Chapter 1: Introduction

Greenways and trails are not a new term or a new theme for Buncombe County, North Carolina. The area, along with much of the rest of Western North Carolina, has been a destination for outdoor enthusiasts who have enjoyed the region's trails for more than a century. Cities and towns within Buncombe County have invested considerable resources in planning for and building greenway systems.

As demand was growing for a countywide, comprehensive approach to greenways and trails planning, Buncombe County, through a variety of partnerships, undertook the effort to develop this Greenways and Trails Master Plan in 2011 and 2012. The results of that effort are summarized in this document and reflect a comprehensive evaluation of the need and ability for Buncombe County, through its partnering with communities, cities and towns, non-profit organization, land conservancies, and other government agencies, to realize a well-connected and integrated system of projects, programs and policies to promote greenways.

The Greenways and Trails Master Plan identifies nearly 102 miles of proposed routes to connect to many of the 13 miles of greenways already in place within town and city limits.

Buncombe County's unincorporated areas are growing and urbanizing, sometimes at a rate faster than the growth and urbanization of the municipalities within its boundaries. This is evident in urban- or suburban-scale development and the land use policies that promote these developments in unincorporated areas. It was also a theme of the County's Land Use Plan Update in 2006.

This type of urbanized growth represents a new trend for County governments, not only in North Carolina, but across the United States. As more residents live in these unincorporated and urban areas and businesses locate there to serve these residents, a desire often emerges from these communities for more amenities than have not historically been provided by a County government.

The residents and businesses enjoy the convenience of municipal water, sewer systems, trash collection, quick response times for fire service and law enforcement. An growing expectation in these urban area is for facilities that provide for movement of pedestrians and bicyclists, not just for recreational purposes but for transportation, running errands, relieving stress and offsetting the effects of obesity, attracting new businesses, and making communities more livable and marketable.

In unincorporated areas that are urbanizing and oftentimes have hybrid development patterns that blend urban and rural characteristics, greenways can provide the type of infrastructure to address this demand. Further, they can be cheaper and more easily-maintained than sidewalks while serving other purposes such as land conservation and stream buffer protection.

What is a Greenway?

The definition of greenways has changed over the last century as the function of what communities call greenways evolved from rings of open space surrounding urban areas to corridors that preserve natural settings around rivers, streams and other features, and to recreational and transportation corridors.

For purposes of this Plan, the definition of greenways is found in Charles Little's book *Greenways for America (1990)* and shown at right.

Greenway *(grēn' - wā) n*

1. *A linear open space established along either a natural corridor, such as a riverfront, stream valley, or ridgeline, or overland along a railroad right-of-way converted to a recreational use, a canal, a scenic road, or other route.*
2. *Any natural or landscaped course for pedestrian or bicycle passage.*
3. *An open-space connector linking parks, nature reserves, cultural features, or historic sites with each other and with populated areas.*
4. *Locally, certain strip or linear parks designated as a parkway or greenway.*

The ribbon-cutting for the trail at Alexander Park in 2011 brought about a new era for Buncombe County as it is the first greenway segment constructed and managed by the County.

Photo Credit: Buncombe County

Greenways & Trails Themes

Before the planning process began, Buncombe County identified several themes to examine during the course of the effort. An integral, over-arching theme was one of creating a meaningful, vibrant and affordable practice today that does not deplete the County's resources for tomorrow. This must be achieved in a fiscally responsible way and with an outcome that is compelling and understood by the people who use it and need to live with it. These themes are consistent with those found in the County's Land Use Plan and Sustainability Plan.

For a system of greenways and trails to contribute to a community's long-term viability, it needs to address the ideas summarized below. These themes inspired much of the Greenways and Trails Master Plan effort and informed recommendations.

Connecting infrastructure. By creating an infrastructure of a connected greenway and trails system, a community is allowing its citizens to use it as transportation infrastructure. By connecting the greenway system to the transit systems, a community allows a greater sense of sustainability by making commuting without a car more feasible. By making the commitment of connecting neighborhoods to commercial corridors, schools and other popular destinations, a community can use greenways as a viable form of transportation. When citizens can connect to their parks and other community gathering places via a greenway, they improve their well-being in many ways. Visitors who explore the area on bike or on foot spend money the same way as those who explore the area by car.

Environmental and ecological integrity. When a community invests in greenways, they are creating ecological buffers that protect water bodies, steep slopes and ridgelines as they promote public access to undevelopable lands. Exposing citizens to their local ecological resources develops an awareness of those resources and a desire to protect them. The environmental and ecological integrity of Western North Carolina is also a significant factor to the continued draw of tourists and businesses to the region, as environmental stewardship has long been a theme of the mountains throughout the 20th century and even before the Civil War.

Social and cultural vibrancy. By creating a well-designed greenway and trails system, a community provides equitable access to a better quality of life through health and wellness benefits. It gives the citizens and visitors the ability to enjoy nature and social aspects of their communities. Unincorporated areas of Buncombe County are more affordable than some areas of nearby cities and towns, which is a draw for families and individuals who may desire more walking and biking activities but cannot afford to live near existing trails.

Economic prosperity. Greenways are a proven economic tool. The third largest industry in Buncombe County is Tourism and Services. So this type of economic development is a very logical investment for a community. Places such as Abingdon, Virginia and Greenville, South Carolina have shown how a well-connected and quality greenways system can be an economic boon, attracting businesses specifically targeting trail users. In Asheville, New Belgium Brewing Company's decision to locate near the French Broad River and the planned Wilma Dykeman RiverWay was stated as a major influence in their site selection process and their ultimate decision to locate in Asheville instead of other east coast cities.

Why a Greenways & Trails Master Plan?

The conceptual framework of any planning effort—land use, recreation, economic development, housing, transportation or otherwise—should include a summary of present-day conditions and a long-range vision for how the community can address the unique characteristics of a specialized plan. It should be a goal of any such master plan to be "comprehensive" inasmuch as time and resources allow.

Being comprehensive entails incorporating the needs of citizens, government agencies and key stakeholders, including businesses, within an integrated examination of various projects, programs and policies that should be pursued to foster a regional greenways and trails system. Involvement of citizens, visitors, businesses and stakeholders is crucial to conducting this evaluation.

The concept of being regional in scope is critical in a comprehensive plan such as the Greenways and Trails Master Plan. Buncombe County represents a significant geographic area that could be classified as a region in and of itself; it is also the county with the largest metropolitan area in Western North Carolina. Trails such as the Point Lookout Trail in McDowell County already connect near Buncombe County's eastern boundary. The Mountains-to-Sea Trail runs the length of the Blue Ridge Parkway in Buncombe County and connects along the parkway to adjacent counties and other trails. Hundreds of miles of trails are located in the Pisgah National Forest.

A major premise of the Greenways and Trails Master Plan was an examination of what is known as the "5E's" of a planning effort with pedestrian and bicyclists themes. Recognition of the variety of pedestrians, bicyclists and other users, as well as the facilities they desire has led to this 5E approach that includes: Engineering, Education, Encouragement, Enforcement, and Evaluation.

Engineering represents what has been built or is planned to be built in the community to promote greenways, inclusive of developing recommendations for how they are built. Specific elements of the built environment include how pedestrian and bicyclists are considered in greenway corridors and in street design and construction that connects neighborhoods, downtown areas, natural features and others destination to the greenways. The interface with rivers, streams, parks, schools and natural areas are also important considerations in how greenways and trails are designed. Land use, including its design and placement, is a key element of a Complete Streets program to ensure pedestrians and bicyclists can access destinations along a well-designed and safe route.

Education is another key component for users of greenways and trails systems—bicyclists, pedestrians, equestrians and others—should be well-informed of safe methods to use greenways, how to interact with other users, and understand how to respect the environment surrounding greenways and trails. Various outreach programs and informational materials should be developed by a community to address all ages and all types of users.

Encouragement is inclusive of how a community promotes and encourages use and stewardship of its greenways and trails through volunteers, schools, non-profit organizations, land conservancies, bicycle clubs, organized events, promotional materials and marketing, maps of all types of greenways and trails, and Safe Routes to Schools programs. The development of other facilities such as sports fields, running tracks, river access points,

The 5E's associated with developing a greenway plan, which were incorporated into the Buncombe County Greenways and Trails Master Plan.

Frederick Law Olmsted could be considered the father of greenways in America through his work on incorporating natural features and trails into urban public works projects.
Portrait of Olmsted from the Biltmore Estate

fishing docks, velodromes, BMX tracks and mountain bike trails are also an element of encouragement that are associated with greenways in many communities.

Enforcement relates primarily to the knowledge base of the law enforcement community and volunteers who look after the greenway system to encourage safe use. Enforcement programs include targeted efforts to encourage user to safely share the trail.

Evaluation is the method by which a community understands and tracks the progress of its various projects, programs and policies to measure how well it is performing. Many communities track performance of their greenway system and progress of the community by examining use through regular counts of users, tallying how many children participate in greenway programs, how many volunteers are registered to help maintain the greenway system and track how it is growing.

Exhibit 1-1: The Back Bay Fens, Boston. Led by Olmsted in the 1800s, the Fens has timeless design that has accommodated modernization and changes in users over the course of 150 years.
Photo Credit: Don Kostelec

The Buncombe County Greenways and Trails Plan addresses each of these components in various chapters and builds upon them through other recommendations, such as economics and health impacts.

Understanding Greenway & Trail Users

Well-planned and well-designed greenways can stand the test of time as uses, users and influences change. The works of Frederick Law Olmsted are a perfect example. Olmsted was an influence in the Asheville region with the Biltmore Estate and Biltmore Village. In the late 1800s Olmsted recognized the needs of different users of the time and the potential conflicts of those users along their recreation and transportation routes.

In Boston's Back Bay Fens project—a public works and water resources management endeavor—Olmsted designed for three distinct pathways through and along the wetlands: a carriage path, a bridle path, and a foot path (Exhibit 1-1). Today, the foot path remains dedicated to pedestrians while the bridle path has transitioned to a route for bicyclists. The carriage path has been paved and is now a roadway for motorists.

Planning for and designing greenways is dependent on understanding the types of users who are most likely to use a trail. While we may not reach the level of usage that Olmstead foresaw in Boston, high use greenways in Buncombe County should consider more generous dimensions. Some pathways in Asheville may someday require a separation of uses or additional trail width. Such challenges are a sign of success of both the community and the greenway system.

These design considerations are not just related to the volume of use, but the type of use, the destina-

tions of users and their desired experience. Pedestrians travel at a speed of 2-3 mph. The 1991 Asheville Riverfront and Open Space Design Guidelines noted that greenways should be designed for 3 mph travel.

Along greenways bicyclists should be expected to travel at 12 mph or less and the rate of speed for pedestrians is best measured in feet per second instead of miles per hour. Riders on horseback may travel four to six miles per hour. The bicyclists or pedestrian sees things at a different scale and interact with one another in different ways.

Casual and/or less confident greenway users include a majority of the population and a wider range of people, pedestrians, bicyclists and children. They may walk, jog or ride infrequently or just enjoy being in the outdoors. They prefer paths with low volumes or fewer conflicts and are more likely to access greenways by car or low-speed streets. This group also includes bicyclists who ride for less strenuous recreation or with children.

Many programs that encourage greenway use are likely to be geared toward casual users. Population groups who are most dependent on walking or bicycling as a mode of transportation are included in this category. In order for this group to regularly choose walking and/or bicycling as a mode of transportation, a network of visible, convenient and well-designed facilities is necessary.

Experienced and/or confident greenway users are those who are comfortable walking, jogging or riding on almost any type of greenway, sidewalk or bicycle facility. These include long distance joggers, utilitarian and recreational bicycle riders of many ages; many with a high level of confidence using greenways and accessing them via busy streets. Inline skaters, BMX riders and unicyclists are also in this group. These users may prefer routes that lead them along low-speed, low-volume residential streets or greenways; or they seek alternative routes if they are more preferred than the most direct route to reach their destination. They are more likely to reach a greenway from their house or destination point via foot or bike.

Seniors generally require different accommodations and rely on different cognitive and perceptual abilities to recreate or travel. Fears over balance and obstacles impact how they use a greenway. Conflicts with other users traveling on the trail at higher speeds—even joggers and youth—can be intimidating. If they ride a bicycle they are more likely to ride on a greenway than on a street. They travel at a slower pace and are less able to overcome hilly terrain, either through physical means or mental determination. The reaction time of seniors is also slower than younger users as is their judgment of speed and distance of other users and vehicles at locations where greenways intersect a street.

Children are similar to seniors in their physical abilities and are further limited by the degree to which their parents will allow them to use a greenway, particularly when alone. Children have greater difficulty understanding the level of danger posed by the roadway system and other motorists, and might not have the on-road knowledge of how to operate a vehicle. Therefore, greenways become a corridor of choice to learn how to ride a bike, play, and spend time with other family members. With parents and health organizations promoting physical activity in any form, greenways and the destinations they connect are a critical influence to help combat childhood obesity and related health problems.

Greenway users are as varied as the settings in which the trails are located. Width, surface treatments, amenities and connectivity to destinations will vary based on the type of users and the desired impacts of the greenway.

Photo Credit: Don Kostelec

The Wilma Dykeman RiverWay Master Plan (2004) remains one of the key guiding documents for greenway development and environmental protection in the French Broad River watershed. Many of the Priority Corridors in the Buncombe County Greenways and Trails Master Plan have direct connections the existing and planned sections of the RiverWay.

Equestrians have difficulties finding suitable trails for riding in urban or developing areas and some trails forbid their use over fears of conflict with other users. Good design and strategic evaluation of where equestrians users would like to ride can help overcome worries over user conflicts. Equestrians prefer natural or soft surface trails. Where space allows, a parallel tread along a paved trail is also a preferred surface for these users. Understanding the dimensional needs of equestrians is important in parking areas as well as along the trail, as space for horse trailers and the turning radius in those parking areas is an important consideration.

Motorized users can vary greatly and may come in conflict with non-motorized trails, particularly for off-highway vehicles (OHV) in rural or forest settings. Roads that connect to many hiking trails in the National Forest may be used by a variety of modes both motorized and non-motorized. For purposes of the Greenways and Trails Master Plan, it is assumed that motorized users are prohibited from using the corridors that will be managed by Buncombe County. Where trails and greenways intersect with trails allowing motorized use, signage and markings become increasingly important to raise awareness of conflicting modes.

Past Planning Efforts

Several existing plans informed the findings of the 2012 Greenways and Trails Master Plan. Some efforts were directly incorporated into this plan, such as corridor-specific master plans or feasibility studies, while others helped establish the theme of the plan. Below is a summary of the past efforts that helped lay the foundation for this Plan.

Wilma Dykeman RiverWay Master Plan (2004). The RiverWay plan sets the tone for development of a regional greenway system, amenities and other enhancements—both for the built and natural environment—along the French Broad and Swannanoa Rivers. Themes of the Plan included: recreation, health, education, transportation, economic development and environment. The RiverWay Plan also serves as demonstration plan for the French Broad River watershed to be replicated elsewhere in the region. The RiverWay is one of eight Priority Corridors in the Buncombe County Greenways and Trails Master Plan; the other seven Priority Corridor have either direct connections or linkages to the RiverWay. Design standards developed for the RiverWay Plan were used as a foundation for design typologies identified in this Greenways and Trails Master Plan. RiverLink, a non-profit organization that helps manage efforts to promote and protect the French Broad River watershed, led the RiverWay Plan and it was adopted by Buncombe County.

Buncombe County Comprehensive Land Use Plan Update (2006). The Land Use Plan was updated in 2006 in response to rapid growth in the County and urbanization around existing town and city limits since its development in 1998. The Update built upon the objectives of the 1998 plan related to growth:

- Continue existing trends for a broad mix of land uses; enhance environmental qualities to preserve natural and scenic areas;
- Ensure transportation/infrastructure patterns following logical corridors and were easily-managed; and
- Strengthen economic development by creating

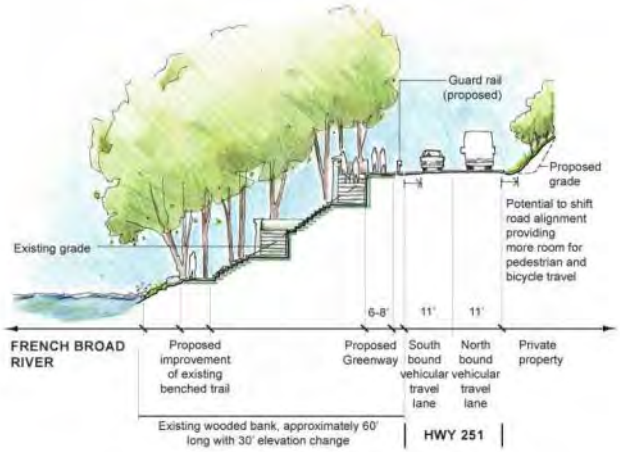
accessible commercial centers.

The Land Use Plan Update references concepts to link parks and greenways across the County and identified growth "hubs" that were conducive to this type of connectivity as well as linkages to schools. The recommendations for Priority Corridors in the Greenways and Trails Master Plan are concentrated in those areas identified the Land Use Plan Update maps of having medium density, located within future MSD service boundaries, and/or in areas proposed for what is noted as a "Primary Service Area" for what is now detailed zoning within those areas.

Land of Sky Regional Council Regional Trails Master Plan (2008). The plan, funded through the North Carolina State Trails Program, covered Buncombe, Haywood, Henderson, Madison and Transylvania Counties to identify existing greenways and trails and generate a map of ideas for future trails. The Trails Master Plan map includes trails, open space, bicycle routes and proposed regional and local trails. Included in Buncombe County were trails along the French Broad River; a Swannanoa River trail connecting Asheville to Black Mountain and Swannanoa with a connection to McDowell County; and connections to the Blue Ridge Parkway, Pisgah National Forest, and the Mountains-to-Sea Trail.

The French Broad River and Swannanoa River routes were the subject of feasibility studies conducted by Buncombe County in 2010 (summarized below). The Buncombe County Greenways and Trails Master Plan used the maps produced from these efforts as the starting point for identifying greenway and trails routes. Some routes were refined based on field observation and evaluation of Priority Corridors and long-term trails mapped for the Plan.

Buncombe County Parks & Recreation Master Plan (2008). The Buncombe County Parks, Greenways and Recreation Services Department (then the Parks and Recreation Services department) drafted the master plan to provide an overview of the department actions as well as an outline of current and future department needs to serve as a strategic plan through 2017. The report includes documentation of facility inventory, statistics of past program attendance, community survey information, focus group recommendations, and agency partnership recommendations for future development within the department. The Plan first identified the need for the County to employ a planner whose main responsibility was overseeing development of greenways.



The French Broad River / NC 251 Greenway Feasibility Study examined options for a route along the east side of the River from the City of Asheville to the Madison County line. The study include conceptual design options for placing the greenway along the route in consideration of notable constraints in both the built and natural environment.

Photo Credit: Don Kostelec

French Broad River / NC 251 Greenway Feasibility Study (2010). This corridor analysis began at the planned northern edge of the Wilma Dykeman RiverWay to identify a greenway route to the Madison County line. This route follows the historic Drovers Road and Buncombe Turnpike that served as a farm-to-market route connecting eastern Tennessee and western North Carolina to other markets in the Southeast in the 1800s and early 1900s. A key influence on this planned corridor is the constrained area east of the French Broad River that will require a greenway to be constructed between the river, NC Highway 251 and steeps slopes / rock out-cropping adjacent to the highway. The west side of the river is more constrained by the presences of the Norfolk Southern Railroad tracks. The planned French Broad River / NC 251is

"Because sustainability is defined in many different ways, it was important for us to develop an understanding of sustainability that speaks specifically to Buncombe County.

- Sustainability Plan for Buncombe County

also identified as one of eight Priority Corridors in this Plan.

US 70 / Swannanoa River Greenway Feasibility Study (2010). The study evaluated route options along or near the Swannanoa River and US 70 from East Asheville and the Wilma Dykeman RiverWay to the eastern edge of Buncombe County. This included connections to Azalea Park, Warren Wilson College, the Swannanoa Community, Black Mountain, Ridgecrest, Montreat and the Point Lookout Trail in McDowell County. The study along the 17-mile route evaluated conceptual alignments, connections to nearby schools and parks, challenge areas in relation to US Highway 70 and other streets, the influences of sewer easements and the Norfolk Southern Railroad. Themes such as Complete Streets, economic growth, environmental impacts and the impacts to private property were also studied. The US 70 / Swannanoa River Greenway route is included as one of the eight Priority Corridors identified in the Greenways and Trails Master Plan.

French Broad River MPO 2035 Long Range Transportation Plan (2010). The Long Range Transportation Plan (LRTP) includes pedestrian, bicycle and greenways themes and is a required document for metropolitan areas with a population greater than 50,000. Buncombe County is part of a three-county metropolitan area covered by the plan (Haywood and Henderson Counties are the other two) which sets a vision for the region's transportation system over the next 20 years. The LRTP contains a summary of key federal policies and the North Carolina Department of Transportation's (NCDOT) Complete Streets policy. For greenway projects to be eligible for transportation-based federal funding managed through several NCDOT-managed funding sources, they must be consistent with the findings of the LRTP. This does not mean that specific greenways have to be identified in the LRTP, but they must fit the major ideas and themes of policies or corridors identified for improvements within the LRTP. The Project Recommendations chapter of the LRTP includes several greenway projects across Buncombe County, including approximately $3 million for the planned US 70 / Swannanoa River and French Broad River / NC 251 greenways. Another $10 million is allocated in the long-range timeframe for general bicycle, pedestrian and greenways investments across the three counties.

Sustainability Plan for Buncombe County (2012). Development of the Sustainability Plan was concurrent with the Greenways and Trails Master Plan. Buncombe County and a group of Sustainability Partners crafted the vision and a mission for the Sustainability Plan to guide both County Government and the community in the development of goals, objectives, indicators, outcomes, and strategies for implementation of the Plan. The Vision included themes of:

- A Sense of community through public engagement;
- A healthy, safe, well-educated, and thriving community with a sustainable quality of life;
- Environmental stewardship through conservation, preservation, and restoration of resources;
- A community and environmentally-conscious economy that is stable and diverse; and
- A strong sense of place with efforts to preserve our distinctive landscape and culture. Each of

these themes has strong parallels to the themes that drove the Greenways and Trails Master Plan. Specifically, the Sustainability Plan identifies an accessible, multi-modal, and efficient transportations system that includes greenways, Complete Streets, outreach programs similar to those targeted for greenway users, and fast-tracking of development that includes multi-modal linkages.

Municipal Greenway, Bicycle and Pedestrian Plans. Several municipalities in Buncombe County have developed plans for greenways, bicycle facilities and sidewalks. Specifically, the greenway plans for Asheville, Black Mountain and Woodfin were used to develop Priority Corridors for the Greenways and Trails Master Plan, prioritizing linkages to the existing or planned investments. It was noted during development of the Plan that community gateways along greenways were important and that the design of these gateways and routes through communities should be allowed to reflect the look and feel of the community.

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Chapter 2: Buncombe County Context

The communities throughout Buncombe County are as diverse as its landscape. Some sectors of the County remain in a rural and natural state, with farmlands and pasture abutting steep mountain grades. Other areas have experienced rapid growth and, while not within city or town limits, have urban centers, neighborhoods and other commercial areas. The cities and towns of Buncombe County—Asheville, Biltmore Forest, Black Mountain, Montreat, Weaverville, and Woodfin—each have qualities that contribute to the overall feel of the County and the region.

Factors such as terrain, historic landmarks and proximity to rivers and streams make each community unique while adding to the challenges of realizing a regionwide, inter-connected greenway system. The challenges faced in planning for and constructing greenways and trails systems in Western North Carolina can be traced back to ancient eras when the network of streams and rivers carved valleys throughout the southern Appalachian Mountains. Travel by any mode—whether for transportation or recreation--in Western North Carolina has always been difficult, as the far-traveling landscape architect Frederick Law Olmsted noted in the late 1800s that the stage roads in Western North Carolina were "as bad as anything, under the name of road, can be conceived to be."

The mountains and waterways of this region will continue to provide the likely course for greenway corridors to connect cities, schools, downtown areas and natural features. The routes to connect our communities will become popular destinations in and of themselves and provide opportunities for a fully integrated system of primary greenway facilities.

Today recreationalists flock to Western North Carolina to ride the Blue Ridge Parkway, experience mountain vistas, hike numerous trails, and wheel down single track mountain bike trails that rank among the best in the United States. The area is also a hub for artists and culinary endeavors. This combined with the cultural influence of like-minded residents who reside in Buncombe County and contribute to our active lifestyles, complement a strong tourism-based economy and create a context within Buncombe County that should help naturally promote a stronger greenway culture.

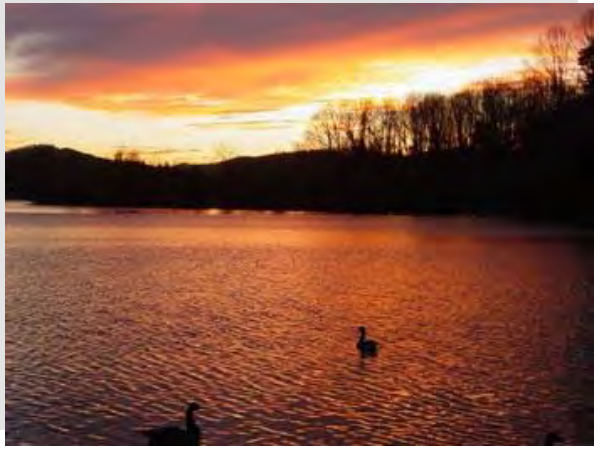
This chapter reflects the factors that contribute to the uniqueness of communities across Buncombe County. It also profiles the feedback gathered during the public meetings and stakeholder workshops in 2011 and 2012.

There is an expectation among area stakeholders that Buncombe County, its municipal partners, non-profits, land conservancies and other government agencies will act as a unified voice to create a regional greenways system.

Community Influences & Destinations

The following pages contain brief profiles of Buncombe County communities, cities and towns. These profiles were developed through stakeholder workshops, seven public meetings held throughout the County, and an online survey that asked respondents to name destinations in their community and across Buncombe County that they would like to access via a greenway.

Influences are major features of a community that can impact how and where a greenway is constructed (e.g. a river or major highway). **Destinations** are places people may travel to or start from to use a greenway. Some influences may also be destinations or have destinations near them.



Sunset over Lake Julian near the Arden community in south Buncombe County. The Lake Julian Greenway Corridor is one of the planned Priority Corridors identified in this Plan.

Photo Credit: Buncombe County

Community Influences & Destinations

Alexander

Influences & Destinations

- French Broad River
- Alexander Park & Greenway Trail
- Marshall & Madison County
- NC 251 / Riverside Drive bicycle route
- Ledges Park
- Mountain bike trails
- Walnut Island

Arden

Influences & Destinations

- Lake Julian & Park
- YMCA Reuter Center & Biltmore Park
- Former Brookwood Golf Course
- Bent Creek Trails & Blue Ridge Parkway
- Jake Rusher Park
- Royal Pines Park
- French Broad River
- Fletcher Park
- Airport area shopping centers
- Roberson area schools

Biltmore Lake in the Enka community.

Walking trail and playground at the Big Ivy Community Center near Barnardsville.

Barnardsville & Big Ivy

Influences & Destinations

- Rural development, farms and pastureland
- Big Ivy Community Center
- Barnardsville township center
- Barnardsville Elementary School
- Ivy River
- Coleman Boundary
- Hiking trails near Blue Ridge Parkway
- Navitat

Enka - Candler

Influences & Destinations

- Buncombe County Sports Park
- Sand Hill - Venable Elementary School
- Pisgah School & Candler Elementary
- Enka High School & Middle School
- AB Tech, Enka Campus
- Hominy Creek
- Beaverdam Community Center
- Biltmore Lake
- Bent Creek trails

Community Influences & Destinations

Fairview

Influences & Destinations

- Rural development, farms and pastureland
- Blue Ridge Parkway
- Fairview Elementary School
- Cane Creek Middle School
- Fairview Public Library
- Reynolds High School & Middle School
- Cane Creek
- US Highway 74A & NC Highway 9
- Hickory Nut Gap

Erwin, Leicester, Sandy Mush

Influences & Destinations

- Rural development, farms and pastureland
- Erwin Schools Complex
- Leicester School
- Leicester Library
- French Broad River
- Sandy Mush Game Lands

Greenway connecting Carrier Park and Hominy Creek in West Asheville.

Facilities at Owen Park in the Swannanoa community.

Swannanoa

Influences & Destinations

- Swannanoa River
- Warren Wilson College
- Owen Schools
- Village center
- Grovemont community & library
- Bee Tree Lake
- Owen Park & Pool
- US Highway 70
- Blue Ridge Parkway
- Azalea Park & Nature Center

Asheville

Influences & Destinations

- Downtown & River Arts District
- French Broad & Swannanoa Rivers
- Carrier Park & West Asheville
- Biltmore Village & Biltmore Estate
- UNC Asheville & Beaver Lake
- AB Tech Main Campus
- Existing Greenways & Wilma Dykeman RiverWay & Blue Ridge Parkway
- Haw Creek, Nature Center & Azalea Park
- City Neighborhoods

Community Influences & Destinations

Biltmore Forest

Influences & Destinations

- Large estate lots
- Blue Ridge Parkway
- Biltmore Estate
- Mountains-to-Sea Trail
- Carolina Day School

Black Mountain

Influences & Destinations

- Downtown & Lake Tomahawk
- Greenways, parks & garden
- Montreat College & The Oaks
- Swannanoa River
- Elementary & Primary School
- Ridgecrest
- Point Lookout Trail
- Retreats & camps
- Catawba Falls & Headwaters
- NC Highway 9 & US 70

Montreat

Influences & Destinations

- Montreat College
- Hiking trails
- Mt. Mitchell
- Downtown Black Mountain
- Point Lookout Trail
- Ridgecrest
- Black Mountain

Point Lookout Trail to Old Fort.

Weaverville

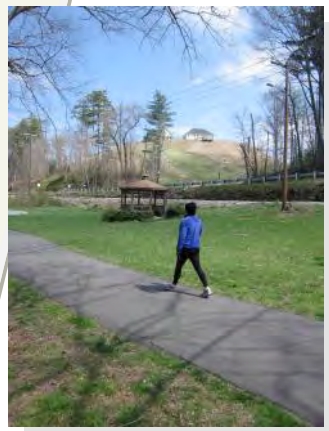
Influences & Destinations

- Downtown Weaverville
- Nature Park
- Lake Louise & Reems Creek
- Vance Birthplace
- Blue Ridge Parkway
- North Buncombe schools
- Woodfin & North Asheville
- Windy Gap
- French Broad River

Woodfin

Influences & Destinations

- YMCA Woodfin
- Woodfin Elementary School
- Riverside Park
- French Broad River
- Weaverville & North Asheville
- Woodfin Community Center
- Reynolds Village



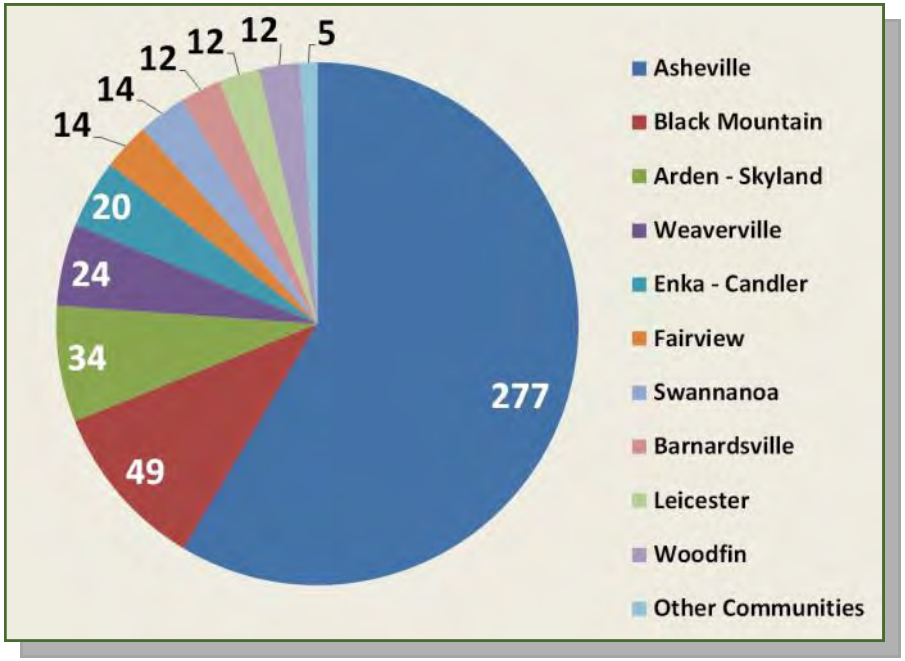
Greenway at Woodfin's Riverside Park.

Community & Stakeholder Outreach

A five-pronged approach to gathering input from across Buncombe County was employed to reach as many communities and diverse populations as possible. While new technology such as online surveys and social networking allow citizens to provide commentary on specific aspects of the Greenways and Trails Master Plan, Buncombe County felt it imperative that citizens and stakeholders be engaged one-on-one through a variety of methods. The five-pronged approach included:

- **11 Public Meetings**, which drew more than 300 citizens, were held in October 2011 and May 2012 at:
  - Arden (x2);
  - Asheville (x2);
  - Barnardsville;
  - Black Mountain;
  - Enka;
  - Fairview;
  - Leicester; and
  - Weaverville (x2).
- **Two-Day Stakeholders Workshop**, which drew 138 invitees from several interest groups across the region, and included sessions for:
  - Elected officials & town managers;
  - Economic development;
  - Health & wellness;
  - Maintenance & policy;
  - Recreation & programs;
  - Sustainability & environment; and
  - Transportation & connectivity.
- **Information Booths at 12 public festivals** throughout the summer and fall of 2011;

Exhibit 2-1: Geographic distribution of survey respondents



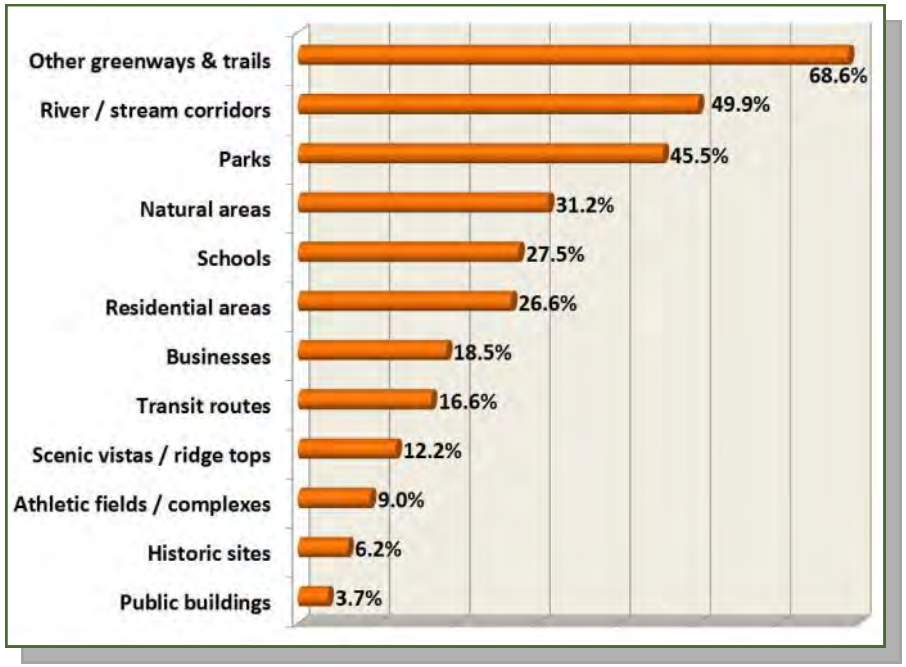


Exhibit 2-2: To what places do you think greenway connectivity should be a priority?

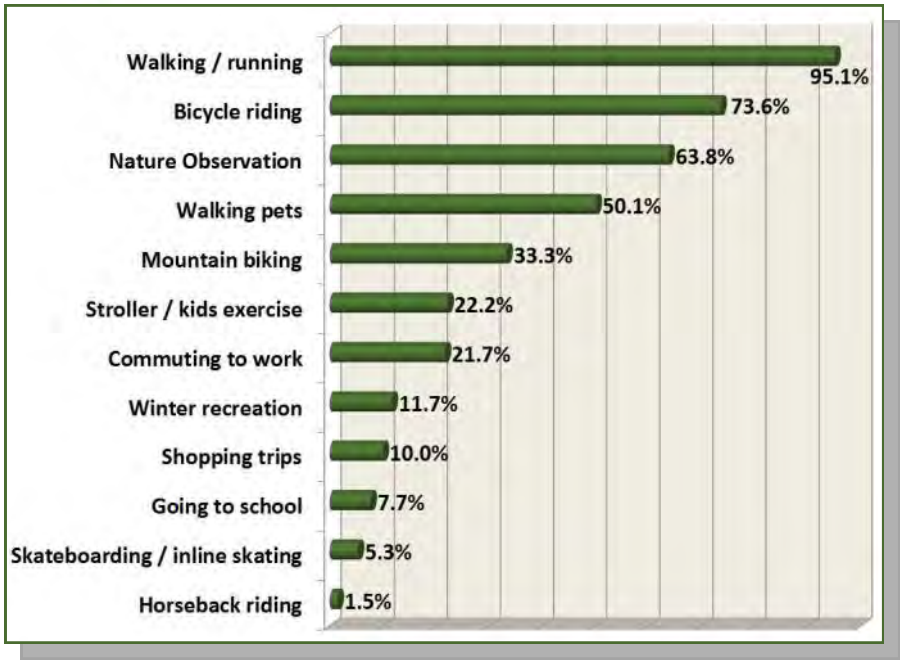
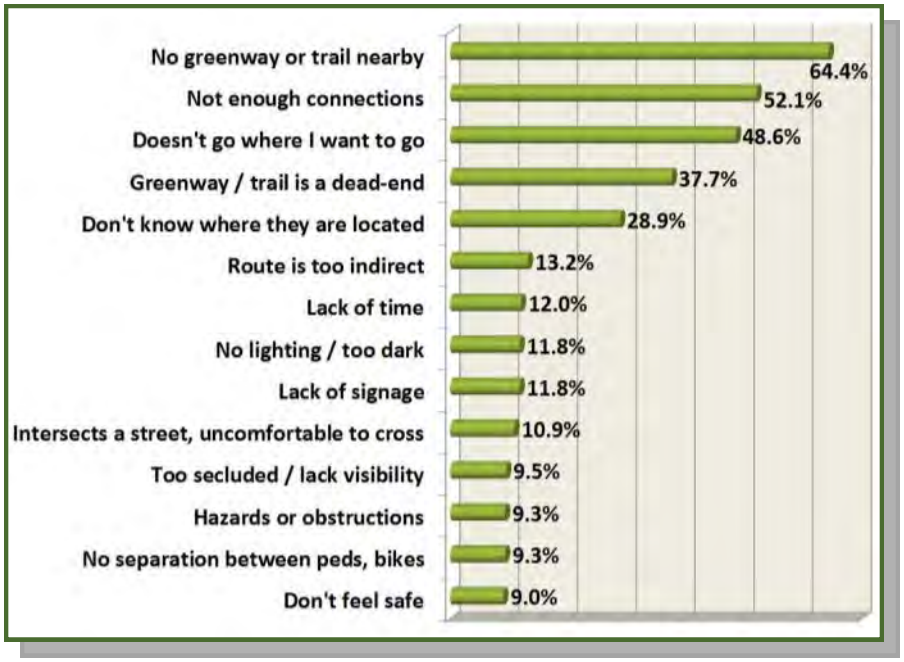


Exhibit 2-3: What activities influence your use of greenways?

Exhibit 2-4: What factors deter you or your family from using a greenway?



- **Online Survey**, which was completed by more than 500 respondents and disseminated through information booths and public forums, Facebook, websites for communities and organizations, and through announcements.
- **Greenways, Please**: A marketing campaign consisting of newspaper columns, public service announcements, a promotional video, social media and photo campaign with 700 images submitted by citizens that drew attention to Connect Buncombe and the Plan throughout the process.

Survey Results

The survey conducted as part of the Greenways and Trails Master Plan was intended to gather specific information from Buncombe County residents and visitors as to what types of places they would like to access via a greenway, with a strong emphasis on their desires for greater connectivity.

Exhibit 2-1 illustrates the geographic distribution of the more than 500 respondents to the survey, of which more than half were from the City of Asheville. Black Mountain, Arden-Skyland, Weaverville and Enka -Candler each had between 20 and 40 respondents.

The survey included 15 questions with a variety of formats to gauge specific interest in projects, programs and connectivity to various destinations, including general desires and community-specific locations. For exhibits 2-2, 2-3, and 2-4, respondents were allowed to pick multiple preferences. Most notable were these responses:

Exhibit 2-2: To what places do you think greenway connectivity should be a priority? Recreational areas and natural areas were the primary general destinations, with schools, residential areas and businesses comprising leading commute destinations.

Exhibit 2-3: What type of activities influence your use a greenway? The leading responses were related to walking, running, bicycling and nature observation. Respondents also strongly noted they use greenways for reaching a destination such as work, schools or shopping areas.

Exhibit 2-4: What factors deter you or your family from using a greenway? The lack of greenways or trails near a residence or business and a lack of connectivity between existing greenways were cited as the main deterrents of greenway usage. A few respondents cited concerns about safety or hazards as reasons that would discourage them from using a greenway.

Respondents were also asked to identify three specific destinations within their community and five specific destinations elsewhere in Buncombe County they would like to access via a greenway or trail. The purpose of the two questions was to encourage them to consider both local and regional attractors. As noted, these individual responses were used to generate the influences and destinations noted in the community profiles. Additionally, Exhibit 2-5 shows the top destinations identified by the more than 500 respondents.

Stakeholders: What We Heard

The two-day stakeholders workshop gathered a diverse set of stakeholders to answer a subject-specific focus question about greenways. Participants were asked to prioritize their responses, which were discussed during each subject area session. The results of the subject area sessions were then cross-tabulated and synthesized into major themes that constitute the major objectives for Buncombe County and its partners to pursue a regional greenways and trails system. The themes of this synthesis are included on the following pages and are listed in no particular order. Throughout development of the Buncombe County Greenways and Trails Plan these themes served as guidance in developing various sections of the Plan and to ensure the results of the plan were consistent with what we heard from stakeholders and citizens.

Exhibit 2-5: Top Destinations Desired for Greenway Connectivity, as Identified by Survey Respondents

Destinations	Responses	Destinations	Responses
West Asheville	112	**Riverside Drive**	27
Blue Ridge Parkway	108	**Beaver Lake**	25
French Broad River	91	**Marshall**	19
Bent Creek	89	**Tunnel Road**	18
Downtown Asheville	88	**Biltmore Estate**	17
River Arts District	81	**Swannanoa**	17
Swannanoa River	60	**Weaverville**	15
Schools	52	**East Asheville**	13
Carrier Park	49	**AB Tech**	12
UNC Asheville	49	**Biltmore Park**	12
Nature Center & Azalea Park	45	**South Asheville**	12
Arboretum	44	**Lake Tomahawk**	11
Black Mountain	42	**North Asheville**	11
Grocery Store	36	**Ridgecrest**	10
Biltmore Village	33	**Farmers Market**	9
Warren Wilson College	32	**Lake Julian**	9
Montreat	29	**Buncombe Co Sports Park**	8

What we heard...

Context & Identity

- Acknowledge community identity and placemaking potential of greenways.
- Build upon community culture and themes.
- Incorporate art
- Engage youth & older adults.
- Recognize that support will vary among communities.
- Create "cool" communities.

Partnerships & Economic Development

- Develop a plan of action to keep the public sector engaged.
- Define what is already in place.
- Know the needs of the private sector.
- Reach out to schools, non-profits and land conservancies.
- Incentivize greenways investment.
- Work with law enforcement.

Access & Connectivity

- Provide direct connections from greenways to gathering places.
- Enhance neighborhoods through greenway connectivity.
- Prioritize schools, parks and natural areas.
- Understand the need for safety features at access points.
- Connections to transit are increasingly important.

Land Acquisition & Management

- Identify appropriate techniques.
- Develop a fee in lieu program for greenways development.
- Place requirements on development as with sewer, roads and water.
- Eminent domain is not preferred.
- Work to preserve large parcels.
- Get ahead of growth.

Funding Strategies

- Pursue a dedicated source of revenue.
- Communities should recognize a common interest in funding greenways.
- Identify less-restrictive (e.g. non-federal) funding sources.
- Coordinate funding to lessen burden on small towns.
- Development-based requirements can allay some costs.

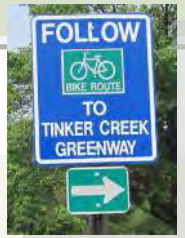
Health Impacts

- Be equitable by constructing greenways in communities that benefit the most.
- Build upon the creativity, spirituality & salubrious lifestyles of people.
- Understand the impacts of safe practices & design on health.
- Recognize the positive role greenways play in stress relief, family dynamics, & mental health.
- Design and access matter.

What we heard...

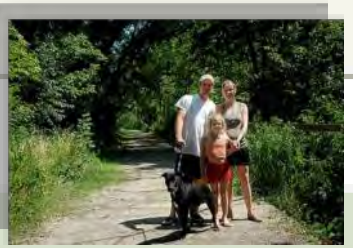
Design

- Consider life-cycle maintenance costs in design and construction.
- Understand the need for visibility and how that relates to security for users.
- Explore different surface types based on context.
- Use local materials and green techniques.
- Recognizing the proper context for amenities is important.



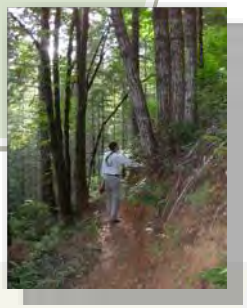
Environment & Ecosystems

- Enhance floodplains and riparian zones.
- Restore streams along greenway routes.
- Connect people to natural features.
- Preserve "wild areas" and design greenways accordingly.
- Identify partners who can provide environmental benefits along with greenways and trails.



Responsibility & Liability

- Define how it affects towns, partners, volunteers and others.
- Develop agreements to lessen liability for private property owners.
- Establish, follow, and enforce policies for use.
- Protect volunteers.



Programs & Education

- Reach out to people of all ages and abilities.
- Build upon existing programs led by various non-profits.
- Coordinate with schools, universities, and colleges.
- Create demonstration projects.
- Develop training programs for greenway usage & maintenance.

Volunteers & Advocacy

- Keep volunteers and advocates engaged.
- Develop an Adopt-A-Trail program in cooperation with schools, retreat centers, neighborhood associations and non-profits.
- Actively promote greenways through various channels.
- Understand the impacts of tourism.

Utilities, NCDOT & Railroads

- Ensure these entities understand a desire to make them a partner.
- Identify easements and right-of-way that can benefit greenways.
- Engage them early in the planning and design of new greenways.
- Make sure they are at the table.
- Understand their business model.

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Chapter 3: Priority Greenway Corridors

The public and stakeholder involvement efforts for the Buncombe County Greenways and Trails Master Plan yielded a myriad of new ideas for greenway corridors connecting communities across the county and to adjacent counties. The ideas for placement of new trail connections generated by citizens and organizations were closely aligned with the key tenets of the vision for Connect Buncombe and the Parks, Greenways, and Recreation Services Department.

The challenge for County staff, planning partners (known as the Active Oversight Committee) and the consultant team overseeing the Plan was to then organize the ideas for new greenways and trails into conceptual corridors. The concepts outlined in this chapter are intended to prepare Buncombe County for further study along Priority Corridors conceptualized for implementation over the next 20 years. They reflect a combination of ideas, field assessments and consideration of known constraints for the areas in which they are proposed.

The 102 miles of Priority Corridors identified in this chapter are not in priority order to allow Buncombe County capitalize on any available opportunity to construction feasible segments of these corridors. The variety of funding sources, current economic conditions, and land ownership will impact the priority of these corridors.

Evaluating Proposed Greenways

Ideas and concepts for greenways planned throughout the region were conceived in efforts by Buncombe County, municipalities, Land of Sky Regional Council, state trails plans, the Blue Ridge Parkway and the input of numerous agencies and organizations. From these efforts, a map of past ideas and concepts for greenways was established to be refined through public and technical processes.

Three sets of completed studies and plans provided the foundation for this analysis:

- Land of Sky Regional Council's Regional Trails & Open Space Plan (2008), which also yielded the initial 2009 Buncombe County Greenways and Trails Plan;
- Municipal greenway planning efforts in Asheville, Black Mountain, Montreat and Woodfin; and
- Three detailed corridor studies: The Wilma Dykeman RiverWay Plan; The US 70 / Swannanoa River Greenway (Exhibit 1-1); and the French Broad River / Highway 251 Greenway.

Several new greenway corridor ideas were then posed by the public and stakeholders in 2011 and 2012 via public meetings across Buncombe County; a September 2011 stakeholder workshop; numerous festivals throughout the County and the online survey. Some ideas confirmed past planning efforts while others established new ideas for greenway connectivity.

Maps of the ideas for future corridors were produced for analysis and reviewed by the project team, County staff and the Plan's Active Oversight Committee. In general, the corridor ideas generated during the outreach process followed logical routes along rivers and streams as well as primary and secondary roadways to connect major destinations such as town centers, schools, parks, and natural areas. From these corridors emerged a set of primary alignments that were vetted through the Active Oversight Committee to confirm their relative importance in the proposed greenway system.

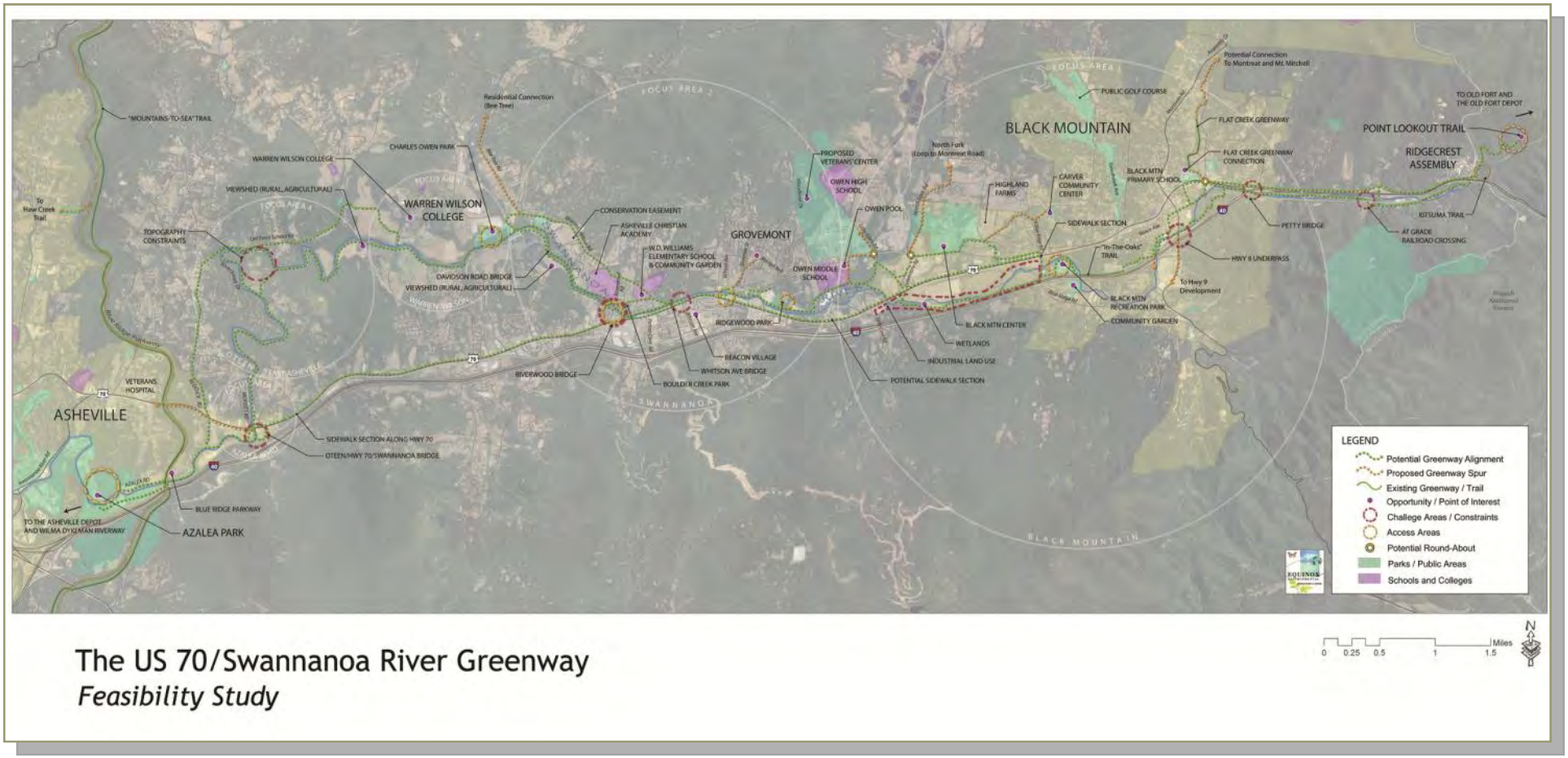
Destinations, such as Karpen Fields / Park near Weaverville (above), were part of the process to identify Priority Corridors for future greenways.

Photo Credit: Fred Grogan

The factors that led to establishment of new Priority Corridors for further analysis were:

- Linkages to existing or planned greenways within municipal boundaries or the already-completed corridor studies for the French Broad River and Swannanoa River, as well as the Wilma Dykeman RiverWay Plan;
- Opportunities to provide the greatest degree of connectivity to existing communities and destinations;
- Emphasis on already-populated or urbanized areas of unincorporated Buncombe County;
- Locations where new development was likely to occur and impact future corridors;
- Strong likelihood for maximizing usage of the greenway based on these factors;
- Identified areas for cultural and recreational destinations; and
- Realistic prospects for detailed planning, design and construction of these corridors within 10

Exhibit 3-1: A Map of Possibilities from the US 70 / Swannanoa River Greenway Feasibility Study. Similar studies are recommended for Priority Corridors identified in the Plan



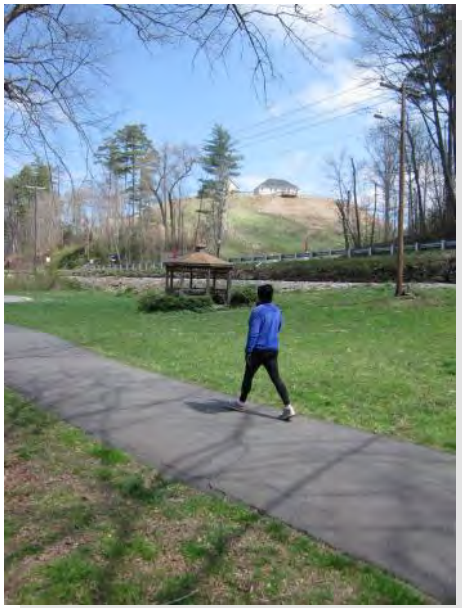
years of adoption of the Plan.

The resulting analysis revealed five new Priority Corridors for study within the plan in addition to the three already-completed studies. Greenways identified in locations other than these Priority Corridors were not evaluated beyond conducting basemap analyses and a scan of constraints for placement on a countywide map of planned greenways.

Step-by-Step Planning for Greenways

The analysis conducted on Priority Corridors in this Plan is the first step in defining a future network. The efforts to fully implement a new greenway trail require several planning and design steps before construction can take place. These steps are defined as:

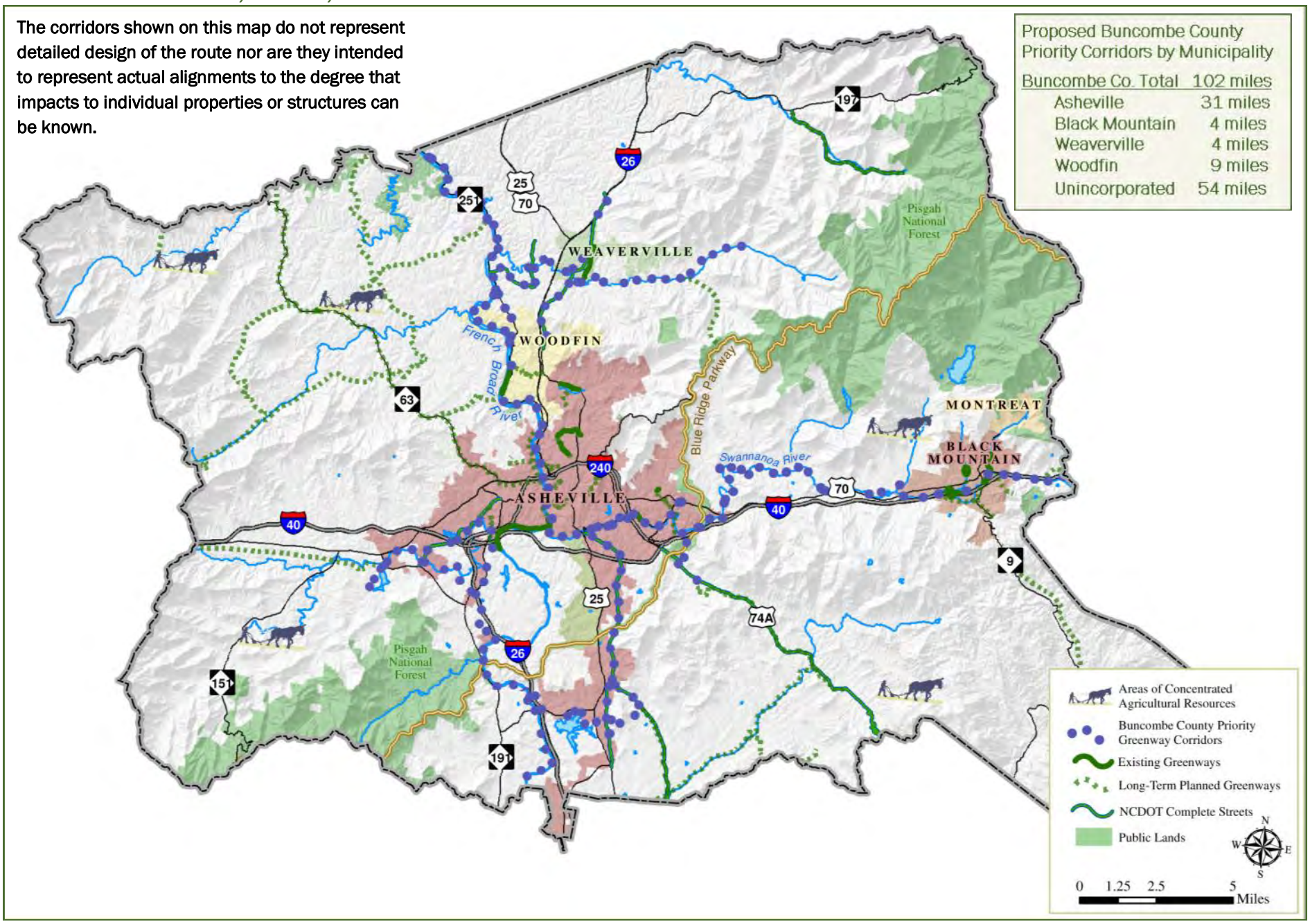
- **Identification of conceptual greenway corridors and connections:** The primary focus of this Plan is to identify which corridors will be the focus of efforts over the next 10-plus years. Identification includes high-level evaluation of the corridor concepts, potential design features, major constraints and logical termini. Corridors should not be viewed as strictly linear as they may encompass a variety of connections, spurs, micropaths or alternative routes emanating from a mainline greenway.
- **Corridor Plan, feasibility study or conceptual design:** Buncombe County has already completed two studies at this level of analysis—the US 70 / Swannanoa River Greenway and the French Broad River / Highway 251 Greenway. These studies include in-depth field work to define location-specific constraints, cost estimates and parameters to guide the generation of design drawings in future analysis phases. Some design drawings may be generated through this analysis to help guide estimates for further design or assist the County in preserving the corridor.
- **Alternative analysis and detailed design:** This phase is where detailed surveying, location-specific analysis and evaluation of design options are conducted, resulting in design drawings to guide the acquisition of property and construction of the greenway. Alternative analyses may be conducted for locations where constraints require a deviation from findings generated in previous phases.
- **Land acquisition:** As outlined in Chapter 5: Land Acquisition, there are several methods employed to secure property for greenway construction. Some acquisition is likely to occur prior to this phase or detailed design. Other land necessary for the greenway will be obtained once detailed design drawings are established and specific routes are identified. Acquisition that occurs pre-design will likely dictate where the corridor can be routed and will impact acquisition on adjacent properties.
- **Construction:** The building of the greenway occurs once design and acquisition are complete. Where there are constraints or property is unable to acquired for greenway use, intermediate route options may be part of construction while other processes are undertaken to build the corridor along a preferred route.
- **Maintenance:** Maintenance of the corridor begins at ribbon-cutting for the new greenway and cannot be over-looked as a critical component in supporting the efforts that pre-



Woodfin's Riverside Park already includes a greenway along the French Broad River. Other planning efforts have identified routes to connect north and south of the park from Asheville to the Madison County line.

Photo Credit: Don Kostelec

Exhibit 3-2: Buncombe County Greenways & Trails Overview



ceded construction to make the trail a reality. Chapter 8 addresses maintenance needs and expectations in more detail.

Priority Corridors

The following pages illustrate the findings of the planning efforts to evaluate five "Priority Corridors", as well as incorporation of the findings from the Wilma Dykeman RiverWay Plan and the US 70 / Swannanoa River and French Broad River / Highway 251 studies. Collectively, these eight corridors represent the highest priority for Buncombe County to pursue for detailed planning, design, land acquisition and construction in the short-term (up to 10 years from adoption of the Plan) to develop a countywide network of greenways and trails.

To the greatest extent possible, the routes were evaluated to identify acceptable corridors along rivers and streams or existing utility or sewer easements; within the boundaries of publicly-owned properties; and situated where they appear to have least impact on private property. Corridors will bisect a variety of contexts that will influence the ultimate cross-section or require evaluation of how to fill gaps through off-road and on-street connections. The options for these typologies and ideas for implemention of Complete Streets concepts are outlined in Chapter 4: Design Features.

These Priority Corridors profiles do not represent detailed design of the route nor are they intended to represent actual alignments to the degree that impacts to individual properties or structures can be known or cost estimates fully derived.

Exhibit 3-2 illustrates a countywide perspective on the proposed greenway trails with Priority Corridors, both those already-studies and those identified as new concept in this Plan, and shown in **BLUE**. The routes identified in this and other plans that are not part of the Priority Corridor analysis are shown in solid (existing) or dotted (proposed) **GREEN**. Areas of Concentrated Agricultural Resources were those general areas identified by the public, stakeholders and property owners as locations where agricultural preservation and agritourism are of interest

Greenway Corridor: The Priority Corridor that is the subject of that particular profile, identified through this Plan or past studies.

3-5 ft Walking Trail: Connectors to corridors that are intended as a hiking trail with natural surfaces. May be alternate routes to Priority Corridors.

Other Greenway Corridors: Priority Corridors that are not the subject of the profile.

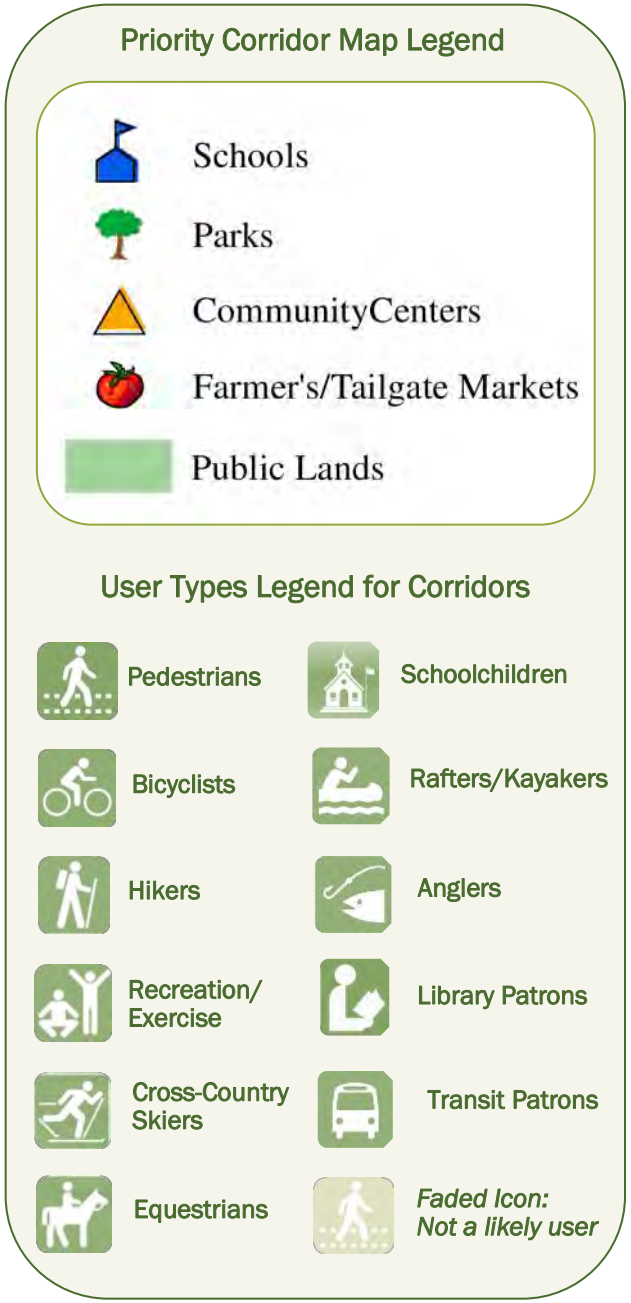
Long-Term Planned Greenways: Corridors that should be studied in future plans or required if new development influences them.

Existing Greenway: Built corridor.

NCDOT Complete Streets: Corridors or connecting routes that are best suited for sidepaths or sidewalks to connect to a Priority Corridor. See Chapter 4.

User Types. The user types highlighted for each Priority Corridor (legend in Exhibit 3-3) represent the likelihood of a particular type of user to regularly patronize the Priority Corridor. The user types helped inform design recommendations and potential connections destinations near the trail.

Exhibit 3-3: Understanding Corridor Profiles



Wilma Dykeman RiverWay

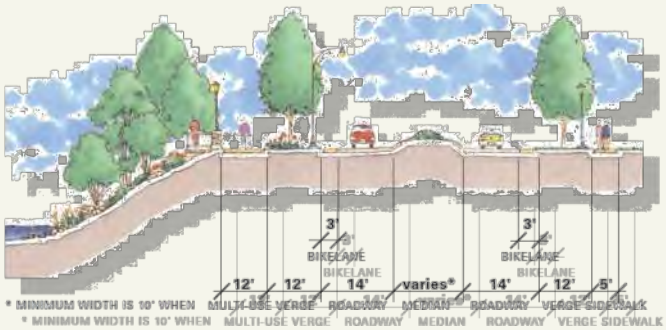
The RiverWay Plan, adopted in 2004, is a multi-faceted master plan for the urban riverfront of the French Broad River and Swannanoa Rivers in the City of Asheville. The Plan includes concepts for a greenway tracing the rivers, as well as environmental management goals, redevelopment concepts and parks. Sections of the RiverWay are in place in several areas.

Influences: The RiverWay is located primarily within a developed corridor along the rivers. Several opportunities and constraints exist, including:

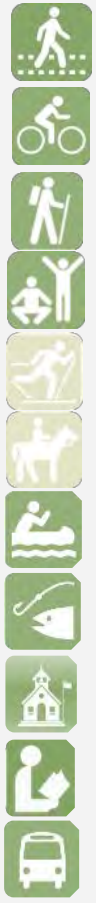
- River Arts District & Biltmore Village
- UNC Asheville & AB Tech
- Asheville neighborhoods
- Azalea Park & WNC Nature Center
- Biltmore Estate
- Development along rivers

Portions of the greenway are constructed through Carrier Park, French Broad River Park and in some private developments along the rivers. Design and environmental analysis is also in progress for sections of the RiverWay east of the French Broad River in the River Arts Districts. Most of the 7 other Priority Corridors in the Greenways & Trails Master Plan have direct linkages to the existing or planned sections of the RiverWay. The RiverWay is the most heavily-developed greenway corridor in Buncombe County in terms of land use.

Typology: The RiverWay plan designates a 12' wide pathway for its entire length to account for the potential for heavy use. Adjacent roadways were included in the design concepts to include sidewalks, bicycle lanes, and landscaped medians and sidewalk buffers.



Likely Users



The User Experience: The RiverWay was planned with a heavy user interface in mind, linking nearby places such as the WECAN neighborhood, River Arts District and Biltmore Village to the corridor. New parks and recreation facilities were master-planned along the route as well as facilities to access the river for fishing, canoeing and kayaking, and other recreation. Plans for residential development and other major redevelopment were also a key component to the RiverWayPlan. Several events occur along the RiverWay each year.

Potential Partners:

- City of Asheville
- RiverLink
- NCDOT, Utilities & Railroad
- Landowners / Developers
- Business organizations

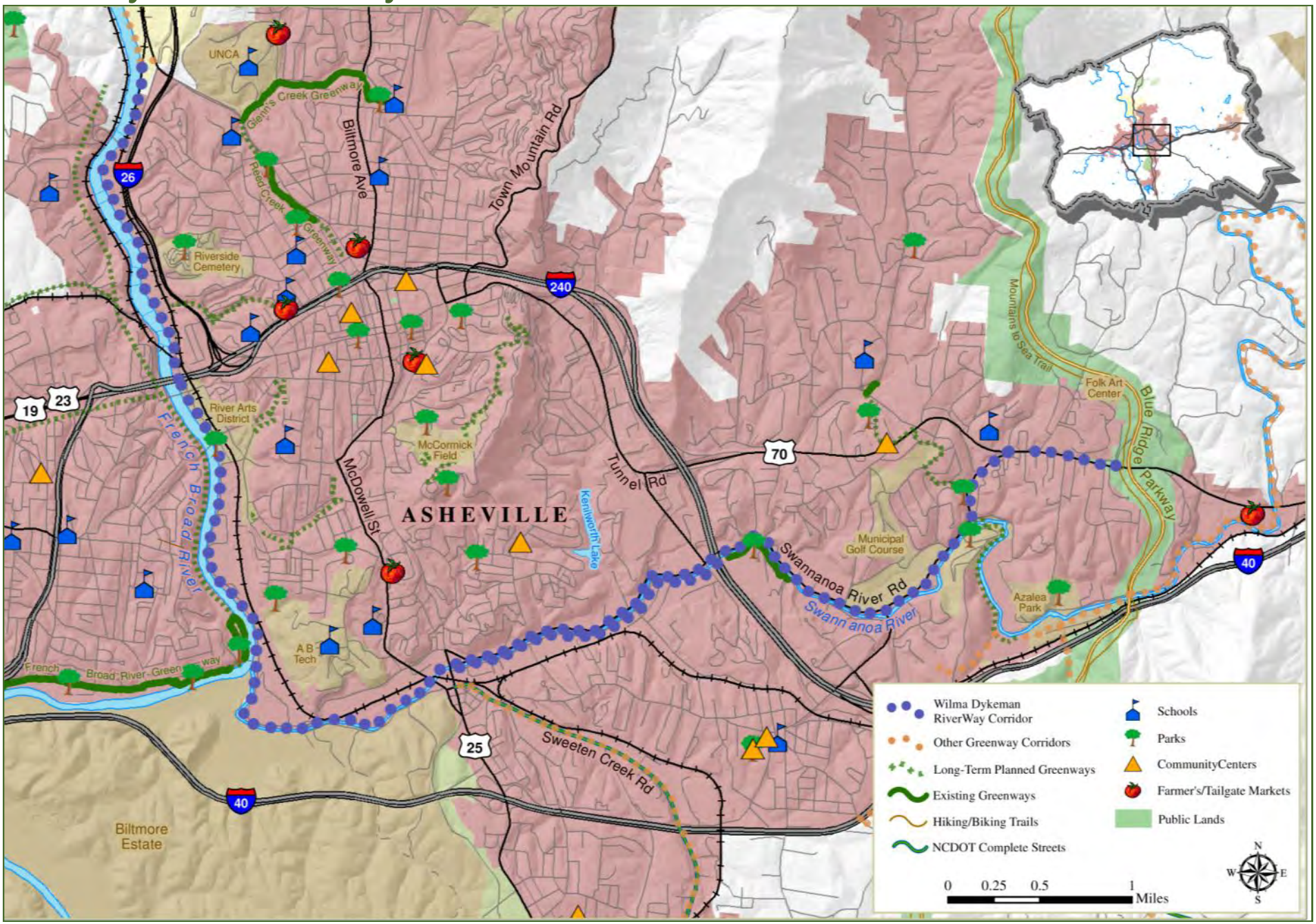
The RiverWay corridor is already utilized for a variety of activities on the trails and the river, which supports usage of the greenway.

Major Challenges

Topographic/Natural Landforms: Much of the corridor is planned or exists between the river, streets and development. Development is typically in commercial or industrial use, with some residential properties. Other segments run near utility easements or railroad.

Existing Infrastructure: Portions of the RiverWay are constructed through Carrier Park and French Broad River Park, as well as in some private developments. River access points are also along the corridor. Adjacent streets are in need of upgrades or additional pedestrian & bicycle facilities. .

Wilma Dykeman RiverWay Corridor



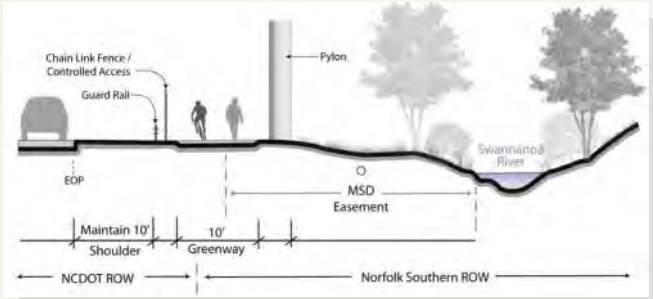
US 70 / Swannanoa River Greenway

The greenway proposed along the US 70 and Swannanoa River Corridor is an 18-mile route with an eastern terminus at the Point Lookout Trail in McDowell County and a western terminus at Azalea Park in East Asheville—the eastern terminus of the Wilma Dykeman RiverWay Plan. A detailed corridor study was completed in 2010.

Influences: The trail generally runs along the Swannanoa River with section adjacent to US Highway 70. Key communities along the route include:

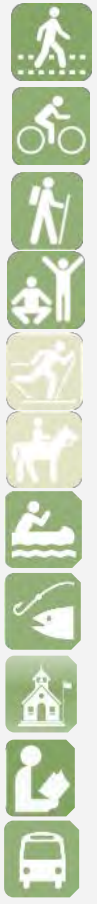
- Ridgecrest & Black Mountain
- Warren Wilson College
- Azalea Road Connection / Azalea Park
- Swannanoa Community
- Oteen/East Asheville
- Blue Ridge Parkway

The US 70 Swannanoa River Greenway has the potential to connect to population centers, public schools, Warren Wilson College, surrounding neighborhoods, several parks, other greenway trails, business, and shopping. In addition, pedestrian and bike safety has plagued certain areas within this corridor. This corridor would provide options for future users to safely and easily access the greenway offering a non-motorized transportation alternative. The planned greenway also crosses the Mountains-to-Sea Trail at the Blue Ridge Parkway.



Typology: The proposed route bisects diverse natural and manmade environments, which prompted the corridor study to recommend 6 cross section options based on constraints and opportunities. In general, a 10' asphalt trail (sample cross-section above) was the preferred treatment, with the exception of the area near Warren Wilson College

Likely Users



The User Experience: The proposed route traverses a diverse set of natural features along the Swannanoa River and makes connections to existing hiking trails at Warren Wilson College, the planned greenway within the City of Asheville to Azalea Park, numerous existing & planned greenways in Black Mountain, and the Point Lookout Trail in McDowell County. Potential exists for day trips taken from one end to another with incorporation of local farming, restaurants and brewpubs.

Potential Partners:

- Municipalities
- Warren Wilson College
- RiverLink
- NCDOT, Utilities, & Railroad
- Ridgecrest Assembly
- Blue Ridge Parkway

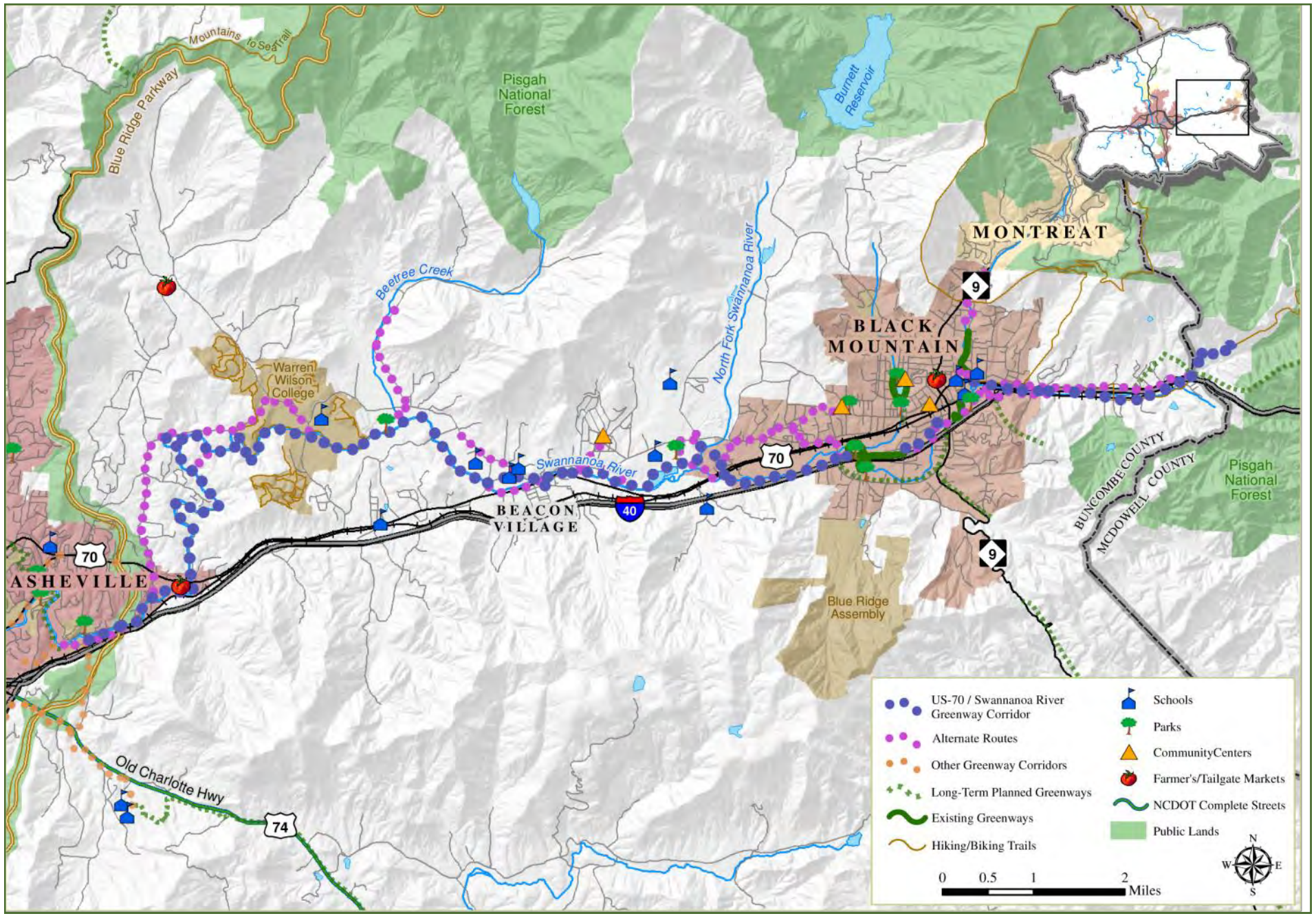
Fields at Warren Wilson College (left) and US Highway 70 (right) were major influences in the US 70 / Swannanoa River Greenway study.

Major Challenges

Topographic/Natural Landforms, including steep terrain, and floodway impacts, such as river and tributary crossings. These features create right-of-way constraints in sections that are adjacent to US 70 or other roadways.

Existing Infrastructure forms physical barriers for development, including existing roadways and buildings, an active railroad, utility lines (wire-based, sewer & water), and drainage structures .

US 70 / Swannanoa River Greenway Corridor



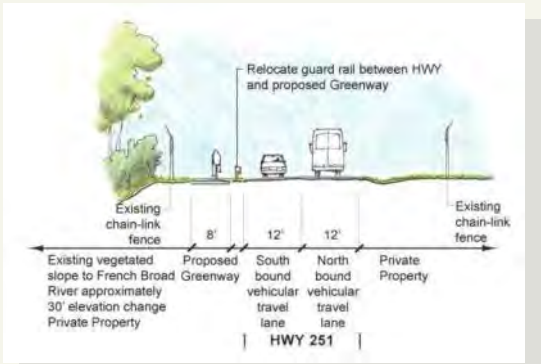
French Broad River / Highway 251 Greenway

The greenway along the French Broad River & Highway 251 is planned from the northern city limit of Asheville to the Madison County line. The planned 15-mile corridor follows the historic route of the Buncombe Turnpike and Drovers' Road, with a connection to the planned Wilman Dykeman RiverWay. A corridor study was completed in 2010.

Influences: The corridor is a gorge carved out of the mountain landscape by the river. Key communities and influences along the route include:

- Asheville & Woodfin
- Reed Creek Greenway
- Alexander River Park & mountain bike trails
- Alexander Community
- Ledges Park & Walnut Island Park

The river has created a narrow gorge within the corridor that varies slightly in width with the wider section located in the south end of the study corridor. These influences along with the Norfolk Southern Railroad along the west bank of the river prompted the study to recommend the corridor follow the east bank. Land uses within the study corridor include industrial, commercial, institutional, residential, and park/open space. In recognition of the scenic and historic qualities of the corridor, Highway 251 is designated as a Scenic Byway.



Typology: A 10-foot asphalt trail was designated as the preferred cross section, however constraints along the corridor make the construction of this design difficult in some locations without blasting . Existing development patterns, topography, elevation between the shoulder of Highway 251 and the river's edge are a few of the constraints.

Likely Users

The User Experience: Lengthy section of the proposed route remain in a natural setting with the trail and highway sandwiched between the river and rock outcroppings. Mountain bikers and road cyclists currently use the highway corridor due to its scenic value and low weekend traffic volumes. Connections to parks, campgrounds, landings for canoes/kayaks/rafts, and fishing areas will likely drive users to the corridor.

Potential Partners:

- Municipalities
- Craggy Prison Property
- NCDOT, MSD & Railroad
- RiverLink
- Campgrounds
- Madison County

Norfolk Southern Railroad (left) and NC Highway 251 (right) were major influences in the French Broad River / Highway 251 Greenway study.

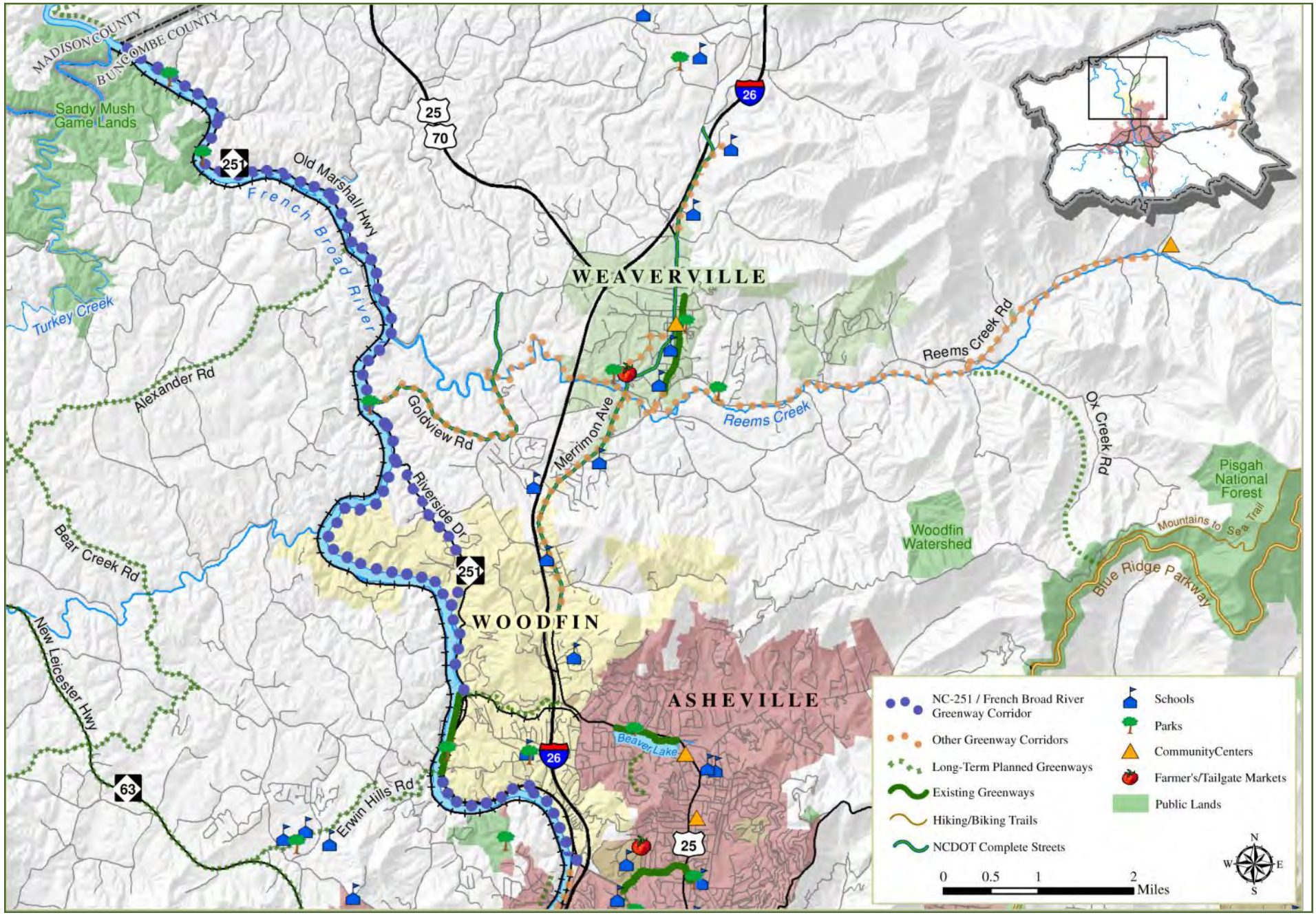
Major Challenges

Space & grade between river & Highway 251 creates numerous constraints along the corridor and will impact transition areas to parks connecting streets and other destinations.

Private property is also located in the narrow strip of land between the highway and the river.

Bridges linking other roads to Highway 251 across the river or crossing creeks draining into the river create height restrictions for greenway underpasses.

French Broad River / Highway 251 Greenway Corridor



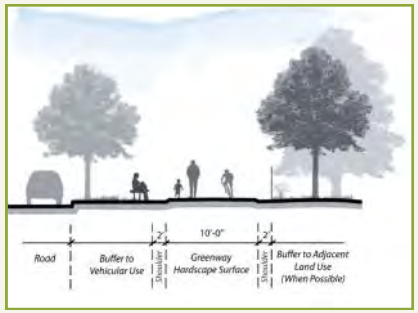
Bent Creek Greenway

West Asheville, the NC Arboretum and Bent Creek were some of the top destinations identified through the public process. This proposed route makes those connections from mountain bike and hiking trails at Bent Creek and the Arboretum as well as greenways in West Asheville. The 8-mile route requires careful consideration of the area around the Farmers Market and Brevard Road.

Influences: The planned greenway would begin at the current terminus of the greenway at the confluence of Hominy Creek and the French Broad River that is part of the Wilma Dykeman RiverWay. Influences along the route include:

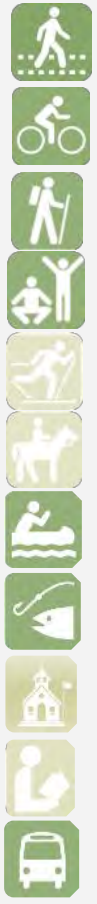
- West Asheville & Bent Creek
- Biltmore Square Mall / Business Park
- I-26, Brevard Road interchange
- Wilma Dykeman RiverWay
- Bent Creek / Arboretum Trails
- WNC Farmers Market
- MSD Easement along I-26
- Blue Ridge Parkway

There is an existing walking trail within the Ridgefield Business Park between Brevard Road and I-26 south of Biltmore Square Mall. The southern terminus at the Arboretum links to the planned Arden/Lake Julian corridor to provide a connection from central Buncombe County to communities in southern Buncombe County. The project would also cross near the Mountains to Sea Trail.



Typology: This corridor has the potential to serve both as a utilitarian connection by providing access from the City limits to Bent Creek Recreational Area, and lunch time exercise users within the business park. Mountain bikers prefer unpaved trails, but that may not be as practical or desired north of the I-26/Brevard Road interchange.

Likely Users



The User Experience: A greenway linking Bent Creek to Hominy Creek could provide exceptional opportunities for connectivity, tourism, Blue Ridge Parkway connection and West Asheville linkages. Extensive discussions have occurred about greenway potential in this corridor for many years. Initially, it is possible the route will link Bent Creek to the Mission Hospital Satellite offices campus in Broadpointe Business Park.

Potential Partners:

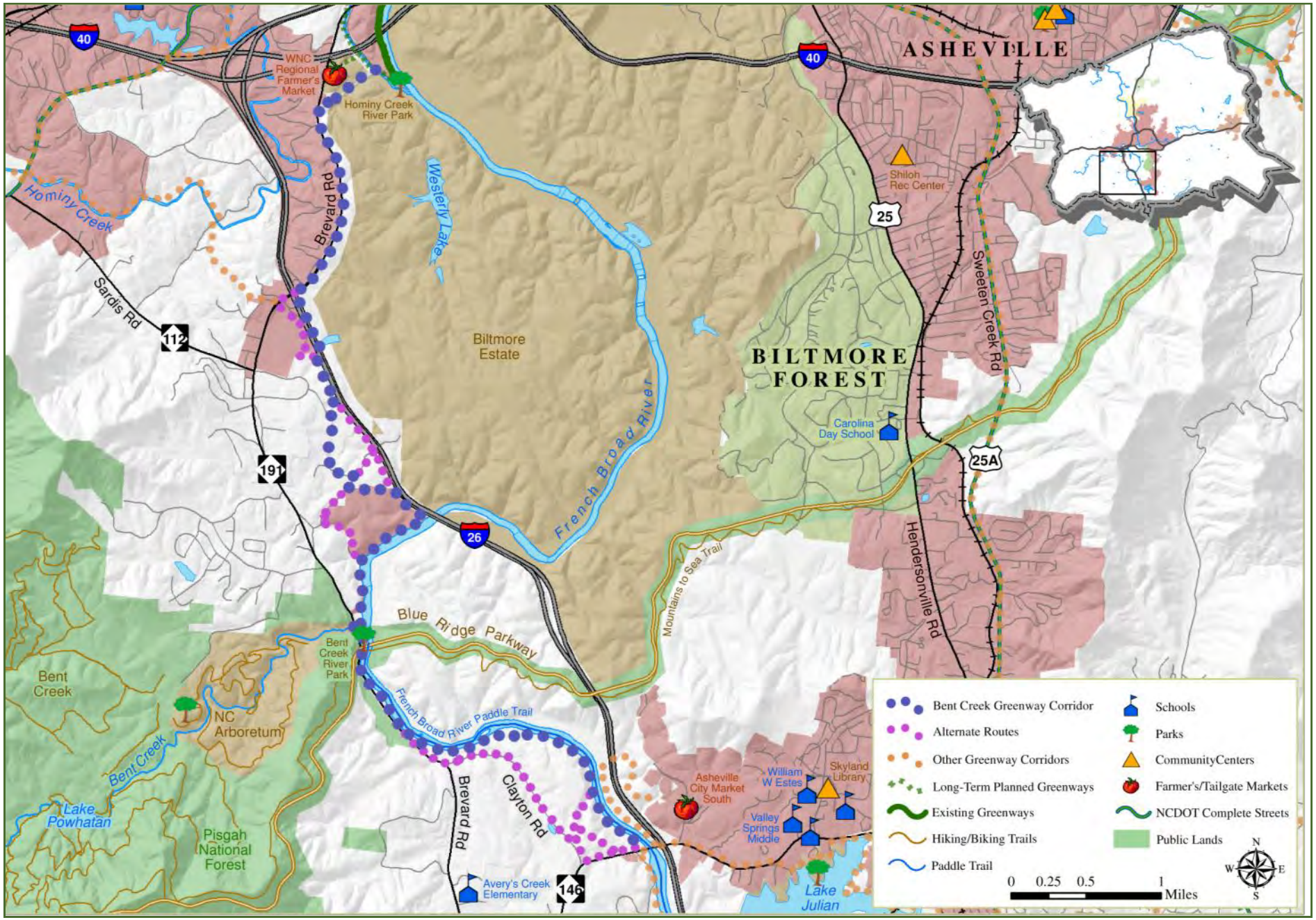
- City of Asheville
- NC Arboretum
- RiverLink
- NCDOT, MSD & Utilities
- Business Association
- WNC Farmers Market
- Blue Ridge Parkway

The French Broad River Floodplain (left) offer opportunity for greenway corridor development. Terrain near the Farmers Market (right) will likely require special considerations and partnerships for trail construction.

Major Challenges

The interchange at I-26 and Brevard Road (NC 191) is a major constraint depending on how the interchange re-build can be configured. There is potential to follow I-26 right-of-way between I-26 and the Biltmore properties to a culvert and MSD lift station south of the interchange near the business park. Connections to Bent Creek trails will offer other challenges if users are expected to travel on existing streets, which are narrow and have sight distance issues. Complete Streets applications may need to be pursued, if possible within existing right-of-way.

Bent Creek Greenway Corridor



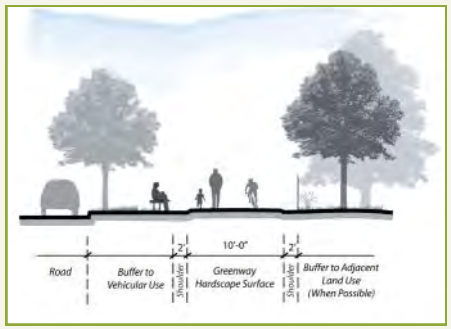
Hominy Creek Greenway

This proposed 7-mile corridor could serve as a utilitarian connection by providing access from the Hominy Creek Greenway/Park to Buncombe County Sports Park. Initially, this focus area begins in West Asheville near Sand Hill Road and terminates near the AB Tech Enka Campus with a spur to Enka High School and nearby public use areas.

Influences: The planned corridor connects urbanized areas of unincorporated Buncombe County to existing greenways in West Asheville and the Wilma Dykman RiverWay. A new development is proposed with the old BASF plant site near AB Tech, which will construct a segment of greenway through the property. Communities and influences along the route include:

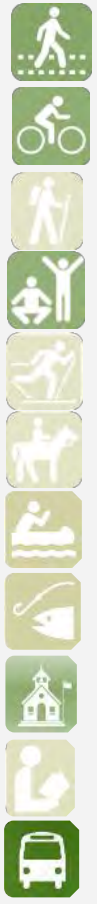
- West Asheville
- AB Tech Enka Campus
- Enka-Candler Library
- I-40 / Sand Hill Road
- Enka High School
- National Forest
- Enka, Candler & Biltmore Lake
- Buncombe County Sports Park
- Sand Hill-Venable Elem. School
- Asheville School
- Hominy Valley Elementary School

Beyond the terminus of the mainline at AB Tech, a long-range greenway corridor is identified paralleling Hominy Creek to the Haywood County line.



Typology: Greenway design should be consistent throughout much of this corridor in off-street segments, with a 10-foot asphalt greenway. On-street section or stream crossings will require Complete Streets applications. The spur to Enka High School could be considered as a natural surface 10-foot trail.

Likely Users



The User Experience: The proposed corridor connects heavily utilized sections of existing greenways in West Asheville and has the potential to be a commuter corridor to and from this area and for AB Tech students. The Hominy Valley area is popular for long-distance recreational cyclists who start their trips in the Enka community or West Asheville.

Potential Partners:

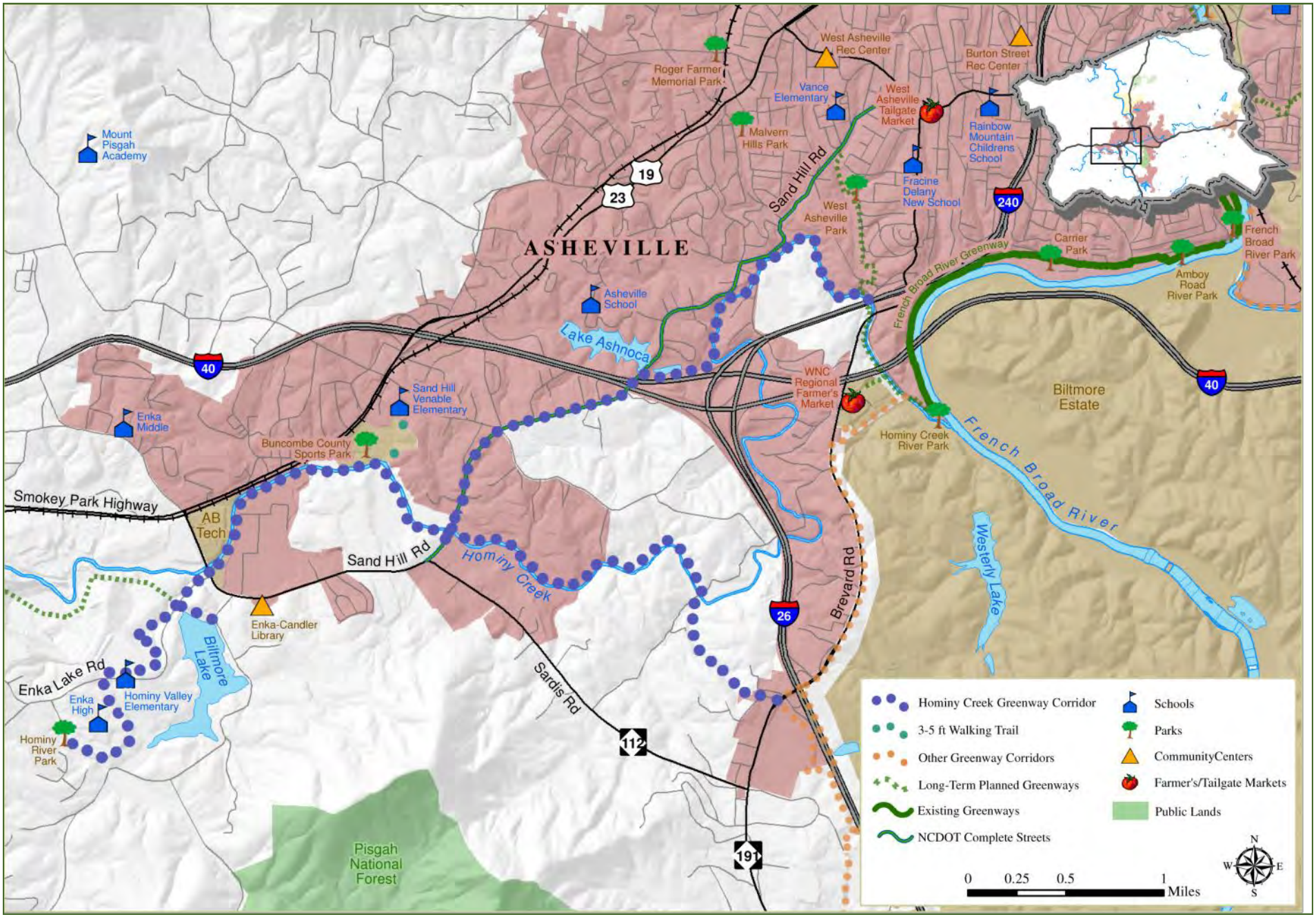
- City of Asheville
- AB Tech
- RiverLink
- NCDOT
- MSD & Utilities
- Buncombe County Schools

Interstate crossings (left) and filling gaps in Complete Street applications (right) will help make connections to off-street trail near Enka .

Major Challenges

The constraints of built out areas, I-40, I-26/I-240 and topography presents limited options for this corridor. The meandering nature of Hominy Creek also requires considerable evaluation as to the best placement of the greenway. The value of the connections it provides however should not be underestimated when considering how these constraints need to be addressed when design commences.

Hominy Creek Greenway Corridor



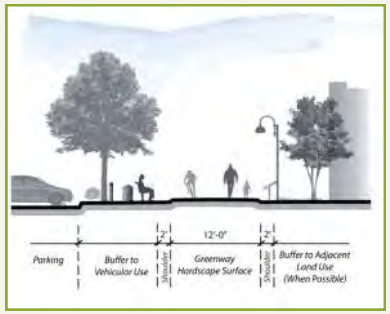
Lake Julian Greenway

Planned greenways linking Mills Gap Road to Bent Creek provide exceptional opportunities for connectivity, tourism, retail support, and the 6-mile French Broad River corridor in this area. Biltmore Park and Lake Julian are primary destinations with linkages planned to the Bent Creek Greenway and long-term trails along Cane Creek.

Influences: West of the French Broad River, the trail follows the alignment of river and roadways. Long Shoals Road will require upgrades for Complete Streets features. A powerline easement east of Lake Julian provides the primary route linking Royal Pines. Influences include:

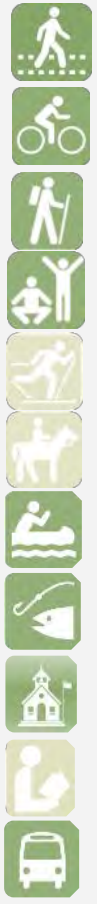
- NC Arboretum & Bent Creek
- Lake Julian
- Small parks throughout the study area
- Several schools
- Biltmore Park Town Square
- Arden Community
- Royal Pine Community

Biltmore Park can be easily accessed via existing sidewalks located along Long Shoals or the construction of an off-road trail near the road. Utilization of the newly improved I-26 interchange has been identified as an alternate route. In both cases, sidewalk connectivity via the newly constructed bridge can be used to span the French Broad River. RiverLink also holds conservations easements in the area.



Typology: The route will likely have high usage connecting development to recreational areas and the National Forest. A combination of 10' hardened surface in addition to a section of Complete Street improvements along Long Shoals Road is likely. From Lake Julian to Mills Gap Road the typology may range from improved neighborhood streets to 4' wide trail systems along the powerline corridor through Rosscraggon Park.

Likely Users



The User Experience: The proposed route bisects a variety of development types and there are several properties along the west side of the river that could be poised for development. Users will have to navigate a corridor where the character and design changes in order to make necessary connections and provide access to schools, shopping areas and natural features. The powerline easement will also be a factor in the user experience.

Potential Partners:

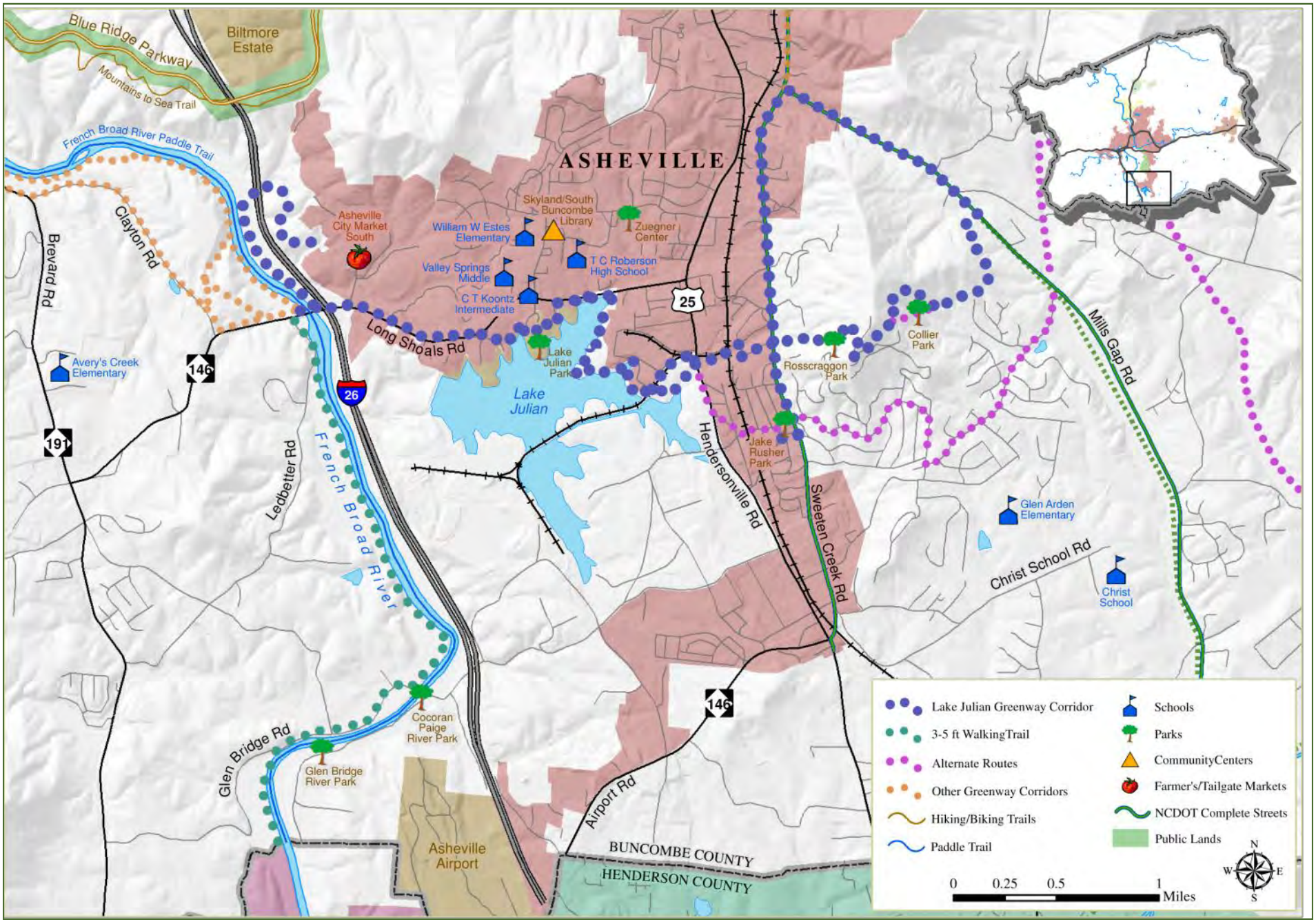
- City of Asheville
- NC Arboretum
- NCDOT
- RiverLink
- MSD, Utilities & Railroad
- Homeowners Associations
- Major Property Owners

The Royal Pines area (left) has shown interest in greenways; proximity of the corridor the French Broad River (right) is a notable constraint.

Major Challenges

It is preferred that the floodplain be utilized to connect to the Bent Creek Recreational Area. Multiple private properties will need to be traversed if this route is followed, however, large tracts, specifically Biltmore Baptist Church, Biltmore Farms, Asheville Firefighters Association, and the UNCA property could be linked together to create this opportunity. Topographic challenges exist from areas between Hwy 191 and the French Broad River. Topographic challenges also exist along the powerline corridor east of Lake Julian.

Lake Julian Greenway Corridor



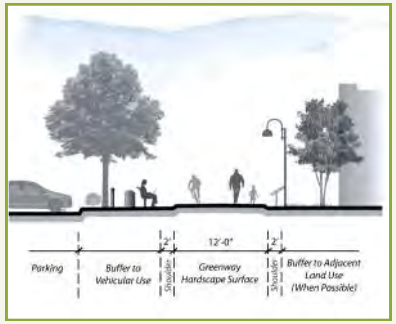
Reems Creek / Weaverville Greenway

The proposed greenway would connect the French Broad River to Weaverville and points east toward the Vance Birthplace & Beech Community with a southern spur along Merrimon Ave. to Woodfin and North Asheville. The 6.5-mile main corridor has 3 distinct sections: French Broad River to Weaverville; Weaverville to Beech Community; & Weaverville to Woodfin/North Asheville.

Influences: The planned greenway will connect to the planned French Broad River / Highway 251 Greenway and bisect the Town of Weaverville with a connection to Lake Louise and the Nature Park. Users following the French Broad River would be able to link the Wilma Dykeman RiverWay in Asheville to reach Weaverville. Other influences and communities along the route include:

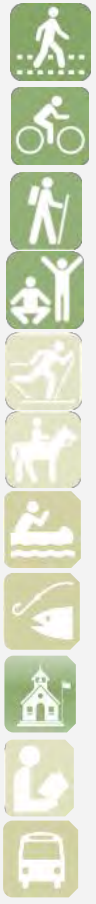
- Reems Creek Valley
- Vance Birthplace
- Karpen Soccer Fields
- Woodfin & North Asheville
- Downtown Weaverville & Parks
- Several schools

Beyond the focus of this corridor are connections to Ox Creek and the Blue Ridge Parkway further east, which are used by recreational bicyclists. The Town of Weaverville owns property adjacent to the proposed trail within town limits that would be suitable for a joint-use maintenance shed.



Typology: Within the city limits of Weaverville, a 12-foot paved section is preferred where constraints are not as prevalent. In the Reems Creek valley there may be sections that necessitate a narrower walking path with signage directing bicyclists to nearby street routes. A Complete Streets section is preferred for the Merrimon Avenue link to Woodfin and North Asheville.

Likely Users



The User Experience: The proposed route will connect Weaverville to the French Broad River and build upon downtown Weaverville as a destination. On-road bicycle connections from Highway 251 to Weaverville are limited and this route would provide an alternative to busy roads. The connections to the downtown Nature Park in Weaverville and the Vance Birthplace have the potential to drive tourism use.

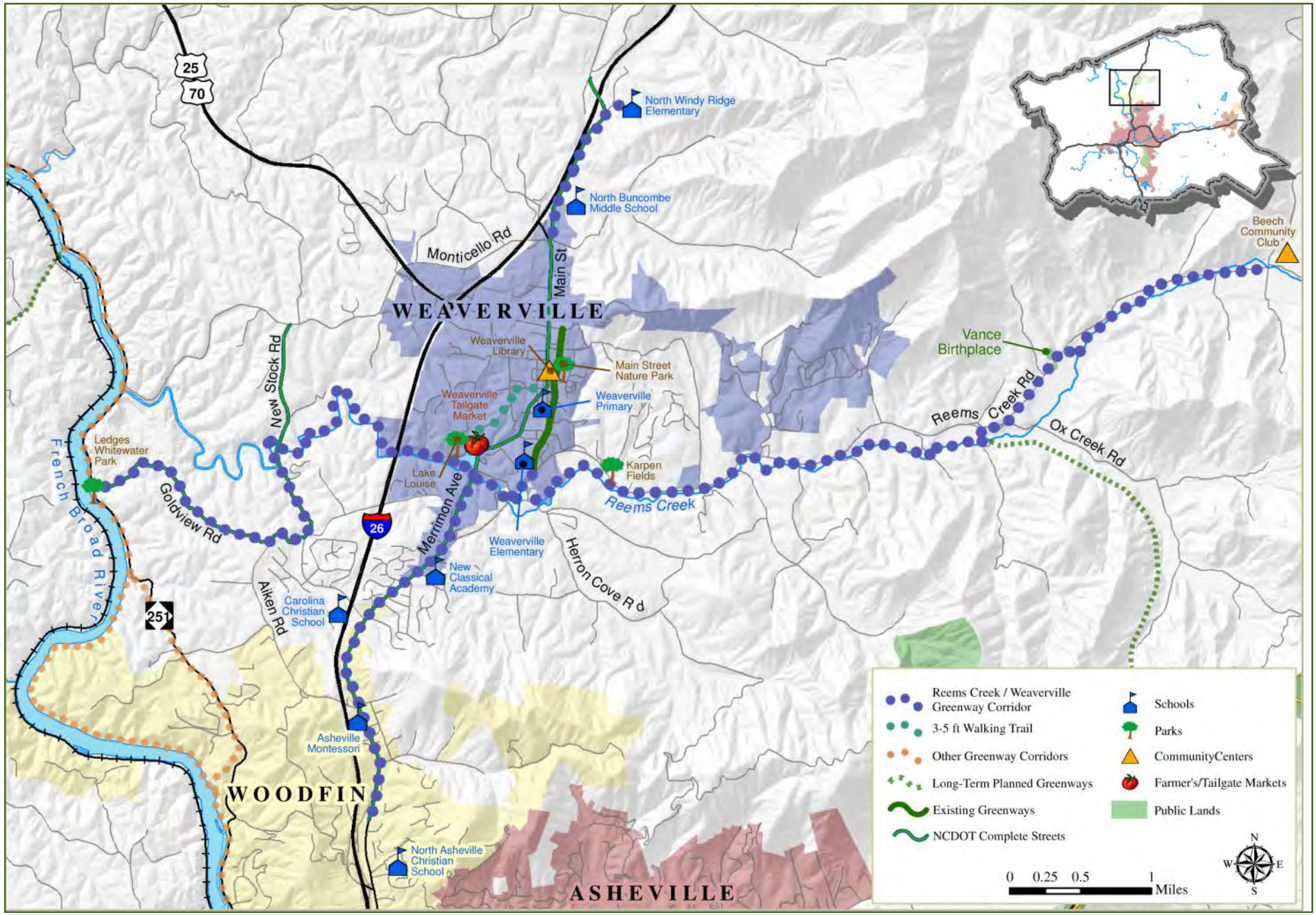
Potential Partners:

- Municipalities
- NCDOT
- Buncombe County Schools
- MSD & Utilities
- Business Association

Merrimon Avenue (left) and an I-26 underpass (right) present contextual challenges for greenway and Complete Streets implementation.

Major Challenges. Topographic challenges exist as the Reems Creek gradient increases and becomes constrained significantly as the corridor drains to the French Broad beyond the Pinebrook Farms Neighborhood. Connectivity to Asheville will be challenging due to commercial development constraints and heavy vehicular traffic. The use of the sewer right-of-way which either parallels or runs within the roadway for a majority of the length can be explored. Established land uses with large tracts are present throughout the Reems Creek Valley which will need to be traversed. Hydrology should be noted as a consideration as considerable crossings and wetlands may be encountered along this corridor.

Reems Creek / Weaverville Greenway Corridor



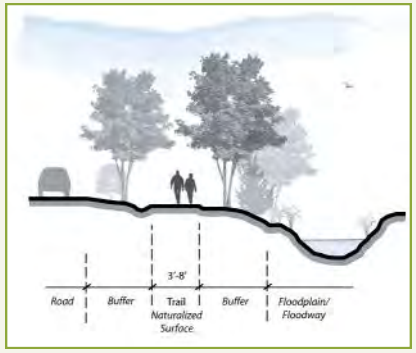
Reynolds Greenway

Azalea Park has become a hub for Asheville and County Greenway planning efforts. This proposed corridor leads south from Azalea Park with primary destination being the Blue Ridge Parkway and AC Reynolds Schools. The 6-mile route would link to long-term greenways planned for connections to Fairview, Cane Creek and Henderson County.

Influences: Connectivity from Azalea Park, the planned termini of the Wilma Dykeman RiverWay and the US 70/Swannanoa River Greenway, to points south of Asheville is an opportunity to introduce users to National Forest and Asheville City Park. Key destination and communities along the route include:

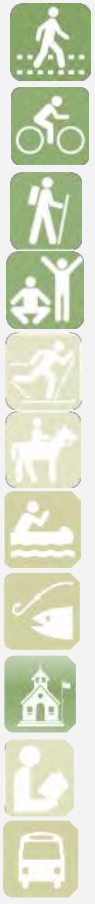
- Asheville, & Oakley Neighborhood
- Blue Ridge Parkway
- Azalea Road Connection / Azalea Park
- AC Reynolds School Complex
- Fairview Community
- Mountains-to-Sea Trail

Next step planning efforts should explore creating a node within the Fairview community that radiates from the Cane Creek intersection with US 74A. Future connectivity includes linking Fairview and Reynolds as well as a potential connection into Henderson County and south. The area has cultural significance and has been identified as a destination for agri-tourism. Cane Creek valley has tremendous opportunity for users to experience rural, long range view settings.



Typology: To minimize disturbance with the Mountains-to-Sea-Trail, a 5-8' foot trail / foot path would allow for access from Azalea Park to the Blue Ridge Parkway. Connections through Parkway property to AC Reynolds Campus would be paved and sections south of the school may be constructed of natural surfaces.

Likely Users



The User Experience: There is strong demand for bicycling connections from East Asheville and the Oakley Community to the Blue Ridge Parkway as the transition of I-240 to US 74A presents numerous challenges. This proposed route would allow bicyclists to connect from the Azalea Park area to the Parkway along local streets and pathways. Individuals wishing to hike the Mountains to Sea trail can also begin their journey at Azalea Park.

Potential Partners:

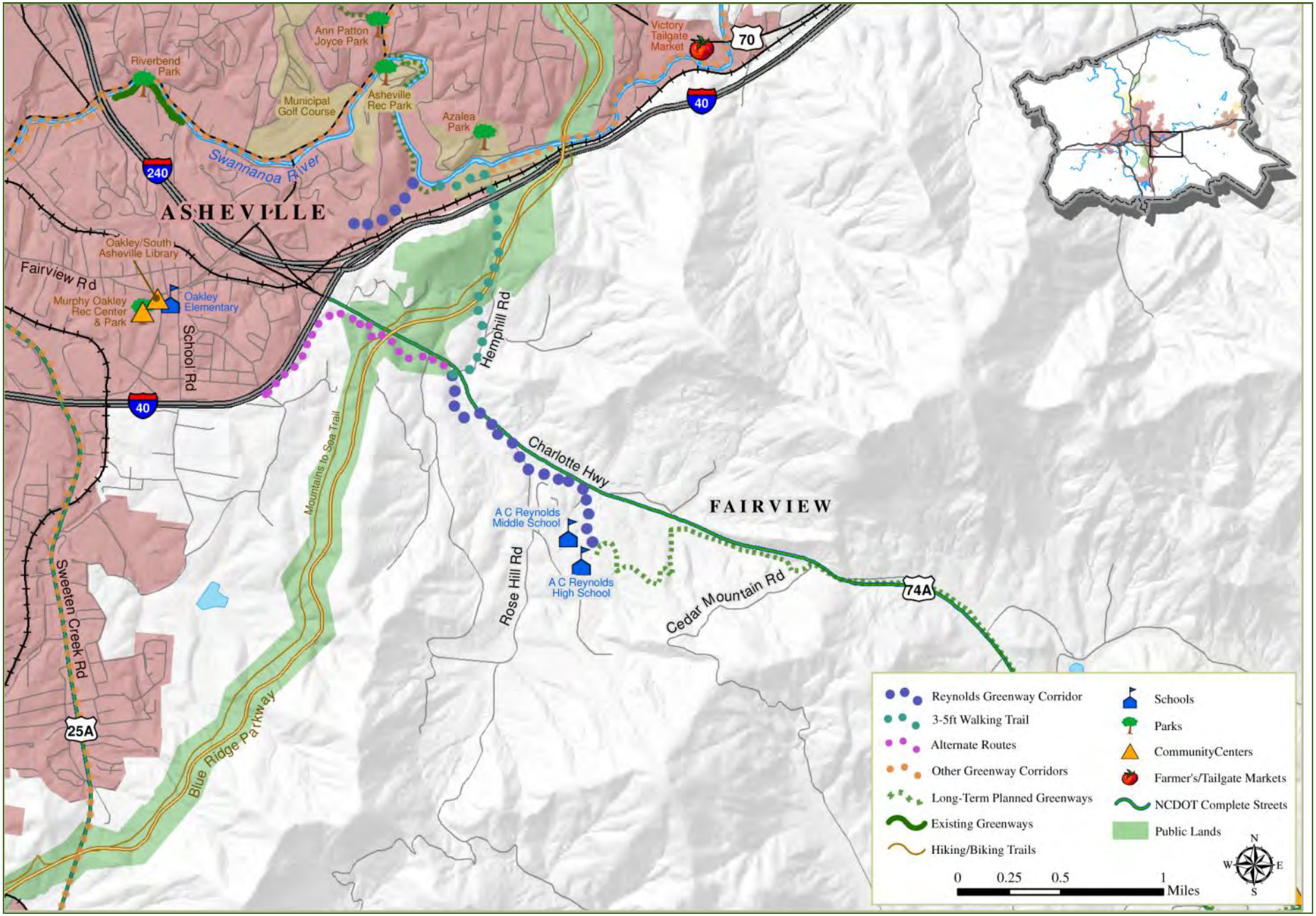
- City of Asheville
- Blue Ridge Parkway
- RiverLink
- NCDOT
- Buncombe County Schools
- Mountains-to-Sea Trail

The Fairview greenway corridors would meander through commercial areas along US 74A (left) and natural areas (right) near the highway.

Major Challenges

Crossing I-40 to connect the Parkway to Azalea Park will require exploration of alternatives, whether using local street connection, culverts or an overpass to make the connection. Constrained sections between commercial development, hydrology, and topography from the Blue Ridge Parkway to AC Reynolds High School will also influence the corridor design. Coordination is required with the Parkway regarding acceptable access onto National Park Service land to ensure proposed access is in line with recent planning efforts.

Reynolds Greenway Corridor



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Chapter 3: Priority Greenway Corridors

The public and stakeholder involvement efforts for the Buncombe County Greenways and Trails Master Plan yielded a myriad of new ideas for greenway corridors connecting communities across the county and to adjacent counties. The ideas for placement of new trail connections generated by citizens and organizations were closely aligned with the key tenets of the vision for Connect Buncombe and the Parks, Greenways, and Recreation Services Department.

The challenge for County staff, planning partners (known as the Active Oversight Committee) and the consultant team overseeing the Plan was to then organize the ideas for new greenways and trails into conceptual corridors. The concepts outlined in this chapter are intended to prepare Buncombe County for further study along Priority Corridors conceptualized for implementation over the next 20 years. They reflect a combination of ideas, field assessments and consideration of known constraints for the areas in which they are proposed.

The 102 miles of Priority Corridors identified in this chapter are not in priority order to allow Buncombe County capitalize on any available opportunity to construction feasible segments of these corridors. The variety of funding sources, current economic conditions, and land ownership will impact the priority of these corridors.

Evaluating Proposed Greenways

Ideas and concepts for greenways planned throughout the region were conceived in efforts by Buncombe County, municipalities, Land of Sky Regional Council, state trails plans, the Blue Ridge Parkway and the input of numerous agencies and organizations. From these efforts, a map of past ideas and concepts for greenways was established to be refined through public and technical processes.

Three sets of completed studies and plans provided the foundation for this analysis:

- Land of Sky Regional Council's Regional Trails & Open Space Plan (2008), which also yielded the initial 2009 Buncombe County Greenways and Trails Plan;
- Municipal greenway planning efforts in Asheville, Black Mountain, Montreat and Woodfin; and
- Three detailed corridor studies: The Wilma Dykeman RiverWay Plan; The US 70 / Swannanoa River Greenway (Exhibit 1-1); and the French Broad River / Highway 251 Greenway.

Several new greenway corridor ideas were then posed by the public and stakeholders in 2011 and 2012 via public meetings across Buncombe County; a September 2011 stakeholder workshop; numerous festivals throughout the County and the online survey. Some ideas confirmed past planning efforts while others established new ideas for greenway connectivity.

Maps of the ideas for future corridors were produced for analysis and reviewed by the project team, County staff and the Plan's Active Oversight Committee. In general, the corridor ideas generated during the outreach process followed logical routes along rivers and streams as well as primary and secondary roadways to connect major destinations such as town centers, schools, parks, and natural areas. From these corridors emerged a set of primary alignments that were vetted through the Active Oversight Committee to confirm their relative importance in the proposed greenway system.

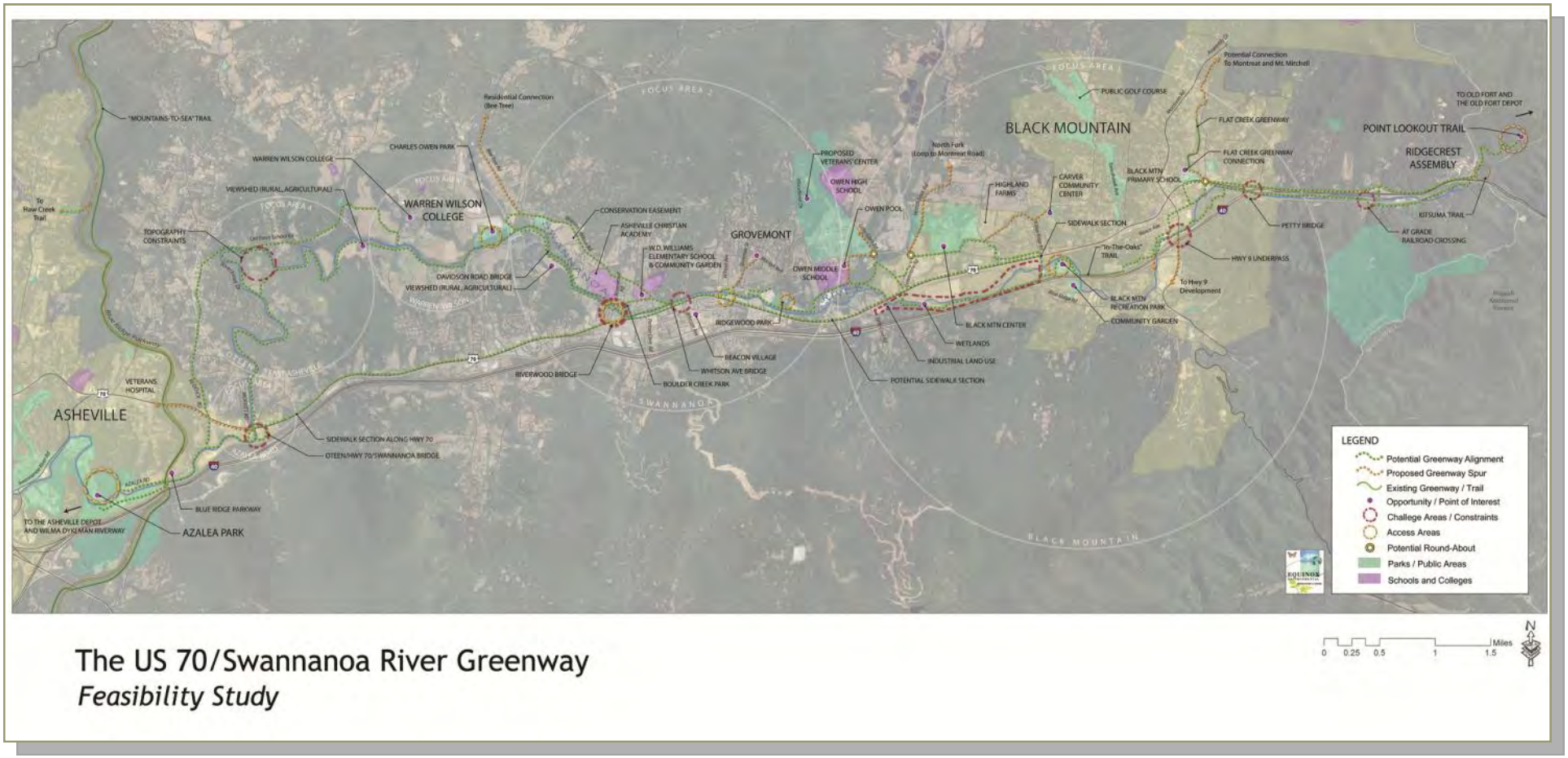
Destinations, such as Karpen Fields / Park near Weaverville (above), were part of the process to identify Priority Corridors for future greenways.

Photo Credit: Fred Grogan

The factors that led to establishment of new Priority Corridors for further analysis were:

- Linkages to existing or planned greenways within municipal boundaries or the already-completed corridor studies for the French Broad River and Swannanoa River, as well as the Wilma Dykeman RiverWay Plan;
- Opportunities to provide the greatest degree of connectivity to existing communities and destinations;
- Emphasis on already-populated or urbanized areas of unincorporated Buncombe County;
- Locations where new development was likely to occur and impact future corridors;
- Strong likelihood for maximizing usage of the greenway based on these factors;
- Identified areas for cultural and recreational destinations; and
- Realistic prospects for detailed planning, design and construction of these corridors within 10

Exhibit 3-1: A Map of Possibilities from the US 70 / Swannanoa River Greenway Feasibility Study. Similar studies are recommended for Priority Corridors identified in the Plan



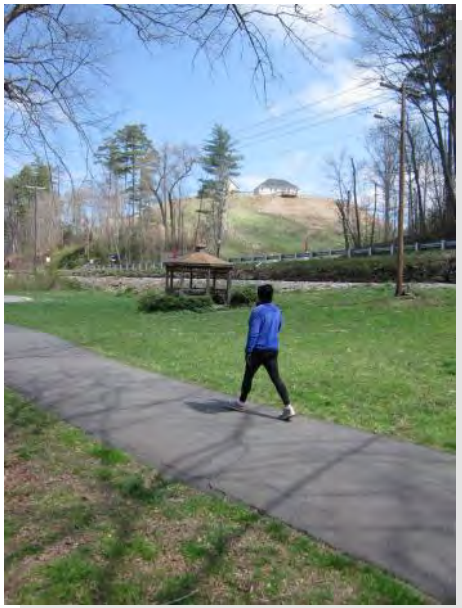
years of adoption of the Plan.

The resulting analysis revealed five new Priority Corridors for study within the plan in addition to the three already-completed studies. Greenways identified in locations other than these Priority Corridors were not evaluated beyond conducting basemap analyses and a scan of constraints for placement on a countywide map of planned greenways.

Step-by-Step Planning for Greenways

The analysis conducted on Priority Corridors in this Plan is the first step in defining a future network. The efforts to fully implement a new greenway trail require several planning and design steps before construction can take place. These steps are defined as:

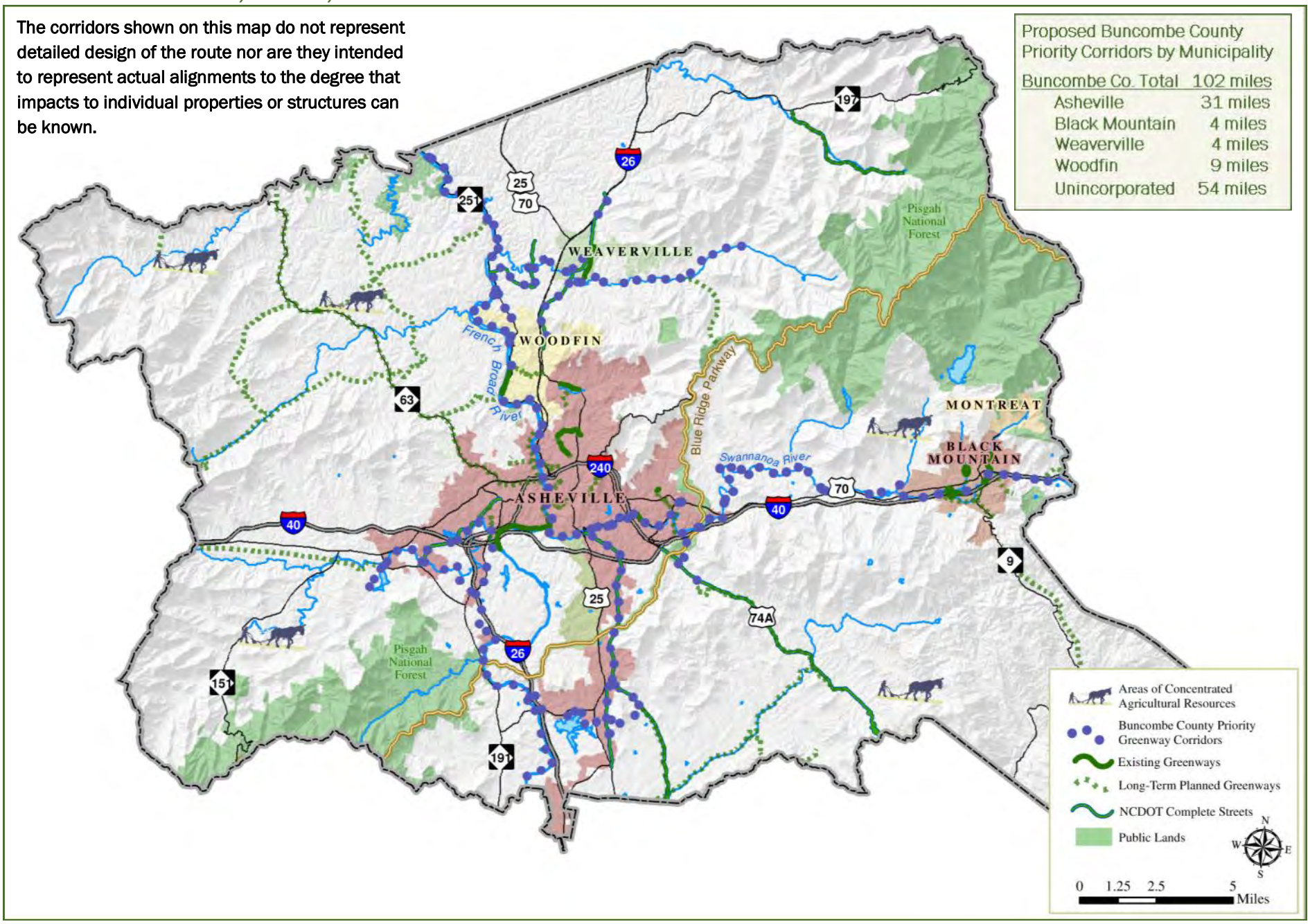
- **Identification of conceptual greenway corridors and connections:** The primary focus of this Plan is to identify which corridors will be the focus of efforts over the next 10-plus years. Identification includes high-level evaluation of the corridor concepts, potential design features, major constraints and logical termini. Corridors should not be viewed as strictly linear as they may encompass a variety of connections, spurs, micropaths or alternative routes emanating from a mainline greenway.
- **Corridor Plan, feasibility study or conceptual design:** Buncombe County has already completed two studies at this level of analysis—the US 70 / Swannanoa River Greenway and the French Broad River / Highway 251 Greenway. These studies include in-depth field work to define location-specific constraints, cost estimates and parameters to guide the generation of design drawings in future analysis phases. Some design drawings may be generated through this analysis to help guide estimates for further design or assist the County in preserving the corridor.
- **Alternative analysis and detailed design:** This phase is where detailed surveying, location-specific analysis and evaluation of design options are conducted, resulting in design drawings to guide the acquisition of property and construction of the greenway. Alternative analyses may be conducted for locations where constraints require a deviation from findings generated in previous phases.
- **Land acquisition:** As outlined in Chapter 5: Land Acquisition, there are several methods employed to secure property for greenway construction. Some acquisition is likely to occur prior to this phase or detailed design. Other land necessary for the greenway will be obtained once detailed design drawings are established and specific routes are identified. Acquisition that occurs pre-design will likely dictate where the corridor can be routed and will impact acquisition on adjacent properties.
- **Construction:** The building of the greenway occurs once design and acquisition are complete. Where there are constraints or property is unable to acquired for greenway use, intermediate route options may be part of construction while other processes are undertaken to build the corridor along a preferred route.
- **Maintenance:** Maintenance of the corridor begins at ribbon-cutting for the new greenway and cannot be over-looked as a critical component in supporting the efforts that pre-



Woodfin's Riverside Park already includes a greenway along the French Broad River. Other planning efforts have identified routes to connect north and south of the park from Asheville to the Madison County line.

Photo Credit: Don Kostelec

Exhibit 3-2: Buncombe County Greenways & Trails Overview



ceded construction to make the trail a reality. Chapter 8 addresses maintenance needs and expectations in more detail.

Priority Corridors

The following pages illustrate the findings of the planning efforts to evaluate five "Priority Corridors", as well as incorporation of the findings from the Wilma Dykeman RiverWay Plan and the US 70 / Swannanoa River and French Broad River / Highway 251 studies. Collectively, these eight corridors represent the highest priority for Buncombe County to pursue for detailed planning, design, land acquisition and construction in the short-term (up to 10 years from adoption of the Plan) to develop a countywide network of greenways and trails.

To the greatest extent possible, the routes were evaluated to identify acceptable corridors along rivers and streams or existing utility or sewer easements; within the boundaries of publicly-owned properties; and situated where they appear to have least impact on private property. Corridors will bisect a variety of contexts that will influence the ultimate cross-section or require evaluation of how to fill gaps through off-road and on-street connections. The options for these typologies and ideas for implemention of Complete Streets concepts are outlined in Chapter 4: Design Features.

These Priority Corridors profiles do not represent detailed design of the route nor are they intended to represent actual alignments to the degree that impacts to individual properties or structures can be known or cost estimates fully derived.

Exhibit 3-2 illustrates a countywide perspective on the proposed greenway trails with Priority Corridors, both those already-studies and those identified as new concept in this Plan, and shown in **BLUE**. The routes identified in this and other plans that are not part of the Priority Corridor analysis are shown in solid (existing) or dotted (proposed) **GREEN**. Areas of Concentrated Agricultural Resources were those general areas identified by the public, stakeholders and property owners as locations where agricultural preservation and agritourism are of interest

Greenway Corridor: The Priority Corridor that is the subject of that particular profile, identified through this Plan or past studies.

3-5 ft Walking Trail: Connectors to corridors that are intended as a hiking trail with natural surfaces. May be alternate routes to Priority Corridors.

Other Greenway Corridors: Priority Corridors that are not the subject of the profile.

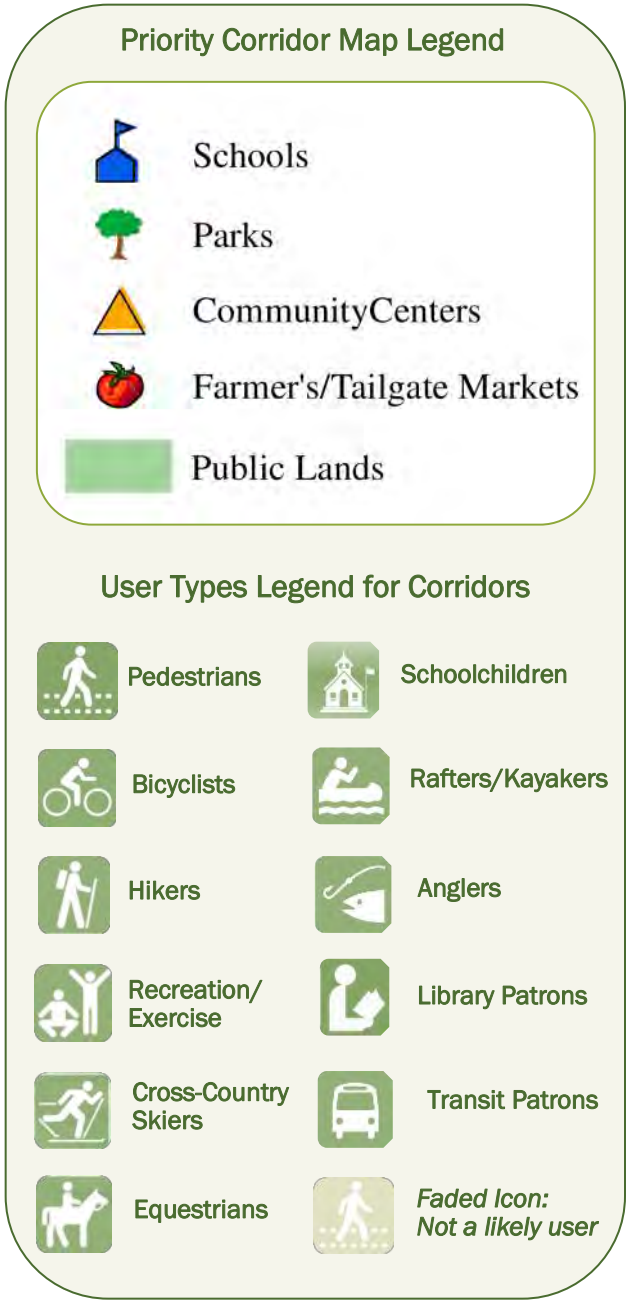
Long-Term Planned Greenways: Corridors that should be studied in future plans or required if new development influences them.

Existing Greenway: Built corridor.

NCDOT Complete Streets: Corridors or connecting routes that are best suited for sidepaths or sidewalks to connect to a Priority Corridor. See Chapter 4.

User Types. The user types highlighted for each Priority Corridor (legend in Exhibit 3-3) represent the likelihood of a particular type of user to regularly patronize the Priority Corridor. The user types helped inform design recommendations and potential connections destinations near the trail.

Exhibit 3-3: Understanding Corridor Profiles



Wilma Dykeman RiverWay

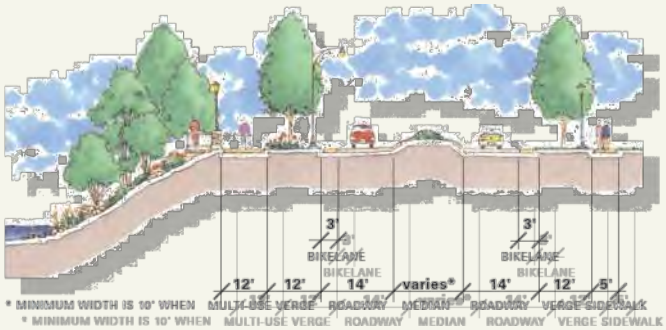
The RiverWay Plan, adopted in 2004, is a multi-faceted master plan for the urban riverfront of the French Broad River and Swannanoa Rivers in the City of Asheville. The Plan includes concepts for a greenway tracing the rivers, as well as environmental management goals, redevelopment concepts and parks. Sections of the RiverWay are in place in several areas.

Influences: The RiverWay is located primarily within a developed corridor along the rivers. Several opportunities and constraints exist, including:

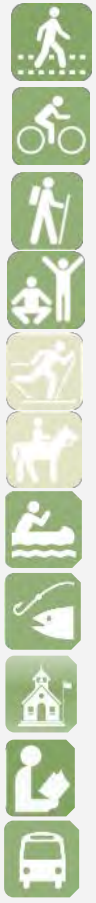
- River Arts District & Biltmore Village
- UNC Asheville & AB Tech
- Asheville neighborhoods
- Azalea Park & WNC Nature Center
- Biltmore Estate
- Development along rivers

Portions of the greenway are constructed through Carrier Park, French Broad River Park and in some private developments along the rivers. Design and environmental analysis is also in progress for sections of the RiverWay east of the French Broad River in the River Arts Districts. Most of the 7 other Priority Corridors in the Greenways & Trails Master Plan have direct linkages to the existing or planned sections of the RiverWay. The RiverWay is the most heavily-developed greenway corridor in Buncombe County in terms of land use.

Typology: The RiverWay plan designates a 12' wide pathway for its entire length to account for the potential for heavy use. Adjacent roadways were included in the design concepts to include sidewalks, bicycle lanes, and landscaped medians and sidewalk buffers.



Likely Users



The User Experience: The RiverWay was planned with a heavy user interface in mind, linking nearby places such as the WECAN neighborhood, River Arts District and Biltmore Village to the corridor. New parks and recreation facilities were master-planned along the route as well as facilities to access the river for fishing, canoeing and kayaking, and other recreation. Plans for residential development and other major redevelopment were also a key component to the RiverWayPlan. Several events occur along the RiverWay each year.

Potential Partners:

- City of Asheville
- RiverLink
- NCDOT, Utilities & Railroad
- Landowners / Developers
- Business organizations

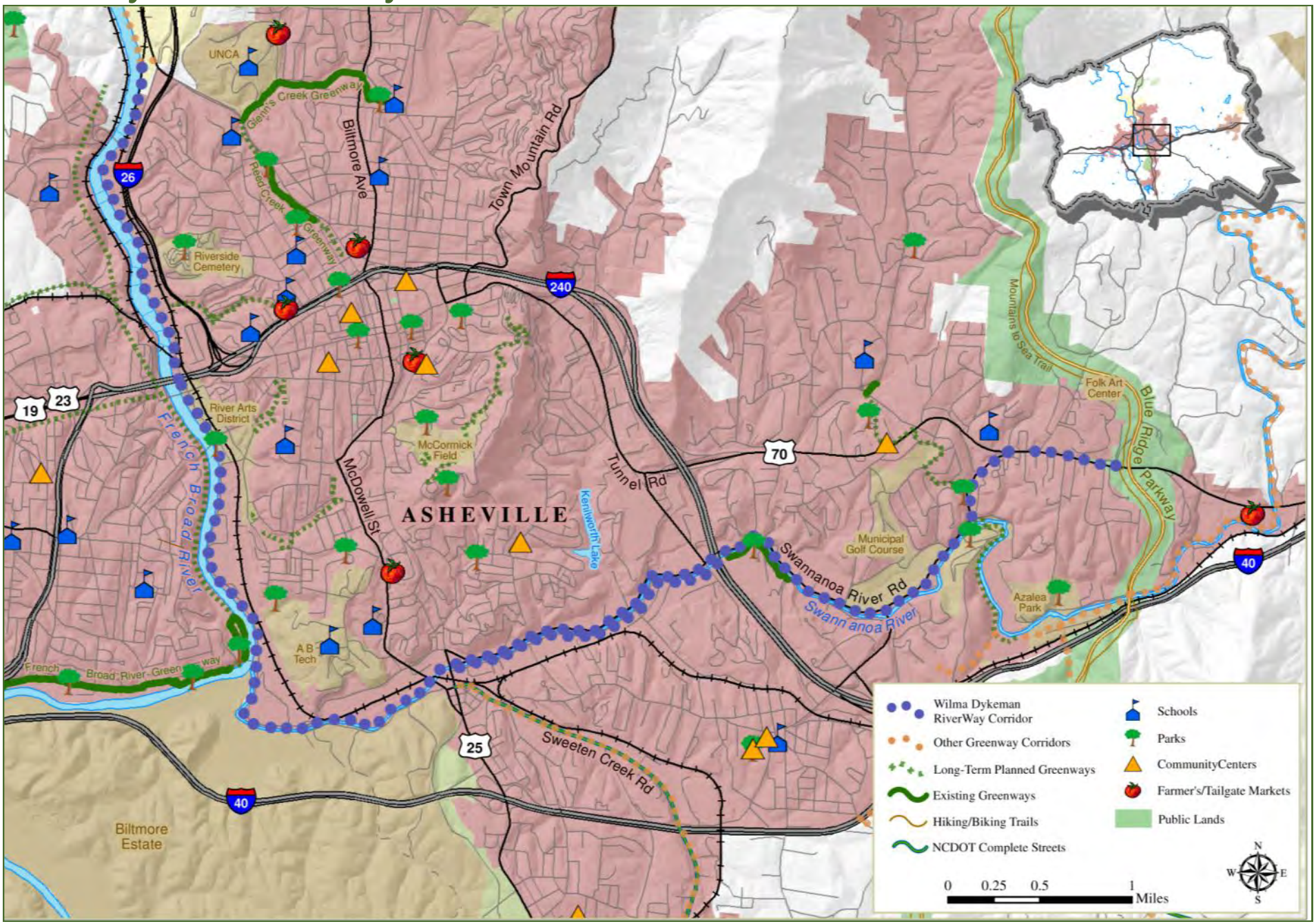
The RiverWay corridor is already utilized for a variety of activities on the trails and the river, which supports usage of the greenway.

Major Challenges

Topographic/Natural Landforms: Much of the corridor is planned or exists between the river, streets and development. Development is typically in commercial or industrial use, with some residential properties. Other segments run near utility easements or railroad.

Existing Infrastructure: Portions of the RiverWay are constructed through Carrier Park and French Broad River Park, as well as in some private developments. River access points are also along the corridor. Adjacent streets are in need of upgrades or additional pedestrian & bicycle facilities. .

Wilma Dykeman RiverWay Corridor



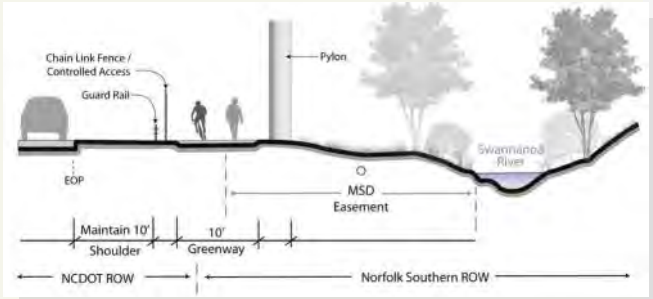
US 70 / Swannanoa River Greenway

The greenway proposed along the US 70 and Swannanoa River Corridor is an 18-mile route with an eastern terminus at the Point Lookout Trail in McDowell County and a western terminus at Azalea Park in East Asheville—the eastern terminus of the Wilma Dykeman RiverWay Plan. A detailed corridor study was completed in 2010.

Influences: The trail generally runs along the Swannanoa River with section adjacent to US Highway 70. Key communities along the route include:

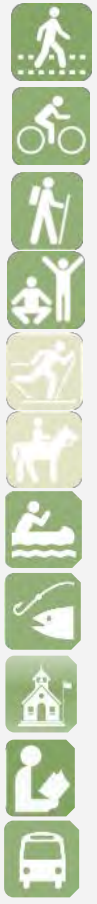
- Ridgecrest & Black Mountain
- Warren Wilson College
- Azalea Road Connection / Azalea Park
- Swannanoa Community
- Oteen/East Asheville
- Blue Ridge Parkway

The US 70 Swannanoa River Greenway has the potential to connect to population centers, public schools, Warren Wilson College, surrounding neighborhoods, several parks, other greenway trails, business, and shopping. In addition, pedestrian and bike safety has plagued certain areas within this corridor. This corridor would provide options for future users to safely and easily access the greenway offering a non-motorized transportation alternative. The planned greenway also crosses the Mountains-to-Sea Trail at the Blue Ridge Parkway.



Typology: The proposed route bisects diverse natural and manmade environments, which prompted the corridor study to recommend 6 cross section options based on constraints and opportunities. In general, a 10' asphalt trail (sample cross-section above) was the preferred treatment, with the exception of the area near Warren Wilson College

Likely Users



The User Experience: The proposed route traverses a diverse set of natural features along the Swannanoa River and makes connections to existing hiking trails at Warren Wilson College, the planned greenway within the City of Asheville to Azalea Park, numerous existing & planned greenways in Black Mountain, and the Point Lookout Trail in McDowell County. Potential exists for day trips taken from one end to another with incorporation of local farming, restaurants and brewpubs.

Potential Partners:

- Municipalities
- Warren Wilson College
- RiverLink
- NCDOT, Utilities, & Railroad
- Ridgecrest Assembly
- Blue Ridge Parkway

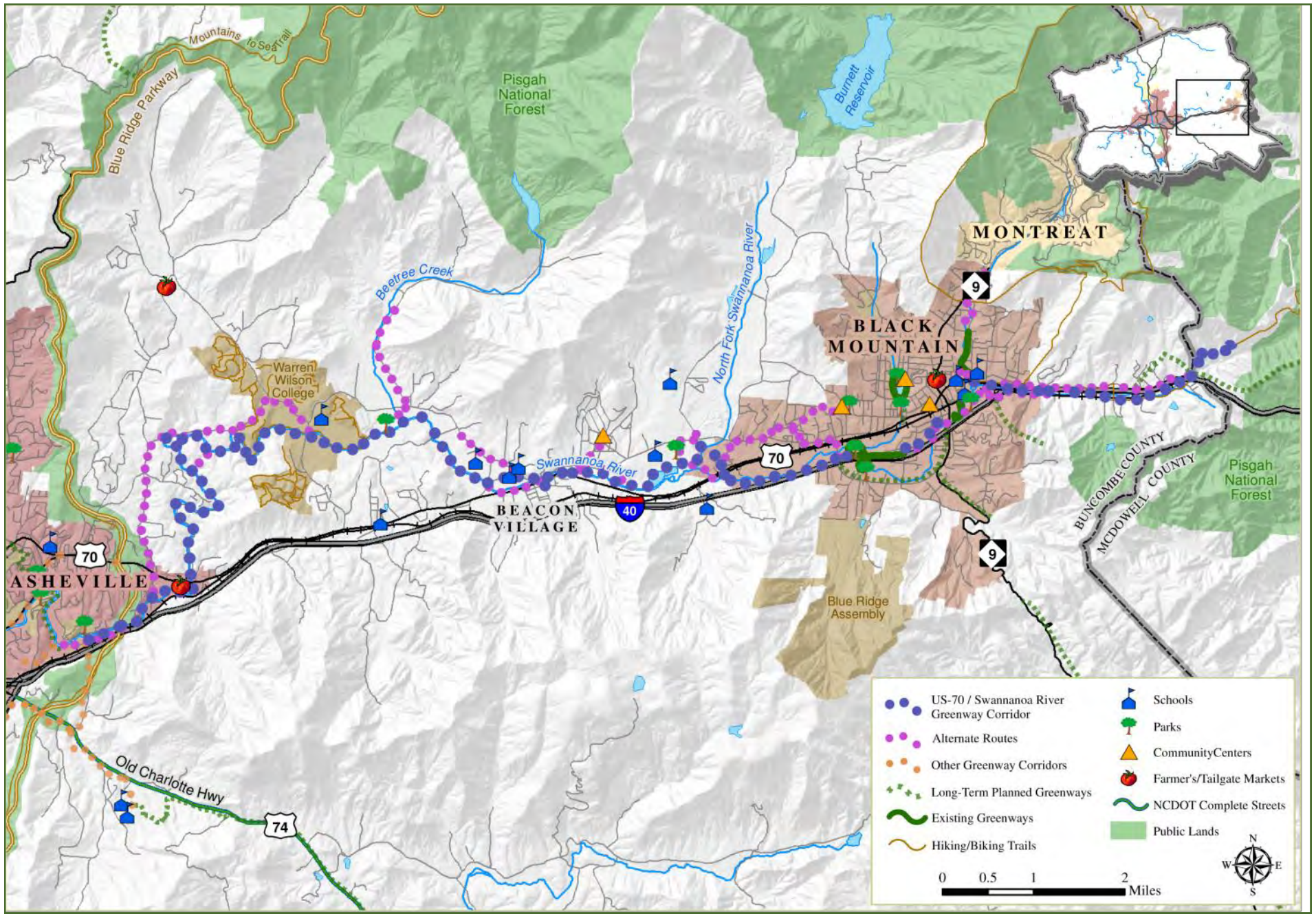
Fields at Warren Wilson College (left) and US Highway 70 (right) were major influences in the US 70 / Swannanoa River Greenway study.

Major Challenges

Topographic/Natural Landforms, including steep terrain, and floodway impacts, such as river and tributary crossings. These features create right-of-way constraints in sections that are adjacent to US 70 or other roadways.

Existing Infrastructure forms physical barriers for development, including existing roadways and buildings, an active railroad, utility lines (wire-based, sewer & water), and drainage structures .

US 70 / Swannanoa River Greenway Corridor



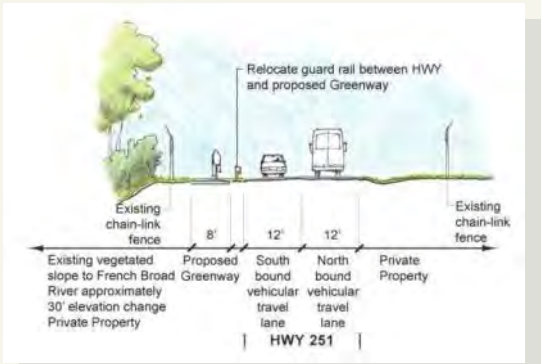
French Broad River / Highway 251 Greenway

The greenway along the French Broad River & Highway 251 is planned from the northern city limit of Asheville to the Madison County line. The planned 15-mile corridor follows the historic route of the Buncombe Turnpike and Drovers' Road, with a connection to the planned Wilman Dykeman RiverWay. A corridor study was completed in 2010.

Influences: The corridor is a gorge carved out of the mountain landscape by the river. Key communities and influences along the route include:

- Asheville & Woodfin
- Reed Creek Greenway
- Alexander River Park & mountain bike trails
- Alexander Community
- Ledges Park & Walnut Island Park

The river has created a narrow gorge within the corridor that varies slightly in width with the wider section located in the south end of the study corridor. These influences along with the Norfolk Southern Railroad along the west bank of the river prompted the study to recommend the corridor follow the east bank. Land uses within the study corridor include industrial, commercial, institutional, residential, and park/open space. In recognition of the scenic and historic qualities of the corridor, Highway 251 is designated as a Scenic Byway.



Typology: A 10-foot asphalt trail was designated as the preferred cross section, however constraints along the corridor make the construction of this design difficult in some locations without blasting . Existing development patterns, topography, elevation between the shoulder of Highway 251 and the river's edge are a few of the constraints.

Likely Users

The User Experience: Lengthy section of the proposed route remain in a natural setting with the trail and highway sandwiched between the river and rock outcroppings. Mountain bikers and road cyclists currently use the highway corridor due to its scenic value and low weekend traffic volumes. Connections to parks, campgrounds, landings for canoes/kayaks/rafts, and fishing areas will likely drive users to the corridor.

Potential Partners:

- Municipalities
- Craggy Prison Property
- NCDOT, MSD & Railroad
- RiverLink
- Campgrounds
- Madison County

Norfolk Southern Railroad (left) and NC Highway 251 (right) were major influences in the French Broad River / Highway 251 Greenway study.

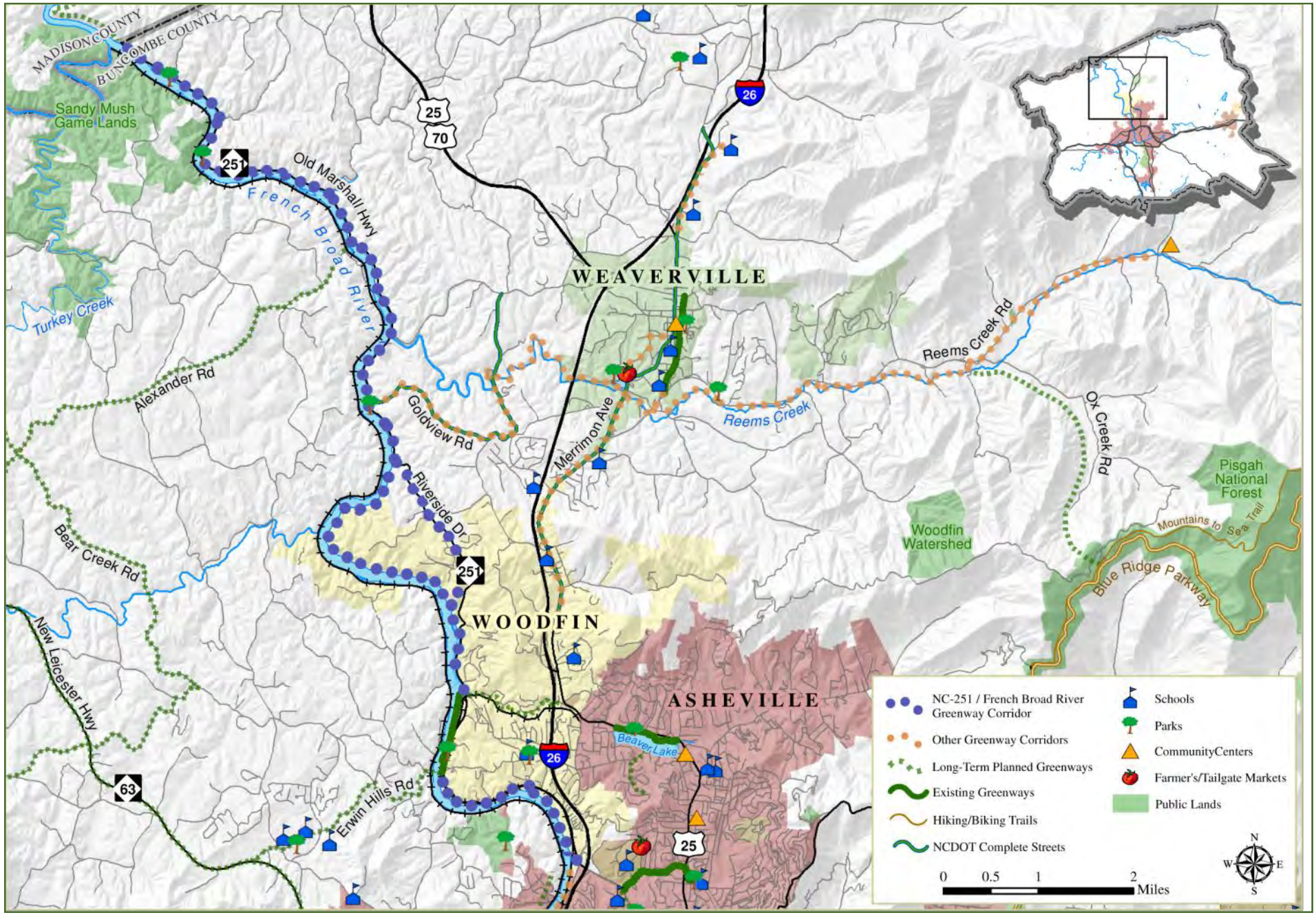
Major Challenges

Space & grade between river & Highway 251 creates numerous constraints along the corridor and will impact transition areas to parks connecting streets and other destinations.

Private property is also located in the narrow strip of land between the highway and the river.

Bridges linking other roads to Highway 251 across the river or crossing creeks draining into the river create height restrictions for greenway underpasses.

French Broad River / Highway 251 Greenway Corridor



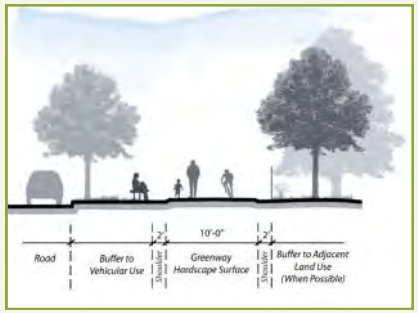
Bent Creek Greenway

West Asheville, the NC Arboretum and Bent Creek were some of the top destinations identified through the public process. This proposed route makes those connections from mountain bike and hiking trails at Bent Creek and the Arboretum as well as greenways in West Asheville. The 8-mile route requires careful consideration of the area around the Farmers Market and Brevard Road.

Influences: The planned greenway would begin at the current terminus of the greenway at the confluence of Hominy Creek and the French Broad River that is part of the Wilma Dykeman RiverWay. Influences along the route include:

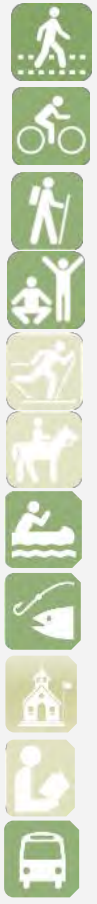
- West Asheville & Bent Creek
- Biltmore Square Mall / Business Park
- I-26, Brevard Road interchange
- Wilma Dykeman RiverWay
- Bent Creek / Arboretum Trails
- WNC Farmers Market
- MSD Easement along I-26
- Blue Ridge Parkway

There is an existing walking trail within the Ridgefield Business Park between Brevard Road and I-26 south of Biltmore Square Mall. The southern terminus at the Arboretum links to the planned Arden/Lake Julian corridor to provide a connection from central Buncombe County to communities in southern Buncombe County. The project would also cross near the Mountains to Sea Trail.



Typology: This corridor has the potential to serve both as a utilitarian connection by providing access from the City limits to Bent Creek Recreational Area, and lunch time exercise users within the business park. Mountain bikers prefer unpaved trails, but that may not be as practical or desired north of the I-26/Brevard Road interchange.

Likely Users



The User Experience: A greenway linking Bent Creek to Hominy Creek could provide exceptional opportunities for connectivity, tourism, Blue Ridge Parkway connection and West Asheville linkages. Extensive discussions have occurred about greenway potential in this corridor for many years. Initially, it is possible the route will link Bent Creek to the Mission Hospital Satellite offices campus in Broadpointe Business Park.

Potential Partners:

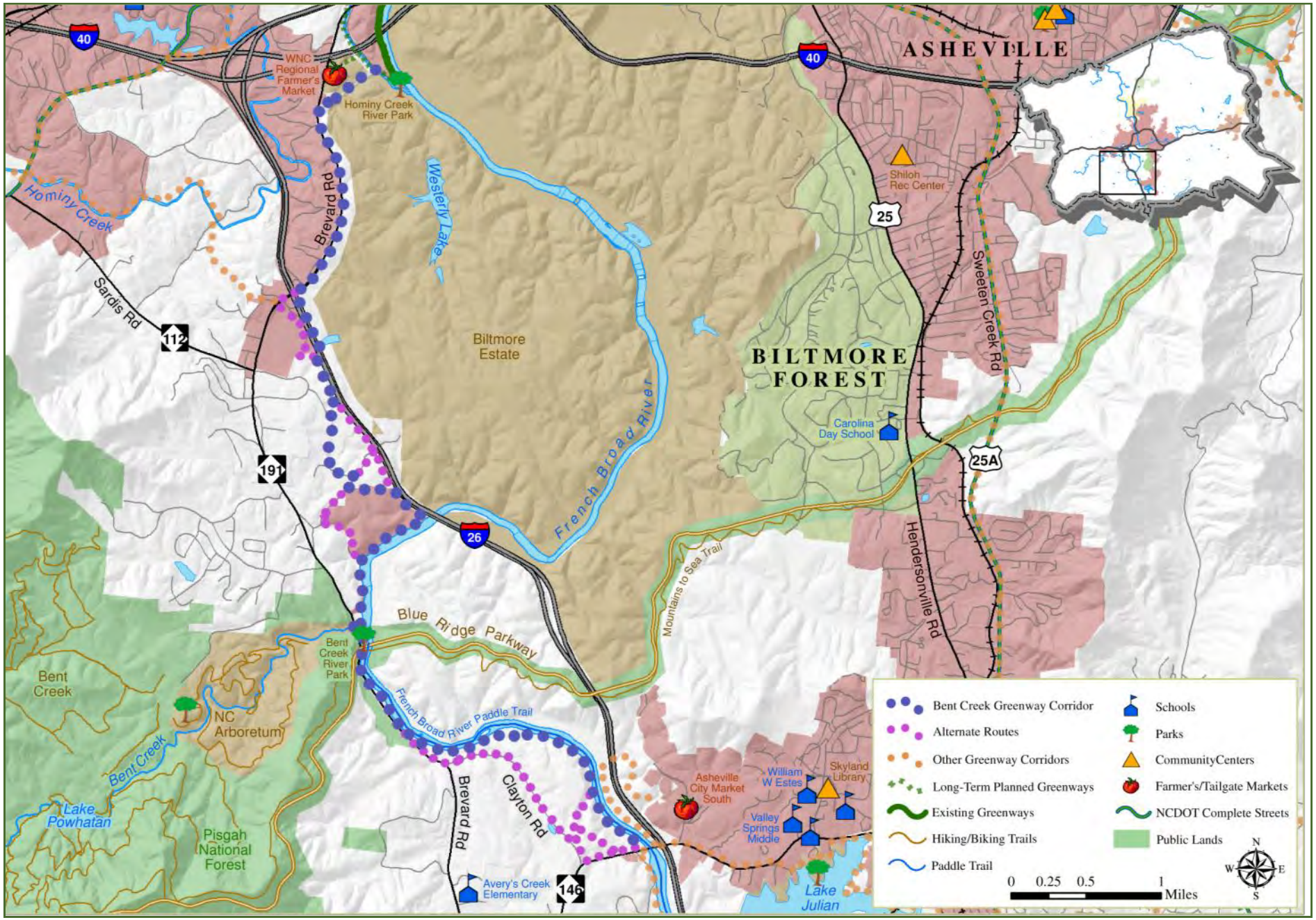
- City of Asheville
- NC Arboretum
- RiverLink
- NCDOT, MSD & Utilities
- Business Association
- WNC Farmers Market
- Blue Ridge Parkway

The French Broad River Floodplain (left) offer opportunity for greenway corridor development. Terrain near the Farmers Market (right) will likely require special considerations and partnerships for trail construction.

Major Challenges

The interchange at I-26 and Brevard Road (NC 191) is a major constraint depending on how the interchange re-build can be configured. There is potential to follow I-26 right-of-way between I-26 and the Biltmore properties to a culvert and MSD lift station south of the interchange near the business park. Connections to Bent Creek trails will offer other challenges if users are expected to travel on existing streets, which are narrow and have sight distance issues. Complete Streets applications may need to be pursued, if possible within existing right-of-way.

Bent Creek Greenway Corridor



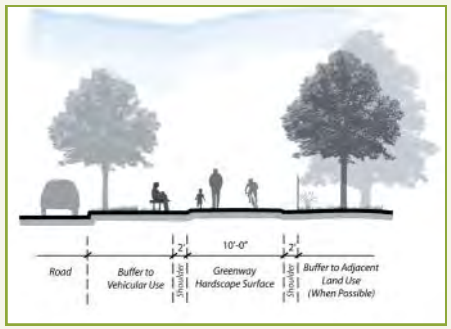
Hominy Creek Greenway

This proposed 7-mile corridor could serve as a utilitarian connection by providing access from the Hominy Creek Greenway/Park to Buncombe County Sports Park. Initially, this focus area begins in West Asheville near Sand Hill Road and terminates near the AB Tech Enka Campus with a spur to Enka High School and nearby public use areas.

Influences: The planned corridor connects urbanized areas of unincorporated Buncombe County to existing greenways in West Asheville and the Wilma Dykman RiverWay. A new development is proposed with the old BASF plant site near AB Tech, which will construct a segment of greenway through the property. Communities and influences along the route include:

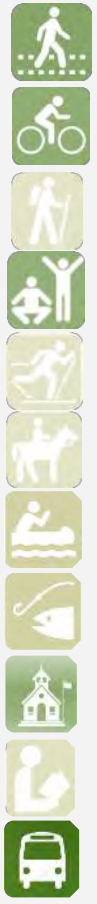
- West Asheville
- AB Tech Enka Campus
- Enka-Candler Library
- I-40 / Sand Hill Road
- Enka High School
- National Forest
- Enka, Candler & Biltmore Lake
- Buncombe County Sports Park
- Sand Hill-Venable Elem. School
- Asheville School
- Hominy Valley Elementary School

Beyond the terminus of the mainline at AB Tech, a long-range greenway corridor is identified paralleling Hominy Creek to the Haywood County line.



Typology: Greenway design should be consistent throughout much of this corridor in off-street segments, with a 10-foot asphalt greenway. On-street section or stream crossings will require Complete Streets applications. The spur to Enka High School could be considered as a natural surface 10-foot trail.

Likely Users



The User Experience: The proposed corridor connects heavily utilized sections of existing greenways in West Asheville and has the potential to be a commuter corridor to and from this area and for AB Tech students. The Hominy Valley area is popular for long-distance recreational cyclists who start their trips in the Enka community or West Asheville.

Potential Partners:

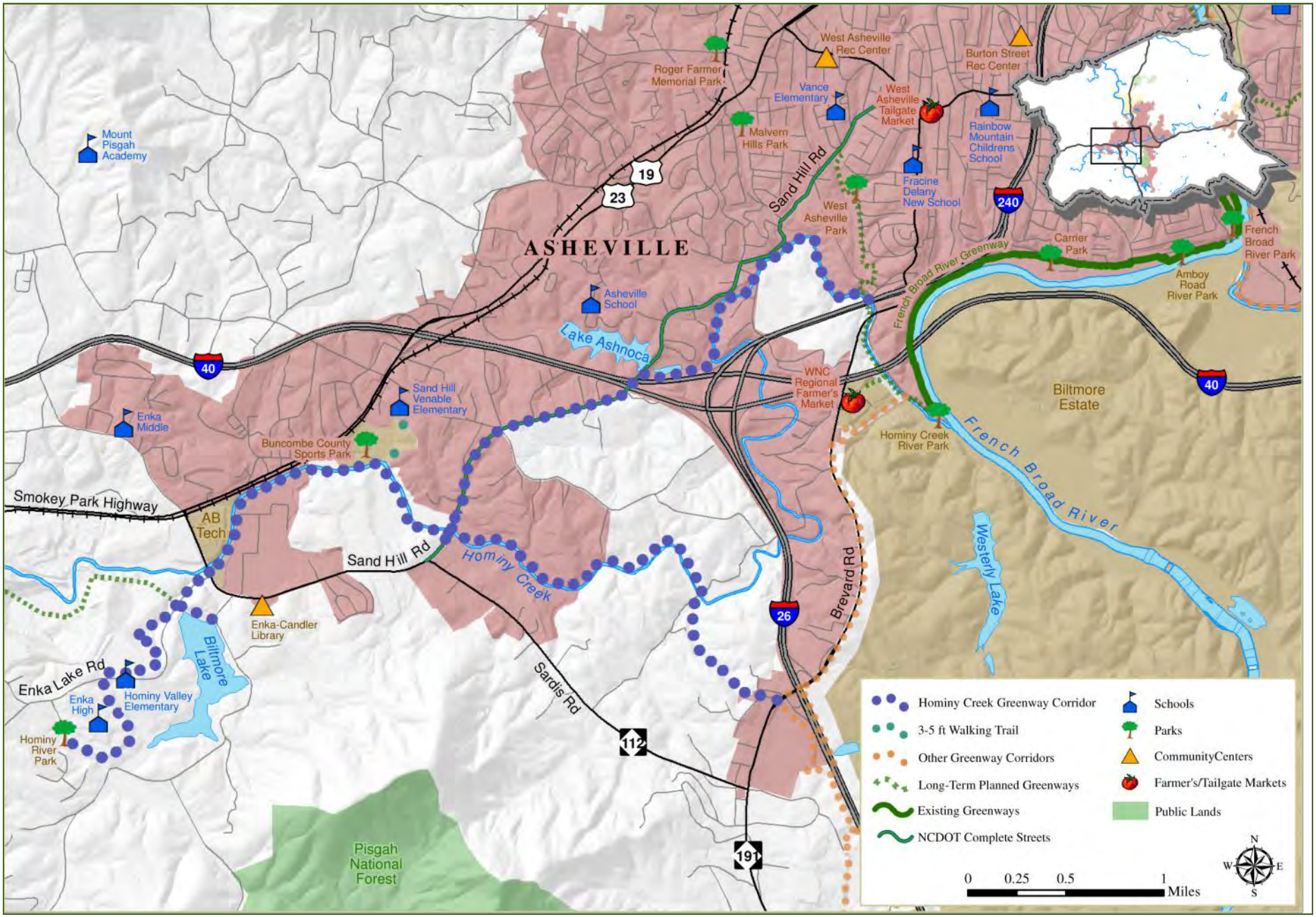
- City of Asheville
- AB Tech
- RiverLink
- NCDOT
- MSD & Utilities
- Buncombe County Schools

Interstate crossings (left) and filling gaps in Complete Street applications (right) will help make connections to off-street trail near Enka .

Major Challenges

The constraints of built out areas, I-40, I-26/I-240 and topography presents limited options for this corridor. The meandering nature of Hominy Creek also requires considerable evaluation as to the best placement of the greenway. The value of the connections it provides however should not be underestimated when considering how these constraints need to be addressed when design commences.

Hominy Creek Greenway Corridor



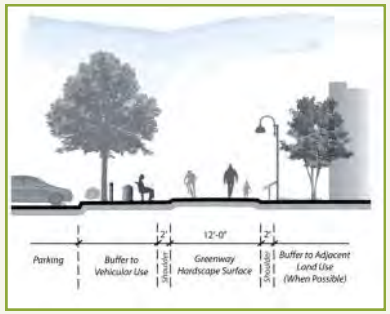
Lake Julian Greenway

Planned greenways linking Mills Gap Road to Bent Creek provide exceptional opportunities for connectivity, tourism, retail support, and the 6-mile French Broad River corridor in this area. Biltmore Park and Lake Julian are primary destinations with linkages planned to the Bent Creek Greenway and long-term trails along Cane Creek.

Influences: West of the French Broad River, the trail follows the alignment of river and roadways. Long Shoals Road will require upgrades for Complete Streets features. A powerline easement east of Lake Julian provides the primary route linking Royal Pines. Influences include:

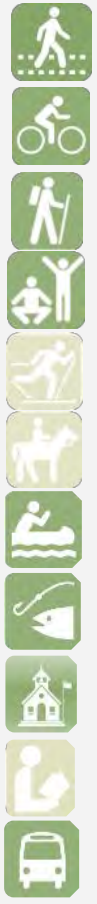
- NC Arboretum & Bent Creek
- Lake Julian
- Small parks throughout the study area
- Several schools
- Biltmore Park Town Square
- Arden Community
- Royal Pine Community

Biltmore Park can be easily accessed via existing sidewalks located along Long Shoals or the construction of an off-road trail near the road. Utilization of the newly improved I-26 interchange has been identified as an alternate route. In both cases, sidewalk connectivity via the newly constructed bridge can be used to span the French Broad River. RiverLink also holds conservations easements in the area.



Typology: The route will likely have high usage connecting development to recreational areas and the National Forest. A combination of 10' hardened surface in addition to a section of Complete Street improvements along Long Shoals Road is likely. From Lake Julian to Mills Gap Road the typology may range from improved neighborhood streets to 4' wide trail systems along the powerline corridor through Rosscraggon Park.

Likely Users



The User Experience: The proposed route bisects a variety of development types and there are several properties along the west side of the river that could be poised for development. Users will have to navigate a corridor where the character and design changes in order to make necessary connections and provide access to schools, shopping areas and natural features. The powerline easement will also be a factor in the user experience.

Potential Partners:

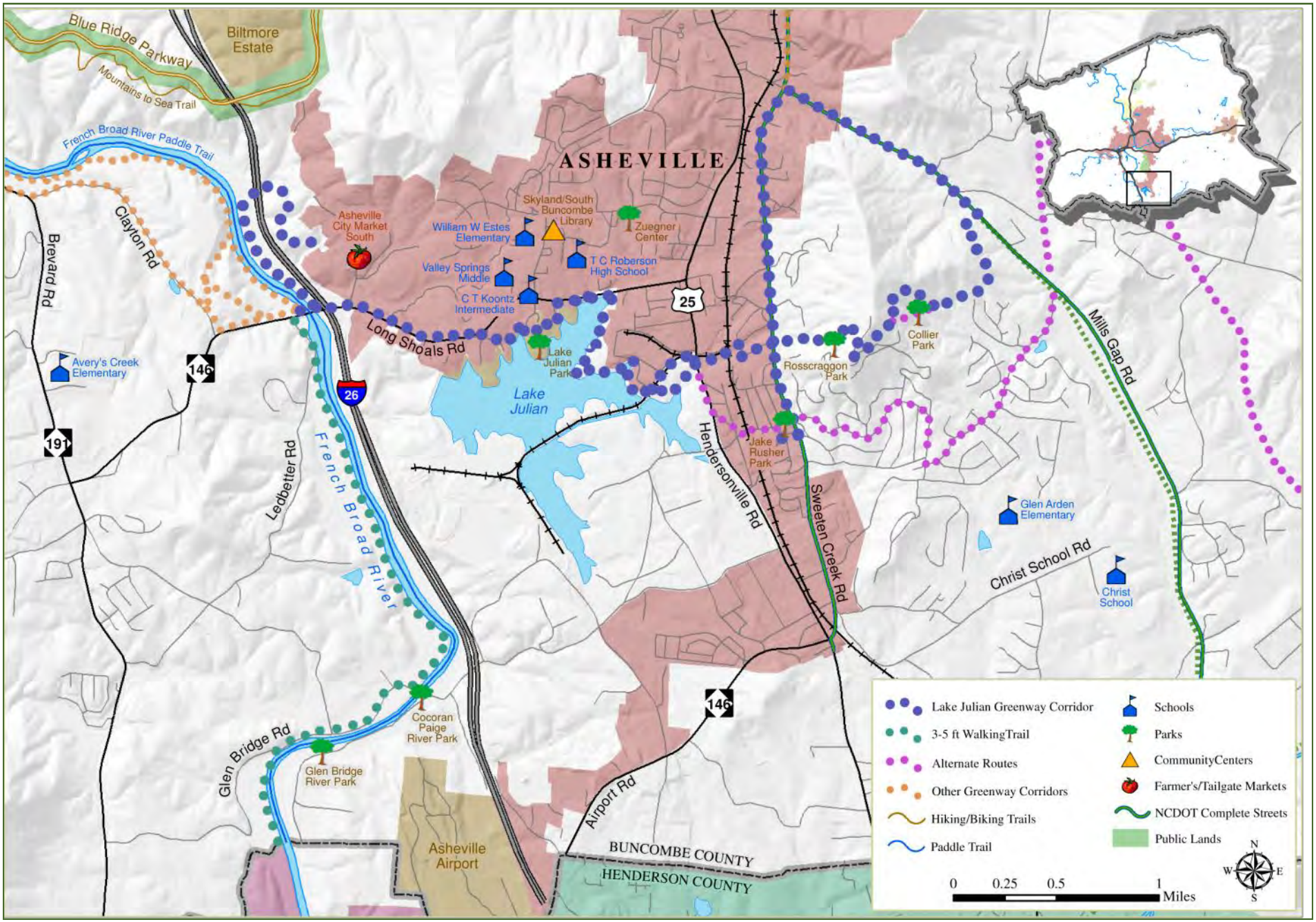
- City of Asheville
- NC Arboretum
- NCDOT
- RiverLink
- MSD, Utilities & Railroad
- Homeowners Associations
- Major Property Owners

The Royal Pines area (left) has shown interest in greenways; proximity of the corridor the French Broad River (right) is a notable constraint.

Major Challenges

It is preferred that the floodplain be utilized to connect to the Bent Creek Recreational Area. Multiple private properties will need to be traversed if this route is followed, however, large tracts, specifically Biltmore Baptist Church, Biltmore Farms, Asheville Firefighters Association, and the UNCA property could be linked together to create this opportunity. Topographic challenges exist from areas between Hwy 191 and the French Broad River. Topographic challenges also exist along the powerline corridor east of Lake Julian.

Lake Julian Greenway Corridor



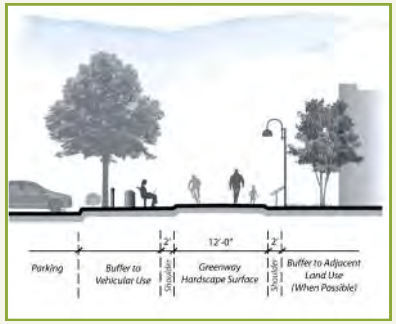
Reems Creek / Weaverville Greenway

The proposed greenway would connect the French Broad River to Weaverville and points east toward the Vance Birthplace & Beech Community with a southern spur along Merrimon Ave. to Woodfin and North Asheville. The 6.5-mile main corridor has 3 distinct sections: French Broad River to Weaverville; Weaverville to Beech Community; & Weaverville to Woodfin/North Asheville.

Influences: The planned greenway will connect to the planned French Broad River / Highway 251 Greenway and bisect the Town of Weaverville with a connection to Lake Louise and the Nature Park. Users following the French Broad River would be able to link the Wilma Dykeman RiverWay in Asheville to reach Weaverville. Other influences and communities along the route include:

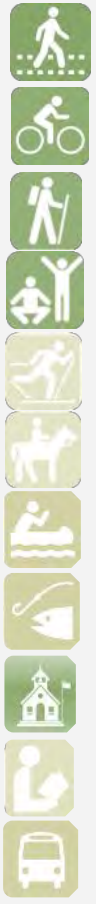
- Reems Creek Valley
- Vance Birthplace
- Karpen Soccer Fields
- Woodfin & North Asheville
- Downtown Weaverville & Parks
- Several schools

Beyond the focus of this corridor are connections to Ox Creek and the Blue Ridge Parkway further east, which are used by recreational bicyclists. The Town of Weaverville owns property adjacent to the proposed trail within town limits that would be suitable for a joint-use maintenance shed.



Typology: Within the city limits of Weaverville, a 12-foot paved section is preferred where constraints are not as prevalent. In the Reems Creek valley there may be sections that necessitate a narrower walking path with signage directing bicyclists to nearby street routes. A Complete Streets section is preferred for the Merrimon Avenue link to Woodfin and North Asheville.

Likely Users



The User Experience: The proposed route will connect Weaverville to the French Broad River and build upon downtown Weaverville as a destination. On-road bicycle connections from Highway 251 to Weaverville are limited and this route would provide an alternative to busy roads. The connections to the downtown Nature Park in Weaverville and the Vance Birthplace have the potential to drive tourism use.

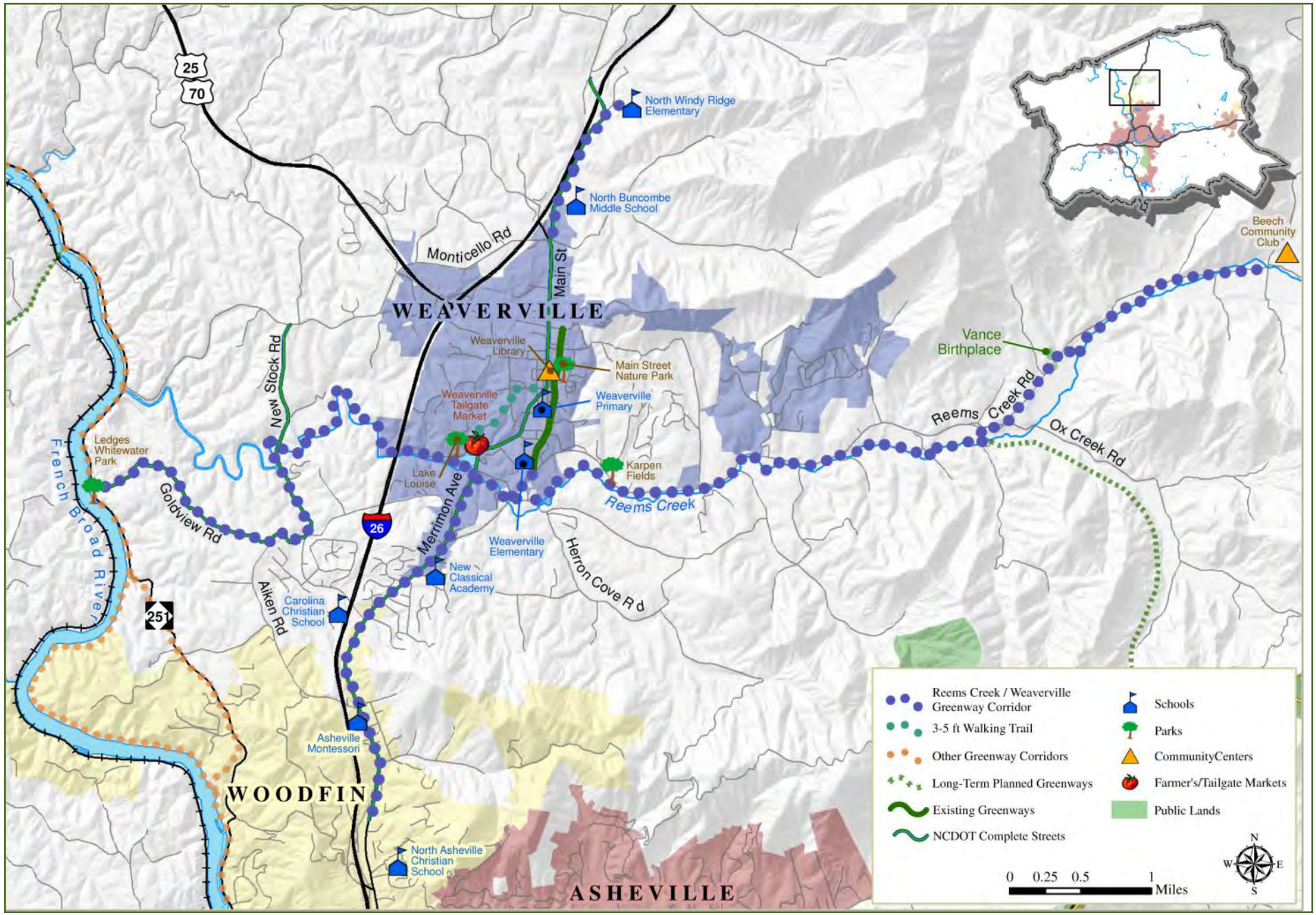
Potential Partners:

- Municipalities
- NCDOT
- Buncombe County Schools
- MSD & Utilities
- Business Association

Merrimon Avenue (left) and an I-26 underpass (right) present contextual challenges for greenway and Complete Streets implementation.

Major Challenges. Topographic challenges exist as the Reems Creek gradient increases and becomes constrained significantly as the corridor drains to the French Broad beyond the Pinebrook Farms Neighborhood. Connectivity to Asheville will be challenging due to commercial development constraints and heavy vehicular traffic. The use of the sewer right-of-way which either parallels or runs within the roadway for a majority of the length can be explored. Established land uses with large tracts are present throughout the Reems Creek Valley which will need to be traversed. Hydrology should be noted as a consideration as considerable crossings and wetlands may be encountered along this corridor.

Reems Creek / Weaverville Greenway Corridor



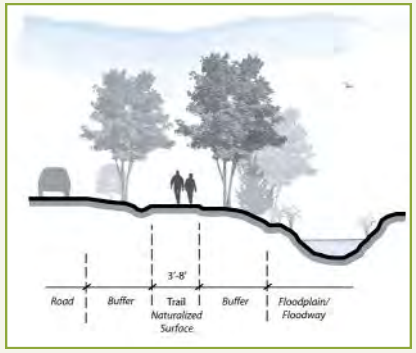
Reynolds Greenway

Azalea Park has become a hub for Asheville and County Greenway planning efforts. This proposed corridor leads south from Azalea Park with primary destination being the Blue Ridge Parkway and AC Reynolds Schools. The 6-mile route would link to long-term greenways planned for connections to Fairview, Cane Creek and Henderson County.

Influences: Connectivity from Azalea Park, the planned termini of the Wilma Dykeman RiverWay and the US 70/Swannanoa River Greenway, to points south of Asheville is an opportunity to introduce users to National Forest and Asheville City Park. Key destination and communities along the route include:

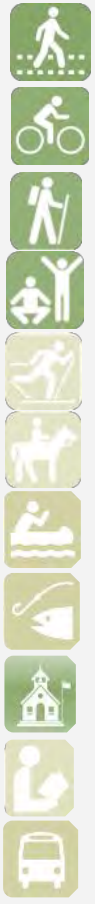
- Asheville, & Oakley Neighborhood
- Blue Ridge Parkway
- Azalea Road Connection / Azalea Park
- AC Reynolds School Complex
- Fairview Community
- Mountains-to-Sea Trail

Next step planning efforts should explore creating a node within the Fairview community that radiates from the Cane Creek intersection with US 74A. Future connectivity includes linking Fairview and Reynolds as well as a potential connection into Henderson County and south. The area has cultural significance and has been identified as a destination for agri-tourism. Cane Creek valley has tremendous opportunity for users to experience rural, long range view settings.



Typology: To minimize disturbance with the Mountains-to-Sea-Trail, a 5-8' foot trail / foot path would allow for access from Azalea Park to the Blue Ridge Parkway. Connections through Parkway property to AC Reynolds Campus would be paved and sections south of the school may be constructed of natural surfaces.

Likely Users



The User Experience: There is strong demand for bicycling connections from East Asheville and the Oakley Community to the Blue Ridge Parkway as the transition of I-240 to US 74A presents numerous challenges. This proposed route would allow bicyclists to connect from the Azalea Park area to the Parkway along local streets and pathways. Individuals wishing to hike the Mountains to Sea trail can also begin their journey at Azalea Park.

Potential Partners:

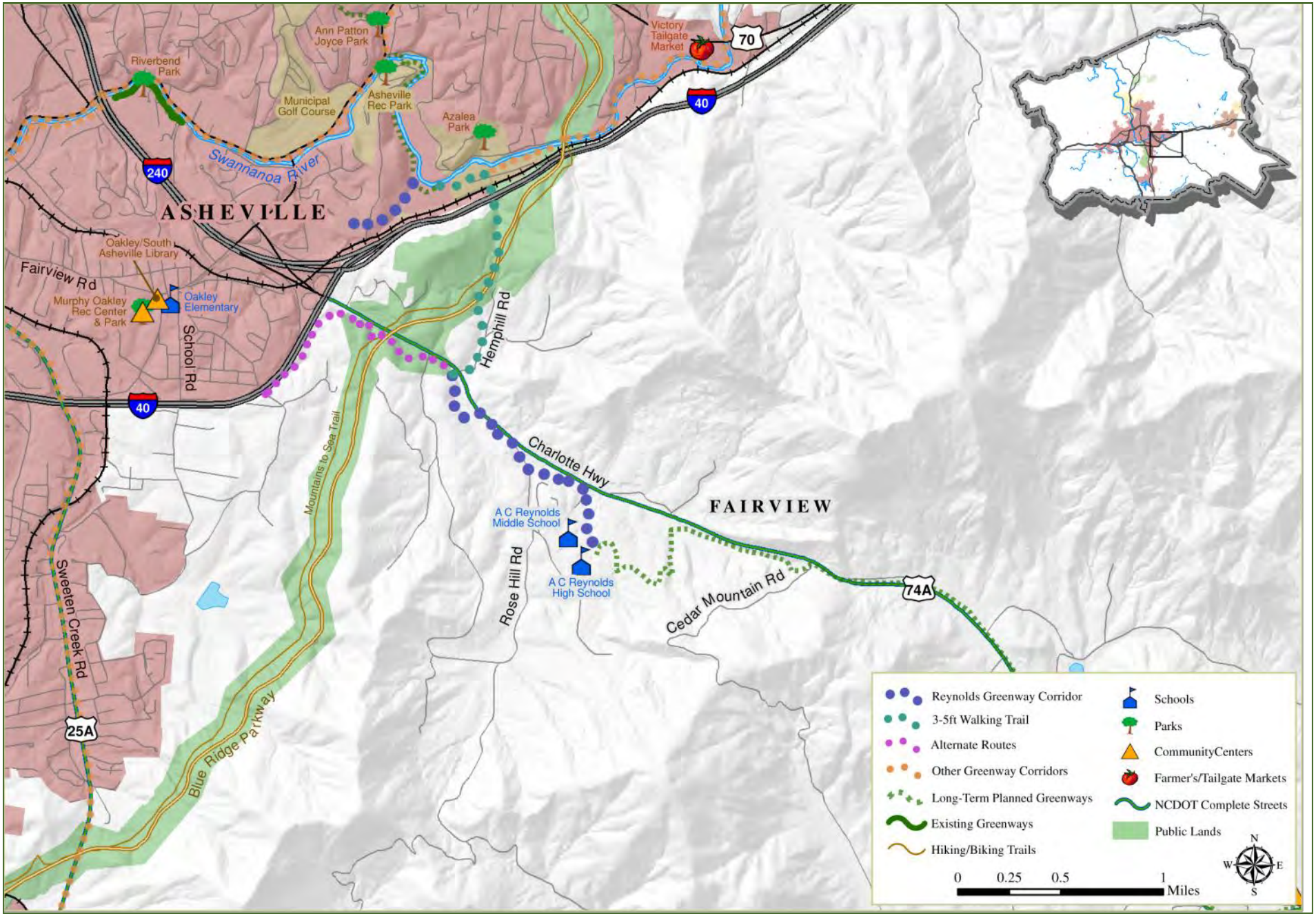
- City of Asheville
- Blue Ridge Parkway
- RiverLink
- NCDOT
- Buncombe County Schools
- Mountains-to-Sea Trail

The Fairview greenway corridors would meander through commercial areas along US 74A (left) and natural areas (right) near the highway.

Major Challenges

Crossing I-40 to connect the Parkway to Azalea Park will require exploration of alternatives, whether using local street connection, culverts or an overpass to make the connection. Constrained sections between commercial development, hydrology, and topography from the Blue Ridge Parkway to AC Reynolds High School will also influence the corridor design. Coordination is required with the Parkway regarding acceptable access onto National Park Service land to ensure proposed access is in line with recent planning efforts.

Reynolds Greenway Corridor



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Chapter 4: Design Features

How we design greenways and trails impacts the experience and, ultimately, the safety of the diverse set of users that take to greenways and trails for a variety of recreational, utilitarian, health and transportation purposes. This chapter illustrates aspects of facility design to help guide future actions by Buncombe County and its partners in planning for, designing, constructing and maintaining greenways that connects to a variety of destinations, promotes a diverse user experience and is built to a maintainable scale.

The Design User

A discussion on the design of greenways and trails should not begin with the dimensional aspects of the trail; rather it begins with understanding the different user types, how their needs are unique, and how those differences are accommodated into trail design and construction.

A well-connected greenway system is one the most diverse facets of our built environment in terms of how people interact. When compared to traditional walking trails or paved walkways within parks, their function transcends a recreational or experiential purpose to include a transportation element. When compared to other transportation facilities, greenways have a much more diverse set of user capabilities, "vehicles", and speeds occupying and traveling through the same space.

A family walking the dog along a trail has different needs than the bicyclist using the greenway as a link between two roadways. The needs of a person in a wheelchair vary greatly from members of a running club, the romantic couple walking arm-in-arm or a child learning to ride a bike.

How we accommodate a multitude of functions depends on understanding the context of the greenway and what user types are most likely to interact. Exhibit 4-1 on the following page illustrates the various functional widths required for the largest share of greenway users. Each type of user has a unique requirement in terms of operating width and clear space required for comfort and safety. These characteristics ultimately drive our design standards, design exceptions and location-based design decisions.

As we establish design standards and practices, it is important that they not conform to a "one-size-fits-all" approach. Such an approach detracts from aesthetics of the trail, thus negating the potential positive aspects of the experience. It can have negative safety impacts if applied universally without consideration of user characteristics.

Exhibit 4-2 illustrates the various contexts where user conflicts tend to be greatest. Not all conflicts can be avoided as the constraints of the natural and built environment oftentimes dictates how we design greenways and where we place them along a corridor. The design of greenways should consider where these conflicts are most likely to exist.

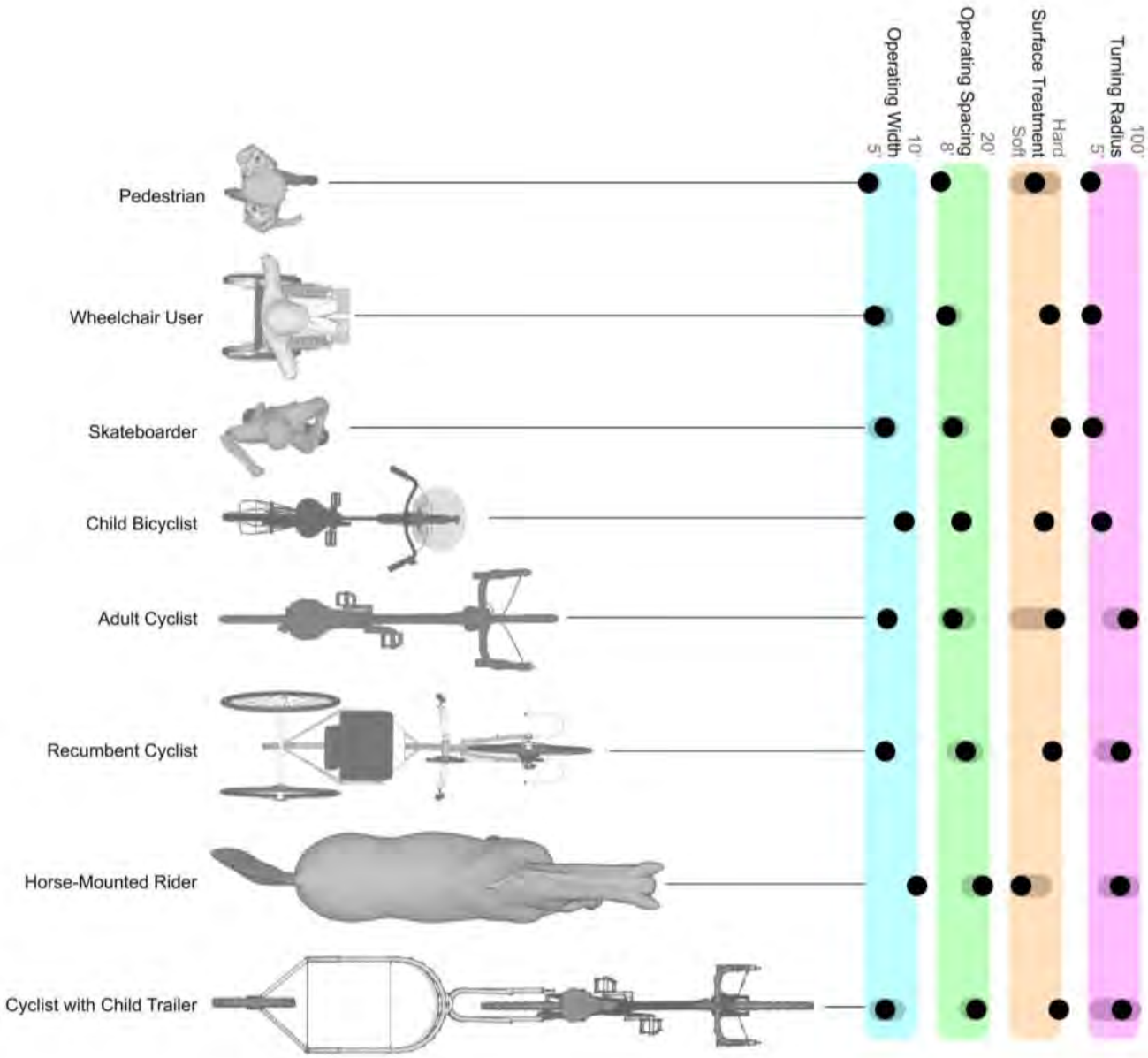
A greenway near an elementary school is likely to have students using the trail during the school day as an outdoor classroom. Children in groups tend to spread across the length of the trail, which creates conflicts with faster walkers, joggers, and bicyclists.

Places where terrain and resulting grades lead to faster speeds for bicyclists creates conflicts with pedestrians due to a greater speed differential as well as uphill bicyclists who need more space to climb.

The users of greenways and trails will vary greatly across Buncombe County as the setting, destinations and experience of users change based on the location of the trail. Understanding the variety of user types and their needs leads to better design decisions and ultimately safer interaction among users.

Photo Credit: Don Kostelec

Exhibit 4-1: Dimensions and Spatial Needs of Greenway Users



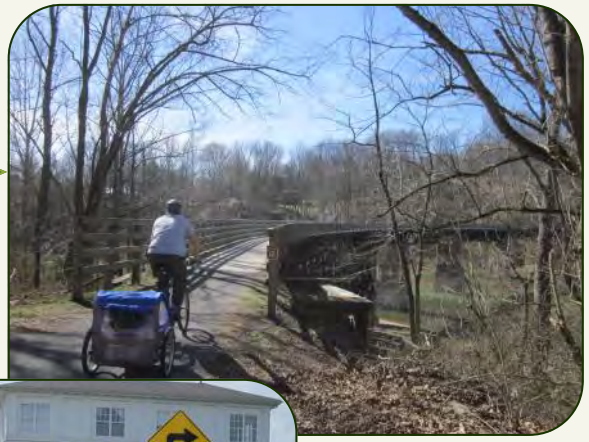
Typical operating widths, spacing requirements and turning radii depend on forward velocity as well as the experience of the operator. Skilled skateboarders frequently turn in less than the length of their own skateboards, for example. The preferred surface treatment for an adult cyclist will also depend on the type of bicycle (e.g., road or mountain or hybrid) that is being ridden as well as the purpose of the ride, for example, commuting as opposed to recreation.

Exhibit 4-2: Common User Conflicts

Common User Conflicts

In high traffic areas or where large groups, such as school classes, are a common user.

On bridges as widths may very from the trail or are constrained due to cost, context and feasibility.



Sidepaths where bicycle traffic from the street is best accommodated on a shared use facility.

The intersections of on-road and off-road facilities, especially where tight turns are required.

Where grades lead to a greater difference in operating speed among modes or uphill vs. downhill users.

The intersection of two greenways where considera-tions such as sight distance, speed and turning radius should be closely examined.

Photo Credits: Don Kostelec

Greenway Character & Context Sensitive Design

Once user needs have been addressed in planning and design, the look and feel of the corridor should be closely examined to fit the setting while adhering to standard design policies. The countywide greenway system should focus on two primary points to help establish a greenway character that fits within the context of Buncombe County:

- First, it should take into consideration the unique aspects of the individual community or neighborhood in which the greenway will traverse; and
- Second, the greenway system should contain cohesive elements to unify the design.

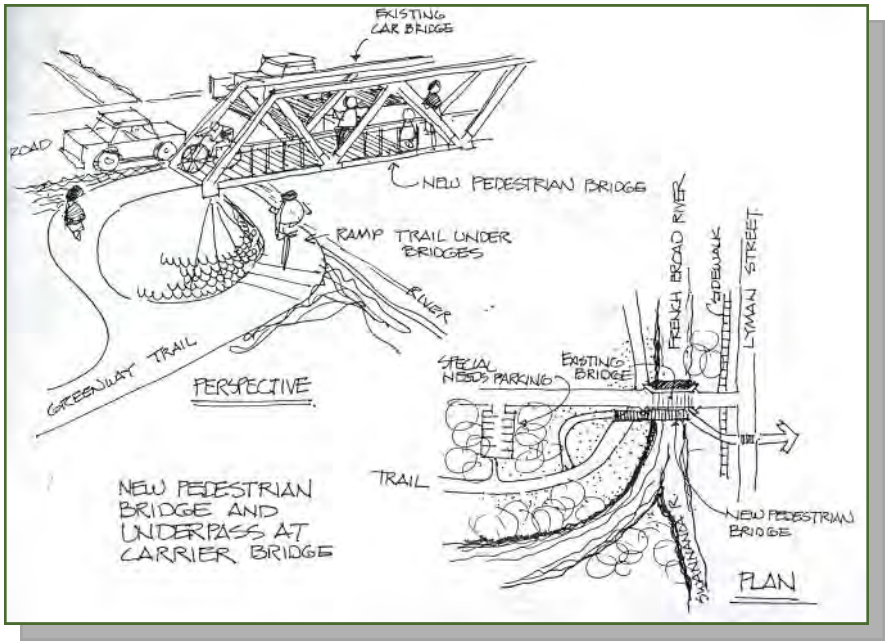
These were key themes posed at the September 2011 Stakeholders Workshop. The participants felt that a regional, coordinated approach to greenway investment was best, but in order to maximize the potential for funding and partnerships, each community should have some ability to control their own destiny through design features that reflect community standards.

By the nature of linear corridors, the greenway will ultimately pass through many communities and varying types of land uses. Sharing the sense of identities of these individual locations is highly encouraged. Design elements and amenities such as signage, trailheads, furnishings, etc. should reflect the "feel" of the community and should speak to the character and history of the communities in which they pass. Incorporating sense of place, or *genius loci*, provides residences an opportunity to share the unique natural systems, historic resources, and archeological resources of the neighborhood.

Cities and towns involved in the planning and design process for greenways, along with local organizations, agencies and non-profits, feel more vested in the outcomes of the effort when their unique needs are incorporated into the design. For example, if a community has expressed concern about excessive parking, access to that section of greenway can be downplayed in contrast to a high use trailhead where parking, signage, and landscaping works together to create high visibility from the roadway.

As well, the vernacular architecture of a community should be considering when designing parking areas, trailhead signage, and other facilities such as shelters and pavilions.

Although elements from one location to another may appear different along the greenway system, they should all maintain some element of consistency whether by the use of logos, graphics, or materials.



Design sketch from the Asheville Riverfront Open Space Guidelines (1991).

This will serve to provide users the dependable visual recognition as being a part of an overall system. It also assist in the wayfinding and orientation.

Two seminal planning efforts in Buncombe County-conducted in the late 1980s and early 1990s addressed the importance of local context. The Riverfront Plan (1989) was a charrette-based plan focusing on the Asheville riverfront area.

In 1991 a set of design guidelines as part of The Asheville Riverfront Open Space Guidelines were crafted. Since many of the greenways identified as part of a countywide system follow natural waterways, these guiding principles are still applicable.

These guidelines addressed three distinct areas of focus in the design of greenways: access and landscape, structures and facilities, and graphics to help create an identifiable and unified greenway system.

Sustainability

Greenways are an integral part of the infrastructure that provides for a sustainable community. There are many definitions of sustainability but for the purpose of this plan, the following definition has been applied. Sustainability: Creating a meaningful, vibrant and affordable practice today that does not deplete our resources for tomorrow.

This is true for any practice—manufacturing, education, agriculture, etc. The bottom line of a sustainable model is the integration of the environment with social and fiscal responsibility. The following planning principles were part of what informed this Plan.

Principle 1: Connecting Infrastructure. A connected greenway system will support alternative transportation to a variety of destinations.

Principle 2: Social Equity. Greenways provide equitable access for all citizens to physical activity that can improve health and wellness.

Principle 3: Economic Prosperity . Greenways are a proven economic development tool. The third largest industry in Buncombe County is Tourism and Services.

Principle 4: Environmental & Ecological. The greenways in Buncombe County should include ecological buffers that protect water bodies, steep slopes, and ridgelines.

In addition to the planning principles outlined above, the following guidelines should be applied during the design and implementation of greenways in Buncombe County. These guidelines will help foster the building of an environmentally sensitive greenways system and minimize environmental impacts of the construction process.

- Protect environmentally sensitive areas
- Reduce exotic invasive plants that outcompete natural vegetation
- Reduce sediment and erosion issued through the use of problems through use of best management practices (BMPs)
- Reduce stormwater runoff or treat runoff to improve water quality through the use of stormwater BMPs
- Increase wildlife habitat
- Increase / maintain floodplain flood storage
- Increase / maintain riparian buffers
- Maximize "soft" engineering solutions that utilize bio-engineering techniques
- Maximize "green" construction and maintenance practices
- Minimize life cycle and true environmental costs of greenway materials, construction methods, and maintenance activities.

"The greenway project has to be designed at 3 mph. We live in a 35 mph world, where everything in the street has to be simplified so drivers traveling at 35 mph can comprehend what they are passing. The greenway should be very detailed, full of variety and texture. It should be very complex and diverse, to engage and entertain people walking at 3 mph."

- Rich Untermann,
Asheville Riverfront Open Space Guidelines (1991)

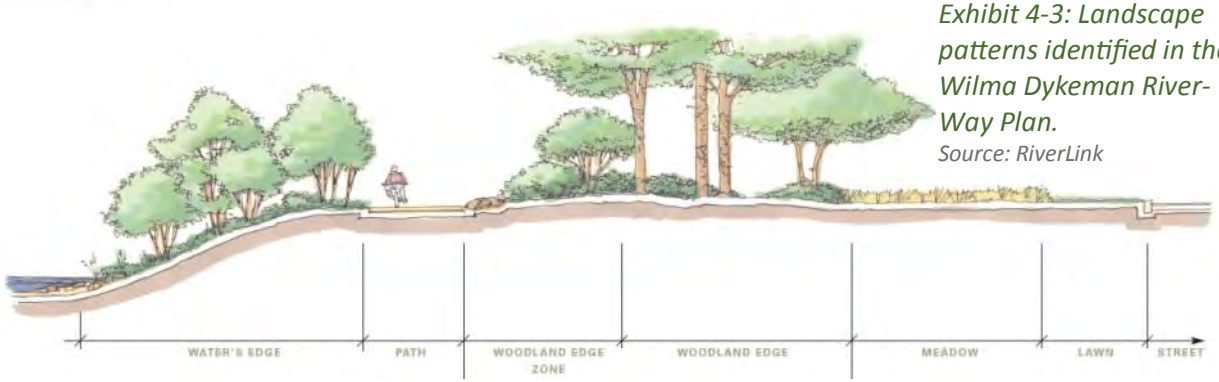


Exhibit 4-3: Landscape patterns identified in the Wilma Dykeman River-Way Plan.
Source: RiverLink

Exhibit 4-4: The Sustainability Wheel from the Wilma Dykeman RiverWay Plan identified the community themes addressed by the RiverWay and its design.
Source: RiverLink

Wilma Dykeman RiverWay Plan

Adopted in 2004, the RiverWay Plan set the standard for the primary greenway route in the City of Asheville along the French Broad and Swannanoa Rivers (see Exhibits of this on the facing page). Nearly all of the Priority Corridors identified in Chapter 3 and through the public and stakeholders involvement meetings for the Buncombe County Greenways & Trails Master Plan have a direct link to one or more legs of the RiverWay. Further, many destinations identified through public input are accessible via the RiverWay.

The RiverWay Plan was developed as "a blueprint for the rebirth of the riverfronts in Asheville" and divided into seven districts. It is located fully within the city limits of Asheville. In the Plan, each district includes specific road alignment/realignment recommendations as well as other subject-specific outcomes such as economic outcomes and development of destinations along the routes.

The RiverWay Plan also established several design typologies for the areas along the rivers, accounting for many of the constraints of the natural and built environments along their banks. The cross-sections for multi-use pathways are designated for a 12-foot wide paved trail, similar to the Urban-Suburban / Heavy Use typology shown later in this chapter.

The corridors in the RiverWay Plan are anticipated to be high use areas because of the population and employment densities existing or planned near them in addition to the high levels of recreational use expected along the rivers.

Since its adoption, the City of Asheville, RiverLink and other stakeholders have pursued implementation of the plan through a variety of projects and more detailed analysis or design efforts.

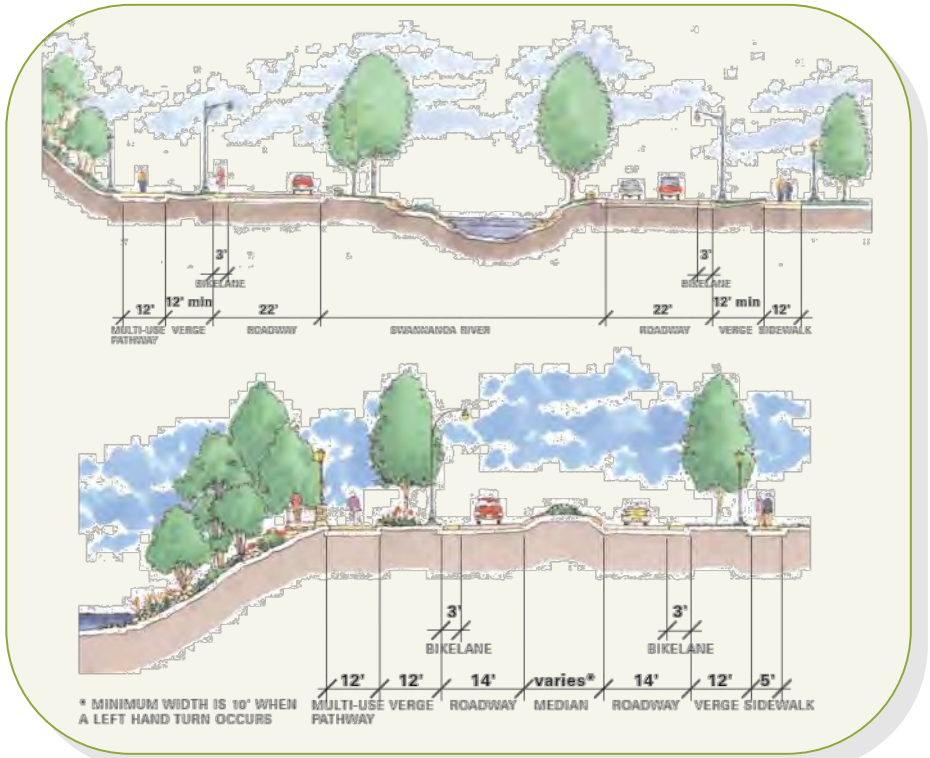


Exhibit 4-5: Full roadway & greenway design cross sections for portions of the Wilma Dykeman RiverWay.
Source: RiverLink

Exhibit 4-6: Conceptual design elements for Azalea Park, which connects to the planned Swannanoa River / US 70 Greenway.
Source: RiverLink

Greenways have to be designed and not simply built. The mounding of a greenway (above), even by just a few inches, maximizes the investment in the greenway by allowing for a better flow of water under the surface, minimizing encroachment of foliage, and protecting the trail surface from root heaves.

Photo Credit: Don Kostelec

Typologies

During public involvement and stakeholder outreach for the Plan it was understood that citizens and potential partners desire greenways and trails that can be unique to their setting. The settings may vary based on environment, community, destinations, desired experience or funding source.

This section defines four typologies (Exhibit 4-7) for greenways and trails in Buncombe County. The typologies illustrated in this chapter are to serve as a starting point for planners, architects and engineers as the County embarks on more detailed analysis of the corridors identified in this Plan.

Buncombe County's context for greenways ranges from rural and natural area to suburban and urban neighborhoods. Even unincorporated areas have characteristics representative of an urban setting. Therefore, the range of typologies were developed to span these varied contexts and potential use.

Using Typologies. The natural and built environment will dictate how a greenway or trail is built. So will the types of landowners and their willingness to sell or dedicate a portion of their property for the greenway. Therefore, it is desirable that the County have a set of diverse design criteria to apply to greenways and trails to best respond to these influences.

Users of greenways and trails expect consistency in design. Consistent design also leads to safer use of the greenways because of predictability for users.

These typologies were developed to reflect the type of land use patterns, density, usage and types of users most likely to be on a greenway segment. As Buncombe County and its partners pursue more detailed corridor planning and design, these typologies should be used to begin the effort with modifications documented through location-specific analysis. It is also helpful to use these typologies when working with developers and other major landowners who are interested in incorporating a greenway or trail into their site plans.

Modifications should not be made so they create user conflicts or a non-conforming situation related to accessibility. The detailed GIS files produced for the Plan and submitted to Buncombe County for us contain attributes of recommended typologies for Priority Corridors identified in Chapter 3.

Understanding Costs. When determining the typology that best fit a section of greenway, it is not advisable to default to the lower cost design. As noted earlier, it is critical to understand the level of use and type of users. A greenway designed and built to a less than desirable standard can incur greater life-cycle costs and impact user safety by creating conflicts.

The construction ONLY cost estimates for the typologies are (in 2012 dollars):

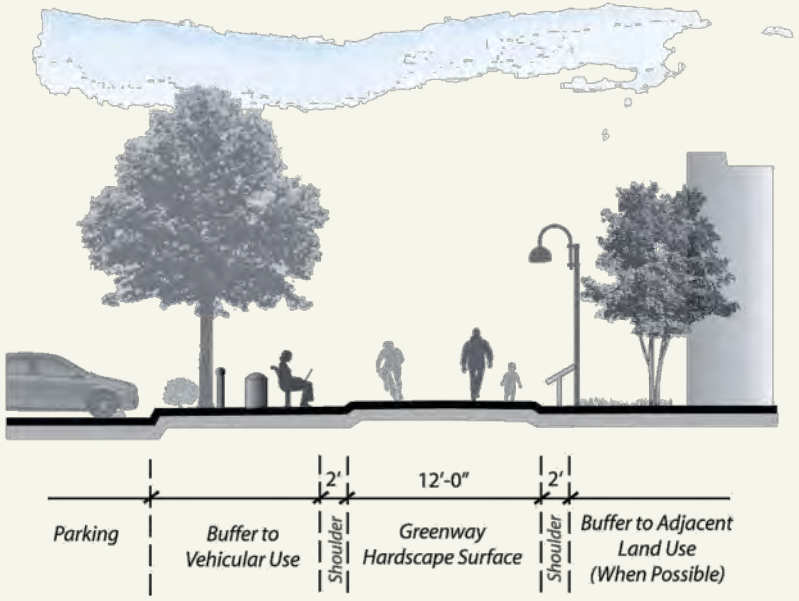
- **Urban-Suburban High Use:** $200,000 to $250,000 per mile.
- **Urban-Suburban Moderate Use:** $150,000 to $200,000 per mile.
- **Suburban-Rural Moderate Use:** $75,000 to $150,000 per mile.
- **Footpath / Hiking Trail:** Up to $30,000 per mile.

The final cost of a greenway will vary greatly based on amenities; the number of access points (to neighborhood or at street crossing); acquisition costs; and life-cycle maintenance costs. The profiles apply a qualitative measure of these costs since they can differ from one area of the County to another. Tradeoffs of amenities and access in favor of getting a greenway built is something that should be analyzed during design.

Exhibit 4-7: Typologies

Costs Key: $ = Low; $$ = Moderate; $$$ = High

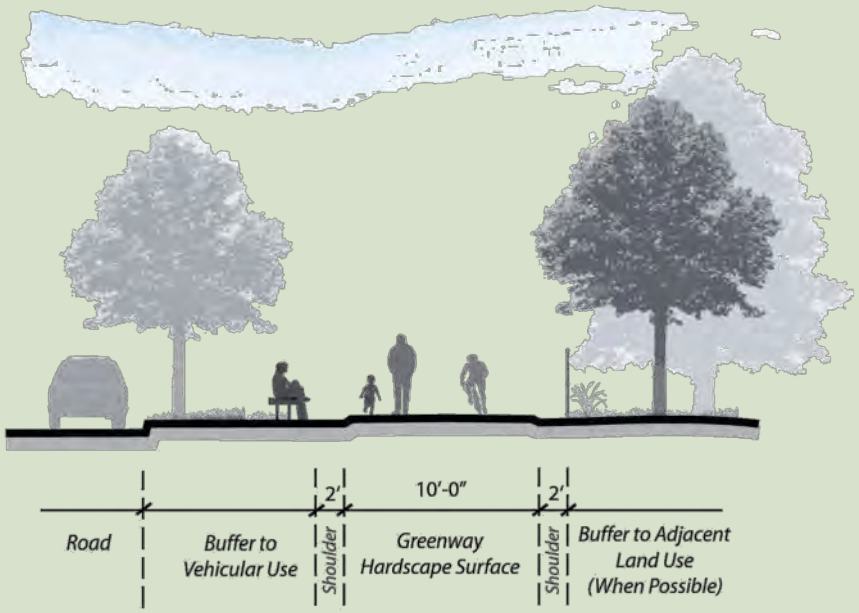
Urban-Suburban / High Use

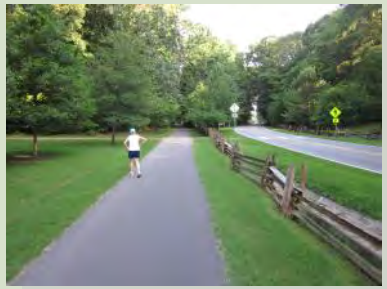


Urban-Suburban / High Use greenways require careful consideration of destinations and the diversity of users. A 12-foot width with a paved surface is recommended and can have considerable acquisition costs. There is an expectation of high levels of amenities and access. Maintenance costs are influenced by landscaping, stormwater management, and tree roots causing heaving of pavement.

Costs	
Construction:	$$$
Amenities:	$$$
Access:	$$$
Acquisition Costs:	$$$
Contingencies:	$$$
Maintenance:	$$ / $

Urban-Suburban / Moderate Use





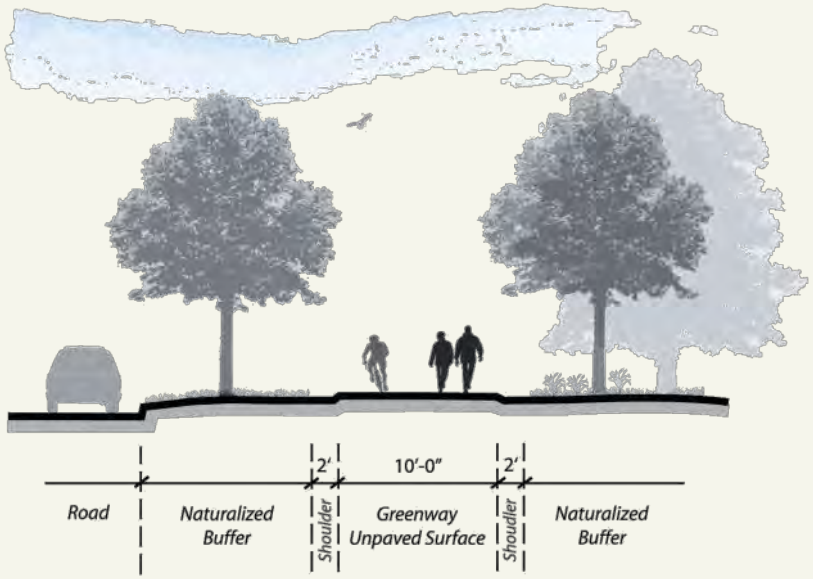
Urban-Suburban / Moderate Use greenways reflect the typical design for most corridors, with a 10-foot paved width and moderate level of amenities based on destinations and context. Acquisition costs are typically lower due to lower land values and less width along the corridor. Maintenance costs are similar to the Urban-Suburban / High Use typology.

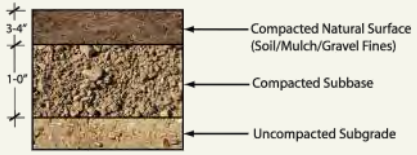
Costs	
Construction:	$$$
Amenities:	$$
Access:	$$$
Acquisition Costs:	$$
Contingencies:	$$$
Maintenance:	$$ / $

Exhibit 4-7 continued: Typologies

Costs Key: $ = Low; $$ = Moderate; $$$ = High

Suburban-Rural / Moderate Use

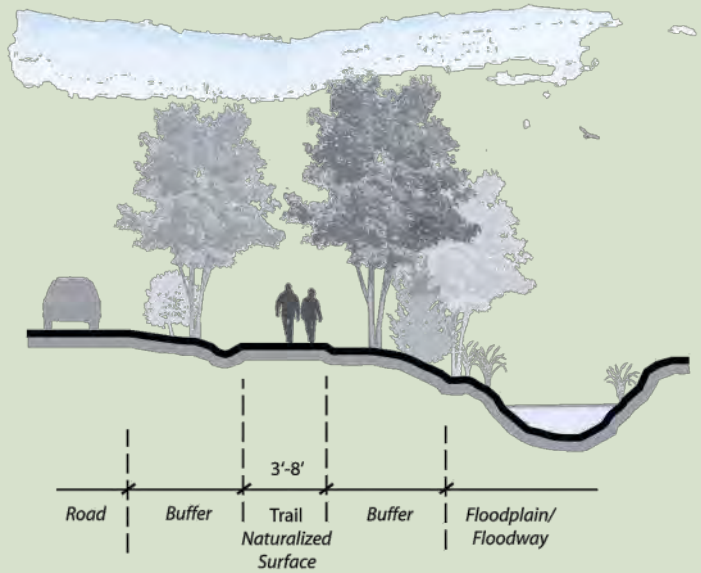




Suburban-Rural / Moderate Use greenways reflect a desire among users to have a more natural experience. Soil, mulch or gravel fines surface are desired and acquisition costs are typically lower due to land values, potential for easements and fewer access points. Maintenance costs can be influenced by the number of users and environment.

Costs	
Construction:	$$
Amenities:	$
Access:	$$
Acquisition Costs:	$$
Contingencies:	$$
Maintenance:	$$

Foot Path / Hiking Trail



Costs	
Construction:	$
Amenities:	$
Access:	$
Acquisition Costs:	$
Contingencies:	$
Maintenance:	Varies

The Foot Path / Hiking trail is a catch-all design for unpaved trails with low use in a natural setting. Costs are low for many features and maintenance may be done by volunteers. These greenways can provide parallel connectivity to other paved greenways to offer a different user experience.

Street Interface, Markings & Signage

An overlooked aspect of greenway and trail design is how facilities intersect and cross roadways. Just as design typologies vary by land use and environment, the interface with a variety of street types requires different considerations of design features and amenities to allow users to safely cross streets; transition from a greenway to a street, sidewalk or bike lane; access a bus stop; or reach a destination.

A street interface designed without consideration of context and user type can create a barrier effect that discourages use and is perceived as unsafe. Since the street interface is also likely to be an ingress and egress point to the sidewalk or other walkways, considerations for universal accessibility (e.g. Americans with Disabilities Act compliance) are also critical.

Many cities, towns and DOTs do not have design standards in place that consider the various characteristics of how a greenway interfaces with roadways (Chapter 11: Implementation includes recommendations for Buncombe County to develop standards and specifications for this and other greenway design features). Therefore, the street interface is often designed and built to reflect sidewalk-based standards. This is not recommended because widths are too narrow for multi-use trail requirements.

Features such as curb cuts/ramps and landing areas, crosswalks, refuge islands, advanced warning / signalization and signage are different for greenways and greenway user than they are for sidewalks and bike lane users. It is important to consider how both the motorist and the greenway user approach the street interface. Each has different expectations that vary by the type of setting.

The following pages contain a catalog of exhibits that identify common street interface features and ways to incorporate the needs of the user in their design. This catalog is intended to generate ideas and serve as an example for how architects, planners and engineers consider the street interface when a greenway is designed.

Many of the street interface treatment images contained in this catalog are not included in most standard design drawings, but generally conform to accepted design principles. This has the potential to cause conflict depending on funding sources. For example, grants awarded through federal transportation programs will be channeled through NCDOT. NCDOT is likely to request or even mandate that the design of projects funded through these sources conform to the DOT's design specification that aren't suite for greenways.

It is imperative that Buncombe County, cities, towns and other stakeholders communicate that there is a need for special greenway-specific design considerations given the absence of design standards by funding agencies or others. The development of typical design standards for the street interface will help make this case. This catalog can be the starting point for development of design specifications. It is not intended to represent standards or specifications, which are a recommended Action Item in Chapter 10: Implementation.

The catalog is also an important resource for working with private landowners or developers who are interested in building greenways on their site but may not have the technical resources to develop special features at the street interface.

Technologies, materials and recommended treatments are continually evolving. It will be important for Buncombe County to determine which of these best fits the local context.

The intersections of greenways and streets are the place where most conflicts occur. This street interface requires special consideration during the design phase of a project to find the best-fit solution. Specialized signage (above) alerts motorists and trails users to potential conflicts.

Photo Credit: Don Kostelec

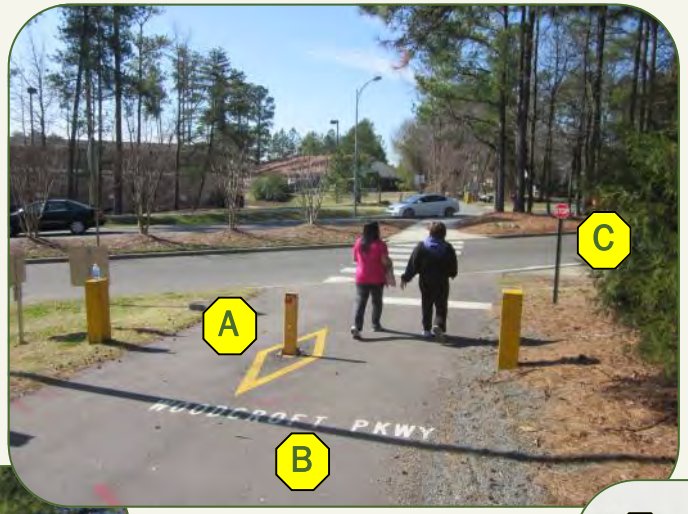
Exhibit 4-8: Urban Street Interface

Urban Street Interface

The urban street interface poses the most challenges due to higher volumes of vehicles and trail users in combination with the constraints of the built environment. Connections to destinations from the trail are important, especially for schools, parks and transit stops as well as the transition to the trail from bike lanes. The greenway/sidewalk interface should not be overlooked. The design of the trail and crossing treatments should be like that of an extra-wide sidewalk, with a preference for 12-foot crossing dimensions of the trail approach, crosswalks and curb ramps to account for diverse users and comply with ADA requirements. Some crossing may be signalized if not at an already-signalized intersection.

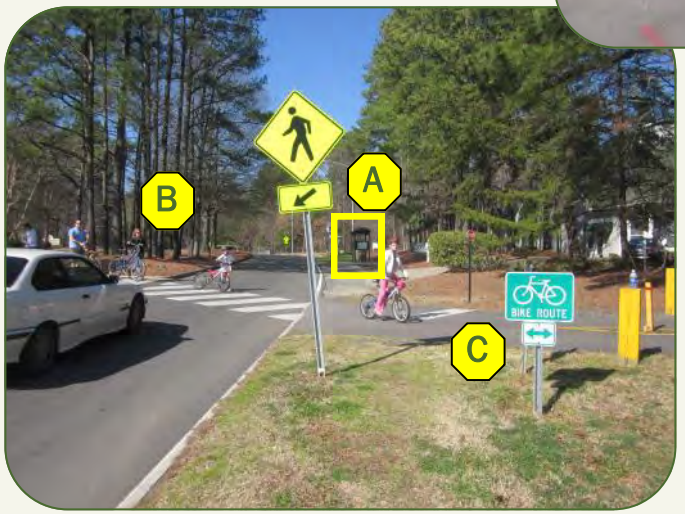
Signalized Trail Crossing

A: Bollard & visible cue to channelize trail users and prevent vehicle use.
B: Wayfinding / Pavement markings.
C: Stop sign.



Crossing treated as 4-way Stop

A: Lighting to provide visibility for trail users.
B: Elongated, flat sidewalk that is flush with street to match trail surface and allow smoother transition for bicyclists from bike lane to greenway.



Mid-Block Crossing

A: Bus stop connection, including paved apron to/from trail.
B: Median for two-stage crossing.
C: Signage for bicyclists entering from street.

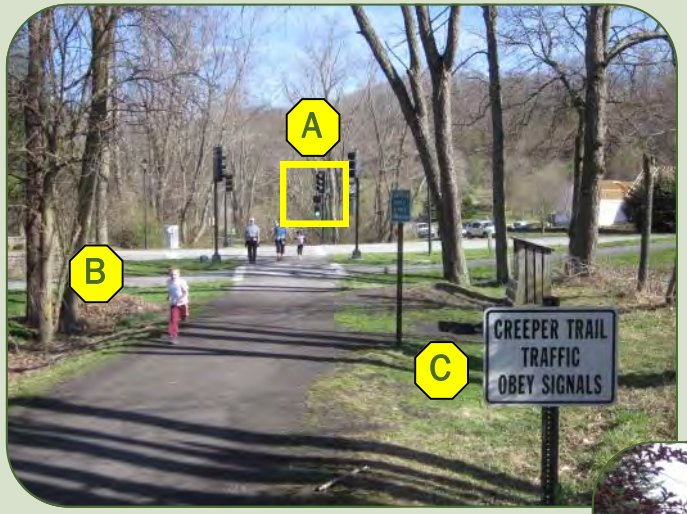
Photo Credits: Don Kostelec

Exhibit 4-9: Suburban Street Interface

Suburban Street Interface

In a suburban setting the most important considerations are:
1) Balancing considerations for higher vehicular volumes and higher trail volumes; and
2) Understanding the need for a higher level of design considerations, signage and technology integration to avoid motorist and user conflicts.

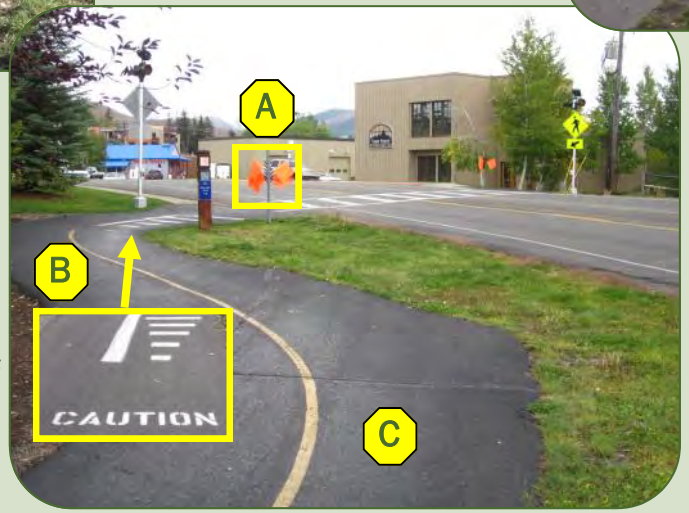
The expectations for whether the motorist or trail user should yield or stop is based on the unique characteristics of the crossing. Crossings should conform to ADA-compliant requirements similar to a mid-block sidewalk crossings: accessible ramps; flat landing areas; detectable warning surfaces; widths corresponding to multi-use trail dimensions. Note the crossings shown do not fully comply with ADA requirements.



Crossing in Residential Area
A: Signal for trail users.
B: Sidewalk crossing of trail.
C: Advance warning for users.

Note: Signal is actuated by vehicles, giving priority to trail users. Therefore it does not require bicyclists to dismount to access push buttons.

Crossing in Commercial Area
A: Special signage.
B: Permanent speed detection sign.



Crossing in Commercial Area
A: Flags for higher visibility for users.
B: Trail pavement marking at street.
C: Meander of trail on approach to street to slow users.

Photo Credits: Don Kostelec

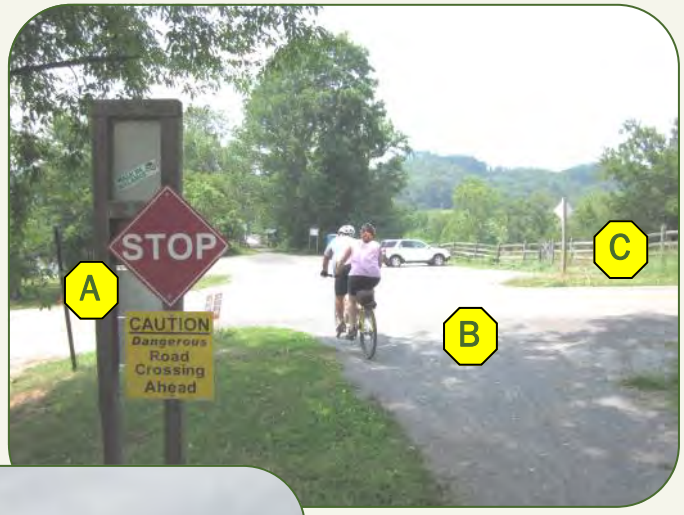
Exhibit 4-10: Rural Street Interface

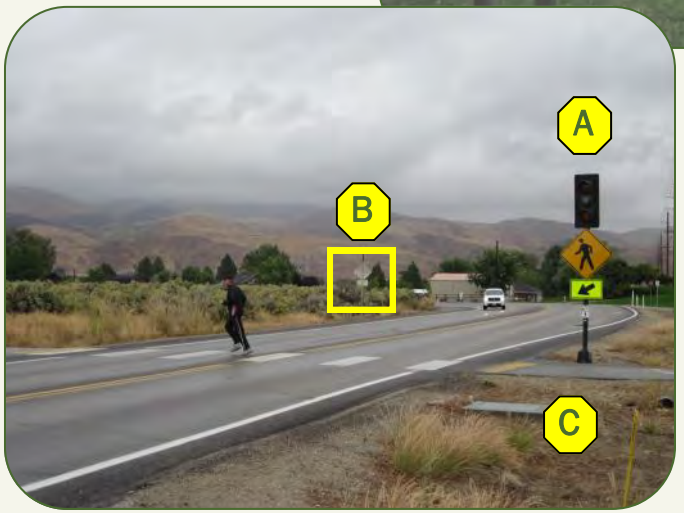
Rural Street Interface

In a rural setting the most important considerations are:
1) Managing the expectations of the approach as pedestrian and bicycle crossings are not as common on rural roads; and
2) Maximizing visibility of both the motorist and trail user through signage, preservation of clear space within the "sight triangle" and specialized crossing treatments based on the volume of vehicular and trail traffic.

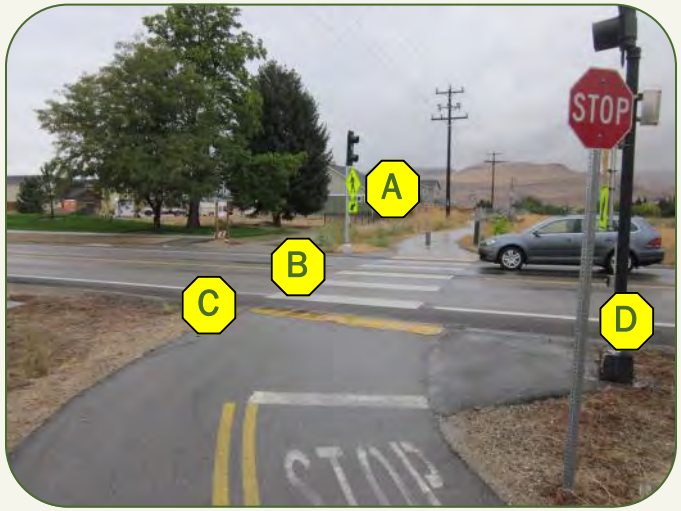
The expectations should always be for the trail user to come a complete stop before crossing . The motorist may not be required to stop but notified in advance—at least 1,000 feet—that a trail crossing is ahead.

Crossing of Trail / Parking Area
A: Warning signs
B: Crossing width matches trail
C: Clear space for visibility





Signalized Trail Crossing
A: Flashing beacon with warning signs. Sign shown does not reflect new reflectivity standards.
B: Advance warning sign.
C: Clear space to allow for maximum visibility of trail crossing.



Signalized Trail Crossing
A: Trail approach meanders to control speed of trail user.
B: High visibility crosswalk with width to accommodate multi-use travel needs.
C: Detectable warning surfaces to comply with ADA requirements.
D: Push buttons for flashing beacons with paved area for access.

Photo Credits: Don Kostelec

Exhibit 4-11: Suburban Street Interface

Other Design Treatments

Pavement markings from private driveways alert motorists to expect users to cross in front of them along a sidepath.

High volume multi-use crosswalks, such as one connecting to a school or park, may require separation of uses to avoid user conflict.

Transit stops along greenways require a paved landing area—minimum dimension of 4' x 4', flat—connecting the pathway to the street. It should have been placed in the area outlined in this image.

On-street pathways can be used to fill gaps in greenways. The width and radius of the transition needs to consider the speed of bicycles.

High volume intersections of two pathways may require special design features, such as this greenway roundabout in Davis, CA.

Micropath connections from neighborhood streets to greenways include signage, smooth transition areas and bollards to prevent vehicle use.

Exhibit 4-12: Marking Obstacles / Obstructions

Marking Obstacles / Obstructions

The Power of Paint

There will inevitably be obstacles and obstructions that have to be addressed in the design of greenways to alert users of potential hazards. The costs to change the placement of these obstacles and obstructions may be prohibitive or other features may be purposely designed for the greenway to handle stormwater.

Greenway users are typically traveling at a speed where these obstructions will not pose a serious safety threat but some may become tripping hazards or cause discomfort for bicyclists.

Sewer caps on the Virginia Creeper Trail are not flush with the trail surface. They are painted yellow as a warning for approaching users.

Sewer caps on paved greenways may be flush with the trail but can pose a hazard to bicyclists when wet.

Fences constructed to keep users out of private property can be marked with a line to delineate the clear zone, keeping users away from obstructions along the trail's edge.

Drainage grates may be necessary to control stormwater and can encroach on the trail. A marking around the grate alerts users to avoid it.

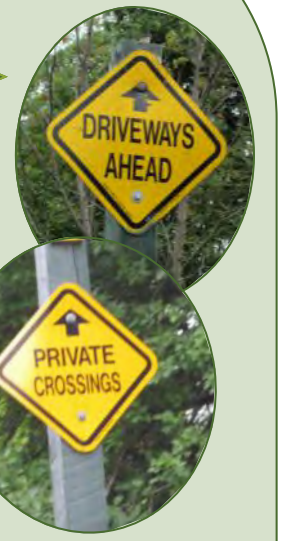
Drainage grates may also be marked with a diagonal line in the direction of travel for trail users so they can avoid it.

Exhibit 4-13: Signage

Signage

Signage, even along a greenway with few amenities, is important to providing users with information on destinations, obstacles and other features along the trail that may present a challenge or hazard.

On-street connections in Roanoke are marked with the logo of the greenway system on posts or on the pavement (inset) .



It is important for users to know when to expect others to be crossing the trail. This is especially important in rural areas for private access roads (bottom) or farm crossings.

The name of the trail and mile markers help users orient themselves, plan their journey and track their progress.

These signs alert users of street crossings (top) and conflict areas (bottom)

The need for wayfinding starts at the access point as different users have different destinations.

Signage is critical in maximizing connections from the trail to destinations.

Street signs direct users to neighborhood connections and motorists to look out for trail users.

Exhibit 4-14: Amenities

Amenities & Structures

The type of amenities and structures, and the degree to which they are incorporated into design and construction should be based on:

- Setting & preferences;
- Budget & funding source requirements;
- Community context;
- Degree of public access;
- Sustainable design;
- Maintenance costs; and
- Screening adjacent properties.

These images reflects some options for amenities along greenways to consider as projects enter a design phase.

Trailheads & Information Kiosks

Bridges

Special Markings & Public Art

Benches

Exhibit 4-14 continued: Amenities

Amenities & Structures

Bicycle Parking

Bag & Monofilament Depositories

Educational Kiosks

Decorative Columns & Bollards

Piers, Shelters & Vault Toilets

Retaining Walls, Trail Edging & Fencing

"Transportation, quality of life, and economic development are all undeniably connected through well-planned, well-designed, and context-sensitive transportation solutions. To NCDOT the designations 'well-planned', 'well-designed' and 'context-sensitive' imply that transportation is an integral part of a comprehensive network that safely supports the needs of the communities and the traveling public that are served."

- NCDOT Complete Streets Policy Statement (2009)

Complete Streets

The Buncombe County Comprehensive Land Use Plan Update acknowledges the growing urban influence in unincorporated areas of the county. As noted in Chapter 1, with this urbanization arises a demand for urban-like amenities for pedestrian and bicycle facilities. Some streets in Buncombe County have been identified in Chapter 3 Priority Corridors for "Complete Streets" treatments to reflect areas of notable demand for bicycle and pedestrian movements along streets. Some routes shown for Complete Streets are where corridors run along roadways or connection to a priority corridor should occur along a street.

A Complete Street can be defined as one that is designed to provide for the safe movement of all users of all abilities at all times. This does not mean that all streets are required or should have bicycle and pedestrian facilities. Some streets may have parallel off-road greenways to provide an accessible route while others may have sidepaths. Some may require a combination of sidewalks and bike lanes to serve as a greenway connection in a constrained area.

For streetside improvements in Buncombe County, a partnership and regular discussion with the North Carolina Department of Transportation (NCDOT) is required as the agency manages all streets in unincorporated areas. NCDOT's Board adopted a "Complete Streets" policy in 2009 to acknowledge how the agency considers the needs of all users in the design of its street system.

Buncombe County should pursue adoption of a Complete Streets policies to help guide discussions with NCDOT, cities, towns and the French Broad River MPO. It will also help in developing partnerships to fund greenways or associated bicycle and pedestrian facilities.

Further, incorporating Complete Streets elements in the built environment is challenging as buildings constructed in downtown areas and along other corridors create limited opportunities for optimal facilities, particularly in a retrofit situation. This is especially difficult in the mountains where many corridors are also constrained by topography and other natural features.

However, these constraints should be defined only as influences to the design of a Complete Street and not reasons to eliminate bicycle and pedestrian facilities or greenways from projects. The real challenges lie in how NCDOT and its partners consider trade-offs between vehicle usage and bicycle, pedestrian and transit usage to achieve a "best fit" solution for a street.

The process of designing a Complete Street must consider the existing and future likelihood of the types of pedestrians and bicyclists who will use a particular street or greenway corridor. For example, a road may exist in a rural setting but if that road connects schools, parks or recreation centers to a greenway or each other, then certain accommodations should be made when compared to a road in a rural setting that may only connect to other streets and provides access for low-density residential neighborhoods or farms.

Safe Routes to Schools

Buncombe County, through the Parks, Greeenways and Recreation Service Department, Healthy Buncombe and the Health Department have been engaged in promoting walking and bicycling to school since 2009 through a Safe Routes to Schools (SRTS) program.

Like Complete Streets, this strategy by Buncombe County recognizes growing demand among parents, students, principals and teachers to find ways for students to travel to school via an active transportation mode. Increasing walking and biking options near schools also reduces traffic demands during arrival and departure times.

These programs help engage children in safe walking behaviors and encourage more bicycling and healthier lifestyles. Common steps to creating a successful program are to kick-off with an event on International Walk-to-School Day, then subsequently work with PTA members, teachers and students to identify needs and program ideas while incorporating encouragement measures and education into the school curriculum for students to learn safe walking and bicycling skills and the benefits of an active lifestyle.

Funding for SRTS through federal programs is in a state of flux due to changes and short-term passage of federal transportation legislation that funds the program. Grants for projects and educational efforts are available through the federal SRTS program and administered by NCDOT.

If SRTS funds are reduced or eliminated from future federal transportation funding programs, it is advisable for Buncombe County and its partners to pursue a commitment through NCDOT to dedicated state-generated transportation funding to continue the SRTS program. Only 25% of NCDOT's budget is generated through federal sources, with roughly the remaining 75% generated through state funding streams.

Buncombe County may also consider existing revenues such as vehicle property taxes, now at approximately $8 million per year, to help fund local SRTS programs or other greenways investments to tie a transportation-based revenue source to a transportation expenditure.

Blue Ridge Parkway

The Parkway is a major destination for hikers and bicyclists. In Buncombe County, the Parkway is designated as part of North Carolina Bicycle Route 2 – Mountains to Sea. The Mountains-to-Sea Trail, which is for hikers only along the Parkway, runs parallel to the Parkway through Buncombe County. Greenway connections to the Mountains-to-Sea Trail should be designed with strong consideration for the user experience along the trail and not detract from its function and feel.

Connections are planned in several Priority Corridors that intersect the Parkway, including:

- Bent Creek Greenway;
- Lake Julian Greenway;
- Reynolds Greenway; and
- US 70 / Swannanoa River Greenway.

In some locations, these connections will likely be made via on-street bicycle access and a footpath for hikers. The interface with the Parkway is critical in ensuring the safety of users and collaborating with Parkway officials to determine the best location and best design of access points.

The Parkway is planning to consolidate many unauthorized, unpaved roadside parking areas hikers are using to access the Mountains-to-Sea Trail. Bicyclists are parking their vehicles at these spots to then ride their bikes along the road. These consolidated access points will likely result in paved parking areas with access to nearby trails.

Access to the Mountains-to-Sea Trail, which runs parallel to the Blue Ridge Parkway in Buncombe County, is becoming a challenge for the Parkway to manage unauthorized parking areas. The consolidation of these parking areas is an opportunity to coordinate access to planned greenway corridors.

Photo Credit: Friends of the Mountains-to-Sea Trail

Park-n-Pedal lots are designated areas in outlying locations or near commercial development for bicyclists to park and then travel by bike to their work or destination. Those shown in these images are near the Boise River and five miles from downtown Boise, Idaho.

Photo Credit: Don Kostelec

It is recommended Buncombe County work closely with Parkway officials to determine where these consolidated access points meet planned greenway corridors to co-locate access and manage ingress and egress from trails at a point where users are most visible.

Park-n-Pedal Lots

A new concept in promoting bicycling is the idea of designating parking lots, similar to park-and-ride lots used for transit and carpooling, whereby bicyclists can access via car to then make the remainder of their trip via bicycle.

These "Park-n-Pedal" lots are an encouragement technique that recognizes rural and suburban areas lack continuity in the bicycle transportation system or commute or travel distances are too great for many bicyclists to consider for regular use. They can also help attract weekend or touring riders from other areas who need a safe place to park while riding.

For example, a resident of Black Mountain who works in downtown Asheville, or vice versa, may not be able to ride along roadways that he or she would consider conducive to bicycle travel. However, the designation of a Park-n-Pedal lot in the Swannanoa area or at Azalea Park reduces the travel distance and travel time of the trip while still allowing for the bicyclist to have some level of physical activity.

Ideally, a Park-n-Pedal lot should be placed at a distance of approximately 3 to 5 miles from major destinations or employment centers, with special signage (example shown at left). These locations are on the edge of towns or communities and allow access to major destinations via lower volume, low speed roads or in combination with existing greenways.

These lots are also likely to be located where greenway parking lots are constructed. Promoting the lot as a park-n-pedal facility may require additional signage and marketing through efforts such as a Transportation Demand Management (TDM) program.

Bridges

Bridges are a necessary and very costly aspect of constructing and maintaining greenways. This is particularly true for entities that do not maintain other structures such as major culverts or bridges as part of a public roadway system. Generally, bridges along greenways are needed to traverse three types of barriers:

- Rivers and streams;
- Streets and highways; and
- Railroads.

The factors in bridging each type of barrier greatly impact the size, cost and permitting requirements associated with building the bridge. While a minimum width of 8-feet must be accommodated, that width is inadequate on bridges due to the influences of multi-use travel (unless dismount requirements are enforced) across them requiring more shy distance; therefore, a 10-foot or 12-foot width is preferred and has an even greater impact on cost.

Rivers and stream bridges. A Federal Emergency Management Agency (FEMA) no rise certification is needed whenever modifications are made in the 100 year floodplain of a river or stream. Bridges over streams will trigger the need for a no-rise analysis and report at each crossing. The FEMA no-rise report demonstrates, using modeling of FEMA stream data to reflect proposed changes in the 100 year floodplain, that there is no increase in the water depth at

the 100 year storm.

If the disturbance does cause a rise in the 100 year storm stream flood level, then a FEMA CLOMR (Conditional Letter of Map Revision prior to construction) and LOMR (Letter of Map Revision done post construction) is required. Because of both the expense and project delay associated with CLOMR and LOMR, the detailed designs for the greenway should endeavor to incorporate design elements which will meet the no-rise requirement and not trigger the more expensive and lengthy CLOMR permitting process. There is a fine balance between designing to avoid a CLOMR and adding additional cost to stream crossings to enable a no-rise or no-impact.

Streets and highways. Bridging of streets and highways for greenways and trails should be a last-resort design solution due to the cost related to the span of such bridges, which can be greater than 100 feet. Surface streets can be crossed in most situations by crosswalks or culverts under them (if incorporated as part of the project's design).

Although many places have attached pedestrian bridges to existing bridges, it is not the preferred approach by highway agencies such as NCDOT. It requires the bridge to have sufficient strength to hold the additional structure required for a pathway and would require an engineering study.

Railroads. Crossing railroad tracks is perhaps the most difficult barrier to overcome due to the requirements of the railroads related to the addition of no new at-grade crossings of their tracks. It is advisable to find an existing at-grade street crossing and work with the DOT and railroad to identify a way to include the greenway as a sidepath to the road to avoid having to construct a bridge.

If an overpass of a railroad is required, the challenges that arise are related to height / clearance requirements of the bridge. Vertical clearance requirements ensure the trail structure does not encroach on railroad right-of-way, while horizontal clearance requirements range from a minimum of 23-feet with most railroads requesting more than that.

Mountain Bike Trails

Mountain bikers are likely to use greenways to access their trails and consideration should be given to their needs. Mountain bike trails are located near planned Priority Corridors in Alexander along the proposed French Broad River / NC 251 Greenway, at the Bent Creek Experimental Forest at the southern terminus of the proposed Bent Creek Greenway, and along the Blue Ridge Parkway north of the US 70 / Swannanoa River Greenway.

Some mountain bikers have concerns over paved trails, but short distances are not detrimental to tire wear. Bicyclists just learning to mountain bike may prefer greenways in natural settings as a way to get used to riding.

Buncombe County should look for ways to incorporate singletrack trails near greenways where land is available. An example of this is in Franklin, NC, where a short 1.5-mile singletrack is located parallel to one section of their 6-mile greenway along the Little Tennessee River.

Mountain bike organizations such as Pisgah SORBA can be consulted on trail design, access and maintenance of mountain bike trails near or along greenways.

This bridge along the Flat Creek Greenway in Black Mountain represents one of the most common structures along greenway.

Photo Credit: Fred Grogan

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Chapter 5: Land Acquisition

Property owners along an existing or proposed greenway are impacted by how it is designed, constructed and maintained, thus requiring a greenways program to be viewed as a whole rather than as distinct elements. In order to avoid challenges later in the greenway development process, strategies for acquisition of land must be considered during the initial planning and throughout the process, including during construction and maintenance of the trail. An understanding of the acquisition strategies and wise use of the funds available for property acquisition adds significantly to the success of a greenway program.

Buncombe County will encounter numerous acquisition-related challenges as it pursues construction of greenways and trails across the region. The strategies described in this chapter are intended to outline the most common acquisition tools available via prevailing laws, recognizing some tools may not be possible or desired at the time of acquisition. The use of some tools may vary based on funding source restrictions, availability of funding and political considerations.

Acquisition of property for the development of a greenway is critical and often considered the most difficult element of implementing a greenway program. Alternative routes that avoid those properties that may be difficult to obtain should be identified during the initial planning phase to avoid a greenway being delayed due to the inability to gain access to one property. Attention to the management of a greenway can impact future greenway plans.

Strategies for acquiring property range from the purchase of property at its fair market value to agreements for the use of property encumbered by other easements, such as a sanitary sewer easement, that is donated due to its reduced value for development.

Familiarity with all the acquisition strategies is necessary due to the variety of situations that will confront those charged with responsibility for acquiring land for greenways. Exhibit 5-1 (following page) is a quick summary of the benefits and disadvantages of each type of acquisition method. Having a full bag of tools available for use will provide flexibility in dealing with the circumstances associated with every situation.

Property Owner Involvement

Owners of property on which a greenway trail is proposed are key stakeholders and should be identified early in the planning process. