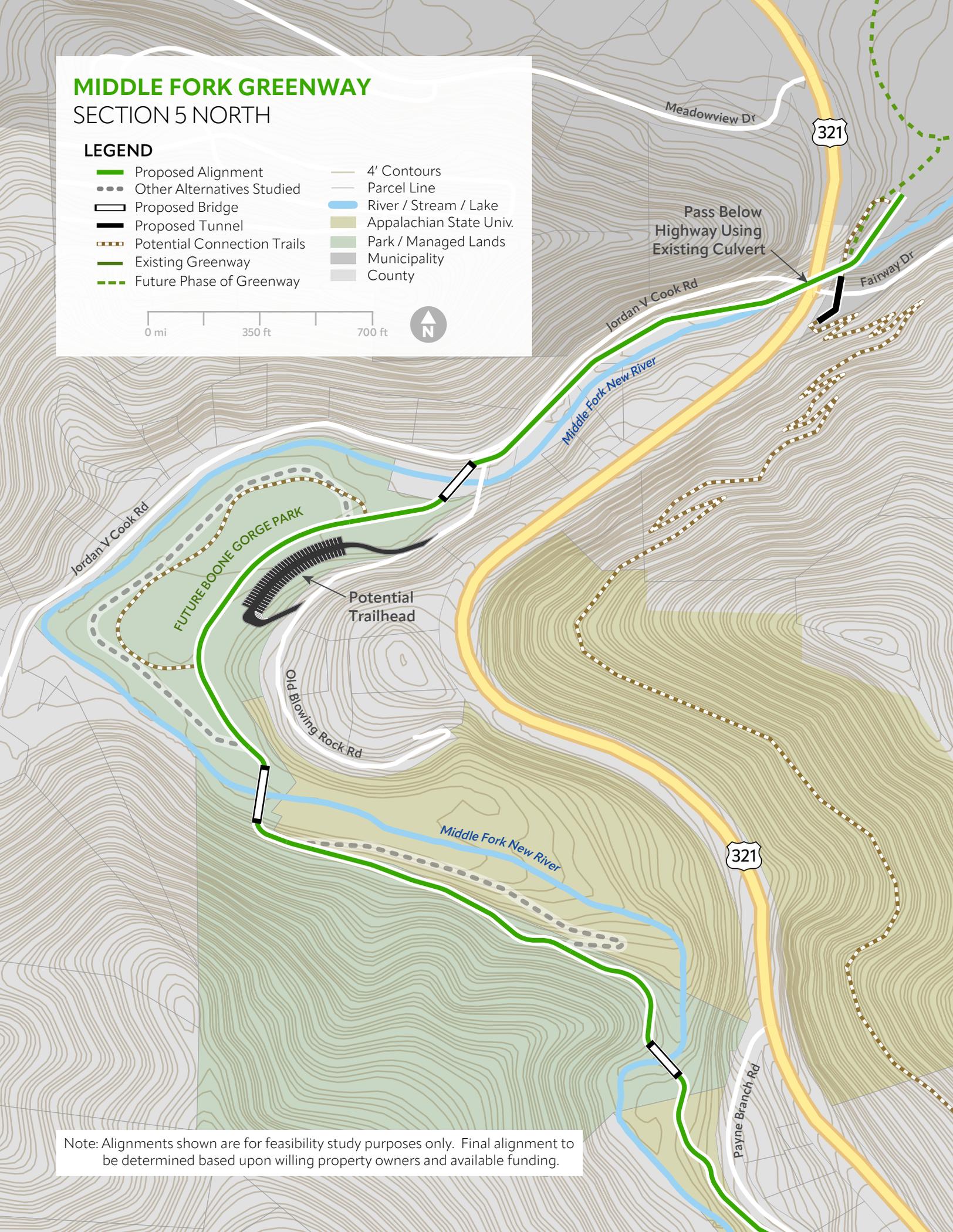
- Greater impacts to traffic during tunnel construction compared to bridge alternatives.
- Tunnel under US 321 does not provide the highly visible branding opportunity for the MFG compared to the bridge alternatives.
- Greatest impacts to floodway.
- Potential impacts to utilities.
- Significant impacts to trout stream buffers, likely requiring variance for permit.
- Potential trail closures due to flooding and increased flood-related maintenance activities.
- Does not provide connection to potential hiking trail on east side of US 321.

MIDDLE FORK GREENWAY

SECTION 5 NORTH

LEGEND

- Proposed Alignment
- Other Alternatives Studied
- Proposed Bridge
- Proposed Tunnel
- Potential Connection Trails
- Existing Greenway
- Future Phase of Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County



Pass Below Highway Using Existing Culvert

FUTURE BOONE GORGE PARK

Potential Trailhead

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.

SECTION 5 NORTH PREFERRED ROUTE

(SEGMENTS 12 > 13 > 15 > 17 > 18)

The preferred route for Section 5 North begins at Payne Branch Park and heads north through land owned by Appalachian State University (ASU) before entering land owned by Blue Ridge Conservancy. Users will cross over the river via a pedestrian bridge and continue northwest as they descend along the side of the mountain before crossing back over to the east side of the river via a second pedestrian bridge as they enter the bottom lands of future Boone Gorge Park. The greenway then continues north through the eastern side of the future park past a potential trailhead location a potential connection trail which will create a loop trail down to the river. Please note the trailhead and connection trail are assumed to be included in the design/construction of the future park and are not included in the cost estimates contained within this study.

The route continues north from the trailhead and crosses over to the west side of the river via a third pedestrian bridge adjacent to Old Blowing Rock Rd, which will require an at-grade crossing. A system of boardwalks between Jordan V Cook Rd and the river will carry users north towards Boone where the greenway will utilize the existing culvert to pass below US 321 and end at Watauga Medical Center property. Connection to a potential hiking trail along the east side of US 321 to Niley Cook Rd could be made possible via a tunnel underneath Fairway Dr (not included in cost estimates in this study).

LENGTH = 1.04 miles

ESTIMATED 2022 CONSTRUCTION COST = \$4,660,000

PROS:

- Highly desirable user experience through park away from US 321 traffic
- Few privately-owned properties requiring trail easements.
- Provides grade-separated crossing of US 321.
- Only one at-grade road crossing required.

CONS:

- Impacts to floodway.
- Potential impacts to utilities on Jordan V Cook Rd.
- Significant impacts to trout stream buffers, requiring variance for permit. If unable to secure variance, alternative options along Jordan V Cook Rd and signalized at-grade crossing of US 321 must be evaluated to make connection to Watauga Medical Center.
- Potential trail closures due to flooding and increased flood-related maintenance activities
- Three pedestrian bridge crossings of river and boardwalk system along Jordan V Cook Rd increase construction costs.



MIDDLE FORK GREENWAY AT STERLING CREEK PARK
CREDIT: MATT RATH

EVALUATION METHODOLOGY

Evaluation criteria were used to supplement the decision-making process to determine the most appropriate alignments for the Middle Fork Greenway Feasibility Study. The following evaluation criteria were used to guide the recommendations for Sections 3 and 5 of the Middle Fork Greenway:

ROUTE ALTERNATIVE EVALUATION CRITERIA

COST-EFFECTIVENESS

The magnitude of the total life-cycle cost for each alternative (including design, construction and ongoing maintenance) is a significant factor in determining which alternative to implement.

PROPERTY IMPACTS

Real estate acquisition can play a major role in project cost and schedule. The ability of the route alternatives to utilize publicly-owned properties, existing easements, public ROW, and limit impacts to privately property owners is considered.

POTENTIAL FUNDING OPPORTUNITIES

Given the importance of securing funding from a variety of potential sources, the diversity, total amount, and likelihood of receiving funding available to each alternative is considered.

ENVIRONMENTAL IMPACTS

The ability of each alternative to minimize impacts to streams, wetlands and other jurisdictional features (including associated buffers, floodplain elevations, and other environmental factors) during construction and operation of the proposed facility is also considered.

PHYSICAL FEASIBILITY

The ability to successfully engineer and permit each alternative is a critical consideration for determining realistic options for the route alternative.

COMMUNITY PRIORITIES

To ensure consistency with public preferences and existing plans, goals identified in previous planning efforts and feedback from public engagement/stakeholder outreach activities are utilized to evaluate the route alternative.

DESIRED CONNECTIVITY

In order to maximize use of the facility, determining which route alternatives connect popular origins and destinations identified by the public and other stakeholders is considered.

TRAFFIC IMPACTS

The magnitude of the disruption of vehicular traffic by the ultimate design of each route alternative and associated temporary impacts during the construction process is considered.

IMPLEMENTATION TIMEFRAME

The amount of time it takes to plan, fund, design, and ultimately construct each route alternative is important to consider, especially in conjunction with community priorities, as to how long is a tolerable time to wait for project completion.

ACCESSIBILITY

Convenience of use and accommodation for users of all ages and abilities is a significant consideration to ensure the ultimate route alternative is a community amenity designed for universal use.

LEADERSHIP SUPPORT

The depth of support from elected officials and agencies for each route alternative as well as whether there is a clear project sponsor to champion the route alternative through implementation, is an important factor for ensuring successful project completion.

PLACEMAKING + USER EXPERIENCE

The potential ability of the route alternatives to help drive tourism, contribute to the local economy, and brand the surrounding area by as one that promotes healthy, active lifestyles is also considered.

DECISION MATRIX + SCORING

The decision matrix is a qualitative assessment tool utilized by the study team to incorporate feedback from the project working group. The six alignment alternatives that were developed for Section 3 and the six alignment alternatives that were developed for Section 5 South are assigned a qualitative ranking (High, Medium, or Low) by the study team based on the analysis performed. Steering committee members and the public (via survey) were asked to rank the evaluation criteria listed above according to their priorities. Based on the feedback, the recommended routes can be identified as those that best align with the priorities of the steering committee and public.

SECTION 3 DECISION MATRIX

ROUTE ALTERNATIVE EVALUATION CRITERIA	ALT A	ALT B	ALT C	ALT D	ALT E	ALT F
COST-EFFECTIVENESS	MED	HIGH	HIGH	MED	MED	MED
PROPERTY IMPACTS	MED	HIGH	MED	LOW	HIGH	MED
POTENTIAL FUNDING OPPORTUNITIES	MED	MED	MED	MED	MED	MED
ENVIRONMENTAL IMPACTS	MED	MED	HIGH	MED	MED	MED
PHYSICAL FEASIBILITY	MED	MED	MED	MED	MED	MED
COMMUNITY PRIORITIES	HIGH	LOW	LOW	MED	MED	MED
DESIRED CONNECTIVITY	MED	MED	MED	MED	MED	MED
TRAFFIC IMPACTS	MED	MED	MED	MED	MED	MED
IMPLEMENTATION TIMEFRAME	MED	HIGH	MED	LOW	MED	MED
ACCESSIBILITY	HIGH	MED	MED	MED	HIGH	MED
LEADERSHIP SUPPORT	MED	LOW	LOW	MED	HIGH	LOW
PLACEMAKING + USER EXPERIENCE	HIGH	MED	LOW	MED	MED	MED

(Score: High=Most desirable, Low=Least desirable)

SECTION 5 SOUTH DECISION MATRIX

ROUTE ALTERNATIVE EVALUATION CRITERIA	ALT A	ALT B	ALT C	ALT D	ALT E	ALT F
COST-EFFECTIVENESS	MED	HIGH	MED	LOW	HIGH	MED
PROPERTY IMPACTS	MED	MED	HIGH	LOW	MED	MED
POTENTIAL FUNDING OPPORTUNITIES	MED	MED	MED	MED	MED	MED
ENVIRONMENTAL IMPACTS	HIGH	MED	LOW	HIGH	MED	LOW
PHYSICAL FEASIBILITY	HIGH	MED	MED	MED	MED	MED
COMMUNITY PRIORITIES	HIGH	LOW	MED	MED	LOW	MED
DESIRED CONNECTIVITY	MED	MED	MED	MED	MED	MED
TRAFFIC IMPACTS	HIGH	MED	LOW	HIGH	MED	LOW
IMPLEMENTATION TIMEFRAME	MED	HIGH	MED	LOW	MED	MED
ACCESSIBILITY	MED	MED	MED	MED	MED	MED
LEADERSHIP SUPPORT	MED	LOW	MED	MED	LOW	MED
PLACEMAKING + USER EXPERIENCE	HIGH	MED	LOW	MED	LOW	LOW

(Score: High=Most desirable, Low=Least desirable)

RECOMMENDED ROUTES

SECTION 3

Upon evaluation of the six alignment options for Section 3, **Alternative E** was chosen as the preferred alternative as it offers the following benefits:

- Follows the river for approximately 85% of its length for a desirable user experience and minimizes the length of greenway along US 321 (a top priority as identified in the public survey).
- Minimizes property impacts to the RV storage site at Mack Hampton Rd.
- Utilizes the existing Jennifer Ln roadbed to minimize grading and impacts to the floodplain.
- Provides opportunity for stream restoration project and additional funding sources.
- Provides trailhead parking and access to the mainline greenway via a connection trail.

SECTION 5 SOUTH

Upon evaluation of the six alignment options for Section 5 South, two alternatives (a bridge option and tunnel option for crossing US 321) were chosen as recommended routes. Two routes were chosen to give flexibility during implementation given the significant challenges and constraints and remaining unknowns in the Section 5 South study area, including property owner willingness to grant easements, impacts to traffic during construction, impacts to the floodplain model, and ability to acquire a trout stream buffer permit variance.

For the bridge crossing option, **Alternative A** was chosen as the preferred alternative as it offers the following benefits:

- Provides grade-separated crossing of US 321.
- Fewer potential impacts to traffic during construction compared to tunnel alternatives.
- Bridge over US 321 provides highly visible branding opportunity for the MFG.
- Minimizes impacts to trout stream buffers.
- Minimizes impacts to floodway.
- Minimizes impacts to utilities.
- "High and dry" routing minimizes trail flooding, keeping the trail open and reducing flood-related maintenance activities.
- Provides connection to potential hiking trail on east side of US 321, giving users an alternate route into Boone.

For the tunnel crossing option, **Alternative C** was chosen as the preferred alternative as it offers the following benefits:

- Provides grade-separated crossing of US 321.
- Fewer number of privately-owned properties requiring trail easements compared to bridge alternatives.
- Only one at-grade road crossing required compared to three at-grade crossings required with bridge alternatives.

Both recommended routes for Section 5 South should be studied in further detail (including property owner outreach, permitting agency coordination and coordination with NCDOT) to determine which alternative to ultimately design and construct.

MATERIALS SELECTION

Factors to be considered in the selection of materials for trails projects include anticipated facility type (recreational versus commuter), expected use activities (i.e. walking/bicycling/running/rollerblading), age and ability of trail users, environmental conditions, construction cost, maintenance burden and costs, and funding source requirements among others. A variety of materials are available as described below and shown in the photographs on the opposite page.

PAVED SURFACE OPTIONS

Paved trail surfaces such as asphalt or concrete offer great accessibility to accommodate users of all ages and abilities. Asphalt pavement tends to be the most popular and cost effective for paved trails. Concrete pavement is more durable, but costs more than asphalt pavement. As such, concrete trails are typically more common in urban settings (where projected user volumes are high or the trail may be subject to vehicular loading more often) or in areas subject to heavy flooding forces that may cause damage to the trail.

NATURAL SURFACE OPTIONS

Compacted aggregates and compacted native soil are two types of natural surfaces considered for this study. Both are budget-friendly options that have been implemented in trail systems across North Carolina (including several existing sections of the Middle Fork Greenway) and beyond to provide a durable alternative to paved trails.

Compacted aggregates have proven to be a durable, affordable, and readily available means of providing a natural surface for trail construction. Granite fines are a commonly used material due to their availability from local quarries and their ability to achieve compaction of a level surface that is accessible to most users. Proper compaction and handling adjacent drainage are keys to the success of using this material. Annual maintenance is required to ensure that the trail's crown pitches to drain. This typically includes laying and grooming additional aggregate as necessary to ensure that water rills and deep grooves do not form within the trail surface as a result of regular rain events. It is critical to establish drainage adjacent to the trail during construction to ensure concentrated runoff is not allowed to cross the trail perpendicularly. Over time these types of flows will erode the trail and surfacing.

One of the cheapest and most easily constructed natural surface options is compacted native soil. Similar to compacted aggregate, this surfacing method relies heavily on material compaction and adjacent drainage. The existing soil must be able to achieve compaction levels of 95-98% to ensure trail integrity. If native soil is unsuitable, material may be imported at additional cost and installed with a roller and small excavating equipment depending on topography. Surface drainage should not be allowed to cross perpendicular to the trail to prevent washout and rills within the walking surface. Annual maintenance is required and includes re-compaction to ensure the trail remains crowned to properly pitch water to adjacent drainage features. Installation of additional soil in rain wash out areas may also be required.

BOARDWALK OPTIONS

Material options for boardwalk decks include timber and concrete (cast-in-place or pre-cast). Timber has traditionally been used for its lower construction cost, but requires regular maintenance and deck repairs/replacement to extend functional life. Concrete deck options typically cost more upfront, but have lower life-cycle costs due to reduced maintenance requirements. Safety rails and hand rails should be provided in accordance with applicable building codes. Timber, metal, and composite railing options are available depending on site conditions, desired aesthetics, and budget. Boardwalk substructure design and materials may vary depending upon specific site conditions and geotechnical recommendations.



Asphalt Trail - Lower McAlpine Greenway - Charlotte, NC



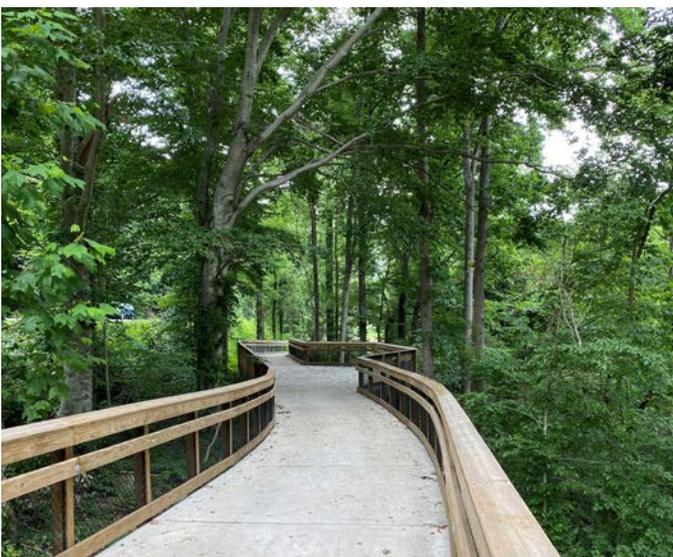
Concrete Trail - Downtown Greenway - Greensboro, NC



Compacted Aggregate Trail - Peavine Trail - Marion, NC



Compacted Soil Trail - American Tobacco Trail - Apex, NC



Concrete Deck Boardwalk- Toby Creek Greenway - Charlotte, NC



Timber Deck Boardwalk - White Oak Creek Greenway - Cary, NC

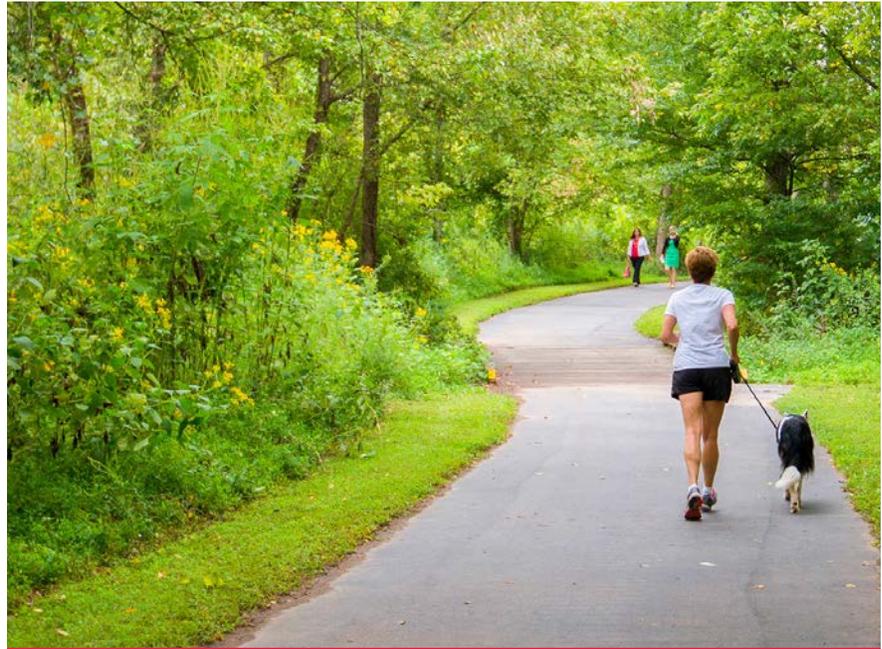
TYPICAL CROSS SECTIONS

MAINLINE (PREFERRED)

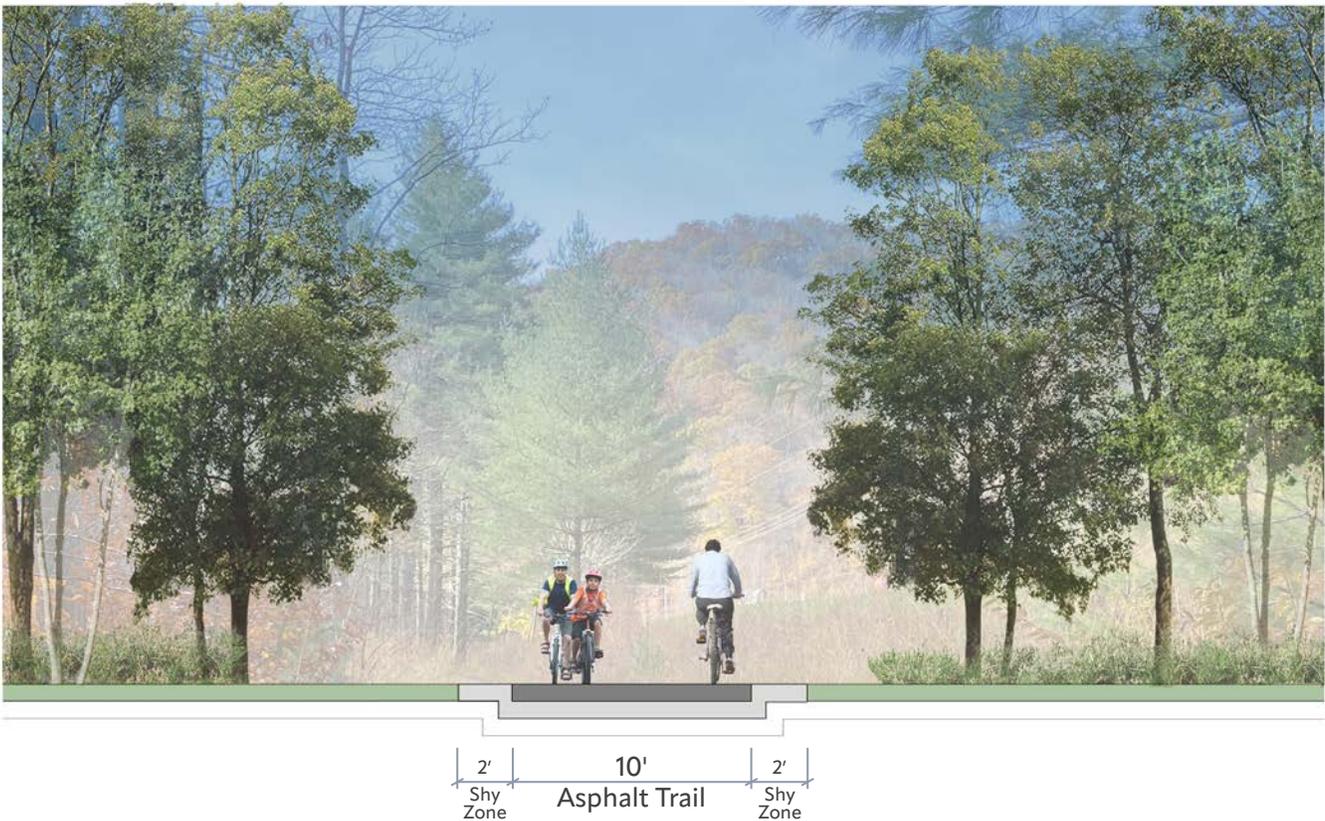
A 10' wide paved trail is recommended for the mainline trail as it will require the least amount of long-term maintenance and has greater eligibility from the widest variety of funding sources.

Asphalt pavement is recommended based on site conditions, anticipated trail use, and cost considerations. Limited sections of concrete pavement may be required to accommodate site conditions as necessary.

Shoulders or shy zones of 2' or greater should be kept clear of any obstacles to ensure full trail width remains usable.



Asphalt Surface Greenway - Mecklenburg County, NC

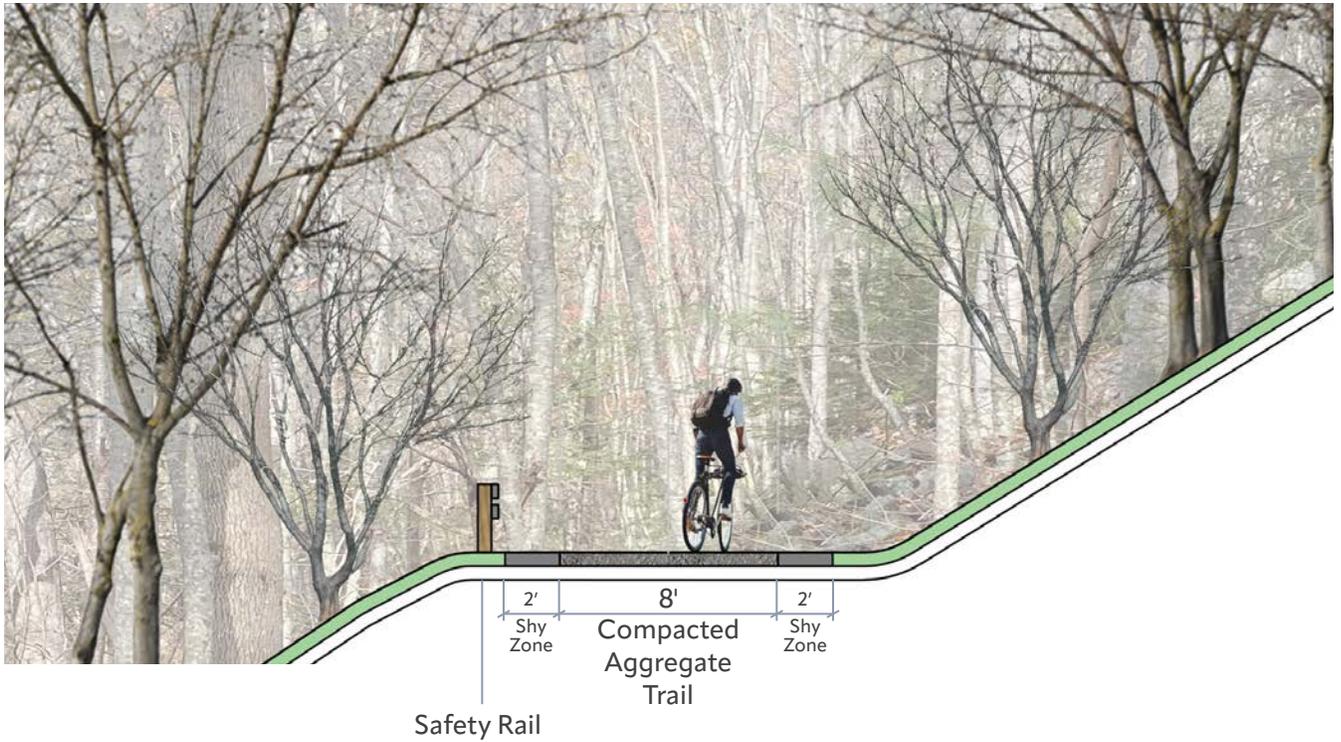


MAINLINE (ALTERNATE)

A slightly narrower 8' wide natural surface trail alternative for the mainline trail may also be considered (see cross section for connections). Although the initial cost of a natural surface trail is less than a paved trail, its overall life-cycle cost may be higher as it will likely require greater long-term maintenance (depending on use and a variety of other environmental factors). Funding sources and amounts for natural surface trails may be more limited as compared to those for paved trails.

CONNECTIONS

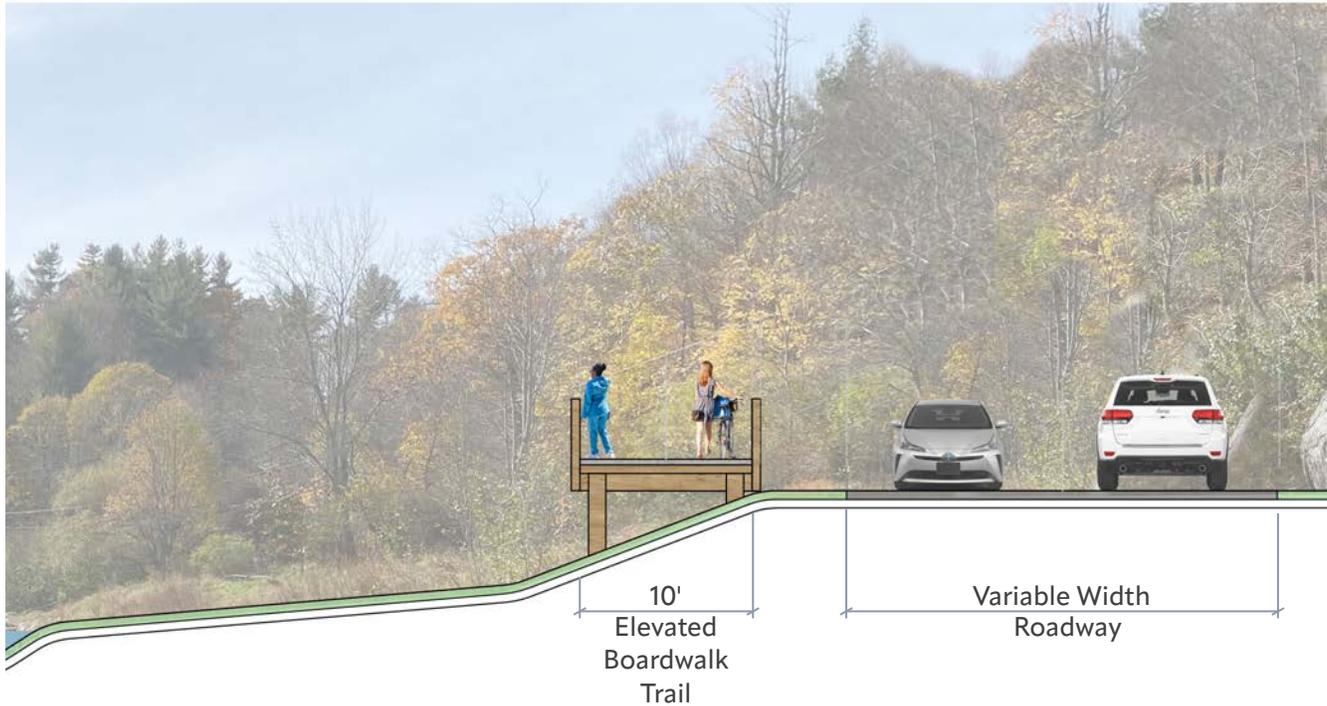
An 8' wide (or narrower in some cases) compacted aggregate natural surface trail is recommended for secondary connection trails as a cost effective way to expand the connectivity to the mainline trail. These types of connections can also be implemented separately from the mainline trail by utilizing primarily local and/or private funding sources and labor forces as funding and real estate constraints allow. Shoulders or shy zones of 2' or greater should be kept clear of any obstacles to ensure full trail width remains usable.



Users on Compacted Aggregate Trail - NC Zoo - Asheboro, NC Credit: Nat LeDonne

BOARDWALK

A 10' clear width elevated boardwalk is recommended in areas where the trail crosses wetlands or in areas of steep cross slope topography to limit grading and need for retaining walls. The deck surface should be concrete which provides greater friction to reduce the risks of slips and falls and reduces long-term maintenance burdens compared to those associated with other materials such as timber. Timber safety rails and hand rails are shown with a timber pile substructure system. Boardwalk substructure design and materials may vary depending upon specific site conditions and geotechnical recommendations.



Elevated Concrete Deck Boardwalk on Toby Creek Greenway - Charlotte, NC

BRIDGE (OVER WATER)

A 10' clear width bridge is recommended in where the trail crosses the river or streams.

Prefabricated steel truss bridges are a common, cost-effective bridge type in this application and are the recommended bridge type for this typical section. Corten / weathering steel is a finish which should be considered for its ability to blend well with natural surroundings and its minimal maintenance requirements as compared to those for painted finishes.

The deck surface should be concrete which provides greater friction to reduce the risks of slips and falls and reduces long-term maintenance burdens compared to those associated with other materials such as timber. Bridge substructure design and materials may vary depending upon bridge design type, specific site conditions, and geotechnical recommendations.



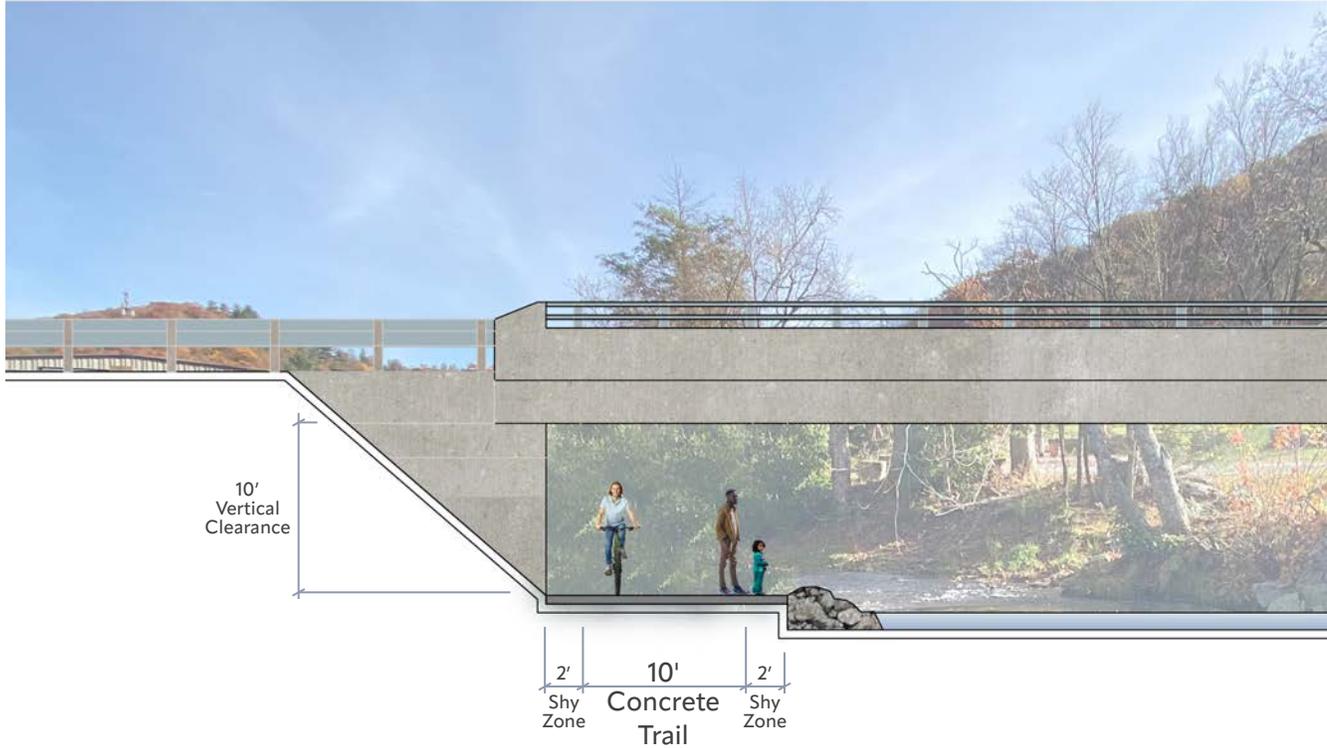
10'
Pedestrian Bridge



Prefabricated Steel Truss Bridge Installation on Little Sugar Creek Greenway - Charlotte, NC

UNDERPASS

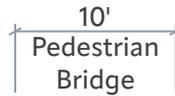
A 10' clear width concrete trail with paved shoulders is recommended in areas where the greenway crosses below roadway bridges, such as the Aho Rd underpass in Section 3. A 10' minimum vertical clearance between the trail surface and the bottom of the roadway bridge is desired, but shall in no case be less than eight feet. Concrete shoulders or shy zones of 2' or greater should be kept clear of any obstacles to ensure full trail width remains usable. A bank of riprap between the trail and river should be used to protect the trail from erosion and potential undercut, reducing maintenance and extending overall life of the greenway. Alternatively, a monolithic concrete trail with a steel reinforced concrete turndown on the edge closest to the river is also a viable option to address these issues.



Roadway Underpass on Little Sugar Creek Greenway - Charlotte, NC Credit: Carrie Ann Taylor

BRIDGE (OVER ROADWAY)

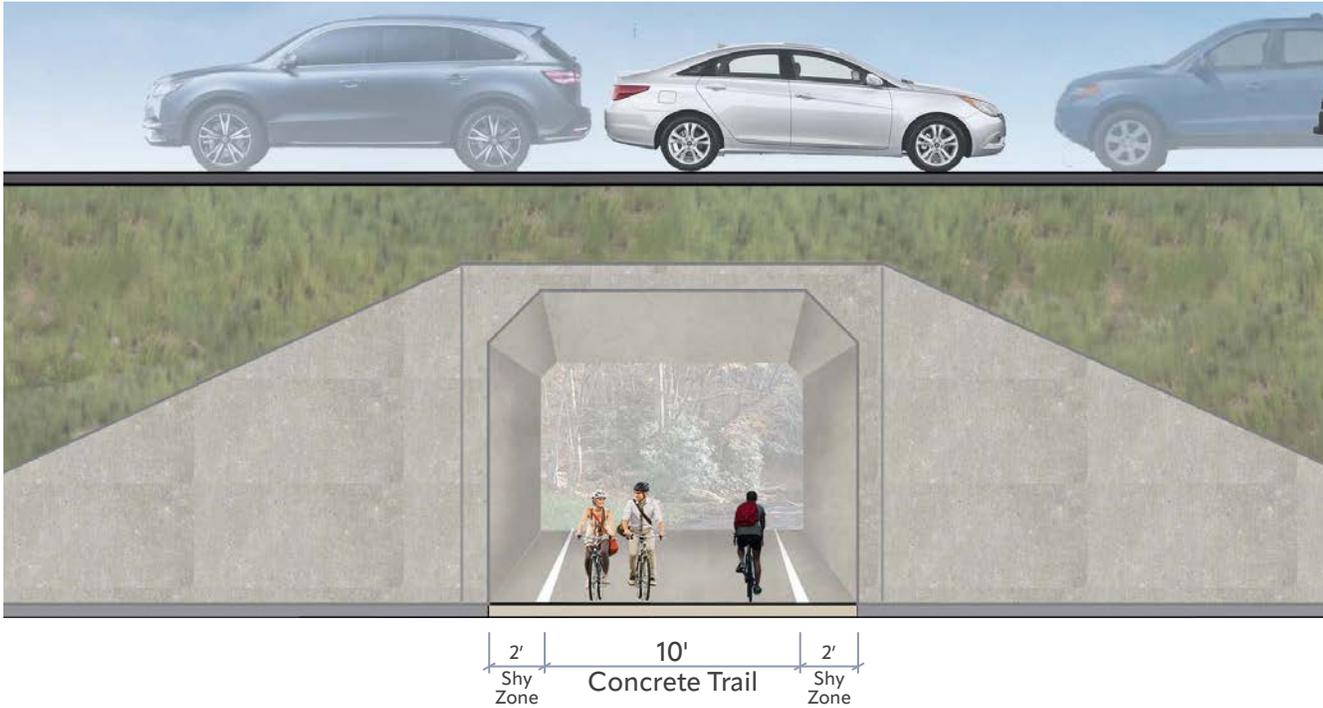
For Section 5 South, a 10' clear width bridge is recommended in where the trail crosses over US 321. Prefabricated steel truss bridges are a common, cost-effective bridge type in this application and are the recommended bridge type for this typical section. Minimum vertical clearance over roadways shall be provided based on NCDOT Bridge Policy requirements. The deck surface should be concrete which provides greater friction to reduce the risks of slips and falls and reduces long-term maintenance burdens compared to those associated with other materials such as timber. Bridge substructure design and materials may vary depending upon bridge design type, specific site conditions, and geotechnical recommendations. Safety rails and hand rails should be provided in accordance with applicable building codes and NCDOT Bridge Policy. Given the high-visibility of these areas to the traveling public, these bridges present a unique opportunity for branding and placemaking. Consideration should be given to design aesthetics and potential incorporation of public art, dynamic lighting, or other elements that create a distinct sense of place in the community.



Prefabricated Steel Truss Bridge Over I-40 on Blue Heron Trail - Bermuda Run, NC

TUNNEL (NEW)

For Section 5 South, a 14' clear width pedestrian tunnel is recommended for crossing under US 321. Two foot shy zones/concrete shoulders with white edge lines provided on either side of the facility help ensure user safety by keeping users away from the tunnel side walls and allowing for use of the full 10' greenway width. Desired minimum vertical clearance inside the tunnel is 12 feet. Designs should maximize the vertical clearance within the tunnel to the extent practicable based on specific site constraints to maintain a sense of openness and security for users. Lighting inside the tunnel is required to ensure continual visibility and user safety at all times. Consideration should also be given to potential incorporation of dynamic lighting, vibrant murals or other public art elements that create a comfortable and inviting environment for users.



Pedestrian Tunnel Under I-540 on Honeycutt Creek Trail - Raleigh, NC Credit: Kris Montgomery

TUNNEL (EXISTING CULVERT)

For Section 5 North, a 10' wide concrete trail is recommended where the trail crosses under US 321 in the existing arched culvert. Concrete shoulders or shy zones of 2' or greater should be kept clear of any obstacles to ensure full trail width remains usable. A 4' shy zone on the outside edge of the trail is required to account for minimum vertical clearance between the outside edge of the trail and the culvert arch. The trail should be elevated approximately two feet above ordinary high water elevation behind a counter sunk wall system to prevent flooding from ordinary high water and minor storm events. The trail should be super elevated to drain towards the river and the wall cap should provide openings or curb cuts at regular intervals to keep water from ponding on the trail. Flood zone advisory signage should be provided at both ends to warn users of flood risks.



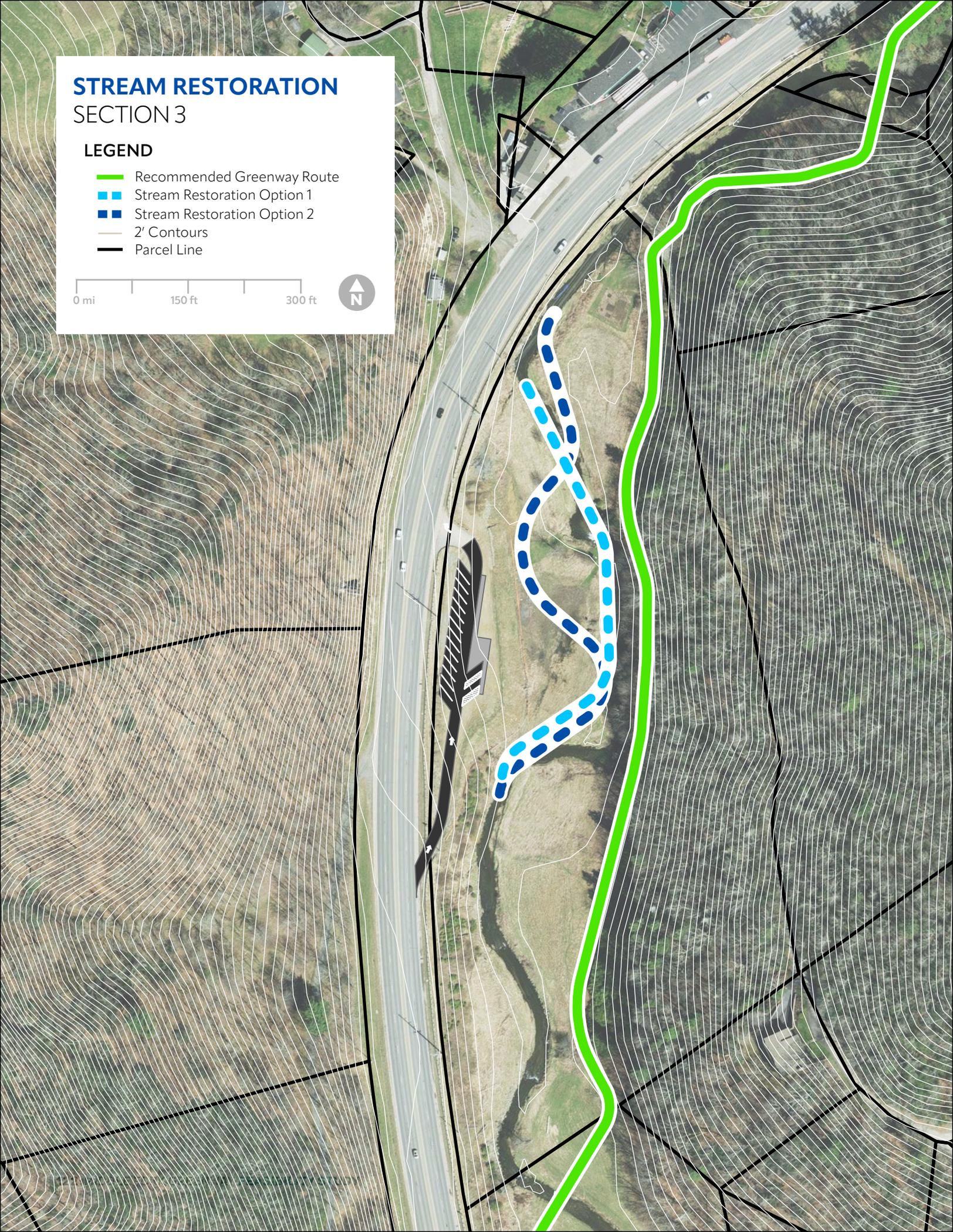
Beechview-Seldom Seen Greenway - Pittsburgh, PA Credit: discovertheburgh.com

STREAM RESTORATION SECTION 3

LEGEND

-  Recommended Greenway Route
-  Stream Restoration Option 1
-  Stream Restoration Option 2
-  2' Contours
-  Parcel Line

0 mi 150 ft 300 ft



STREAM RESTORATION RECOMMENDATIONS

The recommended route in Section 3 utilizes the existing Jennifer Ln roadbed, a portion of which is experiencing erosion and undercut from the river. To ensure integrity of the trail and reduce maintenance burdens, it is recommended that a stream restoration project be constructed in advance of or as part of the greenway construction. Two options for the stream restoration were developed as follows:

OPTION #1 PROGRAM DESCRIPTION:

Option 1 would involve minor channel re-alignment to increase separation between the proposed greenway corridor (existing Jennifer Lane) through increasing the radius of the existing meanders which would counteract the tendency for continued lateral migration into Jennifer Lane. Option #1 proposes approximately 600 linear feet of channel restoration and relocation coupled with approximately 1,000 linear feet of stream enhancement up- and downstream of the restored section. Enhancement would focus on bank stabilization techniques that could include floodplain benching, bank grading, invasive species management, soil lifts, toe protection, and native vegetation installation. It is estimated that this option would cost in the ballpark of \$590,000 to design, permit, and construct.

OPTION #2 PROGRAM DESCRIPTION:

Option 2 would involve more significant channel re-alignment to relocate the river centrally within its confined valley between US 221/321 and Jennifer Lane, providing the stream improved access to its natural floodplain. Option #2 proposes approximately 800 linear feet of channel restoration and relocation coupled with approximately 850 linear feet of stream enhancement up- and downstream of the restored section. Enhancement would focus on bank stabilization techniques that could include floodplain benching, bank grading, invasive species management, soil lifts, toe protection, and native vegetation installation. It is estimated that this option would cost in the ballpark of \$680,000 to design, permit, and construct.

FLOOD STUDY IMPACT

Any stream restoration activity would require detailed hydraulic analysis to assess stability of the proposed alignment and stream channel cross section coupled with determining the overall project's impact to the Effective FEMA floodplain. Evaluation of the effective HEC-RAS model will be required to determine likelihood for obtaining a No-Rise or requiring permitting a CLOMR. Should a CLOMR be required to permit the proposed greenway alignment and/or stream restoration activity, an extended permitting time frame should be anticipated. Additionally, either stream restoration option would likely require a post-construction LOMR and has been factored into the cost estimates presented for each option above.

FUNDING OPTIONS

There are several state agencies that operate grant programs which should be considered to assist in funding the stream restoration design and permitting. Two recommendations would be:

- NC Land and Water Fund (NCLWF) which typically has a maximum grant award of \$500,000 for restoration projects and encourages approximately a 30% match. NCLWF operates a single grant cycle each year with application deadlines in early February and award notification in early Fall.
- North Carolina Water Resources Development Grant Program (WRDG) has a maximum award of \$200,000 with a 50% match requirement. WRDG typically operates two grant cycles each year with application deadlines in June and December and award notifications approximately 6 months after submittal.

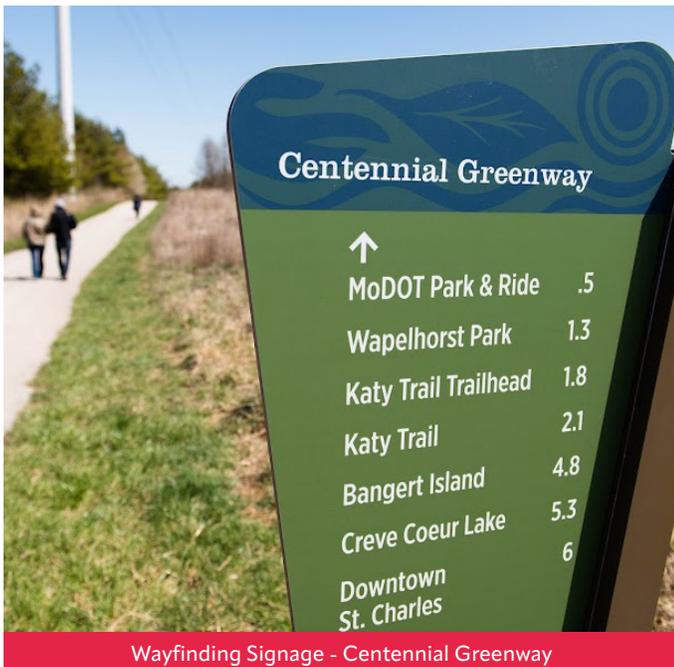
TRAIL AMENITIES

In tandem with infrastructure and policy recommendations, trail amenities improve user safety and experience and enhance recreational and multi-modal accommodations in a community. The overall branding for Middle Fork Greenway has been developed previously and is in use along existing sections of the greenway. A summary of recommended trail amenities are provided below and on subsequent pages.

WAYFINDING

Wayfinding consists of comprehensive signage, mapping, and marking systems that help inform and educate users as they make their way to, from, and along the greenway. A cohesive system across the corridor will enhance access, provide a greater sense of security and comfort, promote desired user behaviors, improve awareness of nearby trail and transit networks, and reinforce the brand and/or identity of the facility. The following principles should guide the continued implementation of the Middle Fork Greenway wayfinding system:

- **CONSISTENCY** - User experience should feel consistent and continuous across the entire corridor, regardless of jurisdiction.
- **CONNECTIVITY** - A primary function of wayfinding is to connect users to destinations and other routes. It should clearly communicate current locations, access points, adjacent streets, distances, directions, destinations, estimated travel times, and historical/cultural/environmental information where applicable.
- **IDENTITY** - A strong wayfinding identity will make the greenway more recognizable and memorable to visitors and residents alike. Custom designs and graphics should be used to create a unique identity which reflects the goals of the Middle Fork Greenway and the character of the region it will serve.
- **PREDICTABILITY** - Apply wayfinding in a predictable manner (including sign placement, design, and content) to allow users to quickly understand the information being presented. For users, this builds trust, increases comfort, reduces stress, and provides a welcoming and low-stress experience as they navigate the greenway.
- **SIMPLICITY** - Present information in a clear, logical, universal way to reach the widest possible demographic. The longer it takes to understand the information presented, the less likely the system will be used or relied upon.



Wayfinding Signage - Centennial Greenway



Wayfinding Signage - Colorado



Greenway Tunnel Lighting

LIGHTING

Well-placed and properly maintained lighting can improve visibility, increase overall greenway access, and give users a greater sense of security. If lighting is implemented along the Middle Fork Greenway, consider the following lighting guidance:

- Meet the American Association of State Highway and Transportation Officials' (AASHTO) Guide for the Development of Bicycle Facilities requirements for shared-use paths.
- Light only what is needed and comply with dark-sky requirements to help minimize light pollution, which impacts people, animals, and the environment.
- Be of appropriate scale and spacing to ensure adequate coverage.
- Be placed where recommended for safety at tunnels and overpasses; trailheads; bridges; gathering places; along streets; crosswalks; where a greenway crosses another path or sidewalk; and on signage.

A variety of lighting types are available including wired, battery-powered, and solar-powered each of which offers unique advantages or disadvantages regarding cost, maintenance burden, and environmental impacts.

Use of colored and/or dynamic lighting schemes in select areas (such as tunnels and bridges) can enhance the user experience, contribute to the overall brand/identity of the greenway network, and raise awareness of the facility to the traveling public.



Blowing Rock Trailhead - Middle Fork Greenway



321 Trailhead - Middle Fork Greenway

TRAILHEADS

Trailheads provide public access point to trails and greenways. They are typically in places where users begin or end their journeys and where they get oriented to the greenway or greenway network. While there are minor access points along greenways such as road crossings, within neighborhoods, or where two greenways intersect, a trailhead tends to be a developed site, purposefully designed to provide amenities to greenway users such as parking, signage, information kiosks, restrooms, drinking fountains, bike racks, bike repair stations, seating, public art, landscaping, and trash receptacles.

Guidance for trailhead placement includes:

- Endpoints are natural places to locate trailheads, but any place where a large volume of users is expected should be considered as a possible trailhead location.
- Utilize areas where amenities already exist, such as parks.
- Consider placing a trailhead where greenways intersect.
- Consider placing a trailhead within residential neighborhoods. Trailheads that are located within neighborhoods should be designed to be compatible with their surrounding uses.
- Consult with the community and seek public input on locations. Residents may have insights or preferences for areas that best meet trail user needs.

At all greenway access points, including trailheads, enhance user safety by implementing access management tools. Bollards, gates, fences, landscaping, and signage can prevent motorized vehicles from accessing the greenway. These barriers should be accessible for persons with disabilities to ensure that users of all ages and abilities can access the greenway. Barriers should also allow emergency or maintenance vehicles to access the greenway.

To supplement the existing trailheads along the Middle Fork Greenway at Blowing Rock, US 321, and Gold Mine Branch Park, this study recommends additional trailheads as follows:

Section 3 - Located along the east side of US 321 within the parcel owned by BRC, this trailhead may provide approximately 16 parking spaces and feature a bridge over the river to connect users to the proposed MFG along Jennifer Ln.

Section 5 North - Located in future Boone Gorge Park off Old Blowing Rock Rd, this trailhead may provide approximately 60 parking spaces.

DATA COLLECTION

Bicycle and pedestrian count data are an essential tool to justify investments in greenway and active transportation infrastructure and communicate needs with the public, elected officials, and other stakeholders. Collecting this data provides insights into temporal user volume trends (time of day and seasonal), user type trends (biking vs. walking), and user volume trends by geographic location (which sections are most frequently used). This information can also help identify potential areas of need as municipalities plan their future pedestrian and bicycling infrastructure projects.

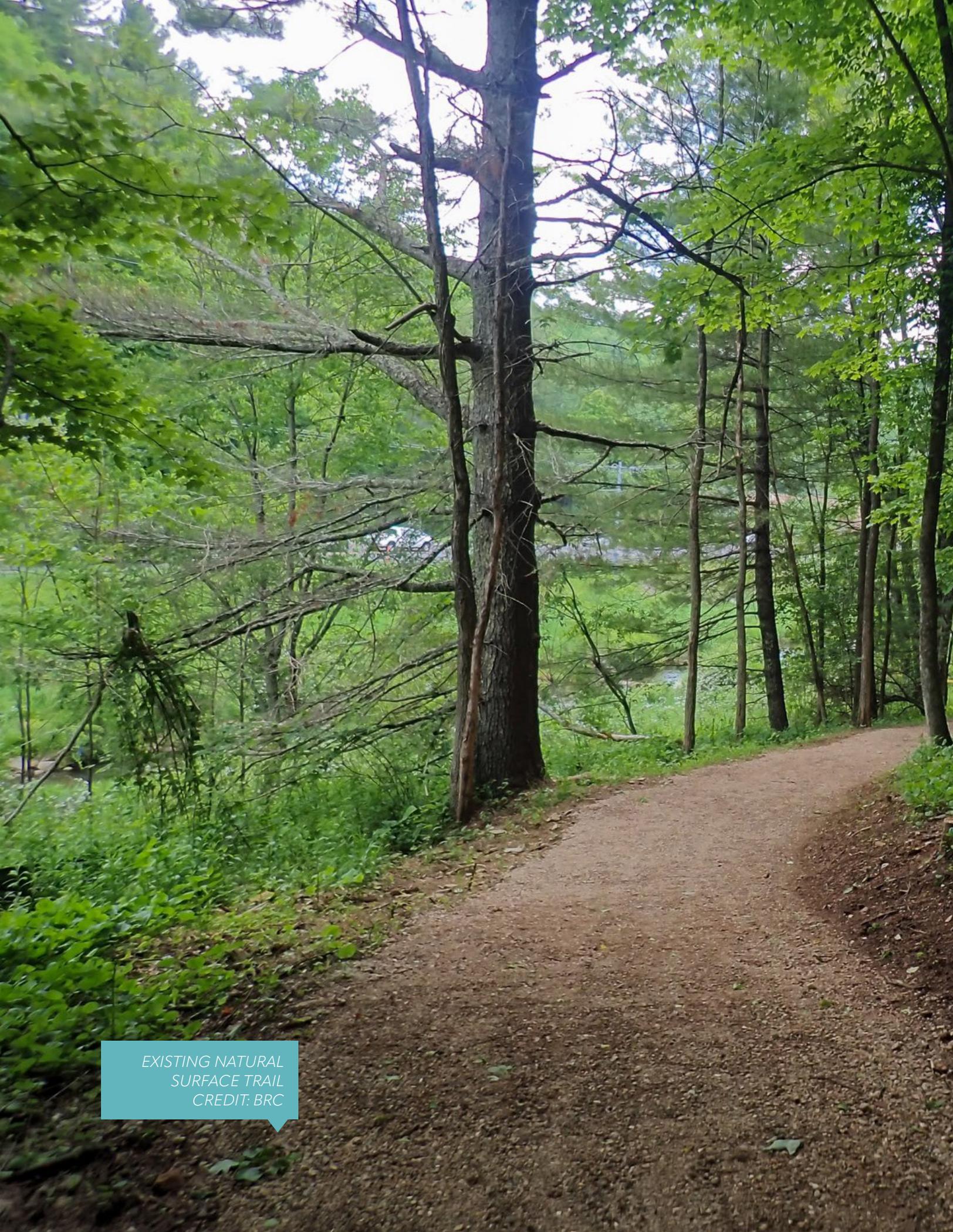
A variety of counting technologies and products are available depending on the specific application and budget. These range from inductive loop detectors, pneumatic tube detectors, and passive infrared detectors among others.

Mobile counters provide the flexibility to collect data in one location before moving to another collection location and are typically battery-powered. Fixed counters are used at locations where long-term data collection is desired and may be wired or battery-powered. Some blend in with their surroundings and others utilize real-time display totems to present daily and yearly counts and engage directly with those users being counted.

Depending on the specific product, count data may be retrieved manually from the counter or may streamline the process via wireless transmission, reducing trips to the field. Online, easy-to-use data platforms are also offered to analyze and visualize the data. Features include dashboards and interfaces to provide access to count data for the development of custom websites and mobile applications. The emerging use of "Big Data" crowd-sourced from mobile phone users, via services such as Streetlight and Strava, may also be an option for collecting user count data.



Bicycle + Pedestrian Counter - Dallas, TX



EXISTING NATURAL
SURFACE TRAIL
CREDIT: BRC



05 IMPLEMENTATION

IMPLEMENTATION

OVERVIEW

Recommendations outlined in the Middle Fork Greenway Feasibility Study represent a significant investment in multimodal transportation that will positively impact how both residents and visitors travel and experience Watauga County between Boone and Blowing Rock. A key output of this study are the project cut sheets and cost estimates, which are essential to establishing project implementation scenarios. The cut sheets and cost estimates are presented in this chapter. Additionally, successful implementation of Sections 3 and 5 of the Middle Fork Greenway will require a coordinated, consistent effort with a wide range of partners. Some of the key agencies and partners include Blue Ridge Conservancy, NC State Parks, NCDOT, Watauga County, the Town of Blowing Rock, the Town of Boone, private partners, regional advocacy organizations, and community members.

