

2024

Swannanoa River Greenway Extension

Feasibility Study

FRENCH BROAD RIVER
METROPOLITAN PLANNING ORGANIZATION

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00 Executive Summary



EXECUTIVE SUMMARY

The proposed Swannanoa River Greenway Extension aims to establish a safer and more accessible route for walking and biking in Asheville, helping to create a complete multimodal corridor along the Swannanoa River. The project expands transportation options for people by linking key areas with a new multimodal facility, bridging important gaps in the network and offering new recreation opportunities. This link is part of the Asheville spine greenway network and also serves regional connections to the Hellbender Regional Trail network and the Fonta Flora State Trail.

The Swannanoa River Greenway Extension Feasibility Study investigates the existing conditions of the area, analyzes different route options to identify opportunities and constraints, provides cost estimates, and proposes strategies for the implementation of the greenway. The study also offers an action plan for implementing the recommended infrastructure.

Study Area

The study area includes various physical constraints, including flood hazard zones, industrial land uses, historic properties, and railroad corridors. The feasibility study team developed alternatives offering a range of implementation options, each with varying degrees of complexity. This approach provides the flexibility needed to advance alignments in a manner that can be adjusted as needed to integrate with the planned NCDOT projects in development that connect sections of the Swannanoa River Greenway to the east and west.

Figure 1. Survey Response Quotes



Alternative Development

The Feasibility Study developed the greenway alternatives and implementation plan through the following steps:

Step 1. Review of study area conditions: Through a detailed evaluation of opportunities and constraints, the team identified potential greenway segments.

Step 2. Greenway segment analysis: The project team vetted the route segments identified in Step 1, analyzing potential railroad and landowner responses, and identifying constructibility challenges. This work resulted in a shortlist of the most viable connections to carry forward into Step 3.

Step 3. Alternatives development and evaluation: The team combined viable segments (from Step 2) into alternatives, established design standards, and estimated costs. Each alignment was evaluated based on criteria developed to identify the preferred alternative(s).

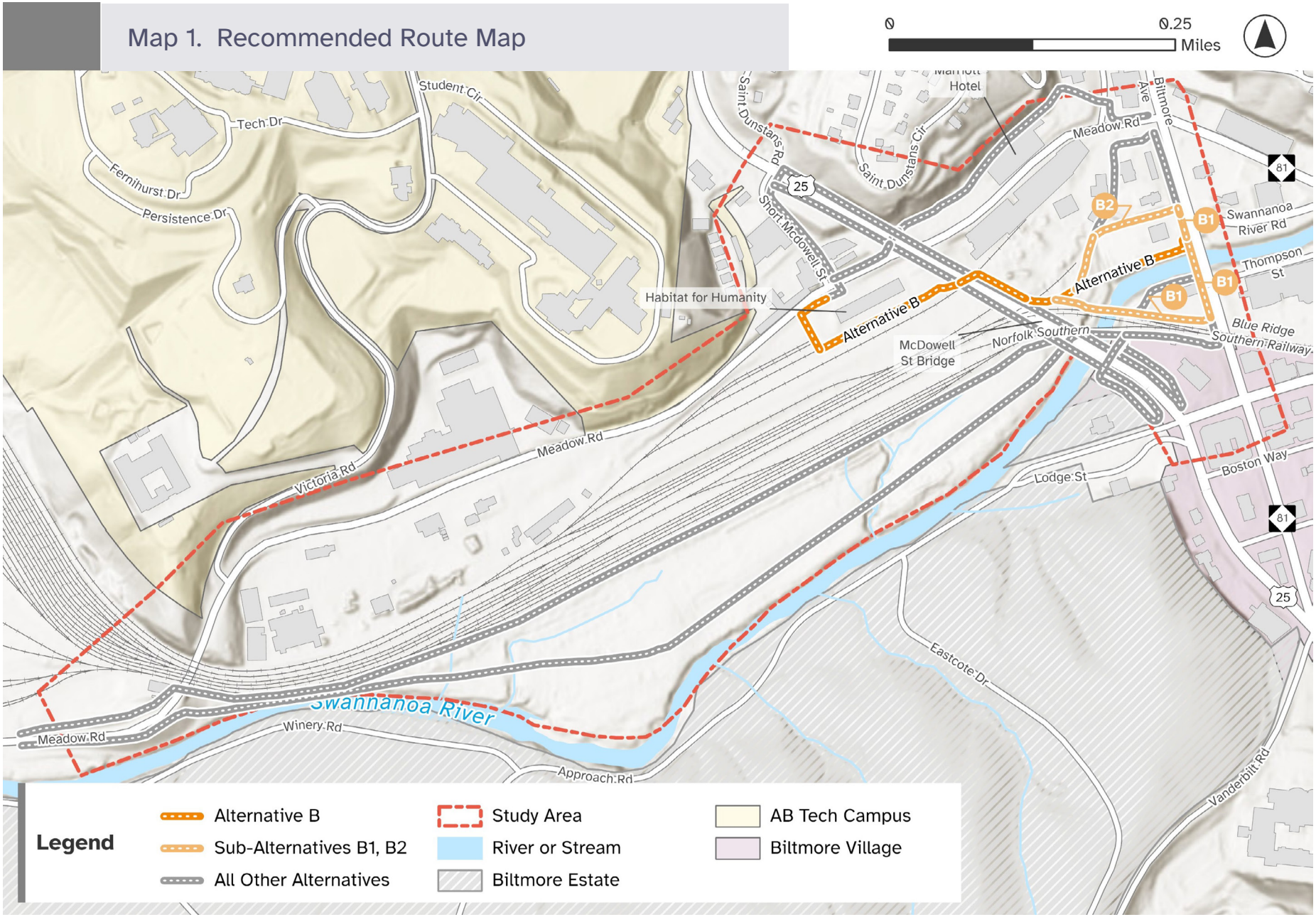
Step 4. Community engagement: The team obtained feedback from the study steering committee, held discussions with key stakeholders, and solicited broad community input through an online survey.

Step 5. Implementation + final study: The team identified and developed an implementation plan and funding options for the preferred alternative(s).

The alternatives developed are as follows:

- **Alternative A**: This alternative follows the Swannanoa River to the greatest extent possible. A paved path would begin at Meadow Road just before the bridge over the railroad tracks. From the western end of the bridge, the trail would divert from the roadway on a proposed new elevated structure and slowly ramp down to run along an existing sewer easement on the north side of the river between the railroad tracks and the river. On the eastern end of this alternative, a new bridge would be required to cross the Swannanoa River under the McDowell Street bridge near the McDonald's restaurant, running parallel and south of the railroad bridges over the river. A connection along Biltmore Avenue will be necessary to access the Swannanoa River Greenway alignment on the east side of Biltmore Avenue that is advancing as a separate project (NCDOT Project #U-5832). Given that there are extensive engineering and permitting challenges with this alternative, further engineering investigation is needed to verify feasibility. This alternative would also require approval from several entities including Norfolk Southern, Duke Energy, Metropolitan Sewerage District (MSD), and the Biltmore Company.
- **Alternative B**: This alternative starts near Meadow Road and Short McDowell Street. Here it will connect with the future Meadow Road sidepath planned to be constructed with NCDOT's Meadow Road Project (NCDOT Project #U-4739). From this intersection, the alternative would continue south as a paved path along the western and southern edges of the Habitat for Humanity ReStore property. After passing under the McDowell Street bridge on an abandoned rail bed, the path would traverse the edge of the Biltmore Iron & Metal property and follow the sewer easement that runs on the south side of the Asaka Japanese restaurant parking lot. A pedestrian crossing across Biltmore Avenue would connect with the future Swannanoa River Greenway to the east that is advancing as a separate project (NCDOT Project #U-5832).
- **Alternative C**: This alternative starts near Meadow Road and Short McDowell Street. Here it will connect with the future sidepath planned for Meadow Road (NCDOT Project #U-4739). From this intersection, the alternative will continue north along Short McDowell Street to McDowell Street before turning south to travel across the bridge to Biltmore Village. Adjustments to McDowell Street bridge would be made to accommodate a sidepath and to provide a barrier from vehicles along the south side of the bridge. The route would then follow the edge of the Biltmore property and pass under the McDowell Street bridge into the McDonald's parking lot. From there it will run parallel with the railroad tracks and then turn north to cross the tracks at Biltmore Avenue. A pedestrian crossing at Biltmore Avenue would connect with the future Swannanoa River Greenway to the east that is advancing as a separate project (NCDOT Project #U-5832).

Map 1. Recommended Route Map

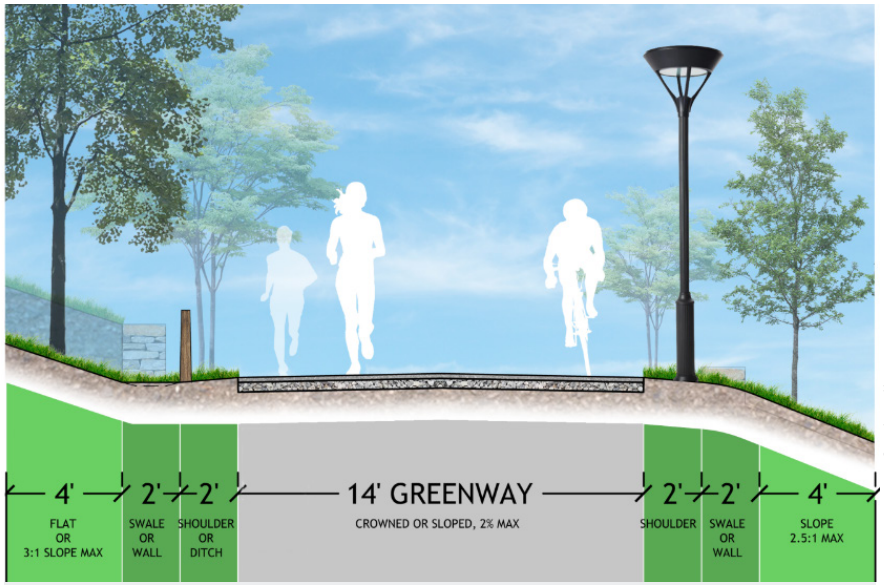


RECOMMENDED ROUTE

Throughout the study process, the project team examined and evaluated three possible alternative routes for the greenway. To determine a preferred route, the team's methodology incorporated community feedback, technical assessments, input from the study steering committee, and discussions with landowners in the study area. This approach helps ensure that the chosen route aligns with the needs and desires of the community while addressing practical considerations and potential challenges. The steering committee for the study has been instrumental in determining the preferred alignment for the project.

After careful consideration, the committee selected **Alternative B** as the preferred route since it is the least expensive and most direct alternative. It also aligns most directly with adjacent trail sections that are in development through NCDOT projects. This option is described in more detail in Chapter 4 and 5, and includes sub-alternatives that may prove more feasible once additional steps are taken towards a final design in the implementation process.

Image 1. Asheville Greenway Spine Network Typology



Source: City of Asheville

This facility will be used for both recreation and transportation, so needs to be wide enough to accommodate a range of different users (and speeds) throughout the day.

IMPLEMENTATION HIGHLIGHTS

Developing a successful greenway project is a complex process that depends on partnerships involving various stakeholders within the community. Key participants in this collaborative effort encompass property owners along the greenway route, the French Broad River MPO, NCDOT, the City of Asheville, advocacy organizations, private sector partners, and local residents. Each of these entities plays a role in contributing their expertise, resources, and support to ensure the project's success and long-term sustainability.

Chapter 5 outlines further implementation considerations, including:

- An action plan delineating recommended implementation tasks, agency leads, key partners, time frames, and performance metrics.
- A summary of available funding sources encompassing NCDOT funding avenues, federal grant opportunities, potential public-private partnerships to leverage grants, and volunteer support for the greenway's completion.
- Considerations on developing a sustainable maintenance strategy, featuring sample maintenance tasks, task categorization, recommended frequency, and other considerations.
- Identification of key partners and their roles, including municipal staff, elected officials, French Broad River MPO staff, regional and state partners, NCDOT, private sector collaborators, and community advocacy organizations.



01 Introduction

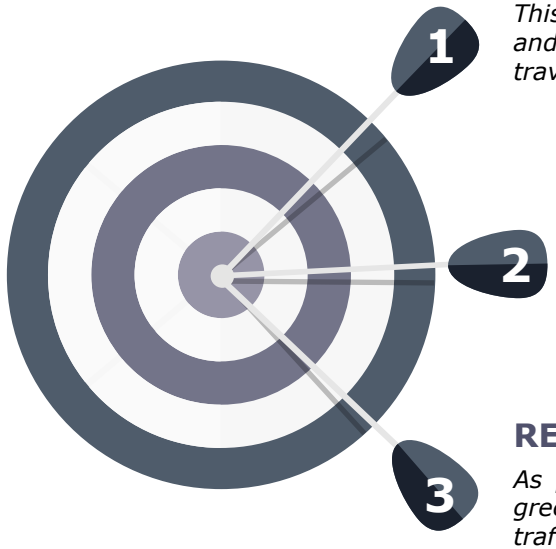


OVERVIEW & STUDY GOALS

The City of Asheville has plans for a greenway spine corridor that parallels the Swannanoa River from the completed Wilma Dykeman Greenway in the River Arts District to US 70/Tunnel Road east of Azalea Road. The aim of the Swannanoa River Greenway is to determine the optimal route alternative for a pedestrian and bicycle connection along the Swannanoa River corridor, providing a new multimodal transportation and recreation corridor for the community - a key "spine" in the network that connects east and west Asheville. The project will connect the River Arts District to Biltmore Village and offer connections to McDowell Street and nearby Asheville High School and Asheville-Buncombe Technical Community College.

Spearheaded by the North Carolina Department of Transportation's (NCDOT) Integrated Mobility Division, this project - the Swannanoa River Greenway Extension - is a collaboration between the French Broad River Metropolitan Planning Organization (FBRMPO) and the City of Asheville.

Figure 2. Project Goals



IMPROVE SAFETY & HEALTH

This project improves safety for people of all ages and abilities by providing a continuous pathway to travel on foot or by bicycle on a dedicated facility.

PROVIDE MOBILITY AND TRANSPORTATION CHOICE

By improving access and mobility options, this project elevates the need of those most disadvantaged by our transportation system - addressing equity by providing a facility for people who cannot or do not want to rely on motorized vehicles for transportation.

REDUCE TRAFFIC & EMISSIONS

As people choose to walk or bicycle along the greenway instead of relying solely on cars, nearby traffic volumes will decrease, with the associated environmental benefits of improvements to air pollution and reduced carbon emissions.

OUTCOMES

A feasibility study yields several specific outcomes, including:

Assess Possible Route Alternatives: By analyzing site conditions, the study identifies opportunities and constraints to develop various route alternatives for this new bicycle and pedestrian connection.

Identify Key Stakeholders: Engagement with project stakeholders helps shape study recommendations and establishes ongoing relationships that are important for the project's progression into the design phase.

Estimate Project Costs: Through thorough analysis, the study calculates anticipated costs associated with designing and constructing the recommended facility, facilitating the development of a project funding plan and future programming.

Plan of Action: Based on informed assessments, the study provides recommendations for preferred route alternatives and outlines a range of potential implementation scenarios and funding sources to guide the project's progression.

WHAT IS A FEASIBILITY STUDY?

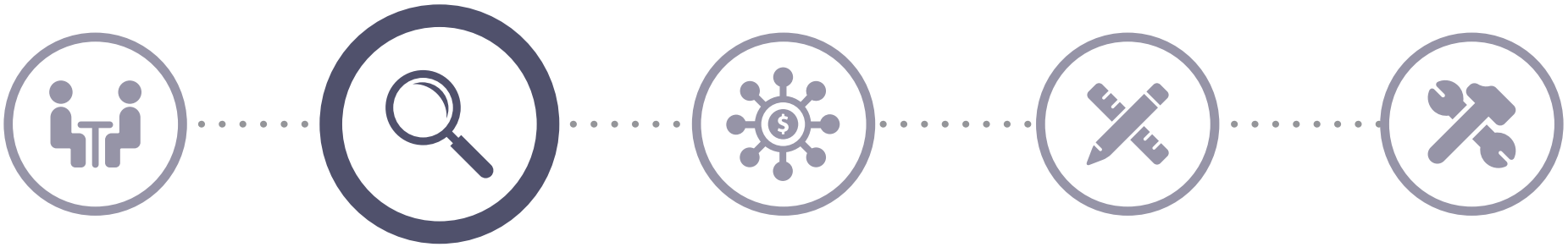
A feasibility study constitutes a technical analysis aimed at assessing the physical and environmental constraints that may affect the construction or enhancement of multimodal facilities. A feasibility study is an important phase in infrastructure development, particularly for projects like greenways. It serves to pinpoint significant project risks requiring further investigation before finalizing scope and cost estimates. These studies play a role in bridging the gap between initial planning and subsequent stages of prioritization, programming, and design.

Equipped with the insights gleaned from such studies, local authorities and their collaborators can effectively identify funding sources, secure necessary permissions, and progress towards finalizing the design and initiating construction.

Key components of a greenway feasibility study include:

- Gathering input from local stakeholders and community members
- Assessing environmental features such as wetlands and endangered species habitats
- Evaluating physical constraints like steep slopes and impacts on private properties
- Determining right-of-way availability (e.g. property ownership or the ability to acquire property for facilities)
- Considering utilities and railroad lines

Figure 3. Key Transportation Project Steps



PROCESS & SCHEDULE

This project is built upon stakeholder engagement and an analysis of existing conditions, leading to the formulation of route alternatives and recommendations. Initiated in June 2023 and finalized in June 2024, the study was guided by a project Steering Committee of individuals with local expertise. This committee provided consultation at key junctures throughout the project timeline.

The process for conducting a greenway feasibility study involves several key steps to assess the viability and potential impact of implementing a new recreational and transportation facility. Initially, the study begins with a kickoff meeting and an analysis of existing conditions, which includes data collection, site visits, fieldwork, and mapping exploration and analysis.

Following this, route analysis takes center stage, involving the identification of route alternatives, the establishment of route selection criteria and decision matrix, and the organization of stakeholder meetings to gather feedback and input.

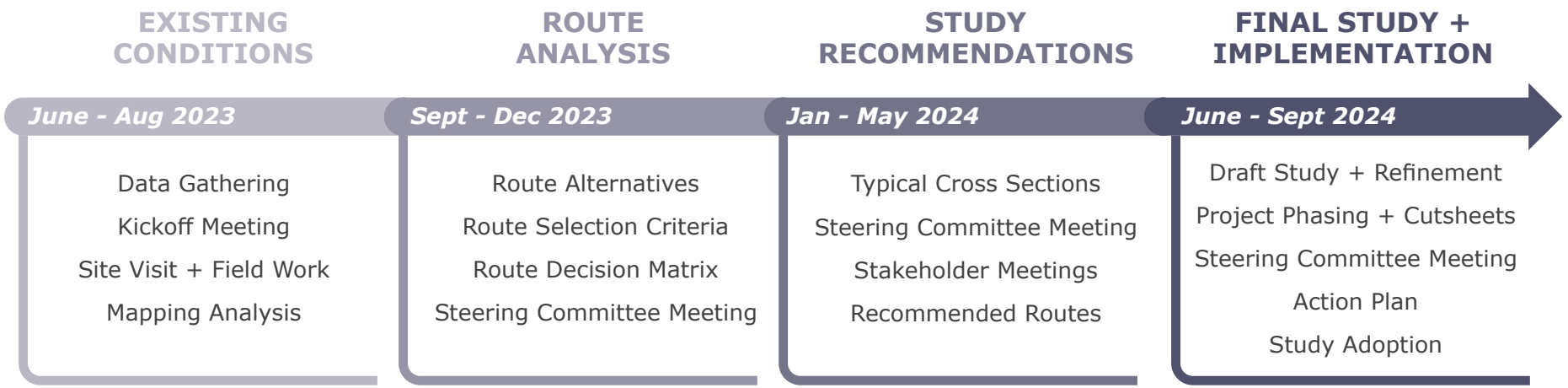
Based on these analyses, study recommendations are formulated, including the identification of recommended routes, design considerations, and ongoing stakeholder engagement to ensure alignment with community needs and preferences.

Finally, the study concludes with the development of a final report, which includes project phasing and cutsheets, refinement based on feedback, and an action plan with potential avenues for implementation. Throughout this comprehensive process, collaboration with stakeholders and rigorous analysis are essential to ensure the feasibility and success of the proposed greenway project.

This study process was divided into the following four phases:

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

Figure 4. Project Process & Schedule



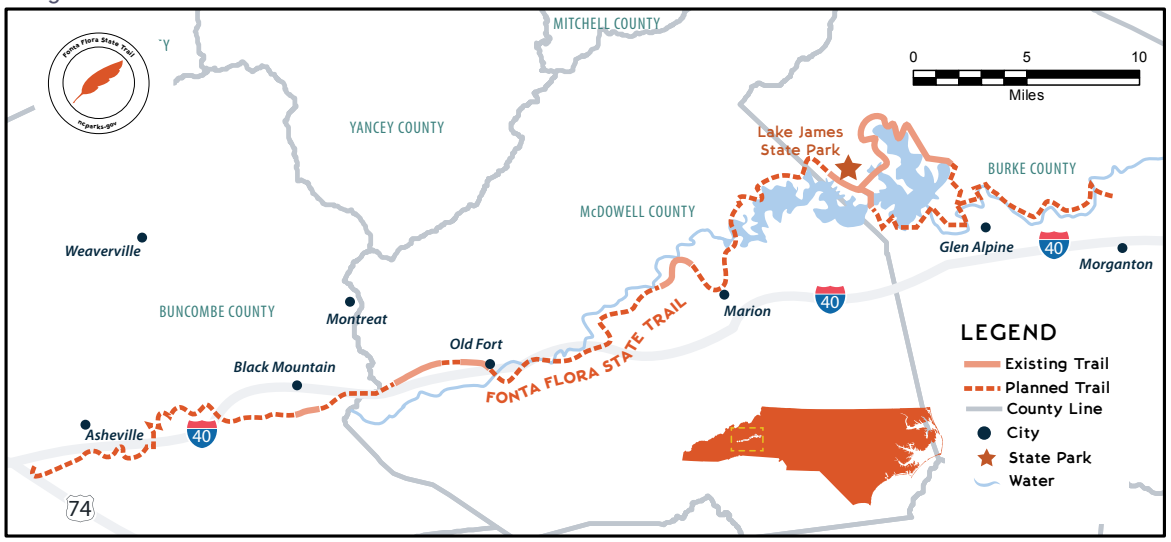
BACKGROUND & SITE HISTORY

Originally conceived in the Wilma Dykeman Riverway Plan and since gaining support through the Close the GAP Plan and Biltmore & McDowell Corridor Study, the Swannanoa River Greenway will eventually extend from the confluence of the French Broad River and the Swannanoa River near the Amboy Road / Meadow Road intersection east to the Asheville city limits near the Azalea Road and Tunnel Road intersection. The Swannanoa River Greenway is a key regional connector greenway and is identified in regional and statewide trail plans including the Fonta Flora State Trail (Asheville to Morganton), the Great Trails State Plan, and the Hellbender Regional Trail.

These existing plan documents demonstrate a commitment to multimodal and recreation planning, providing a foundation for the development of the Swannanoa River Greenway Extension Feasibility Study. The City's continued focus on this corridor as a spine in the greenway network has further emphasized the importance of this project, elevating it to a priority status. Along with NCDOT's planning process for improvements to Meadow Road, this project is one step closer to realization.

In 2023, NCDOT's Integrated Mobility Division awarded the French Broad River MPO a grant to investigate how the Swannanoa River Greenway vision might become a reality.

Image 2. Fonta Flora State Trail



Source: North Carolina State Parks

Image 3. Hellbender Regional Trail Map (Green Line)



Source: French Broad River MPO

The Swannanoa River corridor consistently rises to the top of many local, regional, and state trail planning efforts. The Hellbender Regional Trail is the overarching vision to link municipalities throughout the region with continuous greenway networks.

EXISTING PLANS

Reviewing previously adopted plan documents is helpful to understand desires and project ideas in the community. The Appendix provides the full review of relevant plans reviewed as a part of this feasibility study, which include the following:

- NCDOT Roadway Design Manual (2023)
- Close the GAP: City of Asheville Greenways, ADA, and Pedestrian Plan (2022)
- North Carolina Great Trails State Plan (2022)
- Biltmore Avenue & McDowell Street Corridor Study (2021)
- French Broad River Metropolitan Transportation Plan (2020)
- Hellbender Regional Trail Plan (2020)
- Swannanoa Greenway Phase 1 Schematic Design (2019)
- Swannanoa River Greenway Corridor Study (2019)
- NCDOT Complete Streets Policy (2019)
- City of Asheville Transit Master Plan (2018)
- Asheville in Motion: City of Asheville Mobility Plan (2016)
- Buncombe County Greenways & Trails Master Plan (2012)
- US 70/Swannanoa River Greenway Feasibility Study (2010)
- The Wilma Dykeman Riverway Master Plan (2004)

Image 4. Biltmore & McDowell Corridor Study Map



Source: City of Asheville

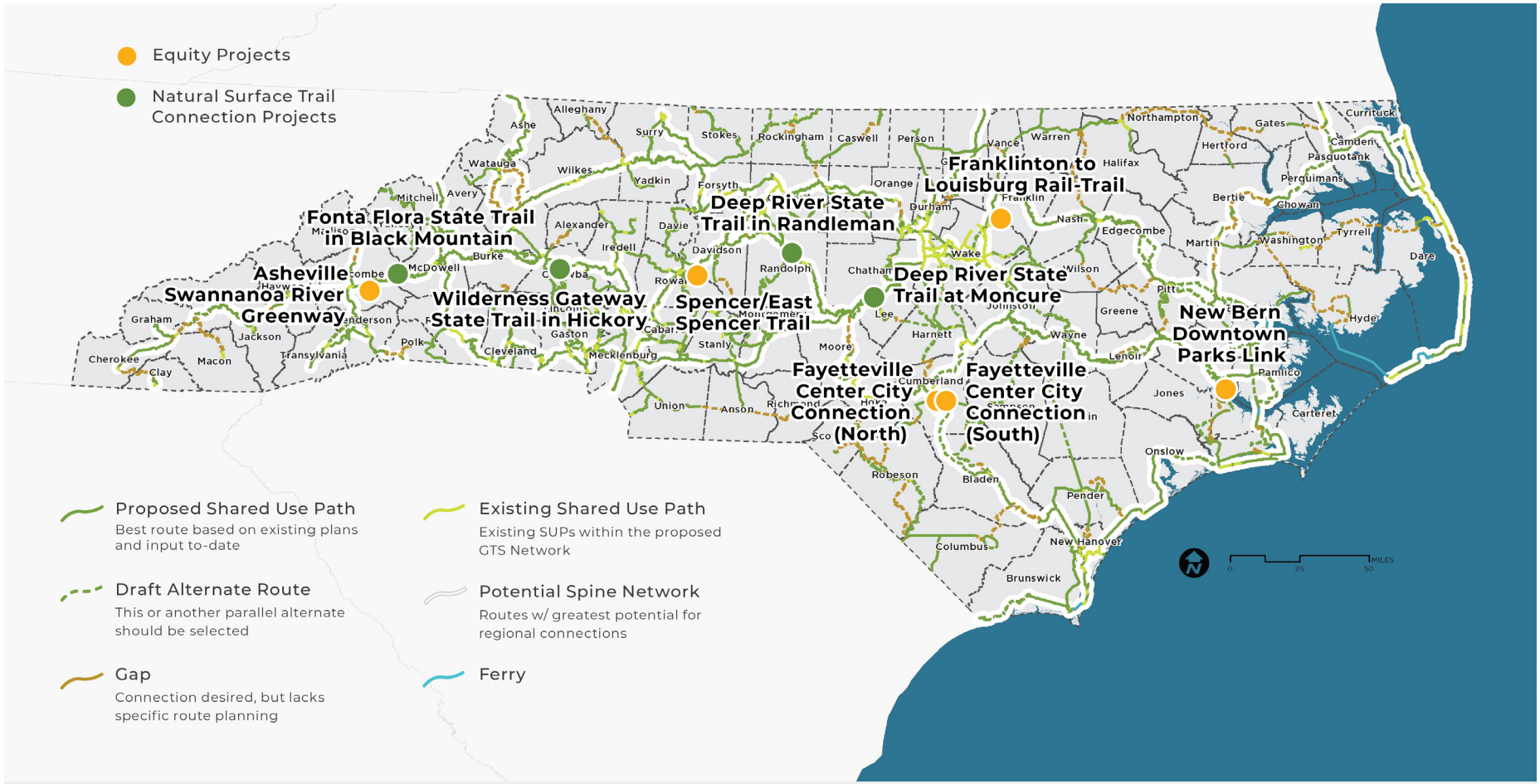
Image 5. McDowell Street Cross-Section (Biltmore & McDowell Corridor Study)



Source: City of Asheville

The Biltmore & McDowell Corridor Study identified the need for improved bicycle and pedestrian accommodations along both streets. A preliminary cross-section included a multiuse path along the western side of McDowell Street.

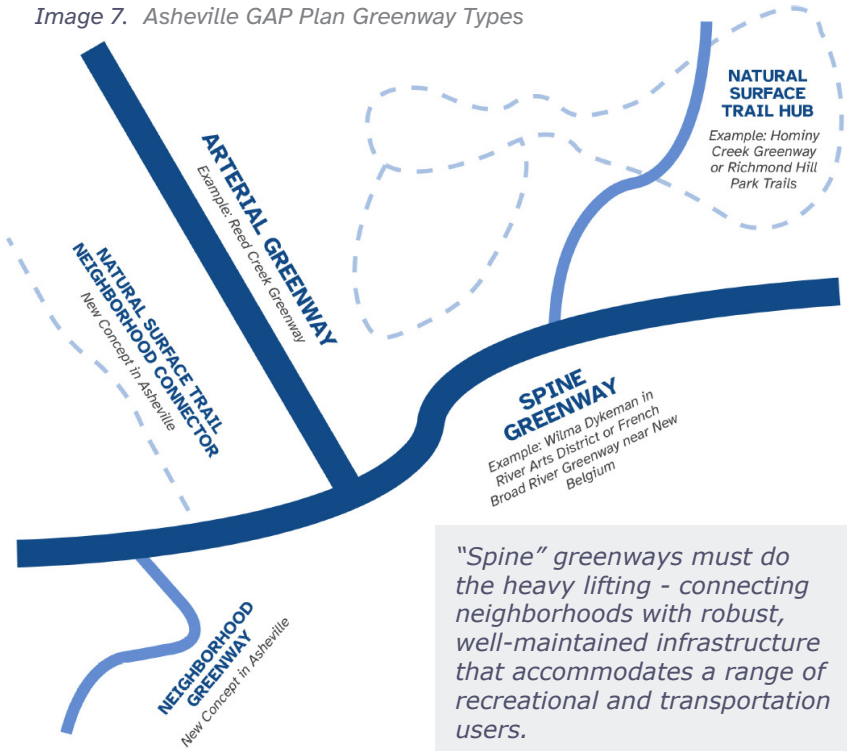
Image 6. North Carolina Great Trails State Plan Top Ten Projects



Source: NCDOT

The Great Trails State Plan (GTSP) envisions a network of trails that connect major destinations throughout North Carolina and can be used for transportation and recreation. The Swannanoa River Greenway was highlighted as one of the plan's Top Ten Projects, with a key equity focus. These projects address areas of greatest transportation disadvantage, defined by NCDOT's Transportation Disadvantage Index, which identifies concentrations of zero vehicle households, poverty level, youth aged 15 and under, seniors aged 65 and older, mobility impairments, and Black, Indigenous, and Persons of Color. These projects also have a high level of constructibility and partner investment.

Image 7. Asheville GAP Plan Greenway Types



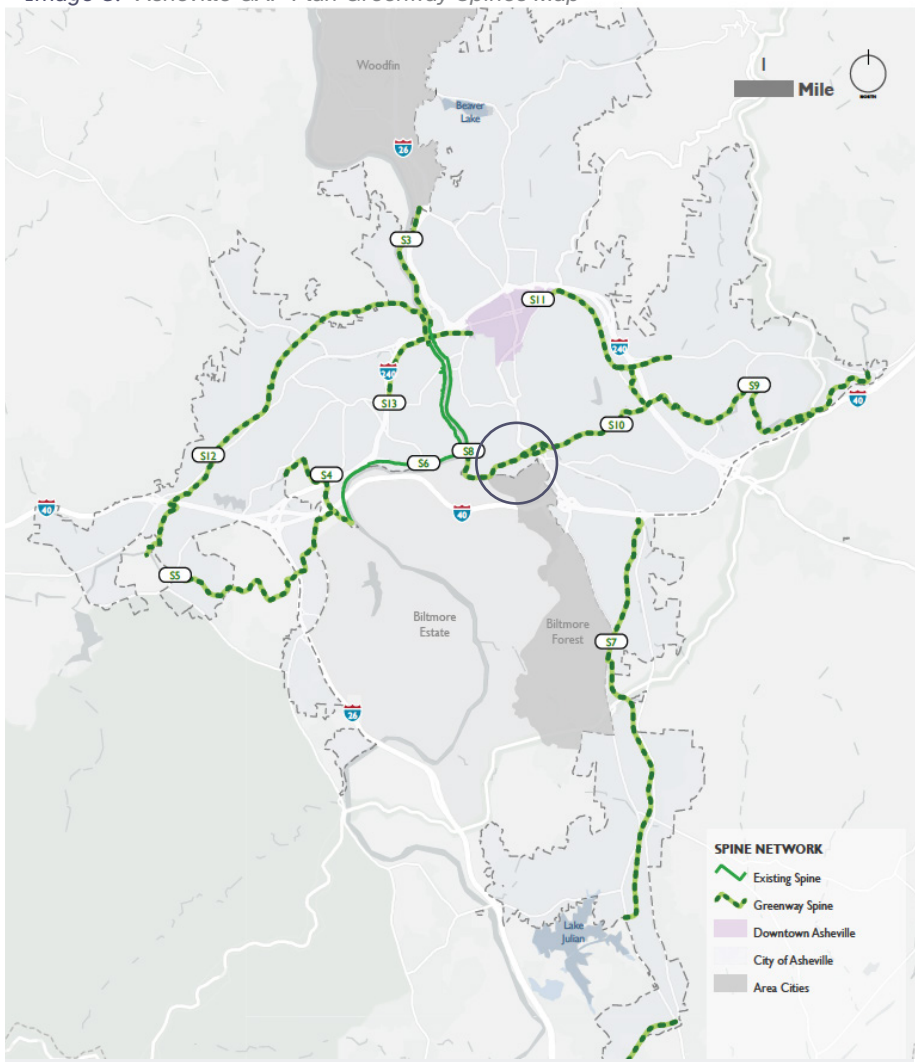
Source: City of Asheville

"Spine" greenways must do the heavy lifting - connecting neighborhoods with robust, well-maintained infrastructure that accommodates a range of recreational and transportation users.

Asheville's Close the GAP plan ranks the Swannanoa River Greenway as Number 1 of the Top Ten Greenway Projects, dividing the Swannanoa River Greenway into three sections, each of which has a projected funding approach:

- Swannanoa River Greenway West, from the French Broad River to Glendale Avenue - construction for this segment is anticipated through NCDOT projects U-4739 and U-5832.
- Swannanoa River Greenway East I, from Glendale Avenue east to Bleachery Boulevard (near Walmart) - construction for this segment is anticipated for 2024. *(see Image 9)*
- Swannanoa River Greenway East II, from Bleachery Boulevard to the city limits - construction for this segment is anticipated through NCDOT project U-5832.

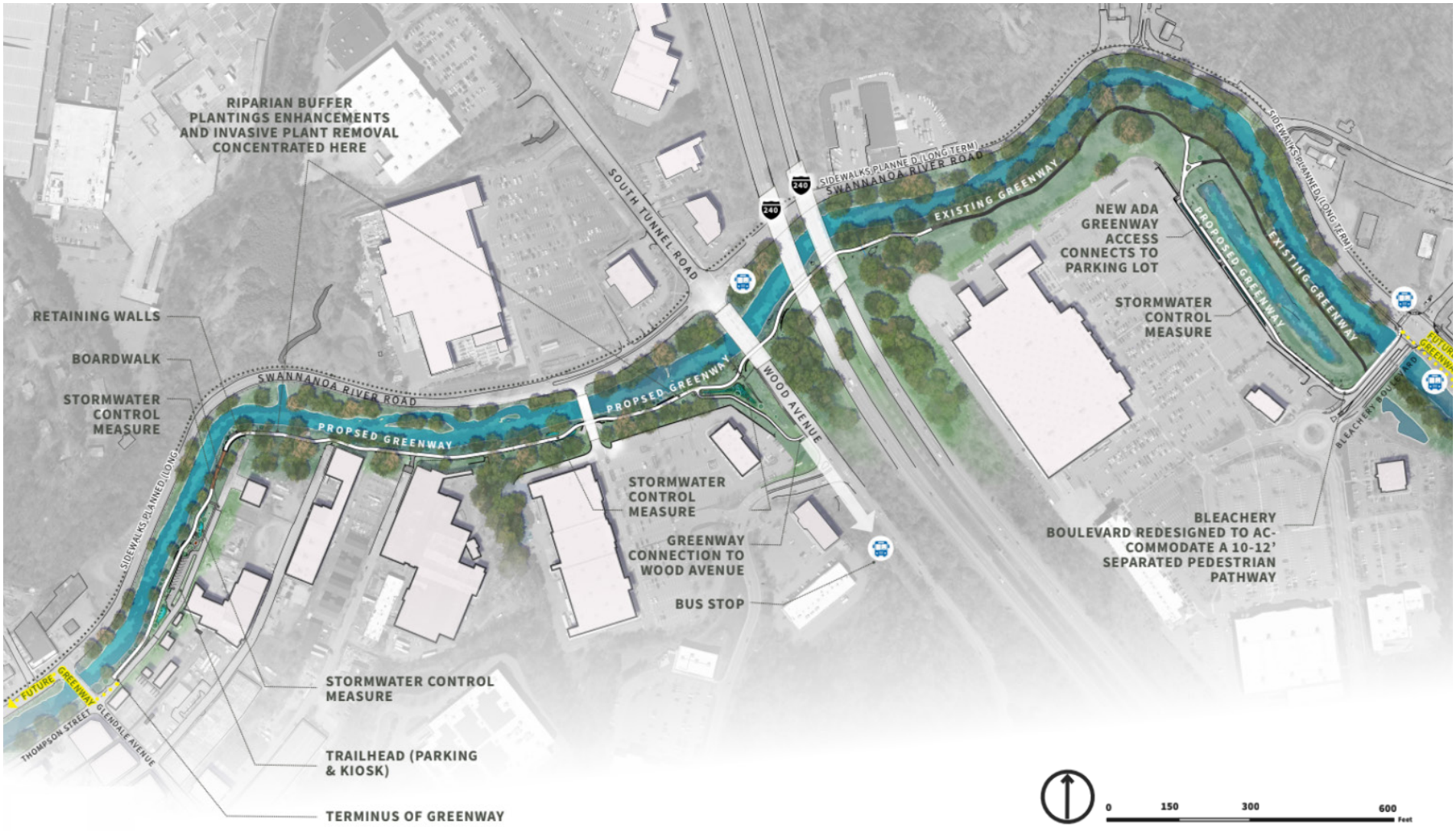
Image 8. Asheville GAP Plan Greenway Spines Map



Source: City of Asheville

This facility is envisioned as a core segment of Asheville's greenway spine network, serving as one of the only east-west multimodal transportation corridors and a continuation of the French Broad River greenway system.

Image 9. Swannanoa River Greenway East I



Source: City of Asheville

The City is moving forward with the first eastern section, constructing the portion of the greenway from Glendale Avenue along the south side of the Swannanoa River to the existing greenway adjacent to the Walmart parking lot. This section of the Swannanoa River Greenway (under construction in 2024) will help highlight the river as a recreational amenity and transportation corridor. Once there is a greenway extending along the river to the study area at Biltmore Avenue, the link to Meadow Road and the River Arts District will be even more important.

Large portions of the Swannanoa River Greenway are planned for construction through two NCDOT projects:

Amboy Road/Meadow Road Widening Project (NCDOT Project U-4739): This project will include a multiuse path (MUP) along Amboy and Meadow Roads. The MUP will terminate at Short McDowell Street, near Habitat for Humanity. Design work is currently underway by Division 13, with construction expected to start in 2029.

Swannanoa River Road Widening Project (NCDOT Project U-5832): This project spans from the intersection of Swannanoa River Road and Biltmore Avenue to South Tunnel Road (US 74A). It may include sections of a MUP, but there is a risk that this project could be removed from the State Transportation Improvement Program (STIP). Division 13 is considering applying for a federal planning grant to advance the project, but no confirmation has been made.

Additionally, the City is working independently on another portion of the Swannanoa River Greenway:

City of Asheville's Bond Project: The City is constructing a section of the Swannanoa Greenway as part of its transportation bond program. This segment, from Thompson/Glendale to Walmart, is under construction and is expected to be completed by Autumn 2026. See **Image 9 - Swannanoa River Greenway East I.**

Meanwhile, the segment of the Swannanoa River Road Greenway from South Tunnel Road to Gashes Creek Road is still in the planning phase, and no funding is currently available for its advancement.

PROJECT BENEFITS

Enhancing pedestrian and bicycling connectivity along the Swannanoa River has potential to expand mobility. This improvement will facilitate easier access to key areas and various destinations, as well as many employment centers along or connected to the corridor. Furthermore, the benefits of improved connectivity extend beyond the river corridor, fostering better links with nearby neighborhoods and educational institutions such as Asheville High School and A-B Tech. By creating a network of pathways along the Swannanoa River, the community stands to benefit from increased accessibility and improved transportation options, further enhancing the overall livability and connectivity of the area.

By providing designated areas for bicycling and walking, conflicts with motor vehicle traffic are minimized, thus enhancing safety for both area residents and visitors. These dedicated spaces allow individuals to traverse longer distances without the need to navigate busy intersections, further reducing potential hazards. Greenways also offer numerous health benefits by encouraging physical activity and supporting both physical and mental well-being. Additionally, the promotion of walking and bicycling can contribute to broader benefits such as public health, economic prosperity, and fostering a sense of community pride.



Figure 5. The Many Benefits of Bicycle & Pedestrian Infrastructure

The positive impact of
WALKING & BIKING

SAFETY



More than 7,388 people
(an average of nearly 21 per day)
nationwide were struck and killed while walking in 2021.[1]



Estimated 60,000 pedestrians
were injured nationwide in 2021.[1]



Approximately 17%
of all traffic fatalities in the U.S. in 2021 were pedestrians, a rate that has been increasing over time *(up from 14% in 2012).*[2]

265

people killed while walking
in North Carolina in 2022
(a 3% increase from 2021).[3]

Despite the disruptions caused by the COVID-19 pandemic, one concerning trend remained unchanged: an increase in pedestrian fatalities. Despite a decrease in driving in 2020 due to the pandemic, the number of pedestrian deaths rose by 4.7% compared to the previous year.

Although walking and bicycling may constitute a smaller portion of total trips compared to other modes of transportation, people who walk and ride bicycles bear a disproportionate burden in terms of traffic fatalities. Referred to as vulnerable users of streets, people walking and bicycling face an increased risk of severe injury when involved in collisions with automobiles, often due to the lack of dedicated infrastructure. This absence forces them to navigate in unsafe conditions, such as alongside shoulders or roads shared with much faster vehicles. Such conditions can make walking and bicycling intimidating or perilous, resulting in reduced levels of active transportation and an increased reliance on private vehicles for those who can drive, or heightened isolation, vulnerability, and unmet needs for those who cannot. By investing in dedicated infrastructure and promoting road safety education, communities can mitigate the risks faced by people walking and bicycling. Everyone benefits when a community designs transportation systems that prioritize the safety of the most vulnerable users.[4]

Investments in greenway infrastructure can yield positive safety benefits for all roadway users by establishing separate spaces for various modes of travel, thereby reducing speed differentials and potential conflicts.[5]

The positive impact of
WALKING & BIKING

HEALTH

5 Reasons to Walk & Bike

Walking or biking for as little as 20 minutes a day has been found to show significant improvements in your overall health, including:

- **Improving cardiovascular health**
- **Strengthening muscles & bones**
- **Increasing focus, mood & memory**
- **Boosting immune system function**
- **Preventing & managing common health problems**

Regular physical activity offers a multitude of health benefits regardless of age, sex, race, ethnicity, or current fitness level. However, data from the CDC's National Health Interview Survey reveals that only about 20% of individuals report meeting the recommended guidelines for both aerobic and muscle-strengthening activities.[6]

Studies have emphasized that adults can attain significant health benefits by engaging in as little as 20-25 minutes of physical activity per day, which equates to walking approximately one mile.[7] Walking and bicycling offer an extensive array of long-term health benefits, impacting various aspects of well-being including brain health, pulmonary function, circulation, and overall physical fitness. Studies have associated regular walking and bicycling with a decreased risk of chronic diseases, heart disease, and certain types of cancer.

Moreover, walking and bicycling provides immediate short-term advantages. According to the U.S. Department of Health and Human Services (HHS), even a single session of moderate-to-vigorous physical activity can lead to immediate benefits such as lowered blood pressure, enhanced insulin sensitivity, improved sleep, reduced symptoms of anxiety, and heightened cognitive function. Additionally, consistent physical activity in children has been demonstrated to enhance attention and memory, while decreasing the risk of depression.[8]

> **"To improve walking and walkability, communities need to be designed to make walking safer and easier; programs and policies need to be available to support and encourage walking; and individuals and families need to support each other to become and stay active."**
>
> *- US Surgeon General*

The positive impact of
WALKING & BIKING

ECONOMY

In NC, greenway users' annual expenditures supported an additional **43 jobs, $1.3 million in employee compensation,** and **$4.9 million** in gross business revenues.[13]

A recent NC study estimated that **every $1.00 invested** in greenway construction resulted in approximately **$1.72 in annual benefits,** including local business revenue, sales tax revenue, and health and transportation-related benefits.

1.5X to 3X MORE

Economic benefit found in NC
generated for a dollar spent at an independent business compared to spending that same dollar at a retail chain.[14]

13:1

13:1 benefits vs cost
Recent UK studies on the economic benefits of walking interventions show an average benefit-to-cost ratio of 13:1.[15]

Several studies conducted in North Carolina have underscored the significant economic advantages associated with investments in bicycle and pedestrian infrastructure. For example, research conducted by the Institute for Transportation Research and Education (ITRE) demonstrated that the establishment of a bicycle and pedestrian bridge resulted in notable economic gains. Moreover, in 2018, ITRE conducted a comprehensive study examining the economic impacts of four shared-use paths across the state, including one in Brevard. These studies have documented the economic benefits of greenways, which encompass augmented property values and heightened expenditures on recreational pursuits such as equipment, dining, and lodging.[9]

Additional studies have shown that well-planned non-motorized transportation improvements can lead to an increase in customer visits and local business activity.[10] Pedestrians tend to be more attentive to window displays, explore multiple stores, and spend more time shopping, factors that can significantly bolster sales. By emphasizing and advocating for walkable and bikeable communities, we cultivate an environment conducive to the prosperity of independent businesses, fueling economic expansion, and strengthening the local economy.[11]

Robust active transportation networks also have the potential to boost tourism by attracting visitors who seek outdoor recreational opportunities and walkable downtowns. Investing in greenways directly contributes to job creation, higher wages, and increased business output for outdoor recreation-related industries and nearby establishments.[12]

The positive impact of
WALKING & BIKING

COMMUNITY

+3.1 friends per person
Residents of a street with 2,000 vehicles per day have three times as many friends as one with 16,000 vehicles.[17]

Residents of highly walkable, mixed use neighborhoods exhibited at least **80% greater levels of four indicators of social capital** (knowing neighbors, sociability, trust and political participation) than those in less walkable neighborhoods.[18]

> **"If you plan cities for cars and traffic, you get cars and traffic. If you plan for people and places, you get people and places."**
>
> *- Fred Kent, Project for Public Spaces*

Improving walking and biking infrastructure in communities not only enhances quality of life but also guarantees access to vital services and opportunities for everyone, regardless of their circumstances or preferences. By prioritizing and facilitating a range of transportation options, individuals gain the autonomy to choose their mode of transportation, fostering a dynamic and inclusive community where people are empowered with mobility choices.

Living in walkable and bikeable neighborhoods correlates with numerous positive social outcomes. National and international research indicates that individuals in walkable communities exhibit higher levels of trust in their neighbors, actively participate in community initiatives, and engage in volunteerism more frequently compared to those in less walkable areas.[16]

Transitioning more trips from motor vehicles to walking and bicycling can alleviate traffic and parking congestion in our communities and greenways play a vital role in supporting the natural environment by contributing to improved air and water quality. They aid in reducing air pollution by effectively removing harmful pollutants such as ozone, sulfur dioxide, carbon monoxide, and airborne heavy metal particles.

Additionally, greenways can enhance water quality by acting as natural buffer zones, safeguarding streams, rivers, and lakes from pollutants, preventing soil erosion, and filtering out contaminants from agricultural and road runoff. Furthermore, greenways can serve as a protective barrier against natural disasters like flooding.

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ENDNOTES

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16 Rogers, S., J. Halstead, K.H. Gardner, C. Carlson, "Examining Walkability and Social Capital as Indicators of Quality of Life at the Municipal and Neighborhood Scales," Journal of Applied Research in Quality of Life, Volume 6, Issue 2 (2011), Page 201. (DOI: 10.1007/s11482-010-9132-4).

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18 *Making the case for investment in the walking environment: A review of the evidence, by Danielle Sinnett, Katie Williams, Kiron Chatterjee and Nick Cavill. 2011*



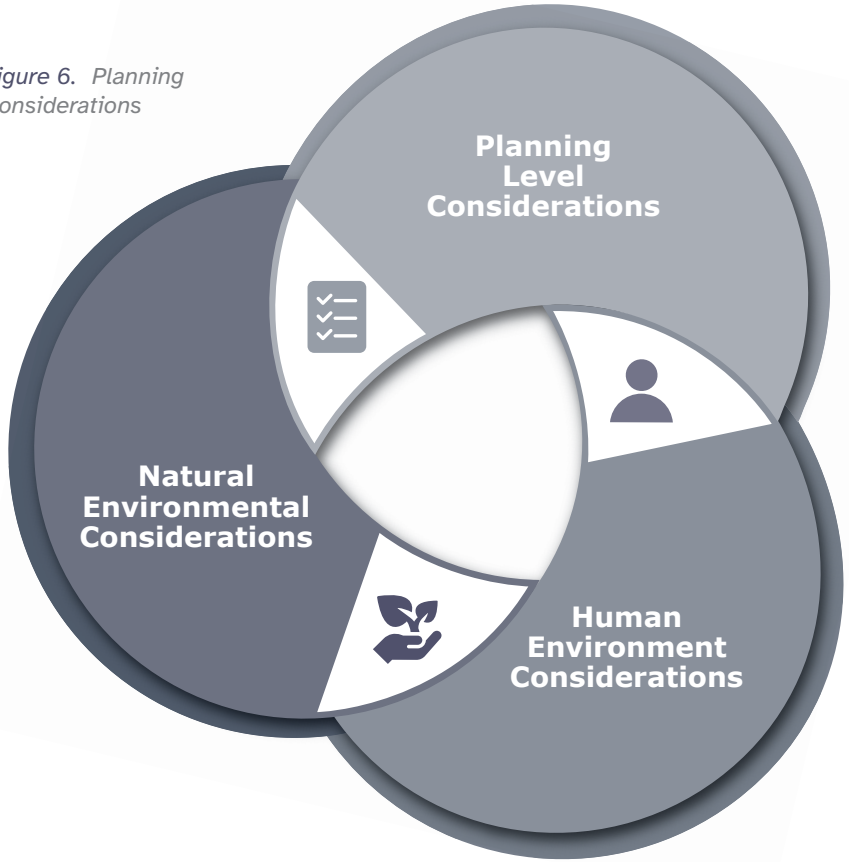
02 Study Considerations + Alternatives Development



INTRODUCTION

This chapter examines the natural environment, human environment, and planning factors that delineate the study area. The natural environment elements include water bodies (e.g., streams and floodplains) and land features (e.g., steep slopes), while the human environment pertains to human-made development patterns like urban areas and rail lines. Meanwhile, planning considerations entail the distinct demographic characteristics of the community's residents. Understanding this framework is valuable, as each aspect shapes this study's project approach and recommendations.

Figure 6. Planning Considerations



PLANNING LEVEL CONSIDERATIONS

Planning level considerations explored during the development of the Swannanoa River Greenway Extension project can be found in the following narratives, figures, and maps.

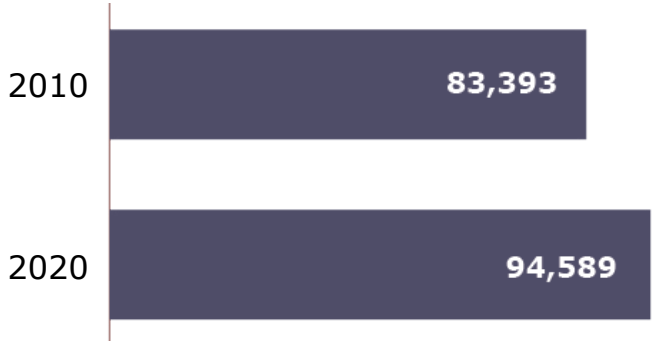
Community Demographics

To understand the current community profile, the project team used data from the U.S. Census Bureau's 2020 Decennial Census and the 2017-2021 American Community Survey for the City of Asheville, Buncombe County, and North Carolina. These findings played a role in shaping the project's focal points and criteria for evaluating route alternatives.

Population

Over the last decade, Asheville's population increased by more than 11,000 people, a 13.4% increase from 2010. The city continues to attract visitors and new residents.

Figure 7. Asheville Population Growth



Data Source: U.S. Census 2020 Decennial Census

Age Groups

Comparing by age, the population of Asheville is roughly in line with Buncombe County's population. However, Asheville's young adult population (25-35 year olds) is considerably higher than in the county. The study area for this project is very close to both Asheville High School and Asheville-Buncombe Technical Community College (A-B Tech), which have 1,100 and 21,000 students, respectively.

Understanding these age disparities is helpful for tailoring transportation and pedestrian infrastructure to meet the mobility needs of different age groups, including providing safe routes to schools for youth and accessible pathways for older adults.

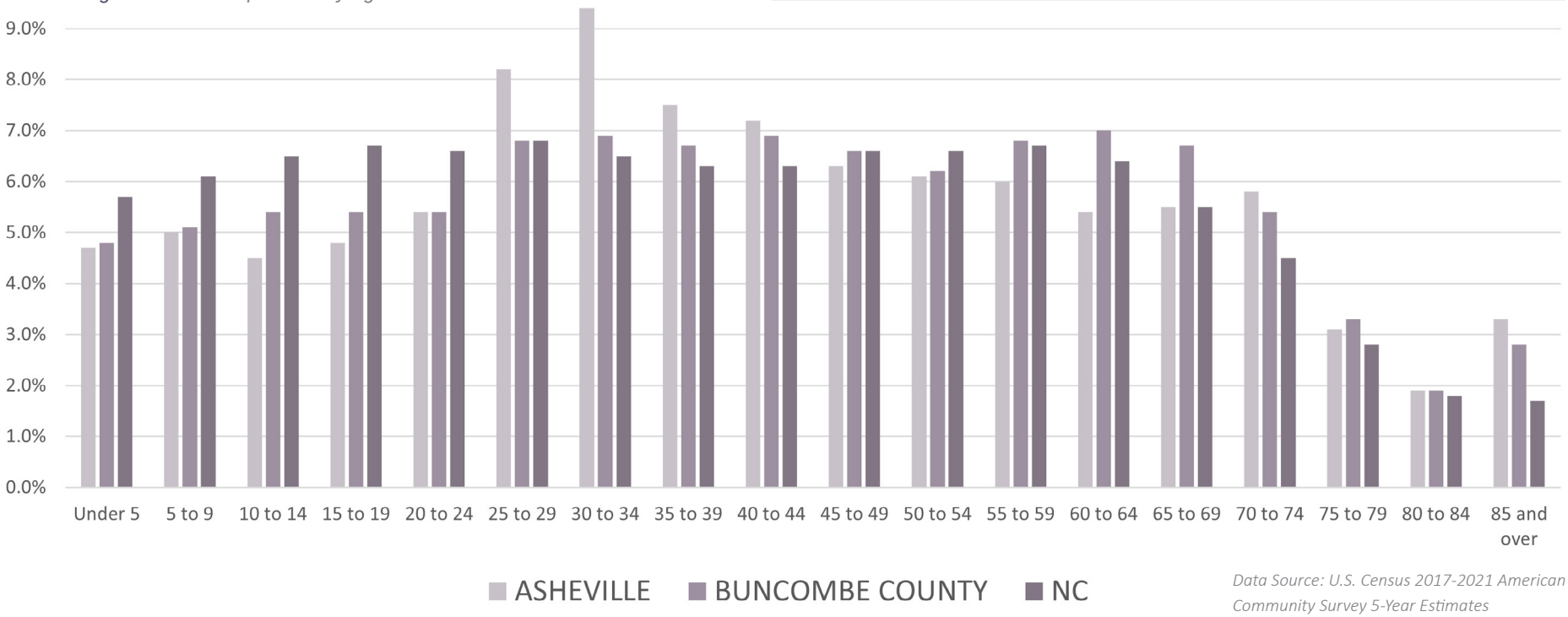
Image 10. Nearby Asheville High School



Source: Tzu Chen Photography

NCDOT recently installed a new pedestrian signal at the Asheville High School entrance on McDowell Street, improving access to the campus.

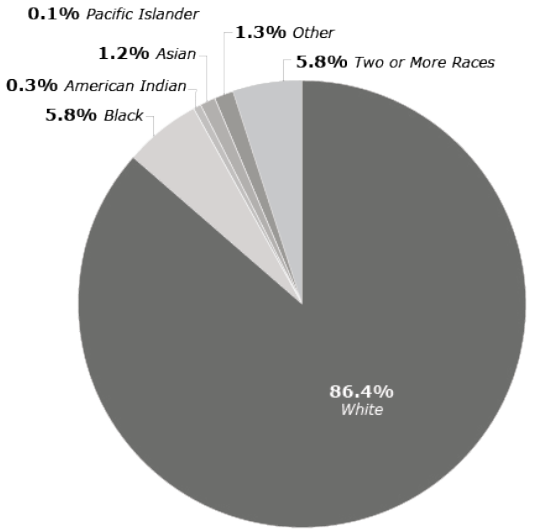
Figure 8. Total Population by Age



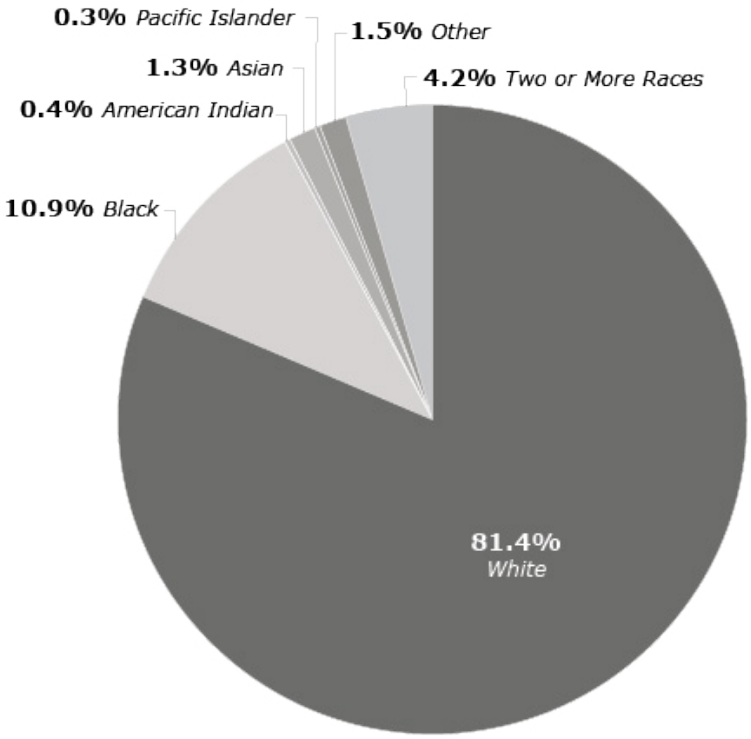
Data Source: U.S. Census 2017-2021 American Community Survey 5-Year Estimates

Diversity

In Asheville, racial demographics depict a notable contrast with statewide trends. While approximately 10% of the population identifies as Black in Asheville, this figure stands at over 20% across North Carolina. Moreover, Buncombe County displays even less racial diversity, with more than 86% of its residents identifying as White. Additionally, while about 10% of individuals in North Carolina identify as Hispanic or Latino, this percentage slightly declines to around 8% in both Asheville and Buncombe County.



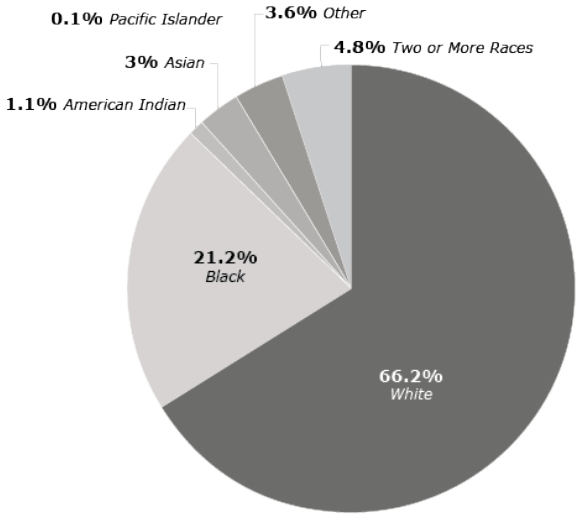
Buncombe County



Asheville

Figure 9. Racial Composition

Data Source: U.S. Census 2020 Decennial Census

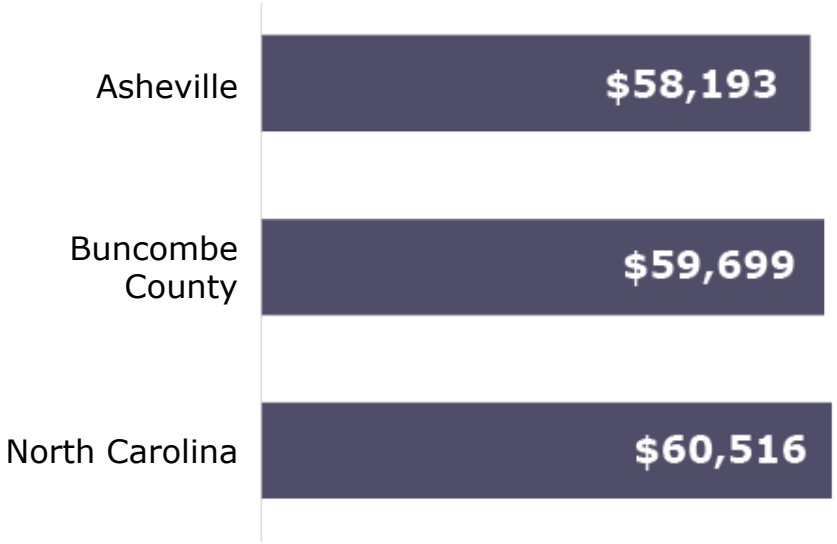


North Carolina

Household Income & Poverty

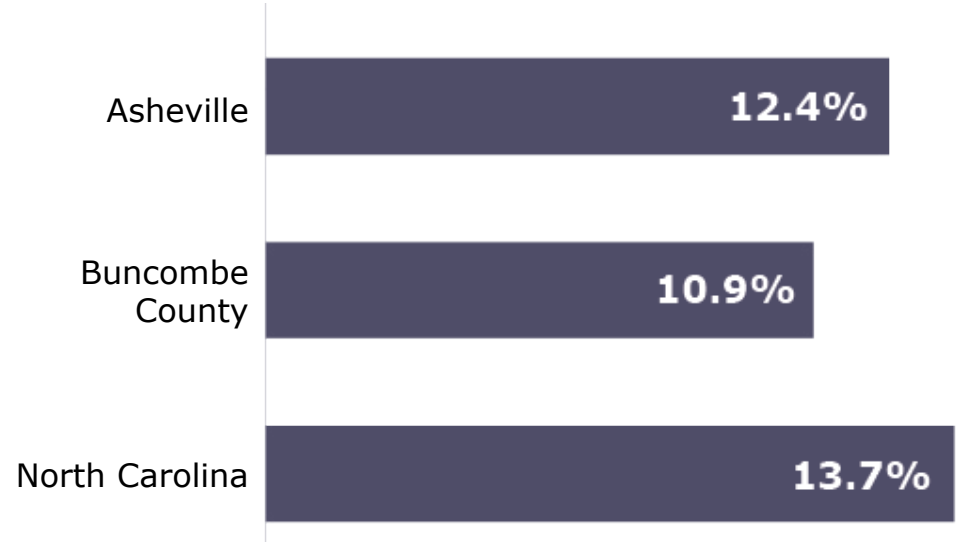
The median household income in Asheville closely aligns with both the county and state averages, hovering around $60,000. Similarly, the percentage of households with incomes below the poverty line mirrors the statewide figures, ranging between 12-14 percent. Notably, this rate is marginally higher than Buncombe County's eleven percent. This suggests that while Asheville's median income is in line with broader economic trends, there remains a slightly elevated proportion of households facing financial hardship compared to the county's average.

Figure 10. Median Household Income



Data Source: U.S. Census 2017-2021 American Community Survey 5-Year Estimates

Figure 11. Households Below the Poverty Level



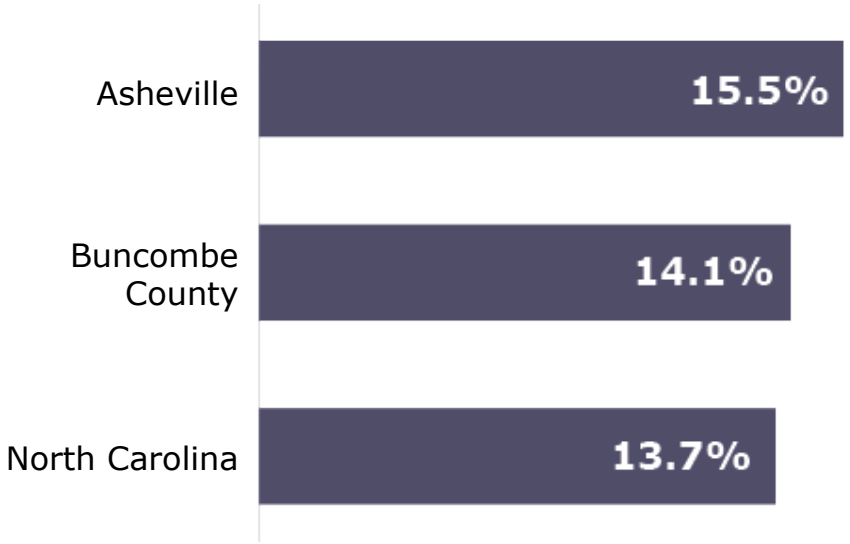
Data Source: U.S. Census 2017-2021 American Community Survey 5-Year Estimates

The Ability to Move

Prioritizing the development and upkeep of accessible transportation infrastructure aligns closely with the City's commitment to cultivating a supportive and equitable environment for all community members. Not all residents of Asheville have the ability to operate a vehicle, whether due to age-related limitations or disabilities. People younger than 16 cannot drive and as people age, driving can become a challenge. Meanwhile, some disabilities prevent people from driving a motor vehicle. The higher percentage of people with disabilities in Asheville suggests a greater demand for accessible transportation infrastructure. This includes sidewalks, curb ramps, crosswalks, and other pedestrian facilities designed to accommodate individuals with varying mobility needs.

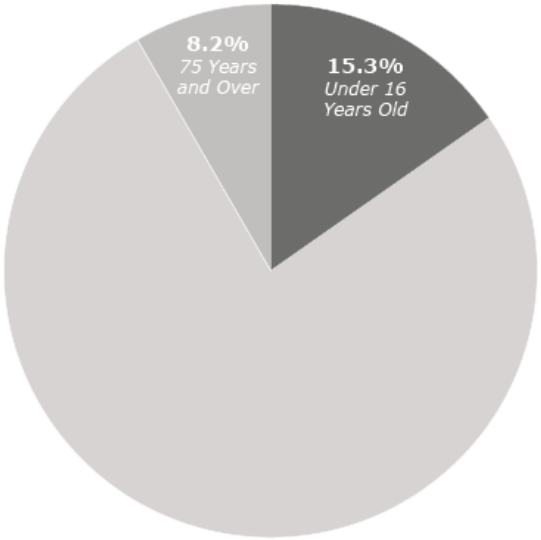
To overcome mobility challenges, it is important to introduce multimodal transportation solutions, offering individuals who cannot drive additional options for navigating the city. The creation of new, accessible greenways is a meaningful step in promoting inclusivity and ensuring mobility for all members of the community, regardless of their physical abilities.

Figure 12. Disability Status



Data Source: U.S. Census 2017-2021 American Community Survey 5-Year Estimates

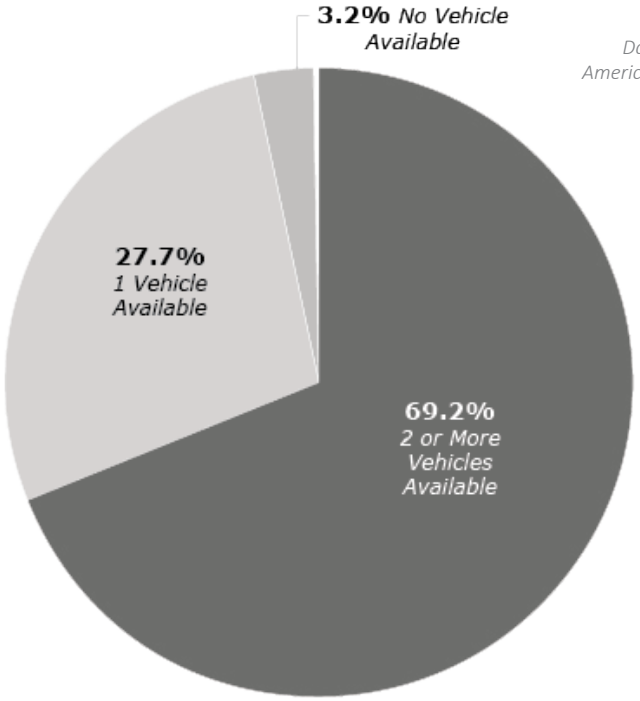
Figure 13. Asheville Population Under 16 and 75 and Over



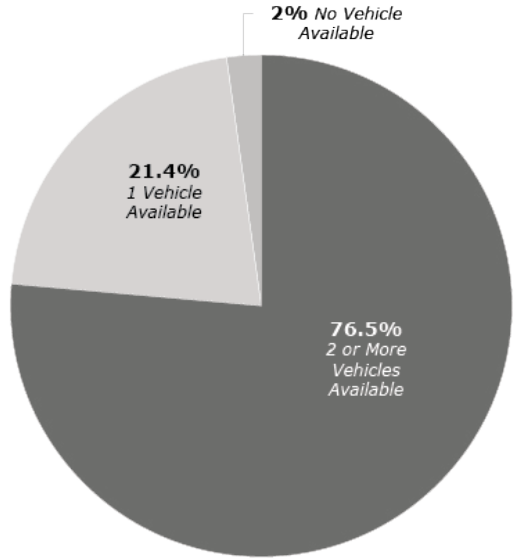
Data Source: U.S. Census 2017-2021 American Community Survey 5-Year Estimates

Access to Vehicles

Not everyone has access to a car, and this is particularly true for Asheville's population in comparison to North Carolina as a whole. Without a car, people face barriers to accessing essential services such as healthcare, employment opportunities, education, and groceries. If they also do not have access to transit service or safe biking and walking paths, this lack of mobility can exacerbate socioeconomic disparities and limit economic mobility, particularly for low-income households and marginalized communities. Addressing these disparities in access to transportation is essential for promoting equity, fostering economic prosperity, and enhancing the well-being of all members of society.



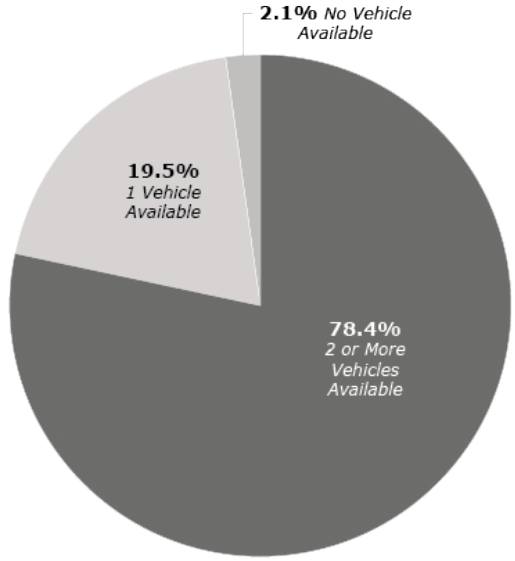
Asheville



Buncombe County

Figure 14. Access to Personal Motor Vehicles

Data Source: U.S. Census 2017-2021 American Community Survey 5-Year Estimates



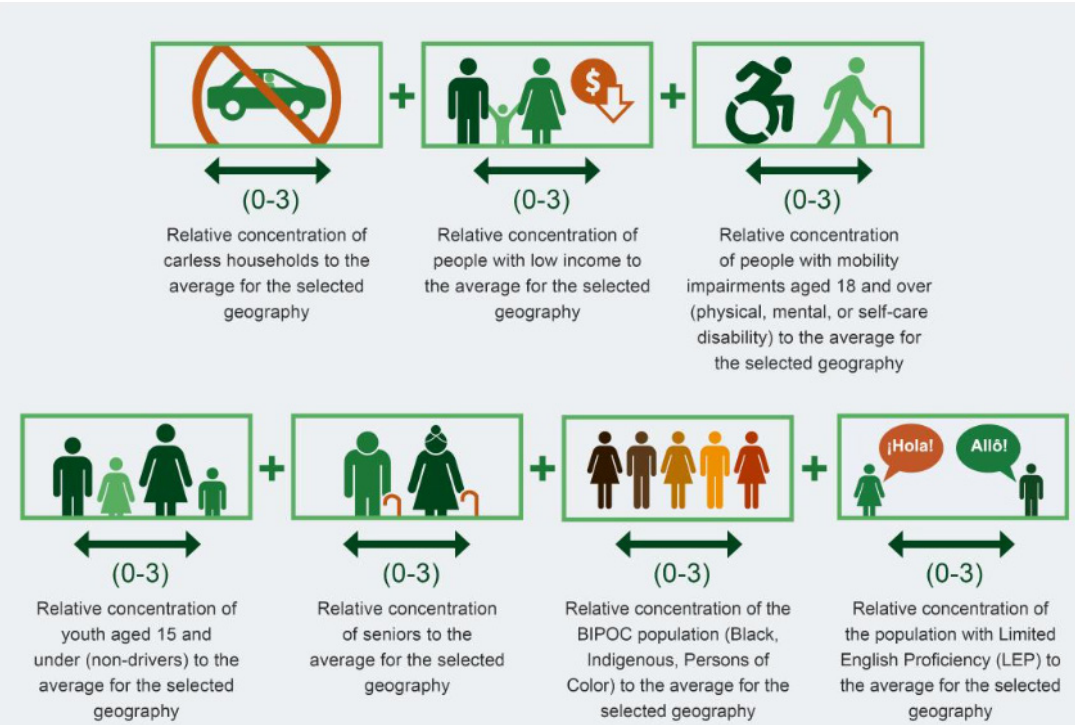
North Carolina

Special Populations & User Groups

Addressing equity in transportation requires consideration of special populations and user groups. The goal of looking at a project through an equity lens is to gain insight into areas that have experienced under-investment or disinvestment in pedestrian and bicycle infrastructure and can help make the case for one greenway route alternative over another.

To assess equity, the Project Team utilized NCDOT's statewide environmental justice map, called the Transportation Disadvantage Index (TDI). **Map 2 - Equity Score** shows the equity scoring for this project's study area. The areas with a higher TDI score have a greater need for solutions that reduce disparities.

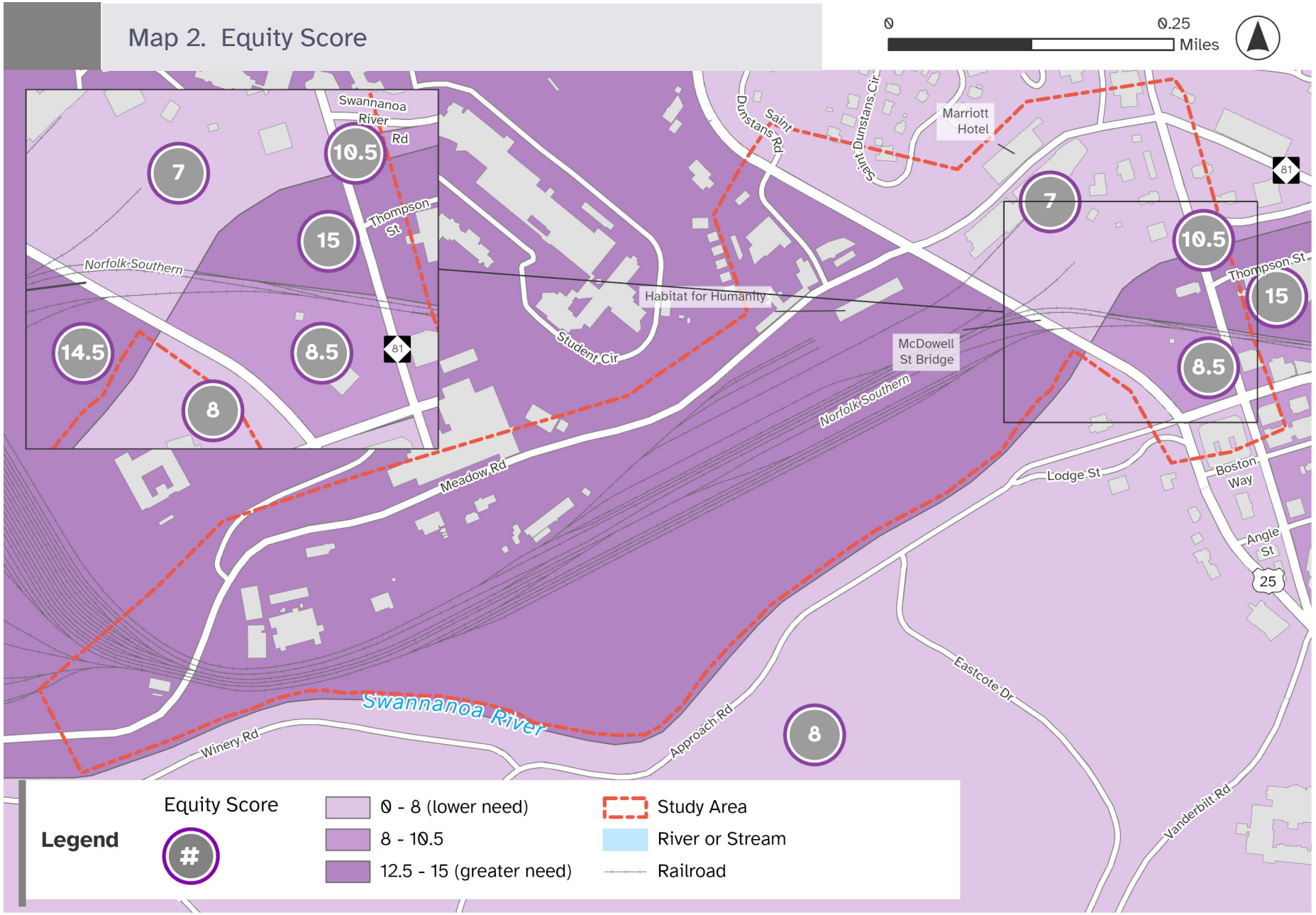
Image 11. NCDOT Transportation Disadvantage Index (TDI) Scoring Metrics



Source: NCDOT

NCDOT uses a range of factors in its TDI scoring that together help indicate areas that have a higher relative concentration of people who might face mobility challenges and could benefit from improved transportation options.

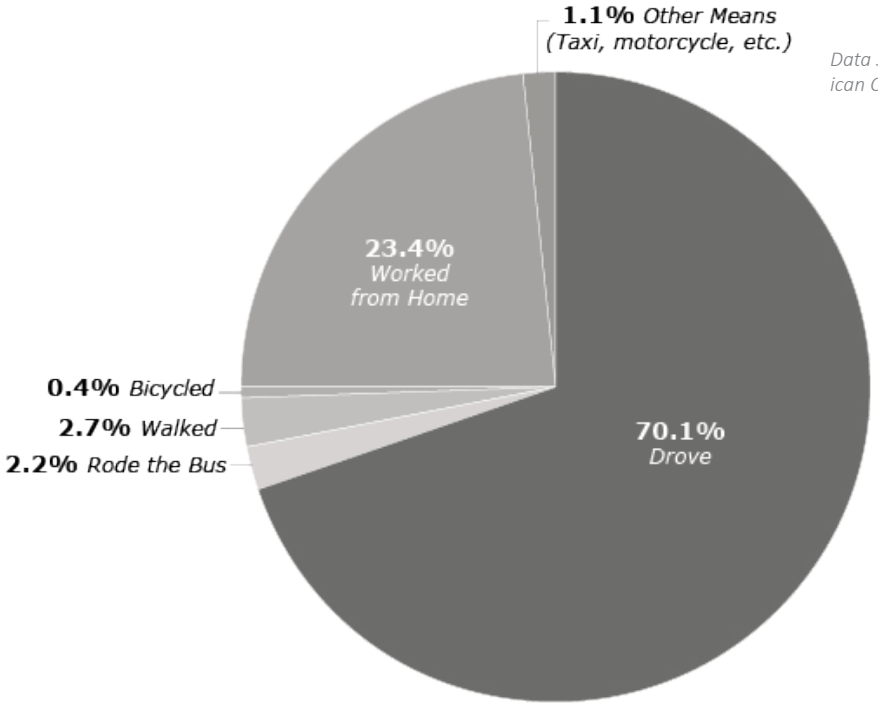
Map 2. Equity Score



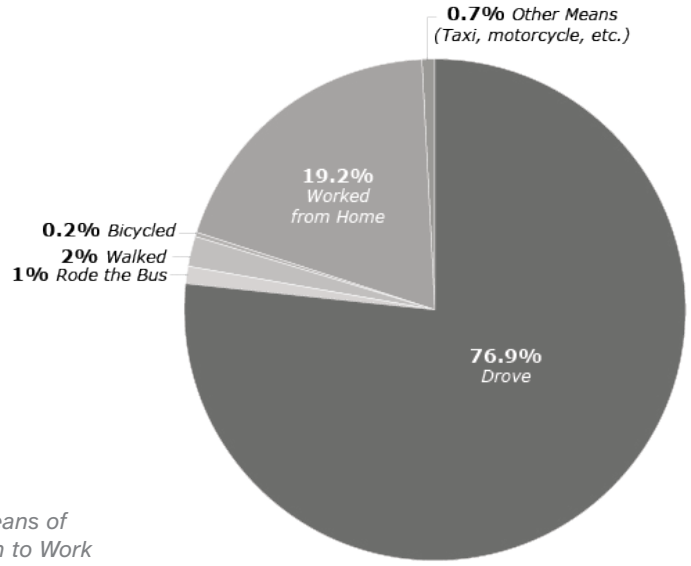
Data Source: NCDOT Transportation Disadvantage Index (TDI)

Commuting Habits

Many residents in Asheville have transitioned away from traditional commuting altogether. The COVID-19 pandemic played a significant role in normalizing remote work, a trend that has persisted. Currently, almost a quarter of Asheville's working-age population opt for remote work, surpassing the statewide average of under 17%. Additionally, a larger proportion of Asheville's workforce relies on walking and public transit for their commute compared to Buncombe County and North Carolina. Although only 0.4% of Asheville residents bike to work, this figure is double that of Buncombe County and the state average. This highlights an opportunity to enhance multimodal infrastructure, creating safer pathways that encourage more individuals to forego driving and instead walk, bike, or take transit to work.



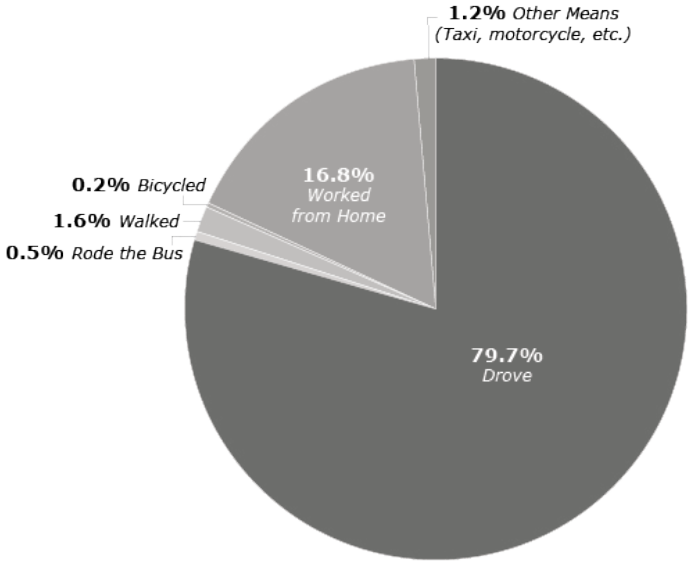
Asheville



Buncombe County

Figure 15. Means of Transportation to Work

Data Source: U.S. Census 2017-2021 American Community Survey 5-Year Estimates



North Carolina

Employment Information

The U.S. Census Bureau's web-based mapping and reporting application, *OnTheMap*, was used to retrieve employment information for a two-mile radius from the study area. **Map 3 - Employment Density & Inflow/ Outflow Analysis** illustrates both employment density as points and an inflow/outflow analysis, which indicates how people are moving about to get to their job.

The employment density points suggest that the study area is likely an important route for commuters, who are heading to Mission Hospital's nearby campus, the Biltmore Estate, A-B Tech, and the numerous shops, restaurants, and hotels in the Biltmore Village neighborhood.

This data is further expanded in the inflow/outflow analysis: significantly more people travel to the study area to work than those that live in the study area. In total more than 20,000 people commute into this area, while 5,000 commute elsewhere from the area. A small number (fewer than 1,000) of people live and work within the area - including those who work from home.

Image 12. Asheville-Buncombe Technical Community College



Source: David Oppenheimer

A-B Tech employs approximately 1,100 faculty and staff, and its 145-acre main campus is near the study area.

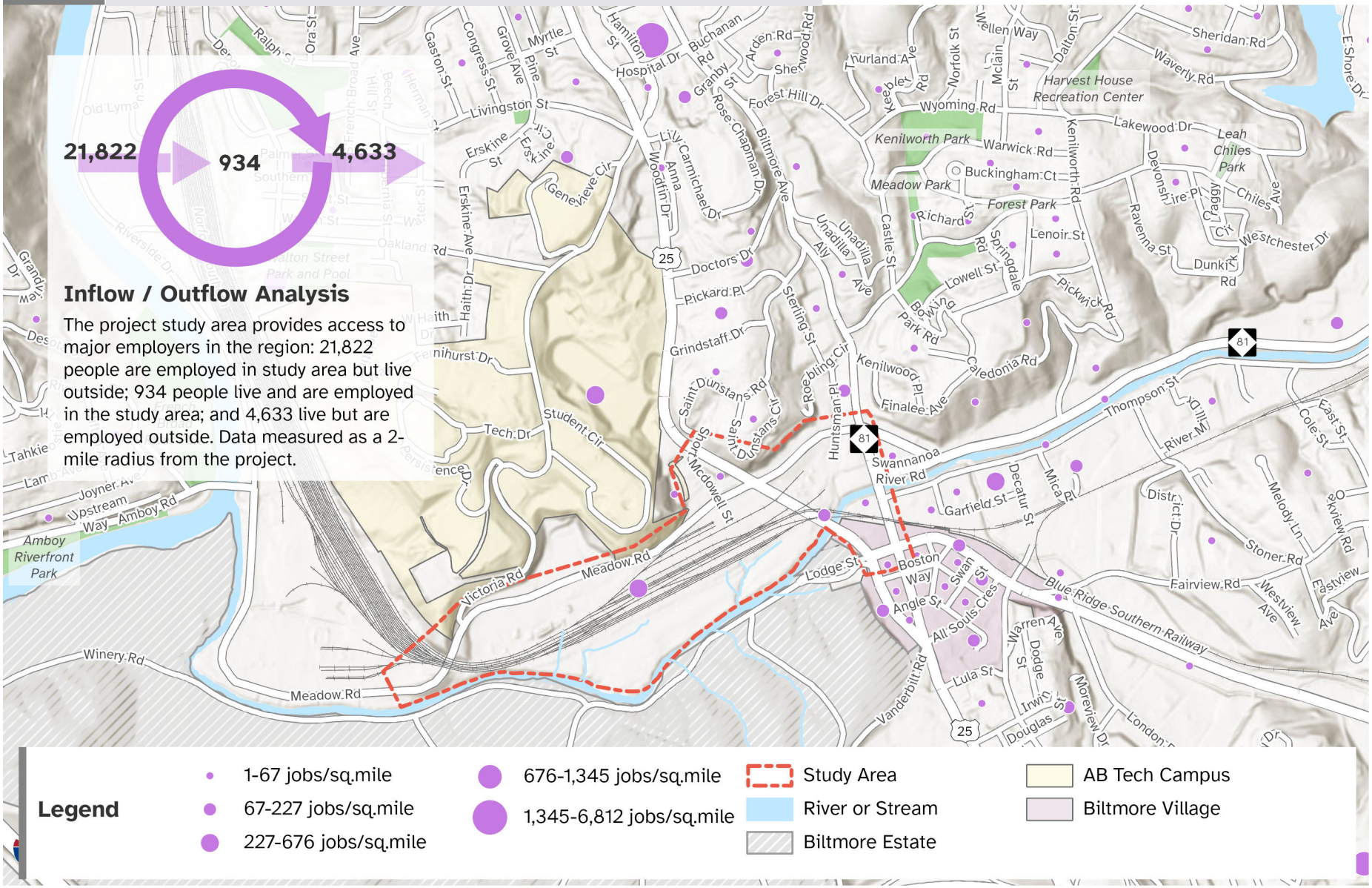
Image 13. Biltmore Estate



Source: Explore Asheville

More than 2,400 people work at the Biltmore Estate to maintainthe 8,000 acres of the property, which includes the estate, hotels, winery, restaurants, and shops.

Map 3. Employment Density & Inflow/Outflow Analysis



Data Source: U.S. Census

The inflow/outflow analysis underscores the interplay between residential areas and employment centers. The insights gleaned from the *OnTheMap* application contribute to a better understanding of local employment dynamics and provide information to support enhanced commuter options and fostering sustainable economic development within the region.

The Swannanoa River Greenway Extension will be an amenity for everyone who lives, works, and visits this part of Asheville - whether they are getting to school, heading to work, enjoying a day outside, or visiting their favorite restaurant. This area is home to many businesses, with new apartments and hotels bringing people who would benefit from a safe walking and bicycling facility along the river.

Image 14. Hi-Wire Brewing



Source: Hi-Wire Brewing

Image 15. Shops at Biltmore Village



Source: Choate Construction

NATURAL ENVIRONMENT CONSIDERATIONS

It is important to consider the natural environment and human development, understanding that each affects the other. This will help foster responsible and informed decisions and respect for our natural surroundings.

Flooding

Map 4 - Floodplain & Floodway illustrates floodway and floodplain data retrieved from NC OneMap, an online resource for geospatial data. The floodway boundary is the area adjoining a waterway (in this case, the Swannanoa River) that will allow floodwaters to pass without increasing the water surface elevation by more than one foot. This is the first land to flood during heavy rains. The 100-year floodplain designation is also known as the 1% chance of annual flood, meaning that the land has a 1% chance of being flooded in any given year during a 100-year storm. The 500-year floodplain represents areas with 0.2% annual chance of flooding.

Most of the study area falls within the 100-year floodplain, with some sections lying within the floodway itself. When water overflows the banks of the Swannanoa River, these areas are periodically inundated by floodwaters. Any development, including greenways, can affect the floodplain's capacity to store and slow floodwaters. Therefore, it is critical to design this facility and its amenities with stormwater best management practices in mind and to anticipate regular maintenance to ensure the long-term functionality of the greenway infrastructure.

Floodways are regulated locally and by the Federal Emergency Management Agency (FEMA). Any structures located within the floodway, including fill material to build a greenway, require a no-impact/no-rise certification through FEMA. A no-rise study, which uses stream modeling to reflect changes in water levels during flood events due to construction in the floodplain, will need to be conducted as part of the next phase of design for the Swannanoa River Greenway Extension.

Image 16. Flooding in Biltmore Village (Lodge Street)



Source: Angeli Wright, Asheville Citizen-Times

Nearby Biltmore Village is flooded by the Swannanoa River cresting higher than usual. Following the flood of 2004, the flood ordinance was revised mandating that new buildings have to be two feet above base elevation, with buildings raised above the street level.

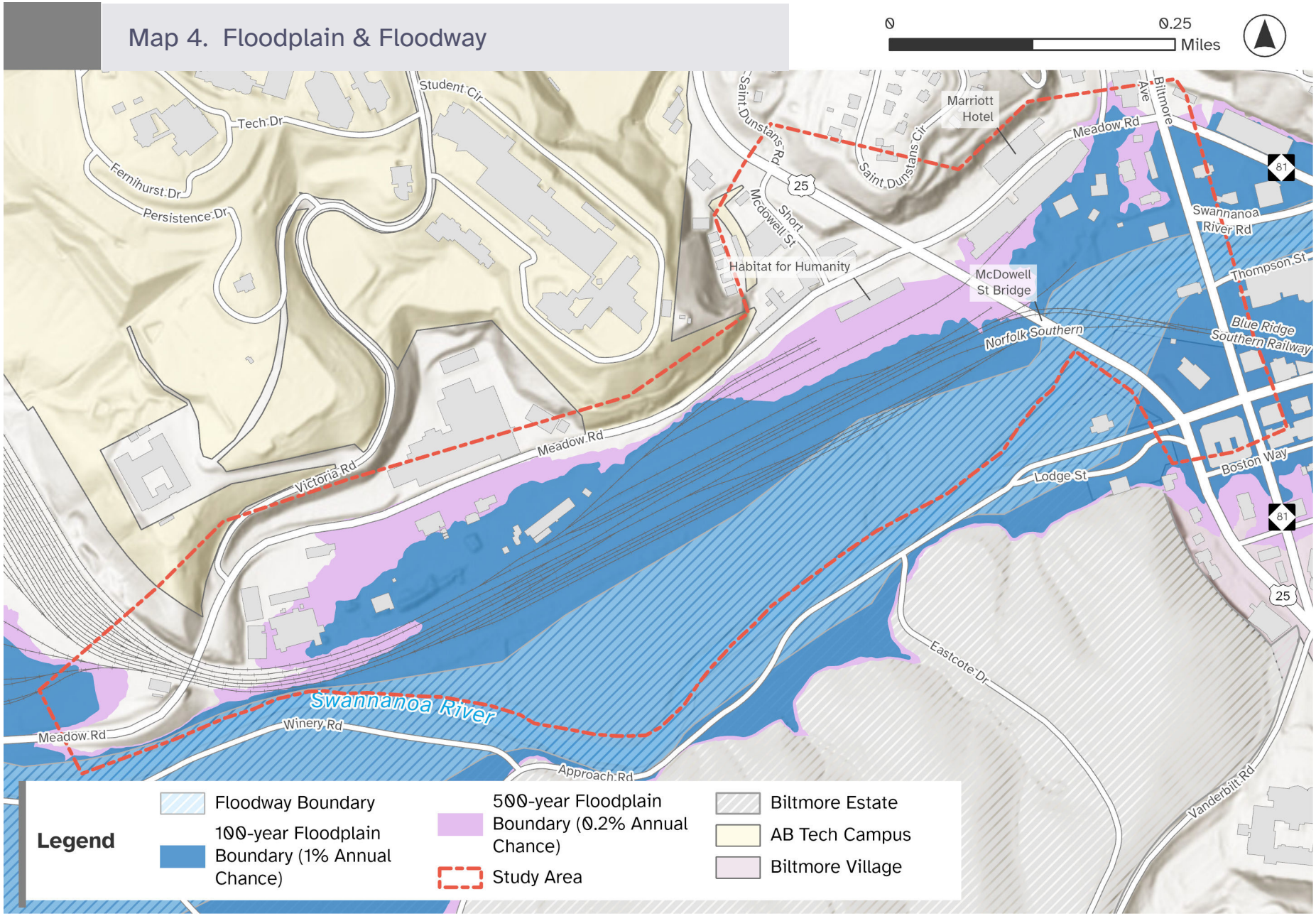
Image 17. Flooding on the Swannanoa River (Biltmore Avenue)



Source: Matt Burkhartt, Asheville Citizen-Times

A lot of factors affect flooding on the Swannanoa River, including topography. Water from the mountains' many unnamed streams feed into creeks and then into the river.

Map 4. Floodplain & Floodway



Data Source: NC OneMap

Topography

NC OneMap was also consulted for contour data for the study area, as shown in **Map 5 - Contours (4-Foot)**. From the contour data, we can visualize the waterways, steep grades north of Meadow Road, and the wide, flat area of the rail bed. Options for routing a 14-foot paved greenway are limited by these topographical constraints. Working within the confines of the steep topographical inclines and the Swannanoa River poses a considerable logistical challenge when coupled with the leveled land of the rail bed and existing structures like bridge pylons and industrial sites. These constraints limit route options and necessitate careful planning and innovative engineering solutions to ensure a safe and accessible connection.

Endangered Species

The project team sought rare and endangered species data for the study area from the NC ATLAS database. From this analysis, only one known occurrence of a rare or endangered species was found in the study area: the Appalachian Elktoe (*alasmidonta raveneliana*), a species of freshwater mussel, which is considered endangered. The 2019 Swannanoa Greenway Phase 1 Schematic Design Report conducted an initial review of potential rare, threatened, or endangered species farther upstream. Species upstream will likely not be affected by a project downstream. However, it is important to do further studies when the project is in design phase.

Table 1. Potential Rare, Threatened, or Endangered Species

Habit	Scientific Name	Common Name	Federal Status
Clam	*Alasmidonta raveneliana*	Appalachian Elktoe	Endangered
Flowering Plant	*Geum radiatum*	Spreading Avens	Endangered
Flowering Plant	*Sagittaria fasciculata*	Bunched Arrowhead	Endangered
Flowering Plant	*Sarracenia rubra ssp. jonesii*	Mountain Sweet Pitcher-plant	Endangered
Flowering Plant	*Solidago spithamaea*	Blue Ridge Goldenrod	Threatened
Flowering Plant	*Spiraea virginiana*	Virginia Spiraea	Threatened
Lichen	*Sisyrinchium dichotomum*	White Irisette	Endangered
Mammal	*Glaucomys sabrinus coloratus*	Carolina Northern Flying Squirrel	Endangered
Mammal	***Myotis griescens***	**Gray Bat**	**Endangered**
Mammal	***Myotis septentrionalis***	**Northern Long-Eared Bat**	**Threatened**
Spider	*Microhexura montivaga*	Spruce-fir Moss Spider	Endangered

Source: US Fish & Wildlife Service

Image 18. McDowell Street Retaining Wall



Source: TPD

Asheville's hilly terrain makes some projects more expensive, like the need for this retaining wall along McDowell Street.

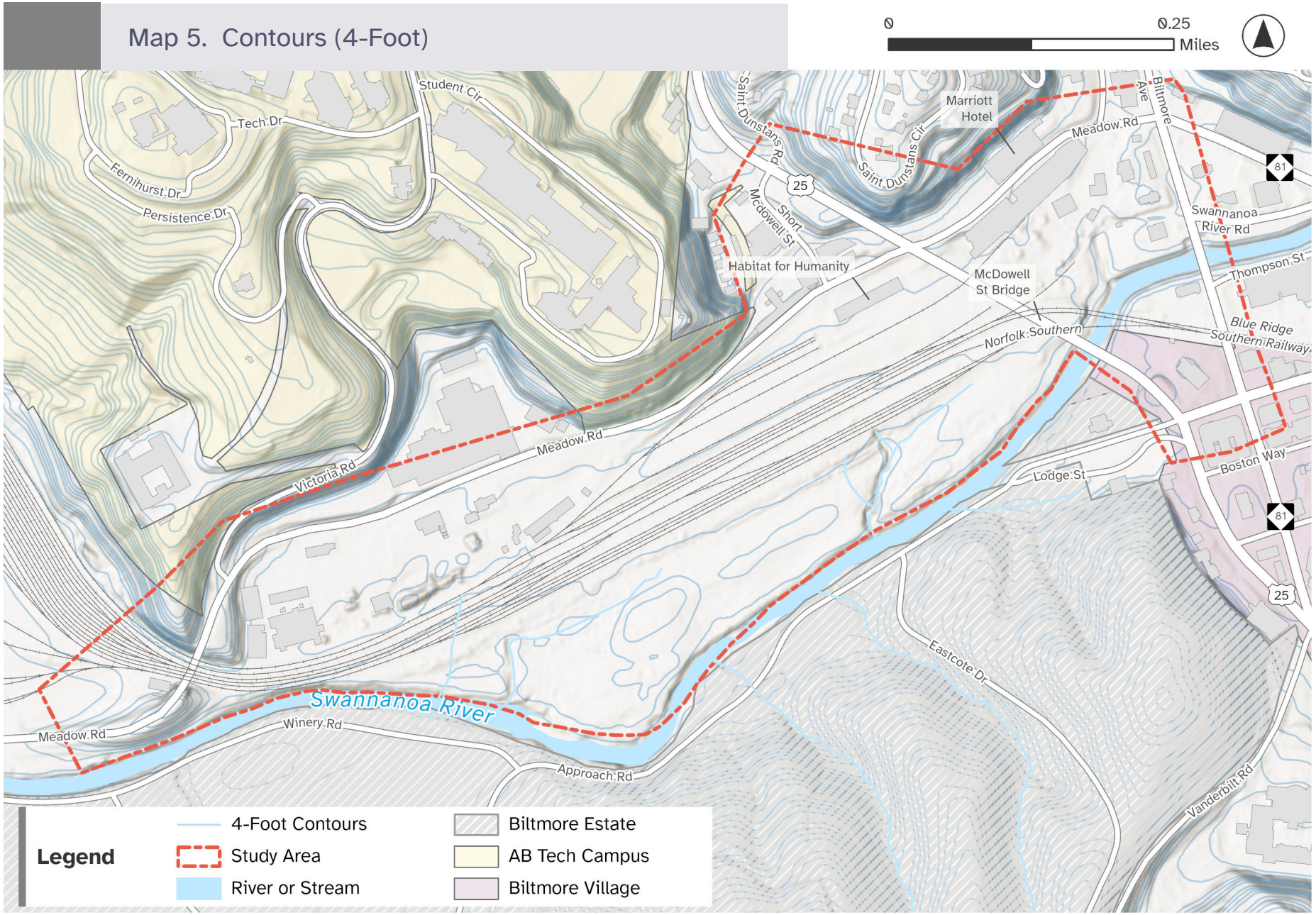
Image 19. Steep Grade at Meadow Road Habitat ReStore



Source: TPD

The shift in elevation from Meadow Road down to the Habitat for Humanity ReStore building is a challenge that limits route options.

Map 5. Contours (4-Foot)



HUMAN ENVIRONMENT CONSIDERATIONS

Within the project study area, significant portions of the natural landscape have been reshaped by human intervention over years of development, including hillside grading and building and road construction. The study area is a mix of different land uses, with light industrial, institutional, highway commercial, and urban commercial. The human footprint is pronounced - large vehicle bridges, rail yards, multiple rail lines, and industrial sites make up this corridor.

Brownfields & Industrial Land Uses

Planning a greenway near a brownfield or existing industrial sites entails addressing several potential pitfalls to ensure the success and safety of the project. These sites may retain hazardous materials or pollutants from past activities, posing environmental risks to both users and the surrounding area. Additionally, compromised soil stability, often a result of excavation or dumping, can lead to erosion or subsidence, potentially compromising greenway infrastructure. Redevelopment efforts are further complicated by navigating complex regulatory frameworks related to environmental cleanup, land use and zoning, and public health standards, which can be time-consuming and costly.

Despite these challenges, and given that the only way to make the Swannanoa River Greenway Extension connection is through and/or near industrial uses, it is worth the extra time and planning it may take to find solutions that are compatible with greenway users and industrial business operators.

Image 20. Biltmore Iron & Metal



Source: TPD

Biltmore Iron & Metal is amenable to a greenway adjacent to their property. The site is not a designated brownfield and, according to owners, complies with current environmental regulations and permitting. However, should a portion of the Swannanoa River Grenway Extension travel on the property, extra consideration may be needed to fully understand the environmental impacts.

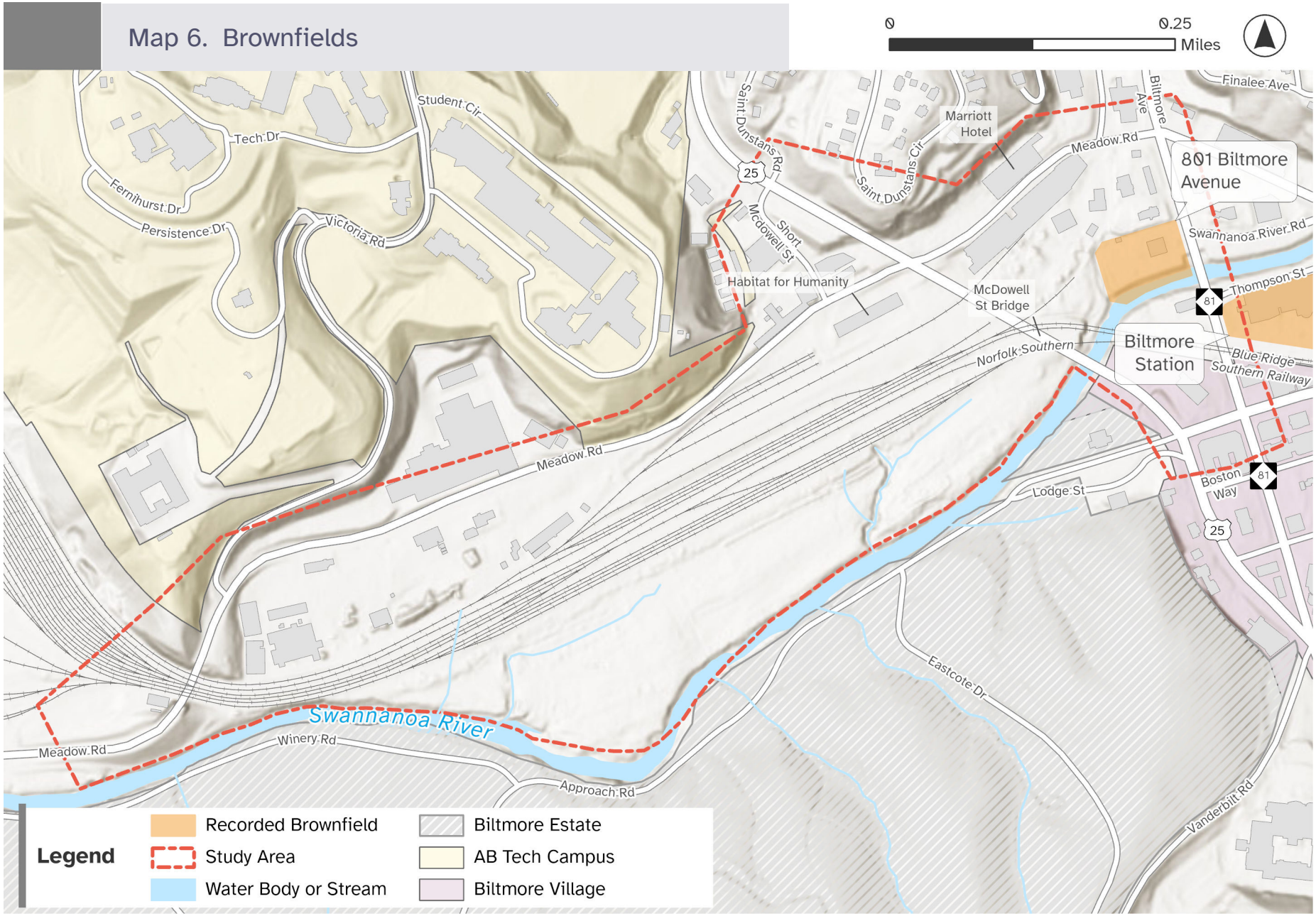
Image 21. Southern Concrete Materials



Source: TPD

Existing businesses like Southern Concrete Materials have depended on the nearby rail lines. Industrial uses can be compatible with greenways, with the right planning and cooperation.

Map 6. Brownfields



Utilities

Utilities such as electric lines, sewer systems, and buried fiber optics can pose significant challenges to a greenway feasibility study. First, these utilities may require easements or rights-of-way, which can complicate the acquisition of land for the greenway project. Negotiating with utility companies or local authorities for access to these areas can prolong the planning process and add to project costs. Additionally, the presence of utilities may limit the available space for constructing the greenway, requiring careful design to avoid conflicts and ensure safety for greenway users. Furthermore, coordinating with utility companies to relocate or adjust existing infrastructure can introduce delays and additional expenses. In some cases, environmental considerations may also arise, particularly when utilities intersect with sensitive habitats or waterways along the proposed greenway route.

Navigating the complexities of utilities during the design process for a transportation facility requires thorough assessment, strategic planning, and collaboration with various stakeholders to ensure the successful implementation of the greenway project. Part of the feasibility study process involves considering these utility locations when determining the optimal route for the greenway and identifying opportunities, such as sewer line easements, which provide relatively level, well-maintained linear corridors potentially ideal for a greenway.

An underground easement, like sewer, presents an opportunity for a compatible use. The City of Asheville has a memorandum of understanding with MSD, permitting the construction of greenways on sewer easements, with the provision that the greenway pavement will be replaced if damaged during maintenance activities.

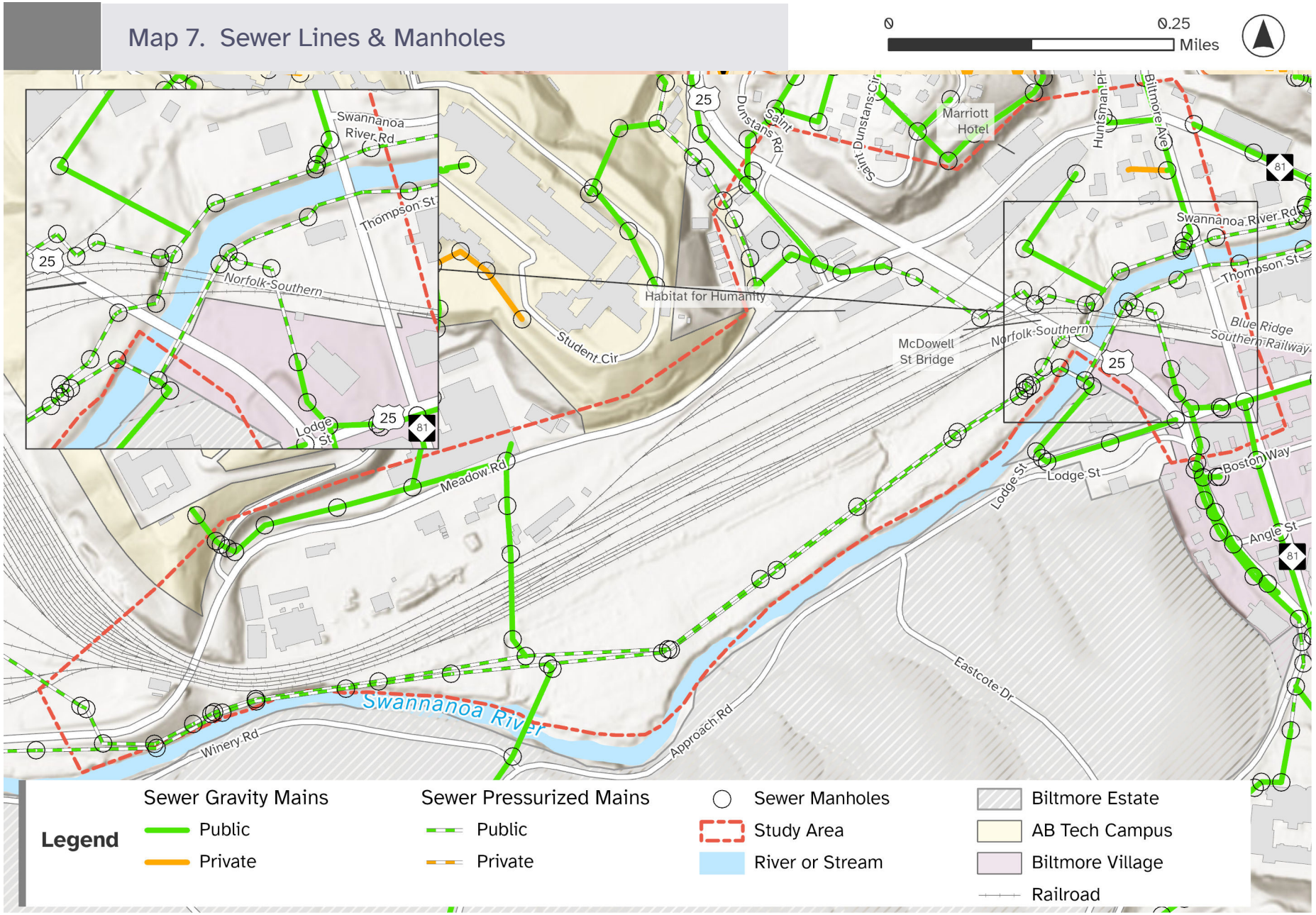
Image 22. Utilities in the Study Area



Source: TPD

The study area is further constrained by electrical power lines (some high voltage), water and sewer infrastructure, and buried fiber optic cables. Many of these have easements through private property and may require specific development restrictions.

Map 7. Sewer Lines & Manholes



Points of Interest

Within the study area, the land uses are mostly light industrial, with more recent developments spurred by the local hospitality and tourism market. These points of interest include:

- Western area light industrial: Dave Steel Company, Southern Concrete Materials, Adams Products - Oldcastle APG.
- Asheville Area Habitat for Humanity administrative offices and ReStore.
- Short McDowell Street: East Fork Pottery, Ice Mill ice sculptures, Cove Realty Company, Broward Flag & Display, Asheville Playgrounds, and At Play with Sparky dog day-care facility.
- Eastern area mix of uses: Biltmore Iron & Metal, Courtyard by Marriott, Hi-Wire Brewing, El Chapala Mexican, Village Antiques, Standard Pizza, and other highway commercial businesses along Biltmore Avenue.

The study area is also located among several nearby activity centers, as shown in **Map 8 - Points of Interest**

- Education: Asheville-Buncombe Technical Community College (A-B Tech) and Asheville High School.
- Medical: Mission Hospital and Mountain Area Health Education Center (MAHEC).
- Historic/Hospitality: Biltmore Estate and Biltmore Village.
- Recreation: French Broad River parks and greenways.

These destinations would all benefit from a more connected greenway network, allowing people to walk or bike to shops, schools, services, and workplaces.

Image 23. Habitat for Humanity Property



Source: TPD

Image 24. Courtyard by Marriott & Habitat ReStore



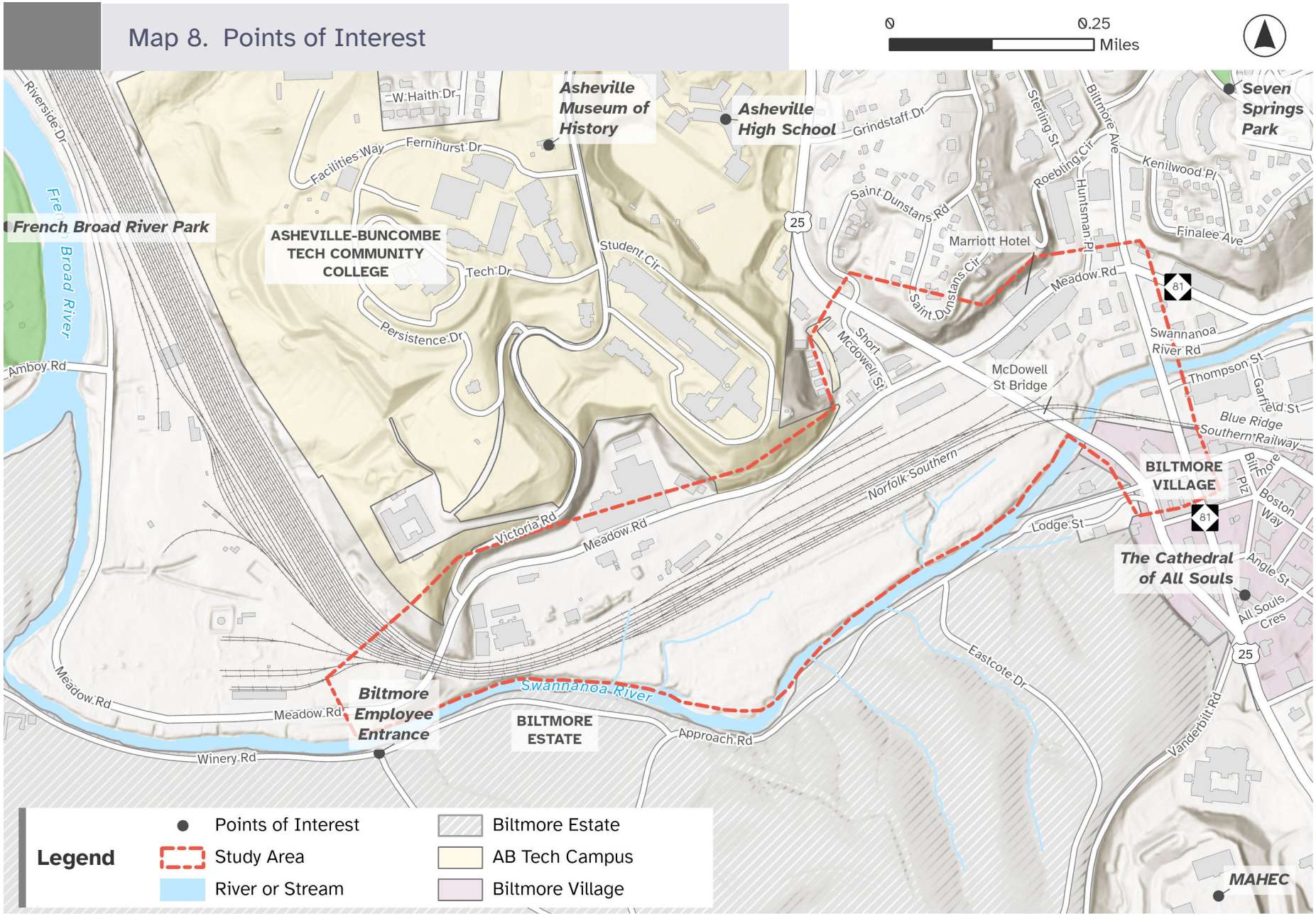
Source: TPD

Image 25. East Fork Pottery Headquarters



Source: Emily Coady

Map 8. Points of Interest



Historic Sites

The North Carolina State Historic Preservation Office (SHPO) serves as the repository for field notes, photographs, research reports, National Register nominations, and other materials related to the statewide survey of historically significant sites, buildings, and districts. By meticulously cataloging a wide spectrum of structures and places, from urban landmarks to rural structures, SHPO creates a comprehensive inventory that reflects North Carolina's diverse history and development.

Map 9 - Historic Resources displays a variety of historic properties and buildings, including some, like Asheville High School and the Biltmore Estate, that are on the National Register of Historic Places. These sites are recognized, celebrated, and protected for their rich architectural heritage. Other properties in the study area are determined eligible for National Register status, including Habitat for Humanity, Dave Steel Company, and large parts of Biltmore Village. Biltmore Village is recognized as one of Asheville's Local Historic Districts, which are subject to design review.

Listing a property in the National Register imposes no obligations or restrictions on a private owner using their own resources to maintain or alter the property. Over the years, various federal incentives have been introduced to support private preservation efforts. A private owner of a National Register property is required to adhere to federal preservation standards only if federal funding or licensing is used for work on the property, or if the owner seeks and receives a special benefit from the National Register designation, such as a grant or tax credit.

Greenway projects are compatible with historic areas but must balance providing a public transportation amenity with respecting the historical significance of the area. By integrating interpretive signage, markers, and public art, greenway projects can offer visitors a meaningful experience that celebrates both the natural beauty and the rich history of the area, fostering a deeper appreciation for the land and its heritage.

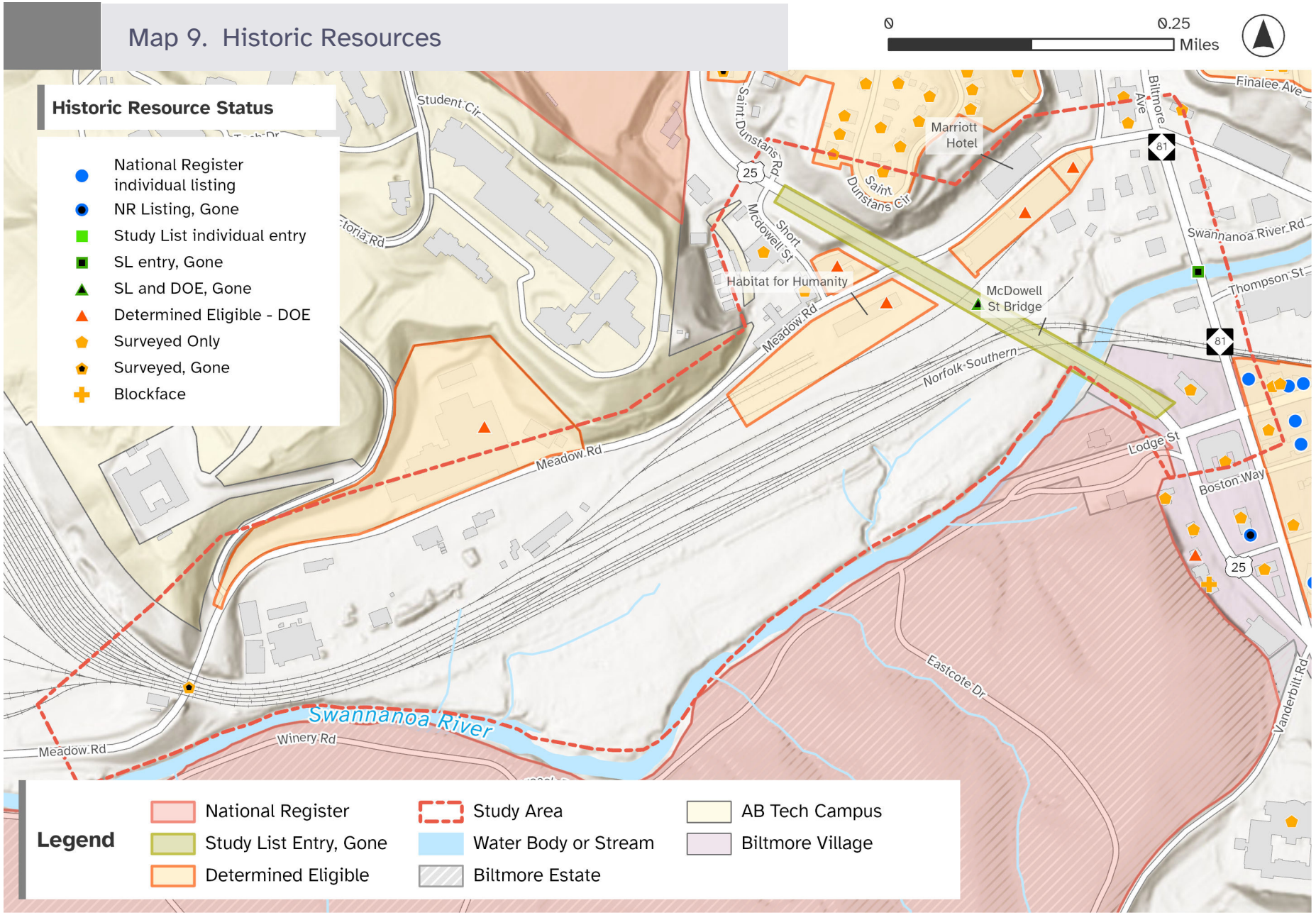
Image 26. Habitat for Humanity Administrative Offices



Source: TPD

This building currently houses Asheville Habitat for Humanity's administrative offices, though once was owned by Norfolk Southern Railway. It is listed as eligible for National Register status.

Map 9. Historic Resources



Data Source: North Carolina State Historic Preservation Office

Existing Multimodal Network

Map 10 - Existing Multimodal Network illustrates the existing sidewalks, bike lanes, crosswalks, and traffic signals in the project study area.

Sidewalks

While there are sidewalks along key roads and throughout the Biltmore Village area, a glaring exception is Meadow Road, which only has sidewalk along the bridge section and near newer development like the Courtyard by Marriott hotel. With no sidewalk and hardly any shoulder (if any), walking between the River Arts District and Biltmore Village is ill-advised. However, the attractiveness of these destinations is spurring commercial development and new hotels and apartments, which makes walkability all the more important.

The proposed greenway will connect to the existing sidewalk network and help create a continuous multimodal path along the river that links to the existing greenways on the French Broad River and the River Arts District bicycle and pedestrian system. Biltmore Avenue, Meadow Road, and McDowell Street are all NCDOT-maintained roadways.

Image 27. Biltmore Avenue (Looking North)



Source: TPD

Biltmore Avenue has sidewalks, occasionally with a grass buffer from traffic.

Image 28. McDowell Street (Looking South)



Source: TPD

McDowell Street typically has a sidewalk on both sides, but no buffer from vehicle traffic.

Image 29. Meadow Road (Looking West)



Source: TPD

Meadow Road only has sidewalks at the eastern edge.

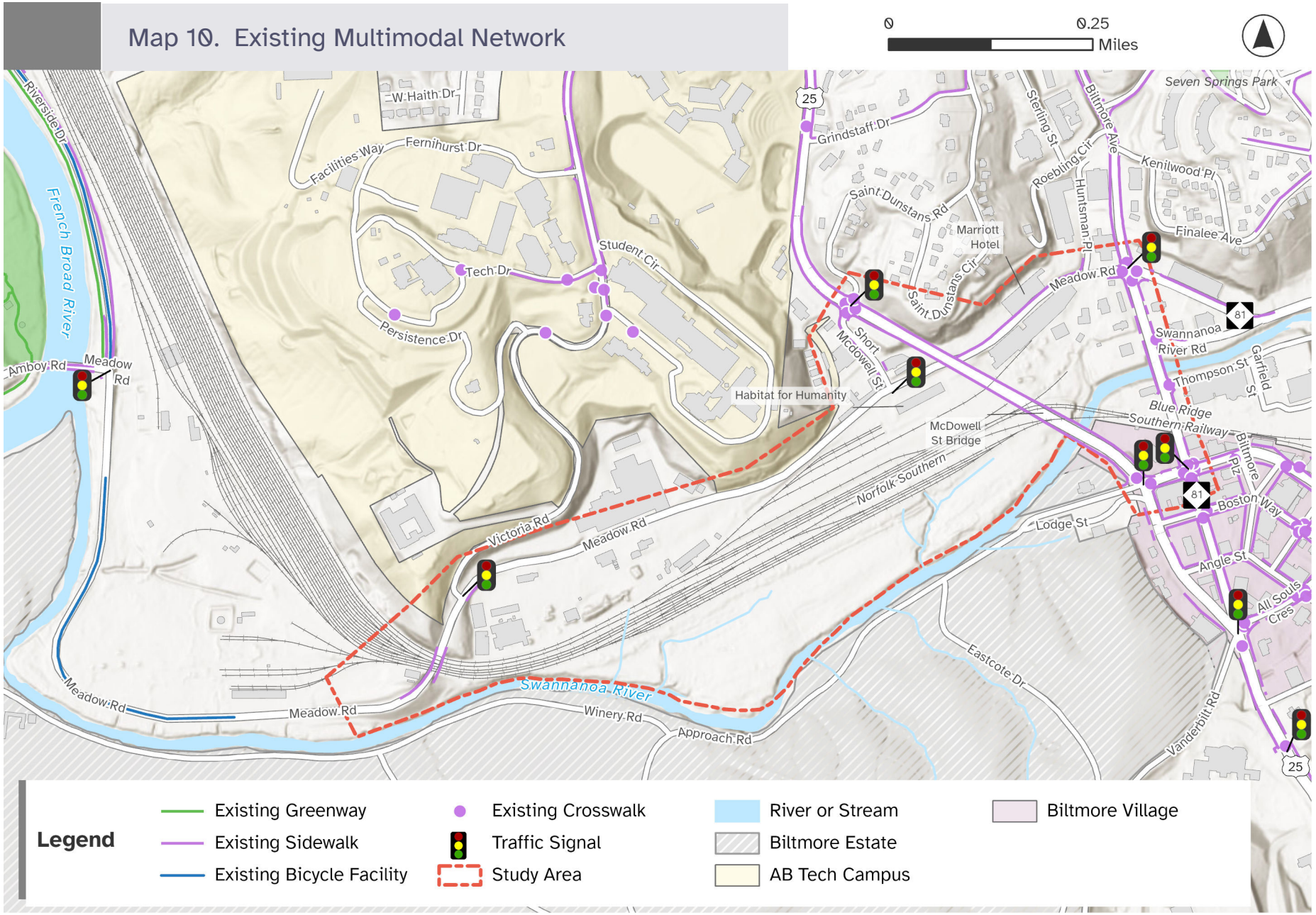
Image 30. Short McDowell Street (Looking South)



Source: TPD

A portion of Short McDowell Street has a narrow sidewalk. The City has plans to repave this street and improve sidewalk connections.

Map 10. Existing Multimodal Network



Bike Lanes

There is a section of Meadow Road with bike lanes (near the intersection with Amboy Road). However, this facility abruptly disappears before reaching the bridge over the railroad tracks (*see* **Image 31 - Bicycling on Meadow Road**). This creates a discontinuity, as people are encouraged to continue along Meadow Road from the River Arts District greenway, only to find themselves suddenly merged into a lane of motor vehicle traffic in a 35 mph zone. This transition poses safety concerns and underscores the need for continuous and cohesive bicycle infrastructure to ensure the safety and comfort of cyclists.

The River Arts District has become a destination for bicycling, and is now a multimodal transportation and recreational hub. This transformation has been facilitated by recent transportation improvement projects that prioritize pedestrian and cyclist safety, enabling people to explore the area on foot or by bike with confidence. New apartment complexes have sprung up farther upstream along the Swannanoa River, with hundreds of new residents who would benefit from safe bicycling options.

Image 31. Bicycling on Meadow Road



Source: TPD

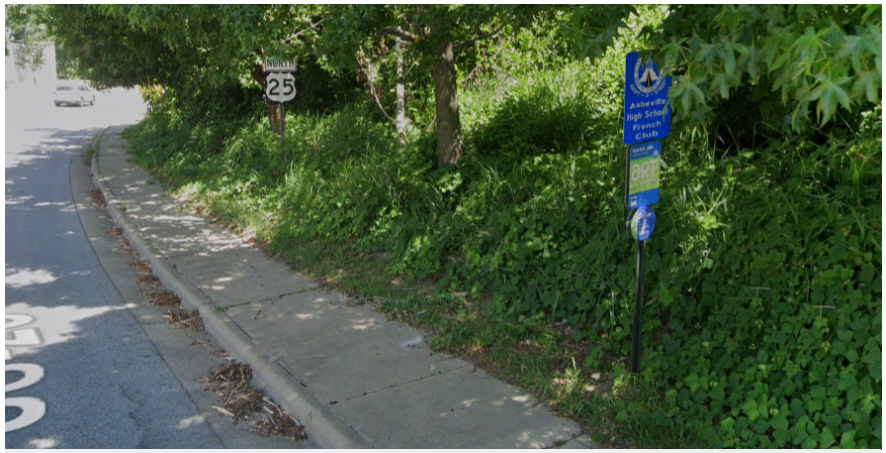
The existing bike lane on Meadow Road ends before you reach the bridge over the rail lines. There are no other bicycle facilities in the study area.

Transit

Asheville Rides Transit (ART) offers service in the study area. Routes S3 and S6 use McDowell Street and have designated stops at the Short McDowell Street intersection and Lodge Street. S1 and S5 traverse along Biltmore Avenue, with stops at Meadow Road and on Lodge Street, connecting the Shiloh and Oakley neighborhoods. Meanwhile, the S4 route stops at the A-B Tech campus. These routes all connect to the ART transfer station in the heart of downtown and provide access to Hendersonville Road and south Asheville.

The City of Asheville's Transit Master Plan recommends two new bus routes that would affect this study area. The Carrier Park route would provide service along Amboy Road and Lyman Street. The Swannanoa River Road route would travel outbound on Biltmore Avenue and turn onto Thompson Street and Glendale Avenue, before returning along Swannanoa River Road back to Biltmore Avenue.

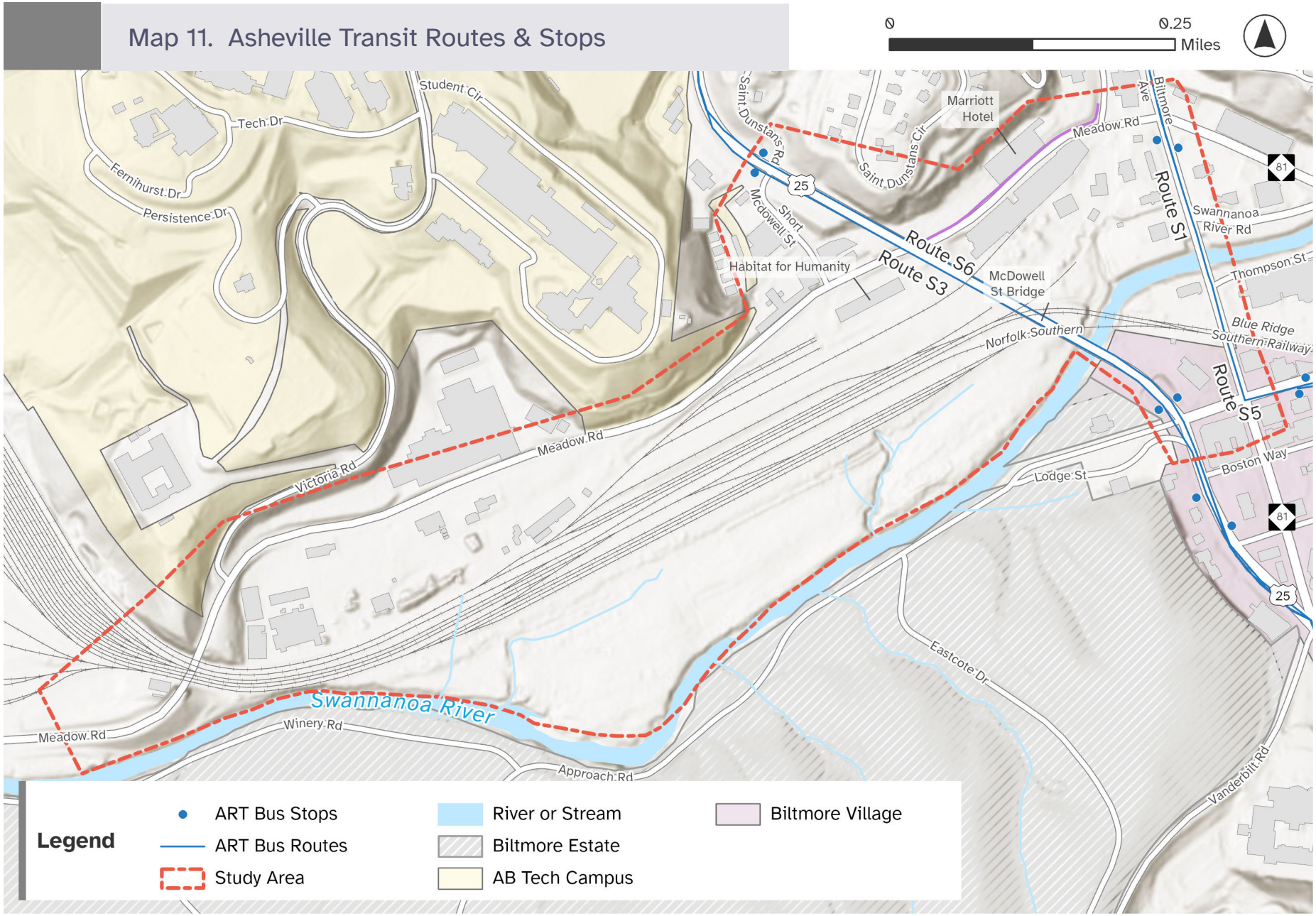
Image 32. Bus Stop on McDowell Street



Source: Google

The ART transit stop at the corner of McDowell Street and Short McDowell Street lacks shelter and seating. A greenway connection could be beneficial for people who ride transit.

Map 11. Asheville Transit Routes & Stops

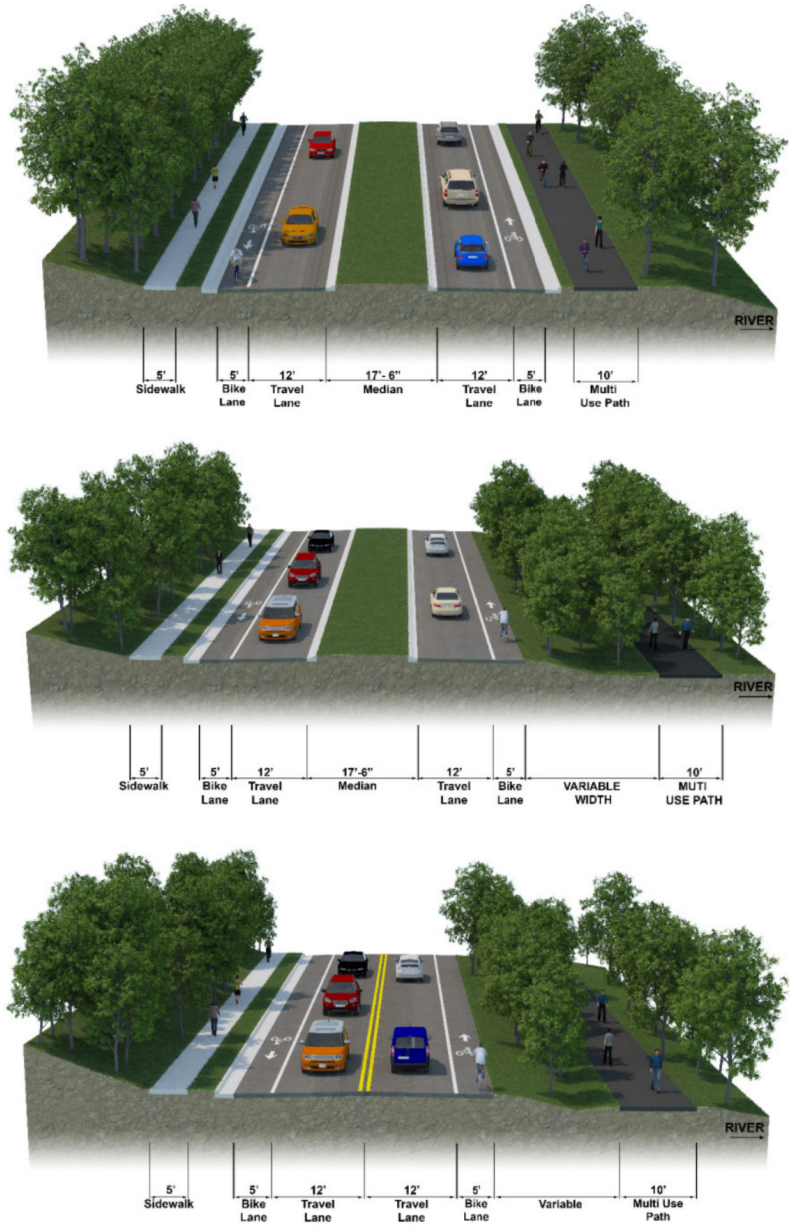


Planned & Programmed Projects

A successful feasibility study must integrate and work in tandem with concurrent project development efforts. **Map 12 - Planned Projects** shows several of these, including linear projects from the NCDOT State Transportation Improvement Program (STIP), the State Highway Maintenance Improvement Program (HMIP), and the 2022 Asheville Close the GAP Plan:

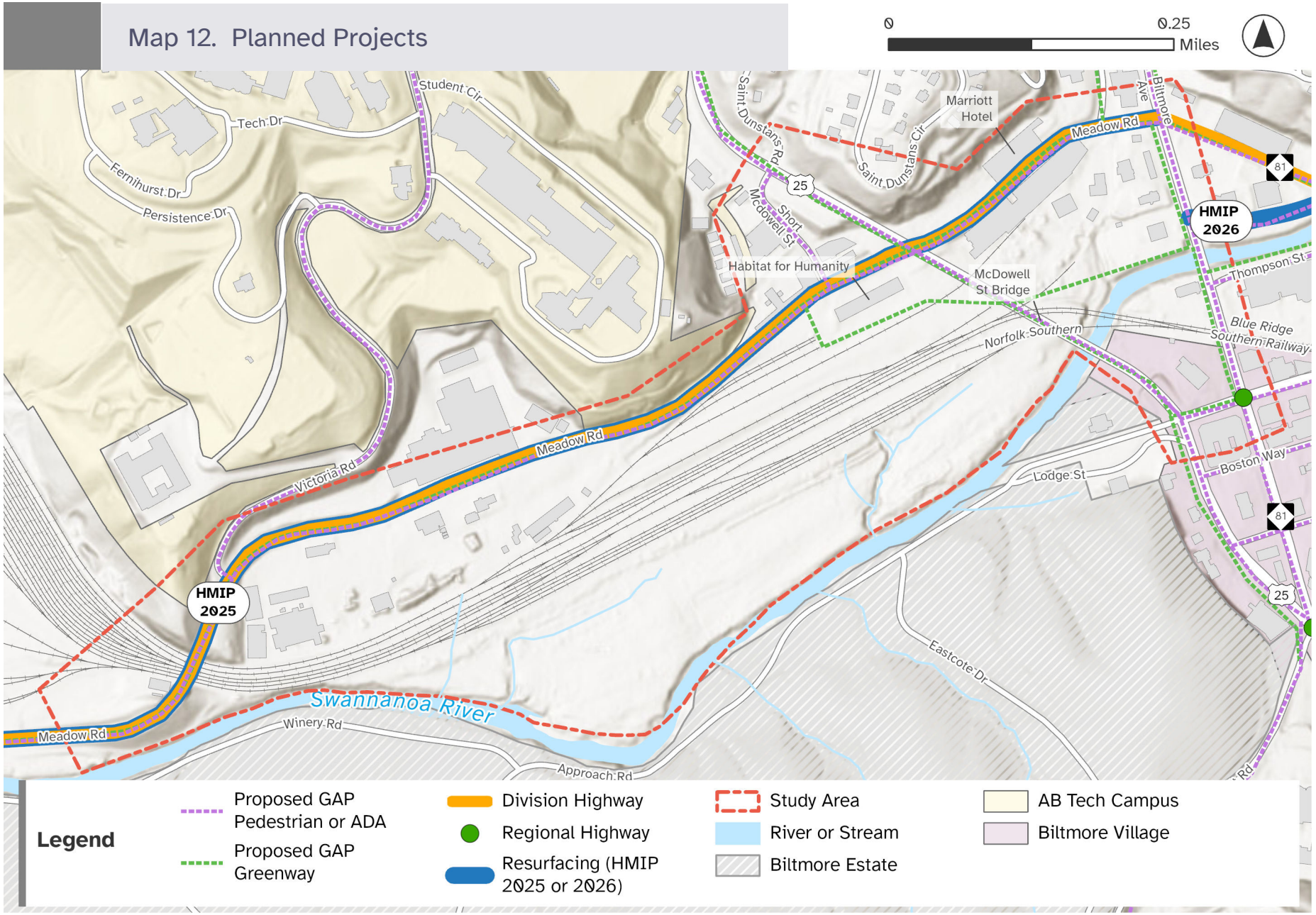
- Meadow Road is part of NCDOT STIP project U-4739, which will upgrade the roadway to include bicycle and pedestrian facilities. The final design is not yet determined, but construction is expected in 2028. *See* ***Image 33 - Possible Typical Sections for Amboy & Meadow Road.*** The recommendations in this study assume that this STIP project will move forward.
- NCDOT STIP project U-5832 is a roadway upgrade along Swannanoa River Road, involving flood mitigation strategies. The final design is not determined, but will include bicycle and pedestrian facilities.
- Meadow Road and Swannanoa River Road are also identified on the HMIP as needing pavement preservation in 2025 and 2026, respectively. Scheduled repavings can sometimes be an opportunity to collaborate on a new re-striping configuration for the roadway (for example, narrowing vehicular lanes to add new bike lanes, without widening the total roadway width).
- STIP project W-5813D includes intersection improvements at All Souls Crescent and Lodge Street at Biltmore Avenue, including curb ramps, sidewalk, and signal upgrades. Pedestrian mobility is important for this area.
- The Close the GAP Plan recommends sidewalks and accessibility improvements throughout the study area. The GAP Plan also recommends greenways along Meadow Road, McDowell Street, and around Habitat for Humanity. These are similar to the Biltmore Avenue & McDowell Street Corridor Study, which explored options to remove a lane of traffic and add a multiuse side path on one or both roadways.

Image 33. Possible Typical Sections for Amboy & Meadow Road

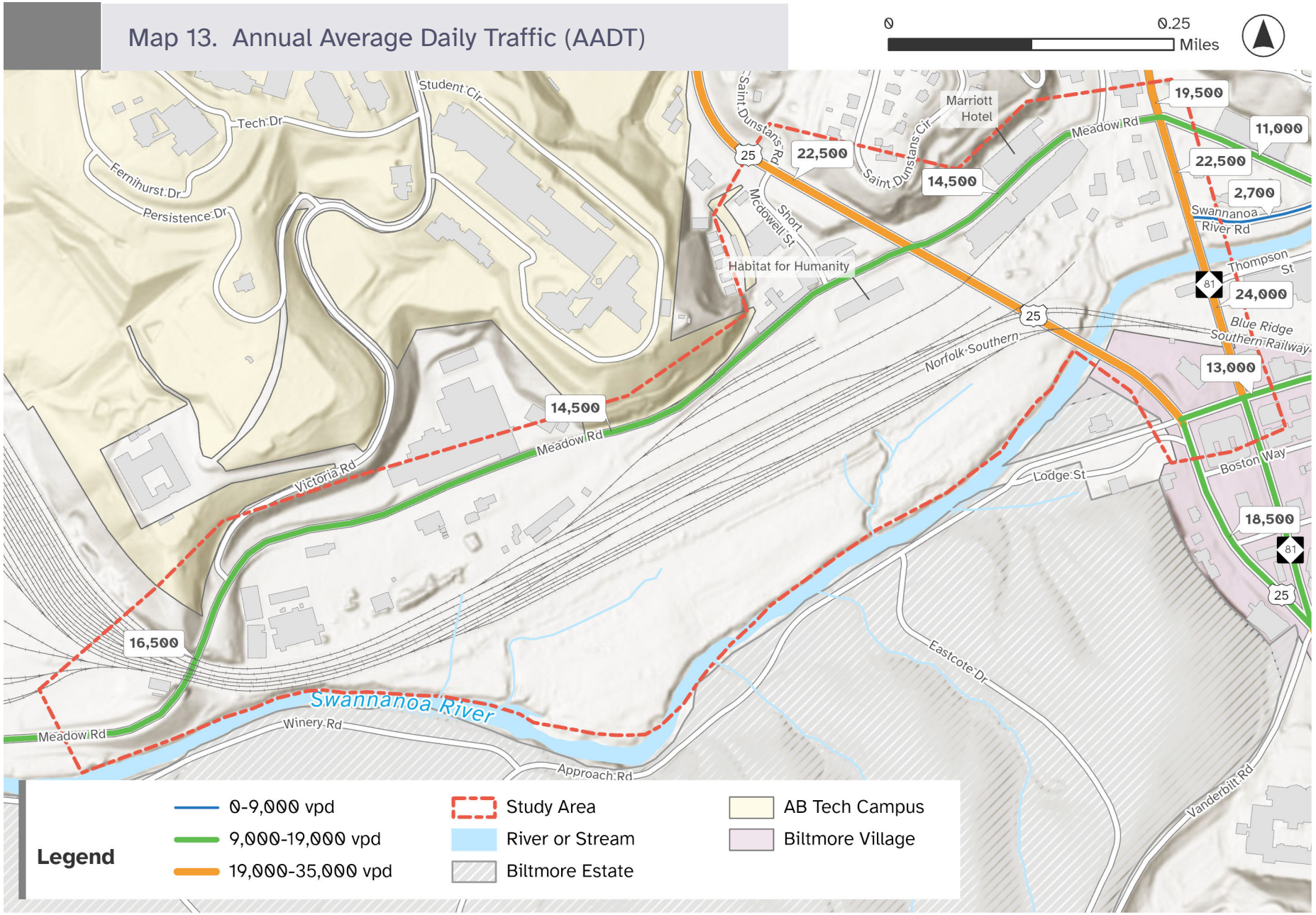


Source: NCDOT

Map 12. Planned Projects



Map 13. Annual Average Daily Traffic (AADT)



Data Source: NCDOT

Traffic Volumes

Utilizing data from NCDOT (2021), we gain insight into the traffic volume on key corridors that influence the study area. Illustrated in **Map 13 - Annual Average Daily Traffic (AADT)**, McDowell Street and Biltmore Avenue emerge as the busiest, accommodating between 18,500 - 22,500 and between 19,500 - 24,000 vehicles per day (vpd), respectively. These thoroughfares are designed to serve as vital commuter routes, facilitating traffic flow to and from the downtown area, while also providing access to nearby Mission Hospital. Traffic volumes on these roadways fluctuate across segments as drivers navigate turns and proceed onto other streets. However, the traffic on Meadow Road west of Biltmore Avenue remains relatively constant at 14,500 vpd.

Understanding traffic patterns and volumes is instrumental in determining suitable routes and infrastructure types for adjacent bicycle and pedestrian facilities, enabling the implementation of measures to alleviate potential conflicts between different road users. This study aims to foster the efficient and safe integration of bicycle and pedestrian infrastructure into the existing road network, thereby enhancing accessibility and promoting sustainable modes of transportation.

Image 34. Traffic on Meadow Road at Biltmore Avenue



Source: Google

Image 35. Traffic on Short McDowell Street at McDowell Street



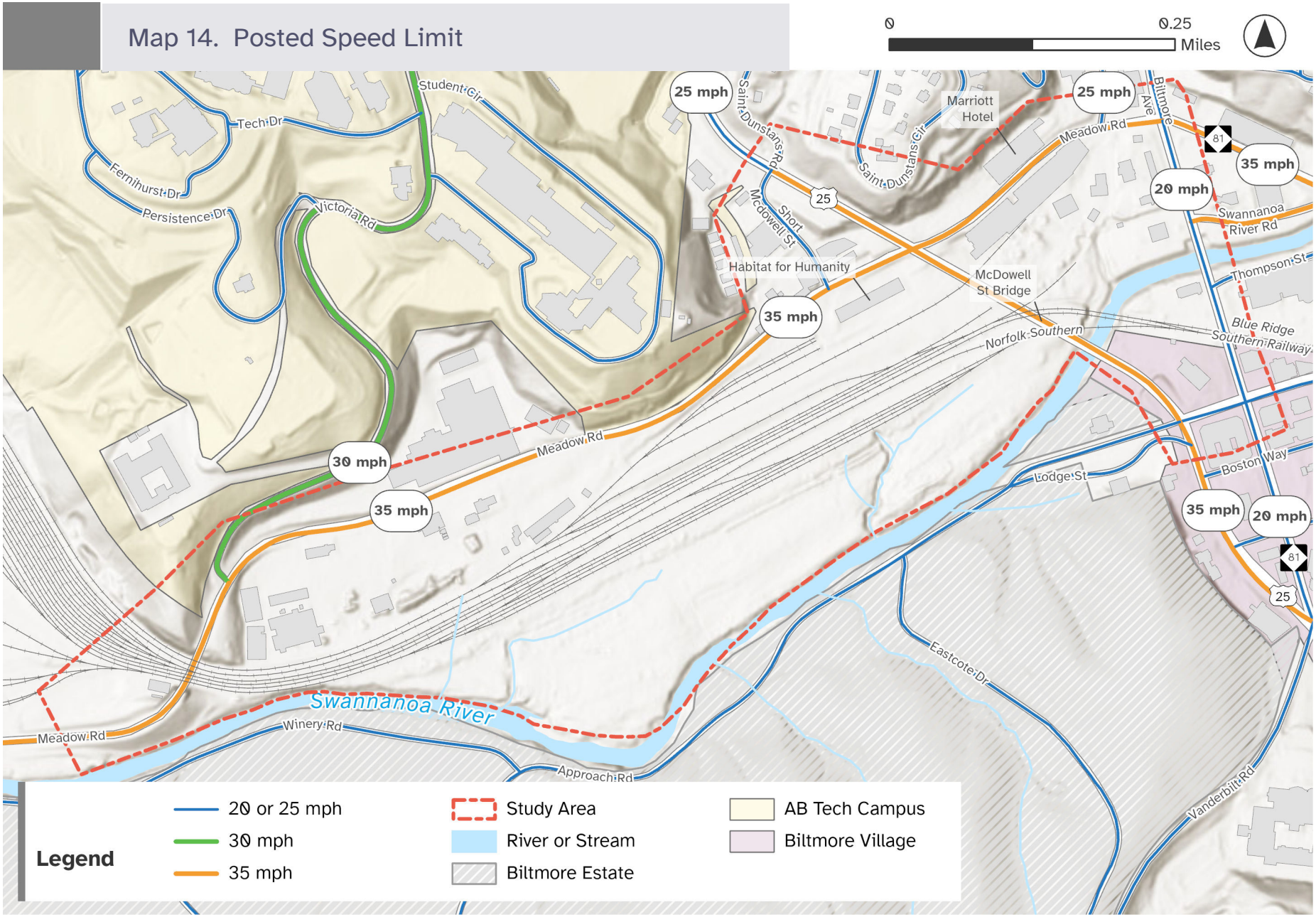
Source: Google

Image 36. Traffic on Meadow Road at Short McDowell



Source: Google

Map 14. Posted Speed Limit



Data Source: NCDOT (2021)

Posted Speed Limit

Drawing upon additional data from NCDOT, **Map 14 - Posted Speed Limit** shows the posted speed limits on various segments within the study area, primarily focusing on state-maintained roads. Understanding these speed dynamics plays a role in guiding decisions regarding route selection and the integration of safety measures so that adjacent bicycle and pedestrian infrastructure can be effectively and safely integrated into the existing road network.

Image 37. Speed Limit Sign on Meadow Road



Source: TPD

Considering a shared use path directly adjacent to a 35 mph roadway could be feasible. However, achieving this requires adequate space and careful design considerations, along with implementing safety measures (such as physical separation using barriers, curbs, or buffers) to minimize conflicts and ensure the comfort and well-being of users. These corridors (including Meadow Road and McDowell Street) are further constrained by steep topographical changes, limited right-of-way, and existing structures, posing challenges and increasing the costs associated with incorporating bicycle and pedestrian infrastructure.

Alternatively, a greenway situated closer to the river may present a more favorable option. Particularly for younger people or older adults, or less experienced bicyclists, a fully separated greenway can offer a more welcoming environment, free from motor vehicle traffic, thereby enhancing accessibility and promoting active transportation. Furthermore, such off-road routes often afford greater flexibility in incorporating amenities such as landscaping, seating areas, and signage, thereby enhancing the overall user experience.

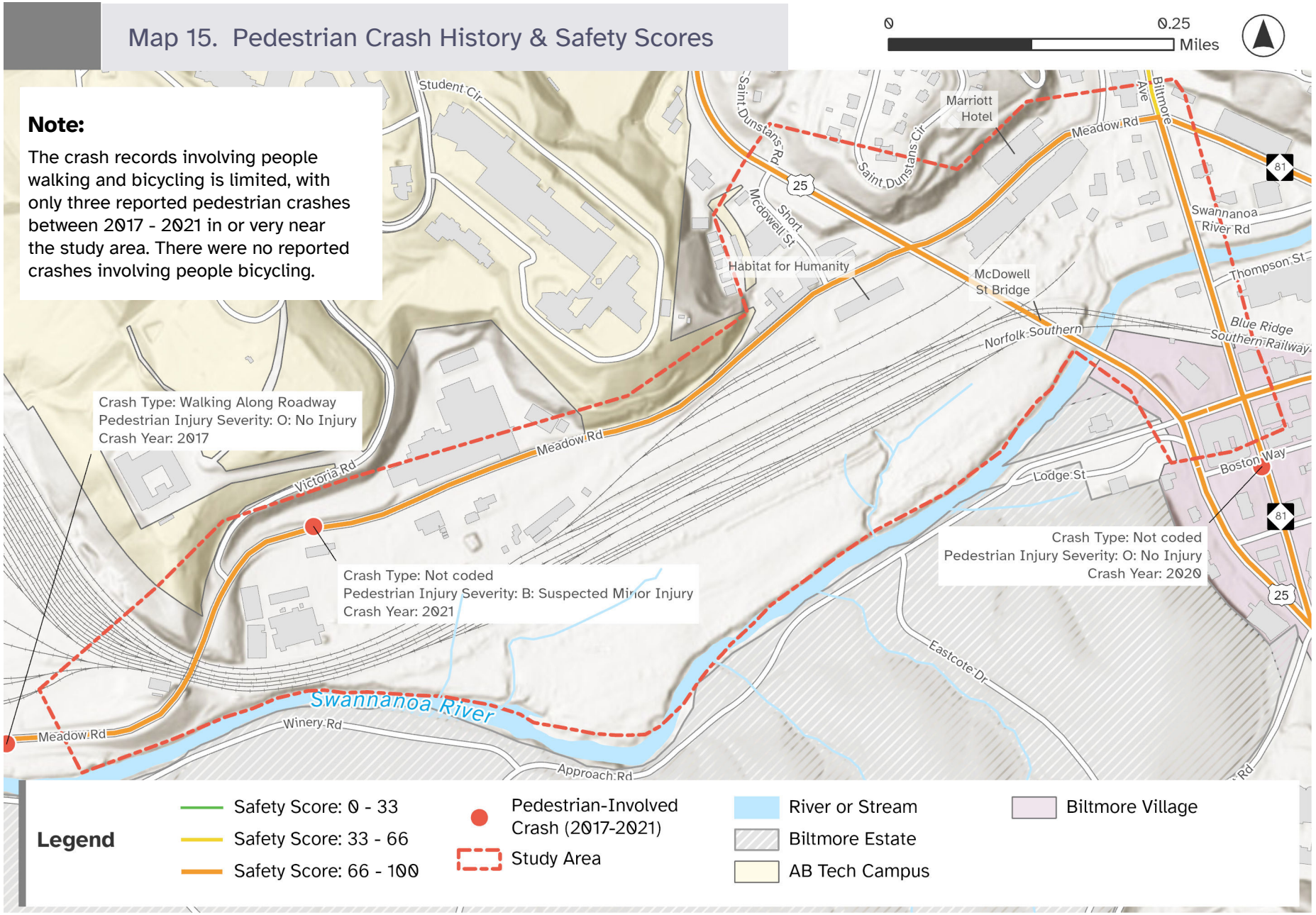
Pedestrian Crash History and Corridor Safety Scores

Map 15 - Pedestrian Crash History & Safety Scores displays the reported pedestrian-involved crash data from 2017 to 2021, along with the NCDOT Corridor Section Safety Scores within the study area. While the presence of only one reported pedestrian crash may not serve as a definitive indicator of safety, it suggests that pedestrian activity is limited due to the absence of a dedicated pedestrian network. Factors such as the number of travel lanes, Annual Average Daily Traffic (AADT), and posted speed limits offer a more comprehensive understanding of crash risk and the perceived safety for pedestrians.

The NCDOT Section Safety Scores offer a summarized overview of crash and safety data pertaining to intersections or road sections for all road users, including people riding bicycles and driving motorized vehicles. These scores are designed to aid in high-level prioritization and network programming. They are calculated based on three main criteria: 1) density of crashes in the study area compared to the average crash density of similar facilities; 2) crash severity index; and 3) the actual crash rate in the study area compared to the critical crash rate. Higher scores indicate segments that pose greater safety challenges, encompassing all roadways within the study area.

As emphasized by survey respondents, prioritizing efforts to "reduce the interaction between motor vehicles and vulnerable users (bicyclists and pedestrians)" is important to improve safety and promote active transportation.

Map 15. Pedestrian Crash History & Safety Scores

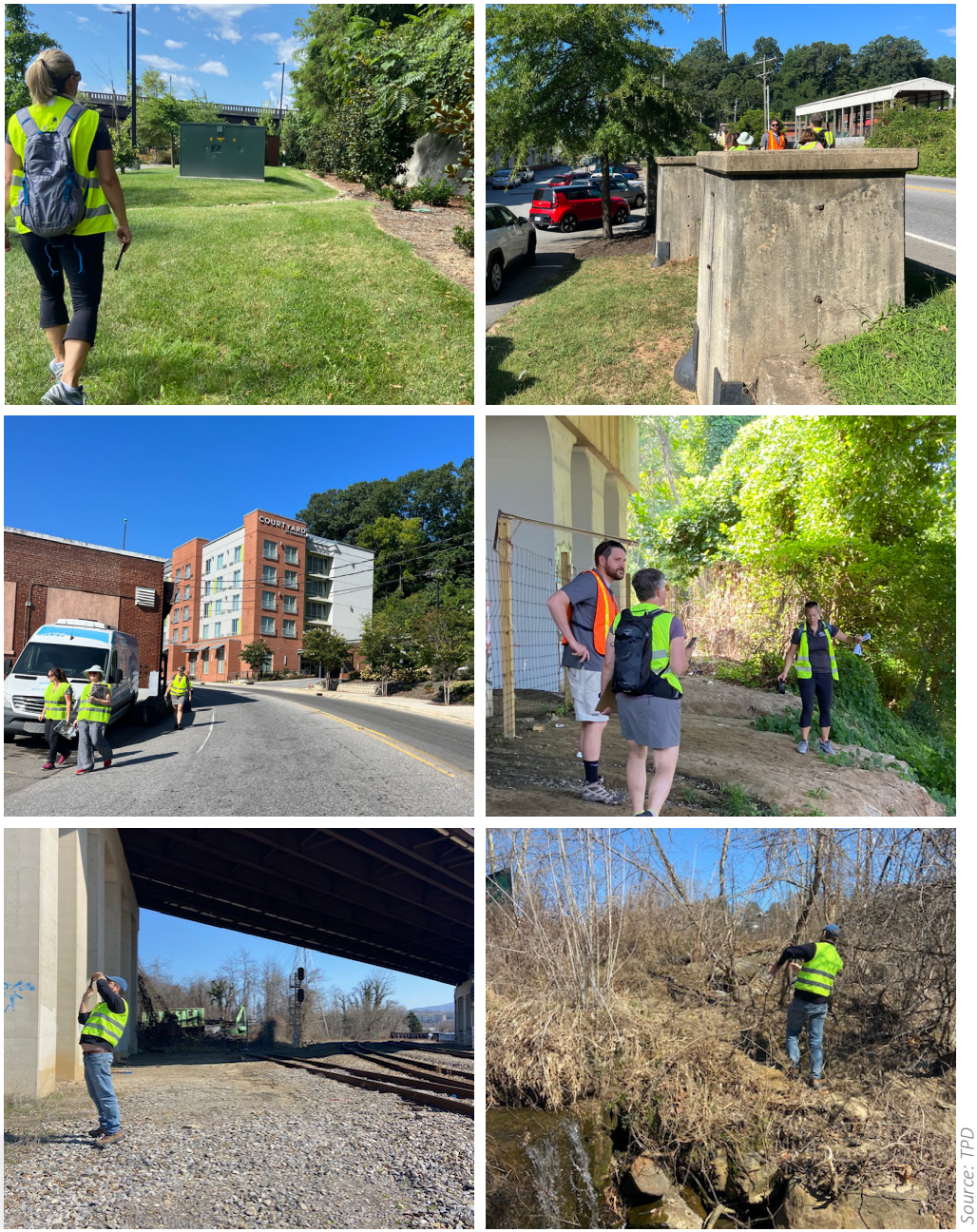


FIELD OBSERVATIONS

Seeing a study area in person is vital to understanding the existing conditions. On September 7, 2023, the project team conducted a visit to the study area to assess the transportation network's alignment with adjacent land uses, taking photographs and measurements to help identify opportunities and constraints. Subsequently, another site visit was conducted on February 21, 2024, further informing the project's contextual analysis. During these site visits, the team reviewed the following items that impact the development of alternatives:

- Municipal boundaries
- Topography
- FEMA Floodway and Floodplain
- Structures (retaining walls, bridges)
- Roadway environment (traffic volumes, posted speed, traffic control, guardrail, sidewalks, crossings, parking)
- Access points and driveways
- Rights-of-way and property impacts
- Building setbacks
- Utilities
- Drainage
- Cemeteries
- New developments

The opportunity and constraint factors are depicted in the subsequent maps and photographs, organized geographically across the study area.



The Project Team in the field during both the summer and winter.

Source: TPD

Map 16. Meadow Road & Biltmore Ave Site Photo Locations



MEADOW ROAD & BILTMORE AVENUE SITE PHOTOS



The sidewalk along Biltmore Avenue has narrow separation between the roadway and sidewalk.



The intersection of Biltmore Avenue and Meadow Road becomes congested and has little room for pedestrians.



Biltmore Iron & Metal Company is in the heart of the study area.



The historic building (Gladheart Farms Distribution) is situated right next to Meadow Road.

Map 17. Meadow Road Site Photo Locations



MEADOW ROAD SITE PHOTOS



A significant slope exists behind the Marriott hotel, presenting a constraint to trail development.



Meadow Road is very constrained between buildings (some new and some historic).



A wide sidewalk constructed in front of the Marriott hotel ends at the McDowell Street bridge overpass.



The Habitat ReStore donation center parking lot has a significant elevation change from Meadow Road.

Map 18. Swannanoa River & Biltmore Ave Site Photo Locations



SWANNANOA RIVER & BILTMORE AVENUE SITE PHOTOS



Asaka Restaurant on Biltmore Avenue is next to the river and has a sewer easement adjacent to their parking lot.



The Swannanoa River Greenway would connect near this intersection with Biltmore Avenue and Swannanoa River Road.



The Swannanoa River is both an opportunity and a constraint for a greenway. Flooding is an issue in this area.



The City of Asheville's sewer easement is a potential opportunity for a connection.

Map 19. Swannanoa River Area Site Photo Locations



SWANNANOA RIVER AREA SITE PHOTOS



The vehicle bridge over the Swannanoa River includes a sidewalk that is not wide enough for a multiuse path.



From the McDowell Street bridge, the rail lines cross over the river and Biltmore Avenue.



The rail line crosses the Swannanoa River and an unnamed tributary.



There is enough space for a trail alignment on the south bank of the Swannanoa River underneath the McDowell Street bridge.

Map 20. McDowell Street & Train Tracks Site Photo Locations



MCDOWELL STREET & TRAIN TRACKS SITE PHOTOS



A sewer easement across a tributary runs adjacent to the rail line.



View of the wide McDowell Street bridge over the railroad and river.



A rail line that once served Biltmore Iron & Metal is no longer in use.



A sewer easement along the open land between the rail lines and the river.

Map 21. Meadow Rd & Habitat Property Site Photo Locations



MEADOW ROAD & HABITAT PROPERTY SITE PHOTOS



A gravel access driveway crosses the railroad tracks near Habitat for Humanity.



The Habitat for Humanity parking lot is constrained between the historic building and Meadow Road.



The historic Southern Railway building is now Habitat for Humanity offices.



Meadow Road near Short McDowell Street is constrained by elevation changes and an existing retaining wall.

Map 22. Meadow Rd & Short McDowell Site Photo Locations



MEADOW ROAD & SHORT MCDOWELL SITE PHOTOS

25



Meadow Road constraints include historic buildings, elevation change, and overhead utilities.

26



Meadow Road near Short McDowell Street will be modified with future NCDOT widening and will incorporate a new multiuse sidepath.

27



Meadow Road near the McDowell Street bridge has several constraints in the right-of-way, including utilities.

Map 23. Meadow Road & Train Tracks Site Photo Locations



MEADOW ROAD & TRAIN TRACKS SITE PHOTOS



Short McDowell Street lacks a continuous sidewalk and is steep. The City is working to add sidewalk in this location.



A parcel owned by the railroad adjacent to Meadow Road and Habitat for Humanity sits vacant.



The land adjacent to the rail lines is wide and flat. A gravel service road parallels the train tracks.

Map 24. Train Track & Utility Easement Site Photo Locations



TRAIN TRACK & UTILITY EASEMENT SITE PHOTOS



These trees are protected by the Biltmore Company as they have a 50' view shed easement which extends across the river and onto the railroad ROW.

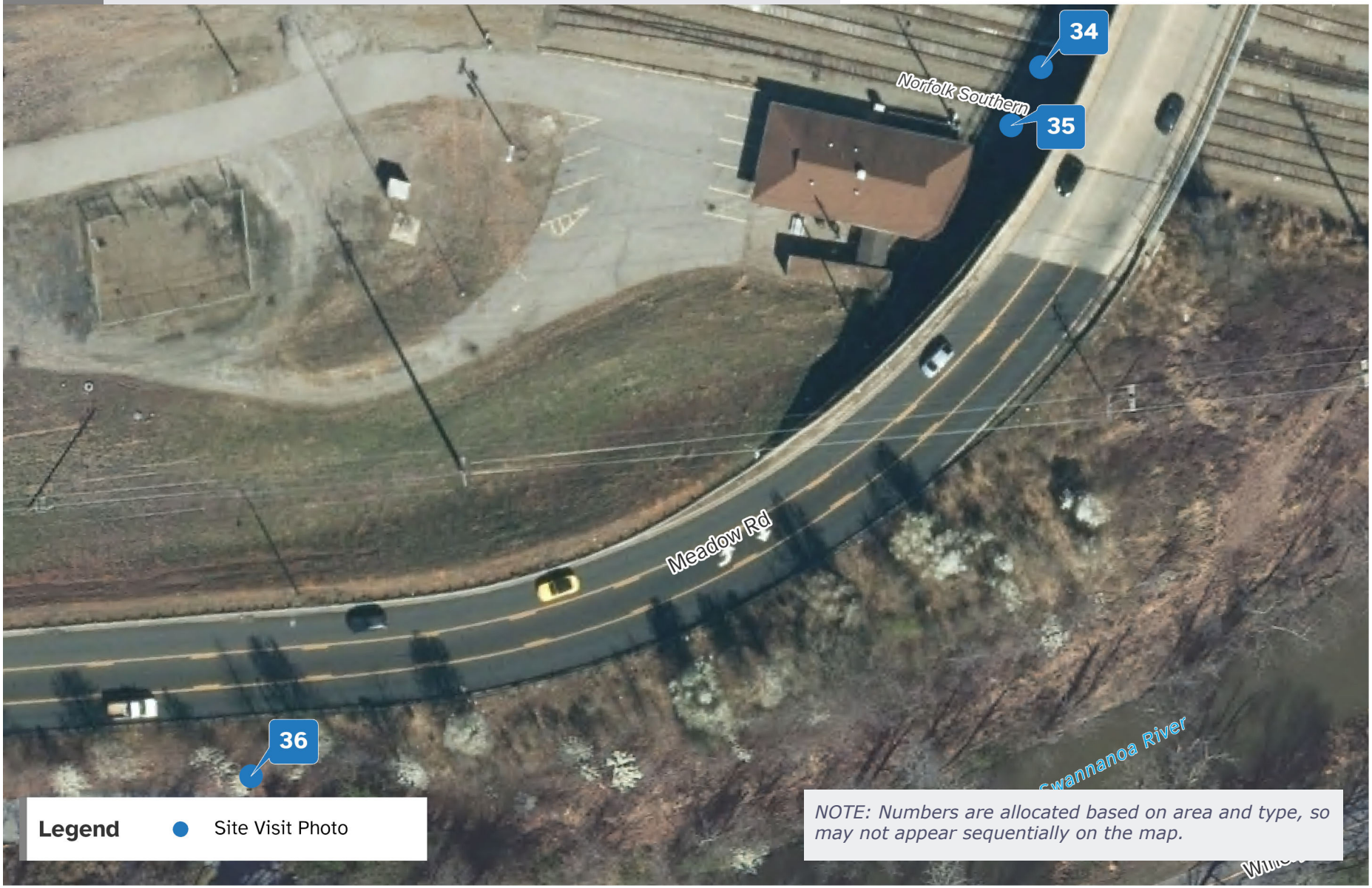


Sewer easement along the Swannanoa River - the pinch point that would require an elevated structure to pass over.



The overhead utility lines between Meadow Road and the river are a constraint for any elevated structures.

Map 25. Amboy/Meadow Road Site Photo Locations



AMBOY/MEADOW ROAD SITE PHOTOS



The rail yard office building is located adjacent to the tracks.



The Meadow Road bridge over the rail lines is constrained; however, there is potential space for a trail.



An access drive to the Biltmore Estate (for employees) is located between Meadow Road and the Swannanoa River.

ALTERNATIVES DEVELOPMENT

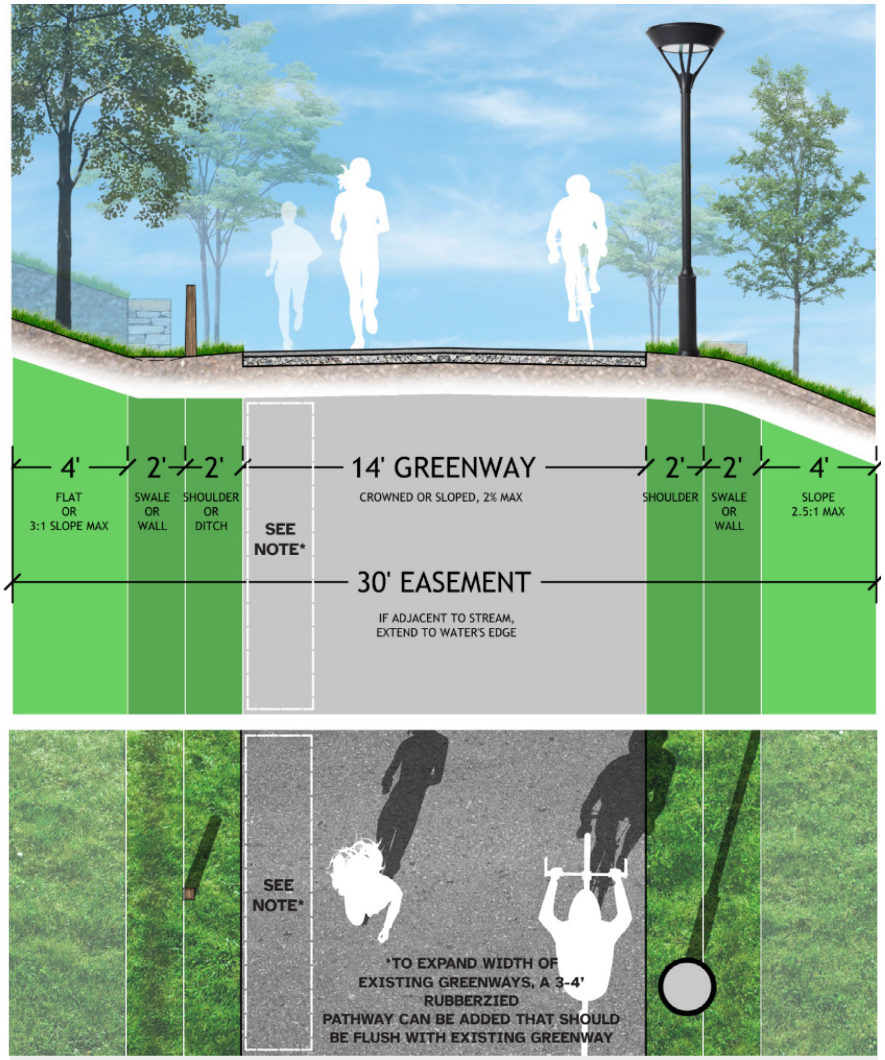
Design Criteria

Engineering design criteria delineate the preferred attributes of a facility, encompassing factors such as its type, width, and grades, which play a role in the development of greenway alignment alternatives. The Swannanoa River Greenway Extension should adhere to design solutions that improve safe multimodal access, allow for phased implementation as needed, and align with NCDOT's Meadow Road plans.

The City of Asheville has design standards for a number of greenway types based on their importance to the network and the number of people they are expected to serve. For the Swannanoa River corridor, the most appropriate type is the Greenway Spines. These pathways serve as vital arteries in the city's pedestrian and bicycle network and offer the highest level of service, with ample carrying capacity and design speed to accommodate a significant number of users efficiently. Characterized by generous width, typically averaging 12-14 feet (or narrower if a parallel bicycle facility is established) along with significant amenities and widespread recognition, these Greenway Spines traverse entire districts of the city, akin to the "highways" of the greenway network.

In instances where a greenway segment is situated adjacent to a roadway or integrated into existing pavement, such as bike lanes or cycle tracks, there may arise constraints related to right-of-way availability and narrower widths may be needed to accommodate these spatial limitations. The incorporation of protective measures becomes important to safeguard the well-being of bicyclists and pedestrians. These protective measures may include the installation of landscaping or barriers, such as concrete curbs or bollards, which serve to delineate and provide a physical separation between the greenway users and vehicular traffic. By implementing these protective features, the safety and security of both bicyclists and pedestrians are enhanced, contributing to a more conducive environment for active transportation.

Image 38. City of Asheville Greenway Spine Typology Cross-Section



Source: City of Asheville

As a section of one of Asheville's key Greenway Spines, the Swannanoa River Greenway Extension project needs to align with design parameters for the broader corridor.

Table 2. City of Asheville Greenway Spine Typology

Definition	Standard Width	Surface Tread	Longitudinal Slope:	Drainage/Cross Slope:
Greenways Spines are the major "highways" of the city's pedestrian/bicycle system. This greenway type carries the highest level of service and has the highest design speed. It also has the highest level of investment due to its prominence within the system, width, amenity investment, and "name recognition."	14' wide. Min 10' and up to 14' in anticipated high use corridors where space allows. If this width can not be used, parallel active transportation facility should be considered (e.g., sidewalks). Optional gravel/crushed fines shoulder could be used where width can not be met. **Shoulders*:** 16"min/24" max grass (turf) shoulders. **To increase existing greenway width, a 3-4' rubberized shoulder can be added.*	Asphalt greenway surface.	Less than 5% slope for accessibility/ ADA compliance.	Proper drainage of the greenway should be provided and can include 2% crown or cross slope of the greenway with a drainage ditch or swale on the inside portion of the greenway. 2% in-slope or out-slope can also be used to provide positive drainage along the greenway. Typical swale cross sections, 3:1 side slopes max, 1' base min. Trees should be offset or cleared 6' from the greenway swale.
User Types	**Temporary Construction Easement**	**Typical Greenway Easement Width**	**Level of Service/ Design Speed**	**Additional Notes**
All types of users. Major transportation routes to access all parts of the city. While transportation is its primary service, it can serve as a destination for out of area users and/or day-long recreation users.	As needed by existing topography with all built elements located within the greenway easement.	30' typical. When along a stream or river, extend the easement to the edge of the water body to promote conservation. If paralleling a road, a reduced easement may be used.	Major transportation routes, user travel speed and level of service is high, requiring design to accommodate via radii and other means.	Centerline striping of the greenway to address high user volumes may be appropriate. Striping should be used on tight or blind corners, near intersections and under bridges, and other areas where the greenway may be confined.

Source: City of Asheville

City of Asheville Greenway Spines are also expected to have a high level of user amenities and wayfinding, including lighting, wayfinding signs and mile markers (for emergency response), trailhead maps and gateway monuments, trash and dog waste receptacles, seating, public art, and parking spaces.

Segment Alternatives

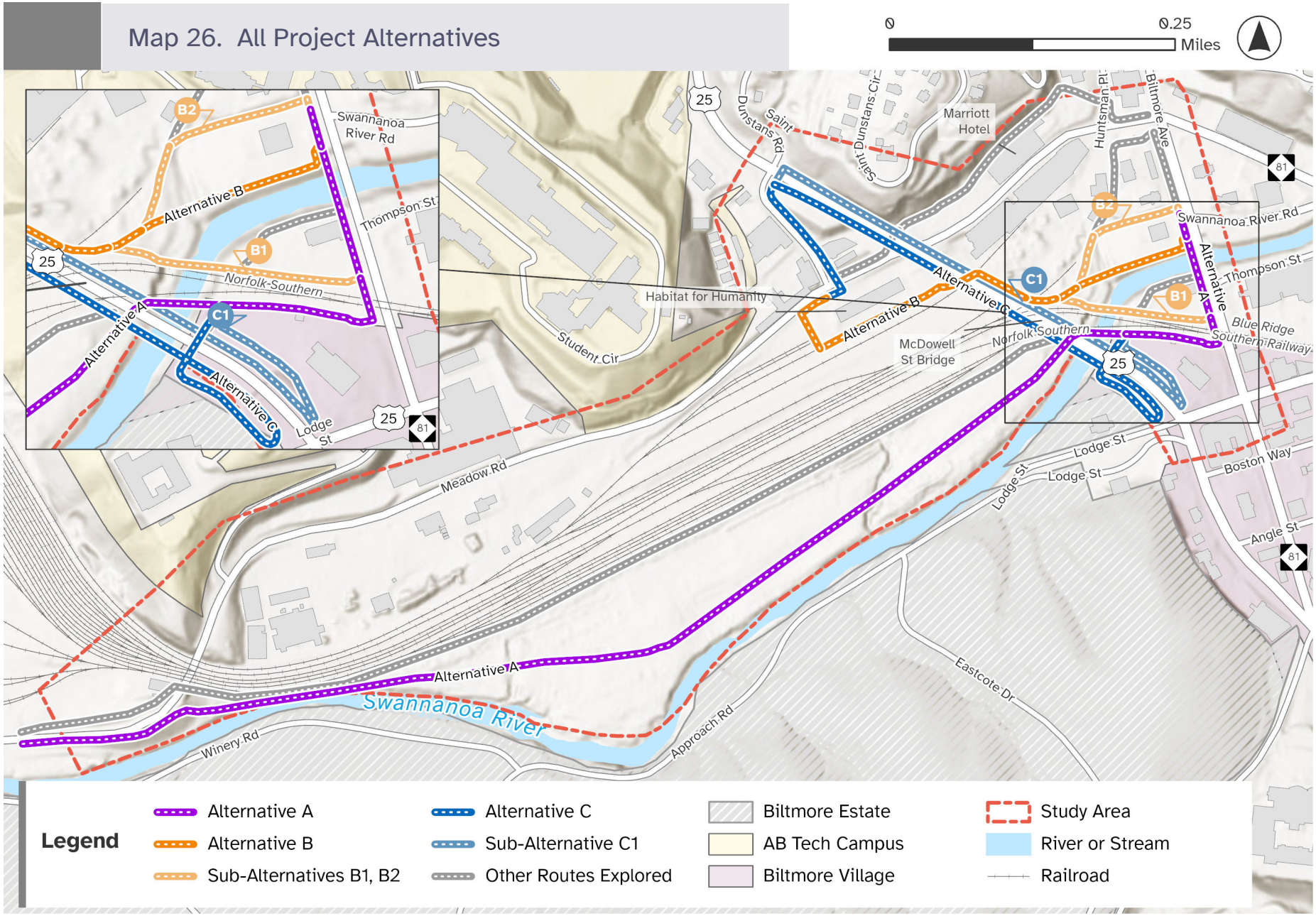
All possible routes were explored to provide bicycle and pedestrian connectivity to and throughout the study area.

These routes are summarized in **Table 3 - Segment Alternatives**, with more detailed and a preferred route alternative provided in Chapter 4. **Map 18 - All Project Alternatives** illustrate these connections.

Table 3. Segment Alternatives

ID	Description	Road Crossings	Length	Relative Cost Range	Challenges/ Constraints
A	Paved off road shared use path following the sewer easement on Norfolk Southern property between the rail lines and the Swannanoa River.	0	~4,900 Linear Feet	HIGH	Elevated structure and pedestrian bridge over Swannanoa River would be required; floodway permitting challenges; approvals would be needed from Biltmore, Norfolk Southern & MSD.
B	Paved off road shared use path from Meadow Road adjacent to Habitat for Humanity; uses abandoned rail line under the McDowell Street bridge; enters sewer easement to Asaka Restaurant parking lot at Biltmore Ave.	0	~1,900 Linear Feet	LOW-MEDIUM	Requires easement from Norfolk Southern and MSD; Habitat for Humanity and Asaka Restaurant parking lot re-configuration; box culvert needed over stream. Possible brownfield.
B1	Similar to Alt B, but after passing underneath the McDowell Street bridge accesses Biltmore Avenue by crossing the Swannanoa River and following the rail line.	0	~2,200 Linear Feet	MEDIUM	Requires a new pedestrian bridge over the Swannanoa River.
B2	Similar to Alt B, but after passing underneath the McDowell Street bridge accesses Biltmore Avenue from the north edge of the Asaka Japanese restaurant near Long John Silver's restaurant.	0	~1,900 Linear Feet	LOW-MEDIUM	Rail line right-of-way; parking space reconfiguration at Habitat property and Asaka and Long John Silver's restaurant; retaining wall needed between Long John Silver's and Asaka parking lots.
C	Paved multiuse path along Short McDowell Street and along the west side of the McDowell Street bridge, passing underneath the bridge and paralleling the rail line to Biltmore Avenue.	1	~3,700 Linear Feet	MEDIUM	Steep slopes along Short McDowell Street; requires reconfiguring lanes on McDowell Street bridge; requires permission from the Biltmore Company.
C1	Paved multiuse path along Short McDowell Street and along the east side of McDowell Street bridge, paralleling the rail line to Biltmore Avenue.	2	~3,700 Linear Feet	HIGH	Steep slopes along Short McDowell Street; lower quality user experience; would require signalized crossing on McDowell Street.

Map 26. All Project Alternatives





03 Community Engagement


USA

OVERVIEW

Active community engagement is essential in every planning initiative, providing insights into local needs and observations that ultimately lead to improved project designs. Engagement opportunities allow the project team to communicate project objectives, manage expectations, and share results. This chapter outlines the efforts and input gathered from a variety of stakeholders, including community members, working group participants, supportive agencies, and non-profit organizations, all of whom have contributed to shaping the Swannanoa River Greenway Extension Feasibility Study.

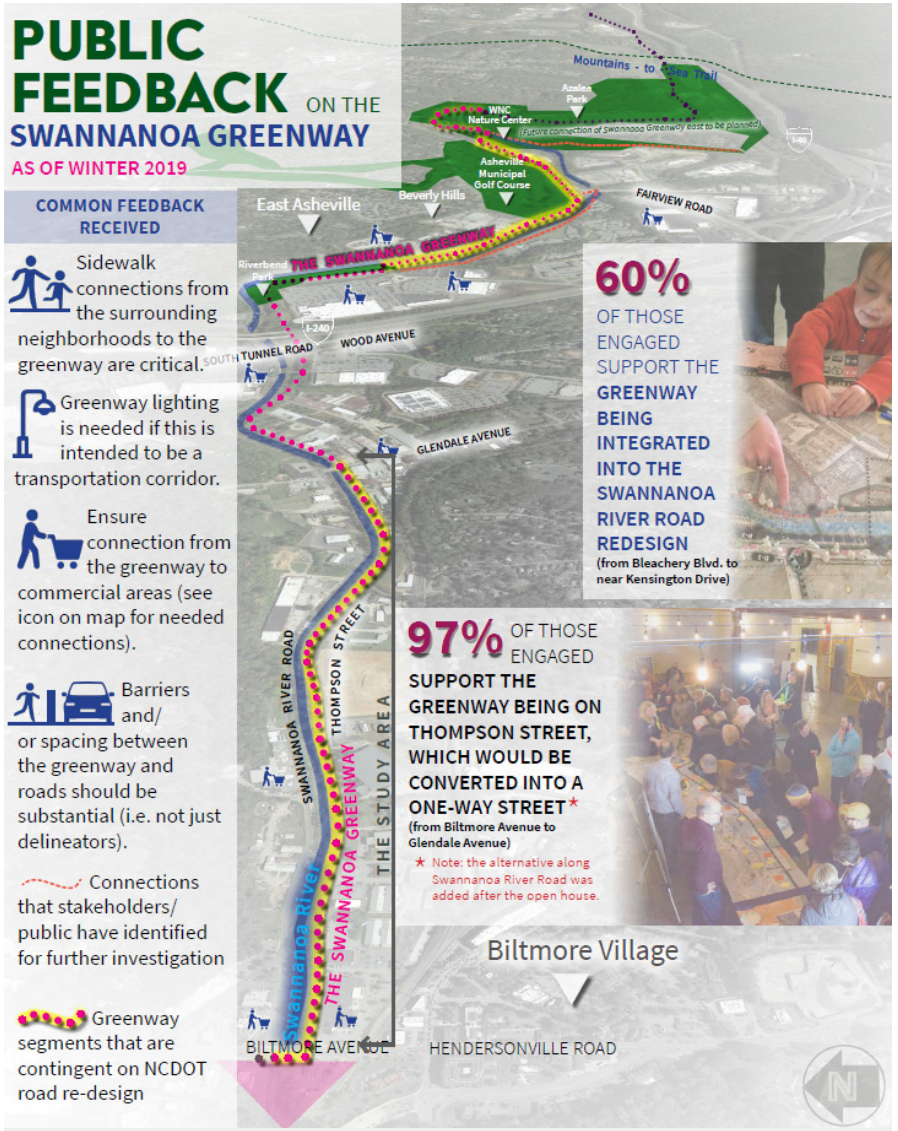
PREVIOUS ENGAGEMENT EFFORTS

Previous engagement initiatives offer insights into the needs, preferences, and concerns of diverse stakeholders, including residents, advocacy groups, local businesses, and governmental organizations. By recognizing and building upon these past endeavors, this study can harness insights to enhance the project based on community input and feedback. The objective is to promote informed decisions and transportation solutions that effectively balance the needs of all road users.

Swannanoa Greenway Phase 1 Report & Phase 2 Feasibility Study

The 2019 Swannanoa Greenway Phase 1 Schematic Design Report included multiple meetings with City staff, members of the public, and stakeholders, including property owners along a portion of the Swannanoa River corridor. Meetings included two technical advisory committee (TAC) meetings, a meeting of City commissions and committees (including the Greenway Committee, Multimodal Transportation Commission, Riverfront Commission, and Bicycle and Pedestrian Task Force), and a larger community meeting - a public open house - to gauge peoples' support for possible routes along the river. Over 170 people attended the open house. The feedback from these meetings was overwhelmingly positive.

Image 39. Swannanoa Greenway Phase 1 Report Public Feedback Summary



Source: City of Asheville

The project team for the Swannanoa Greenway Phase 1 Schematic Design Report held numerous meetings with City staff, property owners, and the public.

Image 40. Swannanoa Greenway Phase 1 Report TAC Meeting



Source: City of Asheville

Image 41. Swannanoa Greenway Phase 2 Corridor Study Committee Meeting



Source: City of Asheville

Image 42. Swannanoa Greenway Phase 2 Open House



Source: City of Asheville

City of Asheville Close the GAP Plan

In early 2021, the City's Close the GAP Plan launched an online survey to gauge peoples' concerns and priorities for greenways, sidewalks, and accessibility. This input provides a good summary of local sentiment regarding greenway projects. The project team also conducted intercept surveys of people on greenways throughout the city, asking about their use of the facility and overall input about the greenway system. Throughout the planning process, the planning team facilitated numerous presentations, focus group meetings, and discussions with City Planning, Transportation, and Capital Projects staff.

Figure 16. Survey Response Snapshot from City of Asheville GAP Plan

94%
USE THE CITY'S GREENWAYS FOR EXERCISE AND FITNESS

83%
SAY BETTER CONNECTIVITY WOULD INCREASE THEIR USE OF GREENWAYS

59%
WANT TO CONNECT SIDEWALKS AND GREENWAYS TO TRANSIT

74%
SAY GREENWAYS ARE IMPORTANT FOR ACCESSIBILITY

51%
SAY MORE FREQUENT ACCESS POINTS WOULD INCREASE THEIR USE OF GREENWAYS

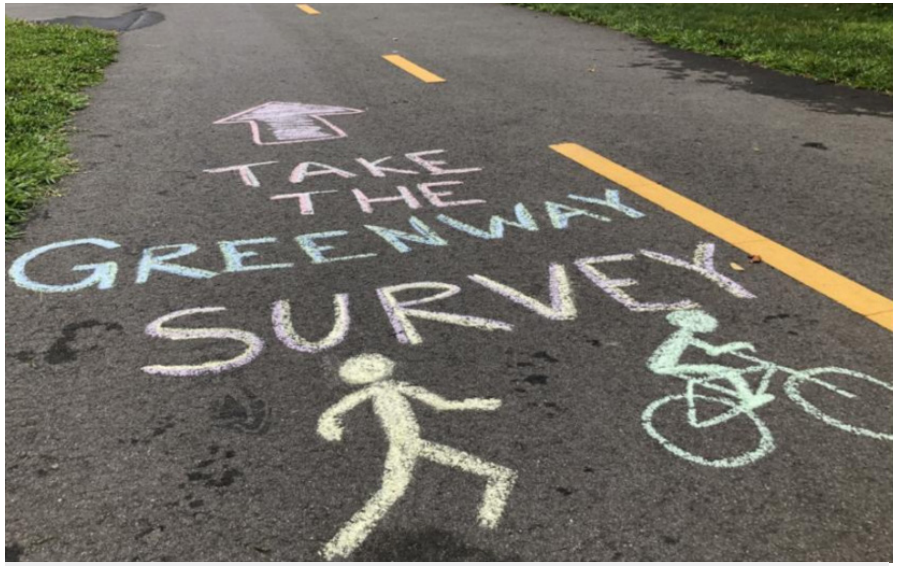
75%
WANT TO CONNECT THE MAJOR GREENWAYS ACROSS THE CITY

Image 43. Close the GAP Plan Intercept Survey



Source: City of Asheville

Image 44. Close the GAP Plan Intercept Survey 2



Source: City of Asheville

These intercept surveys were designed to meet people where they are already using the greenway system and ask them about their trip to help inform understanding of economic impacts of greenways. This intercept survey is expected to be conducted annually.

COMMUNITY ENGAGEMENT PLAN

At the outset of the feasibility project, the project team crafted a Public Involvement Plan (PIP) to delineate forthcoming outreach activities and identify engagement opportunities throughout the project's duration. The PIP functions as a dynamic document throughout the project's life cycle, aiming to:

- Provide an overview of past community involvement and planning efforts.
- Assess public interest in the planning process and consider opportunities for stakeholder input.
- Determine where the community seeks multimodal connections.
- Identify how to phase and prioritize project segments for future investment and development.



SUMMARY OF PROJECT MEETINGS

Kickoff Meeting

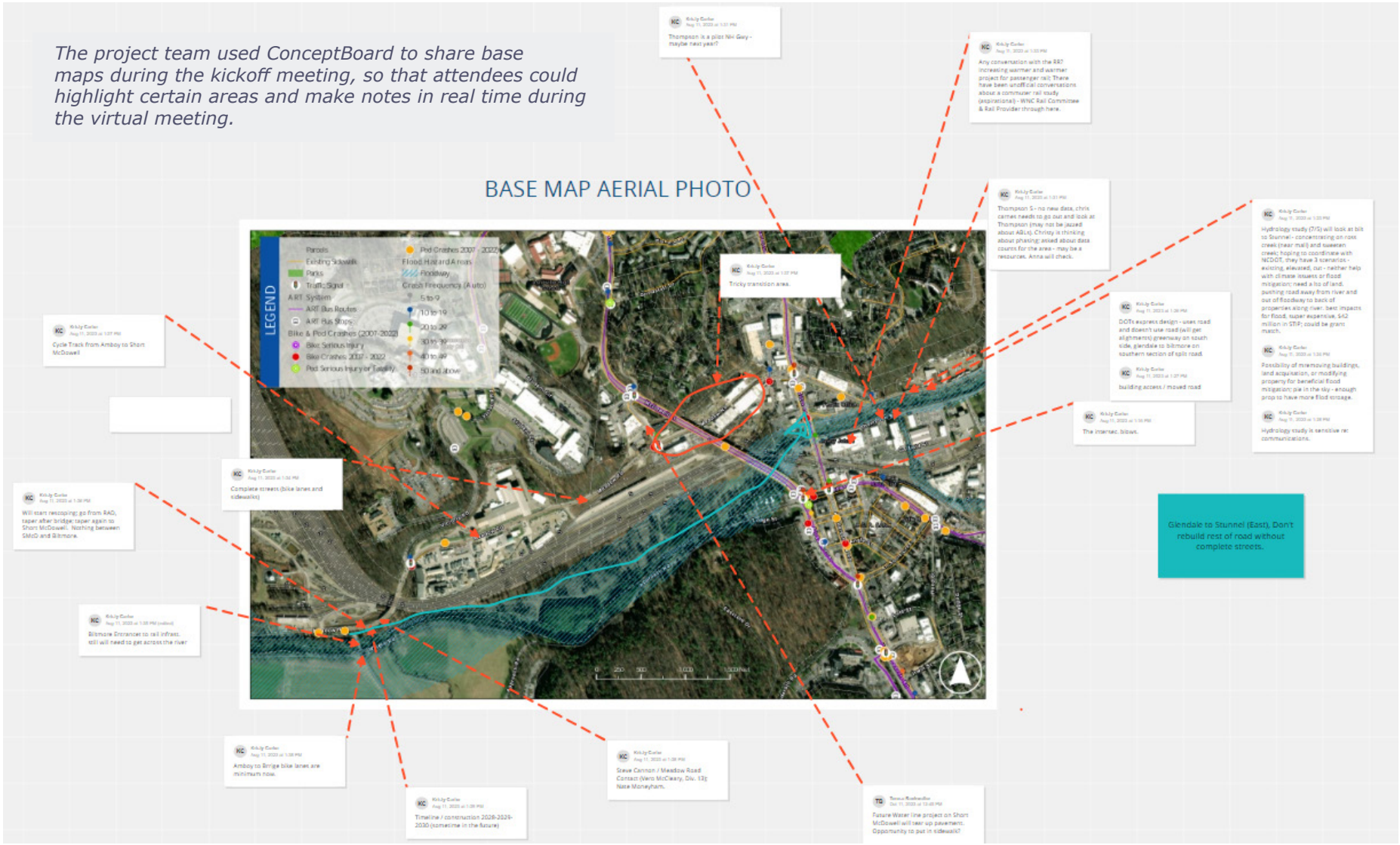
This meeting was held virtually on August 11, 2023, to launch the project and begin discussing important tasks, milestones, and goals. The team shared a ConceptBoard map set to add comments to points of interest or challenges in the study area, and highlight the link to the future Swannanoa River Greenway on the east side of Biltmore Avenue.

KEY FINDINGS:

- List of Steering Committee members drafted.
- Stakeholders identified (Norfolk Southern, the Biltmore Company).
- Implementation for NCDOT STIP U-4739 (Meadow Road improvements) is scheduled for 2028.
- Properties to which the team will need access (and carry a letter from the City) include Biltmore Iron & Metal, Habitat for Humanity, Asaka Japanese restaurant, and the railroad.
- An engineering firm is conducting flood modeling on Meadow Road, which should be available to the project team.
- Connecting to Short McDowell and McDowell may be necessary if property owners (Biltmore Iron & Metal, Asaka) are not amenable to a greenway along their property line.
- Changes to McDowell Street are possible with recommendations from the recent Corridor Study including Complete Street elements.
- Routing the greenway along McDowell would have benefits for access to low-income neighborhoods and the public high school.

Image 45. ConceptBoard Notes from Kickoff Meeting

The project team used ConceptBoard to share base maps during the kickoff meeting, so that attendees could highlight certain areas and make notes in real time during the virtual meeting.



Source: TPD

Stakeholder Meeting (NCDOT Integrated Mobility Division, Rail Division)

In November 2023 the project team held a virtual meeting with representatives from NCDOT's Rail Division. The purpose of the meeting was to discuss constraints and preliminary route alignments in order to refine the alternative route options accordingly.

KEY FINDINGS:

- Any segment that interfaces with the rail line or property in which Norfolk Southern has an investment will have a longer project development timeline due to complications and cost.
- Be prepared for initial reluctance.
- If there is room for negotiation, it will likely come at a cost.
- No impact to existing operations or future industrial clients is permissible.
- Maximize separation of the railroad from the greenway to limit trespassing and liability.
- Stakeholder analysis includes a range of organizations, with varied levels of anticipated cooperation and project impact.

Steering Committee Meeting #1

The first meeting of the Steering Committee was held on December 1, 2023. It was a virtual meeting and included a presentation of project updates, key stakeholder analysis, preliminary contact with Norfolk Southern railways, and site visit observations. The team also showed all possible route options, with considerations for each of them, including existing utility easements and railroad rights-of-way.

KEY FINDINGS:

- Only two alignments avoid railroad and Biltmore Estate.
- Several preliminary alignments are unlikely (infeasible).
- Biltmore Avenue was solidified as the connection point to the future Swannanoa River Greenway, which will be on the other side of Biltmore Avenue at Thompson Street or Swannanoa River Road.

STEERING COMMITTEE

The steering committee was comprised of key local government staff, with representation from the French Broad River Metropolitan Planning Organization (MPO), City of Asheville, and NCDOT's Integrated Mobility Division. Meeting three times during the project, the committee provided guidance by examining and giving feedback on relevant data, community engagement efforts, alternate route proposals, and implementation plans.

MEMBERS

- *Tristan Winkler, French Broad River MPO*
- *Hannah Bagli, French Broad River MPO*
- *Lucy Crown, City of Asheville*
- *Anna Sexton, City of Asheville*
- *Darcy Downs, NCDOT Integrated Mobility Division*

Stakeholder Meeting (NCDOT Division 13)

The project team met with representatives from NCDOT's local division and the engineering team working on their STIP project along Meadow Road (U-4739). The meeting was held virtually on January 30, 2024, to review constraints, hear updates about NCDOT plans for Meadow Road, and discuss preliminary alignments.

KEY FINDINGS:

- Project U-4739 was put on hold, but is now restarting.
- No final typical section yet for bicycle and pedestrian treatment on Meadow Road; aware of constraints between Short McDowell Street and Biltmore Avenue.
- Possible intersection realignment at Short McDowell Street and Meadow Road (with right-of-way implications).
- Possible plan for a one-way pair, with major impacts to various properties; not in current plan for U-4739.
- The U-4739 project will evaluate a multiuse path option. Given constraints, there is potential for NCDOT to consider a greenway alignment away from Meadow Road. Recommended keeping all options on the table.

Stakeholder Meeting (Norfolk Southern)

The project team met with representatives from Norfolk Southern railway, a key stakeholder and property owner in the study area. The meeting was held virtually on January 30, 2024, to review constraints and discuss preliminary alignments. The goal of the meeting was to make sure this group knew about the planning process and to narrow route alternative options based on their feedback.

KEY FINDINGS:

- The response was generally neutral (non-committal).
- Requires agreement and review of concept as a next step.
- Apply for project pre-screening.
- Norfolk Southern review from various departments (e.g., industrial, real estate, engineering).
- Verify industrial use of sites and rail car storage needs.
- Raised structure near Meadow Road bridge was a preferred option since it was grade separated.
- Norfolk Southern prefers grade-separated crossings; will evaluate on a case-by-case basis.
- Separation requirements for parallel greenways: minimum 25' from centerline of tracks (with fencing).

Stakeholder Meeting (Habitat for Humanity)

The project team met with Habitat for Humanity representatives, stakeholders and property owners within the study area. This virtual meeting took place on January 31, 2024. It was aimed at evaluating constraints and initial alignments, specifically as they impact the Habitat administrative offices and ReStore building parking lot and access areas. The objective was to ensure the group was informed about the planning process and to refine route alternatives based on their input.

KEY FINDINGS:

- There are several options for routing a greenway through the Habitat property's parking lot, with one preferred alternative.
- Parking impacts could include shifting from angled to parallel spaces and/or adding additional spaces along the western edge of the parcel. Open to coordinate efforts.
- They understand that a greenway is in the works and know that it could be an amenity and decrease encampments under the McDowell Street bridge.
- Habitat does not have plans for expansion (or relocation).
- They have an agreement with NCDOT to be able to use the area under the McDowell Street bridge.
- Request minimization of interruptions to operations.
- Mentioned safety concerns at Short McDowell signal.
- Mentioned site circulation issues (e.g., truck turning movements, bridge runoff, pedestrian safety, etc.)

Image 46. Habitat Parking Lot Considerations



Source: TPD

Starting conversations early in the process is essential to gain support, find appropriate solutions, and end up with the best possible project.

Stakeholder Meeting (Biltmore Company)

The third stakeholder meeting was held on February 8, 2024, with representatives from the Biltmore Company. While the study area focuses on land north of the Swannanoa River, the Estate is still a key stakeholder. The main entry gate area may be impacted by routing the greenway along McDowell Street (Alternative C). This was a topic of conversation at this meeting.

KEY FINDINGS:

- National Historic Landmark property status is key to their mission.
- Shared their historic deed that states a 50-foot vegetated screen cannot be disturbed on Norfolk Southern property along the north side of the Swannanoa River (a view shed of the Estate).
- Past greenway projects did not reach out to them at an early stage - they appreciated the outreach!
- The fencing under the McDowell Street bridge was installed by the Biltmore Company.
- May consider a request for a greenway under the McDowell Street bridge that would skirt their entry and employee parking on Lodge Street.

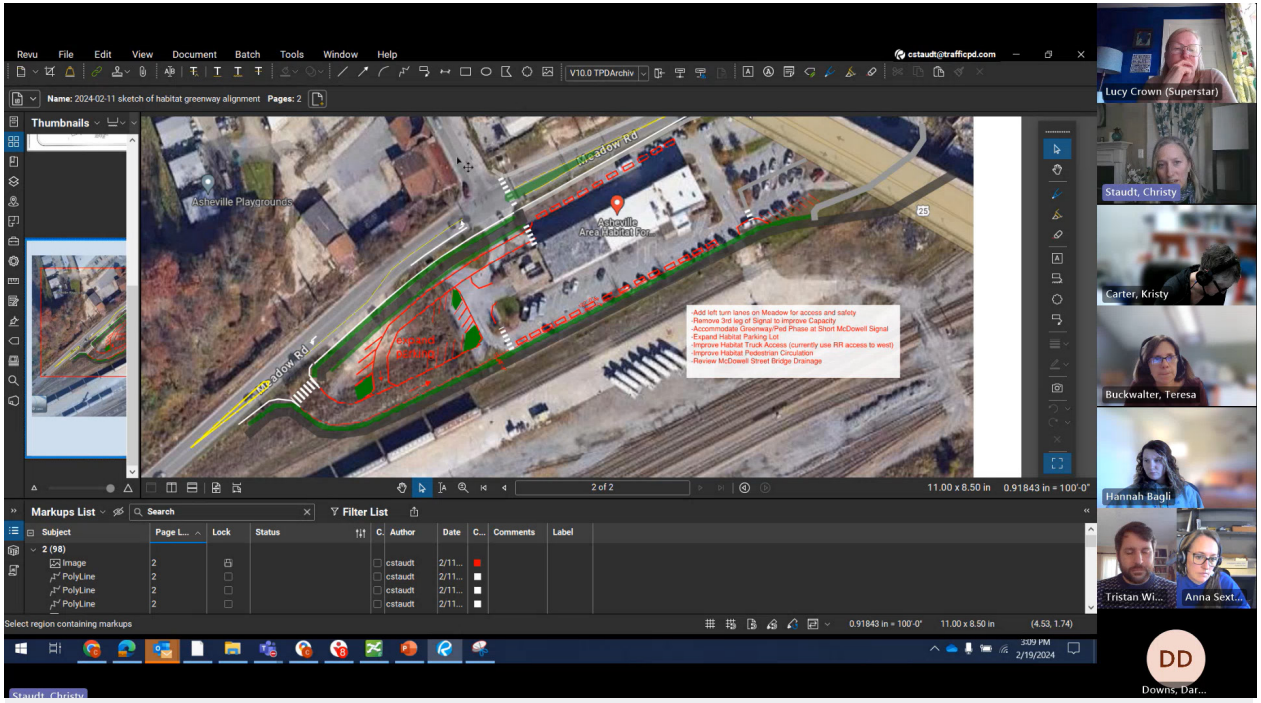
Steering Committee Meeting #2

The second Steering Committee meeting was held on February 19, 2024. It was a virtual meeting and included a presentation of refined route alternative maps, draft evaluation criteria, online survey planning, and a summary of stakeholder engagement. This meeting was used to solidify decisions on prioritization of a preferred route alternative in order to move ahead with finalization and recommendations.

KEY FINDINGS:

- The evaluation criteria scoring resulted in Alternative B as the highest ranking after preliminary scoring.
- Okay to show three alignments on the draft survey and keep it somewhat straightforward for ease of use and summarization of responses.
- Preferred alignment will depend on public input.

Image 47. Steering Committee Meeting #2 Screenshot



Source: TPD

The Steering Committee was integral to the project and helped make decisions at critical junctures, reviewing draft documents along the way.

Steering Committee Meeting #3

The third Steering Committee was held on July 16, 2024 to review the draft feasibility study document. The meeting also covered the adoption process and next steps.

KEY FINDINGS:

- The Steering Committee provided comments on the draft study document.
- Though there is a recommended route alternative, the Committee is interested in exploring every option as they become feasible.

ONLINE SURVEY

The project team conducted an online survey to gather public input on the three route alternatives, greenway usage, and related concerns and ideas. Open for one month, the survey played a role in shaping the final route selection and recommendations. By collecting feedback directly from the community, the study ensures the route reflects local preferences and needs. Additionally, insights into general greenway usage help anticipate future demand and patterns. The online format allowed for broader participation, capturing diverse perspectives and ensuring the decision reflects various stakeholders. This feedback strengthens the study's credibility and helps align the project with community expectations.

87%
USE THE CITY'S GREENWAYS FOR WALKING OR RUNNING

95%
WOULD USE THE SWANNANOA RIVER GREENWAY

















Survey Results

A total of 132 people took the survey. About 2/3 of respondents currently walk or bike through the study area, and 95% say they would use this greenway if it is implemented.

There was not much of a change in stated current greenway use versus future use. People indicated that they would use the future Swannanoa River Greenway in the same ways they use the city's other greenways. More than 80% of respondents use greenways for bicycling, almost 90% for walking/running, 60% to enjoy nature and relaxation, about 40% for dog-walking, and roughly 35% for commuting. Many people would like to see wayfinding signs, lighting, bathrooms, and parking/trailhead areas on the greenway.

Overall, most respondents value connectivity - making sure the greenway connects to the French Broad River greenway system. Also important is separation from automobile traffic (and from Meadow Road).

Most people stated a preference for Alternative A, with comments about the various challenges. Many respondents were excited about the greenway and enthusiastic about whichever alternative is ultimately implemented. Having safe bicycling and walking options in this area is something that people are hopeful for.

Figure 17. Survey Response Quotes





04 Evaluation + Recommendations



ALTERNATIVE A Along the Swannanoa River

This alternative will follow the Swannanoa River to the greatest extent possible. A paved path begins at Meadow Road just before the bridge over the railroad tracks. From the western end of the bridge, the trail will divert from the roadway on a proposed new elevated structure and slowly ramp down to run along an existing sewer easement on the north side of the river between the railroad tracks and the river. On the eastern end of this alternative, a new bridge will be required to cross the Swannanoa River under the McDowell Street bridge near the McDonald's restaurant, running parallel and south of the railroad bridges over the river. A connection along Biltmore Avenue will be necessary to access the Swannanoa River Greenway alignment on the east side of the road that is advancing as a separate project (NCDOT Project #U-5832). Given that there are extensive engineering and permitting challenges with this alternative, further engineering investigation is needed to verify feasibility. This alternative would also require approval from several entities including Norfolk Southern, Duke Energy, Metropolitan Sewerage District (MSD), and the Biltmore Company.

Alternative A Description

- Paved off road multiuse trail following the sewer easement on Norfolk Southern property between the rail lines and the Swannanoa River.
- Two structures needed: one forms a ramp from the sewer easement up to the Meadow Road bridge; and another pedestrian bridge over the Swannanoa River under the McDowell Street bridge.

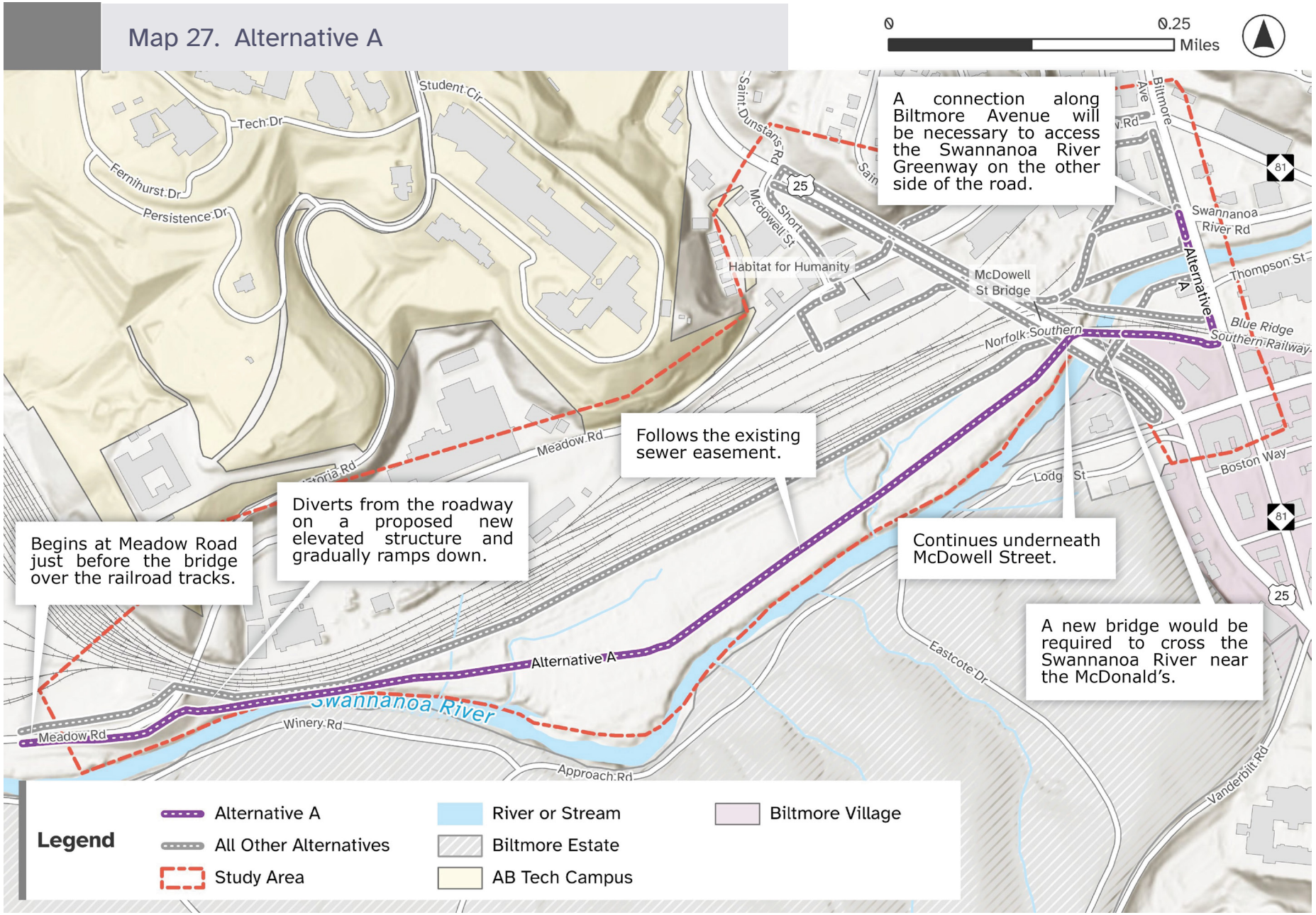
Alternative A Pros

- A high user experience along the Swannanoa River.
- Low impact to commercial properties.
- Very few conflict areas between vehicle traffic and trail users.
- The proposed elevated structure could likely be permitted in the floodway based on a preliminary review of FEMA data.
- The pedestrian bridge over the Swannanoa River would be in the flood "shadow" of the existing rail trestle bridges, and therefore, would likely not cause a rise in the Base Flood Elevation.

Alternative A Cons

- Does not connect to Short McDowell or Victoria Road, which means that it provides less connectivity into Downtown.
- The cost of the elevated structure would be significant.
- Requires Norfolk Southern approval and possibly a purchase of trail easement.
- Requires approval from Biltmore Company to encroach into (and mitigate) their 50' vegetated buffer allowed by Norfolk Southern.
- Requires an upgraded railroad crossing on Biltmore Avenue
- Floodway studies and permitting will be required.
- Reduced possibility for NCDOT cost-sharing opportunity due to off-road location.

Map 27. Alternative A



ALTERNATIVE B Under the McDowell Street Bridge

This alternative starts near Meadow Road and Short McDowell Street. Here it will connect with the future Meadow Road sidepath planned to be constructed with NCDOT's Meadow Road Project (NCDOT Project #U-4739). From this intersection, the alternative will continue south as a paved path along the western and southern edges of the Habitat for Humanity ReStore property. After passing under the McDowell Street bridge on an abandoned rail bed, the path will traverse the edge of Biltmore Iron & Metal property and follow the sewer easement that runs on the south side of the Asaka Japanese restaurant parking lot. A pedestrian crossing across Biltmore Avenue will connect with the future Swannanoa River Greenway to the east that is progressing as a separate project (NCDOT Project # U-5832).

Alternative B Description

- Connects from future multi-use sidepath on Meadow Road at Short McDowell Street.
- Follows edge of Habitat for Humanity Restore parking lot on the west and south side.
- Traverses under the McDowell Street bridge in the overlapping Norfolk Southern and NCDOT right-of-way.
- Follows the edge of the Biltmore Iron & Metal property to the MSD sewer easement.
- Follows the sewer easement on the south side of the Asaka Japanese restaurant parking lot to Biltmore Avenue at Swannanoa River Road.

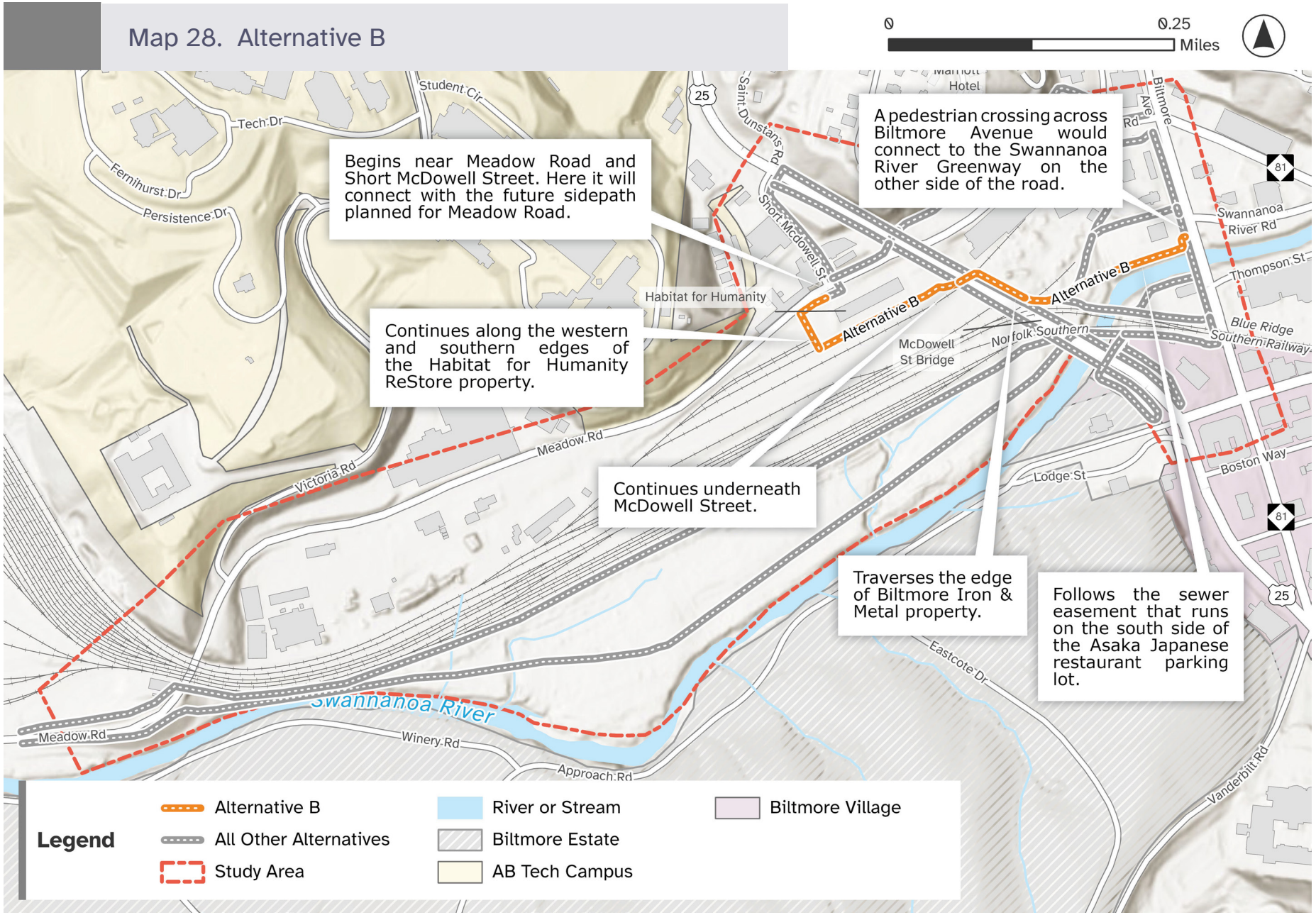
Alternative B Pros

- Uses sewer easement and NCDOT right-of-way for access.
- Early property owner outreach has been positive.
- Shortest route from Meadow Road to Swannanoa River Road.
- More direct transportation route.
- Avoids the need for a pedestrian bridge over the Swannanoa River.
- Provides a needed off-road option for existing bicycle and pedestrian traffic. This route will be useful independent of the adjacent planned greenway sections.

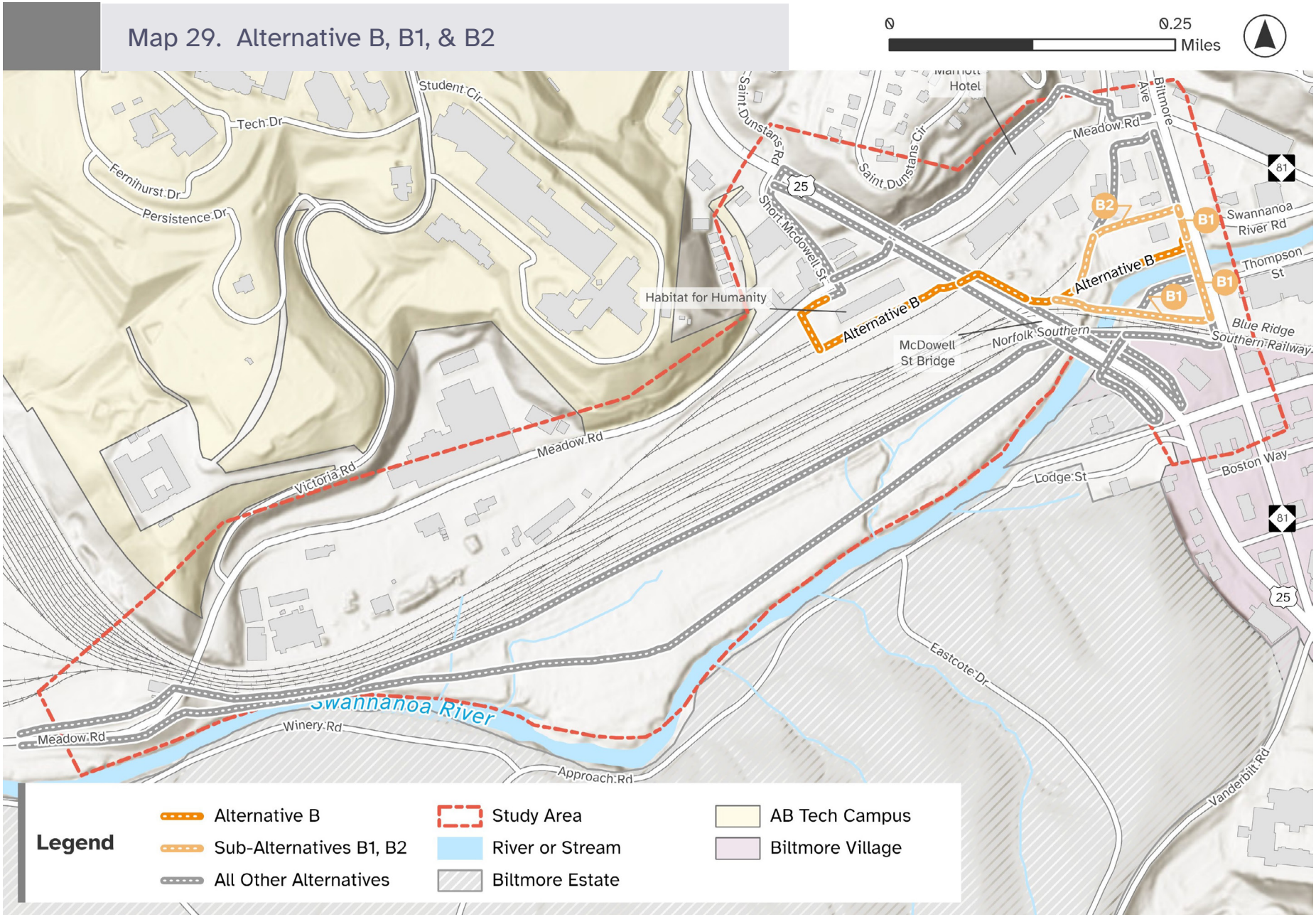
Alternative B Cons

- Potential impacts to parking lots will need to be mitigated for Habitat for Humanity Restore and Asaka Japanese restaurant.
- There is a documented brownfield on the Asaka parcel.
- A box culvert is needed to cross a tributary of Swannanoa River along the MSD sewer easement.
- Will need to conduct right-of-way investigations with Norfolk Southern.
- Floodway permitting will be required.

Map 28. Alternative B



Map 29. Alternative B, B1, & B2



ALTERNATIVE B1

Alternative B1 Description

Instead of following the sewer easement, this alternative route would cross Swannanoa River on a new pedestrian bridge parallel to the railroad trestle bridges and continue alongside the railroad tracks on the south side of Moe's parking lot.

Alternative B1 Pros

- Does not require an upgraded railroad crossing because it does not cross the tracks.
- Avoids a brownfield site.

Alternative B1 Cons

- Requires a new pedestrian bridge over the Swannanoa River.
- Requires altering the lane configuration on the Biltmore Avenue vehicular bridge to accommodate a multiuse path.

ALTERNATIVE B2

Alternative B2 Description

Follows Alternative B, but instead of following the sewer easement to the south side of the Asaka parking lot, this alternative route follows a different sewer easement up to the property line of Long John Silvers and Asaka Japanese restaurant on the north side.

Alternative B2 Pros

- Partially utilizes sewer easement and NCDOT right-of-way for access.
- Avoids the need for a pedestrian bridge over the Swannanoa River.
- The condition of existing development may signal upcoming redevelopment that could make trail incorporation possible.

Alternative B2 Cons

- Impacts two existing commercial properties which would necessitate parking and circulation modifications.
- Retaining walls will be required to address grade changes.
- Documented brownfield at Asaka Japanese.
- Potential existence of contamination on pond at Biltmore Iron & Metal (not documented).
- Right-of-way investigations with Norfolk Southern are needed.

ALTERNATIVE C Short McDowell Street to McDowell Street

This alternative starts near Meadow Road and Short McDowell Street. Here it will connect with the future sidepath planned for Meadow Road (NCDOT Project #U-4739). From this intersection, the alternative will continue north along Short McDowell Street to McDowell Street before turning south to travel across the bridge to Biltmore Village. Adjustments to McDowell Street bridge will need to be made to accommodate a sidepath and to provide a barrier from vehicles along the south side of the bridge. The route will then follow the edge of the Biltmore property and pass under the McDowell Street bridge into the McDonald's parking lot. From there it will run parallel with the railroad tracks and then turn north to cross the tracks at Biltmore Avenue. A pedestrian crossing at Biltmore Avenue will connect with the future Swannanoa River Greenway to the east that is progressing as a separate project (NCDOT Project #U-5832).

Alternative C Description

- Begins at the future Meadow Road multiuse path.
- Traverses Short McDowell Street on the east side of the street.
- Utilizes the McDowell Street Bridge (south side).
- Lanes on the bridge would need to be reconfigured to accommodate a multiuse path.

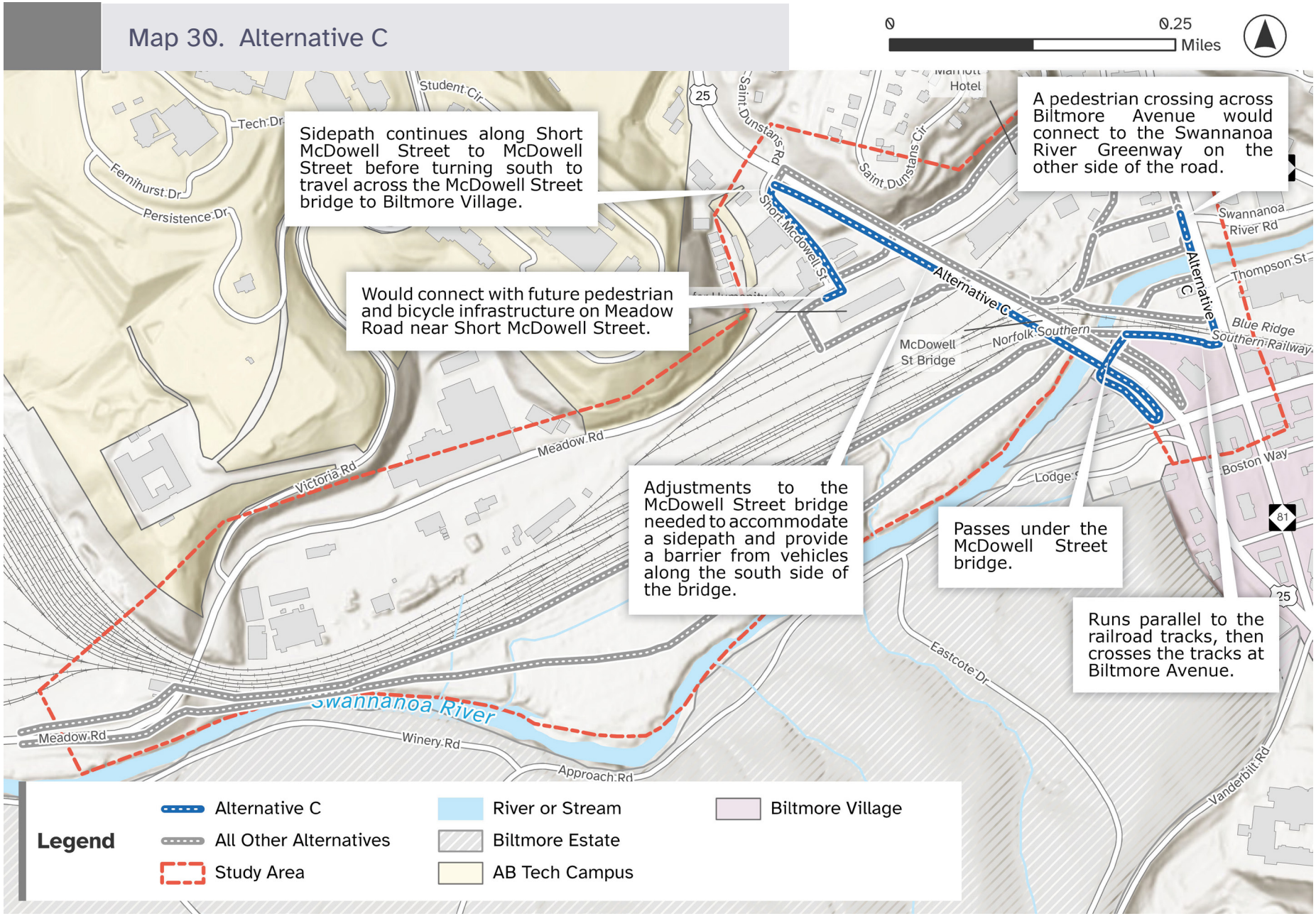
Alternative C Pros

- Fewer private properties impacted.
- Provides an improved connection to Asheville High School and downtown.
- Does not require new pedestrian bridges.
- Aligns with the Biltmore Avenue and McDowell Street Corridor Study recommendations.
- Some improvements could be made with the City's Short McDowell repaving project.

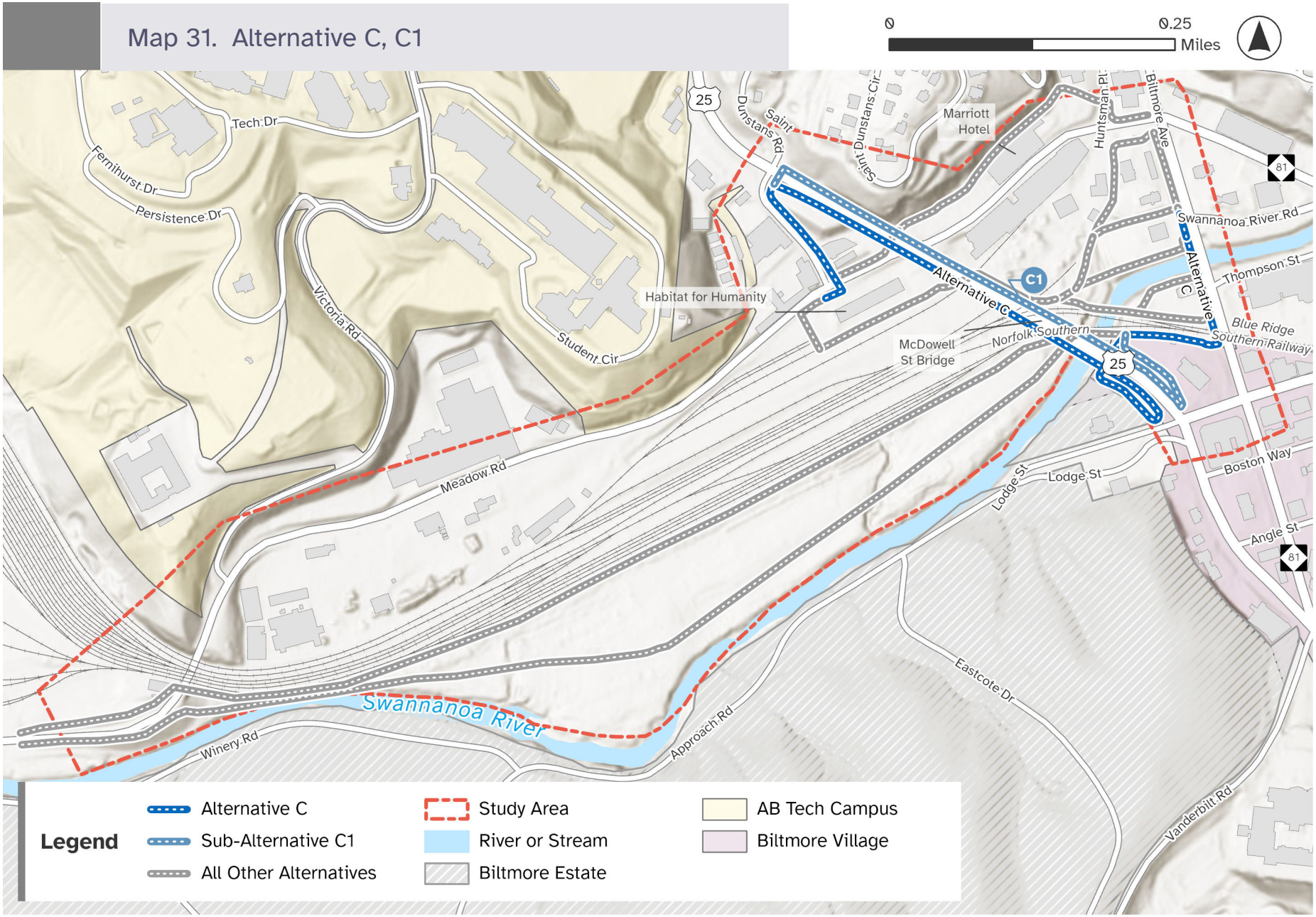
Alternative C Cons

- Mostly along roadways so a lower quality user experience.
- More potential conflicts with vehicle traffic.
- Steep slopes up Short McDowell and the McDowell Street Bridge.
- Would require impacts to on street parking on Short McDowell Street.
- Requires use of McDowell Street Bridge by altering travel lanes to accommodate sidepath.
- Requires use of Biltmore Avenue Bridge by altering travel lanes to accommodate sidepath.
- Mostly along roadways so a lower quality user experience.
- Requires permission from the Biltmore Company to modify their entrance intersection to accommodate a greenway under the McDowell Street Bridge near the Biltmore Estate entrance.
- Floodway studies and permitting will be required (for short segment under the McDowell Street Bridge).

Map 30. Alternative C



Map 31. Alternative C, C1



ALTERNATIVE C1

Alternative C1 Description

Follows the same route as Alternative C, except that it utilizes the north side of the McDowell Street Bridge to widen the sidewalk to accommodate a sidepath.

Alternative C1 Pros

- On the south side of the McDowell Street Bridge, this alternative connects through the McDonald's parking lot which avoids connection to the Biltmore Estate property.

Alternative C1 Cons

- Requires crossing at the signalized intersection of Short McDowell and McDowell Streets.
- Steep slopes and utilities present challenges on the McDonald's site.
- McDonald's parking lot is impacted.
- Unknown cooperation from McDonald's for use of edge of property near the McDowell Street bridge.

EVALUATION CRITERIA

By considering all relatively feasible segments that could form a multimodal connection along the Swannanoa River corridor, the project team was able to determine the preferred route alternative. To identify this preferred alternatives, a prioritization strategy was essential.

The decision-making process was facilitated by evaluation criteria, which assigned a value to each criterion. The evaluation criteria considered for the route alternatives are outlined in **Table 4 - Evaluation Criteria**.

Table 4. Evaluation Criteria

SWANNANOA RIVER GREENWAY EXTENSION EVALUATION CRITERIA	
	**DIRECTNESS OF CONNECTION** After evaluating different options, how straightforward is this route for users to navigate through the corridor?
	**ABILITY TO ACQUIRE ENVIRONMENTAL PERMITS** Considering known natural and human environmental impacts (e.g. flood zones), what is the likelihood that this option can obtain permits?
	**QUALITY OF USER EXPERIENCE** What level of user experience does this route alternative offer in terms of visual surroundings, separation from hazards, personal safety, and connection to nature and topography (including accessible grades)?
	**AVAILABILITY OF RIGHT-OF-WAY/ANTICIPATED PROPERTY OWNER COOPERATION** To what extent is right-of-way available or secured through cooperation with property owners?
	**SECONDARY BENEFITS** In addition to the primary project objective, to what extent does this project offer opportunities for secondary benefits, such as improving access to under-served populations (equity), fostering economic development, facilitating secondary connections to community resources, enhancing the sense of place, etc.?
	**SEPARATION FROM MOTORIZED TRAFFIC CONFLICTS** To what extent does this alternative effectively separate users from motorized traffic, thereby enhancing comfort and minimizing traffic-related disruptions?

SWANNANOA RIVER GREENWAY EXTENSION EVALUATION CRITERIA	
	**ABILITY TO CONSTRUCT** Considering an examination of physical obstacles and constraints such as roads, utilities, topography, buildings, waterways, etc., what is the likelihood that this alternative can be constructed?
	**ALIGNMENT WITH COMMUNITY GOALS** Anticipated community support for the alternative based on community leadership, public feedback, adopted planning efforts, and stated local goals and objectives.
	**COST EFFECTIVENESS** How cost-effective is this alternative compared to others based on a comparative analysis of alternatives?
	**POTENTIAL FOR FUNDING** In comparison to other route alternatives, how probable is it that this route will qualify for known grant and funding opportunities?
	**POTENTIAL FOR TIMELY IMPLEMENTATION** What is the likelihood that this project will secure funding, undergo design, obtain permits, and be constructed compared to other alternatives?

DECISION MATRIX & SCORING

The project team devised a structured scoring methodology to aid in identifying preferred route alternatives aligned with the overarching project objectives. Through a comparative analysis of alternatives, the three principal alternatives (along with their respective sub-alternatives) were evaluated and qualitatively ranked according to their agreement with the predefined criteria listed in **Table 4 - Evaluation Criteria**. Each alternative was scored in each of the criteria categories, with a higher score representing a more positive evaluation:

1 – Below Average

2 – Average

3 – Above Average

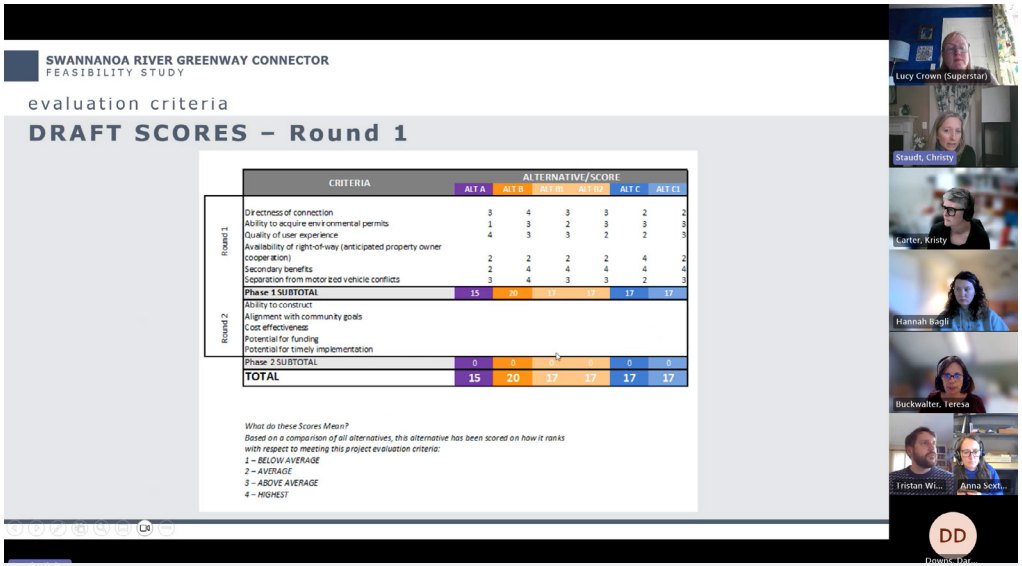
4 – Highest

The outcome of this assessment process is illustrated in phases 1 and 2 of **Table 5 - Evaluation Criteria Scoring**.

Upon completion of the phase 1 rankings, the route alternatives were presented to the Steering Committee. The phase 1 highest ranked route alternatives were also advanced for additional evaluations and cost estimating. After this additional information was developed, a second phase of scoring was applied to the projects.

The sub-alternatives should be regarded as supplementary options to their primary alternatives, serving as potential solutions to address specific constraints. As such, their potential for further investigation may be taken into account in subsequent implementation phases, subject to the availability of funding and opportunities.

Image 48. Steering Committee Meeting #2 Screenshot 2



Source: TPD

The project Steering Committee reviewed preliminary scoring of each criteria for each route alternative.

Table 5. Evaluation Criteria Scoring

CRITERIA	ALTERNATIVE/SCORE					
	ALT A	ALT B	ALT B1	ALT B2	ALT C	ALT C1
Directness of connection *(greenways, downtown, schools, etc.)*	3	4	3	3	2	2
Ability to acquire environmental permits	3	4	3	2	4	4
Quality of user experience	4	3	2	2	2	2
Availability of right-of-way *(anticipated property owner cooperation)*	2	3	2	2	3	3
Secondary benefits	3	4	3	3	3	3
Separation from motorized vehicle conflicts	4	4	3	3	2	1
Phase 1 SUBTOTAL	**19**	**22**	**16**	**15**	**16**	**15**
Ability to construct	2	4	2	2	3	3
Alignment with community goals	4	4	3	3	3	3
Cost effectiveness	2	4	3	3	2	2
Potential for funding	3	4	4	4	3	3
Potential for timely implementation	3	3	3	3	3	3
Phase 2 SUBTOTAL	**14**	**19**	**15**	**15**	**14**	**14**
TOTAL	**33**	**41**	**31**	**30**	**30**	**29**

RECOMMENDATIONS

Table 6 - Evaluation Criteria Scoring indicates that one alternative stands out as the most promising for this critical greenway connection: Alternative B, which achieved a total score of 41. This route alternative earned the highest ranking (a value of 4) for many of the aspects highly prioritized by the community and frequently highlighted in online survey responses. Alternative B's lowest scoring criteria was over quality of the user experience, availability of right-of-way, and potential for timely implementation, but these scores were not much lower than any of the alternative routes. Implementation of Alternative B will require cooperation with Habitat for Humanity, Norfolk Southern, Biltmore Iron & Metal, and MSD. However, these entities seem understanding of the need for this project and have expressed a willingness to collaborate on the final design.

With its high scores in key criteria and an overall high ranking, Alternative B emerges as the recommended choice for implementation. Chapter 5 outlines a strategy to facilitate progress toward the next steps as funding becomes available, helping create a more comprehensive network for people walking and biking.

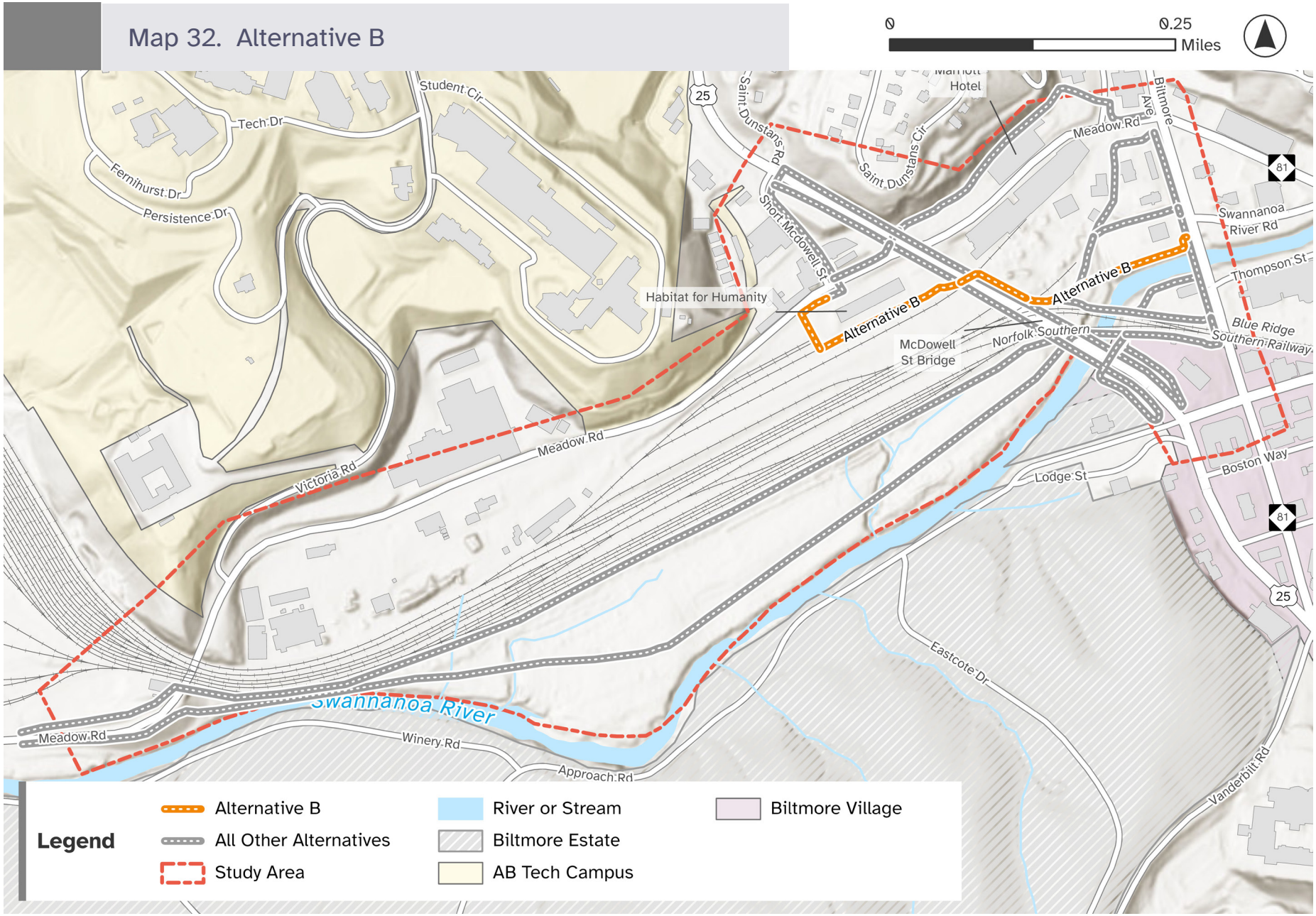
Conceptual Designs

The following pages contain descriptions, typical cross-sections, and renderings illustrating the shared use path connections for route alternative B. These pages highlight various design considerations for this recommended alternative.

Table 6. Evaluation Criteria Scoring (Top Scoring Alternative)

CRITERIA	SCORE
	ALT B
Directness of connection *(greenways, downtown, schools, etc.)*	4
Ability to acquire environmental permits	4
Quality of user experience	3
Availability of right-of-way *(anticipated property owner cooperation)*	3
Secondary benefits	4
Separation from motorized vehicle conflicts	4
Ability to construct	4
Alignment with community goals	4
Cost effectiveness	4
Potential for funding	4
Potential for timely implementation	3
TOTAL	**41**

Map 32. Alternative B

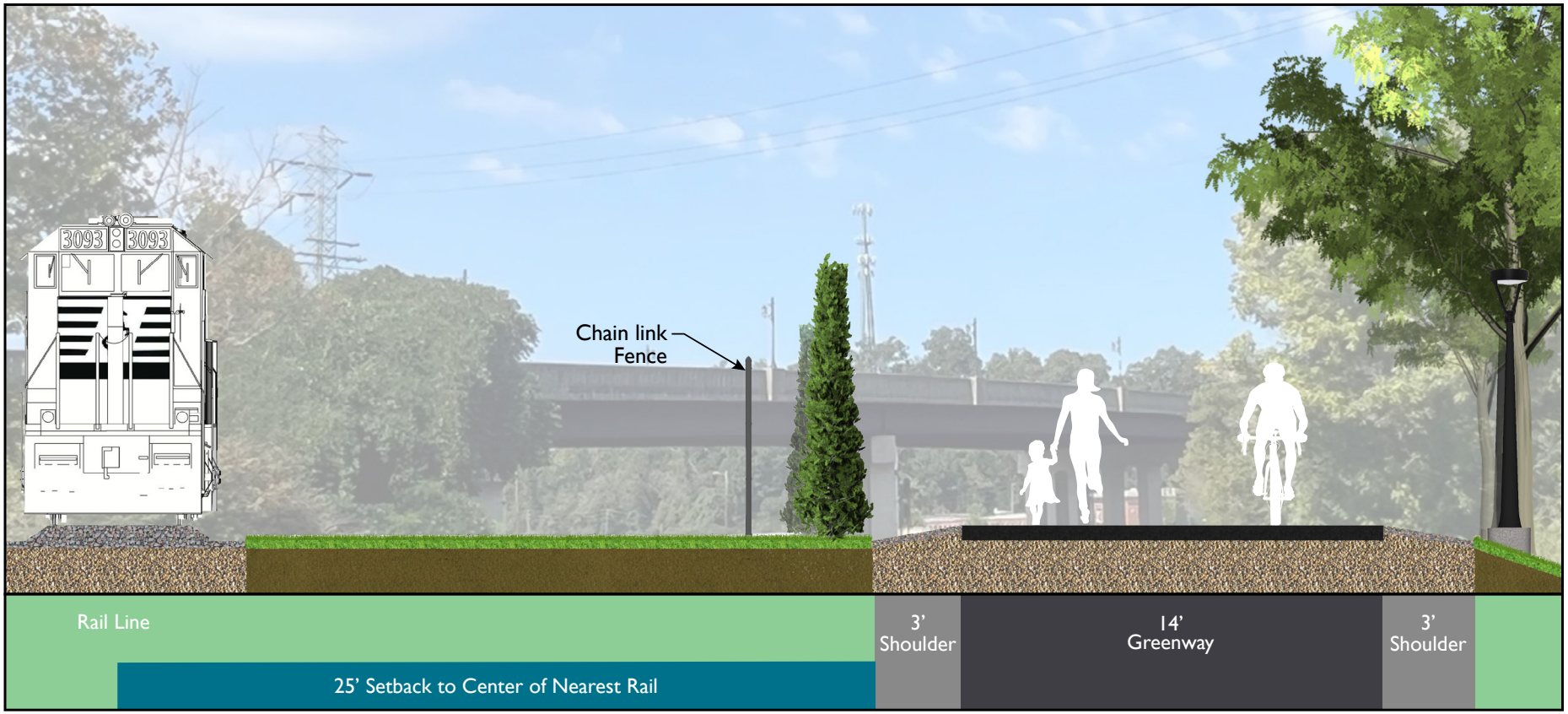


Typical Cross-Section

ALT B

This alternative starts near Meadow Road and Short McDowell Street. Here it will connect with the future Meadow Road sidepath planned to be constructed with NCDOT's Meadow Road Project (NCDOT Project #U-4739). From this intersection, the alternative would continue south as a paved path along the western and southern edges of the Habitat for Humanity ReStore property. After passing under the McDowell Street bridge on an abandoned rail bed, the path would traverse the edge of Biltmore Iron & Metal property and follow the sewer easement that runs on the south side of the Asaka Japanese restaurant parking lot. A pedestrian crossing across Biltmore Avenue would connect with the future Swannanoa River Greenway to the east that is progressing as a separate project (NCDOT Project # U-5832).

Image 49. Alternative B Shared Use Path Cross-Section



14' Paved Path Adjacent to Rail Line

Image 50. Habitat For Humanity Property Shared Use Path Routing Concept (Alternative B)



Habitat for Humanity Site Recommendations

1. Tie in to Meadow Road proposed sidepath.
2. Explore unused parcel as additional parking for Habitat for Humanity.
3. Convert angled parking to parallel parking to allow for greenway between parking and railroad property.
4. New fence at abandoned rail line to parallel greenway.
5. 14’ greenway trail connecting under McDowell Street bridge along abandoned rail line.
6. Repurpose grassed area to add angled parking for Habitat for Humanity.
7. Add pedestrian connection here to Habitat ReStore.

Image 51. Alternative B at Habitat Lot Rendering



Image 52. Alternative B at Asaka Parking Lot Rendering



Typical Cross-Section

ALT C

This alternative starts near Meadow Road and Short McDowell Street. Here it will connect with the future sidepath planned for Meadow Road (NCDOT Project #U-4739). From this intersection, the alternative will continue north along Short McDowell Street to McDowell Street before turning south to travel across the bridge to Biltmore Village. Adjustments to McDowell Street bridge would be made to accommodate a sidepath and to provide a barrier from vehicles along the south side of the bridge. The route would then follow the edge of the Biltmore property and pass under the McDowell Street bridge into the McDonald's parking lot. From there it will run parallel with the railroad tracks and then turn north to cross the tracks at Biltmore Avenue. A pedestrian crossing at Biltmore Avenue would connect with the future Swannanoa River Greenway to the east that is progerssing as a separate project (NCDOT Project #U-5832).

Image 53. Alternative C McDowell Street Multiuse Path Cross-Section

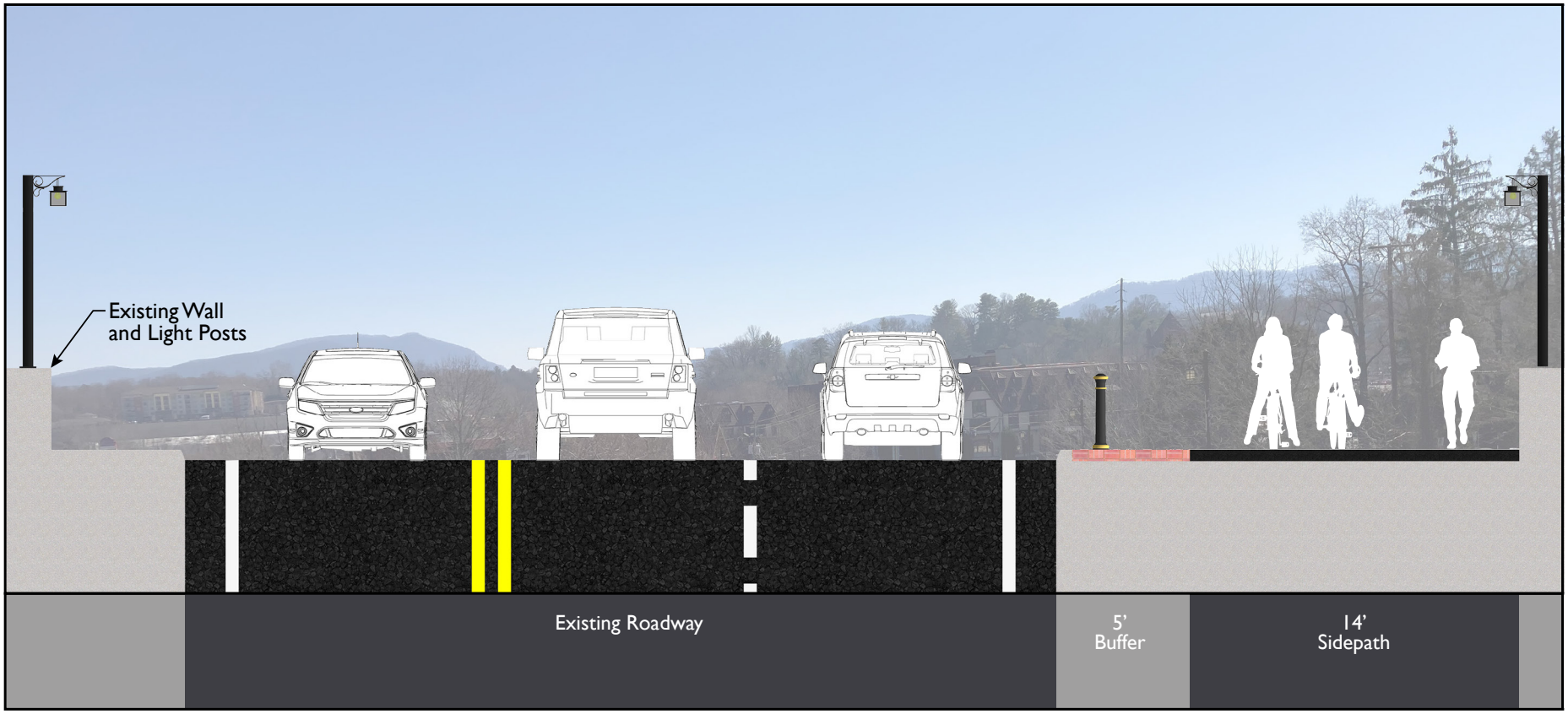


Image 54. *Alternative C Short McDowell Street Multiuse Path Rendering*



MATERIALS SELECTION

When determining materials for a greenway, a community should consider how the greenway will be used, the skill level and interest of the potential user, construction cost, maintenance, and environmental aspects. Furthermore, certain funding sources may also dictate material choice (for example, state and federal transportation funding will require paved surfaces with a minimum width).

Paved Surfaces

Common options for paved surfaces include asphalt and concrete. Asphalt stands out for its cost-effectiveness and suitability for diverse user types. Conversely, concrete offers superior durability albeit with a higher initial cost. Concrete surfaces are often favored in urban settings or flood-prone areas where resistance to heavy use and water damage is important. Concrete also can be more decorative in an urban setting and can be paired with colored pavers.

Asphalt pavement is the recommended choice for this path, considering factors such as site conditions, anticipated greenway usage, and maintenance costs. Asphalt repairs are generally quicker and less expensive than concrete, making it a more cost-effective and practical choice for long-term maintenance. Limited sections of concrete pavement may be necessary to ensure compatibility with the flood-prone Swannanoa River corridor.

Image 55. Asphalt Greenway Example



Source: Martin Johnson

Image 56. Concrete Greenway Example



Source: TPD

Natural Surfaces

Natural surface options comprise compacted aggregates and compacted native soil. Compacted aggregates, typically utilizing granite fines, present a durable and cost-effective alternative to paved greenways. However, ensuring proper compaction and drainage management is vital to prevent erosion and maintain accessibility. Compacted native soil offers another economical option but demands meticulous compaction and drainage control to uphold trail integrity and accessibility requirements. Both options necessitate annual maintenance, including re-compaction and potential soil additions in erosion-prone areas.

Image 57. Aggregate Trail Example



Source: Vermont Rail Trails

Image 58. Native Soil Trail Example



Source: Green Circle Trail

Greenways in Floodways

Flooding events in Asheville underscore the vulnerability of our river corridors. Greenways along rivers remain highly popular pathways in both urban and suburban areas. Often they are ideal for building greenways but it is important to balance the cost of maintaining these greenways, especially when they become inundated with sediment during flood events.

The durability of greenway surfaces is paramount, with considerations varying depending on the material used. Crushed rock, while commonly employed, is highly susceptible to erosion, whereas asphalt is vulnerable to damage from running water. While concrete may endure submersion, severe stream bank erosion can obliterate a concrete greenway, leaving behind substantial debris for disposal.

In areas prone to major flooding, concrete emerges as the optimal surface for enduring flood conditions, particularly when supplemented with transverse saw cuts to alleviate pressure. However, this advantage comes at a considerable cost, as concrete paths are the most expensive to install and repair.

Alternatively, asphalt presents a more cost-effective and smoother option, albeit with the need for more frequent repairs and the tendency to retain heat in the summer. Enhancing the durability of asphalt paths can be achieved by constructing them with a deep base and a turn down below finished grade. Additionally, strategically placed stones along the greenway can reduce water volume if floodwater intersects the path.

Greenway facilities designed with flooding in mind can help preserve and protect sensitive habitats, wetlands, and riparian zones. Implementing erosion control measures, such as vegetative buffers, planting native trees and shrubs, and incorporating stormwater retention devices can all help to prevent soil erosion and protect water quality.

The Swannanoa Greenway should use materials resistant to water, corrosion, and erosion, such as concrete, steel, or composite materials for bridges.

Image 59. Flooding on the French Broad River Greenway (2024)



Source: Karen Chavez (Asheville Citizen-Times)

The Swannanoa River and French Broad River both flood after heavy rains. Greenways along these corridors have to be temporarily closed while inundated, and maintenance is important afterwards to clear debris, remove silt buildup, and repair broken amenities. City of Asheville alert systems are in place to make sure that users are aware of the dangers associated with flooding and park facility closures.

WIDTH

The recommended width for the Swannanoa Greenway is a 14-foot-wide paved path with 3-foot shoulders. This width is chosen because the path will serve as a primary recreation and transportation route for both the city and the region, functioning as a central "spine" in the network. According to the City's Close the GAP Plan, these greenway spines are comparable to major "highways" in the pedestrian and bicycle system, offering the highest level of service and design speed. While a more compact 10- or 12-foot-wide path is possible, 10 feet is considered the absolute minimum and should only be used for sections with significant constraints.

A typical easement width of 30 feet is recommended to accommodate maintenance activities, landscaping, and other amenities along the greenway. When the greenway runs directly alongside a stream or the Swannanoa River, the easement should extend to the top of bank to promote conservation efforts. Where the greenway parallels a road, a reduced easement width may be considered.

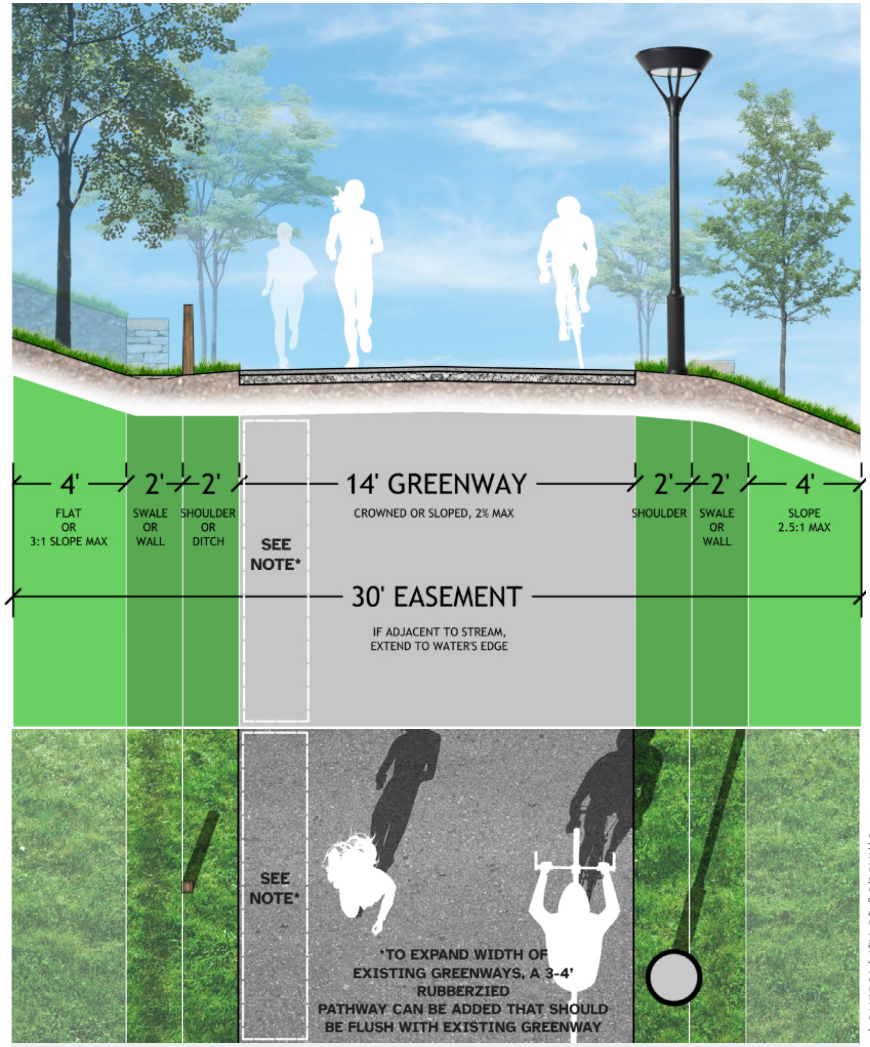
Greenway Amenities

Spine greenways serve as vital corridors for pedestrians, cyclists, and nature enthusiasts. It is imperative to ensure that these greenways offer a range of amenities to enhance the user experience and encourage their use by residents and visitors alike. These should include:

Benches placed strategically along the greenway provide opportunities for users to rest, enjoy the scenery, or simply take a break during their journey. These resting spots not only promote comfort but also encourage people to spend more time outdoors, fostering a sense of community and well-being.

Trash receptacles help maintain the cleanliness of the greenway by providing a convenient way for users to dispose of litter responsibly. By keeping the greenway free of debris, trash receptacles contribute to a pleasant and inviting environment for everyone to enjoy.

Image 60. Asheville Greenway Spine Network Typology



Source: City of Asheville

This facility will be used for both recreation and transportation, so should be wide enough to accommodate a range of different users throughout the day, allowing for safe passing. The FHWA recommends 3-foot shoulders, so that is the only amendment to this cross-section.

Image 61. Hominy Creek Greenway Kiosk



Source: City of Asheville

City of Asheville greenways have kiosks with maps of the facility at key trailheads, along with signs indicating park rules.

Dog waste stations are essential amenities for pet owners who frequent the greenway with their furry companions. These stations provide convenient disposal options, promoting cleanliness and hygiene while minimizing environmental impact.

Entrance signs indicate the beginning of the greenway and provide information about its length and rules for the facility. Meanwhile, **wayfinding signage** is helpful for guiding users along the greenway, especially at intersections, junctions, or points of interest. Clear and informative signage helps prevent confusion and ensures that users can navigate the greenway safely and efficiently.

Lighting is also important on spine greenways, particularly in high-traffic zones, intersections with roads, and areas with low visibility such as beneath bridges or overpasses. As a transportation facility, the Swannanoa Greenway will likely be used at night, making lighting an important safety element.

Image 62. Reed Creek Greenway Entrance Amenities



Source: WLOS

Asheville's greenways each have unique branding incorporated into trailheads, as well as amenities like benches and waste receptacles.

Image 63. Lighting and Parking Under Bridge (Wilma Dykeman Greenway)



Source: Google Streetview

Lighting can be especially helpful under bridges and in parking areas, like this Wilma Dykeman Greenway access point.

Image 64. Example of Greenway Centerline Striping



Source: TPD

Centerline striping is already used on City of Asheville greenways, like here in the busy River Arts District.

Centerline striping on the greenway is helpful, particularly in areas with high user volumes, tight or blind corners, intersections, or under bridges. This serves to alert users, especially newcomers, to two-way traffic and prepares them for constrained or busy segments of the greenway. This simple lane marking can help separate traffic flow, reduce conflicts, and enhance overall user experience. This feature proves especially beneficial in more extensive greenway networks where wayfinding may pose a challenge.

Public art along a greenway can further enhance its appeal and cultural significance. Artistic elements such as sculptures, murals, and installations can serve as focal points along the greenway, creating visual interest and enhancing the overall aesthetic experience for users. Moreover, public art along the greenway can serve as a platform for local artists to showcase their talents and contribute to the cultural vitality of the city. Artistic collaborations and community-led initiatives can further strengthen the sense of ownership and pride in the greenway among residents.

Image 65. Public Art Signage (Wilma Dykeman Greenway)



Source: Barnhill Contracting Company

Image 66. Mural Underneath I-240



Source: Peter's Big Adventure

Retaining Wall Considerations

In addition to selecting the appropriate retaining systems, it is also important to consider factors such as environmental impact, aesthetics, and long-term maintenance requirements when designing retaining walls. Moreover, collaboration with geotechnical engineers, landscape architects, and other relevant professionals can provide valuable insights and ensure comprehensive planning and execution. By integrating these considerations into the design process, retaining walls can not only fulfill their functional requirements but also enhance the overall landscape and contribute to the sustainability of the project.

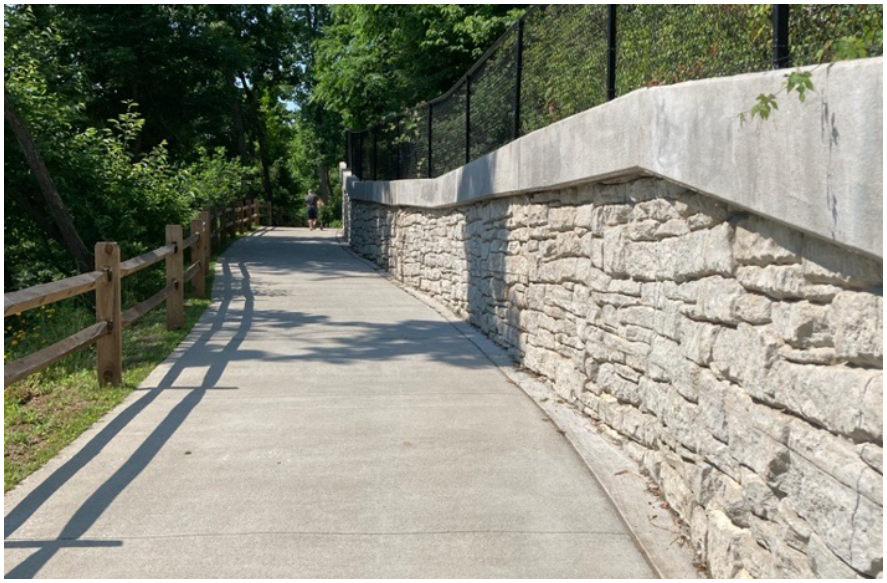
Greenway Flyover Bridges

Bridges may vary due to site-specific constraints, budgetary considerations, or the existing infrastructure. Nonetheless, the following standards should be upheld:

- **Roadway Crossings:** When bridges span roadways, efforts should be made to connect to existing roadway pedestrian and bicycle facilities whenever feasible.
- **Accessibility and Safety:** Bridges should be designed to accommodate maintenance and emergency vehicles. ADA compliance is mandatory for bridge approaches, the bridge surface, railings, and connections to existing pedestrian and bicycle paths.
- **Smooth Transitions:** The transition from the bridge to the greenway must be seamless, maintaining consistency across the width of the greenway. There should be no steps or bumps that could impede passage.

For Alternative A, a flyover bridge is proposed. This treetop-level greenway would extend from Meadow Road (near where the bike lanes terminate) to the sewer easement along the river. Although costly, this option would provide the most direct link in the system, serving as an alternative to NCDOT's multimodal infrastructure along Meadow Road.

Image 67. Retaining Wall on the French Broad River Greenway



Source: TPD

Image 68. Flyover Bridge (Razorback Greenway)



Source: Northwest Arkansas Democrat-Gazette

Design Considerations for Utility Corridors

Existing man-made corridors offer potential opportunities to meet the needs of greenway users efficiently. Underground utilities, including water, sewer, natural gas, or buried electric and optic lines, can often accommodate greenways. Additionally, above-ground utilities such as telephone, cable, or overhead electric lines can also be integrated into these corridors.

This arrangement benefits utility companies by providing them with uninterrupted and easily accessible routes to their service infrastructure. Moreover, it optimizes land use by leveraging existing corridors for multiple purposes, enhancing the overall efficiency and sustainability of the infrastructure.

- **Utility Company Guidelines:** Utility companies have specific design guidelines, routing and alignment requirements, and landscaping limitations to adhere to.
- **Greenway Width for Motor Vehicle Access:** A minimum width of ten feet is required if motor vehicles will need access to the greenway for maintenance purposes.
- **Sewer Easements:** In sewer easements, the edge of the greenway should be at least ten feet away from manhole edges, where feasible.
- **Easement Acquisition:** Acquisition of an easement from the current fee simple title owner of the land is necessary for all greenways.
- **Utility Corridor Width Limitations:** Some utilities impose width limitations within their rights-of-way. When designing greenways in utility corridors, it's essential to confirm the current guidelines with each utility.
- **Bollard Installation:** Bollards may be required at access points to deter motor vehicles, and they must be installed according to the utility's specifications.
- **Minimum Separation for Electrical Utility Corridors:** For electrical utility corridors, a minimum separation of 25 feet is required between the greenway and any associated electrical equipment, such as guy wires, power poles, and towers (based on Duke Energy's right-of-way requirements for greenways). More information **HERE**.
- **Culverts and Vegetation Installation:** Culverts and vegetation must be installed according to the utility's specifications.
- **Restrictions on Structures:** Structures such as signage, lighting, and benches are typically restricted within utility easements.
- **Review of Utility Policies:** Review each utility's policy and construction specifications for repair, maintenance, access, and corridor maintenance requirements.
- **User Expectations:** User expectations for greenways in utility corridors will be similar to other greenways. However, these greenways may be subject to specific conditions and may be closed at certain times for utility repairs.

Image 69. Electrical Utility & Sewer Easement Corridor



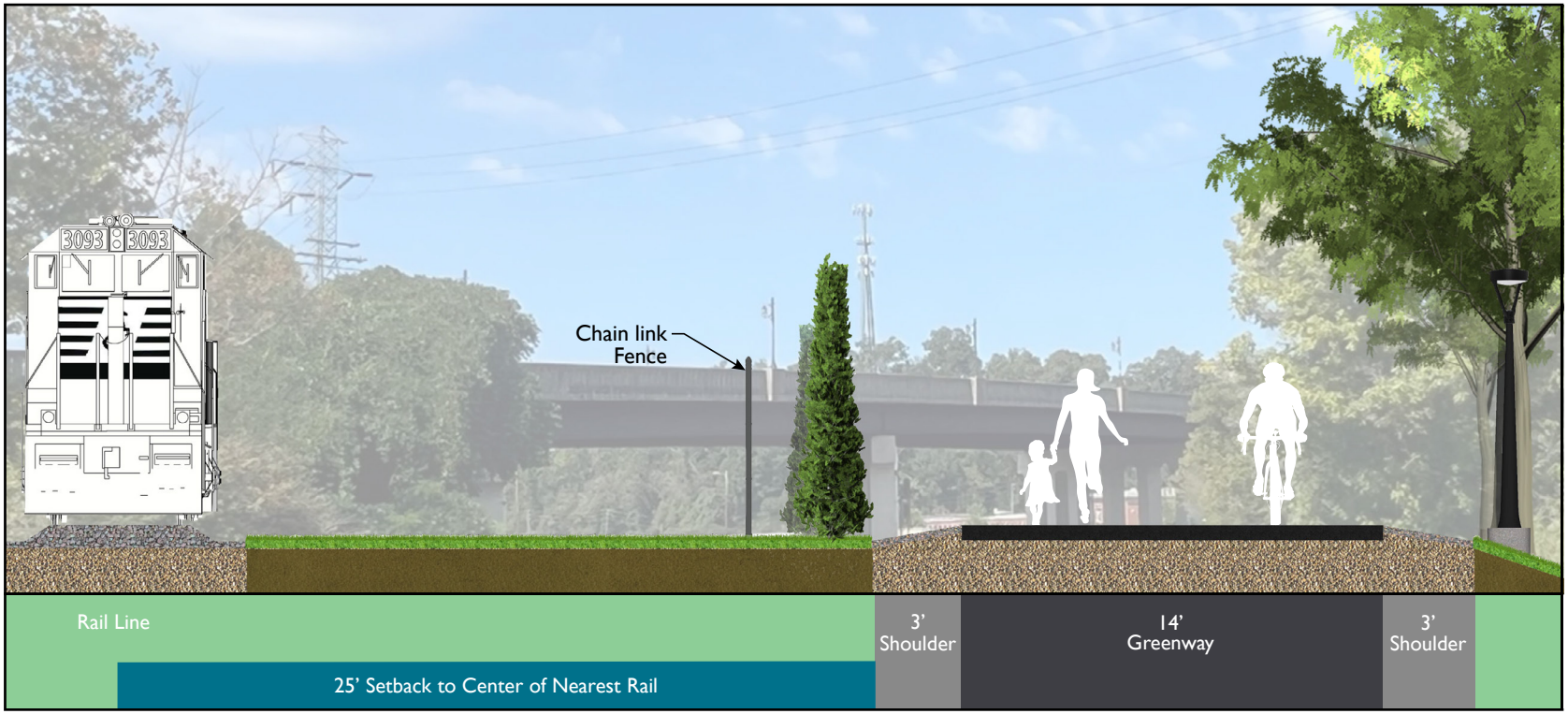
Source: TPD

Greenways in Active Rail Corridors

Greenways located within railway corridors must prioritize adherence to safety standards and regulatory guidelines. Challenges like limited right-of-way width, inadequate space for setbacks, safety concerns regarding trespassing, and the necessity for multiple crossings can significantly affect the feasibility of a project. In some instances, it is essential to reserve space for potential future planned freight or commuter rail services. These factors need to be carefully considered during the planning and design phases to ensure the successful implementation of the greenway while addressing potential constraints and challenges.

In most instances, fencing will be necessary to delineate greenway usage. The fencing should be at least 5 feet in height, with heightened fencing recommended adjacent to sensitive areas like switching yards. Setbacks from active rail lines will vary, contingent on factors such as train speed, frequency, and the available right-of-way. These setbacks should be determined in accordance with safety standards and regulatory guidelines. Where feasible, wider paths and enhanced landscaping are also desirable.

Image 70. Example of Greenway Separation from Rail Line



14' Paved Path Adjacent to Rail Line



Source: FHWA

Rectangular Rapid Flash Beacons (RRFB)

Pedestrian and bicyclist visibility enhancement at a midblock crossing that accompanies a warning sign and consists of two, rectangular yellow indicators each with an LED light that flash with an alternating high frequency.



Source: Portland Bureau of Transportation

Crosswalks

Designated areas where pedestrians have the legal right to cross the street. These crossings can be found at intersections or mid-block locations. They may feature accompanying signage, pavement markings, and traffic control measures such as stop signs, traffic lights, or flashing devices.



Source: City of San Francisco

Curb Ramps

Sloped surfaces that facilitate the transition between the greenway and the street. When designed in compliance with ADA regulations, ramps enable individuals using mobility devices to easily access and leave the greenway to cross a street or get to a parking facility.



Source: New York Post; Maricopa Association of Governments

Pedestrian Signal Heads & Push Buttons

Installed at signalized intersections, these allow people to activate the walk/don't walk pedestrian signal, indicating whether it is safe to cross the street. A countdown timer is helpful for people to gauge remaining time to cross.

Crossing Design

At-grade roadway crossings pose potential conflicts between greenway users and motorists. However, through well-designed crossings, many operational issues can be mitigated, offering a higher level of safety and comfort for all users. Each crossing should be studied and designed to meet state and national standards for crossings. There are various safety countermeasures that can be applied based on location specific factors and engineering judgment.

Infrastructure must prioritize safety not only along corridors but also at locations where pedestrians interact with street crossings and access points like driveways. In busier urban crossing situations, it may be necessary to implement additional safety measures such as physical mid-crossing protection, signals activated by the user, and proactive traffic calming treatments.

For the Swannanoa River Greenway Extension, most crossings will occur at signalized intersections. At these intersections, the greenway should be constructed to merge into the existing pedestrian facilities, with accessible curbs, pedestrian signal heads, and crosswalks. However, if the greenway crosses at mid-block, it should intersect the street at a 90-degree angle if possible. For all crossings, the following are applicable:

Vehicular Scale Signage: Vehicular scale greenway signage should be placed near the crossing to alert motorists of the greenway's presence. All signage must adhere to Manual on Uniform Traffic Control Devices (MUTCD) standards. If the greenway runs parallel to the street before or after the intersection, signage should be installed in advance to inform motorists of the shared corridor.

High Visibility Design: Crossings should be designed for high visibility, using lane markings and signage to draw attention to the crossing in compliance with MUTCD standards.

Surface Material: Where the greenway intersects with sidewalks, a concrete surface should be applied.

Pedestrian Activated Signals: Mid-block crossings of major streets should have pedestrian activated traffic signals.

ADA Compliance: All crossings must comply with ADA and/or Public Right-of-Way Accessibility Guidelines (PROWAG) guidelines, including the use of detectable warnings and other ADA components in accordance with the latest standards and local regulations.

Stormwater Management: Consider opportunities to incorporate stormwater management elements and pervious surfaces to establish the greenway corridor as a sustainable and resilient amenity.

Right-of-Way Considerations: Determine existing right-of-way widths and locations before significant design work. Propose improvements that remain within existing ROW whenever possible. Adjustments to roadway widths and other components are preferred over right-of-way acquisition.

While specific intersection geometry will dictate final design, the recommended layout elements should serve as the foundation for design considerations. It is important to note that the images illustrating these treatments are sourced from various locations across the United States, and specific design details may differ from those used by NCDOT or the City of Asheville.

Both at the state and national levels, significant progress has been achieved in formulating guidance and standards for pedestrian and bicyclist safety. The following resources offer best practices and should be taken into account during the planning and design phases of the Swannanoa River Greenway Extension.

North Carolina Pedestrian Crossing Guidelines (2018) provides guidance on when to consider marking crosswalks at uncontrolled approaches, installing pedestrian signal heads at existing signalized intersections, and supplemental treatments at a crossing location. More information can be found **HERE**.

FHWA's Proven Safety Countermeasures Initiative is the culmination of over 15 years of safety work available in an online tool that can be used to address pedestrian crossing safety, including visibility, lighting, leading pedestrian intervals, refuge islands, RRFBs, and pedestrian hybrid beacons. More information can be found **HERE.**

FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations provides crossing guidance for uncontrolled crossings to help local and state agencies "address significant national safety problems and improve quality of life for pedestrians of all ages and abilities." The guide includes a process for evaluating crossings and determining appropriate countermeasures for specific crossing conditions based on engineering which includes data collection, site condition analysis and crash history review. More information can be found **HERE.**

FHWA's Improving Visibility at Greenway Crossings presents a systemic approach to reviewing existing crossings or planning for improved at-grade greenway crossings with engineering countermeasures, such as enhanced signs and traffic controls. More information can be found **HERE.**

Image 71. Midblock Crossing (French Broad River Greenway)



Source: Google Streetview



05 Implementation



OVERVIEW

The findings outlined in this report furnish an implementation strategy for multimodal investments aimed at connecting neighborhoods in the Asheville area. These investments will facilitate the linkage of key destinations such as Asheville-Buncombe Technical Community College (A-B Tech), Asheville High School, Mission Hospital, Biltmore Village, the Biltmore Estate, and the River Arts District. This chapter introduces project cutsheets, which serve as concise summaries enabling the City and its partners to propel these initiatives forward. Each cutsheet offers a comprehensive overview, including route alternative descriptions, phasing options, cross-sections, maps, visual representations, and planning-level cost estimates.

This chapter underscores the significance of key local and regional partnerships that can help advance these projects. Furthermore, an action plan is presented, delineating specific tasks, identifying lead agencies and primary partners, establishing an implementation timeline, and defining metrics to measure success.

PHASING STRATEGIES

In developing an implementation and phasing plan, the planning team reviewed certain factors that may impact the timing of project implementation. During this analysis, we often split projects into phases based on the following factors:

- Availability of right-of-way and property ownership.
- Permitting challenges including NCDOT coordination, flood impacts, and environmental impacts.
- Project needs, for example, segments with a known safety and crash history or key network gaps may be prioritized.
- Project cost.
- Potential funding and matching funds.
- Project partnerships.

The phasing for this project is relatively simple since all alignment alternatives (A, B and C) are relatively short and do not have segments that will function as standalone projects. As such, the preferred alternative will include only one phase and the content of this chapter focuses on an initial action plan for implementation of the preferred alternative.

ALTERNATIVE B

Alternative B is the least expensive and most direct alternative and is recommended as the City's **first option** to pursue. This alternative assumes NCDOT's Meadow Road project (U-4739) will include multimodal access, whether along the roadway as a multiuse sidepath or separated from the roadway as a shared use path/greenway. If NCDOT's scope of the Meadow Road project changes to exclude a sidepath along the western section of Meadow Road, then Alternative A may be revisited. If easements are harder to obtain, Alternative C may be the only available option.

- **Alternative A** offers an opportunity to create a transportation connection and a recreational amenity that could have broad appeal as a true river-focused greenway. If Meadow Road does not have sufficient bicycle and pedestrian infrastructure, Alternative A provides that function as well as a safe route along the corridor. However, while it would be a direct link from the River Arts District to Biltmore Village, it provides less of a connection to A-B Tech and Asheville High School. Its feasibility is also entirely dependent on successful acquisition of easements from Norfolk Southern and Duke Energy, with some challenging topographical hurdles.
- **Alternative C** provides an alternative connection if railroad easements for Alternatives A and B are unobtainable. Alternative C would require NCDOT approval to implement the modifications on the McDowell Street bridge that were studied and recommended as part of the Biltmore Avenue and McDowell Street Corridor Study.

Additional considerations for advancing these other alternatives are provided in subsequent pages and cutsheets are provided for each alternative to assist in implementation decision-making.

EARLY ACTION PLAN

This section identifies early action implementation recommendations identified based on the following understandings:

1. **Secure easements and/or rights-of-way (ROW) to enable the connection.** An important first step for Alternative B development is to secure easements and/or right of way (ROW) to enable the connection. Coordination with Norfolk Southern (NS) is anticipated to be the most time-consuming implementation step. As such, this coordination should begin as soon as possible. The process for public projects is described in NS's Public Improvement Projects Manual, January 2022. The Appendix summarizes Norfolk Southern coordination items identified during this study.
    - To initiate coordination with NS, the Alternative B cutsheet from this document may provide the basis for a conceptual design submission for NS review. Once NS has a conceptual plan, it will provide a fee for their multi-step review. The specific request will be to construct a multiuse trail on the northern edge of their property under McDowell Street Bridge adjacent to Biltmore Iron & Metal.
    - Simultaneously, the MPO and City should pursue discussions with NS about acquiring the underutilized tract of land west of Habitat for Humanity. If this tract were acquired, it could serve as additional parking for Habitat for Humanity to offset the need to remove some parking on the backside of their parking lot to accommodate the Alternative B's paved path.
2. **Continue coordination with Division 13 on the Meadow Road Project (NCDOT STIP Project #U-4739).** At the time the report was completed (June 2024), the final design for NCDOT's Meadow Road project (U-4739) was not complete. This presents an opportunity to coordinate design efforts of the Swannanoa River Greenway Extension with the Meadow Road project. It is possible that Alternative

Image 72. Norfolk Southern Public Improvement Projects Manual



Source: Norfolk Southern Railway

Norfolk Southern has developed the "Public Improvement Projects Manual", January 2022 (aka The Manual) to guide projects that are being constructed over, under, or adjacent to Norfolk Southern properties. The Manual's intent is to "improve communication and cooperation on construction and improvement projects that may involve Norfolk Southern," and the Manual contains policies, requirements, criteria, and standards for the design and construction of projects. More information here: **Public Improvement Projects**

B (or other Alternatives) could be incorporated into the STIP project. If coordination can happen, then the likely alternative for the Swannanoa Connector would be an off-road option like Alternative B, because Meadow Road between Short McDowell Street and Biltmore Avenue does not have sufficient ROW for a sidepath. Coordinating Meadow Road efforts with the Swannanoa River Greenway Extension could lead to cost savings and integrated connections.

The FBRMPO and the City should continue to discuss plans for this corridor with NCDOT as early as possible in the engineering and design process when there is still time to respond to revisions and new ideas. If, for some reason, the Meadow Road project is put on hold or defunded, the MPO and City can still pursue this alternative as a standalone segment of the Swannanoa River Greenway. However, it would not provide a complete connection to the River Arts District since a greenway gap would remain between Short McDowell Street and the River Arts District. This connection would, however, provide an off-road separate facility for bicycle and pedestrian traffic that uses this corridor and currently must navigate the congested traffic conditions at the intersection of Biltmore Avenue, Meadow Road, and Bryson Street. This connection becomes increasingly important as the City completes segments of Swannanoa River Greenway to the east.

3. **Continue coordination with NCDOT Division 13 on the NC 81 (Swannanoa River Road) Widening (NCDOT STIP Project #U-5832).** NCDOT's Swannanoa River Road project (U-5832) is currently in design. Design plans include completion of the adjacent section of the Swannanoa River Greenway, to the east of the Swannanoa Connector. Based on the current status of the NC 81 project, a Swannanoa River Trail crossing of Biltmore Avenue will be included at some location between Bryson Street and Thompson Street. As such, the City will be required to coordinate with NCDOT on this project to ensure that both greenway segments terminate at the same final location chosen for the Biltmore Avenue crossing.

4. **Initiate early and ongoing communication with key property and facility owners along Alternative B.** Key property and agency owners include:
   - Metropolitan Sewage District (MSD)
   - Habitat for Humanity
   - Biltmore Iron & Metal
   - Asaka Japanese Restaurant
   - Duke Energy: The route passes near an overhead electrical tower. If it is not feasible to stay out of the easement, then the City will need to seek approval.

5. **Define exact trail easement needs.** To refine the project and determine exact trail easement needs, the City should advance to 30% design to include a topographic survey and environmental tasks. This will aid in identifying how far into private and utility property the paved path would encroach and aid in permitting requirements, including stream crossings and sites with potential environmental hazards.

CONSIDERATIONS FOR ADVANCING OTHER ALTERNATIVES

If future coordination with the railroad and NCDOT projects necessitate a shift from the preferred Alternative B to another viable alternative (A or C), the City will need to consider additional factors.

Alternative C

If the City pursues Alternative C, additional considerations are as follows:

- Alternative C will most likely only be feasible if done in conjunction with a full set of improvements as detailed in the *Biltmore McDowell Street Corridor Study*.
- Alternative C also necessitates coordination with the Biltmore Company to gain permission for an encroachment near the Biltmore Estate's entry and under the McDowell Street Bridge. The owner of McDonald's would also need to provide approval to reconfigure the edge of their parking lot to accommodate the greenway.
- Further ROW investigations will be needed to determine which entities, such as NCDOT and Norfolk Southern, would need to approve this connection. Norfolk Southern would also need to approve an improved at-grade railroad crossing at Biltmore Avenue to accommodate the multiuse trail for this alternative.

Alternative A

During meetings with Meadow Road (NCDOT U-4739) design consultants, it was noted that Alternative A could become the preferred option due to possible environmental impacts and design constraints that exist along Meadow Road near existing industrial uses. Alternative A does not provide the most direct connection to Asheville neighborhoods, schools, etc., but this route offers an enhanced user experience along the Swannanoa River. This alternative includes a greenway bridge structure to ramp a greenway from the Meadow Road bridge near the Biltmore Estate employee entrance, to the sewer easement that runs along the north side of the river between Meadow Road and Biltmore Avenue. This alternative also includes a new greenway bridge to cross the Swannanoa River under the McDowell Street Bridge. Additional considerations include:

- The key partners would be similar to the previous alternatives, but the request would be different. Norfolk Southern and MSD would both need to approve the greenway using the sewer easement that parallels the river. In addition, the Biltmore Company holds a "buffer" easement on the land along the north side of Swannanoa River where this route is proposed. An encroachment would be needed. Measures could be taken to visually protect the buffer, specifically a robust planting plan developed in combination with the constructed greenway.
- A flood study would be required to determine if the greenway design, with proposed structures, would cause a rise in the base flood elevation. Based on the placement of the proposed structures and a review of FEMA data, this option appears to be feasible; however, additional study is needed to verify.
- For Alternative A, overhead utility conflicts will need to be investigated and further evaluated to determine the impact and cost of any encroachments.
- The owner of McDonald's would also need to provide approval to reconfigure the edge of their parking lot to accommodate the trail.
- A new railroad crossing for the paved path would also be required at Biltmore Avenue. This crossing is a needed upgrade under existing conditions and will require railroad coordination.

PREFERRED ALTERNATIVE CUTSHEETS

To evaluate phasing strategies, project cut sheets were developed for Alternative A, B and C. These cut sheets are presented on the following pages and include implementation details such as:

- Project map and description of improvements
- Right-of-way availability and property acquisition needs
- Permitting needs
- Cost estimates for survey, design and construction

Explanation of Cost Estimate Items

The project costs presented on the cutsheet pages are described as follows. It should be noted that cost estimates are not based on actual survey and design. As such, these planning level costs should be revisited as the project details and preliminary design investigations are completed:

Baseline Construction

This value reflects an opinion of the probable cost for a contractor to construct the described improvements during the current calendar year and is based on recent bid prices for similar projects. These detailed estimates for various project elements are included in the Appendix.

Survey / Design Services

This value reflects an opinion of the cost for consulting firms to obtain survey, design the project for permitting and approvals and to provide construction documents to be used in bidding the project for construction. Note that various funding sources can impact the necessary approvals, design formats/standards and permitting requirements. In addition, certain environmental items that can be found during preliminary design, can escalate costs. As such, this cost should be revisited as funding is identified. In addition, we recommend completion of design work in stages with an evaluation of project cost and permitting needs to be revisited after preliminary design.

Right-Of-Way (ROW) Acquisition

Many projects have impacts on properties that are outside of the public right-of-way (ROW). Before construction can begin, there are various ROW tasks that must be completed. These range from purchasing property to obtaining permanent or temporary easements for the facility and related construction impacts. Depending on the type of property acquisition involved, there is a cost associated with purchase and/or easements as well as the cost for legal work and right-of-way survey and exhibits. If federal transportation funds are utilized for the project, the ROW negotiations must be in line with the Federal Relocation Assistance and Real Property Acquisition Policies Act of 1970 (aka Uniform Act). Accurate ROW costs require current market research, appraisals, and have varying factors; as such, a special ROW firm may need to be hired to navigate the process. Any ROW costs should be calculated after additional investigation as individual segments of the preferred route move into design and implementation.

Escalated Construction

The baseline construction estimate is based on current year costs. Given that it will take time to get a project through funding, ROW, design and permitting stages, there is a need to escalate costs to account for inflation that will occur between now and the estimated year of construction.

Construction Engineering + Inspection Services

Depending on the funding source, varying levels of construction engineering and inspection (CEI) services are expected. CEI services are typically a percentage of the estimated construction cost based on the project size and elements of construction. This study assumes 7.5% for preliminary engineering and another 7.5% for final engineering.

Total Budget Estimates

In planning projects such as this one, there are always detailed items that come about in later stages of design and construction that may be necessary and are unforeseen. As such, a project

contingency is assumed to help address these unknown and unforeseen costs. Contingency percentages can vary depending on how advanced the design of the project is and the likelihood of unknowns. At the planning level, a higher contingency is often used to ensure that the project is not underfunded. A 25% contingency was assumed for this project given that no actual design has been completed. The final budget for the project is based on the sum of the above items. The values were rounded to the nearest dollar to reflect the planning phase of the project.

If future opportunities and constraints arise that change the dynamic of the final outcome, the City should adapt.

ALTERNATIVE A

Along the Swannanoa River

This alternative would follow the Swannanoa River to the greatest extent possible. A paved path would begin at Meadow Road just before the bridge over the railroad tracks. From the western end of the bridge, the trail would divert from the roadway on a proposed new elevated structure and slowly ramp down to run along an existing sewer easement on the north side of the river between the railroad tracks and the river. On the eastern end of this alternative, a new bridge would be required to cross the Swannanoa River under the McDowell Street bridge near the McDonald's restaurant, running parallel and south of the railroad bridges over the river. A connection along Biltmore Avenue will be necessary to access the Swannanoa River Greenway alignment on the east side of the road that is advancing as a separate project (NCDOT Project # U-5832). Given that there are extensive engineering and permitting challenges with this alternative, further engineering investigation is needed to determine feasibility and cost. This alternative would also require approval from several entities including Norfolk Southern, Duke Energy, Metropolitan Sewerage District (MSD), and the Biltmore Company.

PROJECT SNAPSHOT

Location: North side of Swannanoa River on sewer easement on Norfolk Southern property.

Facility Type(s): 14' wide paved shared use path (off road)

Total Length: ~4,900 linear feet

Structures: 335 linear feet of raised boardwalk; pedestrian bridge over the Swannanoa River

At-Grade Road Crossings: None; upgraded railroad crossing

Greenway Connections: Adjacent Sections of Swannanoa River Greenway (connection to regional trail networks including the Hellbender Regional Trails and the Fonta Flora State Trail).

Destinations Served: Biltmore Village, River Arts District, Regional Multimodal Transportation Spine.

PRIMARY TYPICAL SECTION



Right-of-Way & Easements Needed: Greenway easement or acquisition from Norfolk Southern. Approvals also needed from Duke Energy, Metropolitan Sewer District, McDonald's and the Biltmore Company.

Potential Permitting Needed:

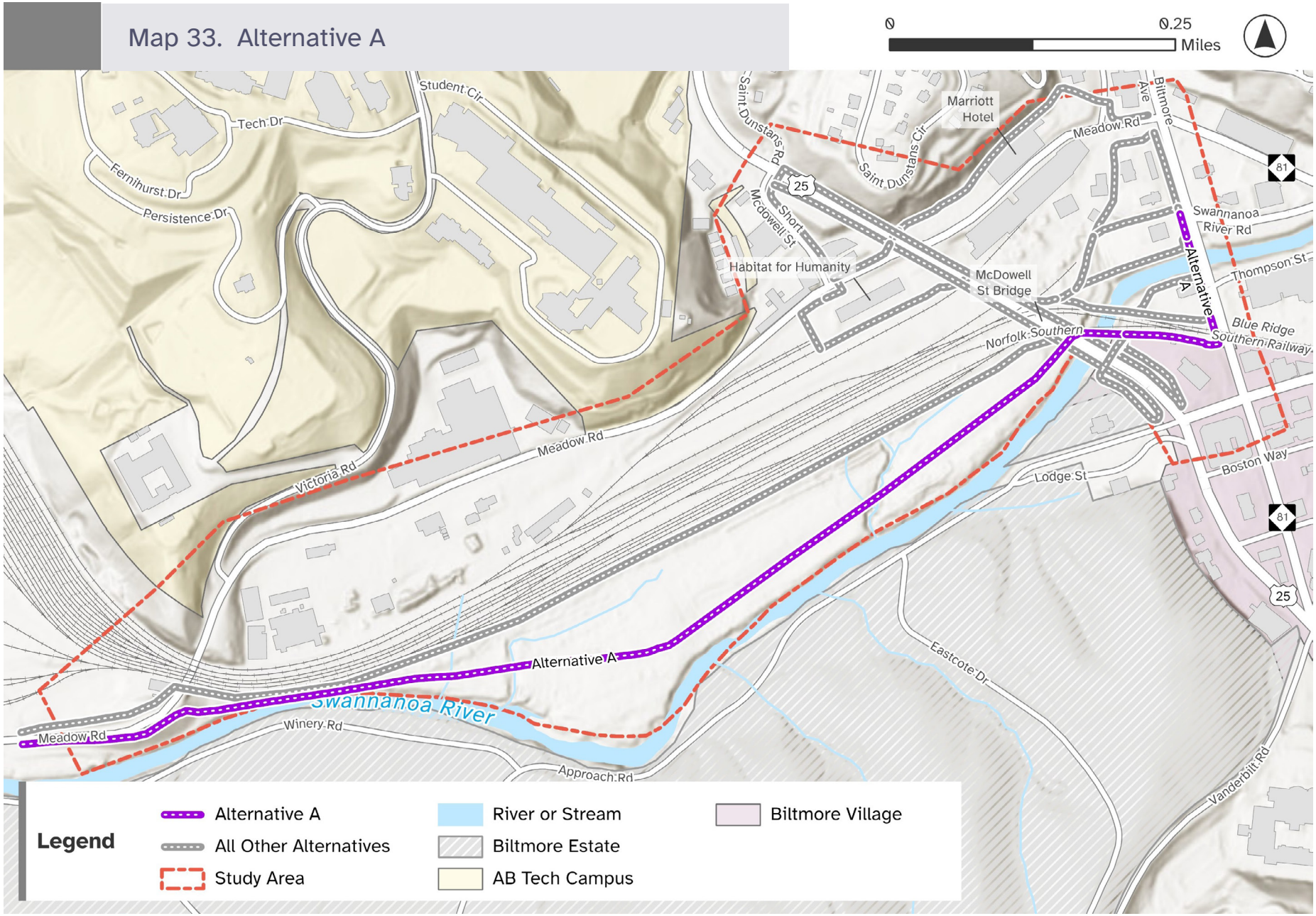
- Floodplain Development Permit including No Rise Certification
- City of Asheville Stormwater Discharge Permit
- Clean Water Act Permits (Sections 401 and 404)
- Soil Erosion and Sediment Control Permit
- NCDOT Encroachment Agreement

COST ESTIMATE

Baseline Construction	$4,000,000
Survey & Design	$705,000
Construction & Project Management	$400,000
Escalation	$300,000
Additional Contingency	$800,000
Total Estimated Cost	**$6,205,000**

**See Cost Estimate Summary in Appendix for breakdown, assumptions, and exclusions.*

Map 33. Alternative A



ALTERNATIVE B

Under McDowell Street Bridge

This alternative starts near Meadow Road and Short McDowell Street. Here it will connect with the future Meadow Road sidepath planned to be constructed with NCDOT's Meadow Road Project (NCDOT Project #U-4739). From this intersection, the alternative would continue south as a paved path along the western and southern edges of the Habitat for Humanity ReStore property. After passing under the McDowell Street bridge on an abandoned rail bed, the path would traverse the edge of Biltmore Iron & Metal property and follow the sewer easement that runs on the south side of the Asaka Japanese restaurant parking lot. A pedestrian crossing across Biltmore Avenue would connect with the future Swannanoa River Greenway to the east that is progressing as a separate project (NCDOT Project # U-5832).

PROJECT SNAPSHOT

Location: Habitat for Humanity property, under the McDowell Street Bridge, and along the river adjacent to Asaka.

Facility Type(s): 14' wide paved shared use path (off road)

Total Length: ~1,900 linear feet

Structures: Culvert over unnamed tributary of Swannanoa River

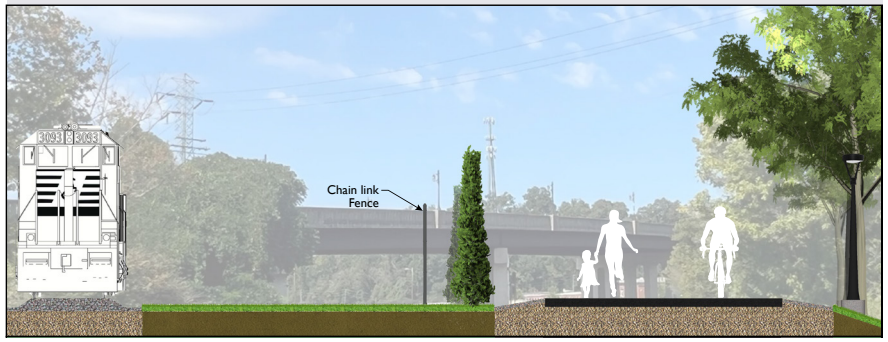
At-Grade Road Crossings: None; possible rail line crossing

Greenway Connections: Adjacent sections of Swannanoa River Greenway (connection to regional trail networks including the Hellbender Regional Trails and the Fonta Flora State Trail).

Destinations Served: Biltmore Village, River Arts District, Downtown (including A-B Tech, Asheville High School, and Mission Hospital), Regional Multimodal Transportation Spine.

Right-of-Way & Easements Needed: Greenway easements needed from Habitat for Humanity, Norfolk Southern, Metropolitan Sewer District and private property owners (Asaka Restaurant and Biltmore Iron & Metal).

PRIMARY TYPICAL SECTION



Potential Permitting Needed:

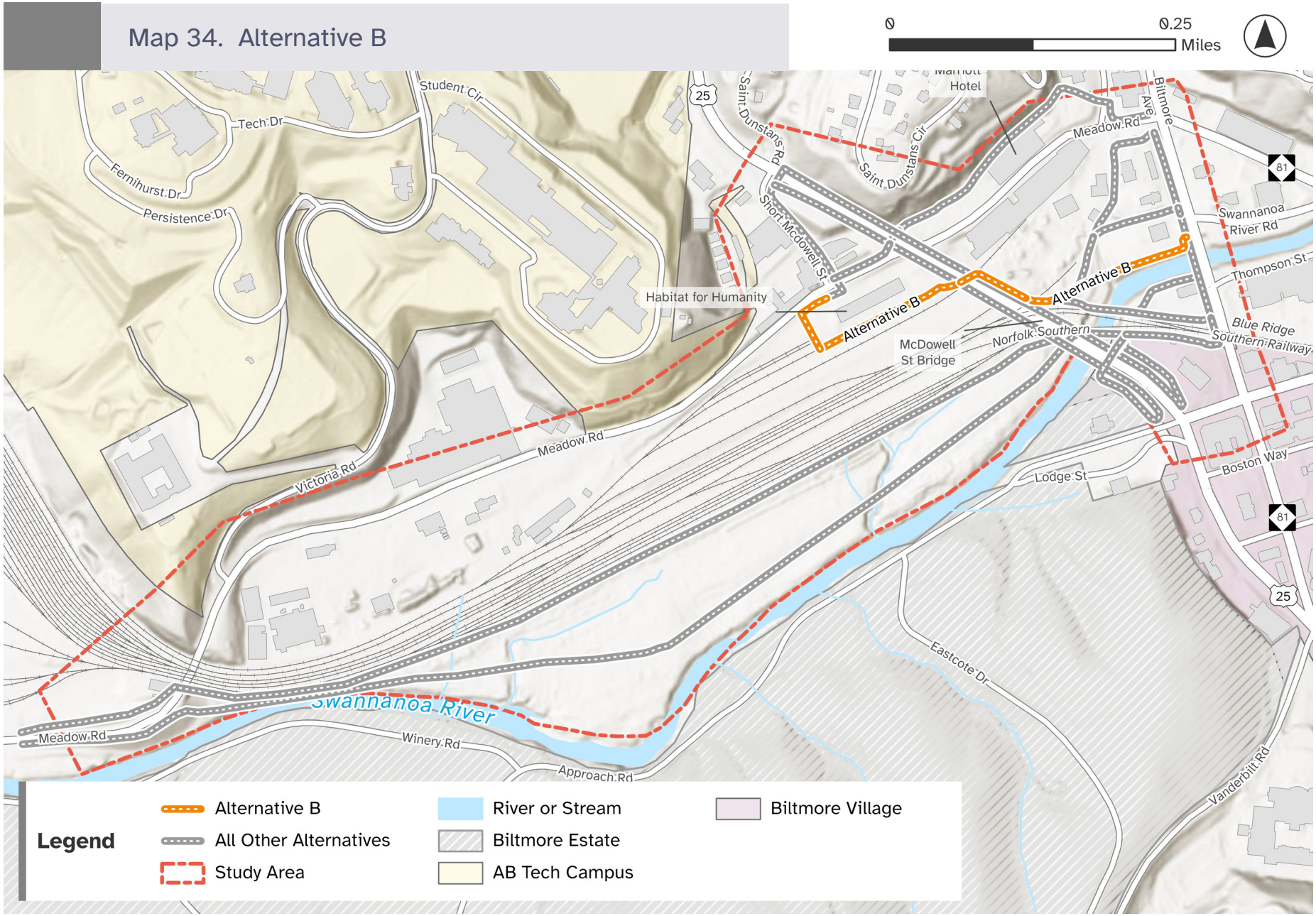
- Floodplain Development Permit including No Rise Certification
- City of Asheville Stormwater Discharge Permit
- Clean Water Act Permits (Sections 401 and 404)
- Soil Erosion and Sediment Control Permit
- NCDOT Encroachment Agreement
- Phase I and possibly Phase II Environmental Site Assessment for 801 Biltmore Ave

COST ESTIMATE

Baseline Construction	$700,000
Survey & Design	$120,000
Construction & Project Management	$65,000
Escalation	$50,000
Additional Contingency	$130,000
Total Estimated Cost	**$1,065,000**

**See Cost Estimate Summary in Appendix for breakdown, assumptions, and exclusions.*

Map 34. Alternative B



ALTERNATIVE C

Shared Use Path Along McDowell Street

This alternative starts near Meadow Road and Short McDowell Street. Here it will connect with the future sidepath planned for Meadow Road (NCDOT Project #U-4739). From this intersection, the alternative will continue north along Short McDowell Street to McDowell Street before turning south to travel across the bridge to Biltmore Village. Adjustments to McDowell Street bridge would be made to accommodate a sidepath and to provide a barrier from vehicles along the south side of the bridge. The route would then follow the edge of the Biltmore property and pass under the McDowell Street bridge into the McDonald's parking lot. From there it will run parallel with the railroad tracks and then turn north to cross the tracks at Biltmore Avenue. A pedestrian crossing at Biltmore Avenue would connect with the future Swannanoa River Greenway to the east that is progressing as a separate project (NCDOT Project #U-5832).

PROJECT SNAPSHOT

Location: Short McDowell Street; McDowell Street Bridge over Swannanoa and Biltmore Avenue.

Facility Type(s): 14' paved multiuse path

Total Length: ~3,700 linear feet

Structures Needed: None

At-Grade Road Crossings: One (1) at Meadow Road

Greenway Connections: Adjacent sections of Swannanoa River Greenway (connection to regional trail networks including the Hellbender Regional Trails and the Fonta Flora State Trail).

Destinations Served: Biltmore Village, River Arts District, Downtown (including A-B Tech, Asheville High, Hospital), Regional Multimodal Transportation Spine

Right-of-Way & Easements Needed: Greenway easement needed from the Biltmore Company, McDonald's and properties on Short McDowell Street. NCDOT would need to be an active partner to accommodate multiuse path on McDowell Street Bridge.

PRIMARY TYPICAL SECTION



Potential Permitting Needed:

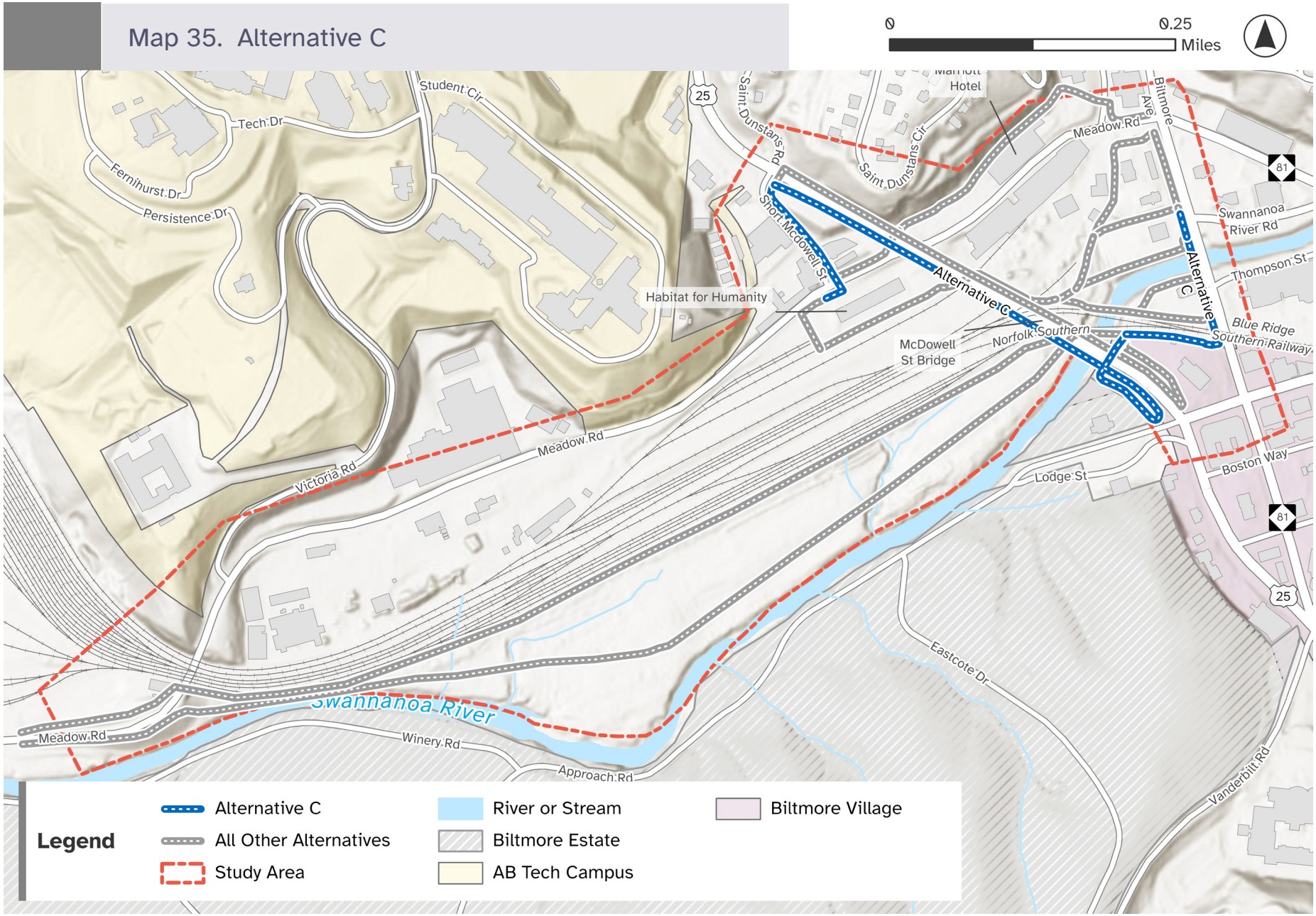
- Floodplain Development Permit including No Rise Certification
- City of Asheville Stormwater Discharge Permit
- Clean Water Act Permits (Sections 401 and 404)
- Soil Erosion and Sediment Control Permit
- Approval for upgraded pedestrian and bicycle railroad crossing on the east side of Biltmore Avenue
- NCDOT Encroachment Agreement

COST ESTIMATE

Baseline Construction	$4,200,000
Survey & Design	$750,000
Construction & Project Management	$420,000
Escalation	$320,000
Additional Contingency	$835,000
Total Estimated Cost	**$6,525,000**

**See Cost Estimate Summary in Appendix for breakdown, assumptions, and exclusions.*

Map 35. Alternative C

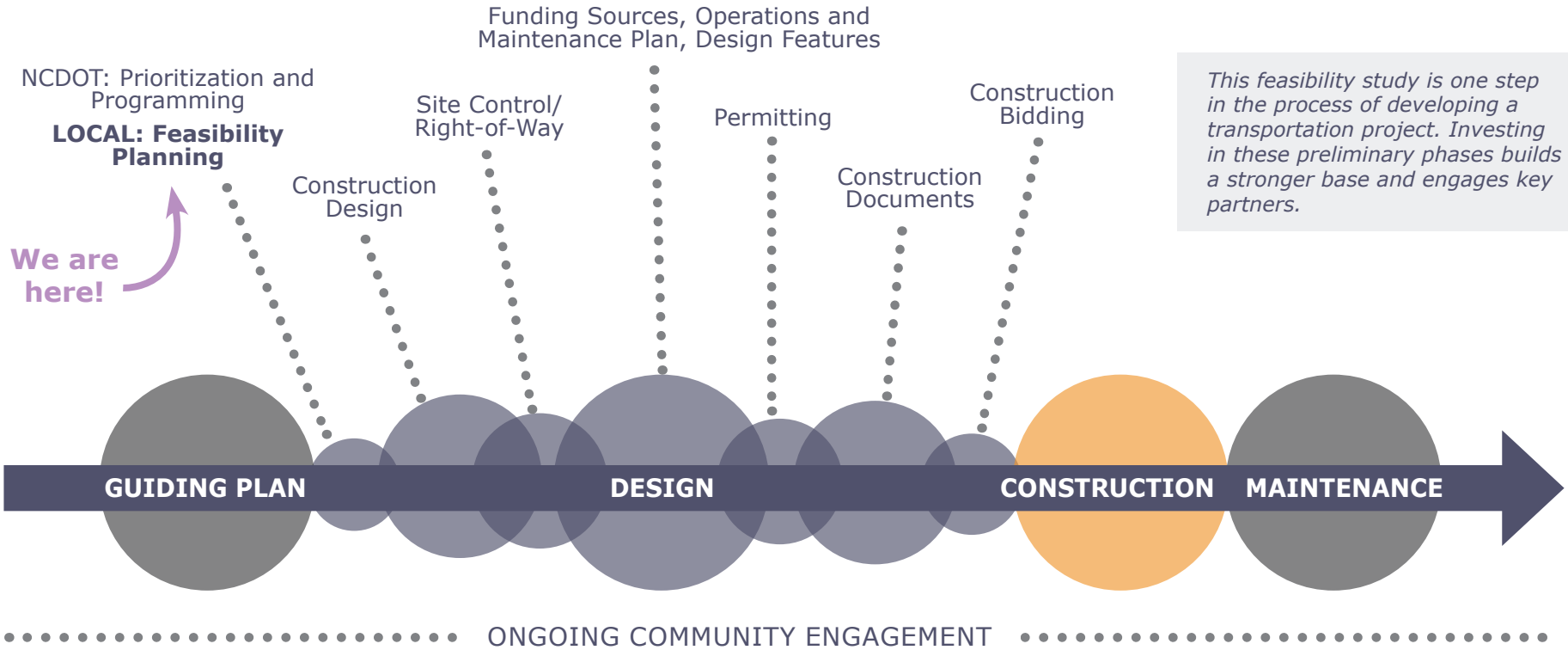


LIFE CYCLE OF A PROJECT

One of the most asked questions in the work of building pedestrian and bicycle networks is, *"When will the project be completed so that I can take a walk or ride my bike?"* While seemingly straightforward, the answer is complex. **Figure 18 - Life Cycle of a Transportation Project** illustrates the typical life cycle of an active transportation project. The time it takes to implement a project depends on the project's complexity, managerial oversight (whether by local authorities or NCDOT), the type of funding involved, how much ROW is needed, and the scale (size) of the project.

The Swannanoa River Greenway Extension study represents the 'Feasibility Planning' stage of projects, and from there it will move into the subsequent stages of funding (programming), design, construction, and then maintenance. The cutsheets will enable these projects to be well-presented for funding opportunities, facilitating their advancement through the subsequent life cycle stages.

Figure 18. Life Cycle of a Transportation Project



This feasibility study is one step in the process of developing a transportation project. Investing in these preliminary phases builds a stronger base and engages key partners.

KEY PARTNERS FOR IMPLEMENTATION

Future success for the Swannanoa River Greenway Extension will involve collaboration with regional and state agencies, local partners, the private sector, and non-profit organizations. **Figure 19 - Key Implementation Partners** identifies the pivotal roles of key partners, elaborated upon below.

Asheville City Council

Through their leadership and decision-making, the City Council contributes to the successful realization of the Swannanoa River Greenway Extension's goals and objectives. As the governing body, the City Council has the authority to guide implementation, including making budget decisions related to the greenway's progress and affirming their support of walking and bicycling. While this study was managed by the French Broad River MPO, the City can adopt it as well to show a commitment to continuing to build out the city's greenway network. The City Council's vote for adoption affirms their support of walking and bicycling, and would be an important step for messaging and agency coordination. Additionally, they play a role in collaborating with entities such as NCDOT and the French Broad River MPO to ensure effective coordination and alignment of efforts.

City of Asheville Staff

City staff's role in projects cannot be understated. They play a role in facilitating the coordination and collaboration necessary for the successful implementation of walking and biking projects and initiatives in Asheville, such as the GAP Plan. Staff coordinates with the City Council to develop and refine project plans, seeking their guidance and support throughout the process. They work closely with key stakeholders such as the French Broad River MPO, the County, and NCDOT to secure funding and ensure smooth project implementation. They seek other funding opportunities, they work with private development, and they and guide projects through design, construction, and maintenance. They direct the creation and implementation of policies to ensure smooth project development. This project stands apart from NCDOT's planned work on Meadow Road (STIP #U-4739). As such, the City of Asheville Transportation department is the likely lead implementation agency for this project, playing a pivotal role in seeing it forward and working with City Planning and Public Works staff in coordination with NCDOT and the French Broad River MPO to a successful end product.

Figure 19. Key Implementation Partners



NCDOT Division 13

NCDOT's local Division 13 plays a key role in advancing the project and achieving its objectives effectively. This includes coordinating efforts to identify funding opportunities, ensuring financial support for its successful implementation, and continuous coordination with pedestrian and bicycle upgrades linked to the U-4739 project on Meadow Road. The Meadow Road project has not been designed yet, so ongoing collaboration and discussion is important for seamless integration and optimal outcomes. Furthermore, collaboration with the design team is essential to integrate the project with the signal at Short McDowell Street and the sidewalk on Biltmore Avenue, including potential future signal upgrades.

NCDOT Integrated Mobility Division

The project involves several critical components that NCDOT's IMD can support, including providing guidance on bicycle and pedestrian policy as well as Complete Streets initiatives. It also entails close coordination with local NCDOT division offices to ensure alignment with regional priorities and strategies. IMD also has a Rail Program Manager who can help with rail negotiations, and securing state and federal funding and identifying grant opportunities to support the project's implementation and sustainability. Additionally, updating the Pedestrian and Bicycle Infrastructure Network (PBIN) mapping database is essential for maintaining accurate records and informing future planning.

French Broad River MPO

The French Broad River Metropolitan Planning Organization (MPO) initiated this project with a grant from NCDOT. The MPO will be integral to supporting project development through future funding opportunities and coordination with NCDOT to manage funds through programs like the State Transportation Improvement Program (STIP) and other available avenues, such as discretionary funding. They are key to successful implementation of this project and should be active partners throughout additional planning, design, and construction.

What is an MPO?

The French Broad River Metropolitan Planning Organization (FBRMPO) is a partnership between local and state government that makes decisions about transportation planning in urbanized areas and meets planning requirements established by federal authorizing legislation for transportation funding. In addition, FBRMPO is required to prepare long range transportation plans for the planning area with a minimum 20-year horizon. Additional tasks include developing an annual planning work program and assistance in prioritization of projects to be included in the State Transportation Improvement Program (NCDOT's funding for a 10-year period). FBRMPO was created in 1962 as the region centered around Asheville continued to experience growth and reached a population density threshold of 50,000 which constitutes the federally-mandated creation of a Metropolitan Planning Organization (MPO). The MPO currently serves over 414,000 people across 21 municipalities.

Metropolitan Sewerage District

The Metropolitan Sewerage District (MSD) could be a key partner in implementing this project because two of the three alternatives have sections along a sewer easement. MSD will need to be involved to grant easements where needed. The City of Asheville has a standard agreement with MSD which allows the City to construct greenways over MSD infrastructure in accordance with the agreement. MSD's involvement ensures that any greenway development is aligned with necessary access and operational requirements for sewer maintenance. Additionally, MSD staff have expertise in managing and maintaining the

existing sewer infrastructure and can provide valuable insights into the environmental and logistical considerations of the area, helping to design a greenway that enhances public use while safeguarding the integrity of the sewer system.

Duke Energy

Depending on which Alternative the City advances to construction, Duke Energy will need to grant an easement. Their involvement is listed as one of the early engagement steps noted above.

Committees and Commissions

Members of the City's Multimodal Transportation Commission, Active Transportation Committee (formerly the Greenway Committee), and Transit Committee can keep engaged in the implementation process and tie recommendations back to the City's adopted land use and transportation plans. Greenways support accessibility goals, broaden recreational opportunities, facilitate active transportation, and can support resiliency metrics and public health outcomes. These commissions serve as liaisons between the public and City Council, connecting the dots on the many benefits of projects like this and continuing to vocalize public support for implementation (including allocation of resources).

Community Members (residents, business owners)

Community members, including residents and business owners, can help implementation by advocating to elected officials and other stakeholders for funding and the advancement of the project. Additionally, encouraging friends and neighbors to use the new infrastructure and garnering public support for walking and bicycling are helpful for the project's success. By involving the broader community and fostering widespread support, the project can effectively address the needs and preferences of local residents while promoting active transportation and enhancing overall livability.

Private Sector (developers, other funders such as non-profit)

By leveraging the resources and expertise of the private sector, additional connections to the project can be established to maximize its benefits. This includes identifying funding opportunities such as grants and sponsorships. Furthermore, involving the private sector in advocacy efforts and volunteer engagement can help build community support and ensure the project's sustainability. Collaborating with the private sector on these fronts enhances the project's overall impact and fosters a stronger sense of ownership within the community.

Additionally, this project includes private sector partners (Habitat for Humanity, Biltmore Iron & Metal, the Biltmore Company, Asaka Japanese restaurant, McDonald's restaurant, and potentially more) who are key to successful implementation. Their buy-in on the merits of the project and willingness to collaborate on a final design and other amenities can help make this a truly great greenway.

FUNDING RESOURCES

The following provides possible funding sources to advance the design and development of this project. For additional funding sources, see the Appendix.

Recreation Trails Program (RTP)

In North Carolina, the Division of Parks and Recreation, part of the North Carolina Department of Natural and Cultural Resources, administers the Recreation Trails Program under the approval of the Federal Highway Administration. The goal of the program is to help states provide and maintain recreational trails for both motorized and non-motorized recreational trail use. A 25% local match is required for funding, and funding is provided on a reimbursement basis. The minimum grant amount for on-the-ground trail projects is $10,000 with a maximum of $100,000. This would be a good source for both the trail development portion and stream bank stabilization. More **HERE**.

Streamflow Rehabilitation Assistance Program

The Streamflow Rehabilitation Assistance Program (StRAP) provides funds to organizations working on projects that help reduce flooding, restore streams, and protect the integrity of drainage infrastructure across North Carolina's waterways. More **HERE**.

Water Resources Development Grant Program

The purpose of this program is to provide cost-share grants and technical assistance to local governments throughout the state. Applications for grants are accepted for seven eligible project types, which include: water management, stream restoration, Natural Resources Conservation Service Environmental Quality Incentives Program (EQIP) stream restoration projects and feasibility/engineering studies. More **HERE**.

NC Parks & Recreation Trust Fund (PARTF)

Since 1994, the North Carolina Parks and Recreation Trust Fund (PARTF) has been granting matching funds to local governments for the enhancement of parks, public beach access, and upgrades within state parks. This statewide initiative aids local governments in achieving their objectives related to parks and public access, ultimately enhancing the overall quality of life in their respective communities. PARTF offers matching grants on a dollar-for-dollar basis to local governments for the acquisition and/or development of park and recreational projects aimed at serving the broader public. Each application from a local government can seek a maximum of $500,000 in funding. More **HERE**.

NCDOT STIP (State Transportation Improvement Program)

The current STIP identifies transportation projects that will receive funding from 2024-2033, including U-4739 (Amboy/ Meadow Road improvements). The final design of that STIP project may include key elements that align with the goals of this study. The current round of Strategic Transportation Prioritization, referred to as "P7.0", is underway to update the 2026-2035 STIP. This project could be submitted to P7.0 as a standalone greenway project; however, the City would need to supply the 20% match. More **HERE.**

The Community Foundation of WNC

The Community Foundation makes grants and works with fundholders to support promising projects across Western North Carolina. They provide grants to 501(c)3 organizations that may be willing partners to support bicycle, pedestrian, and greenway projects. More **HERE**.

MAINTENANCE CONSIDERATIONS

Proper maintenance is critical to ensure that the infrastructure we build can be safely accessed well into the future. Shared use paths should be kept clear of debris and damage so that their surfaces are traversable and curb ramps should be ADA accessible. As much of the study area is in a floodway, it is important to install stormwater mitigation elements and make sure to address maintenance issues after heavy rains and flooding. Maintenance not only extends the life of a project, but it also reduces long-term facility costs. The following includes maintenance considerations for the long-term viability of this pedestrian connector project:

- Acquire the final ADA inspection checklist from the contractor prior to project acceptance.
- Establish a maintenance plan and funding resources for repairs to sidewalks, paths, and curb ramps. More details on development of a maintenance plan are provided in the FHWA 2013 publication, *A Guide for Maintaining Pedestrian Facilities for Enhanced Safety.*

ACTION PLAN

In order for the Feasibility Study to yield meaningful results, a well-defined action plan is imperative, outlining the subsequent steps necessary to realize its vision.

Table 7 - Action Plan delineates a timeline for implementation, designates a lead agency, identifies key partners, and establishes performance measures to assess success. This structured approach enables the City to navigate strategically while remaining adaptable to emerging opportunities.

Table 7. Action Plan

TASK #	DESCRIPTION	LEAD	PARTNER	TIME FRAME	HOW WILL SUCCESS BE MEASURED
1	Adopt this plan, which allows the study to become the official planning document for the Swannanoa River Greenway extension and shows intention to support implementation over time.	City Council	City Staff, NCDOT IMD and Division 13, FBRMPO	Fall/Winter 2024	Adopted plan.
2	Ensure that the preferred route alternatives from this study are incorporated into regional plans.	NCDOT, FBRMPO	City Staff, City Council, NCDOT IMD and Division 13	Winter 2024	Amendments to Plan documents.
3	Consider the creation of an annual work plan to guide the development of this study. The work plan may include key milestones, timelines, and roles.	City Staff	City Staff, FBRMPO, NCDOT Division 13	Ongoing	Annual work plan document.
4	Coordinate with NCDOT Division 13 on the U-4739 STIP project to understand design and timeline.	NCDOT Division 13, City Staff	FBRMPO, City Staff	Ongoing	Coordination notes/meeting minutes.
5	Coordinate with key project partners to evaluate and advance phasing options based on the scenarios presented in this chapter.	City Staff	NCDOT Division 13, FBRMPO	Ongoing, Winter 2025	Coordination notes/meeting minutes.
6	Develop a landowner outreach plan to coordinate with property owners along the project corridor. Formulate strategies to acquire easements from willing participants.	City Staff	City Council	Spring 2025	Landowner outreach approach.
7	Continue to work with key stakeholders (e.g., Norfolk Southern, Biltmore Company) to pursue route alternatives that are amenable to all parties.	City Staff	NCDOT Division 13	Ongoing	Coordination notes/meeting minutes.
8	Seek future funding opportunities for facility construction.	City Staff, FBRMPO	NCDOT Division 13 and IMD	Summer 2025	Funding sources identified.
9	Develop a maintenance plan for the project.	City Staff	NCDOT Division 13	Summer 2026	Maintenance plan document.

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Swannanoa River Greenway Extension

Feasibility Study

FRENCH BROAD RIVER
METROPOLITAN PLANNING ORGANIZATION

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APPENDIX A

Funding Sources



OVERVIEW

This resource outlines major funding sources available for walking and bicycling infrastructure in North Carolina, covering both state and federal levels. It serves as a guide to support projects through various stages, including planning, design, construction, and maintenance. Each funding source has specific eligibility criteria regarding applicants, project types, and costs, which are not detailed here. Please note that funding requirements, eligibility criteria, amounts, and program details may change, so the information provided is accurate as of the publication date of this feasibility study.

STATE SOURCES

North Carolina offers a range of funding sources for bicycle and pedestrian projects. These funds can be utilized as matching sources or to fully finance standalone projects. Many of these state-level funds are derived from federal government allocations.

NCDOT Statewide Project Funds

NCDOT has division-led funding opportunities that are sourced from statewide funds. Division 13 can provide more information about these opportunities, which may include:

Small Construction Funds

Established to fund small projects in and around cities and towns which could not be funded in the STIP Provisions currently allow for use on a variety of transportation projects for municipalities, counties, schools throughout the state.

- Funds allocated equally to each Division.
- $250,000 maximum amount per project per Fiscal Year, unless otherwise approved by the Secretary of Transportation.
- Right-of-way should be provided at no cost to NCDOT.
- Utility relocations should be accomplished at no cost to NCDOT.
- Requests received from municipalities, counties, businesses, schools, and industrial entities, and NCDOT staff.
- Request should be submitted to the Division Engineer providing technical information such as location, improvements being requested, timing, etc. for thorough review.

Statewide Contingency Funds

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 fund administered by the Secretary of Transportation.
- Requests received 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

Created to expedite transportation projects that promote commercial growth as well as either job creation or job retention.

- Established to expedite transportation projects that promote commercial growth as well as either job creation or job retention.
- $2,500 per job (new & retained) allowed unless waived by the Secretary of Transportation.
- $400,000 maximum amount per project, unless otherwise approved by the Secretary of Transportation.

High Impact/Low-Cost Funds

Established to provide funds to complete low-cost projects with high impacts to the transportation system including intersection improvements, minor widening projects and operational improvements.

- Funds allocated equally to each Division.
- Each Division is responsible for selecting their own scoring criteria for determining projects funded in this program.
- $1.5M maximum per project unless otherwise approved by the Secretary of Transportation.
- Projects are expected to be under contract within 12 months of funding approval from the Board of Transportation.

NCDOT Strategic Transportation Investment (STI)

Funds: Infrastructure projects.

The NCDOT Strategic Transportation Investment (STI) law, enacted in 2013, establishes a framework for prioritizing transportation projects across North Carolina. Under this law, available revenues are allocated through a data-driven scoring system that incorporates local input, assessing existing and future conditions, anticipated project benefits, multi-modal characteristics, and alignment with local priorities. This prioritization process, known as Strategic Transportation Prioritization (SPOT), culminates in the Draft State Transportation Improvement Program (STIP).

The SPOT process scores roadway, public transportation, bicycle, pedestrian, rail, and aviation projects based on various criteria, categorizing them into three funding categories: Statewide Mobility, Regional Impact, and Division Needs. Local priorities are further incorporated through points assigned by Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs), and NCDOT Divisions.

The current STIP outlines projects set for funding from 2024 to 2033, while the ongoing "P7.0" prioritization round is updating the STIP for 2026-2035.

Federal funding requires a 20% local match, and North Carolina law prohibits state matching funds for standalone bicycle and pedestrian projects. Therefore, the City of Asheville must secure this 20% match from alternative sources for any bike and pedestrian projects it pursues.

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

NCDOT Spot Safety Program

Funds: Among other activities, improvements for pedestrian including signals, crosswalks, and curb ramps.

The Spot Safety Program, managed by the NCDOT, funds smaller improvement projects that address safety and operational issues. While the program primarily uses state funds, bike and pedestrian projects are supported through Federal Transportation Alternatives Program funds. Additional funding sources, such as Small Construction or Contingency funds, may also contribute, but the maximum Spot Safety fund allocation per project is capped at $400,000. A Safety Oversight Committee (SOC) reviews and recommends projects for approval and funding by the Board of Transportation (BOT). The SOC considers various criteria, including the frequency and severity of correctable crashes, congestion, signal warrant fulfillment, impacts on pedestrians and schools, as well as regional priorities and public interest. For updates on the program, NCDOT Division 14 office staff can be consulted.

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

NCDOT Highway Hazard Elimination Program

Funds: Larger projects that address safety and potential safety issues.

The Hazard Elimination Program aims to develop larger improvement projects that address safety and potential safety concerns. It is funded with 90% federal funds and 10% state funds, with project costs typically ranging from $400,000 to $1 million. Similar to the Spot Safety Program, the Safety Oversight Committee (SOC) reviews and recommends Hazard Elimination projects for approval and funding by the state Board of Transportation (BOT). Funding is prioritized based on a safety benefit-to-cost (B/C) ratio, where the safety benefit is determined by the expected reduction in crashes. Once approved and funded by the BOT, these projects are incorporated into the department's State Transportation Improvement Program (STIP).

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

NC Land and Water Fund (NCLWF)

Funds: Among other activities, planning grants for greenways.

The North Carolina Land and Water Fund (NCLWF) is a non-regulatory organization dedicated to protecting and restoring the state's land and water resources. It provides annual grants to non-profit and governmental entities for various purposes, including land acquisition, stream restoration, innovative stormwater management, and planning mini-grants for donated properties. Bike and pedestrian projects are eligible for funding under their planning grants, which support initiatives that:

- Enhance or restore degraded waters.
- Protect unpolluted waters.
- Contribute to a network of riparian buffers and greenways for environmental, educational, and recreational benefits.
- Provide buffers around military bases.
- Acquire land that showcases the state's ecological diversity or supports a balanced program of historic properties.
- Facilitate improvements in stormwater treatment.

https://nclwf.nc.gov/

NC Parks and Recreation Trust Fund (PARTF)

Funds: Construction and renovation of facilities in parks and to purchase land for new and existing parks.

Managed by North Carolina State Parks, the Parks and Recreation Trust Fund (PARTF) offers dollar-for-dollar matching grants to local governments for public parks and recreational projects. It serves as the primary funding source for building and renovating facilities in state parks and acquiring land for new or existing parks. Eligible applicants include North Carolina counties, incorporated municipalities, and public authorities defined by N.C. General Statute 159-7, provided they are authorized to acquire land or develop recreational facilities. The maximum grant request is $500,000, and funding recipients are selected by the Parks and Recreation Authority, a nine-member board appointed by the Governor and General Assembly.

https://www.ncparks.gov/more-about-us/parks-recreation-trust-fund/parks-and-recreation-trust-fund https://rrs.cnr.ncsu.edu/partf/

FEDERAL SOURCES

In November 2021, Congress enacted the $1.2 trillion Infrastructure Investment and Jobs Act (IIJA), which establishes federal transportation policy and funding through 2026, replacing the FAST Act. The subsequent section outlines funding opportunities for pedestrian and bicycle projects, highlighting existing programs that now have new eligibility criteria and increased funding amounts, as well as newly introduced programs under the IIJA. New programs will be clearly indicated in the following sections.The DOT Discretionary Grants Dashboard can also be used to navigate USDOT sourced grants: https://www.transportation.gov/grants/dashboard

Land and Water Conservation Fund (LWCF)

Funds: Construction and renovation of facilities in parks and to purchase land for new and existing parks.

Managed by North Carolina State Parks, the Parks and Recreation Trust Fund (PARTF) offers dollar-for-dollar matching grants to local governments for parks and recreational projects that benefit the public. PARTF is the primary funding source for building and renovating facilities in state parks and for acquiring land for new and existing parks. Eligible applicants include North Carolina counties, incorporated municipalities, and public authorities authorized to develop recreational facilities. The maximum grant request is $500,000, with funding decisions made by the Parks and Recreation Authority, a nine-member board appointed by the Governor and General Assembly.

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

https://www.lwcfcoalition.com/

Transportation Alternatives Program (TAP)

Funds: Pedestrian and bicycle facilities, streetscaping projects.

The Transportation Alternatives Program (TAP) funds federally-supported community-based projects on a reimbursement basis. With a 60% funding increase under the IIJA, TAP has become the primary source of federal funding for bicycling and walking initiatives, representing about half of such federal funding. Recent changes under the IIJA also mean that TAP funding will grow in proportion to overall surface transportation spending rather than remaining a fixed amount.

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

Active Transportation Infrastructure Investment Program (ATIIP)

Funds: Active transportation networks (within communities) and spine (between communities) projects.

The Active Transportation Infrastructure Investment Program (ATIIP) is a discretionary program designed to fund the development of active transportation networks and spines.

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/atiip/

Healthy Streets Program

Funds: Streetscape improvements to reduce the urban heat island effect.

This discretionary grant program, authorized in the Infrastructure Investment and Jobs Act, offers funding to eligible entities for the deployment of cool pavements, porous pavements, and the expansion of tree cover. The program aims to mitigate urban heat islands, enhance air quality, and reduce impervious surfaces, stormwater runoff, and flood risks. Additionally, it seeks to lessen the heat impacts on infrastructure and road users.

Safe Streets and Roads for All

Funds: Funds Safety Action Plans and implementation projects.

The Safe Streets and Roads for All (SS4A) discretionary program will allocate $5-6 billion in grants over the next five years to support regional, local, and Tribal initiatives aimed at preventing roadway deaths and serious injuries. Aligned with Secretary of Transportation Pete Buttigieg's National Roadway Safety Strategy, this program targets a goal of zero fatalities on our nation's roadways. Funding can be utilized for:

- Developing or updating a Comprehensive Safety Action Plan
- Conducting planning, design, and development activities related to the Action Plan.
- Implementing projects and strategies identified in the Action Plan.

Eligible applicants include:

- Metropolitan planning organizations.
- Counties, cities, towns, and other special districts that are subdivisions of a State, along with transit agencies.
- Federally recognized Tribal governments.
- Multijurisdictional groups composed of these entities.

The French Broad River MPO is currently undertaking a SS4A safety plan called Safe Streets for WNC. The City of Asheville is within the project study area, making the City now eligible for implementation project grants.

https://www.transportation.gov/grants/SS4A

Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT)

Funds: Extreme weather resilience and emergency response infrastructure.

Ensure evacuation and recovery mobility for all road users by integrating biking, walking, and rolling infrastructure into resiliency plans and evacuation routes. The PROTECT discretionary program offers two types of awards: planning grants and Competitive Resilience Improvement Grants.

https://www.transportation.gov/rural/grant-toolkit/promoting-resilient-operations-transformative-efficient-and-cost-saving

Rebuilding American Infrastructure with Sustainability and Equity (RAISE)

Funds: Projects to build or repair transportation systems.

This grant opportunity supports road, rail, transit, and port projects that align with national objectives. Formerly known as BUILD or TIGER Discretionary Grants, Congress has allocated nearly $9.9 billion to fund 700 projects with significant local or regional impact.

https://www.transportation.gov/rural/grant-toolkit/rebuilding-american-infrastructure-sustainability-and-equity-raise

Recreation Trails Program (RTP)

Funds: Recreational trails and trailhead facilities that are open to the public.

In North Carolina, the Division of Parks and Recreation, part of the Department of Natural and Cultural Resources, administers the Recreation Trails Program (RTP) with approval from the Federal Highway Administration. This program aims to support the development and maintenance of recreational trails for both motorized and nonmotorized use. A 25% local match is required, and funding is provided on a reimbursement basis. The minimum grant for on-the-ground trail projects is $10,000, while the maximum is $100,000. RTP funding is allocated through the Transportation Alternatives Program (TAP).

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

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

Highway Safety Improvement Program (HSIP)

Funds: Safety projects for bike and pedestrian infrastructure, educational programs, and evaluation programs.

The Highway Safety Improvement Program (HSIP) is a key Federal-aid initiative aimed at significantly reducing traffic fatalities and serious injuries on all public roads, including non-State-owned and tribal roads. The IIJA introduced major updates to the HSIP, along with a 24% funding increase. The revised HSIP is built on four pillars: Vulnerable Road User (VRU) Safety Assessment, Safe Systems Approach, VRU Special Rule, and FHWA Research.

https://highways.dot.gov/safety/hsip

Safe Routes to School (SRTS)

Funds: Active transportation and complete streets projects, plus education or enforcement activities that allow students to walk, bike, and roll to school safely.

The BIL formalizes the Safe Routes to School (SRTS) initiative within existing law, **increasing funding by 60%** and extending programming to high schools. Additional updates under the IIJA designate SRTS infrastructure as an eligible use of Highway Safety Improvement Program (HSIP) funds, allowing for staffing of local coordinators. However, SRTS continues to operate under the Transportation Alternatives Program and is not a standalone initiative.

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

Thriving Communities Program

Funds: Technical assistance, planning, or capacity building services to help disadvantaged communities.

The Thriving Communities Program (TCP) is designed to empower disadvantaged communities that have been negatively impacted by environmental, climate, and health policies. By equipping these communities with essential technical tools and enhancing their organizational capacity, the program aims to help them effectively compete for federal funding and successfully implement quality infrastructure projects that foster community well-being. Over a two-year period, TCP will offer in-depth support, followed by three years of facilitated peer learning for selected communities. This initiative will assist them in planning and developing a robust pipeline of transportation, housing, and community revitalization projects.

https://www.transportation.gov/rural/grant-toolkit/thriving-communities-program

LOCAL, PRIVATE, AND NON-PROFIT FUNDING SOURCES

Buncombe County Tourism Development Authority (TDA) Tourism Product Development Fund

Funds: Community projects like parks, theaters, greenways, and bicycle/pedestrian infrastructure projects (capital projects, not feasibility or design work).

The Buncombe County Tourism Development Authority (BCTDA) has made a significant impact on the community through the Tourism Product Development Fund (TPDF), investing over $86 million in 64 projects since 2001. These investments have revitalized various aspects of the region, enhancing both infrastructure and cultural attractions.

The funded projects encompass a wide range of initiatives aimed at improving community livability and promoting tourism. In the River Arts District, enhancements include greenways, sidewalks, public art installations, bike lanes, and landscaping, all designed to create a vibrant atmosphere that attracts visitors and residents alike. Family-oriented attractions like the WNC Nature Center and Pack Square Park have been supported to ensure that Asheville remains a family-friendly destination.

https://www.ashevillecvb.com/product-development/

Conserving Carolina

Funds: Programs to connect people and nature.

Conserving Carolina prioritizes connecting people with nature, particularly through trails and recreation. They have opened over 23,000 acres for public enjoyment, including notable areas like Chimney Rock State Park, DuPont State Recreational Forest, and Headwaters State Forest. There local initiatives include the Ecusta Trail and Saluda Grade Trail (in nearby Henderson County and Transylvania County), as well as hiking trails throughout Buncombe County.

https://conservingcarolina.org/

Robert Wood Johnson Foundation (RWJF) Grants and Grant Programs

Funds: Among other activities, planning and demonstration projects, community engagement, and public education.

The RWJF grant programs have three main objectives: to explore transformative ideas, to disseminate impactful model interventions, and to conduct research and evaluations. They fund a variety of projects, including:

- Planning and demonstration initiatives
- Research and evaluations
- Policy and statistical analysis
- Learning networks and communities
- Public education and strategic communications
- Community engagement and coalition-building
- Training/fellowship programs and technical assistance

The foundation typically issues a competitive call for proposals that outlines specific challenges, desired outcomes, and eligibility criteria. Additionally, they provide funding through open calls for ideas, various challenges and prize competitions, and direct project solicitations.

https://www.rwjf.org/en/grants.html

The Community Foundation of WNC

Funds: Various activities in the 18 counties of Western NC.

The Community Foundation provides grants and collaborates with fundholders to support innovative projects throughout Western North Carolina. They specifically offer grants to 501(c)(3) organizations that can partner on bicycle, pedestrian, and greenway initiatives.

https://cfwnc.org/

Blue Cross Blue Shield of North Carolina Foundation Grants

Funds: Programs related to health.

The BCBSNC Foundation supports organizations dedicated to enhancing the health and well-being of North Carolinians across the state. Their grants aim to foster long-term impact by investing in organizations, collaborations, and communities. Rather than following a traditional grant cycle, they periodically announce funding opportunities. Grants range from small, one-time awards to larger, multi-year partnerships. The foundation focuses on initiatives aligned with its core values, such as transforming the healthcare system (including oral health), expanding access to healthy food, supporting children's healthy development, improving living environments, and empowering communities to improve their health.

http://www.bcbsncfoundation.org/

Duke Energy Foundation

Funds: Programs and projects supporting conservation and access.

The Duke Energy Foundation focuses on strategic investments to create thriving communities where nature and wildlife flourish, students succeed, and a skilled workforce promotes economic prosperity. They fund projects in key areas, including those that support conservation efforts and improve access to natural resources.

https://www.duke-energy.com/community/duke-energy-foundation

America Walks Community Change Grants

Funds: Programs and projects supporting physical activity and active communities.

This grant program supports advocates, organizations, and agencies implementing innovative and inclusive community-level projects. It offers $1,500 community stipends for initiatives that promote healthy, active, and engaged environments. Funded projects should aim to:

- Increase physical activity and active transportation.
- Engage new participants and organizations in walkability efforts.
- Foster a culture of inclusive health.
- Build and sustain healthy, active, and connected communities.

https://americawalks.org/community-change-grants/

National Safety Council Community Traffic Safety Grants

Funds: Projects supporting programs, research, and infrastructure to achieve vision zero goals.

The Road to Zero Community Traffic Safety Grant Program aims to support innovative and effective strategies for implementing evidence-based safety measures. It promotes the Safe System approach and funds research to reduce traffic fatalities, address disparities in mobility and safety, and improve overall traffic safety.

https://www.nsc.org/road-safety/get-involved/road-to-zero/grants

Dogwood Health Trust Immediate Opportunities and Needs Grant

Funds: One-time immediate pressing needs or opportunities for non-profit organizations and tribal governments.

Grants ranging from $500 to $25,000 are available to address one-time, urgent needs or new opportunities. These Immediate Opportunities and Needs grants do not cover ongoing programs or general operating expenses. Organizations can submit one application per funding cycle, and if awarded, they are ineligible to apply again in the following round.

https://dogwoodhealthtrust.org

AARP Community Challenge

Funds: "Quick-action" projects that can help communities become more livable for people of all ages.

The AARP Community Challenge offers small grants for "quick-action" projects aimed at making communities more livable for people of all ages. Grants are available for initiatives that enhance housing, transportation, public spaces, technology (including "smart cities"), civic engagement, and other areas. These funds can be used for projects that result in:

- Permanent physical improvements within the community.
- Temporary demonstrations that inspire long-term change.

https://www.aarp.org/communitychallenge



APPENDIX B

Design Resources



DESIGN GUIDELINE RESOURCES

Planners, engineers, and project designers need clear standards to create safe, consistent, and predictable pedestrian and bicycle facilities. In the past, multimodal design resources were limited and lacked detailed guidance for certain conditions. However, significant advancements in the past 15 years now offer innovative tools and successful case studies from local and international projects. These improvements have led to more inclusive designs for users of all ages, adaptable to both urban and rural settings. Key factors such as connectivity, comfort, continuity, and convenience are essential in developing effective pedestrian and bicycle facilities.

To assist in this, state and national design guidelines have been compiled for Asheville to build a multimodal transportation system that encourages shifts in transportation modes. As this field evolves, it's important to stay updated with new resources and ensure that designs are tailored to specific contexts, with sound engineering judgment and thorough documentation throughout the process.

Table 1. Design Resources

North Carolina Department of Transportation	
Roadway Design Manual	2021
Complete Streets Policy A.09.0106	2019 (2022 methodology update)
Evaluating Temporary Accommodations for Pedestrians	2018
Pedestrian Crossing Guidelines	2018
Greenway Accommodations Guidelines	2015
WalkBike NC: The Statewide Pedestrian and Bicycle Plan	2013
Manual on Uniform Traffic Control Devices (MUTCD)	
MUTCD 11th Edition Guidance and Supplemental Information (including NC Supplement)	2024
American Association of State Highway and Transportation Officials (AASHTO)	
Guide for the Development of Bicycle Facilities	2012
Guide for the Planning, Design and Operation of Pedestrian Facilities	2004

Table 1. Design Resources (Cont'd)

Federal Highway Administration (FHWA)	
Strategies for Accelerating Multimodal Project Delivery	2019
Bikeway Selection Guide	2019
Guide for Improving Pedestrian Safety at Uncontrolled Crossing Intersections	2018
Small Town and Rural Multimodal Networks Design Guide	2016
Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts	2016
Guidebook for Developing Pedestrian and Bicycle Performance Measures	2016
Separated Bike Lane and Planning Design Guide	2015
US Access Board	
Proposed Public Rights-of-Way Accessibility Guidelines (PROWAG)	2011
Guide to the Standards	2010
USDOT/Department of Justice	
USDOT ADA Standards for Transportation Facilities	2006
DOT/DOJ Joint Technical Assistance Memos	Varies
ADA Standards for Accessible Design	2010
National Association of City Transportation Officials (NACTO)	
Transit Street Design Guide	2016
Urban Street Design Guide	2013
Urban Bikeway Design Guide	2013
Norfolk Southern Railway Company	
Public Improvement Projects Manual (for Projects Which May Impact Norfolk Southern Railway Company)	2022



APPENDIX C

Plan Document Review



OVERVIEW & TAKEAWAYS

Asheville, along with the County and its regional partners, has a well-established history of multimodal planning, reflected in the numerous plan documents that address multimodal issues within the city. These documents, detailed below, provide the foundation for developing the Swannanoa River Greenway Extension. Common themes across these plans include linking parks, neighborhoods, and key destinations, expanding the current greenway network, and creating connections to a broader regional system of greenways.

NCDOT Roadway Design Manual (2023)

The Roadway Design Manual provides general design information and criteria for NCDOT roadways, with the latest updates introduced in November 2023. These updates include significant enhancements to multimodal design guidance, which will be essential for the City of Asheville. Key guidance on multimodal design elements can be found in sections 4.14 (Pedestrian Facilities) and 4.15 (Bicycle Facilities).

More here: https://connect.ncdot.gov/projects/Roadway/Pages/RDM.aspx

FBRMPO 2024-2033 Transportation Improvement Plan (2024)

The Transportation Improvement Program (TIP) is a ten-year work plan that outlines all regionally significant transportation projects within the FBRMPO planning area. It covers projects across various modes of transportation, including roads, public transit, rail, aviation, as well as bicycle and pedestrian infrastructure. The TIP includes a variety of greenway projects in and near the City of Asheville, including the following multimodal projects:

- **EB-5823: Hominy Creek Greenway Extension.** Construct a multi-use path from Hominy Creek River Park to the Western NC Farmer's Market, along Hominy Creek and Brevard Road, tying into the existing Hominy Creek Greenway and French Broad River Greenway. Engineering is slated for 2029.
- **EB-5824: Enka Heritage Trail.** This project involves the construction of a greenway along Hominy Creek from Sand Hill Road to the A-B Tech Enka campus. Construction in 2026.
- **U-5019A: Nasty Branch Greenway.** This is a key greenway connection in the Southside neighborhood, which will link the River Arts District to the South Slope. Construction will be underway in 2025/2026.
- **EB-5831: Coxe Avenue Bicycle & Pedestrian Improvements.** This is a complete overhaul of Coxe Avenue from Patton Avenue to Short Coxe Avenue, widening the sidewalks and adding an uphill bicycle lane. Construction is anticipated to begin in 2025.
- **U-5019E: Craven Bridge Improvements.** This involves updating the Craven Street bridge with wider sidewalks, to help create a better riverway multi-modal network. Construction in 2027.
- **EB-5944: Johnston Boulevard Sidewalks.** Sidewalk from Patton Avenue to Iona Circle. 2024.
- **U-5019D: Livingston Street Complete Streets Improvements**. Slated for 2026.
- **EB-5965: Deaverview Road Sidewalks.** Installation of sidewalk from Patton Avenue to Westmore Drive. On track for 2027 construction.
- **EB-5822: Wilma Dykeman Greenway Extension.** This is a riverside greenway that will extend the existing French Broad River Greenway farther north to Pearson Bridge Road. Construction is expected in 2026.

More here: https://frenchbroadrivermpo.org/tip/

Close the GAP: City of Asheville Greenways, ADA, and Pedestrian Plan (2022)

This plan serves as a comprehensive update to the City's Greenway Master Plan (G), ADA Transition Plan (A), and Pedestrian Master Plan (P), combining all three elements into one cohesive document. By integrating these plans, Asheville

ensures that its pedestrian network is stronger and more effective, as greenways, ADA accessibility, and pedestrian infrastructure are considered and planned in unison. The GAP Plan not only identifies key greenway corridors, accessibility improvements, and pedestrian routes but also outlines programs and policies that support the growth and development of these networks. This unified approach allows for better coordination in creating a pedestrian-friendly environment, where greenways seamlessly connect with accessible routes and broader pedestrian infrastructure, promoting inclusivity and enhanced mobility for all residents. By aligning these three aspects, the city can strategically prioritize investments and improvements that foster a more connected, accessible, and vibrant community).

This plan identifies the Swannanoa River Greenway as one of the top ten greenway "spines," the primary "highways" of the city's pedestrian and bicycle network. These routes provide the highest level of service, feature the fastest design speeds, and receive the most investment due to their central role in the system. Their prominence is reflected in their wider paths, extensive amenities, and strong "name recognition" within the community. The GAP Plan also shows streets in Biltmore Village that represent accessibility needs as part of the ADA Transition Plan.

The City has initiated the implementation of its recently adopted GAP Plan, focusing on several key steps. This phase includes coordinating with various City departments to identify which action items from Chapter 10 can be tackled in the near term. Additionally, the City will develop an annual report to update City staff and City Council on progress made in the ADA Transition Plan over the past fiscal year. The ADA & Pedestrian Prioritization Lists will also be utilized to guide staff in planning future projects and determining budget priorities.

More here: https://www.ashevillenc.gov/projects/close-the-gap-planning-process/

North Carolina Great Trails State Plan (2022)

The Great Trails State Plan builds on existing plans and introduces new recommendations to create a statewide network of shared-use paths and trails, connecting every county in North Carolina. The focus is on linking population centers with North Carolina State Parks. The key result of this planning effort is a comprehensive statewide trail map, supported by an action-oriented network plan and a 5-year implementation strategy.

The Swannanoa River Greenway is a primary link in the vision for a cross-state trail network.

More here: https://www.ncdot.gov/divisions/integrated-mobility/multimodal-planning/great-trails-state/Pages/default.aspx

Biltmore Avenue & McDowell Street Corridor Study (2021)

Biltmore Avenue and McDowell Street connect downtown Asheville and Biltmore Village, two highly walkable areas with diverse destinations. The Asheville in Motion Mobility Plan (2016) highlighted the need for improved bicycle and pedestrian facilities along Biltmore Avenue. The ongoing Biltmore Avenue and McDowell Corridor Study aims to explore ways to enhance multi-modal transportation on these corridors while maintaining vehicle mobility and access to key destinations like Mission Hospital and Asheville-Buncombe Tech.

The study's draft recommendations focus on three themes:

- **Connect the Neighborhoods:** Prioritize pedestrian connectivity and safety, including sidewalk gap closures and improved crossings.
- **Bike the Biltmore:** Add high-quality bicycle facilities along Biltmore and McDowell using travel lane reallocations and sidepaths.
- **Keep Biltmore Moving:** Ensure smooth traffic flow with targeted intersection improvements and minor roadway widening.

Three alternatives are proposed for rebalancing travel lanes and improving bike/pedestrian access:

- **Alternative A:** Focus on rebalancing Biltmore Avenue, with improvements to Asheland Avenue and Biltmore Village.
- **Alternative B:** Rebalance McDowell Street, with enhancements to Biltmore Avenue and Biltmore Village.
- **Alternative C:** Combine rebalancing both corridors, but this would be the most challenging option with significant intersection and ROW impacts.

The study's recommendations will guide future projects, though none will be implemented immediately without further study and design. Aligning this vision with the final design for the Swannanoa River Greenway will make sure that both projects support the overarching need for multimodal accessibility.

More here: https://storymaps.arcgis.com/stories/feb7dcd894e646759aac95b69a722dcd

FBRMPO Metropolitan Transportation Plan (2020)

The Metropolitan Transportation Plan (MTP), formerly known as the Long-Range Transportation Plan (LRTP), is a fiscally-constrained document that outlines planned transportation investments for the next twenty-five years. It forecasts regional changes and identifies necessary improvements to ensure the smooth movement of travelers and goods, along with funding strategies for these enhancements. The plan is multi-modal, encompassing investments in roadways, public transportation, bicycle and pedestrian facilities, rail, and aviation projects.

The current MTP 2045 was adopted by the MPO on September 24, 2020. The complete plan, along with maps and the executive summary, can be accessed below. The previous MTP is available on the Regionwide plans page.

The MTP includes project **HD134505**, which is the $50 million modernization project (U-4739 in the STIP) along Amboy/Meadow Road. This project recommends sidewalks, bike lanes, and/or a multiuse path from the I-240 off-ramp to Biltmore Avenue. Also included is project HD134502, which is the $10 million roadway widening project (U-5832 in the STIP) along Swannanoa River Road from Biltmore Avenue to Tunnel Road.

More here: https://frenchbroadrivermpo.org/mtp/

FBRMPO The Hellbender Regional Trail Plan (2020)

The Hellbender Regional Trail Plan (2020) envisions a regional trail network that brings together existing and planned infrastructure across Buncombe, Henderson, Haywood, Madison, and Transylvania counties. The goal is to elevate local projects to a regional scale, creating a connected bicycle and pedestrian network that unites Western North Carolina's communities. As described in the plan, "the goal of this approach is to form a regional bicycle and pedestrian network that is more than the sum of its parts, connects the communities of Western North Carolina, and enables a safe way for residents and visitors to explore our region on foot or bike."

The Hellbender concept routes through Asheville along both the French Broad River and Swannanoa River corridors. The Swannanoa River Greenway is an integral part of the east arm of the Hellbender Regional Trail vision, representing a portion of the west-east Green Line connecting Waynesville to Black Mountain. This segment also helps link the Green Line to the north-south Orange Line.

Key next steps in implementing the plan include developing partnerships and securing funding to bring the vision to reality.

More here: https://storymaps.arcgis.com/stories/2516fc1870db47cb8e3c7aa36dbed751

Swannanoa Greenway Phase 1 Schematic Design & Swannanoa River Greenway Corridor Study (2019)

Swannanoa River Greenway Feasibility Study (Phase 1) was a feasibility study and greenway corridor design on the eastern end of the greenway starting at the intersection of Thompson Street and Glendale Avenue and ending at the City of Asheville's

park complex with the Nature Center, Recreation Park and JB Lewis Soccer Fields. This study included the design for the first segment of the greenway from Thompson Street to Bleachery Boulevard.

Swannanoa River Greenway Corridor Study (Phase 2) was a planning-level study funded through the North Carolina Department of Transportation's (NCDOT) Bike and Pedestrian Mini-Grant Program for the section of the greenway that starts at Biltmore Avenue and ends at the intersection of Thompson Street at Glendale Avenue. This study did not include engineering and design in the scope of work.

These studies help provide background information for furthering the Swannanoa River Greenway project. They focus on the portion of the project east of Biltmore Avenue, which is the terminus of this feasibility study's trail alignment.

More here: https://www.ashevillenc.gov/projects/swannanoa-river-greenway-corridor/

NCDOT Complete Streets Policy (2019)

NCDOT adopted its Complete Streets policy in 2009 and updated it in 2019, requiring transportation engineers and planners to integrate multimodal facilities into the design and improvement of transportation projects across North Carolina. In 2022, further updates provided additional guidance and a refined methodology for evaluating Complete Streets projects.

The policy sets out procedures for developing multimodal transportation networks, ensuring all users are considered at every stage—planning, design, construction, funding, and maintenance—while avoiding barriers or safety hazards. Multimodal considerations are required from the start of the planning process, with decisions thoroughly documented. The 2022 update introduced a Project Evaluation Methodology, offering clearer guidance on facility selection and balancing competing needs within public rights-of-way.

Under this policy, projects advance through Strategic Prioritization and the local Comprehensive Transportation Plan (CTP). For cities like Asheville, the updated policy is particularly important because it reduces or eliminates cost-sharing requirements, a common barrier to implementing multimodal projects. With the Above the Mud project already included in both City and NCDOT plans, it now qualifies for full NCDOT funding.

More here: https://connect.ncdot.gov/projects/BikePed/Pages/Complete-Streets.aspx

City of Asheville Transit Master Plan (2018)

The 2018 Transit Master Plan aims to create a shared mobility vision and a program of investments that enjoys community consensus, enhancing the effectiveness and efficiency of ART public transportation services to meet Asheville's evolving needs and support ongoing growth. Originally developed in 2009 and adopted in 2010, the initial Transit Master Plan has since become outdated due to significant growth in Asheville that has affected transit operations. The updated plan includes short-term recommendations to improve current system issues such as route timing and reliability, as well as long-term strategies for future service expansion.

The Transit Master Plan influences the Swannanoa River Greenway by emphasizing integrated transportation solutions that connect public transit and active transportation. The plan aims to enhance ART services while accommodating Asheville's growth, highlighting the need for multimodal connections, including greenways, to improve accessibility. Incorporating the greenway into the transit network can provide residents with safe routes to transit stops, promoting a seamless transition between travel modes. This alignment enhances the greenway's effectiveness and supports a more cohesive transportation system in Asheville.

More here: https://www.ashevillenc.gov/department/transit/transit-master-plan/#:~:text=The%20goal%20of%20the%202018,and%20support%20our%20continued%20growth.

Asheville in Motion: City of Asheville Mobility Plan (2016)

The Asheville in Motion (AIM) plan aims to create a multimodal transportation strategy by consolidating various plans into a cohesive framework. Previous efforts treated operations, parking, walking, and bicycling as separate entities, focusing on modal rather than integrated strategies. AIM prioritizes transportation investments aligned with desired outcomes, emphasizing planning that considers performance, policy options, and metrics related to quality of life and sustainability.

As a long-term mobility plan, AIM serves as a tool for Asheville to achieve clear, relevant goals that resonate with city leaders and residents. It promotes the idea that community vitality, economic growth, and quality of life are best realized through maximized mobility.

AIM recognizes The Swannanoa River Greenway as a priority greenway investment.

More here: https://drive.google.com/file/d/1iUiMkQ3yh-ujFyGzaPav8DxDrKJ6hIfV/view

FBRMPO Blue Ridge Bike Plan (2013)

The Blue Ridge Bike Plan aims to develop and improve a regional bicycle route system across seven counties in Western North Carolina. A primary goal of the plan is to enhance bicycle mobility and connectivity throughout the region. The plan highlights several Regional Priority Corridors for bicycle improvements, linking various communities and key destinations. While focused on cycling, many of these facilities also serve pedestrians, such as greenways, and certain on-street improvements have been shown to benefit walking conditions as well. In or near the study area, these include:

- **Swannanoa River Road (NC 81):** This is the #1 priority corridor for Buncombe County, with recommendations for bike lanes along with a riverside greenway (as part of the Wilma Dykeman RiverWay) from Biltmore Avenue to Tunnel Road; a 4-mile connection.
- **Meadow Road:** This is the #1 priority corridor for Asheville, envisioning 1.5 miles of bike lanes along Meadow Road from Amboy Road to Biltmore Avenue, in conjunction with a riverside greenway (as part of the Wilma Dykeman RiverWay).
- **Sweeten Creek Road (US 25A):** The #5 priority corridor for Buncombe County, this is a recommendation for bike lanes, greenways or multiuse side paths along Sweeten Creek Road from Lodge Street to Airport Road.

The highest priority recommendation from public input and the steering committee was the following: "Develop, implement and maintain a core network of safe and well-connected bicycle facilities (bike lanes and greenways)."

These connections and project goals are important to consider for the Swannanoa River Greenway project.

More here: https://www.landofsky.org/brbp.html

Buncombe County Greenways & Trails Master Plan (2012)

The Greenways and Trails Master Plan identifies near-ly 102 miles of proposed routes to connect to many of the 13 miles of greenways already in place within town and city limits. This plan identifies the Swannanoa River Greenway as one of Buncombe County's priority greenway corridors, extending all the way to Black Mountain and the Fonta Flora State Trail.

More here: https://www.buncombecounty.org/governing/depts/parks/greenways.aspx

Buncombe County US 70/Swannanoa River Greenway Feasibility Study (2010)

The study area spans from Ridgecrest, east of Black Mountain, through Swannanoa, East Asheville, and ends near the Wilma Dykeman Riverway at the John B. Lewis soccer fields on Azalea Road in Asheville. The trail follows the Swannanoa River and US Highway 70, divided into five sectors:

- Ridgecrest and Black Mountain

- Swannanoa
- Warren Wilson College
- Oteen/East Asheville
- Azalea Road Connection

This corridor was selected for the greenway feasibility study due to ongoing greenway projects in the region. Several local entities, including Black Mountain, Montreat, Old Fort, and Buncombe and McDowell Counties, are participating in regional trail planning. Black Mountain and Swannanoa have also requested sections of the trail in their NCDOT submissions.

The feasibility study is an initial step to assess terrain, ordinances, and other potential obstacles before engaging property owners and the public. The study aims to explore potential greenway alignments, with the goal of creating over 18 miles of trails for non-motorized transportation. Key objectives include mapping the study area, collaborating with stakeholders like NCDOT and Norfolk Southern Railroad to determine rights-of-way, identifying challenges and opportunities within each sector, and providing cost estimates for each section.

More here: https://www.buncombecounty.org/common/parks/documents/greenways-master-plan/feasibility-study-reports/swannanoa.pdf

The Wilma Dykeman Riverway Master Plan (2004)

Asheville City Council in 2004 unanimously approved The Wilma Dykeman RiverWay Master Plan, a detailed master plan for urban areas along the French Broad and Swannanoa rivers. It took Dykeman's words as guidance: "Just as the river belongs to no one, it belongs to everyone – and everyone is held accountable for its health and its condition. Every city and town and every industry is responsible for cleaning up the pollution it creates."

This plan provides a vision for how to link the French Broad River and Swannanoa River into a continuous mult-access parkway, with land uses and development strategies to invigorate the corridor. For the Swannanoa River corridor, the plan states that "extra effort should be taken to preserve the natural beauty of the river valley with native landscaping and riparian buffer plantings while creating a RiverWay with increased capacity," which also applies to the extent of Meadow Road. This plan envisions more public park space around the Biltmore Avenue/Meadow Road/Swannanoa River Road intersection, with a seamless transition between greenway segments.

More here: https://drive.google.com/file/d/1HigLzuIPvNkZUy7lv3-viOb4mAEf7v75/view



APPENDIX D

Detailed Cost Estimates



Table 2. Cost Estimate Summaries

COST ESTIMATE SUMMARY BY SECTION			
Section	**Project Name**		**Estimate**
A	Baseline Construction	$	3,917,274.00
A	Survey & Design	$	705,109.32
A	Construction & Project Management	$	391,727.40
A	Escalation	$	300,846.64
A	Contingency	$	783,454.80
A	***Alternative A - Swannanoa River***	***$***	***6,098,412.16***
B	Baseline Construction	$	652,833.00
B	Survey & Design	$	117,509.94
B	Construction & Project Management	$	65,283.30
B	Escalation	$	50,137.57
B	Contingency	$	130,566.60
B	***Alternative B - Under McDowell St. Bridge***	***$***	***1,016,330.41***
C	Baseline Construction	$	4,178,672.00
C	Survey & Design	$	752,160.96
C	Construction & Project Management	$	417,867.20
C	Escalation	$	320,922.01
C	Contingency	$	835,734.40
C	***Alternative C - Over McDowell St. Bridge***	***$***	***6,505,356.57***

**NOTE: These costs have been adjusted to reflect a reduced contingency of 20% and to account for escalation.*

Table 3. Alternative A Cost Estimate

DESIGNERS OPINION OF PROBABLE COST

TYPE OF ESTIMATE: CONCEPTUAL

PROJECT: **Swan River Greenway Trail**
MUNICIPALITY: Asheville, North Carolina
TPD JOB #: NCCO.0003 WO 8

PLAN TITLE: Alternative A
PLAN DATE: 5/29/2024
ROAD(S): Swan River Greenway Trail
DESCRIPTION OF WORK: Multi-use Trail

ESTIMATE DATE: **5/30/2024**
PREPARED BY: SEP
CHECKED BY: MR
SOURCE FOR UNIT COSTS: Penn DOT Publication 287, Bulletin 50 Construction Cost Catalog (ECMS) (1/3/22 to 1/3/24)
Costs are based on PennDOT Statewide Average for previous 2 years of data, low 3 bidders

NOTES: Unit prices last revised 01/03/2024, Project total inflated based on ENR CCI Index, Jan 2024
Construction Year of 2024
4,900 LF New alignment
2 new structures and 1 bridge modification (conversion of SB thru lane to trail)
Boardwalk bridge assumed to span existing exposed sewer without impeding future maintenance access.
Improvements along Meadow Road to be completed by others (not included in estimate)

DISCLAIMER: *TPD IS FURNISHING THIS COST ESTIMATE AS REQUESTED BY THE CLIENT. PLEASE NOTE THAT ESTIMATED COSTS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS, LOCAL OR REGIONAL DIFFERENCES, CHANGES TO THE PLANS, AND/ OR CHANGES IN UNIT COSTS. COST ESTIMATES ARE PROVIDED FOR USE IN BUDGETING, BUT IN NO WAY SHOULD THIS ESTIMATE BE CONSTRUED AS A FINAL COST FOR THE PROJECT. FINAL COSTS ARE CONTINGENT ON ACTUAL BIDS FROM CONTRACTORS.*
TPD WILL NOT BE HELD RESPONSIBLE FOR DIFFERENCES BETWEEN THIS COST ESTIMATE AND BID COSTS.

DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	COST
GRADING AND PREPARATION				
CLEARING AND GRUBBING	AC	2.25	$15,000.00	$33,750
CLASS 1 EXCAVATION	CY	1,830	$38.00	$69,540
SAWCUT	LF	675	$5.20	$3,510
SUBTOTAL GRADING AND PREPARATION				**$106,800**

Table 3. Alternative A Cost Estimate (Cont'd)

PAVEMENT ITEMS				
SUPERPAVE **WEARING COURSE**,1" DEPTH, SRL-H	SY	7,700	$10.00	$77,000
SUPERPAVE **WEARING COURSE**,1.5" DEPTH, SRL-H	SY	7,700	$14.00	$107,800
SUBBASE 6" DEPTH (NO. 2A)	SY	7,700	$18.00	$138,600
GEOTEXTILE, CLASS 4, TYPE A	SY	7,700	$3.70	$28,490
ASPHALT TACK COAT (NTT/CNTT)	SY	7,700	$0.89	$6,853
SUBTOTAL PAVEMENT ITEMS				**$358,743**
CURBING ITEMS				
PLAIN CEMENT CONCRETE CURB, 8" HEIGHT	LF	250	$61.00	$15,250
PLAIN CEMENT CONCRETE CURB, INCLUDING REMOVAL OF EXISTING CURB AND PAVEMENT RESTORA	LF	640	$170.00	$108,800
PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH	SY	140	$120.00	$16,800
CONCRETE SIDEWALK	SY	310	$190.00	$58,900
DETECTABLE WARNING SURFACE	SF	100	$53.00	$5,300
GUIDERAIL (TYPE 31-SC)	LF	975	$43.00	$41,925
TERMINAL SECTION	EA	1	$150.00	$150
TYPICAL AND ALTERNATE CONCRETE BRIDGE BARRIER TRANSITION WITHOUT INLET PLACEMENT	EA	1	$2,600.00	$2,600
GUIDERAIL END TREATMENT (MASH)	EA	2	$3,600.00	$7,200
SUBTOTAL CURBING ITEMS				**$256,925**

Table 3. Alternative A Cost Estimate (Cont'd)

DRAINAGE ITEMS				
LUMP SUM ESTIMATE FOR TRAIL DRAINAGE	LS	1	$110,000.00	$110,000
18" REINFORCED CONCRETE PIPE (TYPE A)	LF	385	$230.00	$88,550
TYPE C INLET TOP UNIT W/ BICYCLE SAFE GRATE	SET	2	$1,900.00	$3,800
STANDARD INLET BOX <10' DEPTH	EA	2	$3,700.00	$7,400
SUBTOTAL DRAINAGE ITEMS				**$209,750**
SIGNS AND LANE MARKINGS				
POST MOUNTED SIGNS, TYPE B	SF	200	$56.00	$11,200
4" WHITE WATERBORNE PAVEMENT MARKINGS	LF	11,500	$0.59	$6,785
4" YELLOW WATERBORNE PAVEMENT MARKINGS	LF	5,750	$0.67	$3,853
SUBTOTAL SIGNS AND LANE MARKINGS				**$21,838**
LANDSCAPING, SEEDING & EROSION CONTROL ITEMS				
TOPSOIL, FURNISHED AND PLACED	CY	1,075	$92.00	$98,900
SEEDING & SOIL SUPPLEMENTS - FORMULA B INCLUDING MULCH	LB	135	$40.00	$5,400
TEMPORARY SHORT-TERM, ROLLED EROSION CONTROL PRODUCT, TYPE 2B	SY	28,710	$1.90	$54,549
CHAIN LINK FENCE	LF	2,000	$35.00	$70,000
SUBTOTAL LANDSCAPING ITEMS				**$228,849**

Table 3. Alternative A Cost Estimate (Cont'd)

MISCELLANEOUS CONSTRUCTION ITEMS				
NON-QUANTIFIED ITEMS (10%)	LS	1	$118,290	$118,290
BILTMORE AVE BRIDGE MODIFICATION (160' X 17')	LS	1	$240,000	$240,000
PED BRIDGE #1 OVER SWAN RIVER (PRE-FAB PED BRIDGE) (115' X 14')	LS	1	$1,046,500	$1,046,500
PED BRIDGE #2 OVER SEWER (BOARDWALK BRIDGE) (335' X 14')	LS	1	$515,900	$515,900
TRAIL RAILROAD CROSSING	LS	1	$120,000	$120,000
DEMOLITION/RELOCATION (MCDONALD'S DUMPSTER BUILDING)	LS	1	$20,000	$20,000
CONSTRUCTION TRAILER	LS	1	$18,000	$18,000
EQUIPMENT PACKAGE	LS	1	$2,800	$2,800
SUBTOTAL MISCELLANEOUS ITEMS				$2,081,490
SUBTOTAL PAY ITEMS				**$3,264,395**

Table 3. Alternative A Cost Estimate (Cont'd)

OTHER ITEMS				
MOBILIZATION (5%)	LS	1	$163,220	$163,220
MAINTENANCE AND PROTECTION OF TRAFFIC (5%)	LS	1	$163,220	$163,220
CONSTRUCTION SURVEY & STAKEOUT (2%)	LS	1	$65,288	$65,288
POST CONSTRUCTION STORMWATER MANAGEMENT (5%)	LS	1	$163,220	$163,220
EROSION AND SEDIMENTATION CONTROL (3%)	LS	1	$97,932	$97,932
SUBTOTAL OTHER ITEMS				**$652,879**
TOTAL: PAY ITEMS + OTHER ITEMS				**$3,917,274**
25% CONTINGENCY				$979,318
TOTAL ESTIMATE FOR CONSTRUCTION*				**$4,896,592**

**** Does <u>not</u> include:***

Surveying/Engineering/Permitting/Legal Fees

Acquisition Costs for Right-of-Way/Easements/Releases

Utility pole relocation, underground utility relocation/exploration

Construction Inspection

Construction Management

or any other items not specifically listed above.

Table 4. Alternative B Cost Estimate

DESIGNERS OPINION OF PROBABLE COST

TYPE OF ESTIMATE: CONCEPTUAL

PROJECT: **Swan River Greenway Trail**
MUNICIPALITY: Asheville, North Carolina
TPD JOB #: NCCO.0003 WO 8

PLAN TITLE: Alternative B
PLAN DATE: 5/29/2024
ROAD(S): Swan River Greenway Trail
DESCRIPTION OF WORK: Multi-use Trail

ESTIMATE DATE: **5/30/2024**
PREPARED BY: SEP
CHECKED BY: MR
SOURCE FOR UNIT COSTS: Penn DOT Publication 287, Bulletin 50 Construction Cost Catalog (ECMS) (1/3/22 to 1/3/24)
Costs are based on PennDOT Statewide Average for previous 2 years of data, low 3 bidders

NOTES: Unit prices last revised 01/03/2024, Project total inflated based on ENR CCI Index, Jan 2024
Construction Year of 2024
1,850 LF of new alignment
1 box culvert for minor stream crossing

DISCLAIMER: *TPD IS FURNISHING THIS COST ESTIMATE AS REQUESTED BY THE CLIENT. PLEASE NOTE THAT ESTIMATED COSTS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS, LOCAL OR REGIONAL DIFFERENCES, CHANGES TO THE PLANS, AND/ OR CHANGES IN UNIT COSTS. COST ESTIMATES ARE PROVIDED FOR USE IN BUDGETING, BUT IN NO WAY SHOULD THIS ESTIMATE BE CONSTRUED AS A FINAL COST FOR THE PROJECT. FINAL COSTS ARE CONTINGENT ON ACTUAL BIDS FROM CONTRACTORS.*
TPD WILL NOT BE HELD RESPONSIBLE FOR DIFFERENCES BETWEEN THIS COST ESTIMATE AND BID COSTS.

DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	COST
GRADING AND PREPARATION				
CLEARING AND GRUBBING	AC	0.85	$15,000.00	$12,750
CLASS 1 EXCAVATION	CY	675	$38.00	$25,650
SAWCUT	LF	140	$5.20	$728
SUBTOTAL GRADING AND PREPARATION				**$39,128**

Table 4. Alternative B Cost Estimate (Cont'd)

PAVEMENT ITEMS				
SUPERPAVE **WEARING COURSE**,1" DEPTH, SRL-H	SY	2,675	$10.00	$26,750
SUPERPAVE **WEARING COURSE**,1.5" DEPTH, SRL-H	SY	2,675	$14.00	$37,450
SUBBASE 6" DEPTH (NO. 2A)	SY	2,675	$18.00	$48,150
GEOTEXTILE, CLASS 4, TYPE A	SY	2,675	$3.70	$9,898
ASPHALT TACK COAT (NTT/CNTT)	SY	2,675	$0.89	$2,381
SUBTOTAL PAVEMENT ITEMS				**$124,628**
CURBING ITEMS				
PLAIN CEMENT CONCRETE CURB, INCLUDING REMOVAL OF EXISTING CURB AND PAVEMENT RESTORA	LF	55	$170.00	$9,350
CONCRETE SIDEWALK	SY	145	$190.00	$27,550
DETECTABLE WARNING SURFACE	SF	40	$53.00	$2,120
GUIDERAIL (TYPE 31-SC)	LF	240	$43.00	$10,320
TERMINAL SECTION	EA	1	$150.00	$150
GUIDERAIL END TREATMENT (MASH)	EA	3	$3,600.00	$10,800
SUBTOTAL CURBING ITEMS				**$60,290**
DRAINAGE ITEMS				
LUMP SUM ESTIMATE FOR TRAIL DRAINAGE	LS	1	$40,000.00	$40,000
SUBTOTAL DRAINAGE ITEMS				**$40,000**
SIGNS AND LANE MARKINGS				
POST MOUNTED SIGNS, TYPE B	SF	200	$56.00	$11,200
4" WHITE WATERBORNE PAVEMENT MARKINGS	LF	3,700	$0.59	$2,183
4" YELLOW WATERBORNE PAVEMENT MARKINGS	LF	1,850	$0.67	$1,240
SUBTOTAL SIGNS AND LANE MARKINGS				**$14,623**

Table 4. Alternative B Cost Estimate (Cont'd)

LANDSCAPING, SEEDING & EROSION CONTROL ITEMS				
TOPSOIL, FURNISHED AND PLACED	CY	150	$92.00	$13,800
SEEDING & SOIL SUPPLEMENTS - FORMULA B INCLUDING MULCH	LB	60	$40.00	$2,400
TEMPORARY SHORT-TERM, ROLLED EROSION CONTROL PRODUCT, TYPE 2B	SY	1,350	$1.90	$2,565
CHAIN LINK FENCE	LF	2,100	$35.00	$73,500
SUBTOTAL LANDSCAPING ITEMS				**$92,265**
MISCELLANEOUS CONSTRUCTION ITEMS				
NON-QUANTIFIED ITEMS (10%)	LS	1	$37,093	$37,093
BOX CULVERT FOR STREAM CROSSING (8H x 8W x 20L)	LS	1	$115,200	$115,200
CONSTRUCTION TRAILER	LS	1	$18,000	$18,000
EQUIPMENT PACKAGE	LS	1	$2,800	$2,800
SUBTOTAL MISCELLANEOUS ITEMS				$173,093
SUBTOTAL PAY ITEMS				**$544,027**

Table 4. Alternative B Cost Estimate (Cont'd)

OTHER ITEMS				
MOBILIZATION (5%)	LS	1	$27,201	$27,201
MAINTENANCE AND PROTECTION OF TRAFFIC (5%)	LS	1	$27,201	$27,201
CONSTRUCTION SURVEY & STAKEOUT (2%)	LS	1	$10,881	$10,881
POST CONSTRUCTION STORMWATER MANAGEMENT (5%)	LS	1	$27,201	$27,201
EROSION AND SEDIMENTATION CONTROL (3%)	LS	1	$16,321	$16,321
SUBTOTAL OTHER ITEMS				**$108,805**
TOTAL: PAY ITEMS + OTHER ITEMS				**$652,833**
25% CONTINGENCY				$163,208
TOTAL ESTIMATE FOR CONSTRUCTION*				**$816,041**

**** Does <u>not</u> include:***

Surveying/Engineering/Permitting/Legal Fees

Acquisition Costs for Right-of-Way/Easements/Releases

Utility pole relocation, underground utility relocation/exploration

Construction Inspection

Construction Management

or any other items not specifically listed above.

Table 5. Alternative C Cost Estimate

DESIGNERS OPINION OF PROBABLE COST

TYPE OF ESTIMATE: CONCEPTUAL

PROJECT: **Swan River Greenway Trail**
MUNICIPALITY: Asheville, North Carolina
TPD JOB #: NCCO.0003 WO 8

PLAN TITLE: Alternative C
PLAN DATE: 5/29/2024
ROAD(S): Swan River Greenway Trail
DESCRIPTION OF WORK: Multi-use Trail

ESTIMATE DATE: **5/30/2024**
PREPARED BY: SEP
CHECKED BY: MR
SOURCE FOR UNIT COSTS: Penn DOT Publication 287, Bulletin 50 Construction Cost Catalog (ECMS) (1/3/22 to 1/3/24)
Costs are based on PennDOT Statewide Average for previous 2 years of data, low 3 bidders

NOTES: Unit prices last revised 01/03/2024, Project total inflated based on ENR CCI Index, Jan 2024
Construction Year of 2024
750 LF New Alignment
Modifications to 2 existing structures (assume conversion of existing SB travel lane to trail)

DISCLAIMER: *TPD IS FURNISHING THIS COST ESTIMATE AS REQUESTED BY THE CLIENT. PLEASE NOTE THAT ESTIMATED COSTS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS, LOCAL OR REGIONAL DIFFERENCES, CHANGES TO THE PLANS, AND/ OR CHANGES IN UNIT COSTS. COST ESTIMATES ARE PROVIDED FOR USE IN BUDGETING, BUT IN NO WAY SHOULD THIS ESTIMATE BE CONSTRUED AS A FINAL COST FOR THE PROJECT. FINAL COSTS ARE CONTINGENT ON ACTUAL BIDS FROM CONTRACTORS.*
TPD WILL NOT BE HELD RESPONSIBLE FOR DIFFERENCES BETWEEN THIS COST ESTIMATE AND BID COSTS.

DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	COST
GRADING AND PREPARATION				
CLEARING AND GRUBBING	AC	0.35	$15,000.00	$5,250
CLASS 1 EXCAVATION	CY	1,250	$38.00	$47,500
SAWCUT	LF	1,230	$5.20	$6,396
SUBTOTAL GRADING AND PREPARATION				**$59,146**

Table 5. Alternative C Cost Estimate (Cont'd)

PAVEMENT ITEMS				
SUPERPAVE **WEARING COURSE**,1" DEPTH, SRL-H	SY	1,225	$10.00	$12,250
SUPERPAVE **WEARING COURSE**,1.5" DEPTH, SRL-H	SY	1,225	$14.00	$17,150
SUBBASE 6" DEPTH (NO. 2A)	SY	1,225	$18.00	$22,050
GEOTEXTILE, CLASS 4, TYPE A	SY	1,225	$3.70	$4,533
ASPHALT TACK COAT (NTT/CNTT)	SY	1,225	$0.89	$1,090
SUBTOTAL PAVEMENT ITEMS				**$57,073**
CURBING ITEMS				
PLAIN CEMENT CONCRETE CURB, 8" HEIGHT	LF	700	$61.00	$42,700
PLAIN CEMENT CONCRETE CURB, INCLUDING REMOVAL OF EXISTING CURB AND PAVEMENT RESTORA	LF	1,130	$170.00	$192,100
PLAIN CEMENT CONCRETE PAVEMENT, 4" DEPTH	SY	345	$120.00	$41,400
CONCRETE SIDEWALK	SY	950	$190.00	$180,500
DETECTABLE WARNING SURFACE	SF	100	$53.00	$5,300
SUBTOTAL CURBING ITEMS				**$462,000**
DRAINAGE ITEMS				
LUMP SUM ESTIMATE FOR TRAIL DRAINAGE	LS	1	$15,000.00	$15,000
18" REINFORCED CONCRETE PIPE (TYPE A)	LF	700	$230.00	$161,000
TYPE C INLET TOP UNIT W/ BICYCLE SAFE GRATE	SET	4	$1,900.00	$7,600
STANDARD INLET BOX <10' DEPTH	EA	4	$3,700.00	$14,800
SUBTOTAL DRAINAGE ITEMS				**$198,400**
SIGNS AND LANE MARKINGS				
POST MOUNTED SIGNS, TYPE B	SF	200	$56.00	$11,200
4" WHITE WATERBORNE PAVEMENT MARKINGS	LF	1,550	$0.59	$915
4" YELLOW WATERBORNE PAVEMENT MARKINGS	LF	775	$0.67	$519
SUBTOTAL SIGNS AND LANE MARKINGS				**$12,634**

Table 5. Alternative C Cost Estimate (Cont'd)

LANDSCAPING, SEEDING & EROSION CONTROL ITEMS				
TOPSOIL, FURNISHED AND PLACED	CY	55	$92.00	$5,060
SEEDING & SOIL SUPPLEMENTS - FORMULA B INCLUDING MULCH	LB	20	$40.00	$800
TEMPORARY SHORT-TERM, ROLLED EROSION CONTROL PRODUCT, TYPE 2B	SY	480	$1.90	$912
CHAIN LINK FENCE	LF	800	$35.00	$28,000
SUBTOTAL LANDSCAPING ITEMS				**$34,772**
MISCELLANEOUS CONSTRUCTION ITEMS				
NON-QUANTIFIED ITEMS (10%)	LS	1	$82,402	$82,402
BILTMORE AVE BRIDGE MODIFICATION (160' X 17')	LS	1	$240,000	$240,000
US 25 BRIDGE MODIFICATION (1450' X 17')	LS	1	$2,175,000	$2,175,000
TRAIL RAILROAD CROSSING	LS	1	$120,000	$120,000
DEMOLITION/RELOCATION (MCDONALD'S DUMPSTER BUILDING)	LS	1	$20,000	$20,000
CONSTRUCTION TRAILER	LS	1	$18,000	$18,000
EQUIPMENT PACKAGE	LS	1	$2,800	$2,800
SUBTOTAL MISCELLANEOUS ITEMS				$2,658,202
SUBTOTAL PAY ITEMS				**$3,482,227**

Table 5. Alternative C Cost Estimate (Cont'd)

OTHER ITEMS				
MOBILIZATION (5%)	LS	1	$174,111	$174,111
MAINTENANCE AND PROTECTION OF TRAFFIC (5%)	LS	1	$174,111	$174,111
CONSTRUCTION SURVEY & STAKEOUT (2%)	LS	1	$69,645	$69,645
POST CONSTRUCTION STORMWATER MANAGEMENT (5%)	LS	1	$174,111	$174,111
EROSION AND SEDIMENTATION CONTROL (3%)	LS	1	$104,467	$104,467
SUBTOTAL OTHER ITEMS				**$696,445**
TOTAL: PAY ITEMS + OTHER ITEMS				**$4,178,672**
UNIT PRICE ESTIMATE INFLATION FACTOR (0%-AUG 2023)				$0
TOTAL WITH INFLATION FACTOR				**$4,178,672**
ESCALATION (3% FOR 0 YEARS)				$0
ESTIMATE TO MID-CONSTRUCTION YEAR (2025)				**$4,178,672**
25% CONTINGENCY				$1,044,668
TOTAL ESTIMATE FOR CONSTRUCTION*				**$5,223,340**

**** Does <u>not</u> include:***

Surveying/Engineering/Permitting/Legal Fees

Acquisition Costs for Right-of-Way/Easements/Releases

Utility pole relocation, underground utility relocation/exploration

Construction Inspection

Construction Management

or any other items not specifically listed above.



APPENDIX E

Online Survey Results


USA

Image 1. Online Survey Response Summary

Swannanoa River Greenway Extension Feasibility Study

Project Engagement

VIEWS	PARTICIPANTS	RESPONSES	COMMENTS
807	133	1,698	250

Do you currently walk or bike through this area?

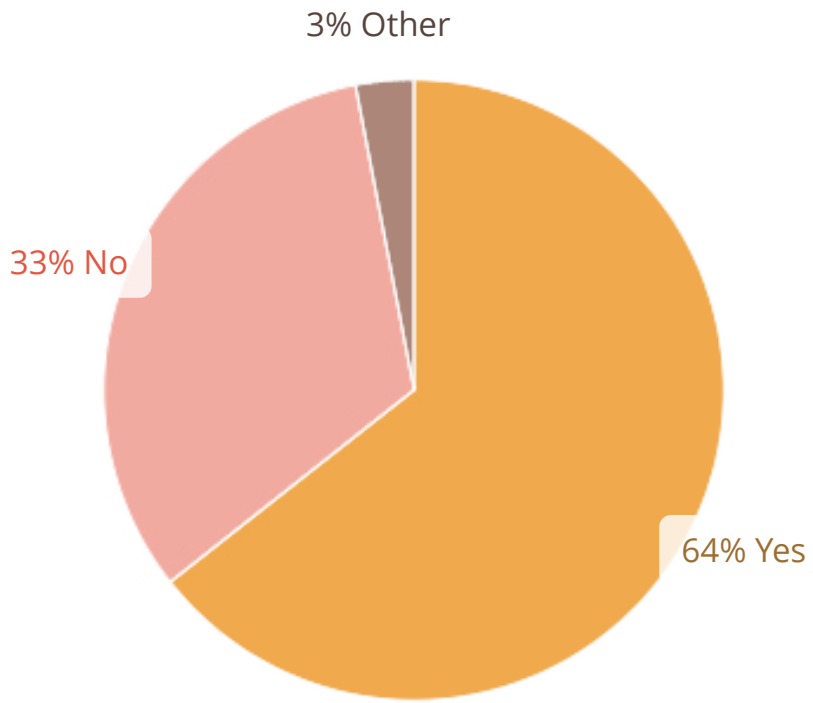


Image 1. Online Survey Response Summary (Cont'd)

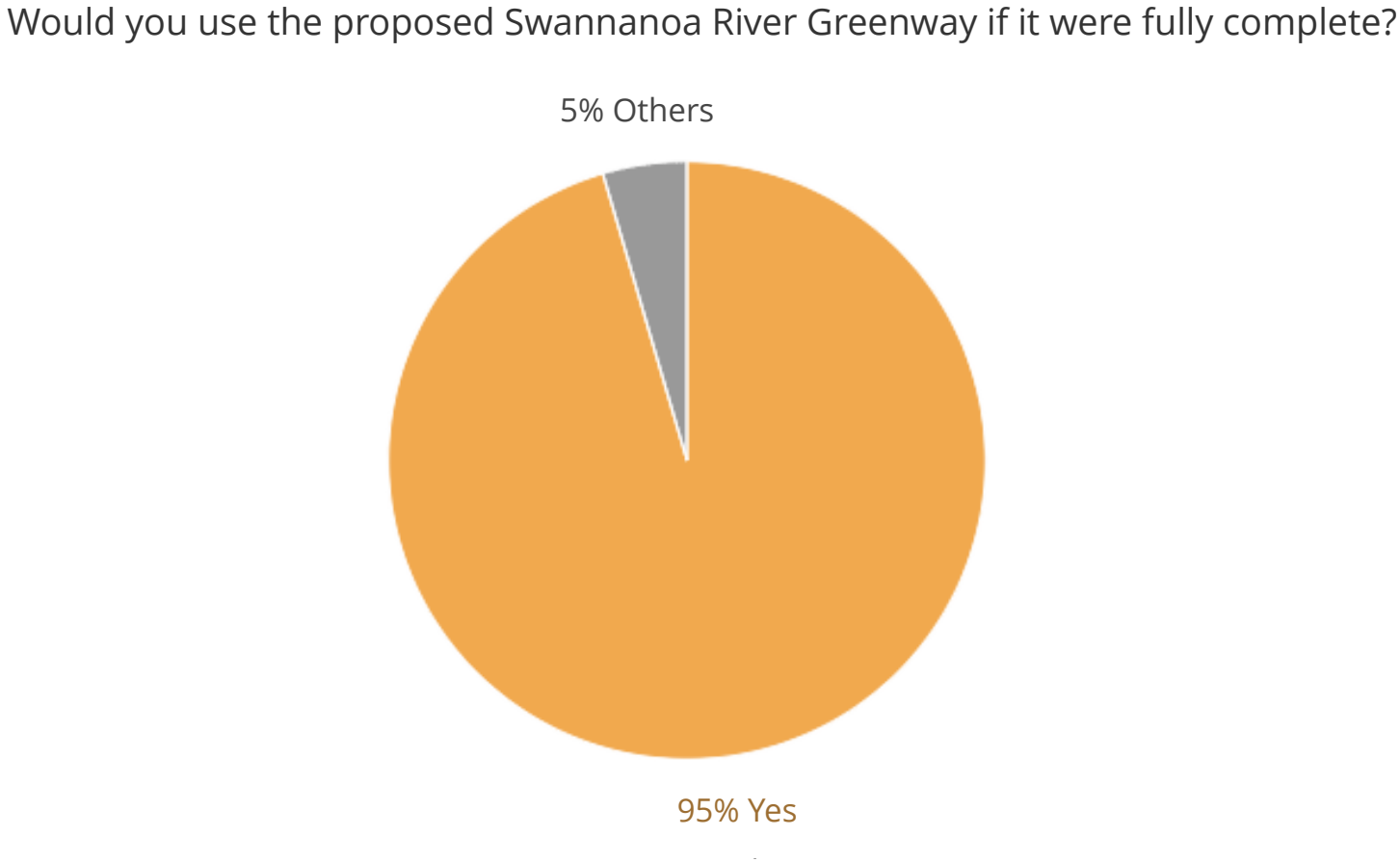


Image 1. Online Survey Response Summary (Cont'd)

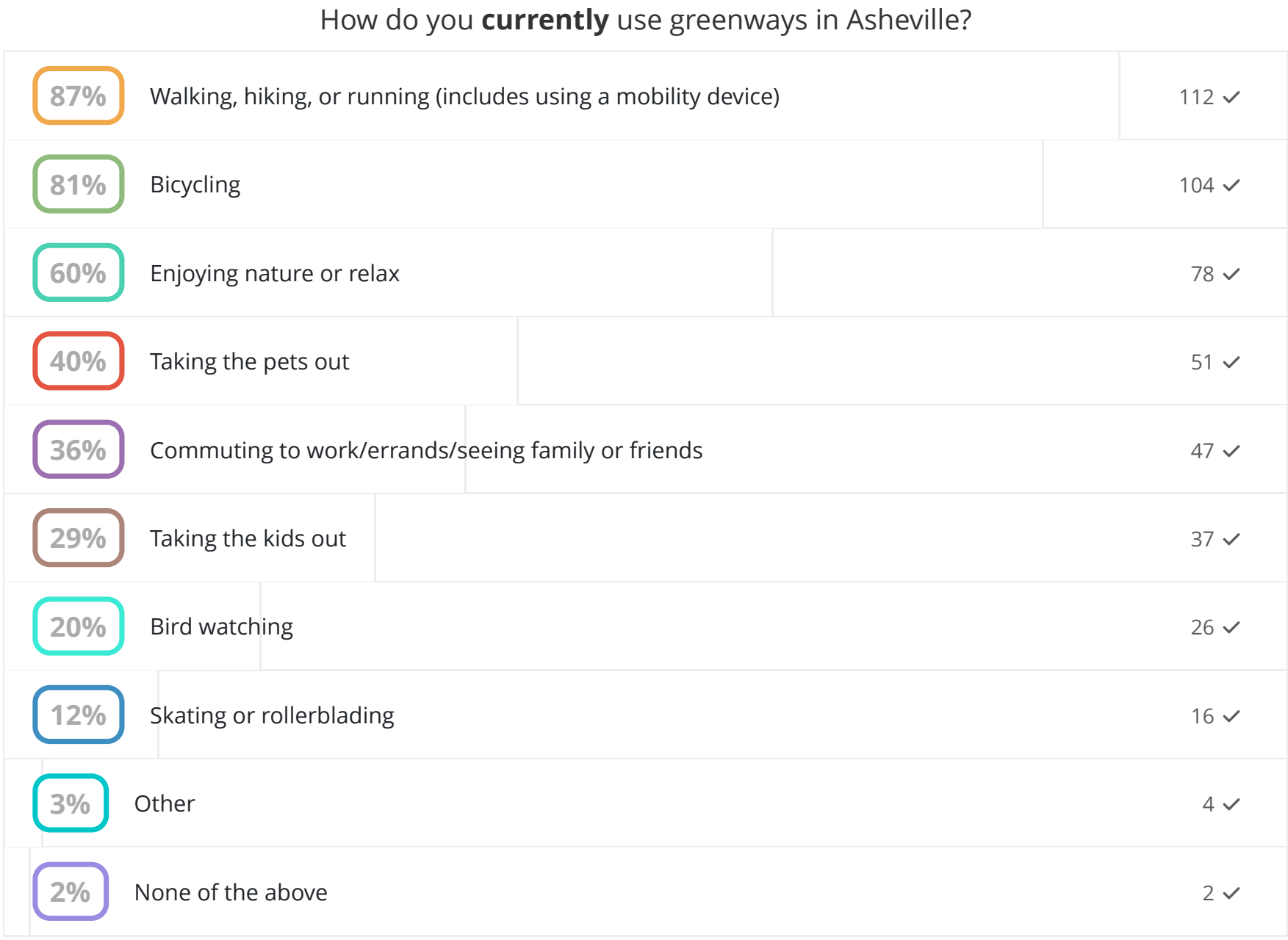


Image 1. Online Survey Response Summary (Cont'd)

How **would you** use the Swannanoa River Greenway Extension that is proposed in this study?

87%	Walking, hiking, or running (includes using a mobility device)	110 ✓
83%	Bicycling	105 ✓
57%	Enjoying nature or relaxing	72 ✓
40%	Commuting to work/errands/seeing family or friends	51 ✓
36%	Taking the pets out	46 ✓
27%	Taking the kids out	34 ✓
22%	Bird watching	28 ✓
12%	Skating or rollerblading	15 ✓
2%	Other	3 ✓
2%	None of the above	2 ✓

Image 1. Online Survey Response Summary (Cont'd)

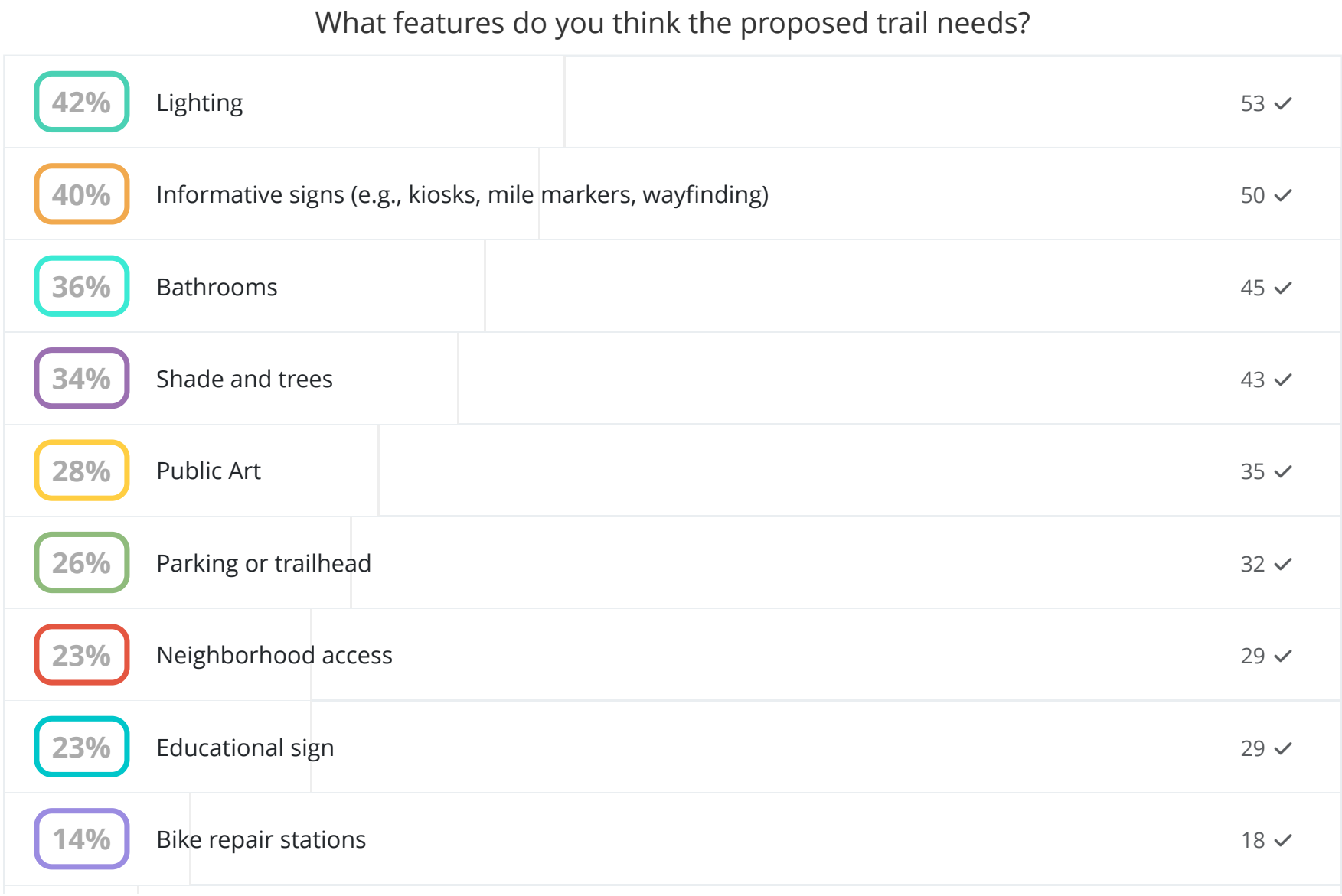


Image 1. Online Survey Response Summary (Cont'd)

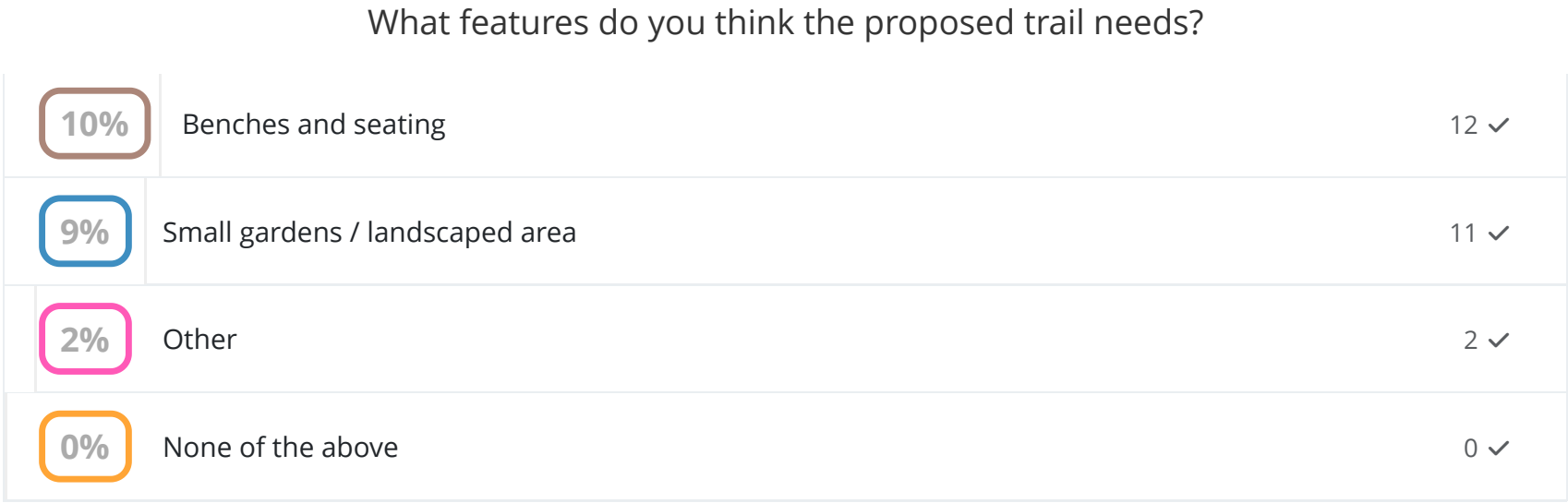


Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

Easy connection to French Broad Park/Carrier Park/Riverside greenway, keeping it closer to grade as possible, well lit, as little interaction with traffic as possible.

6 months ago

17 Agree

Agree

6 months ago

1 Agree

Connections to French Broad River Greenway

6 months ago

15 Agree

Completion of a thoroughfare for walking and biking that is safe from injury by cars!! Thank you!

6 months ago

14 Agree

Connecting it to other pieces of greenway to create a full system that gives people the option to safely forego driving

6 months ago

12 Agree

Option A is the most difficult - needing RoW's from the RR and Biltmore. Options B&C require connection via Meadow Rd. to the Amboy Bridge. Today, Meadow Rd. from Victoria Rd. to Short McDowell is unpleasant to bike and unsafe to walk. Getting Meadow Rd. fixed is a prerequisite for the Swannanoa Greenway to be successful.

6 months ago

3 Agree

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

Very clear signs about keeping to the right and ringing a bell/calling out left in advance of passing on a bike. The Virginia Creeper trail has good signage for this.

5 months ago

2 Agree

We need a beautiful trail along the river with a signature ped/bike bridge crossing the river. This Is right next to a tourist area so it should be a unique bridge!

5 months ago

2 Agree

Connecting to existing greenway along the French Board River.

5 months ago

2 Agree

Option C should be a non-starter it makes users go way out of their way and adds more grade than both A and B with out adding any benefits. A is the best for green space and separation from car traffic even though it might be a little longer. B is less desirable even if the Meadow RD changes get funding and happen it will still be uncomfortable to deal with the heavy truck traffic on that corridor from the industrial businesses there. So I think A even with it's many challenges would make for the most successful greenway if implemented.

5 months ago

2 Agree

This greenway will be very beneficial to all !

6 months ago

2 Agree

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

Effective communication and engagement with all local communities that the Greenway would impact.

6 months ago

2 Agree

connectivity to other ped/bike infrastructure (including streets with appropriate infrastructure for non-motorized travel such as sidewalks or protected bike lanes)

5 months ago

1 Agree

Seeing how many people enjoy using the River Arts walkway, I'm certain that if and when this Greenway is developed it'll be very well received.

5 months ago

1 Agree

Connecting surrounding neighborhoods

5 months ago

1 Agree

If it is part of a larger connected greenway system that is actually useful to get around town.

5 months ago

1 Agree

I think a continued connection to the east side of the City of Asheville and then to the east side of the county makes it most exciting.

5 months ago

1 Agree

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

Access to useful destinations like work, grocery stores, and housing. Protection from motor vehicles. Restaurants and stores facing the greenway. Secure bike racks with upside down staple design. Flattest route possible.

5 months ago — 1 Agree

Functional starting and ending point for bicycle commuters and easy access along the greenway from abtech campus and nearby neighborhoods. Thank you for taking community input.

5 months ago — 1 Agree

Connectivity to other Greenway/carrier park/Riverside path that's protected from car traffic.

5 months ago — 1 Agree

Limit parking and emphasize multimodal opportunities

5 months ago — 1 Agree

Connection to existing greenway/bike infrastructure. Wide paths capable of handling traffic in both directions.

5 months ago — 1 Agree

Environmental education opportunities

5 months ago — 1 Agree

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

AN OVERWHELMING FEELING OF SAFETY. PLS DO WHATEVER YOU CAN FOR USERS TO FEEL SAFE.

5 months ago

1 Agree

Bring it all the way to Swannanoa!

5 months ago

1 Agree

Greenway connectivity between RAD, Biltmore Village, and the Amboy recreation parks! Talk about options!

5 months ago

1 Agree

It needs to safely connect to the greenway along Lyman St. The bike path that is currently on Meadow Rd is way too scary for most folks.

5 months ago

1 Agree

I think it should be as beautiful as possible. The area involved gets lots of car traffic and needs a serious investment to create the type of green space that makes people outside of cars feel prioritized.

5 months ago

1 Agree

Thru-connection to Biltmore at lowest possible cost!

5 months ago

1 Agree

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

protection from automobile traffic and exhaust. Minimal stop signs / lights on path.

5 months ago

1 Agree

Connectivity, like that of Alt. A, is critical to the success of improving safety and enjoyment for all users!

5 months ago

1 Agree

Separated from meadow road and not reliant on the NCDOT meadow project.

5 months ago

1 Agree

Safe, beautiful, connected greenway to other greenways, services.

5 months ago

1 Agree

Connectivity from East Asheville to RAD with separated trail from auto traffic that allows parents to feel safe letting 10-year old child explore. Adults will love it also!

5 months ago

1 Agree

It would provide a far safer alternative to riding a bicycle on the roads. Having been hit by a car in the past, safe biking trails are increasingly important in an urban setting.

6 months ago

1 Agree

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

Reduce the interaction between motor vehicles and vulnerable users (bicyclists and pedestrians). This is especially a problem during peak travel hours when vulnerable users and motorists become frustrated.

6 months ago — 1 Agree

Since restrooms already exist at Carrier park and at the old CP%L property park they are probably a lessor need but would still be a nice lower priority addition. Benches are also a nice addition for some walkers but a lower priority item. (I have greatly enjoyed, with my grandchildren, the greenway between Carrier Park, the Brewery, and return loop after a White Duck lunch.)

6 months ago — 1 Agree

Build it

6 months ago — 1 Agree

Connection to other greenways

6 months ago — 1 Agree

More publicity about using this greenspace.

6 months ago — 1 Agree

If it connects to other Greenways/cycling&walking paths.

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

Connect to French Broad Park & Carrier Park.

5 months ago

Defined walking and cycling lanes

5 months ago

A plan to keep restrooms clean.

5 months ago

Proper connections to every crossing

5 months ago

Planning for this to be an essential infrastructure for pedestrians and bicycle commuters into the future. As such, limit the interactions with vehicles, limit steep slopes, and ensure it is well connected to safe transportation networks and walkable streets.

5 months ago

if/when it fully connects the west side of town to the east via connections with other safe pathways for bikes and pedestrians

5 months ago

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

focusing on connection and accessibility from neighborhoods and businesses so people can use it to commute

5 months ago

Completely separate from the road

5 months ago

Getting a trail from one side of Asheville to the other

5 months ago

Connect with other greenways, neighborhoods, and commercial areas. Provide plenty of shade and seating as well as access to the river.

5 months ago

I think it's very important to have lighting on this trail in particular as it passes through an area that is more desolate than the rest of the RAD Greenway. It is extremely dark at night on the new part of the Greenway (New Belgium side) in RAD.

5 months ago

Stick to the river if possible, avoid twists and turns along McDowell and Short McDowell.

5 months ago

Don't let it turn into a homeless camp filled with drugs, crime and trash.

5 months ago

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

Being able to safely get to businesses and work by bike and by foot

5 months ago

Stop talking about it and do it already. How many years have you been studying it and not doing anything?

5 months ago

Visual buffers between the industrial sites and the greenway corridor. Alternative A would be the most preferable as to a river-oriented corridor, but lots of rail lines and utilities in that option. By the way, Alternatives B and C in your package do not mention the connection(s) being proposed between the west end of Meadow Road and Short McDowell.

5 months ago

responsibly resourced production and environmentally responsible production and education opportunities.

5 months ago

Connecting to French Broad River Greenway

5 months ago

Also adding adult outdoor exercise equipment. So a person who is walking or running can stop and do a modified work out.

5 months ago

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

Integrative design!

5 months ago

Connection to French Broad River Greenway

5 months ago

I would focus the greatest investment into the greenway as a practical utility, rather than investing it into a park-like atmosphere. For example, lighting will help the greenway continue to be a safe and useful option for getting around after sunset. I would rather see investment in things like lighting or wayfinding rather than aesthetic features like public art or educational signs.

5 months ago

sponsored chalk art events, passport

5 months ago

Connectivity from east Buncombe to RAD on trail separated from auto traffic that parents feel comfortable letting 10-year old child explore on their own.

5 months ago

Connecting it as far as possible - a complete trail system along the French Broad and Swannanoa, seamlessly continuing along the waterways would be HUGE! (for both recreation and transportation).

5 months ago

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help make the proposed Swannanoa River Greenway exciting and successful?

Bike share program

6 months ago

Continuing publicity.

6 months ago

Easy access, safe and welcoming environment and functionality - the trail has to connect things/place people use

6 months ago

Keeping away from traffic as much as possible and making the users feel safe when using it

6 months ago

Connecting it to other pieces of greenway.

6 months ago

Marketing

6 months ago

Image 1. Online Survey Response Summary (Cont'd)

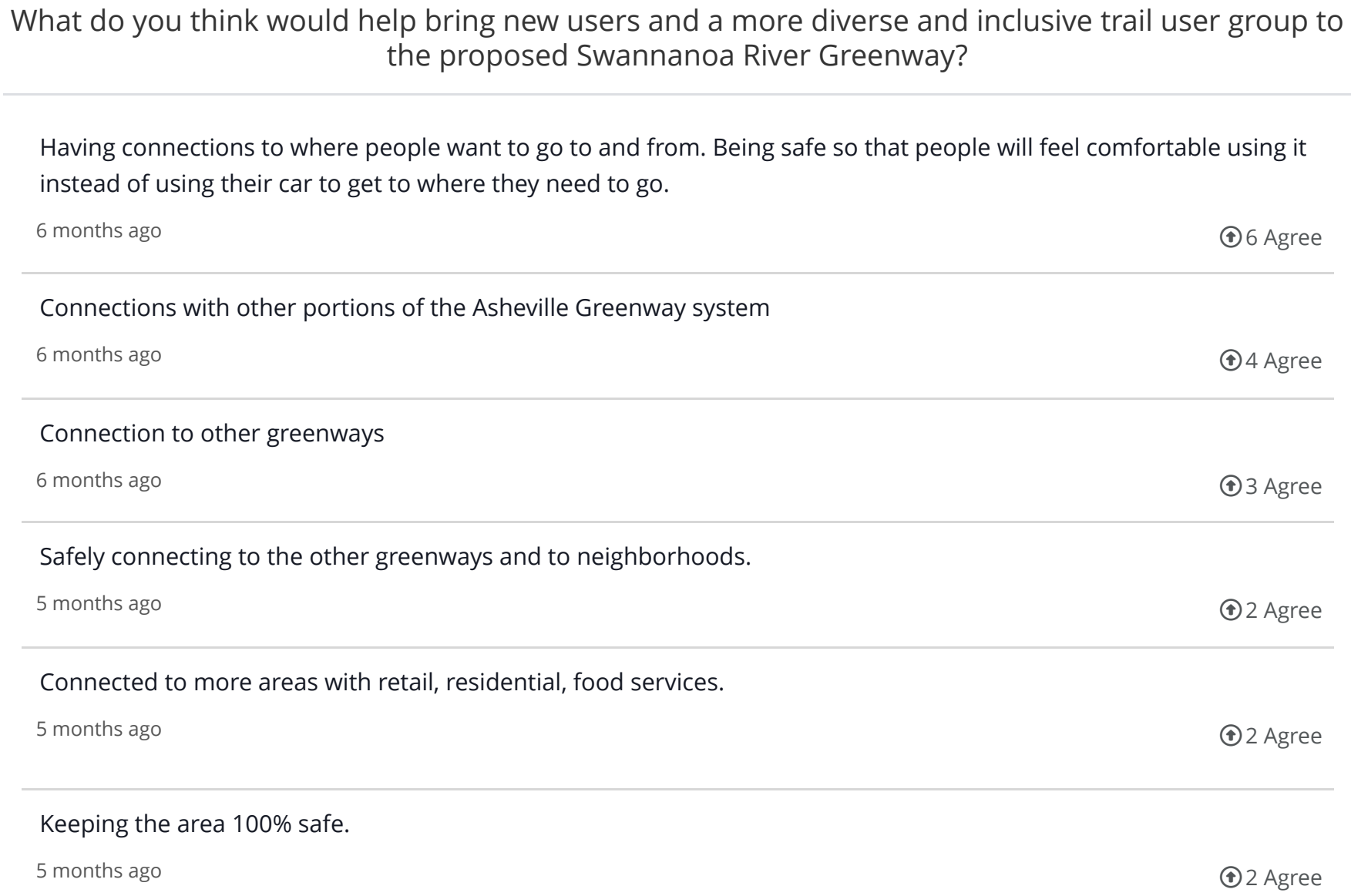


Image 1. Online Survey Response Summary (Cont'd)

What do you think would help bring new users and a more diverse and inclusive trail user group to the proposed Swannanoa River Greenway?

Make it feel safe and connections	6 months ago	2 Agree
Build it and folks will use it.	6 months ago	2 Agree
If it connects to neighborhoods/streets where lower income or people of color tend to live.	6 months ago	2 Agree
Actively building out and connecting our existing trail systems so more communities can access them without needing to drive to a trailhead/parking lot.	6 months ago	2 Agree
Just it's existing. Having a connected greenway system allows people of all walks of life to opportunity to move through their city without cars in a way that makes them feel safe.	6 months ago	2 Agree
Connectivity and lighting	6 months ago	2 Agree
Connectivity with neighborhoods and commercial centers like RAD and Biltmore Village... for commuting	5 months ago	1 Agree

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help bring new users and a more diverse and inclusive trail user group to the proposed Swannanoa River Greenway?

easy connection with buses, for shoppers and car parks outside town.

5 months ago

1 Agree

Ease of use, connected to the existing Carrier Park/French Broad Park/Riverside system

6 months ago

1 Agree

Multiple, weii marked access to residential areas and hotels.

6 months ago

1 Agree

Marketing, outreach to local groups to get on the trail, connect with restaurants and breweries to use trail

6 months ago

1 Agree

Connection to other greenways

5 months ago

Is there a problem? Publicity and easy access are what will bring anyone to the Greenway.

5 months ago

advertising of it once it's finished

5 months ago

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help bring new users and a more diverse and inclusive trail user group to the proposed Swannanoa River Greenway?

We need to connect all the neighborhoods to the greenways, and do smaller feeder paths from areas may not need a full size greenway.

5 months ago

Provide good access points from surrounding neighborhoods. Make it feel safe and inviting.

5 months ago

provide convenient, inexpensive access to jobs and necessary commerce (eg, grocery stores)

5 months ago

Safe connections with existing trails.

5 months ago

Connections to other Greenways and neighborhoods. Opportunity for businesses along this corridor other than the current industrial businesses.

5 months ago

A safe and scenic route, ability to park (or connectivity to a place to park) and identifying signage.

5 months ago

1 Agree

Wide enough to make it safe for handicapped, children/strollers, and elderly people with room for bicyclists.

5 months ago

1 Agree

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help bring new users and a more diverse and inclusive trail user group to the proposed Swannanoa River Greenway?

Connections to neighborhoods that did not previously have close proximity. The support of Biltmore Village business owners. Publicity to those visiting the Biltmore Estate.

5 months ago

Connecting RAD to Biltmore Village as quickly and safely as possible will ensure more users make use of the investment.

5 months ago

Thousands of people work at Mission Hospital. Biltmore, AB Tech, MAHEC, Hotels, and etc. We need to connect people on foot and bikes from housing to work!

5 months ago

Having it be safe, well lit, side paths connecting it to local businesses.

5 months ago

1 Agree

Neighborhood access. Wide paths. Creating space between people and cars/traffic.

5 months ago

Access, parking, shade, safety lighting

5 months ago

Covered picnic table areas, cleanliness, closed off dog park.

5 months ago

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help bring new users and a more diverse and inclusive trail user group to the proposed Swannanoa River Greenway?

Connect to schools, neighborhoods and businesses so that it can be used for commuting in addition to exercise and recreation

5 months ago

Connects to more neighbors along the corridor from Biltmore Village, Kenilworth and East View.

5 months ago

Connecting the greenway by sidewalks to the northern end of Caribou Rd (Shiloh) would increase diversity in this section of the trail.

5 months ago

Providing a safe and informative experience would encourage new users to explore these natural features of our diverse riverfront areas

5 months ago

Build it and they will come. Connect Black Mountain to Enka, Fletcher, Henderson County and a huge economic driver will be created.

5 months ago

1 Agree

Connections to other greenway sections which enable users a safe way to traverse Asheville without a car.

5 months ago

Image 1. Online Survey Response Summary (Cont'd)

What do you think would help bring new users and a more diverse and inclusive trail user group to the proposed Swannanoa River Greenway?

A safer way to continue from Carrier Park, crossing French Broad River, and along Meadow Rd to get to the SRG.

6 months ago

Connections to other greenways and neighborhoods, support for low income, people to have access to bikes and helmets , destination events for kids, events at stores along the way community events by nonprofit, and education on the benefits of exercise through the schools

6 months ago

Of course, any garden like additions would make the whole project an added attraction particularly for out of town visitors but cost and maintenance for such additions may militate against such additions.

6 months ago

Building it

6 months ago

Completely connected system of Greenways. Safety.

6 months ago

Again, practicality. Events with Boys and Girls Clubs, Y'a etc.

6 months ago

Image 1. Online Survey Response Summary (Cont'd)

Do you have any final comments, ideas, concerns or thoughts regarding the proposed Swannanoa River Greenway?

Option A is the best option. I realize it may be the most difficult option, but it gets users off of a tall bridge shared with traffic, and doesn't require people to ride on a very busy meadow road any longer than absolutely necessary.

6 months ago — 15 Agree

Option A is best. The least amount of interaction with cars the better.

6 months ago — 7 Agree

Option A is the only safe efficient option to allow non car users to move along this corridor.

5 months ago — 5 Agree

Clearly a challenging area to navigate so making it as safe and usable without car interactions will be a win!

6 months ago — 4 Agree

This will be a game changer for bike and pedestrian commuting and use for those in east asheville and beyond

6 months ago — 3 Agree

I agree option A is the most useful and I think the easiest to construct. The closer to the river the better

5 months ago — 2 Agree

Parking is already a challenge in the area so if this project could add capacity with a trailhead or on-street parking, that would be amazing!

Image 1. Online Survey Response Summary (Cont'd)

Do you have any final comments, ideas, concerns or thoughts regarding the proposed Swannanoa River Greenway?

Option A is the best, but a better connection to the other side of the tracks is needed near Biltmore Village. Whether it is along McDowell St or Hendersonville Rd depends on the connections planned from there. I would hope that there could be a continuous throughfare to the proposed Swannanoa River greenway. It would be beneficial to have a protected throughfare for bikers and pedestrians going towards downtown Asheville.

5 months ago

1 Agree

Just Do It! Thank you for offering this forum for expression of interest ...

5 months ago

1 Agree

This will be a long difficult project which will probably not be able to use because I might not live to see or use it. But this project will be a boom to our community when it get done. It will change to way many people travel in our community for local people and visitors.

6 months ago

1 Agree

option a is the most complex to make happen, but I think it should be the goal, for all the reasons already stated!

5 months ago

Option A is the only acceptable route. Any greenway that dumps bike and ped traffic onto the road or directly adjacent to the road without a buffer is an unacceptable design

5 months ago

Image 1. Online Survey Response Summary (Cont'd)

Do you have any final comments, ideas, concerns or thoughts regarding the proposed Swannanoa River Greenway?

The prospect of rediscovering the Swannanoa through this corridor is important. The river has been lost to roads and development. Creating the greenway on the river brings it back to public appreciation.

5 months ago

Pin didn't work for me, but I wish it could eventually connect east to Swannanoa.

5 months ago

Long term hopes of connecting the rest of the greenway systems along the river suggest that option A would be best. It would eliminate redundant work which B or C would end up as.

5 months ago

The roadways in this area are already crowded with vehicles. I think a design that minimizes anything on road or even with pedestrian crossings of the roads should be prioritized.

5 months ago

Option A. I don't care if it costs a billion dollars. I'm a terrible driver with poor vision and hearing. I should not be driving.

5 months ago

I prefer Option A.

5 months ago

Image 1. Online Survey Response Summary (Cont'd)

Do you have any final comments, ideas, concerns or thoughts regarding the proposed Swannanoa River Greenway?

Option A is the best!

5 months ago

This is an important project- can't wait to have it completed!

5 months ago

Hurry up and get it done before it gets more expensive and then you will say you have no money to do it.

5 months ago

Make it so!
Please.

5 months ago

I live in Oakley and love the bike path addition created a few years ago along the French Broad. It would be nice to extend that up to Thompson street because traffic is pretty scary down there.

6 months ago

The pin didn't work for me, but it would be great if you could access it from near the gray Eagle, spaces off of Biltmore Avenue so it's pretty accessible to people in town

6 months ago

Thank you! So needed!

6 months ago

Image 1. Online Survey Response Summary (Cont'd)

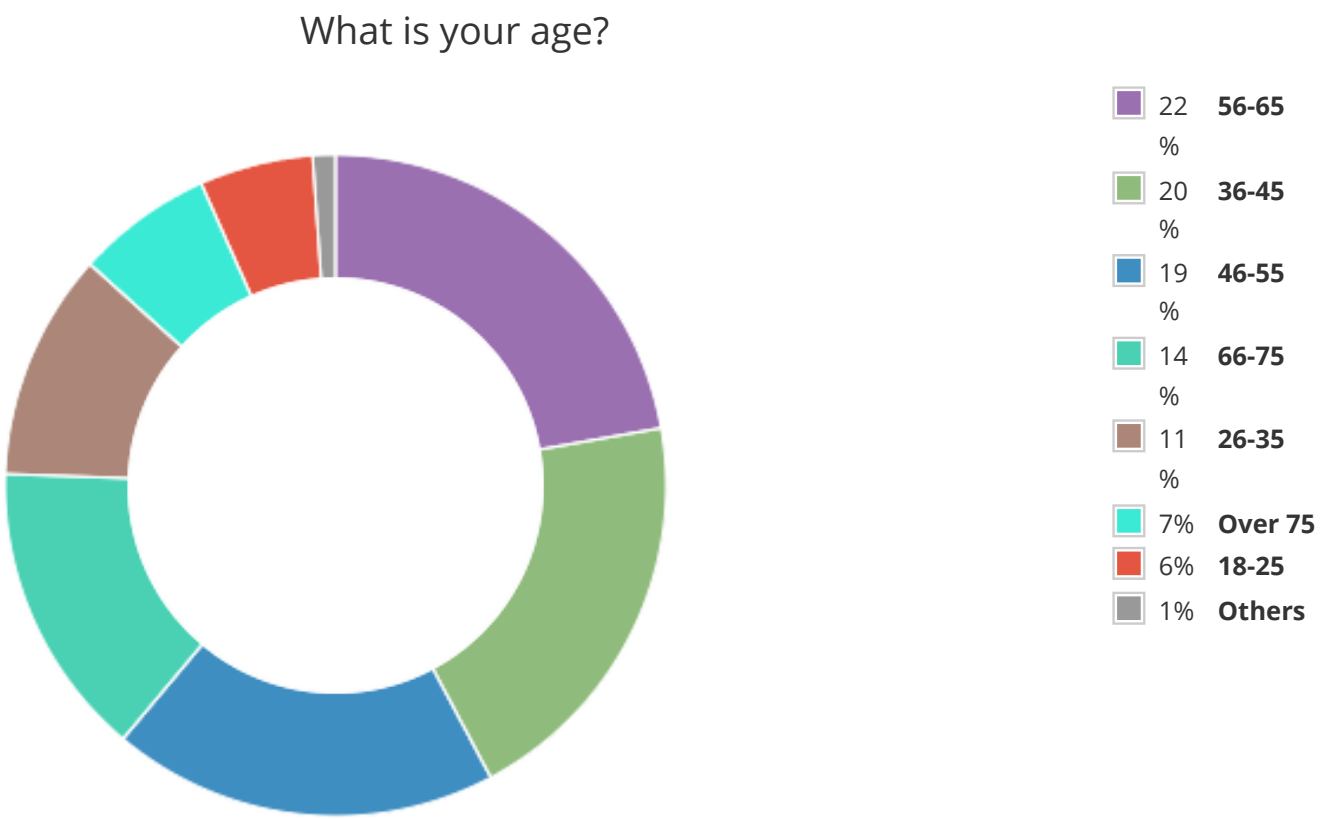
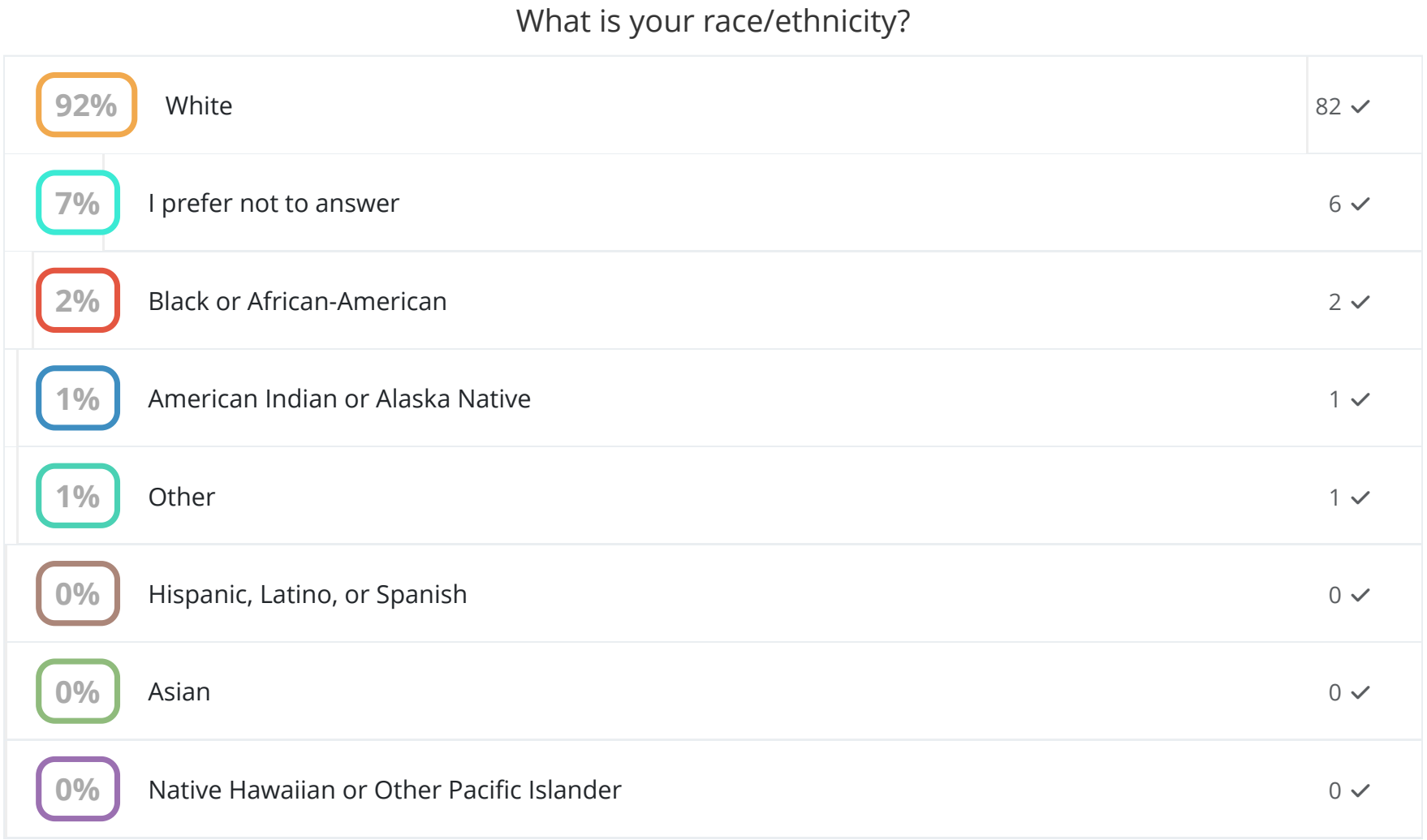


Image 1. Online Survey Response Summary (Cont'd)



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APPENDIX F

Project Screening Report



Table 6. NCDOT Project Development Screening Report

Project Development Screening Report

This report is for high-level screening purposes only. Staff and consultants must continue to adhere to NCDOT standard operating procedures including, but not limited to, ETRACS requests and field validations.

Report Date: 05/13/2024

Swann Feas IMD

Cultural and Env. Screening

County: Buncombe

Division: 13

Study Area Size: 104.5 Acres

Buffer Size: N/A

User Customized Screening

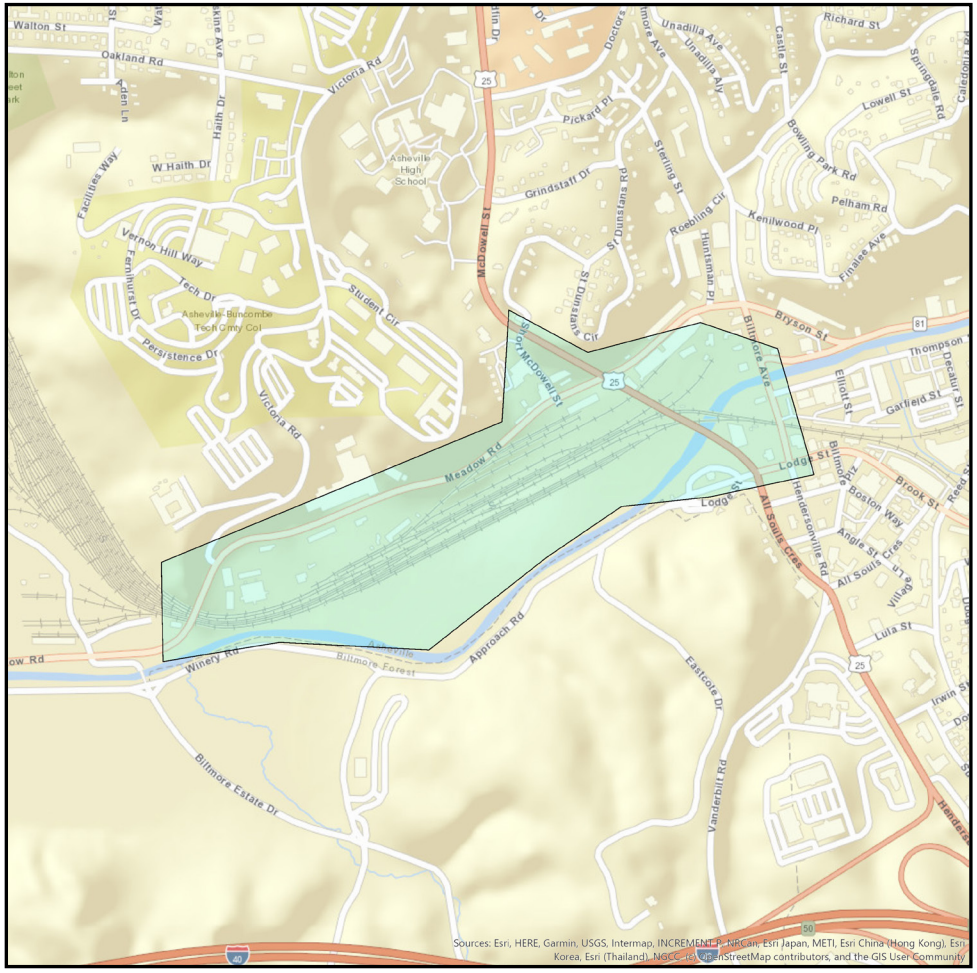


Table 6. NCDOT Project Development Screening Report (Cont'd)

EPA Level III Ecoregion:	Blue Ridge
EPA Level IV Ecoregion:	Broad Basins
HUC8:	06010105
Riparian Buffer:	No
CAMA:	No
Airport within 4 miles:	Yes

Human Environment

Cultural Resources	Feature Count	Total Coverage	Nearest Feature
NC Historic Preservation NR Points	1	N/A	25.2 ft
American Indian Reservations-Federally Recognized Tribal Entities	0	0 ac	0
NC Archaeological Site Hexagons	0	0	0
NCDOT ATLAS NC Cemeteries	0	0	683.7 ft

Table 6. NCDOT Project Development Screening Report (Cont'd)

Human Environment			
Geo Environmental	**Feature Count**	**Total Coverage**	**Nearest Feature**
NC DEQ Underground Storage Tank Incidents	6	N/A	42.8 ft
EPA NEPA Assist Toxic Releases (TRI)	3	N/A	1626.1 ft
NC Brownfields Boundary	2	1.9 ac	1131.6 ft
NC DEQ Inactive Hazardous Sites	2	N/A	1220.7 ft
NCDOT ATLAS NC Geo Environmental Sites of Concern Pre 2018	2	N/A	88.2 ft
NC Brownfields Locations	1	N/A	552.6 ft
NC DEQ Active Permitted Landfills	0	0	0
NC DEQ Coal Ash Structural Fills (CCB) (CLOSED)	0	0	0
NC DEQ Dry Cleaning Solvent Cleanup Act Sites	0	0	1426.6 ft
NC DEQ Hazardous Waste Sites	0	0	1414.0 ft
NC DEQ Non-UST AST Incidents	0	0	817.4 ft
NC DEQ Pre Regulatory Landfill Sites	0	0	0
Other Permitted Solid Waste Facilities (Open)	0	0	0
US EPA Superfund Sites	0	0 ac	0

Table 6. NCDOT Project Development Screening Report (Cont'd)

Human Environment			
Utilities	**Feature Count**	**Total Coverage**	**Nearest Feature**
WasteWater Service Areas	2	104.5 ac	N/A
Duke Transmission Easements	14	7.6 ac	207.7 ft
NC DEQ Groundwater Sources	0	0	0
NC Water Supply Intakes	0	0	0

Natural Environment			
Fish and Aquatics	**Feature Count**	**Total Coverage**	**Nearest Feature**
USACE Western NC Waters	6	5262.5 ft	36.9 ft
USACE Western NC Water Buffers	1	104.5 ac	N/A
NC DEQ Primary Fish Nursery Areas	0	0 ac	0
NC Shellfish Growing Area Classifications	0	0 ac	0
NC WRC Public Mountain Trout Waters	0	0 ft	0
NC WRC Public Mountain Trout Waters Impoundments	0	0 ac	0
NOAA Essential Fish Habitat	0	0 ac	0
Submerged Aquatic Vegetation 1981 to 2021	0	0 ac	0
USACE Trout Watersheds	0	0	1898.0 ft

Table 6. NCDOT Project Development Screening Report (Cont'd)

Natural Environment			
Threatened and Endangered	**Feature Count**	**Total Coverage**	**Nearest Feature**
NC Natural Heritage Element Occurrences	7	104.5 ac	1982.5 ft
Appalachian elktoe (Alasmidonta raveneliana) potential habitat	3	104.5 ac	44.4 ft
Bat Bridges Habitat Probability	3	N/A	1550.2 ft
ATLAS USFWS Critical Habitat (polygon)	0	0 ac	0
Carolina heelsplitter (Lasmigona decorata) potential habitat	0	0 ac	0
Carolina madtom (Noturus furiosus) Potential habitat	0	0 ac	0
Dwarf wedgemussel (Alasmidonta heterodon) potential habitat	0	0 ac	0
Eastern Black Rail Potential Habitat	0	0 ac	0
Green floater (Lasmigona subviridis) potential habitat	0	0 ac	0
Hawksbill Turtle Potential Habitat	0	0	0
James spinymussel (Pleurobema collina) Potential habitat	0	0 ac	0
Kemps Ridley Turtle Potential Habitat	0	0	0
Roanoke logperch (Percina rex) Potential habitat	0	0 ac	0
Roseate Tern Potential Habitat	0	0 ac	0
Rufa Red Knot Potential Habitat	0	0 ac	0
Spotfin chub (Erimonax monachus) potential habitat	0	0 ac	0
Tar River spinymussel (Elliptio steinstansana) potential habitat	0	0 ac	0
Yellow lance (Elliptio lanceolata) potential habitat	0	0 ac	0

Table 6. NCDOT Project Development Screening Report (Cont'd)

Natural Environment			
Water Quality	**Feature Count**	**Total Coverage**	**Nearest Feature**
NCDOT Hosted NC DEQ 303d and 305b Streams	18	5323.6 ft	34.3 ft
NC DEQ DRAFT 2016 DWR 303(d) Water Quality Assessment	0	0	0
NC DEQ High Quality Waters	0	0	0
NC DEQ Water Supply Watershed II	0	0 ft	0
NC DEQ Water Supply Watershed III	0	0	0
NC DEQ Water Supply Watershed IV	0	0	0
NC DEQ Water Supply Watersheds	0	0	0
NC High Rock Watershed Boundary	0	0 ac	0
NCDOT Industrial Outfalls	0	0	0
Wetlands	**Feature Count**	**Total Coverage**	**Nearest Feature**
USFWS National Wetland Inventory	1	2.8 ac	42.7 ft
NC DEQ Unique Wetlands	0	0	0
NCDOT ATLAS NC NRTR Preliminary Jurisdictional Wetlands	0	0	0

Table 6. NCDOT Project Development Screening Report (Cont'd)

Species Element Occurrences with federal status in study area

Scientific Name	Common Name	Federal Status	EO Status	Sensitive Record
Alasmidonta raveneliana	Appalachian Elktoe	E	Current	N
Crataegus pallens	Pale Hawthorn		Historical	N
Crotalus horridus	Timber Rattlesnake		Historical	Y
Erimystax insignis	Blotched Chub		Current	N
Helianthus occidentalis ssp. occidentalis	Naked-stem Sunflower		Historical	N
Percina burtoni	Blotchside Logperch		Historical	N
Vermivora chrysoptera	Golden-winged Warbler		Historical	N

Species Element Occurrences with federal status within 1 mile of study area

Scientific Name	Common Name	Federal Status	EO Status	Sensitive Record
Alasmidonta raveneliana	Appalachian Elktoe	E	Current	N
Crataegus pallens	Pale Hawthorn		Historical	N
Crotalus horridus	Timber Rattlesnake		Historical	Y
Erimonax monachus	Spotfin Chub	T	Historical	N
Erimystax insignis	Blotched Chub		Current	N
Gaylussacia orocola	Appalachian Dwarf Huckleberry		Historical	N
Helianthus occidentalis ssp. occidentalis	Naked-stem Sunflower		Historical	N
Percina burtoni	Blotchside Logperch		Historical	N

Table 6. NCDOT Project Development Screening Report (Cont'd)

Species Element Occurrences with federal status within 1 mile of study area

Scientific Name	Common Name	Federal Status	EO Status	Sensitive Record
Polyodon spathula	Paddlefish		Historical	N
Sarracenia jonesii	Mountain Sweet Pitcherplant	E	Current	Y
Trifolium reflexum	Buffalo Clover		Historical	N
Vermivora chrysoptera	Golden-winged Warbler		Historical	N

Report Metadata

Created by: TeresaKBuckwalter **Date/Time Executed:** 05/13/2024 3:01 PM

For definitions of terms and values please refer to the North Carolina Natural Heritage Program's documentation found at: **https://ncnhde.natureserve.org/help**. To obtain or request an official correspondence from the North Carolina Natural Heritage Program, please visit **https://ncnhde.natureserve.org/**.

This report is not an official correspondence from the North Carolina Natural Heritage Program.

Table 6. NCDOT Project Development Screening Report (Cont'd)

Report Disclaimer:

While the N.C. Department of Transportation strives to provide complete and accurate information, the data provided in this screening report are reported "as is." This report does not replace field data collection and data verification conducted by licensed professionals. No warranty is expressed or implied regarding the accuracy of available data for general or scientific purposes. NCDOT shall under no circumstances be responsible for any errors or omissions which may occur in these records, nor liable for any actions taken as a result of reliance upon any information contained within this web site from whatever source, or any consequences from such reliance.

Values displayed the Output Report: (N/A vs 0)
N/A: When this value is displayed it indicates that the calculation requested cannot be completed do to a limitation of the geometry. For example, you cannot calculate the area of a point.

0: When this value is displayed it means that the calculation was able to be performed with no limitations due to the input geometry, however the result was 0. For example, your study area did not overlap a hydrography feature, therefore the resulting overlap length is 0.

Total Coverage = Total number of linear feet (lines) or area (polygons) from a particular GIS layer that are contained within the user-defined project study area. N/A under Total Coverage refers to point layers as point layers cannot have coverage.

Nearest Feature = Distance from the boundary of the user-defined project study area to next closest feature (point, line, or polygon) for a particular GIS layer within the vicinity (1 mile) of the project study area boundary. Zero (0) under Nearest means there are no features in the project vicinity (1 mile buffer).

Availability of Web Services:

The layers referenced in this report utilize web services. If any web services were unavailable at the time of the report execution, related errors are noted in the following table:

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