STRATEGIES

PRIORITIZATION + PHASING

Considerations when prioritizing sections may include:

- Additional land acquisition needs
- Cost / available funding
- Connectivity (to existing segments of greenway and to parks/other destinations)

Sections may be further split into multiple phases (based on the considerations previously listed above) to accelerate implementation.

PRIORITIZATION + PHASING RECOMMENDATIONS

Based on analysis by the project team and input from the Steering Committee, this study recommends the following:

- Section 5 should be divided up into the following three phases for implementation (Phase 1 = Highest Priority, Phase 3 = Lowest Priority):

Phase 1 - Boone Gorge Park to Payne Branch Park;

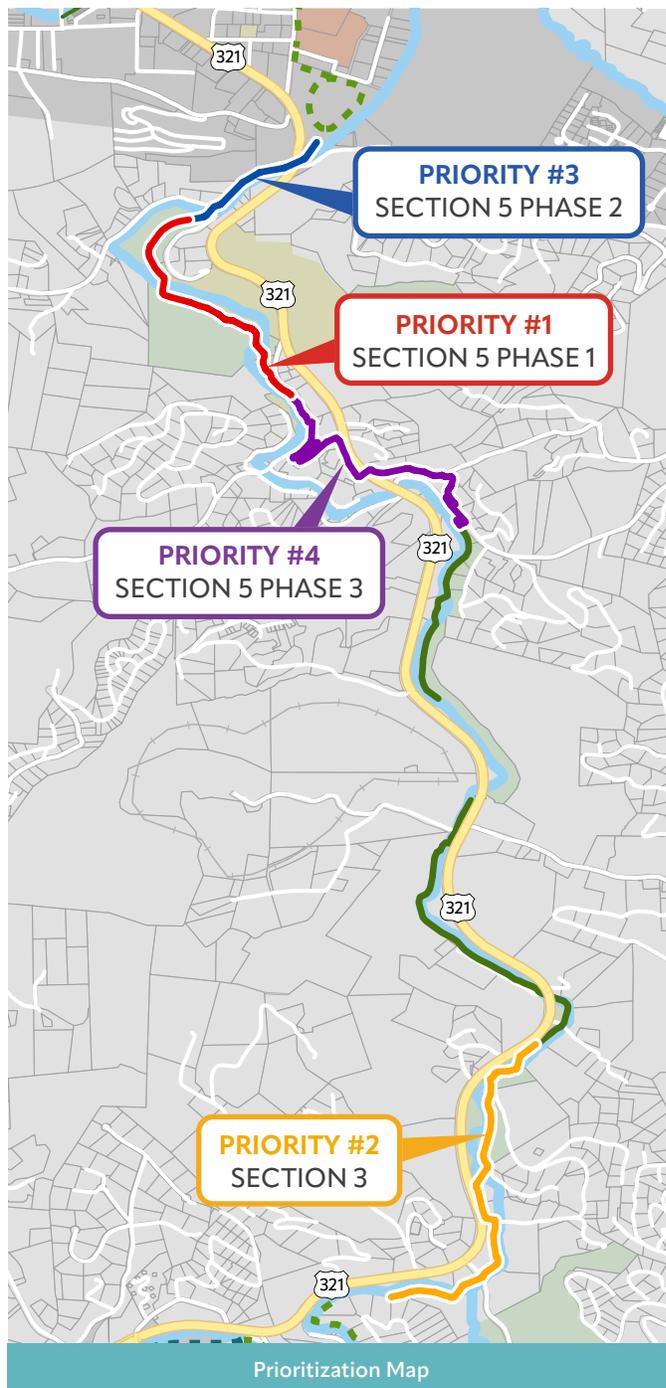
Phase 2 - Boone Gorge Park to Jordan V Cook Rd (end at Watauga Medical Center Property east of US 321); and

Phase 3 - Niley Cook Rd/Gold Mine Branch Park to Payne Branch Park.

- Section 3 should be prioritized over Section 5 Phases 2 and 3 as it appears easier to implement from both a land acquisition and construction standpoint.

TYPICAL SECTIONS + SURFACE MATERIALS

If funding is limited, consider constructing alternate typical sections utilizing a narrower paved width and/or utilizing natural surface trails in strategic locations to provide interim connectivity.



RECOMMENDED ROUTE CUT SHEETS

Cut sheets for the recommended routes are based on the four prioritized implementation phases proposed in this study. Each cut sheet includes descriptive project information (i.e., project length, roadway crossings, and trail connections), potential ROW impacts, and planning level cost estimates.

PROJECT COST ESTIMATES

In addition to understanding if a project is feasible from a technical perspective, understanding project cost is an equally important component to any feasibility study. This information enables communities to make informed decisions related to whether proceeding with the project and may influence funding strategies. There are several types of costs to consider when establishing a project budget including, but not limited to, the following:

Baseline Construction

Baseline construction costs for the current year, 2022, were generated using quantity takeoffs and calculations based on the preliminary design concepts and included a 20% contingency. Detailed line-item estimates for the recommended routes analyzed, as well as for the individual segments which make up those routes can be found in Appendix C. Please note that due to rounding, the sum of individual segments may result in a greater estimate than that of the route they combine to form.

Survey / Design Services

Costs were estimated for survey and design services based on project size, design elements, anticipated permitting required, and other activities related to funding source requirements.

ROW Acquisition

Permanent easement and ROW acquisition costs were not developed as part of the scope for this project. However, the total number of properties anticipated to be impacted has been calculated. These costs should be calculated at a later date, as individual segments of the preferred route move into design and implementation.

Escalated Construction

To account for inflation, the baseline costs were projected five years into the future to a fiscal year of probable construction. Assumed future year for implementation ranges from 2023 to 2027 depending on the implementation phase. This adjustment was performed using a linear compound interest formula assuming an annual inflation rate of 5%.

Construction Engineering + Inspection Services

A requirement for many state and federal funding sources, Construction Engineering & Inspection (CEI) services typically range from 9% to 12% of the estimated construction cost. This study assumes 10% based on the project size and elements of construction.

Total Budget Estimates

Project contingencies help address unforeseen costs due to a variety of reasons. They typically range from 5% to 25% or more of the construction cost, depending on how well defined the project scope is and the existing site condition are known at the time of the estimate. A 5% overall contingency was assumed for this project due to the extent of the study area, the total length of the project, the number of potential environmental impacts, total structures anticipated, and the amount of ROW which may need to be acquired. Total budget estimates were calculated by adding the aforementioned cost components and contingency. Appendix C contains a summary table of this process for each of the project components. All calculated values were rounded up to the nearest \$1,000 for the simplicity of this planning-level cost exercise.

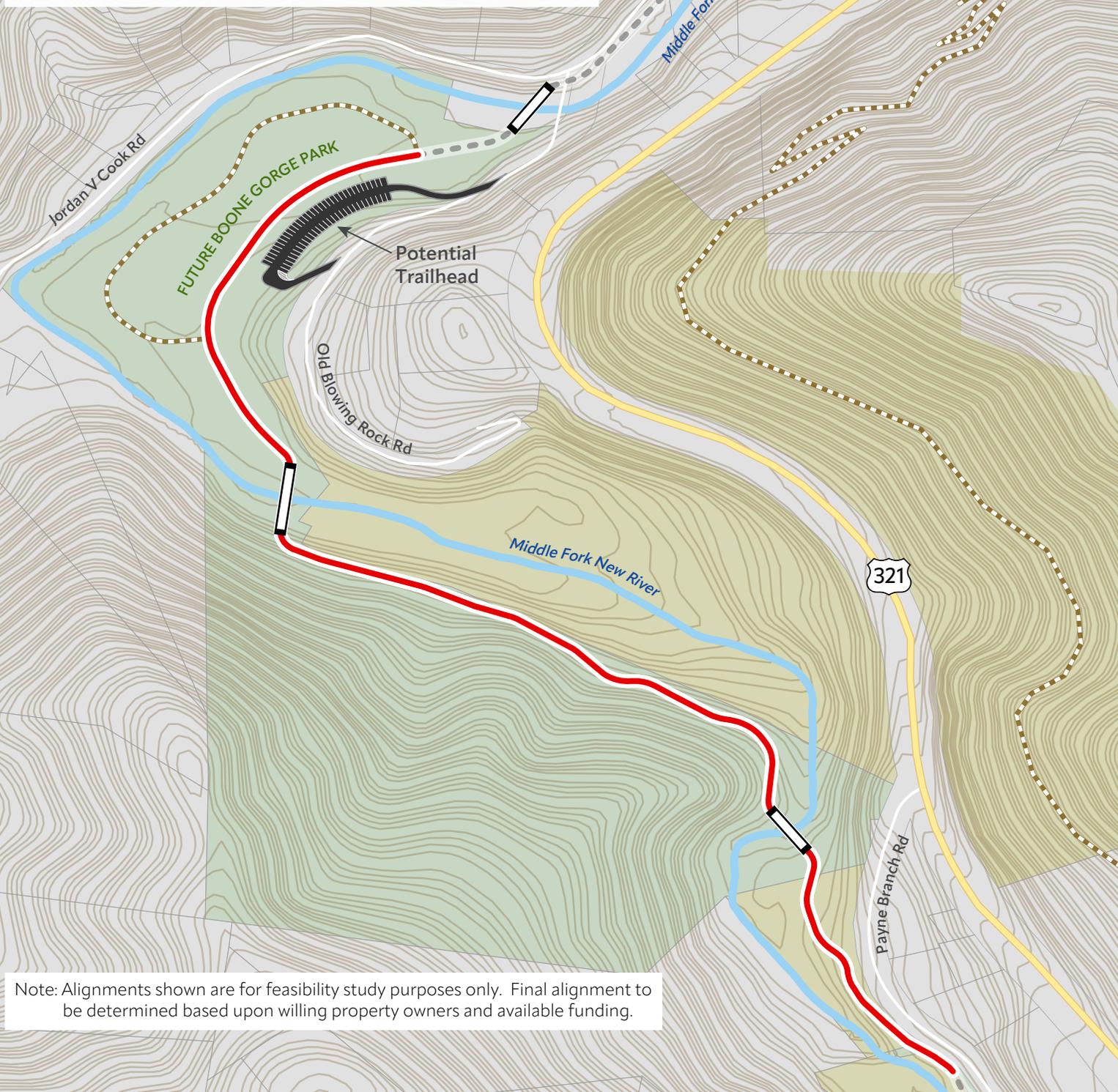
Please note these are planning-level cost estimates and should be refined as more detailed information becomes available throughout the design process. Actual costs will vary based on final project scope and prevailing market conditions for materials and labor forces used.

PRIORITY #1

SECTION 5 PHASE 1

LEGEND

- | | | | |
|---|-----------------------------|---|-------------------------|
|  | Proposed Greenway Route |  | 4' Contours |
|  | Other Section 5 Phases |  | Parcel Line |
|  | Proposed Bridge |  | River / Stream / Lake |
|  | Proposed Tunnel |  | Appalachian State Univ. |
|  | Potential Connection Trails |  | Park / Managed Lands |
|  | Existing Greenway |  | Municipality |
|  | Future Phase of Greenway |  | County |



Pass Below Highway Using Existing Culvert

FUTURE BOONE GORGE PARK

Potential Trailhead

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.

PRIORITY #1 - SECTION 5, PHASE 1

Section 5 Phase 1 begins at Payne Branch Park and heads north through land owned by Appalachian State University (ASU) before entering land owned by Blue Ridge Conservancy. Users will cross over the river via a pedestrian bridge and continue northwest as they descend along the side of the mountain before crossing back over to the east side of the river via a second pedestrian bridge as they enter the bottom lands of future Boone Gorge Park. The greenway then continues north through the eastern side of the future park past a potential trailhead location a potential connection trail which will create a loop trail down to the river. Please note the trailhead and connection trail are assumed to be included in the design/construction of the future park and are not included in the cost estimates contained within this study.

PROJECT SNAPSHOT

Location: Payne Branch Park to Future Boone Gorge Park

Jurisdictions: Watauga County

Facility Type(s): Shared Use Greenway, Shared Use Bridge, Shared Use Boardwalk

Total Length: 0.69 miles

Structures: 2 Bridges (approx. 255 LF),
1 Boardwalk (approx. 175 LF)

Grade-Separated Road Crossings: None

At-Grade Road Crossings: None

Trail Connections:

- Existing MFG at Payne Branch Park
- Future Boone Gorge Park Hiking Trails
- Future Boone Gorge Park Loop Trail

Destinations Served:

- Payne Branch Park
- Future Boone Gorge Park + Trailhead

POTENTIAL REAL ESTATE ACQUISITION NEEDS

Permanent Easement: 0 Privately-Owned Parcels
(All parcels are owned by Blue Ridge Conservancy or Appalachian State University)

PRIMARY TYPICAL SECTIONS



10' Shared Use Greenway



10' Shared Use Bridge

POTENTIAL PERMITTING NEEDS

- Erosion Control Permit
- 401/404 Permit
- Trout Stream Buffer Permit
- Floodplain Development Permit

ESTIMATED PROJECT COSTS

2022 Baseline Construction Cost Estimate	\$2,132,000
Design Services Cost Estimate	\$275,000
Escalated Construction Cost Estimate (Build Year 2023)	\$2,240,000
Construction Engineering + Inspection Services	\$224,000
Additional Project Contingency (5%)	\$112,000
TOTAL RECOMMENDED PROJECT BUDGET	\$2,851,000

* Costs associated with real estate acquisition to be determined during design process and are not included in this estimate.

**Detailed cost information is located in Appendix C.

PRIORITY #2 - SECTION 3

Section 3 begins on a mountain between US 321 and the Firethorn subdivision before crossing over the river via a pedestrian bridge between Faithbridge United Methodist Church and The Mustard Seed Market. The route then passes below the recently reconstructed Aho Rd bridge and continues alongside the river to Mack Hampton Rd. After crossing Mack Hampton Rd at-grade, the route turns west and follows the east side of US 321 before crossing over to the east side of the river via a second pedestrian bridge to Jennifer Ln. Utilizing the existing roadbed on Jennifer Ln, the route continues north through land owned by Blue Ridge Conservancy before crossing Dexter Dr at-grade and connecting to the existing section of the MFG at Sterling Creek Park on the west side of the river via a third pedestrian bridge. A trailhead is proposed adjacent to US 321 on the Blue Ridge Conservancy land, which will connect to the mainline MFG along Jennifer Ln via a connection trail with pedestrian bridge over the river.

PROJECT SNAPSHOT

Location: Aho Rd to Sterling Creek Park

Jurisdictions: Watauga County

Facility Type(s): Shared Use Greenway, Shared Use Bridge, Shared Use Boardwalk, Shared Use Underpass

Total Length: 0.91 miles

Structures: 4 Bridges (approx. 415 LF),
6 Boardwalks (approx. 675 LF)

Grade-Separated Road Crossings: Aho Rd (Under)

At-Grade Road Crossings:

- Mack Hampton Rd
- Dexter Dr

Trail Connections:

- Existing MFG at Sterling Creek Park
- Future Trail to Blue Ridge Conservancy

Destinations Served:

- Sterling Creek Park
- Blue Ridge Conservancy + Trails
- Future Trailhead on US 321

POTENTIAL REAL ESTATE ACQUISITION NEEDS

Permanent Easement: 5 Privately-Owned Parcels
(4 Owners)

ESTIMATED PROJECT COSTS

2022 Baseline Construction Cost Estimate	\$4,378,000
Design Services Cost Estimate	\$400,000
Escalated Construction Cost Estimate (Build Year 2024)	\$4,830,000
Construction Engineering + Inspection Services	\$483,000
Additional Project Contingency (5%)	\$242,000
TOTAL RECOMMENDED PROJECT BUDGET	\$5,955,000

* Costs associated with real estate acquisition to be determined during design process and are not included in this estimate.

**Detailed cost information is located in Appendix C.

PRIMARY TYPICAL SECTIONS



10' Shared Use Greenway

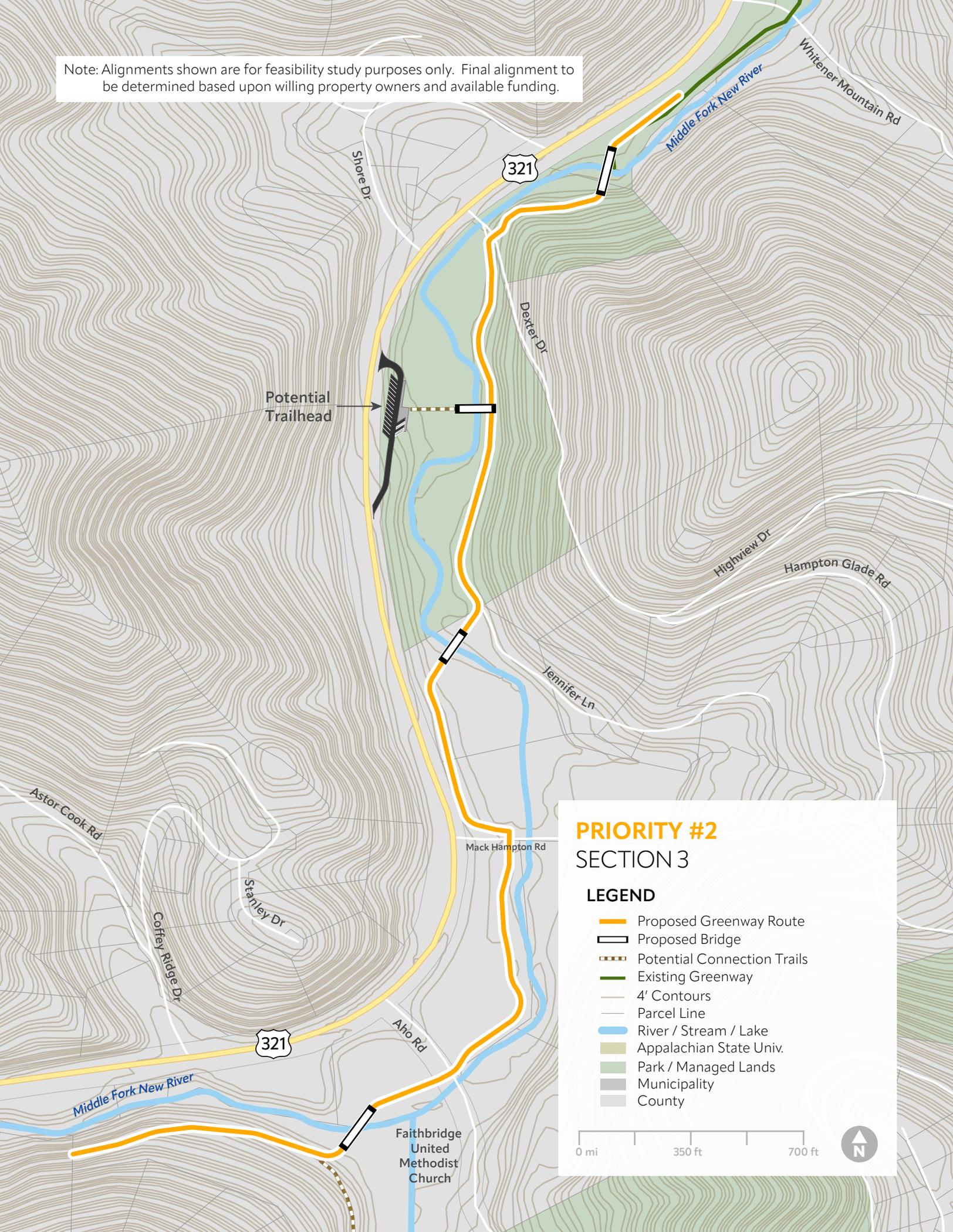


10' Shared Use Bridge

POTENTIAL PERMITTING NEEDS

- Erosion Control Permit
- 401/404 Permit
- Trout Stream Buffer Permit
- Floodplain Development Permit
- NCDOT Encroachment

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



PRIORITY #2 SECTION 3

LEGEND

- Proposed Greenway Route
- Proposed Bridge
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

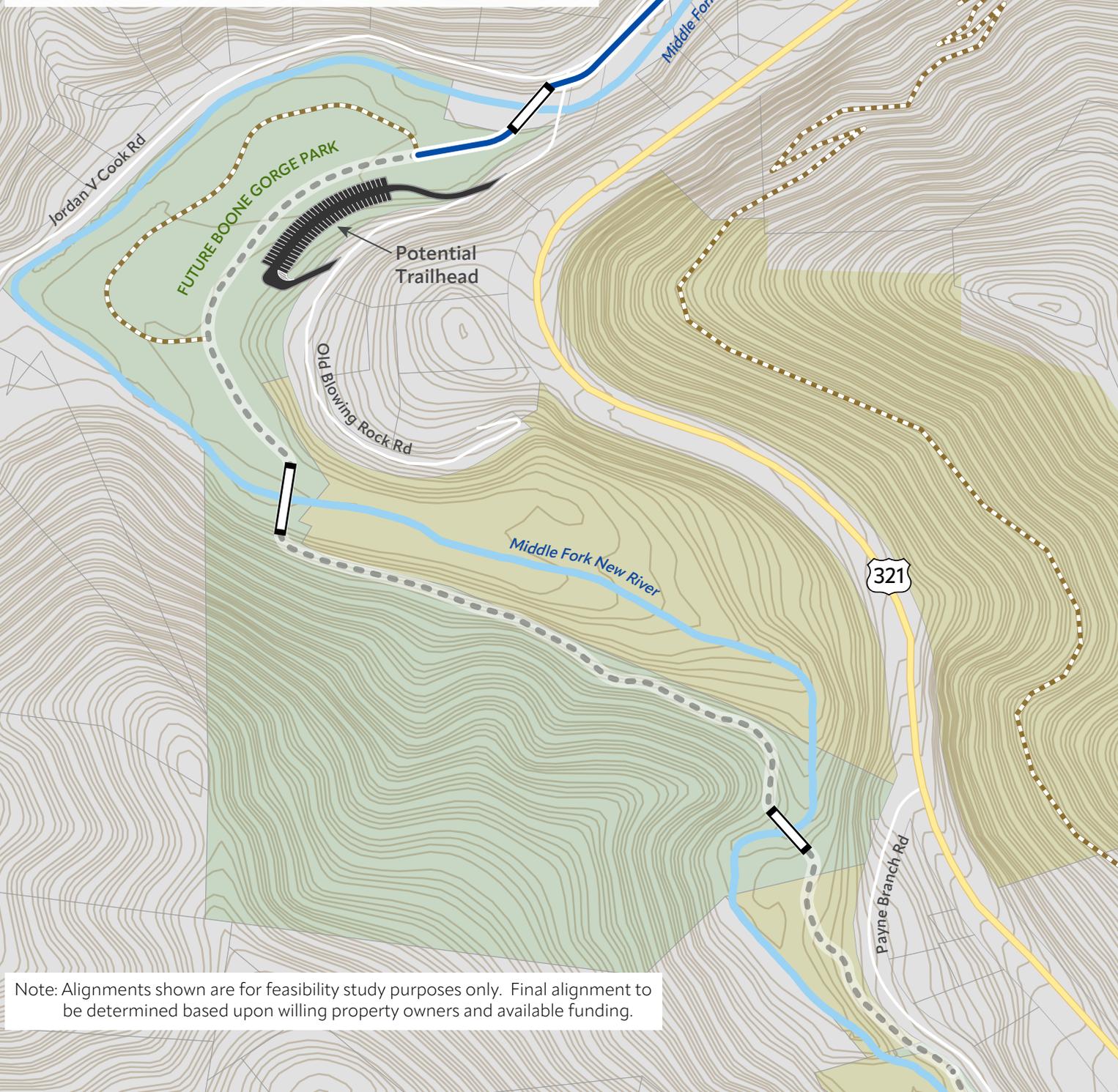


PRIORITY #3

SECTION 5 PHASE 2

LEGEND

- Proposed Greenway Route
- - - Other Section 5 Phases
- Proposed Bridge
- Proposed Tunnel
- Potential Connection Trails
- Existing Greenway
- - - Future Phase of Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County



Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.

PRIORITY #3 - SECTION 5, PHASE 2

Section 5 Phase 2 continues north from the trailhead at future Boone Gorge Park and crosses over to the west side of the river via a pedestrian bridge adjacent to Old Blowing Rock Rd, which will require an at-grade crossing. A system of boardwalks between Jordan V Cook Rd and the river will carry users north towards Boone where the greenway will utilize the existing culvert to pass below US 321 and end at Watauga Medical Center property. Connection to a potential hiking trail along the east side of US 321 to Niley Cook Rd could be made possible via a tunnel underneath Fairway Dr (not included in cost estimates in this study).

PROJECT SNAPSHOT

Location: Future Boone Gorge Park to US 321

Jurisdictions: Watauga County, Town of Boone

Facility Type(s): Shared Use Greenway, Shared Use Bridge, Shared Use Boardwalk, Shared Use Tunnel (Existing Culvert)

Total Length: 0.34 miles

Structures: 1 Bridge (approx. 115 LF),
3 Boardwalks (approx. 1,005 LF)

Grade-Separated Road Crossings: US 321 (Under)

At-Grade Road Crossings: Old Blowing Rock Rd

Trail Connections:

- Future Boone Gorge Park
- Future Hiking Trail East of US 321

Destinations Served:

- Future Boone Gorge Park + Trailhead
- Watauga Medical Center

POTENTIAL REAL ESTATE ACQUISITION NEEDS

Permanent Easement: 7 Privately-Owned Parcels
(5 Owners)

ESTIMATED PROJECT COSTS

2022 Baseline Construction Cost Estimate	\$2,528,000
Design Services Cost Estimate	\$400,000
Escalated Construction Cost Estimate (Build Year 2024)	\$2,790,000
Construction Engineering + Inspection Services	\$279,000
Additional Project Contingency (5%)	\$140,000
TOTAL RECOMMENDED PROJECT BUDGET	\$3,609,000

* Costs associated with real estate acquisition to be determined during design process and are not included in this estimate.

**Detailed cost information is located in Appendix C.

PRIMARY TYPICAL SECTIONS



10' Shared Use Boardwalk

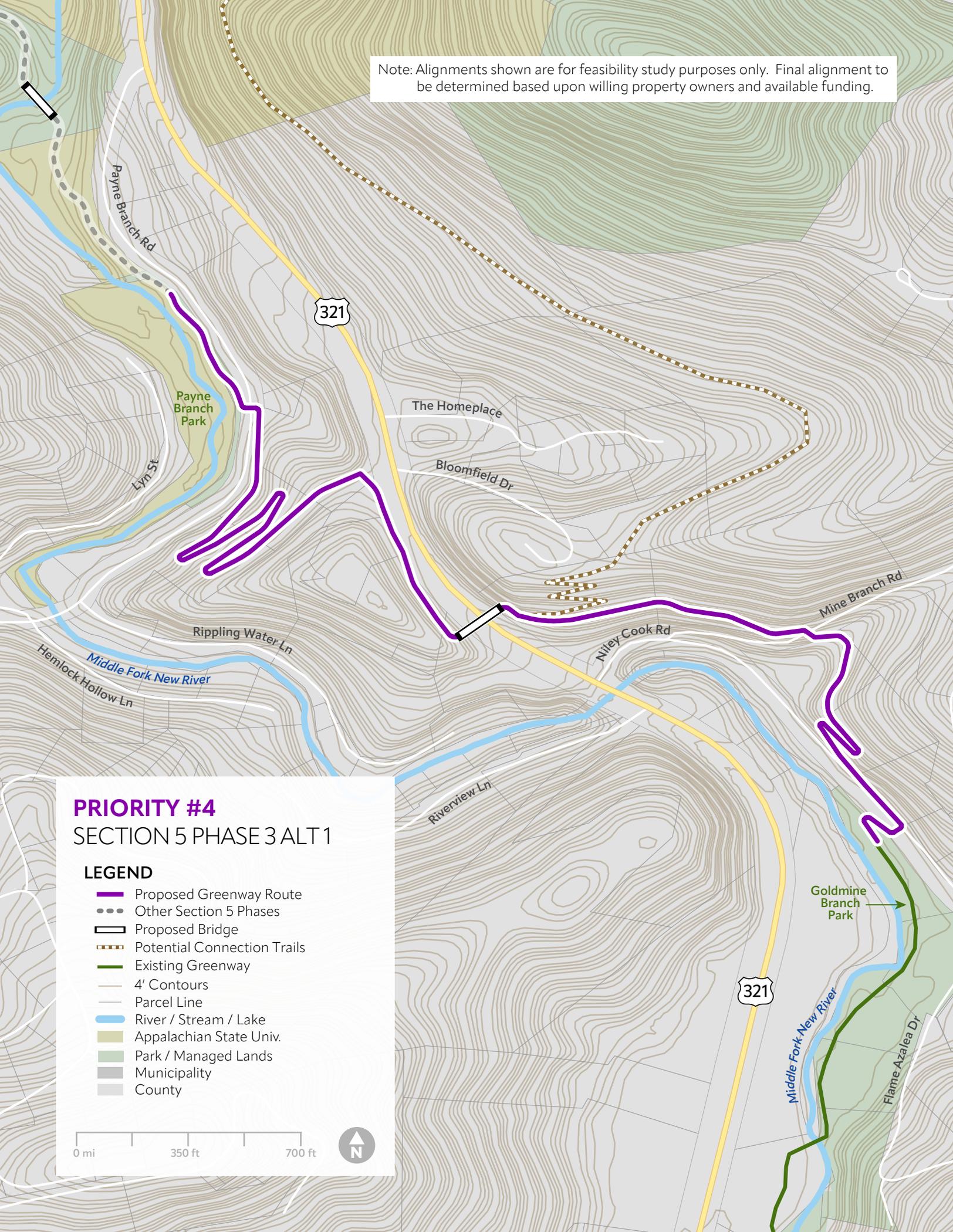


10' Shared Use Tunnel (Existing Culvert)

POTENTIAL PERMITTING NEEDS

- Erosion Control Permit
- 401/404 Permit
- Trout Stream Buffer Permit Variance
- Floodplain Development Permit
- NCDOT Encroachment

Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.



PRIORITY #4 SECTION 5 PHASE 3 ALT 1

LEGEND

- Proposed Greenway Route
- Other Section 5 Phases
- Proposed Bridge
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



PRIORITY #4 - SECTION 5, PHASE 3 ALT 1

Section 5 Phase 3 Alt 1 begins at the existing trailhead at Goldmine Branch Park and crosses Niley Cook Rd at-grade. The route then climbs in elevation along the east side of Niley Cook Rd via a series of switchbacks to meet Mine Branch Rd. After crossing Mine Branch Rd at-grade, the greenway heads west and continues to climb as it crosses under a power transmission line until reaching the top of the east cut bank on US 321. Users then cross over US 321 via a pedestrian bridge and head down to roadway grade along the west side of the roadway. The route then turns west and descends north via a series of switchbacks and approaches an at-grade crossing of Payne Branch Rd into Payne Branch Park from the south.

PROJECT SNAPSHOT

Location: Goldmine Branch Park to Payne Branch Park

Jurisdictions: Watauga County

Facility Type(s): Shared Use Greenway, Shared Use Bridge, Shared Use Boardwalk

Total Length: 0.85 miles

Structures: 1 Bridge (approx. 125 LF),
4 Boardwalks (approx. 1,270 LF)

Grade-Separated Road Crossings: US 321 (Over)

At-Grade Road Crossings:

- Niley Cook Rd
- Mine Branch Rd
- Payne Branch Rd

Trail Connections:

- Existing MFG at Payne Branch Park
- Existing MFG at Goldmine Branch Park
- Future Hiking Trail East of US 321

Destinations Served:

- Payne Branch Park
- Goldmine Branch Park + Trailhead

POTENTIAL REAL ESTATE ACQUISITION NEEDS

Permanent Easement: 12 Privately-Owned Parcels
(10 Owners)

ESTIMATED PROJECT COSTS

2022 Baseline Construction Cost Estimate	\$5,716,000
Design Services Cost Estimate	\$650,000
Escalated Construction Cost Estimate (Build Year 2026)	\$6,950,000
Construction Engineering + Inspection Services	\$695,000
Additional Project Contingency (5%)	\$348,000
TOTAL RECOMMENDED PROJECT BUDGET	\$8,643,000

* Costs associated with real estate acquisition to be determined during design process and are not included in this estimate.

**Detailed cost information is located in Appendix C.

PRIMARY TYPICAL SECTIONS



10' Shared Use Greenway



10' Shared Use Bridge

POTENTIAL PERMITTING NEEDS

- Erosion Control Permit
- 401/404 Permit
- Trout Stream Buffer Permit
- Floodplain Development Permit
- NCDOT Encroachment

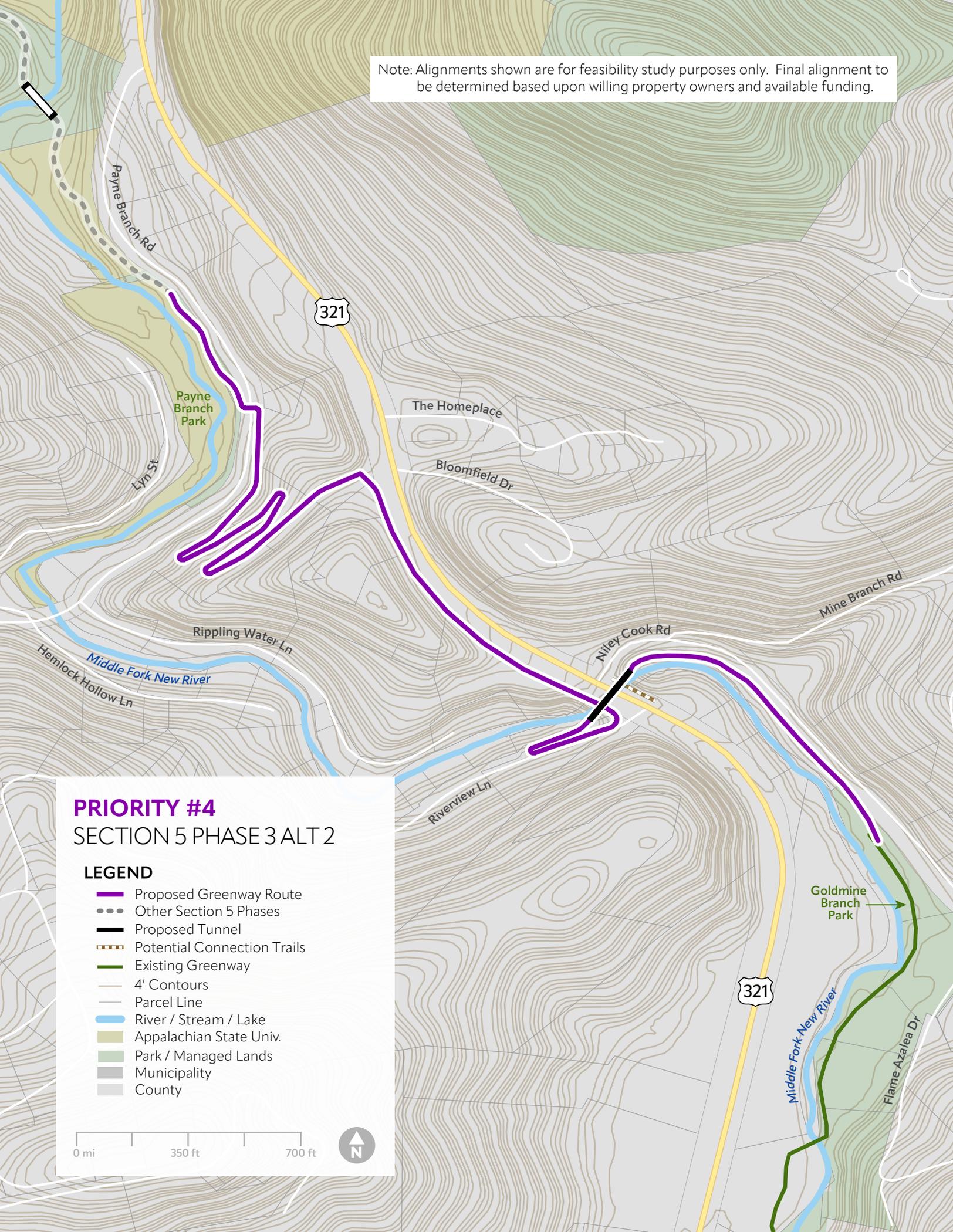
Note: Alignments shown are for feasibility study purposes only. Final alignment to be determined based upon willing property owners and available funding.

PRIORITY #4 SECTION 5 PHASE 3 ALT 2

LEGEND

- Proposed Greenway Route
- Other Section 5 Phases
- Proposed Tunnel
- Potential Connection Trails
- Existing Greenway
- 4' Contours
- Parcel Line
- River / Stream / Lake
- Appalachian State Univ.
- Park / Managed Lands
- Municipality
- County

0 mi 350 ft 700 ft



PRIORITY #4 - SECTION 5, PHASE 3 ALT 2

Section 5, Phase 3 Alt 2 begins at the existing trailhead at Goldmine Branch Park and heads north between the river and Niley Cook Rd within the power transmission easement. The route then crosses below US 321 via a pedestrian tunnel (located above the existing culvert) and climbs up to the west side of US 321 via a series of switchbacks along Riverview Ln. Users then continue north along the west side of US 321 up to the crest of the roadway. The route then turns west and descends north via a series of switchbacks and approaches an at-grade crossing of Payne Branch Rd into Payne Branch Park from the south.

PROJECT SNAPSHOT

Location: Goldmine Branch Park to Payne Branch Park

Jurisdictions: Watauga County

Facility Type(s): Shared Use Greenway, Shared Use Tunnel, Shared Use Boardwalk

Total Length: 0.82 miles

Structures: 1 Tunnel (approx. 150 LF),
3 Boardwalks (approx. 990 LF)

Grade-Separated Road Crossings: US 321 (Under)

At-Grade Road Crossings: Payne Branch Rd

Trail Connections:

- Existing MFG at Payne Branch Park
- Existing MFG at Goldmine Branch Park
- Connection Trail to Businesses on US 321

Destinations Served:

- Payne Branch Park
- Goldmine Branch Park + Trailhead

POTENTIAL REAL ESTATE ACQUISITION NEEDS

Permanent Easement: 12 Privately-Owned Parcels
(9 Owners)

ESTIMATED PROJECT COSTS

2022 Baseline Construction Cost Estimate	\$5,492,000
Design Services Cost Estimate	\$800,000
Escalated Construction Cost Estimate (Build Year 2026)	\$6,680,000
Construction Engineering + Inspection Services	\$668,000
Additional Project Contingency (5%)	\$334,000
TOTAL RECOMMENDED PROJECT BUDGET	\$8,482,000

* Costs associated with real estate acquisition to be determined during design process and are not included in this estimate.

**Detailed cost information is located in Appendix C.

PRIMARY TYPICAL SECTIONS



10' Shared Use Boardwalk



10' Shared Use Tunnel (New)

POTENTIAL PERMITTING NEEDS

- Erosion Control Permit
- 401/404 Permit
- Trout Stream Buffer Permit (may require variance)
- Floodplain Development Permit
- NCDOT Encroachment



PARTNER ROLES

As a multi-jurisdictional project, achieving success in the development of the Middle Fork Greenway depends on collaboration with community partners and stakeholders at the state, regional, and local levels. Successful implementation of the Middle Fork Greenway will depend on maintaining and developing partnerships with all project stakeholders. Key partners and their respective roles in the implementation of Sections 3, 5 North, and 5 South of the Middle Fork Greenway are outlined below.

BLUE RIDGE CONSERVANCY (BRC)

BRC is a private, non-profit organization that partners with landowners and local communities to permanently protect natural resources with agricultural, cultural, recreational, ecological, and scenic value in northwest North Carolina. Since its founding, BRC has protected over 22,000 acres in Alleghany, Ashe, Avery, Mitchell, Watauga, Wilkes, and Yancey Counties.

The Middle Fork Greenway is a BRC project in partnership with the Town of Blowing Rock, Town of Boone, and Watauga County. As the lead agency for the Middle Fork Greenway initiative, BRC plays an integral role in shaping and developing local parks and trailheads along the Middle Fork River between Boone and Blowing Rock. In 2014, a multi-year grant was awarded to BRC to fund staffing and oversight for the greenway. Today, BRC continues to successfully raise funds for land acquisition through the annual Round Up for the Greenway campaign to expand the Middle Fork Greenway along US-321.

BRC's strong presence and close-knit relationships with surrounding communities showcase its dedication to land conservation in the region. In addition, BRC's land protection expertise, administrative capabilities, and financial support make it a well-versed partner in the development of greenways in Watauga County.

Anticipated Roles:

- BRC should continue to educate the community on the benefits of greenways and promote environmental stewardship for the Middle Fork River and surrounding land within the Middle Fork Greenway corridor.
- BRC should continue to advocate for the Middle Fork Greenway with local elected officials, businesses, and other stakeholders.
- BRC and Watauga County staff should continue to hold meetings with the Middle Fork Greenway Executive Committee to guide study implementation for the greenway.
- BRC should continue to seek funding opportunities for planned sections of the Middle Fork Greenway (Sections 3, 5 North, and 5 South).
- BRC should continue to improve public access along the Middle Fork Greenway by protecting and securing land along the greenway corridor through landowner coordination. One example includes continuing to pursue the development of Boone Gorge Park and coordinating the proposed trailhead at Section 5 North with the park.

WATAUGA COUNTY + MUNICIPALITIES

Who Is Involved? Watauga County, the Town of Boone, and the Town of Blowing Rock

Watauga County

Watauga County staff play a large role in the development of the Middle Fork Greenway. For example, the Watauga County Board of Commissioners are responsible for adopting the Middle Fork Greenway Feasibility Study for Sections 3 and 5. This group is also responsible for supporting the action steps required to implement plan recommendations. By adopting the plan, the County expresses its commitment to expanding active transportation infrastructure between Boone and Blowing Rock. Plan adoption also demonstrates the County's intent to support the efforts of other key partners, such as Town departments (Boone and Blowing Rock) and NCDOT. In addition, the County may act as a funding partner for construction of future sections along the Middle Fork Greenway (Sections 3, 5 North, and 5 South). As sections of greenway are constructed, BRC donates the land to Watauga County and the County assumes maintenance responsibilities for the property.

Town of Boone and Town of Blowing Rock

Town departments lead and/or support the development of active transportation projects within their respective jurisdictions. Municipal staff often play a large role on projects that they lead, such as through the act of primary coordinators for project development, community engagement, policy development, funding strategies, and maintenance.

The Town of Boone plays a coordinating role with BRC and the Watauga Medical Center in the development of Section 5 North. This feasibility study proposes that Section 5 North will pass below US-321 using an existing culvert, and it will tie into the planned greenway loop on Watauga Medical Center's property within Town limits. From there, the hospital's planned greenway loop will connect to the existing Boone Greenway, which will result in a continuous greenway network between Blowing Rock and Boone. Although the Town of Blowing Rock already hosts the southernmost end of the soon to be constructed Middle Fork Greenway (and a constructed trailhead), it serves as the administrator of federal grants to construct the 1.2 miles through town, Blue Ridge Parkway property, and private landowners. The town may still consider serving as a supporting partner for future sections of the Middle Fork Greenway (Sections 3, 5 North, and 5 South).

Anticipated Roles:

- Watauga County Board of Commissioners should adopt this feasibility study for Sections 3, 5 North, and 5 South of the Middle Fork Greenway.
- Watauga County and Town of Boone staff should reference the proposed alignments for Sections 3, 5 North, and 5 South in local plans.
- Watauga County and municipal staff should coordinate with regional agencies and neighboring jurisdictions on funding strategies for the design and construction of Sections 3, 5 North, and 5 South of the Middle Fork Greenway.
- Watauga County and municipal staff should coordinate with regional agencies and neighboring jurisdictions on the design and construction of Sections 3, 5 North, and 5 South of the Middle Fork Greenway.
- Watauga County and municipal staff should support regional agencies with NCDOT coordination on STIP project development to ensure alignment with Sections 3, 5 North, and 5 South of the Middle Fork Greenway.
- Watauga County and municipal staff should support, promote, and continue coordination on the existing branding and wayfinding for the Middle Fork Greenway.
- Watauga County and municipal staff should coordinate with regional agencies on the development of a Middle Fork Greenway Maintenance Plan.
- Watauga County, Boone, and Blowing Rock will maintain sections of the Middle Fork Greenway that fall within their jurisdictional boundaries.

REGIONAL + STATE PARTNERS

Who is Involved? High Country Council of Governments (HCCOG), High Country Rural Transportation Planning Organization (RPO), Watauga Tourism Development Authority (TDA), NC Department of Natural and Cultural Resources (NCDNCR) - NC Division of Parks and Recreation (DPR), NC Department of Water Quality (NCDEQ) - Division of Water Resources (DWR), Appalachian State University (ASU), and the NC General Assembly.

Other governmental organizations that have jurisdictional authority or administer services in the Middle Fork Greenway play a key role in project implementation by working with lead agencies to advance shared goals of improving multi-modal connectivity and expanding travel choices and recreational opportunities in the region. Key agency partners include the High Country COG, High Country RPO, Watauga TDA, NC DPR, NC DWR, ASU, and the NC General Assembly.

High Country Council of Governments (HCCOG) and Rural Transportation Planning Organization (RPO)

The HCCOG provides planning assistance through the development of regional plans related to natural resources and infrastructure, land-use plans, comprehensive plans, recreation plans, and revisions to local development ordinances. Transportation planning services are provided through operation of the High Country RPO, which is housed within the HCCOG. The RPO often acts as a facilitator with local officials to develop plans and projects in conjunction with NCDOT. The RPO also ranks and prioritizes projects submitted to the Strategic Transportation Prioritization (SPOT), which is the methodology NCDOT uses to develop the State Transportation Improvement Program (STIP).

Watauga Tourism Development Authority (TDA)

The Watauga TDA promotes travel, tourism, corporate travel, sponsor tourist-related events, and activities, and finance tourism-related capital projects in the County. The TDA is eager to support the Middle Fork Greenway since it is an economic driver for the region's tourism economy. In 2010, the TDA published the Boone Area Outdoor Recreation Plan which identified the Middle Fork Greenway as a priority initiative. In addition, the TDA led an effort to place the US-321 underpass at Mystery Hill on the NCDOT STIP. More recently, the TDA provided funding resources for Phase 3 of Section 4 of the Middle Fork Greenway and provided support for the purchase of land for the future Boone Gorge Park located on Section 5 North. The Boone Gorge Park will serve as a potential trailhead site along the Middle Fork Greenway.

Watauga TDA has been an essential funding partner on the development of the Middle Fork Greenway. BRC's continued coordination with the TDA may lead to additional funding support or development opportunities for Sections 3, 5 North, and/or 5 South of the Middle Fork Greenway. The TDA could also help market the Middle Fork Greenway to promote economic development, community health, and tourism in the region.

NC Department of Environmental Quality (NCDEQ), Division of Water Resources (DWR)

The DWR is housed within the NCDEQ, and it is responsible for the environmental protection and quality of the State's surface water and groundwater, and to ensure safe drinking water for its residents. The DWR provides services related to the following disciplines: public water supply, water planning, water quality permitting, water quality regional operations, water sciences, and groundwater resources.

The DWR administers the Water Resources Development Grant Program which provides cost-share grants and technical assistance to local governments throughout the state. Applications for grants are accepted for the following eligible project types: general navigation, recreational navigation, water management, stream restoration, water-based recreation, Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) stream restoration projects and feasibility/engineering studies. Matching funds are not specified for this grant, but a 20 percent local match is encouraged and considered competitive. Since the Middle Fork Greenway serves as an access area at multiple points along the Middle Fork River, it may serve as a viable project for this funding source. DWR has provided 3 grants over the past 7 years to the Middle Fork Greenway, and the Middle Fork Greenway team continues to apply for additional funding as sections are developed.

NC Department of Natural and Cultural Resources (NCDNCR), NC Division of Parks and Recreation (DPR)

The NCDNCR is a state agency that focuses on leveraging the state's natural and cultural resources to build the social, cultural, educational, and economic future of North Carolina. The DPR aims to inspire all its citizens and visitors through conservation, recreation, and education. It also supports and assists other recreation providers by administering grant programs for park and trail projects, and by offering technical advice for park and trail planning and development. Select grant opportunities are outlined below.

Recreational Trails Program (RTP) Grant

To obtain additional funding for the Middle Fork Greenway (Sections 3, 5 North, and 5 South), BRC may apply for grants provided by the Recreational Trails Program (RTP). The North Carolina Trail Program is managed by the DPR, and it administers the RTP, which provides federal grants for trail creation and maintenance. Trails Program staff (affiliated with DPR) are available to assist in all phases of the application process of projects that are construction ready for grant funding. Applications submitted with "shovel-ready" projects can leverage local funds to meet recreational trail and trail-needs, to provide low infrastructure economic development opportunities through natural resource tourism. DPR also states that staff are also available to assist applicants with conceptual projects, to meet the technical requirements of an RTP Grant before applying. RTP funded a portion of the construction costs for Section 4 of the Middle Fork Greenway. <https://trails.nc.gov/trail-grants>

Land and Water Conservation Fund (LWCF)

BRC may also apply to the Land and Water Conservation Fund (LWCF) program. The LWCF program is administered by the US Department of the Interior's National Park Service at the federal level and by the NC DNCR at the state level. The program's resources have been used to fund outdoor recreation development and land acquisition by local governments and state agencies. Historically, North Carolina's LWCF annual allocation has been split 60/40 between local governments and state agencies. <https://www.ncparks.gov/more-about-us/grants/lwcf-grants>

Parks and Recreation Trust Fund (PARTF)

A third funding opportunity for the remaining sections of the Middle Fork Greenway is the Parks and Recreation Trust Fund (PARTF). The DPR is responsible for administering PARTF. This grant awards matching grants to local governments for parks, public beach access, and improvements in state parks. The grant helps fund and maintain recreational resources, including, but not limited to parks, greenways, and trails. Specific funding allocations are outlined below.

The money from the PARTF is allocated as follows:

- 65 percent for North Carolina state parks capital projects, repairs, and renovations of facilities, and land acquisition;
- 4 percent of these funds go to the DuPont State Recreational Forest;
- 30 percent for local government grants on a dollar-for-dollar basis, which create or improve parks and recreational projects; and
- 5 percent for the Coastal and Estuarine Water Beach Access Program.

It is important to note that no more than 3 percent may be used for administration of the funds. NC PARTF funded a portion of the construction costs for Section 4 of the Middle Fork Greenway.

<https://www.ncparks.gov/more-about-us/parks-recreation-trust-fund/parks-and-recreation-trust-fund>

Appalachian State University (ASU)

ASU is a medium-sized university in the Town of Boone that enrolls approximately 17,000 students. The main campus is spread across 410 acres, with an additional 900 acres of land holdings throughout the County. Part of ASU's mission statement references a commitment to the protection of the environment, which is often promoted through its courses.

In 2001, the Middle Fork Greenway Association partnered with an ASU professor to determine the feasibility of a trail along the Middle Fork River between Blowing Rock and Boone in their Geography and Planning Project Management class. The project was determined feasible, and the report served as the primary planning document until 2013. Today, BRC is working closely with ASU to secure an easement for the Middle Fork Greenway along property within Section 5 North.

NC General Assembly

The NC General Assembly, composed of the Senate and House of Representatives, is the legislative body of the State government of North Carolina. All members are elected by the voters from their respective districts and their primary duties are to create new laws, amend existing laws, and create a budget.

The NC General Assembly filed House Bill 936 in 2021 to support access to the scenic beauty of North Carolina's environment for the citizens of North Carolina by providing dedicated funds for support of state and local trails. Sections of the bill specified funding for natural surface trails, paved trails, paddle trails, maintenance and trail signage, a State Trails Coordinator, and planning efforts including the development of a master plan for the state trails system. Following House Bill 936, the NC Legislature declared 2023 North Carolina Year of the Trail, highlighting an opportunity to showcase, promote, and celebrate our state's extensive trail systems. Although the Middle Fork Greenway is not a state designated trail, the Great Trails State Coalition (GTSC) still highlights Sections 3 and 5 as projects ready for investment.

BRC maintains strong relationships with NC legislative members that are in support of greenways in the region. These members have helped BRC secure several Directed Grants for the Middle Fork Greenway, such as the State Capital and Infrastructure Funds (SCIF) which may be used for capital improvements (i.e., greenway construction and maintenance). The SCIF was created by the NC General Assembly in 2017 and the North Carolina Office of State Budget and Management (OSBM) administers this grant (and others). This funding will likely be used to support bridge construction along the Middle Fork Greenway.

Anticipated Roles:

- HCCOG and the High Country RPO should update the Watauga County CTP with the preferred alignments for the Middle Fork Greenway sections.
- HCCOG and the High Country RPO should provide technical assistance to regional, county, and municipal partners on trail design, funding, and land acquisition.
- Watauga County TDA should coordinate with NCDOT, HCCOG/RPO, municipalities, and BRC on funding opportunities and project phasing.
- ASU should coordinate with BRC and Watauga County on easements for segments of the Middle Fork Greenway, as well as connector trails.
- Watauga TDA may coordinate on marketing efforts with BRC to promote economic development, community health, and tourism in the region.

NCDOT

Who Is Involved? Integrated Mobility Division (IMD) and Division 11

NCDOT allocates federal and state funding and establishes policies for transportation improvements in communities across North Carolina. Every two years, NCDOT develops the STIP, which identifies projects that will receive funding during a 10-year period. NCDOT policies, such as Complete Streets provide guidance and oversight for permitting and implementing active transportation projects. The Complete Streets Policy (adopted in August 2019) requires NCDOT to consider and incorporate multimodal facilities in the design and improvement of the state's transportation projects. According to the Complete Streets Policy, if an active transportation facility is included in an adopted local plan, the municipalities will not be held responsible for the cost. As the lead state agency allocating funding, guiding implementation of the Complete Streets Policy, and approving activities along NCDOT-maintained roadway corridors, NCDOT plays a critical role in the implementation of the Middle Fork Greenway.

While most of the land will be obtained through partnerships and coordination with landowners, a portion of the Middle Fork Greenway will utilize DOT ROW. For example, several of the alternatives presented in this feasibility study (potentially on Sections 3 and 5 South) fall within NCDOT ROW along US-321 so coordination with NCDOT is critical. Infrastructure recommendations along NCDOT-maintained roadways would require review and approval by NCDOT Division 11 prior to implementation. The NCDOT IMD will also play a large role since it works with other business units of the NCDOT as well as local municipalities to develop and design active transportation projects.

R-5874 and R-5915 are two current STIP projects within the Middle Fork Greenway study area. R-5874 proposes to construct a new roadway to realign the intersection of Deerfield Road and Meadowview Drive. This project may affect the planned greenway at Watauga Medical Center if the greenway alignment shifts on Deerfield Road (expected ROW acquisition in 2029). R-5915 (Daniel Boone Parkway) is the US 421 freeway construction project that will run perpendicular with Segment 5, just north of Payne Branch Park (expected ROW acquisition in 2028).

Anticipated Roles:

- NCDOT Division 11 should provide guidance on the design of Sections 3, 5 North, and 5 South of the Middle Fork Greenway.
- NCDOT IMD and Division 11 should lead coordination with regional and municipal partners in Complete Streets implementation for STIP projects along the Middle Fork Greenway corridor.
- NCDOT IMD and Division 11 should provide technical assistance to regional, county, and municipal partners on Complete Streets Policy, STI, and other state funding opportunities.
- NCDOT IMD and Division 11 should provide guidance and technical assistance on shared use path design that will apply to Sections 3, 5 North, and 5 South of the Middle Fork Greenway.

PRIVATE SECTOR

Who Is Involved? Private landowners, local businesses, Faithbridge United Methodist Church, Watauga Medical Center, New River Light and Power (NRLP), and Blue Ridge Energy.

Private Landowners and Local Businesses

Local businesses adjacent to the Middle Fork Greenway may serve as key destinations and potential generators of bicycle and pedestrian travel along the corridor. As a result, they may have the resource capacity to advance projects for the Middle Fork Greenway and make the case for increased investment in active transportation infrastructure within the region. Several landowners and local businesses along the corridor provide opportunities for lead and supporting agencies to explore funding outside of traditional revenue streams. As an example, many of these stakeholders participated in the Round Up for the Greenway. Since 2018, this annual community-wide fundraiser has raised \$450K for the Middle Fork Greenway. In addition, these contributions were used to leverage over \$2 million in grant funding.

BRC is currently working with private landowners and local businesses to identify and acquire land and easements for the Middle Fork Greenway corridor (Sections 3, 5 North, and 5 South).

Faithbridge United Methodist Church

Faithbridge United Methodist Church is located off Aho Road, just south of US-321 and within the corridor for Section 3 of the Middle Fork Greenway. The church is situated on a 10-acre wetland, protected by a conservation easement with BRC.

Private landowners and Faithbridge United Methodist Church may help BRC acquire more land or grant easements for greenway access along US-321. Faithbridge United Methodist Church may assume partnership responsibilities for Section 3 since it is located near the southern terminus and proposed bridge. BRC is currently coordinating with the private landowners and Faithbridge United Methodist Church for land acquisition and easements associated with Section 3.

Watauga Medical Center

The Watauga Medical Center is a regional referral medical complex located off Deerfield Road in the southern portion of Boone. The medical center offers both primary and secondary acute and specialty care and includes many outpatient clinics and a diagnostics center.

As portrayed in the Town of Boone's Wellness District Small Area Plan (2015), the proposed alignment for Section 5 North of the Middle Fork Greenway will connect to Boone's existing greenway trail following possible routes through the Wellness District beginning at the Town's corporate limits to the south of the district. The Watauga Medical Center is in the southeastern portion of the Wellness District and will support a planned greenway loop that will connect Section 5 North of the Middle Fork Greenway to the existing Boone Greenway in downtown Boone. Watauga Medical Center will include trail and trailhead opportunities in their master planning.

New River Light and Power

The NRLP, ASU's nonprofit electric utility, recently completed a grant-funded project to rehabilitate a section of the Middle Fork of the New River through the removal of the Payne Branch Dam. The restoration effort is expected to greatly improve water quality and the wildlife habitat in the area while also providing for the expansion of recreational opportunities near Payne Branch Park. Through a partnership with NRLP, Section 5 South of the Middle Fork Greenway will continue to serve as a safe and scenic environment that may potentially generate tourism from the recreational opportunities and river access this section will provide.

Blue Ridge Energy

Blue Ridge Energy provides both electric service and propane service in Watauga County. More specifically, Blue Ridge Energy operates several power lines along US-321 between Boone and Blowing Rock which acts as the Middle Fork Greenway corridor. In addition, Blue Ridge Energy worked with BRC in the past and provided funding to the Middle Fork Greenway to purchase land in the region for conservation purposes (i.e., Paddy Mountain).

BRC and Watauga County staff should continue to coordinate with Blue Ridge Energy on the alignment of Section 5 South of the Middle Fork Greenway to discuss land acquisition or easement for public access to the greenway at Goldmine Branch Park. Land acquisition at this site provides a strategic opportunity for BRC to connect the existing 321 trailhead to the existing Middle Fork Greenway section at Tweetsie Railroad.

Anticipated Roles:

- Support regional agencies and municipalities in developing public/private partnerships to fund the design and construction of the Middle Fork Greenway.
- Support marketing efforts and participate in the Round Up for the Greenway fundraising event.
- BRC should coordinate with the Watauga Medical Center to identify a suitable trailhead site and trail area for Section 5 North of the Middle Fork Greenway.

COMMUNITY PARTNERS / ADVOCACY ORGANIZATIONS

Who Is Involved? Boone Area Cyclists, WalkBikeNC, and the Great Trails State Coalition (GTSC)

Advocates for active transportation, including residents and community groups that promote bicycling and walking as viable forms of transportation, serve a key role in advocating for project and program investment. Community members and groups generate support for projects by raising awareness among the public, advocating to elected officials to prioritize funding for active transportation, and fostering collaboration amongst jurisdictional partners. Key advocacy organizations that may also support the implementation of Sections 3 and 5 of the Middle Fork Greenway include Boone Area Cyclists, WalkBikeNC, and the GTSC.

Boone Area Cyclists

Boone Area Cyclists is a 501(c)3 tax exempt organization that aims to empower the local bike community through advocacy, partnership, and stewardship. This group could help BRC promote awareness of the Middle Fork Greenway through hosting volunteer events and awareness campaigns provided its local presence in the community. This group could also assume maintenance responsibilities for sections of the greenway.

Great Trails State Coalition

The GTSC is a broad-based group of diverse organizations, agencies and supporters advocating for increased state investment in all types of trails statewide. This group supports the establishment of the Great Trails State Fund (\$50M one time funding opportunity) which will support both natural and paved surface trails in the state. Although the Middle Fork Greenway is not a state designated trail, it will connect to the Mountains-to-Sea Trail (MST) at the Blue Ridge Parkway near the Middle Fork Greenway trailhead in Blowing Rock (Section 1). The Great Trails State Coalition (GTSC) highlights Sections 3 and 5 as projects ready for investment on their website.

WalkBikeNC

WalkBikeNC is a statewide advocacy organization that promotes non-motorized transportation choices on North Carolina. This group could showcase successes from the Middle Fork Greenway at upcoming conferences and support additional networking opportunities for current partners that are invested in the Middle Fork Greenway (i.e., developing partnerships for future funding).

Anticipated Roles:

- Community groups and advocacy organizations should support the Watauga County Board of Commissioners in the adoption of the Middle Fork Greenway Feasibility Study (Sections 3, 5 North, and 5 South).
- Community groups and advocacy organizations should support regional agencies in developing public/private partnerships to fund the design and construction of the Middle Fork Greenway (Sections 3, 5 North, and 5 South).
- Community groups and advocacy organizations should coordinate with regional agencies and municipalities on the design of the Middle Fork Greenway (Sections 3, 5 North, and 5 South).
- Volunteers from the community or members associated with advocacy groups may assume responsibilities for community volunteer workdays along the Middle Fork Greenway.

ACTION PLAN

The following table provides a summary of action steps to implement Sections 3 and 5 of the Middle Fork Greenway over a 10-year planning horizon.

INITIAL ACTION STEPS

TASK #	ACTION	LEAD	PARTNERS	TIME FRAME	PERFORMANCE MEASURES
1	Adopt the Middle Fork Greenway Feasibility Study. This action allows the study to become the official planning document for Sections 3 and 5 of the Middle Fork Greenway and demonstrates a regional intent to support project implementation.	Watauga County Board of Commissioners	BRC, Town of Boone, Town of Blowing Rock, NCDOT IMD, Div. 11, High Country COG/RPO, Boone Area Cyclists, WalkBikeNC, Great Trails State Coalition	Fall 2022	Plan Adoption, Meeting Minutes
2	Update the Watauga County CTP to include study recommendations and preferred alignments for Sections 3 and 5 of the Middle Fork Greenway.	NCDOT Transportation Planning Division and Watauga County	Town of Boone, Town of Blowing Rock, NCDOT IMD, Div. 11, High Country COG/RPO	Fall/Winter 2022	CTP Adoption, Meeting Minutes
3	The Town of Boone should adopt a Resolution of Support for the Middle Fork Greenway Study and amend local plans to reference study recommendations for Section 5 North.	Town of Boone	BRC, Watauga County, NCDOT IMD, Div. 11, High Country COG/RPO, Boone Area Cyclists, WalkBikeNC, Great Trails State Coalition	Fall/Winter 2022	Resolution of Support, Plan Amendments
4	Continue to hold meetings with the Middle Fork Greenway Executive Committee to guide study implementation for the greenway.	BRC and Watauga County	Town of Boone, Town of Blowing Rock, High Country COG/RPO	Ongoing, Begin Fall 2022	Meeting Agendas and Minutes
5	Develop a formalized Maintenance Plan for the Middle Fork Greenway that outlines maintenance roles and responsibilities.	BRC and Watauga County	Town of Boone, Town of Blowing Rock, NCDOT IMD, Div. 11, High Country COG/RPO, NC State Parks, Division of Water Resources, Watauga Medical Center, ASU, and Boone Area Cyclists	Winter 2022/ Spring 2023	Meeting Agendas, Minutes, and Draft Maintenance Plan

SECTION 5 PHASE 1 - BOONE GORGE PARK TO PAYNE BRANCH PARK ACTION STEPS

TASK #	ACTION	LEAD	PARTNERS	TIME FRAME	PERFORMANCE MEASURES
6	Continue to pursue the development of Boone Gorge Park. Coordinate the proposed trailhead design with the park and continue with construction.	BRC	Watauga County, Town of Boone, Town of Blowing Rock, NCDOT IMD, Div. 11, High Country COG/RPO	Ongoing, Fall/Winter 2022	Meeting Agendas, Minutes, and Design Plans
7	<p>Development of the southern end of the segment between the two bridges (South of Boone Gorge Park):</p> <p>A) BRC and Watauga County staff should prioritize the development of this segment.</p> <p>B) BRC and Watauga County staff should pursue design for this segment and develop a grant procurement and fundraising plan using cost estimates developed through this study to identify funding for construction.</p> <p>Development of the segment that crosses the Middle Fork River and heads towards Payne Branch Park:</p> <p>A) Coordinate with ASU and landowners on acquiring an easement for this segment.</p> <p>B) Coordinate with Watauga County to develop a grant procurement and fundraising plan using cost estimates developed through this study to identify funding for the connection to Payne Branch Park.</p>	BRC and Watauga County	NCDOT IMD, Div. 11, High Country COG/RPO, ASU, Landowners	Ongoing, Winter/Spring 2023	Meeting Agendas, Minutes, and Design Plans

SECTION 3 STERLING CREEK PARK TO FAITH BRIDGE CHURCH ACTION STEPS

TASK #	ACTION	LEAD	PARTNERS	TIME FRAME	PERFORMANCE MEASURES
8	<p>A) Select the preferred alignment for Section 3; the public survey indicated that Alternative A was preferred but this study determined that E may be most feasible based on landowner coordination.</p> <p>B) Continue coordination with landowners located between Aho Rd and Jennifer Lane to acquire an easement for this segment.</p> <p>C) Continue coordination with NCDOT along US-321 and Aho Rd to determine how the trail will be constructed underneath the bridge.</p>	BRC and Watauga County	NCDOT IMD, Div. 11, High Country COG/RPO, Landowners	Ongoing, Spring/Summer 2023	Meeting Agendas and Minutes
9	Design Section 3 of the Middle Fork Greenway and the proposed trailhead on BRC property (west of Jennifer Ln). The greenway and trailhead should be designed concurrently to streamline development and ensure the project is cost effective.	BRC and Watauga County	NCDOT IMD, Div. 11, High Country COG/RPO	Ongoing, Winter 2023/ Spring 2024	Design Plans, Meeting Agendas and Minutes
10	Develop a grant procurement and fundraising plan (using cost estimates in this study) to identify steps in securing funding to construct Section 3 of the Middle Fork Greenway.	BRC and Watauga County	NCDOT IMD, Div. 11, High Country COG/RPO	Ongoing, Spring 2024	Draft Grant Procurement and Fundraising Plan

SECTION 5 PHASE 2 BOONE GORGE PARK TO JORDAN V COOK RD ACTION STEPS

TASK #	ACTION	LEAD	PARTNERS	TIME FRAME	PERFORMANCE MEASURES
11	Pursue design and develop a grant procurement and fundraising plan (using cost estimates in this study) to identify steps in securing funding to construct this segment of Section 5 North.	BRC and Watauga County	NCDOT IMD, Div. 11, High Country COG/RPO	Ongoing, Fall 2024	Draft Grant Procurement and Fundraising Plan, Design Plans
12	Coordinate with permitting agencies on required trout stream buffer variances along Middle Fork River for the segment between the bridge north of the Payne Branch Park to the culvert under US-321.	BRC and Watauga County	NCDEQ, NCDOT IMD, Div. 11	Ongoing, Fall/Winter 2024	Obtain Variance
13	A) Coordinate with NCDOT and landowners of adjacent parcels on land acquisition needs and design plans for the segment that runs parallel with Jordan V Cook Rd. B) Coordinate with adjacent landowners and NCDOT to determine land acquisition needs and design of the segment under US-321 through the existing culvert.	BRC and Watauga County	NCDOT IMD, Div. 11, Landowners	Ongoing, Fall/Winter 2024	Meeting Agendas and Minutes
14	A) Coordinate with Watauga County Medical Center to ensure connections to their proposed trails. B) Continue discussion and coordination with the Medical Center on a potential trailhead opportunity for the Middle Fork Greenway.	BRC and Watauga County	Watauga County Medical Center	Ongoing, Fall/Winter 2024	Meeting Agendas and Minutes
15	Coordinate with NCDOT on the development of US 421 (STIP R-5915 - Daniel Boone Parkway) for the trail segment on Section 5 North.	NCDOT Div. 11 and High Country COG/RPO	NCDOT IMD, Div. 11, High Country COG/RPO, Watauga County, Boone, and Blowing Rock	Ongoing, Winter 2024	Meeting Agendas and Minutes

SECTION 5 SOUTH NILEY COOK RD/GOLD MINE BRANCH PARK TO PAYNE BRANCH PARK ACTION STEPS

TASK #	ACTION	LEAD	PARTNERS	TIME FRAME	PERFORMANCE MEASURES
16	Continue coordination with landowners along Section 5 South to determine the final alignment. Note that survey results and Committee member input determined that Alternative A was the preferred alignment, followed by F, C, D. Alternatives B and E were the least preferred.	BRC and Watauga County	NCDOT IMD, Div. 11, High Country COG/RPO, Landowners	Ongoing, Spring 2025	Meeting Agendas and Minutes
17	Coordinate with NCDOT to determine whether the trail segment will cross over US-321 on a bridge or under the road through a tunnel. If the trail uses the tunnel, then coordination with NCDEQ will be required to obtain a variance for the trout stream buffer requirements along the Middle Fork River.	BRC and Watauga County	NCDOT IMD, Div. 11, High Country COG/RPO, NCDEQ	Ongoing, Spring 2025	Meeting Agendas and Minutes
18	A) Pursue design once the final alignment is determined. B) Coordinate with project stakeholders, such as Blue Ridge Energy, during the design process to acquire an easement for the segment along Niley Cook Rd from Goldmine Branch Park to US-321. C) Continue coordination with NCDOT for land acquisition needs of the segment within the ROW along Niley Cook Rd.	BRC and Watauga County	NCDOT IMD, Div. 11, High Country COG/RPO, Blue Ridge Energy	Ongoing, Summer/Fall 2025	Meeting Agendas, Minutes, and Design Plans

TASK #	ACTION	LEAD	PARTNERS	TIME FRAME	PERFORMANCE MEASURES
19	Coordinate the development of Section 5 South with the Payne Branch Dam restoration project.	BRC and Watauga County	NCDOT IMD, Div. 11, High Country COG/RPO, New River Light & Power	Ongoing, Summer/Fall 2025	Meeting Agendas, Minutes, and Design Plans
20	Coordinate with landowners, ASU, and Watauga County Medical Center to continue discussions related to natural trail connections on the east side of US-321 to create a trail loop to the Watauga County Medical Center's property.	BRC and Watauga County	High Country COG/RPO, Watauga County Medical Center, ASU, Landowners	Ongoing, Winter 2025	Meeting Agendas and Minutes
21	Develop a grant procurement and fundraising plan (using cost estimates in this study) to identify steps in securing funding to construct Section 5 South.	BRC and Watauga County	NCDOT IMD, Div. 11, High Country COG/RPO	Ongoing, Winter 2025/ Spring 2026	Draft Grant Procurement and Fundraising Plan

ADDITIONAL ACTION STEPS

TASK #	ACTION	LEAD	PARTNERS	TIME FRAME	PERFORMANCE MEASURES
22	Continue to identify funding sources to support the design and construction of future trail segments. Compile findings in a Middle Fork Greenway Funding Strategy Plan. Potential opportunities may include grants from Watauga TDA, NCPARTF, NCWRDG, NCRTP, NCSCIF, USDOT RAISE, local, foundations, as well as private sources.	BRC and Watauga County	Watauga County, Boone, Blowing Rock, Watauga Medical Center, Faithbridge United Methodist Church, NRLP, Blue Ridge Energy, Landowners, and Local Businesses	Ongoing, Spring 2023	Meeting Agendas, Minutes, Draft Funding Strategy Plan, and Grant Applications
23	Continue to engage with community members on the development of the MFG. Build community consensus on project phases and encourage environmental stewardship for the surrounding land.	BRC and Watauga County	Town of Boone, Town of Blowing Rock, and High Country COG/RPO	Ongoing, Spring 2023	Meeting Agendas and Minutes
24	Continue to develop an annual work plan to prioritize segments as development opportunities arise. This should include key goals/milestones to progress land acquisition, funding sources, and information that details designs, permits, and construction for the projects.	BRC and Watauga County	Town of Boone, Town of Blowing Rock, and High Country COG/RPO	Ongoing, Spring/Summer 2023	Meeting Agendas, Minutes, and Draft Work Plan
25	Coordinate with the High Country RPO to assist with project development and to prioritize funding of Middle Fork Greenway segments with available regional and state funding.	BRC and Watauga County	Town of Boone, Town of Blowing Rock, NCDOT IMD, Div. 11, High Country COG/RPO	Ongoing, Summer 2023	Meeting Agendas and Minutes
26	Coordinate with Watauga County Tourism Development Authority and the Great Trails State Coalition to explore economic development opportunities along the Middle Fork Greenway.	BRC	Watauga County Tourism Development Authority, Great Trails State Coalition, NC State Parks, Town of Boone, Town of Blowing Rock, NCDOT IMD, High Country COG/RPO, Local Businesses	Ongoing Fall, 2023	Meeting Agendas and Minutes

FUNDING RESOURCES

Numerous agencies, departments, organizations, non-profits, and commissions have provided funding and guidance to BRC on the Middle Fork Greenway. According to BRC, funding is currently being secured through public grants and private donations. Private donations have been critical to providing matching funds to attract public dollars. The completed one-mile section was funded by NCDOT, Appalachian Healthcare System, Tweetsie Railroad, and private donors. Current funding partners include the Watauga County TDA, Appalachian District Health Department, Blowing Rock TDA, Town of Boone, NC DWR, NC Parks and Recreation Trust Fund, NC Recreational Trails Program, The Cannon Foundation, Wells Fargo Foundation, BB&T Foundation, Bank of America, Anne Cannon Trust, NC Land and Water Fund, Blue Cross Blue Shield of North Carolina, Appalachian Ski Mountain, Mast General Store, NCDOT, ZAP Endurance, Tweetsie Railroad, Watauga County Community Foundation, Blue Ridge Energy, and many other generous donations from private individuals and businesses across the High Country.

According to BRC, funding may be used to support land acquisition, design and engineering, permitting, bridges, retaining structures, underpasses, trail construction, park amenities, and operations for the Middle Fork Greenway. While BRC has been successful in obtaining funding for the Middle Fork Greenway through private donations and the Round Up for the Greenway fundraising event, other opportunities may help BRC secure the funding required to complete the remaining sections of the Middle Fork Greenway more quickly. For this reason, the study team recommends BRC consider the following additional funding opportunities:

NCDOT Funding Opportunities:

Watauga County staff and BRC could build sections of the Middle Fork Greenway along US-321 with NCDOT STIP projects via the Complete Streets Policy. Trail segments along NCDOT-maintained roadways are funded by NCDOT through roadway improvement projects. This would be considered a long-term strategy since there are not any viable projects within the current STIP (2020-2029) that are near the recommended alignments for Sections 3, 5 North, and 5 South.

A second NCDOT funding opportunity would be to build the remaining Middle Fork Greenway sections (3, 5 North, and 5 South) with NCDOT SPOT submittals. Bundling sections of the Middle Fork Greenway as one submission would result in a more competitive score for the project. This strategy requires a 20 percent local match, and it is important to note that state funds cannot be used for independent active transportation projects. This opportunity is also considered a long-term strategy due to NCDOT/STIP budget shortfalls.

Federal Grant Funding Opportunities:

The Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant can be used for capital investments in surface transportation projects that will have a significant local or regional impact. More specifically, RAISE Grant funds can be used to fund planning, design, and construction for submitted projects. This grant requires a 20 percent local match; however, a 30-40 percent local match is often encouraged due to the competitive nature of this grant.

Public/Private Partnerships to Leverage Grant Funding:

BRC currently partners with non-profit partners to raise project development funds for the Middle Fork Greenway. BRC should continue this successful strategy, as well as consider expanding partnerships throughout Watauga County which could result in additional funding opportunities.

BRC leads the annual Round Up for the Greenway campaign which was developed to raise local match funds for the Middle Fork Greenway. This annual campaign focuses on a designated phase of project development and has raised approximately \$200,000 to \$400,000 through community-based donations and local business support. BRC shares the achievements associated with the Round Up campaign with the public, which continues to contribute to the program's success.

Volunteer Support:

If funding is limited or difficult to obtain, volunteers may serve as a critical resource. BRC's long standing history with the community and ability to maintain strong partnerships with stakeholders across the region may make it easier to find volunteers who can assist with trail maintenance, as well as other jobs to keep the trail healthy and safe for the community and visitors for years to come.

See Appendix A for a comprehensive list of funding resources at private, local, state, and federal funding levels.



EXISTING NATURAL SURFACE TRAIL CREDIT: BLUE RIDGE CONSERVANCY

MAINTENANCE CONSIDERATIONS

Maintenance of greenways is essential to the long-term viability of the network. Greenways that are consistently maintained have lower costs over time and provide a safe and positive trail user experience than greenways that require major rehabilitation work from a lack of consistent maintenance. Good maintenance practices also prolong the useful life of greenways, promote positive relationships with adjacent landowners, and create a sense of stewardship in the community.

This plan recommends a comprehensive approach to maintenance with the development of a maintenance plan to prioritize funding and responsibilities amongst jurisdictions. The maintenance plan should be reviewed and updated annually, responding to lessons learned and changes in tasks, operational policies, standards, and maintenance goals. Key considerations for a greenway system maintenance plan include:

- Understanding the anticipated needs of the greenway system and assessing the capacity of Town staff to meet those maintenance needs.
- Developing a facility inventory to understand the routine and substantial maintenance needs of greenway signs, amenities, bridges, culverts, and pavement conditions.
- Estimation of baseline maintenance costs by determining necessary maintenance activities, such as mowing, edging, landscaping, trash removal, debris clearing, lighting, drainage, seasonal maintenance needs, sealcoating, repaving, patching, and bridge repair.
- Consideration of labor costs based on which maintenance activities can be completed in-house versus contracted out.
- Assessment of available technologies to collect data on facility conditions and facilitate maintenance functions.
- Developing methodology to prioritize annual maintenance needs based on facility conditions and available funding.
- Consideration of emergency services including designated ingress/egress locations, mile-marker signage along the facility for location identification, and emergency notification systems.

SAMPLE MAINTENANCE TASK	TASK TYPE	RECOMMENDED FREQUENCY
Tree / Bush trimming	Routine	On-Going / Annually
Mowing		
Trail sweeping		
Signage / Map / Kiosk Updates / Replacement		
Trash removal / Litter clean-up		
Planting, pruning, landscaping		
Flooding repairs		
Repainting / Restriping		
Minor patching		
Minor bridge repairs		
Lighting replacement		
Bollard locks / Replacement		
Pest management		
Greenway and sidepath sealcoating		
Greenway and sidepath resurfacing:	Major Reconstruction	Every 10-15 Years
• Asphalt		Every 20 Years
• Concrete		10 Years
• Boardwalk		
Complete greenway and sidepath replacement, regrading, and resurfacing	Major Reconstruction	Every 20 Years

Source: *Best Practices in Trail Maintenance: A Manual by the Ohio River Greenway, Perdue University*



PEDESTRIAN BRIDGE ON
MIDDLE FORK GREENWAY
CREDIT: BRC



APPENDICES

APPENDIX A: FUNDING RESOURCES

Below are several funding sources that can be leveraged to provide the necessary dollars to plan, design, and/or construct bicycle, pedestrian, and greenway facilities. The following sources of funding have been instrumental in the successful development of bicycle and pedestrian networks in North Carolina communities.

FEDERAL FUNDING

North Carolina communities have partnered with Federal agencies to build multi-use paths, greenways, sidewalks, bike lanes and improve crossings. Federal funding is primarily distributed to municipalities through state agencies and Metropolitan Planning Organizations (MPO), as well as through discretionary grant programs.

The Fixing America's Surface Transportation (FAST) Act authorizes transportation funding for highway, transit, rail, bicycle and pedestrian, and safety programs and infrastructure. FAST Act funding is administered by the Federal Highways Administration (FHWA). FHWA distributes funding to NCDOT and directly to MPOs through the Locally Administered Projects Program (LAPP). Communities wishing to access Federal funding must submit their candidate projects to their MPO or RPO to then be entered into the NCDOT's Strategic Transportation Investment (STI) Mobility Formula. This formula ranks projects and identifies those to be funded in the State Transportation Improvement Program (STIP). These funds require a 20% match from the municipality. Federal transportation funds for bicycle and pedestrian projects are primarily distributed through four programs: Transportation Alternatives (TA), Congestion Mitigation & Air Quality (CMAQ), Recreational Trails Program, (RTP), and Highway Safety Improvement Program (HSIP).

Additional federal funding sources for bicycle and pedestrian projects are administered through the Department of Housing and Urban Development (HUD) with the Community Development Block Grant (CDBG) Program, and several discretionary grant programs administered by the US Department of Transportation (USDOT), National Park Service (NPS), and the National Endowment for the Arts (NEA).

STATE & MPO ADMINISTERED FUNDING

TRANSPORTATION ALTERNATIVES (TA)

Transportation Alternatives provides federal funds for community-based projects that expand travel choices and enhance the transportation experience by integrating modes and improving the cultural, historic, and environmental aspects of our transportation infrastructure. In North Carolina, TA funds are administered by NCDOT. Program-eligible projects must be submitted through STI and require a 20 percent local match.

Project types include:

- On and off-road pedestrian and bicycle facilities;
- Infrastructure projects for improving non-driver access to public transportation and enhanced mobility;
- Community improvement activities;
- Environmental mitigation;
- Safe routes to school projects;
- Streetscape improvements;
- Refurbishment of historic transportation facilities; and
- Other investments that enhance communities.

NCDOT has created a bicycle and pedestrian scoping guidance document for local governments that have been awarded Transportation Alternatives funding. The Bike/Ped Project Scoping Guidance for Local Governments provides an overview of the four scoping tools used for locally managed, federally funded transportation projects in North Carolina. The document provides guidance on the project delivery process, scoping, identifying project risks, and project cost estimation. The document is available at the link below.

<https://connect.ncdot.gov/projects/BikePed/Documents/BikePed%20Project%20Scoping%20Guidance%20for%20Local%20Governments.pdf>

https://www.fhwa.dot.gov/environment/transportation_alternatives/

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

The purpose of the North Carolina Highway Safety Improvement Program (HSIP) is to provide a continuous and systematic procedure that identifies and reviews specific traffic safety concerns throughout the state. The goal of the HSIP process is to reduce the number of traffic crashes, injuries, and fatalities by reducing the potential for these incidents on public roadways. Areas with bicycle and pedestrian safety concerns are primarily analyzed based on bicycle and pedestrian crash data.

<https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx>

RECREATIONAL TRAILS PROGRAM (RTP)

The Recreational Trails Program provides funds to state agencies to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. RTP is an assistance program of the Department of Transportation's Federal Highway Administration (FHWA). In North Carolina, the Recreational Trails Program is a \$1.5 million grant program that funds trails and trail-related recreational needs identified by the Statewide Comprehensive Outdoor Recreation Plan. Grant funding is available for trail planning, construction of new trails; maintenance and repair of existing trails; land acquisition; purchase of trail tools; and legal, environmental, and permitting costs. RTP is a reimbursement grant program. Municipalities must provide project funds upfront and are reimbursed upon completion of deliverables. Eligible applicants are state, federal, or local government agencies or qualified nonprofit organizations. Grants range from \$10,000 - \$100,000 and require a 25% match by the municipality.

https://www.fhwa.dot.gov/environment/recreational_trails/

<https://trails.nc.gov/trail-grants>

COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)

The Community Development Block Grant Program provides annual grants on a formula basis to states, cities, and counties to develop viable urban communities by providing decent housing, suitable living environments, and expanding economic opportunities for low- and moderate-income persons. The program is authorized under Title 1 of the Housing and Community Development Act of 1974. CDBG funds are allocated at the federal level by HUD and at the state level by the NC Department of Commerce. All municipalities are eligible to receive State CDBG funds except for entitlement communities, which receive funds directly from HUD. North Carolina's 24 entitlement municipalities are: Asheville, Burlington, Cary, Chapel Hill, Charlotte, Concord, Durham, Fayetteville, Gastonia, Goldsboro, Greensboro, Greenville, Hickory, High Point, Jacksonville, Kannapolis, Lenoir, Morganton, New Bern, Raleigh, Rocky Mount, Salisbury, Wilmington, and Winston-Salem. In addition, all counties are eligible to receive State CDBG funds except Mecklenburg County, Wake County, Union, and Cumberland County, which have been designated by HUD as urban entitlement counties.

CDBG funds may be used for activities which include, but are not limited to:

- Acquisition of real property;
- Relocation and demolition;
- Rehabilitation of residential and non-residential structures;
- Construction of public facilities and improvements, such as water and sewer facilities, streets, neighborhood centers, and the conversion of school buildings for eligible purposes;
- Public services, within certain limits;
- Activities relating to energy conservation and renewable energy resources; and
- Provision of assistance to profit-motivated businesses to carry out economic development and job creation/retention activities.

https://www.hud.gov/program_offices/comm_planning/communitydevelopment

DISCRETIONARY GRANTS

REBUILDING AMERICAN INFRASTRUCTURE WITH SUSTAINABILITY AND EQUITY (RAISE)

The 2021 Consolidated Appropriations Act appropriated \$1 billion to be awarded by the Department of Transportation (DOT) for National Infrastructure Investments, formerly known as TIGER and BUILD Grants and now as Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grants. RAISE Grants are for capital investments in surface transportation that will have a significant local or regional impact. Since this program was created, \$8.9 billion has been awarded for capital investments in surface transportation infrastructure over 12 rounds of competitive grants. The FY2021 RAISE Notice has been updated to reflect the current Administration's priorities for creating good-paying jobs, improving safety, applying transformative technology, and explicitly addressing climate change and advancing racial equity. Consistent with the FY 2021 Appropriations Act requirement, the Secretary shall award projects based solely on the selection criteria. The primary selection criteria are safety, environmental sustainability, quality of life, economic competitiveness, and state of good repair, and the secondary selection criteria are partnership and innovation. The Federal share of project costs may not exceed 80 percent for a project located in an urban area. The Secretary may increase the Federal share of costs above 80 percent for projects located in rural areas and for planning projects located in areas of persistent poverty.

Project Awards:

- Total Funding: \$1 billion.
- Minimum Project Awards: Urban Projects: \$5 million, Rural Projects: \$1 million.
- Planning Grants: No project minimum required.
- Maximum Awards: Urban/Rural Projects: \$25 million, Per State: \$100 million.
- Geographic Distribution: 50% of total funds (\$500 million) awarded to both urban and rural projects.

<https://www.transportation.gov/RAISEgrants>

FEDERAL LANDS ACCESS PROGRAM (FLAP)

The Federal Lands Access Program (FLAP) provides funds for projects to improve Federal Lands Access Transportation Facilities that provide access to, are adjacent to, or are located within federal lands. This can include public roads, bridges, paved trails, or transit systems that are owned and/or maintained by the state, county, town, township, tribal, municipal, or local government. Funds may be used for the costs of transportation planning, research, engineering, preventive maintenance, rehabilitation, restoration, construction, and reconstruction of transportation facilities located on or adjacent to, or that provide access to, federal lands. Applicable activities include parking areas; acquisition of scenic easements or historic sites; bicycle and pedestrian provisions; environmental mitigation; public safety; and roadside rest areas. Other eligible activities include the operation and maintenance of transit facilities, and any transportation project that is within, adjacent to, or provides access to federal land. The program requires a minimum 20% local match.

<https://highways.dot.gov/federal-lands/programs-access/nc>

FEDERAL LAND AND WATER CONSERVATION FUND (LWCF)

The Land and Water Conservation Fund was established by Congress in 1964 to fulfill a bipartisan commitment to safeguard natural areas, water resources and cultural heritage, and to provide recreation opportunities to all Americans. The LWCF program is divided into the "State Side" which provides grants to State and local governments for the acquisition and development of public outdoor recreation areas and facilities, and the "Federal Side" which is used to acquire lands, waters, and interests therein necessary to achieve the natural, cultural, wildlife, and recreation management objectives of federal land management agencies. State Side funds are distributed by the State and Local Assistance Programs Division of the National Parks Service. Funding is available as 50/50 matching grants to states and territories to plan, acquire, and develop public lands for outdoor recreation. Projects are selected by states and submitted to NPS for approval. In North Carolina, grants are selected by the Parks and Recreation Division in the NC Department of Cultural and Natural Resources. To be eligible for LWCF assistance, every state must prepare and regularly update a statewide comprehensive outdoor recreation plan (SCORP). Applicants can request a maximum grant of \$500,000. An applicant must match the grant with a minimum of 50 percent. Due to a federal share cap of \$500,000, a greater match is required for projects that exceed total costs of \$1 million.

<https://www.nps.gov/subjects/lwcf/stateside.htm>

<https://www.ncparks.gov/more-about-us/grants/lwcf-grants>

RIVERS, TRAILS, AND CONSERVATION ASSISTANCE PROGRAM (RTCA)

The National Parks Service (NPS) Rivers, Trails and Conservation Assistance Program supports community-led natural resource conservation and outdoor recreation projects across the nation. Although RTCA is not a traditional funding program, NPS staff provide planning, design and technical expertise for trails and outdoor recreation projects. Depending on the project scale, RTCA can invest up to four years of planning and project development assistance. Eligible entities include community groups, nonprofit organizations, tribes, and governments.

Technical Assistance Services:

- Define project vision and goals.
- Set priorities and build consensus.
- Inventory and map community resources.
- Identify funding strategies.
- Identify and analyze key issues and opportunities.
- Design community outreach, participation, and partnerships plans.
- Create project management and strategic action plans.
- Develop concept plans for trails, parks, and natural areas.

<https://www.nps.gov/orgs/rtca/index.htm>

NATIONAL ENDOWMENT FOR THE ARTS (NEA) OUR TOWN PROGRAM

Our Town is the National Endowment for the Arts' creative placemaking grants program. Through project-based funding, the NEA supports projects that integrate arts, culture, and design activities into efforts that strengthen communities by advancing local economic, physical, and/or social outcomes. These projects require a partnership between a local government entity and nonprofit organization, one of which must be a cultural organization; and should engage in partnership with other sectors (such as agriculture and food, economic development, education and youth, environment and energy, health, housing, public safety, transportation, and workforce development). Cost share/matching grants range from \$25,000 to \$150,000, with a minimum cost share/match equal to the grant amount.

<https://www.arts.gov/grants/our-town>

STATE FUNDING

North Carolina communities have partnered with state agencies to build bicycle and pedestrian facilities. State agency funding sources for bicycle and pedestrian planning, infrastructure, and programs are administered primarily through the North Carolina Department of Transportation (NCDOT), North Carolina Department of Natural and Cultural Resources, and North Carolina Department of Commerce. Discretionary grant programs focusing on public health and community development are administered by the North Carolina Department of Health and Human Services (DHHS), North Carolina Department of Environmental Quality (NCDEQ), and the North Carolina Department of Agriculture when funding is available.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT)

STRATEGIC TRANSPORTATION INVESTMENTS (STI)

The Strategic Transportation Investments law, passed in 2013, establishes the Strategic Mobility Formula, which allocates available funding based on data-driven scoring and local input. The Strategic Mobility Formula is used to develop the State Transportation Improvement Program (STIP), which identifies projects that will receive funding during a 10-year period. The STIP is state and federally mandated and updated by NCDOT every 2 years. The Strategic Mobility Formula groups projects in three categories: Division Needs, Regional Impact, and Statewide Mobility.

FUNDING CATEGORY	FUNDING DISTRIBUTION	OVERVIEW
Division Needs	30%	Funding in this category is shared equally between NCDOT's 14 transportation divisions, Project scores are based 50% on data and 50% on rankings by MPOs and RPOs and the NCDOT Divisions.
Regional Impact	30%	Projects on this level compete within regions made up of two NCDOT Divisions with funding based on population, Project scores are based 70% on data and 30% on rankings by MPOs and RPOs and the NCDOT Divisions.
Statewide Mobility	40%	Projects in this category are of statewide significance and are based 100% on data.

Independent bicycle and pedestrian projects are programmed in the Division Needs category. Eligible bicycle and pedestrian projects submitted for prioritization must be included in a locally adopted plan and have a minimum project cost of \$100,000. Eligible activities include right-of-way acquisition, design, and construction. Additionally, the STI law prohibits the use of state funding for bicycle and pedestrian projects, requiring municipalities to provide the 20% match for federally funded projects.

Bicycle and Pedestrian STI Prioritization Qualitative Scoring:

Local input points represent 50% of the scoring for bicycle and pedestrian projects. 25% of local input points are assigned by MPOs and RPOs, which are determined by municipal and county project priorities and public comment. The remaining 50% of the local input points are assigned by NCDOT Division Engineers.

CRITERIA	MEASURE	DIVISION NEEDS (50%)
Safety	(Number of crashes x 40%) + (Crash severity x 20%) + (Safety risk x 20%) + (Safety benefit x 20%)	20%
Accessibility / Connectivity	Points of interest pts + Connection pts + Route pts	15%
Demand / Density	# of households and employees per square mile near project	10%
Cost Effectiveness	(Safety + Accessibility / Connectivity + Demand / Density) / Cost to NCDOT	5%

Project Bundling:

Multiple bicycle and pedestrian projects can be bundled to better compete with other projects submitted in the Division Needs category. Bundled projects are allowed across s geographies and project types. Projects do not have to be contiguous or related, and projects can be in a single or multiple jurisdictions. Bundled projects must be under one project manager, which must be a TAP eligible entity.

<https://www.ncdot.gov/initiatives-policies/Transportation/stip/Pages/strategic-transportation-investments.aspx>

INCIDENTAL BICYCLE AND PEDESTRIAN FACILITIES WITH ROADWAY PROJECTS

The NCDOT Complete Streets Policy Update was adopted by the Board of Transportation in August 2019. This policy requires NCDOT to consider and incorporate multimodal facilities in the design and improvement of all transportation projects in North Carolina. The adopted Comprehensive Transportation Plan (CTP) is considered the controlling plan for the identification of non-motorized facilities to be evaluated as part of a roadway project. The CTP may include and/or reference locally adopted plans for public transportation, bicycle and pedestrian facilities, and greenways. Bicycle, pedestrian, and public transportation facilities that appear in the CTP directly or by reference will be included as part of the proposed roadway project, and NCDOT is responsible for the full cost of the project. Bicycle, pedestrian, and transit facilities incidental to a roadway project where a need has been identified through the project scoping process but not identified in an adopted plan may be included in the project. Inclusion of these incidental facilities requires the local jurisdiction to share the incremental cost of constructing the improvements based on population thresholds. Projects that have not completed environmental review prior to August 2019 are subject to the Complete Streets Policy.

<https://connect.ncdot.gov/projects/BikePed/Pages/Complete-Streets.aspx>

STATEWIDE PROJECTS FUNDS

Small Construction Funds: These funds were established in 1985 to fund small projects in and around cities and towns that could not be funded in the Statewide Transportation Improvement Program (STIP). Funds are allocated equally to each of 14 Transportation Divisions. Funds can be used on a variety of transportation projects for municipalities, counties, businesses, schools, and industries throughout the State. Funds projects up to \$250,000 per fiscal year, unless otherwise approved by the Secretary of Transportation. Right-of-way and utility relocations should be provided and accomplished at no cost to NCDOT. Funding requests should be submitted to the Division Engineer providing technical information such as location, improvements being requested, and project timeline.

Statewide Contingency Funds: These funds were created for statewide rural or small urban highway improvements and related transportation enhancements to public roads/public facilities, industrial access roads, and spot safety projects. The President Pro Tempore of the Senate, the Speaker of the House, and the Secretary of Transportation sponsor project requests from this fund. \$12 million in funds are administered by the Secretary of Transportation. Requests can be submitted from municipalities, counties, businesses, schools, citizens, legislative members, and NCDOT staff. Request should include a clear description and justification of the project.

Economic Development Funds: These funds were created to expedite transportation projects that promote commercial growth as well as either job creation or job retention. \$2500 per job (new & retained) allowed unless waived by the Secretary of Transportation. Funds projects up to \$400,000 per fiscal year, unless otherwise approved by the Secretary of Transportation. New access roads must be approved by NCDOT and serve multiple property owners or government owned property; roads will become part of the State Highway System or serve as public roads maintained by a government agency.

High Impact / Low-Cost Funds: This program provides funds complete low-cost projects with high impacts to the transportation system including intersection improvement projects, minor widening projects, and operational improvement projects. Funds are allocated equally to each of 14 Transportation Divisions. Each Division is responsible for selecting their own scoring criteria for determining projects funded in this program. At a minimum, Divisions must consider all of the following in developing scoring formulas: (1) The AADT of a roadway and whether the proposed project will generate additional traffic. (2) Any restrictions on a roadway. (3) Any safety issues with a roadway. (4) The condition of the lanes, shoulders, and pavement on a roadway. (5) The site distance and radius of any intersection on a roadway. Funds projects up to \$1.5 million per fiscal year, unless otherwise approved by the Secretary. Projects are expected to be under contract within 12 months of funding approval by the BOT.

<https://connect.ncdot.gov/projects/planning/Economic%20Development/Small%20Project%20Fund%20Request.docx>

SPOT SAFETY PROGRAM

The Spot Safety Program is used to develop smaller improvement projects to address safety and potential safety and operational issues. The program is funded with state funds and currently receives approximately \$9 million per fiscal year. Other monetary sources (such as Small Construction or Contingency funds) can assist in funding Spot Safety projects, however, the maximum allowable contribution of Spot Safety funds per project is \$400,000. A Safety Oversight Committee (SOC) reviews and recommends Spot Safety projects to the Board of Transportation (BOT) for approval and funding. Criteria used by the SOC to select projects for recommendation to the BOT include, but are not limited to, the frequency of correctable crashes, severity of crashes, delay, congestion, number of signal warrants met, effect on pedestrians and schools, division and region priorities, and public interest.

<https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx>

STATE PLANNING & RESEARCH FUNDS (SPR)

The State Planning and Research Program funds States' statewide planning and research activities. This program funds metropolitan and statewide planning for future highway programs and local public transportation systems. The FAST Act expanded the statewide transportation planning process' scope of consideration to include projects, strategies, and services that will improve transportation system resiliency and reliability; reduce (or mitigate) the stormwater impacts of surface transportation; and enhance travel and tourism. In 2017, NCDOT extended the use of SPR funds to Rural Planning Organizations (RPOs) by establishing an annual call for proposals to fund planning and research projects for rural communities. Since the program expansion, RPOs have used SPR funds for a range of transportation planning activities, including to develop greenway and trail feasibility studies. SPR funding requires a 20% local match. However, the local match is 5% for Tier 1 Counties with NCDOT contributing 15% of the local match and 10% for Tier 2 Counties with NCDOT contributing 10% of the local match. RPOs must administer the funds.

<https://connect.ncdot.gov/projects/planning/Pages/Transportation-Planning-Program-and-Services.aspx>

POWELL BILL FUNDS

The State Street Aid to Municipalities Program, also known as Powell Bill Funds, assists local governments with transportation system improvements. The Powell Bill requires municipalities to use the money primarily for street resurfacing, but it can also be used for the construction and maintenance of roads, bridges, drainage systems, sidewalks, and greenways.

Funding amounts for each municipality are based on a formula set by the N.C. General Assembly, with 75 percent of the funds based on population, and 25 percent based on the number of locally maintained street miles.

NORTH CAROLINA DEPARTMENT OF NATURAL AND CULTURAL RESOURCES

PARKS AND RECREATION TRUST FUND (PARTF)

PARTF provides dollar-for-dollar matching grants to local governments for parks and recreational projects to serve the public. PARTF is the primary source of funding to build and renovate facilities in the state parks as well as to buy land for new and existing parks.

<https://www.ncparks.gov/more-about-us/parks-recreation-trust-fund/parks-and-recreation-trust-fund>

NORTH CAROLINA LAND & WATER FUND (NCLWF)

The NCLWF (formerly known as the Clean Water Management Trust Fund) was created in 1996 by the General Assembly to conserve North Carolina's streams, rivers, and open space. The NCLWF funds land acquisition, stream restoration, stormwater, and planning projects that protect and conserve riparian buffers for the purpose of providing environmental protection for surface waters and urban drinking water supplies and establishing a network of riparian greenways for environmental, educational, and recreational uses. NCLWF also funds mini grants of up to \$25,000 for donated property or the value of the conservation donation to pay transaction costs associated with the donation of property in fee simple, or a permanent conservation agreement. NCLWF has one grant cycle per year. Applications are available in early December and close in February. Final award decisions are made in the fall.

<https://nclwf.nc.gov/apply>

NORTH CAROLINA DEPARTMENT OF COMMERCE

MAIN STREET SOLUTIONS FUND

The Main Street Solutions Fund supports small businesses in designated micropolitans located in Tier 2 and Tier 3 counties or designated North Carolina Main Street communities. The grants assist planning agencies and small businesses with efforts to revitalize downtowns by creating jobs, funding infrastructure improvements and rehabilitating buildings.

<https://www.nccommerce.com/grants-incentives/downtown-development-funds>

RURAL INFRASTRUCTURE PROGRAM

The Rural Economic Development Division provides grants and loans to local government units to support economic development activity that will lead to the creation of new, full-time jobs. The program gives priority to projects located in the 80 most distressed counties in the state; and resident companies as defined in N.C.G.S. 143B-472 (a) 4. The Rural Infrastructure Program funding is available for publicly owned infrastructure including water, sewer, electric, broadband, rail, and road improvements that will lead to the direct creation of new, full-time jobs. Eligible applicants are units of local government with priority given to the Tier 1 and Tier 2 counties. A cash match equivalent to at least 5% of the grant amount is required for all projects.

Eligible project activities include:

- Construct public infrastructure improvements;
- Upgrade or repair of public drinking water or wastewater treatment plants;
- Upgrade, extensions, or repair of public water or sewer lines;
- Publicly owned natural gas lines (requires an executed Pipeline Construction, Operating and Resale Agreement);
- Installation or extension of public broadband infrastructure;
- Construction of public rail spur improvements; and
- Construction of publicly owned access roads not funded or owned by the Department of Transportation.

<https://www.nccommerce.com/grants-incentives/public-infrastructure-funds/infrastructure-state-rural-grants>

NORTH CAROLINA NEIGHBORHOOD REVITALIZATION PROGRAM

The NC Neighborhood Program offers non-entitlement municipalities and counties the opportunity to tailor a project to meet the community development needs specific and most critical to their locality, primarily for their low- and moderate-income residents. NC Neighborhood Program projects must incorporate at least one of the following three livability principles as an area of focus:

- Promote equitable, affordable housing. Expand location and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- Support existing communities. Target federal funding toward existing communities - through strategies like transit-oriented, mixed-use development, and land recycling - to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.
- Value communities and neighborhoods. Enhance the unique characteristics of all communities by investing in health, safe, and walkable neighborhoods - rural, urban, or suburban.

All municipalities are eligible to receive State CDBG funds except for entitlement communities, which receive funds directly from HUD. The maximum grant amount is \$750,000 per grantee with some restrictions for specific activities. There is no minimum grant amount, and the program does not have a matching fund requirement.

<https://www.nccommerce.com/grants-incentives/community-housing-grants#neighborhood-revitalization-/-federal-cdbg>

NORTH CAROLINA STATE CAPITAL INFRASTRUCTURE FUND (SCIF)

The NC Office of State Budget and Management administers several Directed Grants as appropriated by the NC General Assembly, which includes the State Capital Infrastructure Fund (SCIF). The SCIF dedicates 4 percent of General Fund revenues each year to debt service and state capital needs (i.e., greenway funding).

<https://www.osbm.nc.gov/stewardship-services/directed-grants/osbm-administered-grants#:~:text=Your%20SCIF%20grant%20funds%20may,language%20of%20the%20current%20law.>

LOCAL FUNDING

BONDS

Wake County, City of Raleigh, City of Wilmington, Town of Chapel Hill, Town of Cornelius, and City of Greenville have all passed bonds to protect open space corridors and build greenway networks. Multi-use paths and greenways are also frequently included in municipal transportation bond packages. Successful bond campaigns require a well-defined plan with specific projects supported by the community. Bond campaigns should be well organized with a community's public affairs department and thoroughly coordinated across all internal departments. Public outreach during the campaign is essential to educate residents about the benefits of infrastructure investment and to understand which projects garner the highest community support.

DEVELOPER BUILT TRAILS/IN-LIEU FEES

The Town of Cary built its first greenway 40 years ago and now has more than 80 miles of greenway trails. A significant portion of their network development has been the result of developer-built trails. The Town of Cary requires developers to set aside important open space providing trail connectivity, wildlife habitat corridors, and water quality protection. Per the Cary Land Use Ordinance, developers must dedicate land or make payment in-lieu of public park and/or greenway development to serve the recreational needs of residents. Land dedications for greenways are required for both residential and commercial development for those locations indicated in the Town's greenway master plan.

IMPACT FEES

Impact fees represent financial payments made to a local government by a developer to fund certain off-site capital improvements needed to accommodate future growth. Many communities impose impact fees for transportation, parks and recreation, and open space facility needs. The City of Durham imposes transportation impact fees to fund for a portion of the costs for new streets and sidewalks, paving, grading, resurfacing, and widening of existing streets, traffic control signals and markings, lighting, and crosswalks. The City's development fees for open space and parks and recreation are used for the acquisition of park land and the provision of facilities, including athletic fields, parks, playgrounds, courts, recreation centers, shelters, stadiums, arenas, swimming pools, lighting, trail construction, and bike paths.

CAPITAL IMPROVEMENT PROGRAM (CIP)

A Capital Improvement Program (CIP) is one element in a municipality's long-term planning process. It is a bridge between the municipality's Comprehensive Plan and short-term planning for infrastructure and operations. A Capital Improvement Program analyzes major facility and equipment needs, establishes priorities, estimates fiscal resources, and schedules the development of funded projects. The City of Raleigh funds parks, greenways, and active transportation facilities through the city's Capital Improvement Program. The Parks, Recreation and Cultural Resources Department's CIP primary sources of funding come from Parks and Recreation Bonds, Facility Fees, General Fund (Tax Base), grants, and donations.

MUNICIPAL SERVICE DISTRICTS (MSD)

Municipal Service Districts provide an equitable method for funding special improvements to public right-of-way areas because property owners share in the cost. The Town of Morrisville uses Municipal Service Districts in several neighborhoods to perform pavement, curb and gutter, and sidewalk enhancements and repairs on the public streets throughout neighborhoods in the MSD.

PUBLIC/PRIVATE PARTNERSHIPS

The City of Greensboro is leading North Carolina in leveraging public-private partnerships to complete their Downtown Greenway Loop. Through the Action Greensboro Foundation, the project has raised over \$10 M in private funds by working with foundations and private givers. This money leverages over \$21 M in local and federal funds.

PRIVATE FUNDING

NORTH CAROLINA LAND TRUSTS AND CONSERVANCIES

North Carolina land trusts partner with landowners and local communities to permanently protect natural resources with agricultural, cultural, recreational, ecological, and scenic value across the state. In Watauga County, Blue Ridge Conservancy is leading the effort to develop the Middle Fork Greenway along the Middle Fork New River to connect Boone and Blowing Rock via trail. Blue Ridge Conservancy has purchased property and easements along the Middle Fork New River to preserve the corridor and develop the greenway in partnership with Watauga County, the Town of Blowing Rock, and the Town of Boone. The conservancy is also leading planning, design, and construction of each phase of the greenway's development.

Provided below is a list of Land Trusts & Conservation Organizations active in eastern North Carolina:

- Conservation Trust for North Carolina;
- Land Trust for Central North Carolina;
- NC Coastal Land Trust; and
- Tar River Land Conservancy.

<https://www.presnc.org/nc-land-trusts-conservation-organizations/>

NORTH CAROLINA COMMUNITY FOUNDATION (NCCF)

The NCCF is the statewide community foundation serving North Carolina and sustains more than 1,200 endowments established to provide long-term support of a broad range of community needs, nonprofit organizations, institutions, and scholarships. The NCCF partners with a network of affiliate foundations to provide local resource allocation and community assistance across the state. NCCF's community grantmaking programs are advised by its network of affiliate foundations. Each affiliate is advised by a local board who help to assemble resources through their unique knowledge and understanding of local needs and opportunities. Organizations must be qualified as tax-exempt public charities under Section 501(c)(3) of the Internal Revenue Code or be classified as a unit of local government or public school.

<https://www.nccommunityfoundation.org/apply/grants>

THE CONSERVATION FUND

The Conservation Fund works with public, private, and nonprofit partners to protect land and water resources through land acquisition, sustainable community and economic development, and leadership training. The City of Durham partnered with the Conservation Fund to assist with negotiations to purchase the Durham Belt Line rail corridor from Norfolk Southern to convert the rail line into an urban trail. In 2017 the Conservation Fund successfully purchased the property as the interim owner while the city secured the necessary funding. The property was transferred to the City of Durham in 2018, which allowed for the rail-trail's development.

<https://www.conservationfund.org/where-we-work/north-carolina>

BLUE CROSS BLUE SHIELD OF NORTH CAROLINA FOUNDATION

The Blue Cross Blue Shield of North Carolina Foundation funds a range of programs from targeted, mini grants to multi-year partnerships. Their grantmaking supports initiatives that focus on early childhood, healthy communities, healthy food, and oral health. The Foundation does not operate regular grant cycles. Instead, the Foundation invites applications based on specific strategic objectives or announces broader opportunities to apply for funding on a periodic basis.

<https://www.bcbsncfoundation.org/grants-programs/grantmaking-overview/>

NATIONAL ASSOCIATION OF REALTORS SMART GROWTH AND PLACEMAKING GRANTS

The National Association of Realtors (NAR) funds placemaking and smart growth grants to make communities better places to live by transforming unused or underutilized sites into welcoming destinations accessible to everyone in a community.

Smart Growth Grants: Smart Growth Grants fund efforts to engage in local land-use, growth, and transportation policy issues with other stakeholders and elected officials. Eligible projects include Better Block events, placemaking visioning processes, charettes, pop-up workshops, project mock-ups, developer open houses, public open houses, utility roundtables, Main Street analysis, walkable community workshops/audits, assistance with updating land use ordinances and codes and community plans, and hosting conferences and webinars. Applications can only be submitted by a state or local REALTOR® association, and grants provide up to \$5,000 per award.

Placemaking Grants: Placemaking Grants fund the creation of new, outdoor public spaces and destinations in a community. Funds can be used for amenities such as street furniture, paint, signage, materials, landscaping, murals, site preparation, and artist fees. Applications can only be submitted by a state or local REALTOR® association, and grants provide up to \$5,000 per award.

<https://realtorparty.realtor/community-outreach/>

GOLDEN LEAF FOUNDATION

The Golden LEAF Foundation is a nonprofit organization established in 1999 to receive a portion of North Carolina's funding received from the 1998 Master Settlement Agreement with cigarette manufacturers. Golden LEAF works to increase economic opportunity in North Carolina's rural and tobacco-dependent communities through leadership in grantmaking, collaboration, innovation, and stewardship as an independent and perpetual foundation. Golden LEAF's grantmaking focuses on the following priorities: Job creation and economic investment; workforce preparedness; agriculture; and community competitiveness, capacity, and vitality. Golden LEAF has two standard programs open to eligible entities seeking grants: Open Grants Program and Economic Catalyst Program. These programs complement other ongoing initiatives of the Foundation, such as the Community-Based Grants Initiative.

Open Grants Program: The Open Grants Program is open to all governmental entities and 501(c)(3) organizations that propose projects in Golden LEAF's priority areas. This program funds economic development projects aligned with the Golden LEAF priority areas. Most awards will be for \$200,000 or less.

Economic Catalyst Program: The Economic Catalyst process is open to governmental entities and 501(c)(3) organizations with projects that will create jobs at risk without Golden LEAF funding. Grants include funds for public infrastructure, job training, upfit for buildings owned by governmental or nonprofit entities, or equipment acquisition where the building or equipment will be leased or sold at fair-market value to a company creating jobs. Grants are available only for projects that include a specific company's commitment to create full-time jobs in NC.

Community-Based Grants Initiative: Each year, the Golden LEAF Foundation invites organizations from counties from a different Prosperity Zone to participate in the Community-Based Grant Initiative (CBGI). The process is competitive, but organizations from all counties within the Prosperity Zone will have an opportunity to apply. The CBGI is designed to identify projects with the potential to have a significant impact. It is a focused process with grants targeted toward investments in the building blocks of economic growth. Funds are limited to projects that address economic development, agriculture, workforce preparedness, infrastructure, and capital costs necessary to create health care jobs. County managers serve a key role in the process. Each county manager will submit a slate of up to four projects for consideration. Applicants must be 501(c)(3) organizations or governmental entities (county and municipal governments, community colleges, universities, etc.). Funds do not have to be administered or implemented by the county government. Awards are limited to no more than three projects per county and will total no more than \$1.5 million per county.

<https://www.goldenleaf.org/>

AARP COMMUNITY CHALLENGE GRANT

The AARP Community Challenge provides small grants to fund quick-action projects that can help communities become more livable for people of all ages. Applications are accepted for projects to improve public spaces, housing, transportation, civic engagement, coronavirus recovery, diversity, and inclusion, and more. Project types include those that provide permanent physical improvements in the community, temporary demonstrations that lead to long-term change, and innovative programming or services. The program is open to 501(C)(3), 501(C)(4) and 501(c)(6) nonprofits and government entities. Grants can range from several hundred dollars for smaller, short-term activities to several thousand or tens of thousands of dollars for larger projects.

<https://www.aarp.org/livable-communities/community-challenge/info-2021/2021-challenge.html>

APPENDIX B: DESIGN RESOURCES

OVERVIEW

Below are several design resources that can be used to inform bicycle and pedestrian design decisions. Organizations such as Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO), National Association of City Transportation Officials (NACTO), and North Carolina Department of Transportation (NCDOT) offer general guidelines and project-specific tools to help professionals make design decisions. These guidelines promote flexibility to ensure context-sensitive applications.

AASHTO GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES

The AASHTO Guide for the Development of Bicycle Facilities is the authoritative national standard for bikeway design. The document provides guidance to designers and planners by referencing a recommended range of design values and describing alternative design approaches. The guide provides information on how to accommodate bicycle travel and operations in most environments. Sufficient flexibility is permitted to encourage designs that are sensitive to local context and incorporate the needs of bicyclists, pedestrians, and motorists.

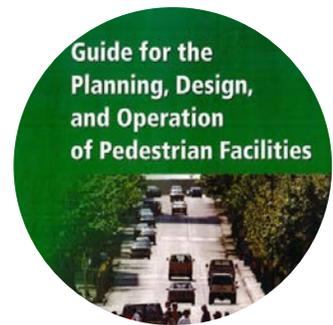
Guide for the Development of
Bicycle Facilities
2012 • Fourth Edition



AASHTO GUIDE FOR THE PLANNING, DESIGN AND OPERATION OF PEDESTRIAN FACILITIES

The AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities provides guidance for pedestrian facilities along streets and highways. The primary audiences for this manual are planners, roadway designers, and transportation engineers, whom make decisions on a daily basis that affect pedestrians. The guide focuses on identifying effective measures for accommodating pedestrians on public rights-of-way, and it recognizes the effect that land use planning and site design have on pedestrian mobility and addresses these topics as well.

Guide for the
Planning, Design,
and Operation
of Pedestrian Facilities



MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

The Manual on Uniform Traffic Control Devices for Streets and Highways, or MUTCD defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel. The MUTCD is published by the Federal Highway Administration (FHWA) and is a compilation of national standards for all traffic control devices, including road markings, roadway signs, and traffic signals.



NCDOT ROADWAY DESIGN GUIDE

The North Carolina Department of Transportation (NCDOT) Roadway Design Guide defines standards for roadways owned and maintained by NCDOT, including typical sections for roadways. Typical sections establish design elements that emphasize safety, mobility, complete streets, and accessibility for multiple modes of travel. Typical sections also provide guidelines for comprehensive transportation planning, project planning, and project design activities.



NCDOT COMPLETE STREETS IMPLEMENTATION GUIDANCE

The North Carolina Department of Transportation (NCDOT) Complete Streets Implementation Guide is designed to assist NCDOT staff engineers, project managers and designers in implementing the Complete Streets Policy adopted by the Board of Transportation in August 2019. This document provides comprehensive guidance for incorporating a complete streets approach into NCDOT’s planning, programming, design, and maintenance processes.



FHWA SMALL TOWN & RURAL MULTIMODAL NETWORKS

The Federal Highway Administration (FHWA) Small Town and Rural Multimodal Networks applies existing national design guidelines in a rural setting and highlights small town and rural case studies. It addresses challenges that are specific to rural areas and focuses on opportunities to make improvements despite the geographic, fiscal, and other challenges that many rural communities face. It also includes several design concepts applicable to National Scenic and Historic Trails.



ADA STANDARDS FOR ACCESSIBLE DESIGN

This guide explains requirements in the current editions of the Americans with Disabilities Act (ADA) Standards issued by the Department of Justice (DOJ) and the Department of Transportation (DOT). It provides the scoping and technical requirements for new construction and alterations resulting from the adoption of revised 2010 Standards in the final rules for Title II and Title III.



RESOURCES:

AASHTO GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES

https://nacto.org/wp-content/uploads/2015/04/AASHTO_Bicycle-Facilities-Guide_2012-toc.pdf

AASHTO GUIDE FOR THE PLANNING, DESIGN AND OPERATION OF PEDESTRIAN FACILITIES

[https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07\(263\)_FR.pdf](https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07(263)_FR.pdf)

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

<https://mutcd.fhwa.dot.gov/>

NCDOT ROADWAY DESIGN GUIDE

<https://connect.ncdot.gov/projects/Roadway/pages/roadway-design-manual.aspx>

NCDOT COMPLETE STREETS IMPLEMENTATION GUIDANCE

<https://connect.ncdot.gov/projects/BikePed/Pages/Complete-Streets.aspx>

FHWA SMALL TOWN & RURAL MULTIMODAL NETWORKS

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/

FHWA BIKEWAY SELECTION GUIDE

https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf

ADA STANDARDS FOR ACCESSIBLE DESIGN

https://www.ada.gov/2010ADASTandards_index.htm

APPENDIX C: DETAILED COST INFORMATION

Baseline construction costs for the current year of 2022 were generated using quantity takeoffs and calculations based on the preliminary design concepts. Detailed line item estimates for each project component are shown on the following pages.



Prepared By: JAP Date: 6/13/2022
Checked By: AJH Date: 6/13/2022
McAdams Project No: 2021210422

Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
Project Description: Section 3 - Aho Rd to Sterling Creek Park
Client: Blue Ridge Conservancy
Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

SECTION 3 SEGMENT SUMMARY

MAINLINE

Segment	Segment Length (mi.)	Cost
1	0.20	\$1,203,000
2	0.16	\$130,000
3	0.16	\$140,000
4	0.09	\$58,000
5	0.12	\$198,000
6	0.03	\$130,000
7	0.27	\$959,000
8	0.22	\$568,000
9	0.17	\$1,427,000

CONNECTIONS

Segment	Segment Length (mi.)	Cost
TRAILHEAD CONNECTION	0.04	\$552,000

TRAILHEAD

Location	# of Spaces	Cost
HWY 321	16	\$300,000

Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

SECTION 3 ALTERNATIVES SUMMARY

ALTERNATIVE A

Segment	Segment Length (mi.)	Cost
1	0.20	\$1,203,000
3	0.16	\$140,000
5	0.12	\$198,000
8	0.22	\$568,000
9	0.17	\$1,427,000
TRAILHEAD CONNECTION	0.04	\$552,000
TRAILHEAD	N/A	\$300,000
Total	<u>0.91</u>	<u>\$4,388,000</u>

ALTERNATIVE B

Segment	Segment Length (mi.)	Cost
1	0.20	\$1,203,000
3	0.16	\$140,000
4	0.09	\$58,000
7	0.27	\$959,000
9	0.17	\$1,427,000
TRAILHEAD	N/A	\$300,000
Total	<u>0.89</u>	<u>\$4,087,000</u>

ALTERNATIVE C

Segment	Segment Length (mi.)	Cost
1	0.20	\$1,203,000
2	0.16	\$130,000
4	0.09	\$58,000
7	0.27	\$959,000
9	0.17	\$1,427,000
TRAILHEAD	N/A	\$300,000
Total	<u>0.89</u>	<u>\$4,077,000</u>

ALTERNATIVE D

Segment	Segment Length (mi.)	Cost
1	0.20	\$1,203,000
2	0.16	\$130,000
5	0.12	\$198,000
8	0.22	\$568,000
9	0.17	\$1,427,000
TRAILHEAD CONNECTION	0.04	\$552,000
TRAILHEAD	N/A	\$300,000
Total	<u>0.91</u>	<u>\$4,378,000</u>

Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

SECTION 3 ALTERNATIVES SUMMARY

ALTERNATIVE E

Segment	Segment Length (mi.)	Cost
1	0.20	\$1,203,000
3	0.16	\$140,000
4	0.09	\$58,000
6	0.03	\$130,000
8	0.22	\$568,000
9	0.17	\$1,427,000
TRAILHEAD CONNECTION	0.04	\$552,000
TRAILHEAD	N/A	\$300,000
Total	<u>0.91</u>	<u>\$4,378,000</u>

ALTERNATIVE F

Segment	Segment Length (mi.)	Cost
1	0.20	\$1,203,000
2	0.16	\$130,000
4	0.09	\$58,000
6	0.03	\$130,000
8	0.22	\$568,000
9	0.17	\$1,427,000
TRAILHEAD CONNECTION	0.04	\$552,000
TRAILHEAD	N/A	\$300,000
Total	<u>0.91</u>	<u>\$4,368,000</u>

Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 3 - Segment 1						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 47,600.00	\$ 47,600.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	820	SY	\$ 4.00	\$ 3,280.00
520	1121000000-E	AGGREGATE BASE COURSE	320	TON	\$ 50.00	\$ 16,000.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	90	TON	\$ 115.00	\$ 10,350.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	10	TON	\$ 650.00	\$ 6,500.00
SP		COMPREHENSIVE GRADING, SECTION 3-SEG 1	1	LS	\$ 30,000.00	\$ 30,000.00
SP		EROSION CONTROL	1	LS	\$ 21,000.00	\$ 21,000.00
SP		PREFABRICATED PEDESTRIAN BRIDGE	125	LF	\$ 3,300.00	\$ 412,500.00
SP		TIMBER PILE CONCRETE BOARDWALK	180	LF	\$ 1,300.00	\$ 234,000.00
SP		6" REINFORCED CONCRETE	90	SY	\$ 80.00	\$ 7,200.00
SP		RETAINING WALL	1500	SF	\$ 140.00	\$ 210,000.00

SUBTOTAL \$1,002,430.00

CONTINGENCY @ 20% \$200,486.00

CONSTRUCTION COST SAY \$1,203,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 3 - Segment 2						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 5,000.00	\$ 5,000.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	970	SY	\$ 4.00	\$ 3,880.00
520	1121000000-E	AGGREGATE BASE COURSE	380	TON	\$ 50.00	\$ 19,000.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	100	TON	\$ 115.00	\$ 11,500.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	10	TON	\$ 650.00	\$ 6,500.00
SP		COMPREHENSIVE GRADING, SECTION 3-SEG 2	1	LS	\$ 20,000.00	\$ 20,000.00
SP		EROSION CONTROL	1	LS	\$ 18,000.00	\$ 18,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 5,000.00	\$ 5,000.00
SP		6" REINFORCED CONCRETE	90	SY	\$ 80.00	\$ 7,200.00
SP		AT-GRADE ROADWAY CROSSING	1	EA	\$ 8,000.00	\$ 8,000.00

SUBTOTAL \$108,080.00

CONTINGENCY @ 20% \$21,616.00

CONSTRUCTION COST SAY \$130,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 3 - Segment 3						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 5,400.00	\$ 5,400.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	900	SY	\$ 4.00	\$ 3,600.00
520	1121000000-E	AGGREGATE BASE COURSE	350	TON	\$ 50.00	\$ 17,500.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	100	TON	\$ 115.00	\$ 11,500.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	10	TON	\$ 650.00	\$ 6,500.00
SP		COMPREHENSIVE GRADING, SECTION 3-SEG 3	1	LS	\$ 10,000.00	\$ 10,000.00
SP		EROSION CONTROL	1	LS	\$ 18,000.00	\$ 18,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 5,000.00	\$ 5,000.00
SP		6" REINFORCED CONCRETE	160	SY	\$ 80.00	\$ 12,800.00
SP		GRAVEL DRIVEWAY RE-ALIGNMENT	280	LF	\$ 50.00	\$ 14,000.00
SP		AT-GRADE ROADWAY CROSSING	1	EA	\$ 8,000.00	\$ 8,000.00

SUBTOTAL \$116,300.00

CONTINGENCY @ 20% \$23,260.00

CONSTRUCTION COST SAY \$140,000

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 3 - Segment 4						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 2,200.00	\$ 2,200.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 2,000.00	\$ 2,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	560	SY	\$ 4.00	\$ 2,240.00
520	1121000000-E	AGGREGATE BASE COURSE	220	TON	\$ 50.00	\$ 11,000.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	60	TON	\$ 115.00	\$ 6,900.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 3-SEG 4	1	LS	\$ 10,000.00	\$ 10,000.00
SP		EROSION CONTROL	1	LS	\$ 10,000.00	\$ 10,000.00

SUBTOTAL \$47,590.00

CONTINGENCY @ 20% \$9,518.00

CONSTRUCTION COST SAY \$58,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 3 - Segment 5						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 7,700.00	\$ 7,700.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 3,000.00	\$ 3,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	650	SY	\$ 4.00	\$ 2,600.00
520	1121000000-E	AGGREGATE BASE COURSE	260	TON	\$ 50.00	\$ 13,000.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	70	TON	\$ 115.00	\$ 8,050.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 3-SEG 5	1	LS	\$ 10,000.00	\$ 10,000.00
SP		EROSION CONTROL	1	LS	\$ 13,000.00	\$ 13,000.00
SP		TIMBER PILE CONCRETE BOARDWALK	80	LF	\$ 1,300.00	\$ 104,000.00

SUBTOTAL \$164,600.00

CONTINGENCY @ 20% \$32,920.00

CONSTRUCTION COST SAY \$198,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 3 - Segment 6						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 5,200.00	\$ 5,200.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 1,000.00	\$ 1,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	120	SY	\$ 4.00	\$ 480.00
520	1121000000-E	AGGREGATE BASE COURSE	50	TON	\$ 50.00	\$ 2,500.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	20	TON	\$ 115.00	\$ 2,300.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 3-SEG 6	1	LS	\$ 5,000.00	\$ 5,000.00
SP		EROSION CONTROL	1	LS	\$ 4,000.00	\$ 4,000.00
SP		TIMBER PILE CONCRETE BOARDWALK	65	LF	\$ 1,300.00	\$ 84,500.00

SUBTOTAL \$108,230.00

CONTINGENCY @ 20% \$21,646.00

CONSTRUCTION COST SAY \$130,000

Notes:

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2. Cost opinion does not include engineering, geotech, design survey, or construction administration.
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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 3 - Segment 7						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 37,800.00	\$ 37,800.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 6,000.00	\$ 6,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	1490	SY	\$ 4.00	\$ 5,960.00
520	1121000000-E	AGGREGATE BASE COURSE	580	TON	\$ 50.00	\$ 29,000.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	160	TON	\$ 115.00	\$ 18,400.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	10	TON	\$ 650.00	\$ 6,500.00
SP		COMPREHENSIVE GRADING, SECTION 3-SEG 7	1	LS	\$ 50,000.00	\$ 50,000.00
SP		EROSION CONTROL	1	LS	\$ 29,000.00	\$ 29,000.00
SP		PREFABRICATED PEDESTRIAN BRIDGE	105	LF	\$ 3,300.00	\$ 346,500.00
SP		TIMBER PILE CONCRETE BOARDWALK	100	LF	\$ 1,300.00	\$ 130,000.00
SP		RETAINING WALL	1000	SF	\$ 140.00	\$ 140,000.00

SUBTOTAL \$799,160.00

CONTINGENCY @ 20% \$159,832.00

CONSTRUCTION COST SAY \$959,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 3 - Segment 8						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 22,300.00	\$ 22,300.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 5,000.00	\$ 5,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	1280	SY	\$ 4.00	\$ 5,120.00
520	1121000000-E	AGGREGATE BASE COURSE	500	TON	\$ 50.00	\$ 25,000.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	140	TON	\$ 115.00	\$ 16,100.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	10	TON	\$ 650.00	\$ 6,500.00
SP		COMPREHENSIVE GRADING, SECTION 3-SEG 8	1	LS	\$ 10,000.00	\$ 10,000.00
SP		EROSION CONTROL	1	LS	\$ 24,000.00	\$ 24,000.00
SP		PREFABRICATED PEDESTRIAN BRIDGE	85	LF	\$ 3,300.00	\$ 280,500.00
SP		TIMBER PILE CONCRETE BOARDWALK	60	LF	\$ 1,300.00	\$ 78,000.00

SUBTOTAL \$472,520.00

CONTINGENCY @ 20% \$94,504.00

CONSTRUCTION COST SAY \$568,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 3 - Segment 9						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 56,500.00	\$ 56,500.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	240	SY	\$ 4.00	\$ 960.00
520	1121000000-E	AGGREGATE BASE COURSE	100	TON	\$ 50.00	\$ 5,000.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	30	TON	\$ 115.00	\$ 3,450.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 3-SEG 9	1	LS	\$ 20,000.00	\$ 20,000.00
SP		EROSION CONTROL	1	LS	\$ 18,000.00	\$ 18,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 15,000.00	\$ 15,000.00
SP		PREFABRICATED PEDESTRIAN BRIDGE	125	LF	\$ 3,300.00	\$ 412,500.00
SP		TIMBER PILE CONCRETE BOARDWALK	245	LF	\$ 1,300.00	\$ 318,500.00
SP		6" REINFORCED CONCRETE	370	SY	\$ 80.00	\$ 29,600.00
SP		RETAINING WALL	2100	SF	\$ 140.00	\$ 294,000.00
SP		AT-GRADE ROADWAY CROSSING	1	EA	\$ 8,000.00	\$ 8,000.00

SUBTOTAL \$1,188,760.00

CONTINGENCY @ 20% \$237,752.00

CONSTRUCTION COST SAY \$1,427,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 3 - Aho Rd to Sterling Creek Park
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 3 - Trailhead Connection						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 21,900.00	\$ 21,900.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 1,000.00	\$ 1,000.00
SP		COMPREHENSIVE GRADING, SECTION 3-TH CONNECTION	1	LS	\$ 5,000.00	\$ 5,000.00
SP		EROSION CONTROL	1	LS	\$ 5,000.00	\$ 5,000.00
SP		PREFABRICATED PEDESTRIAN BRIDGE	80	LF	\$ 3,300.00	\$ 264,000.00
SP		TIMBER PILE CONCRETE BOARDWALK	125	LF	\$ 1,300.00	\$ 162,500.00

SUBTOTAL \$459,400.00

CONTINGENCY @ 20% \$91,880.00

CONSTRUCTION COST SAY \$552,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

SECTION 5 SEGMENT SUMMARY

SECTION 5 SOUTH - MAINLINE

Segment	Segment Length (mi.)	Cost
1	0.15	\$456,000
2	0.16	\$928,000
3	0.37	\$2,532,000
4	0.10	\$975,000
5	0.03	\$284,000
7	0.15	\$2,455,000
8	0.11	\$88,000
9	0.05	\$55,000
10	0.33	\$2,454,000
11	0.33	\$2,154,000

SECTION 5 NORTH - MAINLINE

Segment	Segment Length (mi.)	Cost
12	0.30	\$890,000
13	0.15	\$465,000
15	0.07	\$664,000
17	0.17	\$113,000
18	0.34	\$2,528,000

Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

SECTION 5 SOUTH ALTERNATIVES SUMMARY

ALTERNATIVE A

Segment	Segment Length (mi.)	Cost
3	0.37	\$2,532,000
4	0.10	\$975,000
9	0.05	\$55,000
11	0.33	\$2,154,000
Total	<u>0.85</u>	<u>\$5,716,000</u>

ALTERNATIVE B

Segment	Segment Length (mi.)	Cost
1	0.15	\$456,000
2	0.16	\$928,000
4	0.10	\$975,000
9	0.05	\$55,000
11	0.33	\$2,154,000
Total	<u>0.79</u>	<u>\$4,568,000</u>

ALTERNATIVE C

Segment	Segment Length (mi.)	Cost
1	0.15	\$456,000
5	0.03	\$284,000
7	0.15	\$2,455,000
8	0.11	\$88,000
9	0.05	\$55,000
11	0.33	\$2,154,000
Total	<u>0.82</u>	<u>\$5,492,000</u>

ALTERNATIVE D

Segment	Segment Length (mi.)	Cost
3	0.37	\$2,532,000
4	0.10	\$975,000
9	0.05	\$55,000
10	0.33	\$2,454,000
Total	<u>0.85</u>	<u>\$6,016,000</u>

ALTERNATIVE E

Segment	Segment Length (mi.)	Cost
1	0.15	\$456,000
2	0.16	\$928,000
4	0.10	\$975,000
9	0.05	\$55,000
10	0.33	\$2,454,000
Total	<u>0.78</u>	<u>\$4,868,000</u>

ALTERNATIVE F

Segment	Segment Length (mi.)	Cost
1	0.15	\$456,000
5	0.03	\$284,000
7	0.15	\$2,455,000
8	0.11	\$88,000
9	0.05	\$55,000
10	0.33	\$2,454,000
Total	<u>0.82</u>	<u>\$5,792,000</u>

Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

SECTION 5 NORTH SUMMARY

<u>PREFERRED ROUTE</u>		
Segment	Segment Length (mi.)	Cost
12	0.30	\$890,000
13	0.15	\$465,000
15	0.07	\$664,000
17	0.17	\$113,000
18	0.34	\$2,528,000
Total	<u>1.04</u>	<u>\$4,660,000</u>

Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 1						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 17,900.00	\$ 17,900.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	850	SY	\$ 4.00	\$ 3,400.00
520	1121000000-E	AGGREGATE BASE COURSE	330	TON	\$ 50.00	\$ 16,500.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	90	TON	\$ 115.00	\$ 10,350.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	10	TON	\$ 650.00	\$ 6,500.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 1	1	LS	\$ 25,000.00	\$ 25,000.00
SP		EROSION CONTROL	1	LS	\$ 16,000.00	\$ 16,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 10,000.00	\$ 10,000.00
SP		TIMBER PILE CONCRETE BOARDWALK	100	LF	\$ 1,300.00	\$ 130,000.00
SP		RETAINING WALL	1000	SF	\$ 140.00	\$ 140,000.00

SUBTOTAL \$379,650.00

CONTINGENCY @ 20% \$75,930.00

CONSTRUCTION COST SAY \$456,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 2						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 36,700.00	\$ 36,700.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 2	1	LS	\$ 40,000.00	\$ 40,000.00
SP		EROSION CONTROL	1	LS	\$ 17,000.00	\$ 17,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 20,000.00	\$ 20,000.00
SP		TIMBER PILE CONCRETE BOARDWALK	230	LF	\$ 1,300.00	\$ 299,000.00
SP		6" REINFORCED CONCRETE	680	SY	\$ 80.00	\$ 54,400.00
SP		RETAINING WALL	2100	SF	\$ 140.00	\$ 294,000.00
SP		AT-GRADE ROADWAY CROSSING	1	EA	\$ 8,000.00	\$ 8,000.00

SUBTOTAL \$773,100.00

CONTINGENCY @ 20% \$154,620.00

CONSTRUCTION COST SAY \$928,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 3						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 100,300.00	\$ 100,300.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	370	SY	\$ 4.00	\$ 1,480.00
520	1121000000-E	AGGREGATE BASE COURSE	150	TON	\$ 50.00	\$ 7,500.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	40	TON	\$ 115.00	\$ 4,600.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 3	1	LS	\$ 75,000.00	\$ 75,000.00
SP		EROSION CONTROL	1	LS	\$ 40,000.00	\$ 40,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 10,000.00	\$ 10,000.00
SP		TIMBER PILE CONCRETE BOARDWALK	940	LF	\$ 1,300.00	\$ 1,222,000.00
SP		6" REINFORCED CONCRETE	820	SY	\$ 80.00	\$ 65,600.00
SP		RETAINING WALL	4000	SF	\$ 140.00	\$ 560,000.00
SP		AT-GRADE ROADWAY CROSSING	2	EA	\$ 8,000.00	\$ 16,000.00

SUBTOTAL \$2,109,730.00

CONTINGENCY @ 20% \$421,946.00

CONSTRUCTION COST SAY \$2,532,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 4						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 38,600.00	\$ 38,600.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 2,000.00	\$ 2,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	380	SY	\$ 4.00	\$ 1,520.00
520	1121000000-E	AGGREGATE BASE COURSE	150	TON	\$ 50.00	\$ 7,500.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	40	TON	\$ 115.00	\$ 4,600.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 4	1	LS	\$ 25,000.00	\$ 25,000.00
SP		EROSION CONTROL	1	LS	\$ 11,000.00	\$ 11,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 20,000.00	\$ 20,000.00
SP		PREFABRICATED PEDESTRIAN BRIDGE	125	LF	\$ 3,300.00	\$ 412,500.00
SP		6" REINFORCED CONCRETE	80	SY	\$ 80.00	\$ 6,400.00
SP		RETAINING WALL	2000	SF	\$ 140.00	\$ 280,000.00

SUBTOTAL \$812,370.00

CONTINGENCY @ 20% \$162,474.00

CONSTRUCTION COST SAY \$975,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 5						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 11,100.00	\$ 11,100.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 3,000.00	\$ 3,000.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 5	1	LS	\$ 10,000.00	\$ 10,000.00
SP		EROSION CONTROL	1	LS	\$ 4,000.00	\$ 4,000.00
SP		TIMBER PILE CONCRETE BOARDWALK	160	LF	\$ 1,300.00	\$ 208,000.00

SUBTOTAL \$236,100.00

CONTINGENCY @ 20% \$47,220.00

CONSTRUCTION COST SAY \$284,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
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 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 7						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 97,200.00	\$ 97,200.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 6,000.00	\$ 6,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	320	SY	\$ 4.00	\$ 1,280.00
520	1121000000-E	AGGREGATE BASE COURSE	130	TON	\$ 50.00	\$ 6,500.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	40	TON	\$ 115.00	\$ 4,600.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 7	1	LS	\$ 25,000.00	\$ 25,000.00
SP		EROSION CONTROL	1	LS	\$ 17,000.00	\$ 17,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 100,000.00	\$ 100,000.00
SP		TIMBER PILE CONCRETE BOARDWALK	400	LF	\$ 1,300.00	\$ 520,000.00
SP		PEDESTRIAN TUNNEL UNDER 321 (CUT AND COVER)	150	LF	\$ 7,500.00	\$ 1,125,000.00
SP		RETAINING WALL	1000	SF	\$ 140.00	\$ 140,000.00

SUBTOTAL \$2,045,830.00

CONTINGENCY @ 20% \$409,166.00

CONSTRUCTION COST SAY \$2,455,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
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ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 8						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 3,400.00	\$ 3,400.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 3,000.00	\$ 3,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	710	SY	\$ 4.00	\$ 2,840.00
520	1121000000-E	AGGREGATE BASE COURSE	280	TON	\$ 50.00	\$ 14,000.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	80	TON	\$ 115.00	\$ 9,200.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 8	1	LS	\$ 10,000.00	\$ 10,000.00
SP		EROSION CONTROL	1	LS	\$ 12,000.00	\$ 12,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 15,000.00	\$ 15,000.00

SUBTOTAL \$72,690.00

CONTINGENCY @ 20% \$14,538.00

CONSTRUCTION COST SAY \$88,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
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ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 9						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 2,100.00	\$ 2,100.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 2,000.00	\$ 2,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	330	SY	\$ 4.00	\$ 1,320.00
520	1121000000-E	AGGREGATE BASE COURSE	130	TON	\$ 50.00	\$ 6,500.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	40	TON	\$ 115.00	\$ 4,600.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 9	1	LS	\$ 10,000.00	\$ 10,000.00
SP		EROSION CONTROL	1	LS	\$ 6,000.00	\$ 6,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 10,000.00	\$ 10,000.00

SUBTOTAL \$45,770.00

CONTINGENCY @ 20% \$9,154.00

CONSTRUCTION COST SAY \$55,000

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
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ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 10						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 97,200.00	\$ 97,200.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 10	1	LS	\$ 50,000.00	\$ 50,000.00
SP		EROSION CONTROL	1	LS	\$ 35,000.00	\$ 35,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 10,000.00	\$ 10,000.00
SP		TIMBER PILE CONCRETE BOARDWALK	930	LF	\$ 1,300.00	\$ 1,209,000.00
SP		6" REINFORCED CONCRETE	890	SY	\$ 80.00	\$ 71,200.00
SP		RETAINING WALL	4000	SF	\$ 140.00	\$ 560,000.00
SP		AT-GRADE ROADWAY CROSSING	1	EA	\$ 8,000.00	\$ 8,000.00

SUBTOTAL \$2,044,400.00

CONTINGENCY @ 20% \$408,880.00

CONSTRUCTION COST SAY \$2,454,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
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 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 11						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 85,300.00	\$ 85,300.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 11	1	LS	\$ 75,000.00	\$ 75,000.00
SP		EROSION CONTROL	1	LS	\$ 35,000.00	\$ 35,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 10,000.00	\$ 10,000.00
SP		TIMBER PILE CONCRETE BOARDWALK	330	LF	\$ 1,300.00	\$ 429,000.00
SP		6" REINFORCED CONCRETE	1580	SY	\$ 80.00	\$ 126,400.00
SP		RETAINING WALL	7300	SF	\$ 140.00	\$ 1,022,000.00
SP		AT-GRADE ROADWAY CROSSING	1	EA	\$ 8,000.00	\$ 8,000.00

SUBTOTAL \$1,794,700.00

CONTINGENCY @ 20% \$358,940.00

CONSTRUCTION COST SAY \$2,154,000

Notes:

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3. Cost opinion does not include cost for private utility relocations.
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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 12						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 35,000.00	\$ 35,000.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 7,000.00	\$ 7,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	1620	SY	\$ 4.00	\$ 6,480.00
520	1121000000-E	AGGREGATE BASE COURSE	630	TON	\$ 50.00	\$ 31,500.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	170	TON	\$ 115.00	\$ 19,550.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	15	TON	\$ 650.00	\$ 9,750.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 12	1	LS	\$ 25,000.00	\$ 25,000.00
SP		EROSION CONTROL	1	LS	\$ 33,000.00	\$ 33,000.00
SP		PREFABRICATED PEDESTRIAN BRIDGE	105	LF	\$ 3,300.00	\$ 346,500.00
SP		TIMBER PILE CONCRETE BOARDWALK	175	LF	\$ 1,300.00	\$ 227,500.00

SUBTOTAL \$741,280.00

CONTINGENCY @ 20% \$148,256.00

CONSTRUCTION COST SAY \$890,000

Notes:

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 13						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 18,300.00	\$ 18,300.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	990	SY	\$ 4.00	\$ 3,960.00
520	1121000000-E	AGGREGATE BASE COURSE	390	TON	\$ 50.00	\$ 19,500.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	110	TON	\$ 115.00	\$ 12,650.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	10	TON	\$ 650.00	\$ 6,500.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 13	1	LS	\$ 25,000.00	\$ 25,000.00
SP		EROSION CONTROL	1	LS	\$ 17,000.00	\$ 17,000.00
SP		RETAINING WALL	2000	SF	\$ 140.00	\$ 280,000.00

SUBTOTAL \$386,910.00

CONTINGENCY @ 20% \$77,382.00

CONSTRUCTION COST SAY \$465,000

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 15						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 26,300.00	\$ 26,300.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 2,000.00	\$ 2,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	250	SY	\$ 4.00	\$ 1,000.00
520	1121000000-E	AGGREGATE BASE COURSE	100	TON	\$ 50.00	\$ 5,000.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	30	TON	\$ 115.00	\$ 3,450.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 15	1	LS	\$ 10,000.00	\$ 10,000.00
SP		EROSION CONTROL	1	LS	\$ 7,000.00	\$ 7,000.00
SP		PREFABRICATED PEDESTRIAN BRIDGE	150	LF	\$ 3,300.00	\$ 495,000.00

SUBTOTAL \$553,000.00

CONTINGENCY @ 20% \$110,600.00

CONSTRUCTION COST SAY \$664,000

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 17						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 4,300.00	\$ 4,300.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 4,000.00	\$ 4,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	1130	SY	\$ 4.00	\$ 4,520.00
520	1121000000-E	AGGREGATE BASE COURSE	440	TON	\$ 50.00	\$ 22,000.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	120	TON	\$ 115.00	\$ 13,800.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	10	TON	\$ 650.00	\$ 6,500.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 17	1	LS	\$ 20,000.00	\$ 20,000.00
SP		EROSION CONTROL	1	LS	\$ 19,000.00	\$ 19,000.00

SUBTOTAL \$94,120.00

CONTINGENCY @ 20% \$18,824.00

CONSTRUCTION COST SAY \$113,000

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Middle Fork Greenway Feasibility Study

Project Location: Watauga County, NC
 Project Description: Section 5 - Niley Cook Rd to Jordan V Cook Rd
 Client: Blue Ridge Conservancy
 Client Project No. XXX

ENGINEER'S OPINION OF PROBABLE COST OF CONSTRUCTION - Feasibility Study

Section 5 - Segment 18						
Section	Item Code	Item Description	Quantity	Unit	Unit Price	Cost
800	0000100000-N	MOBILIZATION	1	LS	\$ 100,000.00	\$ 100,000.00
801	0000400000-N	CONSTRUCTION SURVEYING	1	LS	\$ 7,000.00	\$ 7,000.00
SP	1115000000-E	GEOTEXTILE FOR PAVEMENT STABILIZATION	180	SY	\$ 4.00	\$ 720.00
520	1121000000-E	AGGREGATE BASE COURSE	70	TON	\$ 50.00	\$ 3,500.00
610	1519000000-E	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	20	TON	\$ 115.00	\$ 2,300.00
620	1575000000-E	ASPHALT BINDER FOR PLANT MIX	5	TON	\$ 650.00	\$ 3,250.00
SP		COMPREHENSIVE GRADING, SECTION 5-SEG 18	1	LS	\$ 25,000.00	\$ 25,000.00
SP		EROSION CONTROL	1	LS	\$ 37,000.00	\$ 37,000.00
SP		TRAFFIC CONTROL	1	LS	\$ 10,000.00	\$ 10,000.00
SP		PREFABRICATED PEDESTRIAN BRIDGE	115	LF	\$ 3,300.00	\$ 379,500.00
SP		TIMBER PILE CONCRETE BOARDWALK	1005	LF	\$ 1,300.00	\$ 1,306,500.00
SP		6" REINFORCED CONCRETE	520	SY	\$ 80.00	\$ 41,600.00
SP		RETAINING WALL	1300	SF	\$ 140.00	\$ 182,000.00
SP		AT-GRADE ROADWAY CROSSING	1	EA	\$ 8,000.00	\$ 8,000.00

SUBTOTAL \$2,106,370.00

CONTINGENCY @ 20% \$421,274.00

CONSTRUCTION COST SAY \$2,528,000

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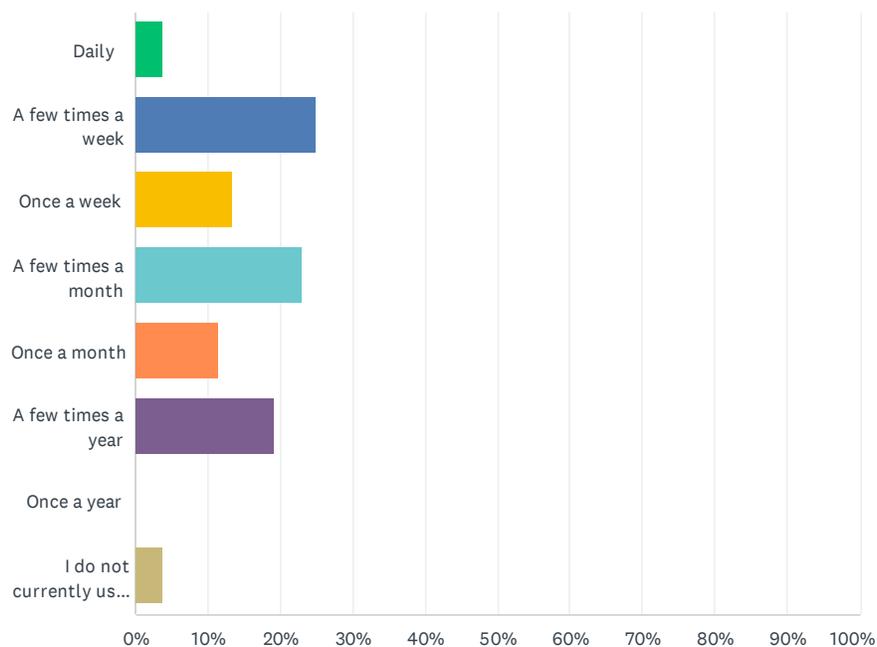
APPENDIX D: ADDITIONAL COMMUNITY ENGAGEMENT INFORMATION

Full results data from the online community survey are provided below and on the following pages:

Middle Fork Greenway Feasibility Study

Q1 How often do you use the existing sections of the Middle Fork Greenway?

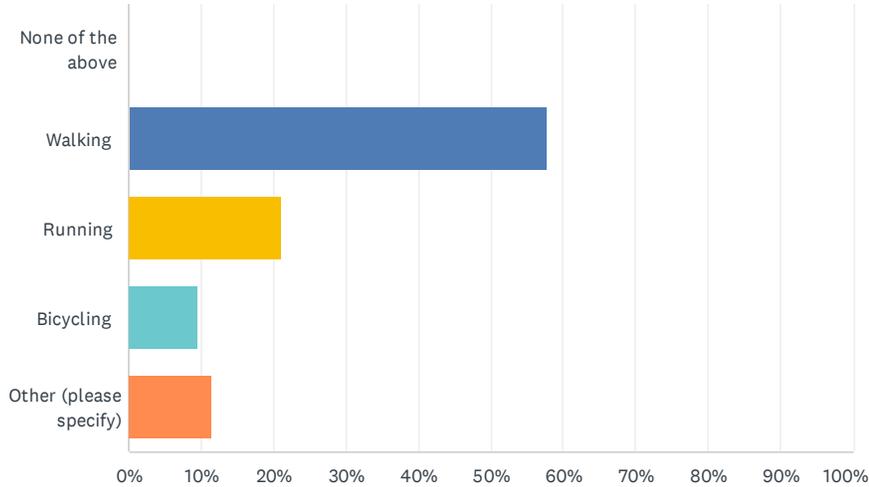
Answered: 52 Skipped: 0



ANSWER CHOICES	RESPONSES	
Daily	3.85%	2
A few times a week	25.00%	13
Once a week	13.46%	7
A few times a month	23.08%	12
Once a month	11.54%	6
A few times a year	19.23%	10
Once a year	0.00%	0
I do not currently use the greenway	3.85%	2
TOTAL		52

Q2 How do you use the Middle Fork Greenway?

Answered: 52 Skipped: 0

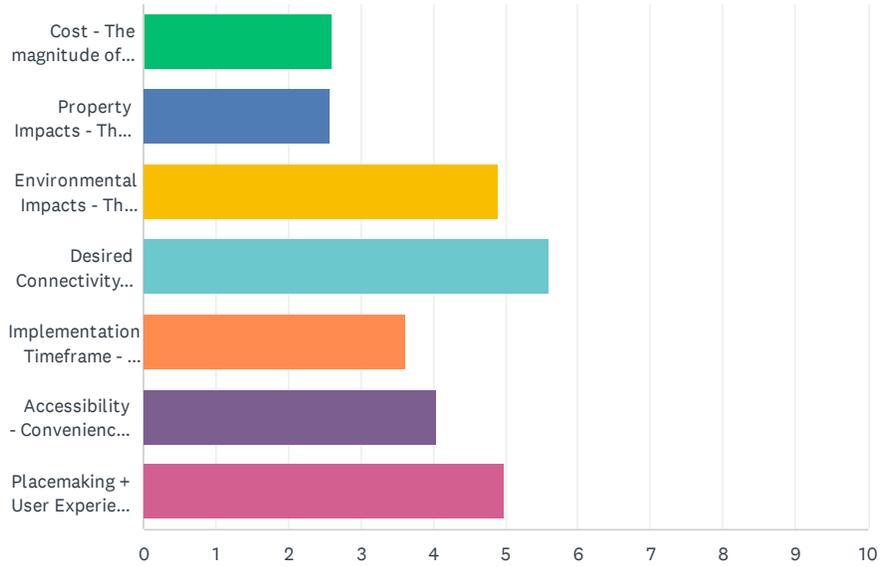


ANSWER CHOICES	RESPONSES	
None of the above	0.00%	0
Walking	57.69%	30
Running	21.15%	11
Bicycling	9.62%	5
Other (please specify)	11.54%	6
TOTAL		52

#	OTHER (PLEASE SPECIFY)	DATE
1	To access fishing	5/16/2022 1:39 PM
2	It will be used for cycling and walking once a long stretch of it is completed. But use the current large section of greenway multiple times a week for cycling and walking.	5/12/2022 2:38 PM
3	With the kids and picnics	5/12/2022 12:59 PM
4	viewing	5/11/2022 9:54 PM
5	walk, bike, rum	5/11/2022 12:54 PM
6	fishing	5/10/2022 1:03 PM

Q3 Please rank the following evaluation criteria in order from most important at the top to least important at the bottom (1 = Highest Priority and 7 = Lowest Priority):

Answered: 52 Skipped: 0



Middle Fork Greenway Feasibility Study

	1	2	3	4	5	6	7	TOTAL	SCORE
Cost - The magnitude of the total life-cycle cost for each alternative (including design, construction and ongoing maintenance).	0.00% 0	7.69% 4	5.77% 3	13.46% 7	19.23% 10	19.23% 10	34.62% 18	52	2.60
Property Impacts - The ability of the route alternatives to utilize publicly-owned properties, existing easements, public right-of-way, and limit impacts to privately property owners.	2.08% 1	6.25% 3	6.25% 3	10.42% 5	12.50% 6	33.33% 16	29.17% 14	48	2.58
Environmental Impacts - The ability of each alternative to minimize impacts to streams, wetlands and other jurisdictional features (including associated buffers, floodplain elevations, and other environmental factors) during construction and operation of the proposed greenway.	19.61% 10	25.49% 13	15.69% 8	11.76% 6	19.61% 10	7.84% 4	0.00% 0	51	4.90
Desired Connectivity - In order to maximize use of the facility, determining which route alternatives connect popular origins and destinations identified by the public and other stakeholders is considered.	35.42% 17	20.83% 10	27.08% 13	8.33% 4	4.17% 2	2.08% 1	2.08% 1	48	5.60
Implementation Timeframe - The amount of time it takes to plan, fund, design, and ultimately construct each route alternative.	12.24% 6	10.20% 5	4.08% 2	20.41% 10	20.41% 10	20.41% 10	12.24% 6	49	3.63
Accessibility - Convenience of use and accommodation for users of all ages and abilities to ensure the ultimate route alternative is a community amenity designed for universal use.	8.00% 4	16.00% 8	20.00% 10	20.00% 10	14.00% 7	10.00% 5	12.00% 6	50	4.06
Placemaking + User Experience - The potential ability of the route alternatives to help drive tourism, contribute to the local economy, and brand the surrounding area by as one that promotes healthy, active lifestyles.	26.00% 13	16.00% 8	26.00% 13	14.00% 7	4.00% 2	8.00% 4	6.00% 3	50	4.98

Middle Fork Greenway Feasibility Study

Q4 Click here to open a new window and review the route alternatives for Section 3: Aho Rd to Sterling Creek Park. After reviewing the routes, please provide any feedback or comments in the box below.

Answered: 36 Skipped: 16

#	RESPONSES	DATE
1	Looks great!	6/1/2022 4:29 PM
2	I like A or E the best. Following the waterway is important, as is staying away from the noise and other issues that come with being too close to the highway.	5/23/2022 1:55 PM
3	All of these routes seem similar from the user perspective. I imagine it will depend of ability to have use / right a way and construction access / cost.	5/23/2022 10:58 AM
4	D>B>C>A, I like the idea of sticking close to the river in nature as much as possible.	5/20/2022 11:49 AM
5	Keep it along the river as much as possible. In this section you would be further away from the road noise. TH and connectors are fine.	5/18/2022 1:27 PM
6	Alternative A or any alternative that gets away from 321 and allows for a more peaceful setting is preferred.	5/17/2022 3:09 PM
7	Prefer A or B	5/17/2022 1:04 PM
8	Stay as far away from Hwy 321 as possible.	5/16/2022 2:39 PM
9	It's hard to know the nuances of these options. Ideally, the route could stay away from the road and provide a beautiful user experience.	5/15/2022 3:27 PM
10	F seems better, but main goal would be to follow the river and minimize the need for bridges and alternative access trails.	5/14/2022 3:45 PM
11	Alternative A is best because it maximizes the distance to Hwy 321. This will lessen carbon monoxide and vehicle noise. Also, it stays near the Middle Fork New River for the longest distance.	5/13/2022 4:13 PM
12	Like the potential trailhead off 321, but assume only need one path & bridge to meetup to the greenway	5/13/2022 11:40 AM
13	Alternate A keeps the Greenway further away from 321, which is ideal and closer to the river. Alternate B may be more accessible for a wider variety of fitness levels. Both are excellent.	5/13/2022 9:41 AM
14	Alternative A stays close to the Middle Fork river and away from the road. It also makes use of Jennifer Rd. which may help save on cost	5/13/2022 8:13 AM
15	Least amount of time spent close to 321 the better	5/13/2022 7:52 AM
16	I don't have a strong preference for one route over another; routes running right next to 321 will likely provide a less satisfying user experience but could be preferable if much less complicated/expensive to complete.	5/13/2022 7:26 AM
17	Go with A it is the most removed from 321. Being on a greenway close to the busy road is scary and dangerous.	5/12/2022 9:39 PM
18	I prefer Alternative A. Being as close to the River and as far from 321 is ideal. I know there is not much room between 321 and the river, but safety and user experience is priority from my perspective!	5/12/2022 9:36 PM
19	Prefer routes closer to the river and a little bit away from 321. options d e and f preferred.	5/12/2022 7:24 PM
20	too many alternatives and too difficult to tell the differences between each one. Not a good way to gather survey information.	5/12/2022 3:49 PM

Middle Fork Greenway Feasibility Study

21	I like A or D because they are further away from the road. I think part of the beauty of the greenway is that it will get people outside but I don't want the noise of the traffic to completely overpower nature if the greenway were to be right next to 321. Plus that means that the trash that disrespectful people throw out of their cars has a lesser chance of ruining the greenway.	5/12/2022 2:54 PM
22	Alternate A because it is the least amount next to the main road and give some space.	5/12/2022 2:38 PM
23	Alternative A looks great but other studied route options appear suitable as well.	5/12/2022 1:50 PM
24	Option a	5/12/2022 1:10 PM
25	You can't view half of the maps	5/12/2022 12:59 PM
26	Alternatives A and D would be further from 321 which could be more pleasant.	5/12/2022 12:57 PM
27	Strongly prefer option A to maximize distance from 321, to follow river, and to skirt behind commercial properties instead of in front of them when ever possible	5/12/2022 9:48 AM
28	Hard to understand the alternatives, but think I like A.	5/11/2022 9:54 PM
29	C is my least favorite. Staying closer to the water will be the most enjoyable, crossing with bridges add interest.	5/11/2022 8:16 PM
30	First choice is Alt A if landowner who owns metal building will let us stay by the creek beside his building; if he will not, then Alt D is the choice, as it will be nearest the creek otherwise.	5/11/2022 5:23 PM
31	A is by far the most desirable and most direct route	5/11/2022 4:04 PM
32	Sections A and E stay away from the highway and provide more natural surroundings and screen the participant hopefully from any commercial development	5/11/2022 12:54 PM
33	I like A the best, or any option that limits the time spent directly on the side of US321.	5/11/2022 12:51 PM
34	Other factors being equal, Alternative A looks like the most attractive option. Perhaps it could add a bridge connect to the potential parking, or even just have a trail from parking back to connect with trail before bridge to the south.	5/11/2022 12:16 PM
35	Alternative A is preferred as it maximizes following along the river.	5/10/2022 1:14 PM
36	Alternate A	5/10/2022 1:03 PM

Middle Fork Greenway Feasibility Study

Q5 Click here to open a new window and review the route alternatives for Section 5 South: Goldmine Branch Park/Niley Cook Rd to Payne Branch Park. After reviewing the routes, please provide any feedback or comments in the box below.

Answered: 36 Skipped: 16

#	RESPONSES	DATE
1	Looks great!	6/1/2022 4:29 PM
2	I like Alternate C. I believe it is the strongest choice.	5/23/2022 1:55 PM
3	Again, hard to be clear on the differences. I would expect that fewer crossings over / under 321 would be best. It's unclear what the "potential existing trail" is and why that wouldn't be a considered route.	5/23/2022 10:58 AM
4	The routes that offer less switchbacks would be desirable.	5/20/2022 11:49 AM
5	I like the new tunnel the best - F. It also seems to have the least amt. of challenging topography, which is nearly impossible to avoid. This one seems to have less "switchback" turns which is good for a greenway. Keep it simple. haha	5/18/2022 1:27 PM
6	Alternative B or E would be preferred as more direct and along the river in longer stretches	5/17/2022 3:09 PM
7	Avoiding crossing Niley Cook Rd is important unless it can be done in a safe way but many people drive very fast on this road	5/17/2022 1:04 PM
8	Really don't like any of these alternatives because they bring the trail to an area that is just not suited for Hwy 321 crossing and the area has no particular natural beauty. Can we cross further south somewhere?	5/16/2022 2:39 PM
9	I would love to see a cool pedestrian bridge over the highway. It would be nice to avoid the switchbacks.	5/15/2022 3:27 PM
10	E	5/14/2022 3:45 PM
11	Alternative A is best for the same reasons as in Section 3 above. Also, bridges are preferable to tunnels since they are less subject to flooding and mud.	5/13/2022 4:13 PM
12	the alternative trail & tunnel from Goldmine Branch seems "easier" than the planned trail up higher on the crossing Miles Branch Rd - any reason for alternate path?	5/13/2022 11:40 AM
13	Alternate C looks like it makes the most sense if possible as it appears to be the most direct.	5/13/2022 9:41 AM
14	Alternative A and D look like the most "dramatic and interesting" routes. With a bridge over 321 and multiple switchbacks to gain the elevation needed. Alternative C and F look like the most practical by using the culvert under 321	5/13/2022 8:13 AM
15	which ever is cheaper and can get done the quickest; they look to be very similar	5/13/2022 7:52 AM
16	These all seem fine/feasible; I'd prioritize options that have the potential to connect to other trails/potential trails.	5/13/2022 7:26 AM
17	Much prefer C or F. Keep people from having to cross active streets as much as possible. Existing tunnel under 321 is better than a pedestrian bridge and crossing niley cook and the route gets away from 321 which is good.	5/12/2022 9:39 PM
18	I prefer Alternative A or D. The intersection of Niley Cook and 321 is so sketchy already. I do not find that intersection enjoyable for a Greenway bridge or tunnel.	5/12/2022 9:36 PM
19	No preference	5/12/2022 7:24 PM
20	same	5/12/2022 3:49 PM

Middle Fork Greenway Feasibility Study

21	I think all of these routes look nice :)	5/12/2022 2:54 PM
22	Alternate F	5/12/2022 2:38 PM
23	All possible proposed routes for Section 5 South look suitable.	5/12/2022 1:50 PM
24	Option b d e	5/12/2022 1:10 PM
25	F- niley cook is already very dangerous. Make it easy. Minimal walking alongside 321 and dont cross NC. Keep it safe.	5/12/2022 12:59 PM
26	Once again, A and D are further from the road and would seem better.	5/12/2022 12:57 PM
27	Realizing that open cut and cover is likely prohibitively expensive, I would select option A or D - ascend as far away from 321 as possible. Descent at the back-end (A switchbacks or D switchbacks would depend on the views and trail interest. If it is possible to tunnel, that would be my first choice... C or F.	5/12/2022 9:48 AM
28	B, a bit shorter?	5/11/2022 9:54 PM
29	I like the idea of a tunnel under the highway much better than a bridge.	5/11/2022 8:16 PM
30	If we can find funding for a tunnel, then Alt C is first choice; if we cannot, then Alt A is first choice (presumes pedestrian bridge and extra length of greenway costs less than tunnel).	5/11/2022 5:23 PM
31	Very challenging section. Prefer the fewest possible amount of switchbacks	5/11/2022 4:04 PM
32	A is my choice. The area along Niley Cook (below the shops) is not pretty and getting above the roadway would be a better alternative.	5/11/2022 12:54 PM
33	All of these look great...really like the idea of staying on the PBP side.	5/11/2022 12:51 PM
34	If the funding required is not prohibitive, I think Alternative F looks like the most attractive route with best separation from road. The big drawback being that it would require separate bridge to allow potential loop along hillside to east. If that is a priority, then I think Alternative D would be nice.	5/11/2022 12:16 PM
35	Suggest picking the route that is the least expensive to implement. Route A is preferred.	5/10/2022 1:14 PM
36	Alternate A	5/10/2022 1:03 PM

Middle Fork Greenway Feasibility Study

Q6 Click here to open a new window and review the recommended route for Section 5 North: Payne Branch Park to Jordan V Cook Rd. After reviewing the route, please provide any feedback or comments in the box below.

Answered: 31 Skipped: 21

#	RESPONSES	DATE
1	Looks great!	6/1/2022 4:29 PM
2	It sure is going to be hot down there in the summer..	5/23/2022 1:55 PM
3	No additional comments - concern about using a culvert to pass under the highway for water or snow / ice accumulation and runoff during storms.	5/23/2022 10:58 AM
4	Looks great. Proposed alignment on the approach to the bridges (from the south side of each) is steep. Final design on the ground will be important in those spots.	5/18/2022 1:27 PM
5	I really like this section	5/17/2022 3:09 PM
6	Really excited about this section	5/17/2022 1:04 PM
7	Fantastic!	5/16/2022 2:39 PM
8	Very excited about the Boone Gorge Park!	5/15/2022 3:27 PM
9	A bridge would be preferable to going under Hwy 321 in the existing culvert due to potential flooding and mud. Are the potential connection trails east of 321 for mountain bikers and hikers? They have switchbacks and cross several contour lines. Can these be completed prior to Section 5 North to give more earlier access to Section 5 South?	5/13/2022 4:13 PM
10	looks good	5/13/2022 11:40 AM
11	Love it!	5/13/2022 9:41 AM
12	Section 5 connects some potential park land with the rest of the Greenway. This would be a popular destination and turn around point for people looking for a shorter trip on the Boone side	5/13/2022 8:13 AM
13	This looks good.	5/13/2022 7:26 AM
14	Can this connect to the existing greenway by the hospital by goin go around the back of the hospital not on or near the roads.	5/12/2022 9:39 PM
15	SO excited for Boone Gorge Park! Looks great.	5/12/2022 9:36 PM
16	No comment	5/12/2022 7:24 PM
17	I think this looks good as well :)	5/12/2022 2:54 PM
18	Looks great.	5/12/2022 2:38 PM
19	The proposed alignment through the Boone Gorge Park looks great and is exciting!	5/12/2022 1:50 PM
20	No comment.	5/12/2022 12:57 PM
21	This is the one!	5/12/2022 12:55 PM
22	Love Boone Gorge Park and the culvert to Boone! if possible, please include the proposed connector on the east side of 321 to create a loop alternative.	5/12/2022 9:48 AM
23	Challenging. Good job.	5/11/2022 9:54 PM
24	Looks good	5/11/2022 8:16 PM
25	This should be really nice; too bad we have crossing of Old Blowing Rock Road, but oh well.	5/11/2022 5:23 PM

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26	Lovely section. Probably has best placemaking and user experience attributes	5/11/2022 4:04 PM
27	As for all areas, making choices that will not flood if possible and keep the trails open.	5/11/2022 12:54 PM
28	Like this, and how it will bring even current residents to a relatively underappreciated part of the community.	5/11/2022 12:51 PM
29	Looks great!	5/11/2022 12:16 PM
30	Suggested route looks good.	5/10/2022 1:14 PM
31	Exciting section!	5/10/2022 1:03 PM

Middle Fork Greenway Feasibility Study

Q7 Please provide any additional comments/general feedback you have on the study in the box below:

Answered: 30 Skipped: 22

#	RESPONSES	DATE
1	I dont use the Greenway as often as I could, but definately will as the new soft section is completed.	6/1/2022 4:29 PM
2	Build it and they will come!	5/23/2022 1:55 PM
3	Very excited about this project and look forward to continued progress.	5/23/2022 10:58 AM
4	Very excited about the progression of this greenway. Having a connector from Blowing Rock to Boone would be amazing. I know I would personally use it almost daily and would consider biking to work.	5/20/2022 11:49 AM
5	Good work!	5/18/2022 1:27 PM
6	Would love to have connecting access from properties on the other side of 321 or have some paved areas along 321 that would allow property owners to get to crossings and access to the trail	5/17/2022 3:09 PM
7	Although I'm a fan of the "get er done" approach. I also think the timeframe is long enough that better alternative routes might present themselves in the future particularly for Section 5 South.	5/16/2022 2:39 PM
8	my priorities are follow the river, be concerned about environmental impact, be away from 321 as much as possible. You are doing a great job.	5/15/2022 8:29 PM
9	Thank you for all your efforts!	5/15/2022 3:27 PM
10	Excellent presentation. We favor routes with as much river exposure as possible. High to high road crossovers make sense. Can promote visibility.	5/15/2022 4:03 AM
11	Thanks for all you've done to move this closer to reality!	5/13/2022 4:13 PM
12	Thank you so much for all your hard work. The completion of the Middle Fork Greenway is a game changer for this area. It also creates opportunities for so many small businesses that will cater to health & fitness and tourism.	5/13/2022 9:41 AM
13	These sections are critical to connect Boone to the Greenway and Blowing Rock. I think alternatives should look at the fastest implementation time.	5/13/2022 8:13 AM
14	It is really exciting to see these concrete plans for the MFG - Blue Ridge Conservancy folks, you're the best, thank you!!	5/13/2022 7:26 AM
15	Less surface roads and 321 that you have to cross the better. Safety for kids and people from cars should be a top priority and trying to route the greenway by the river but not close to the road when possible.	5/12/2022 9:39 PM
16	LOVE this Greenway! We stop and walk it multiple times per week and DREAM of riding our kids from Blowing Rock to Watauga High in 14 years!!	5/12/2022 9:36 PM
17	I'm a long distance runner and really looking forward to sections being connected - and the project overall!	5/12/2022 4:41 PM
18	Can't wait to see more of this project come to life!	5/12/2022 2:54 PM
19	Can wait for it to be finished and hopefully 100% paved for road bike please! Thank you for all you are doing!!	5/12/2022 2:38 PM
20	Keep up the great work and momentum!	5/12/2022 1:50 PM
21	Thank you for the amazing work you do. We are all looking forward to the completion of this	5/12/2022 12:57 PM

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	amazing project.	
22	Great work! Keep going! Press on!	5/12/2022 12:55 PM
23	Think big.	5/12/2022 9:48 AM
24	Brilliant job with lots of info for discussion.	5/11/2022 9:54 PM
25	As a rule, we should avoid all surface road crossings possible. Also, on pretty days in peak season, there is never enough parking, so try to design as many spots as you can. Try to make as much surface asphalt as possible because of its user-friendly surface compared to crushed stone. It will be more accessible to more people, I think.	5/11/2022 5:23 PM
26	Completing the MFG is important for the lifestyles our area is known for. When you travel to other areas they already have these lengths in place and in use. Boone is behind. Keeping the trails in natural settings is healthy.	5/11/2022 12:54 PM
27	Keep fighting the good fight. This has been a dynamic project and you all have done so well navigating the various twists and turns (no pun intended). The connectivity both literally and in a broader community sense will unlock so many opportunities. Your willingness to reconsider options along the way only further motivates others to take a similar cooperative approach with projects. Keep it going!!	5/11/2022 12:51 PM
28	This was great update on this important project and presentation of alternatives!	5/11/2022 12:16 PM
29	Nice review today and good suggestions on proposed routes!	5/10/2022 1:14 PM
30	Grateful for the detailed work in analyzing the route alternatives	5/10/2022 1:03 PM

APPENDIX E: P6.0 SPOT SCORING COMPONENT RESOURCES

NCDOT uses a strategic, data-driven process to develop the State Transportation Improvement Program (STIP). The process involves scoring all roadway, public transportation, bicycle, pedestrian, rail, and aviation projects on a number of criteria. Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs), and the NCDOT Divisions also contribute to the final project score by assigning local priority points to projects. The current round of prioritization is referred to as "P6.0" which is used to update the 2023-2032 STIP.

HOW IT WORKS

Projects receive a percentage of available revenue in the following three categories: Statewide Mobility (40%), Regional Impact (30%), and Division Needs (30%). The Statewide Mobility projects are 100% data driven and selected based on quantitative scores. Regional Impact projects focus on improving connectivity within regions (7). Selection is based on 70% data and 30% local input. Division Needs projects focus on addressing local needs, and selection is based on 50% data and 50% local input. Projects that receive the highest scores will have a greater chance of being programmed into the STIP.

BICYCLE + PEDESTRIAN SCORING

Bicycle and pedestrian projects are scored in a specific manner. Independent bicycle and pedestrian projects are programmed in the Division Needs category. Eligible bicycle and pedestrian projects submitted for prioritization must be included in a locally adopted plan and have a minimum project cost of \$100,000. Eligible activities include ROW acquisition, design, and construction. Additionally, the STI law prohibits the use of state funding for bicycle and pedestrian projects, requiring municipalities to provide the 20% match for federally funded projects. More details on the scoring for these projects are outlined in the following pages. The scoring mechanism should be used to score the preferred alignment presented in this feasibility study.

For scoring purposes, project criteria includes safety, accessibility/connectivity, demand/density, and cost effectiveness. Measure and Division Needs for each are provided below.

CRITERIA	MEASURE	DIVISION NEEDS (50%)
Safety	(Number of crashes x 40%) + (Crash severity x 20%) + (Safety risk x 20%) + (Safety benefit x 20%)	20%
Accessibility / Connectivity	Points of interest pts + Connection pts + Route pts	15%
Demand / Density	# of households and employees per square mile near project	10%
Cost Effectiveness	(Safety + Accessibility / Connectivity + Demand / Density) / Cost to NCDOT	5%

To access scoring resources online, follow these two links:

Project ATLAS

<https://connect.ncdot.gov/resources/Environmental/EAU/Project-Atlas/Pages/default.aspx>

SPOT Online

<https://gis13.services.ncdot.gov/SpotOnline/login.aspx?ReturnUrl=%2fSpotOnline%2fdefault.aspx>

Safety Risk

The analysis for Safety Risk is based on all bicycle and pedestrian crashes to identify scores per risk factor, weighted to calculate total score per roadway segment. This information is geoprocesed in [SPOT Online](#). It is important to note that the higher the exposure means that the risk is higher, which results in a higher score. Five safety risk factors are outlined in the table below.

RISK FACTOR	BACKGROUND	NOTES	WEIGHT
Location within an incorporated area (includes ETJ)	Overall descriptor for crash locations	Preferred over urbanized/non-urbanized; similar to land use results	10
Surrounding land uses	More refined context descriptor for crash locations, indicates travel	Residential/Commercial rank highest; Agriculture/Vacant, Institutional, Other lower categories	20
Roadway configuration	Median without positive control OR one-way may indicate longer crossing distances	Heavy emphasis on two-way, undivided roadways (over one-way or divided roadways)	20
Posted speed limit	Indicator for risk for severe or fatal crashes	25, 35 mph rank highest; 45, 55 mph mid-tier; 60+ mph lowest scores	20
Annual average daily traffic	Indicates increased risk for crash (exposure)	Highest scores to 15,000-40,000; Mid-tier scores for (2,000-6,000), (6,000-9,000), (9,000-15,000); Lowest scores for roads <2,000 or >40,000	30

SPOT Online: <https://gis13.services.ncdot.gov/SpotOnline/login.aspx?ReturnUrl=%2fSpotOnline%2fdefault.aspx>

Safety Benefit

Safety Benefit assesses the Specific Improvement Types (also referred to as SIT).

BICYCLE	SIT	PEDESTRIAN	SIT	SCORE
New Bicycle/Pedestrian Bridge, New Bicycle/Pedestrian Tunnel, Rail-Trail, Shared-Use Path / Multi-Use Path	1, 2	New Pedestrian Bridge, New Pedestrian Tunnel, Rail-Trail, Shared-Use Path / Multi-Use Path	6, 7	7
Buffered Bicycle Lane, Contra-Flow Bicycle Lanes, Separated Bike Lane, Sidepath	2	Sidepath, Sidewalk	7	6
Bicycle Lane	3	Sidewalk Widening, Trail Improvement	9	5
Paved Shoulder	4	Crossing Island, Curb Extensions, Streetscape / Corridor Improvements	8, 9	4
Bicycle Detection / Actuation, Bicycle Signal, Curb Radii Revisions, Hybrid Beacon, Intersection Markings / Signage, Lighting, Mid-Block Crossing	5	Accessible Pedestrian Signals, Curb Ramp, Lighting, Marked Crosswalk, Mid-Block Crossing, Pedestrian Hybrid Beacon, Pedestrian Signal, Rectangular Rapid Flashing Beacon	8	3
Shared Lane Marking ("Sharrows"), Signage	4			2
Bicycle Corral, Bicycle Parking, Bicycle Share / Micro-Mobility Share, Bicycle Wheel Channel, Wayfinding	5	Wayfinding	8	1

Accessibility / Connectivity

The purpose of Accessibility / Connectivity is to identify projects that provide access to nearby points of interest; improve connectivity between destinations; improve connectivity of bicycle/pedestrian network; and improve access and continuity of designated bicycle routes. The Division Needs are 15%, while the criteria weight for Statewide Mobility and Regional Impact are unavailable.

HOW TO MEASURE
POI # total (no cap) + Connection # total (no cap/average) + Route # total

Points of Interest (POI)

POI utilizes Advancing Transportation through Linkages, Automation, and Screening (ATLAS) data and other data layers to measure the number of points of interest within a project buffer.

Project ATLAS: <https://connect.ncdot.gov/resources/Environmental/EAU/Project-Atlas/Pages/default.aspx>

HOW TO MEASURE
1.5-mile buffers for bicycle projects (SITs 1-5)
0.5-mile buffers for pedestrian projects (SITs 6-9)

Specific Improvement Types (SIT)

The nine SITs for bicycle and pedestrian projects are listed below.

NUMBER	SIT	TYPE
1	Grade-Separated Bicycle Facility	Bicycle
2	Off-Road/Separated Linear Bicycle Facility	Bicycle
3	On-Road; Designated Bicycle Facility	Bicycle
4	On-Road Bicycle Facility	Bicycle
5	Multi-Site Bicycle Facility	Bicycle
6	Grade-Separated Pedestrian Facility	Pedestrian
7	Protected Linear Pedestrian Facility	Pedestrian
8	Multi-Site Pedestrian Facility	Pedestrian
9	Improved Pedestrian Facility	Pedestrian

Points of Interest (POI) Categories

POI categories automatically measure the following within [SPOT Online](#):

- Government buildings
- Fire/EMS
- Transit routes
- Schools (K-12, public/private), universities, colleges
- Parks (national, state, and local)
- Tourist destinations (historic districts, major sports)
- Medical (hospitals and public/private clinics)
- Places of worship
- Adult education centers

The following POI categories are manually added by project submitters:

- Employment centers
- Tourist destinations (museums, theaters, auditoriums, historic landmarks)
- Shelters

Connectivity

Points are totaled for connections made by project to various degrees of bicycle / pedestrian infrastructure / projects. Connections are allowed at either end of a project or anywhere along a project (Not required to have connection at endpoints). You may assign one point per each connection to existing bicycle/pedestrian infrastructure or committed bicycle/pedestrian projects. "Committed" means that the project is in the STIP or has local funds. One point (max) may be assigned to any connections to bicycle/pedestrian projects in a plan. Connections should be entered manually by project submitters. [ATLAS](#) PBIN (Pedestrian Bicycle Infrastructure Network) should be utilized as the reference layer since it displays existing and planned infrastructure.

Project ATLAS: <https://connect.ncdot.gov/resources/Environmental/EAU/Project-Atlas/Pages/default.aspx>

Designated Routes

Points are assigned if the project is improving a National/State/Regional bike route or is designated as state/federal trails. Two points are assigned if the project is on or improves a designated route. One point is assigned if the project connects to a designated route. NC State Parks State Trails and NC Bike routes are listed below for reference.

NC STATE PARKS STATE TRAILS
Dan River
Deep River
East Coast Greenway
Fonta Flora
French Broad River
Hickory Nut Gorge
Mountains-to-Sea
Northern Peaks
Overmountain Victory
Roanoke River
Wilderness Gateway
Yadkin River

NC BIKE ROUTES
US 1 - Carolina Connector
NC 2 - Mountains-to-Sea
NC 3 - Ports of Call
NC 4 - North Line Trace
NC 5 - Cape Fear Run
NC 6 - Piedmont Spur
NC 7 - Ocracoke Option
NC 8 - Southern Highlands
NC 9 - Sandhills Sector
Lake Norman Bicycle Route (Regional)
Pottery Loop (Regional)

Bundling Projects

Project bundling is allowed across geographies and across varying project types. This means that projects do not have to be contiguous or related. Projects can consist of multiple SITs (SIT used for submittal must be majority by cost). Projects can be within a single municipality, or across multiple governments. However, multiple governments will need to provide documentation of agreement on bundling, local matches, and project management – further requirements documentation will be created by SPOT.

Bundling will be limited by project management requirements rather than geographic limitations. Any bundled project must be expected to be under one project manager/administrative unit. These must be Transportation Alternative Program (TAP)-eligible entity. Bundling projects makes projects more attractive for Local Input Points (LIP) and easier to manage/let.



**MIDDLE FORK GREENWAY
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2022**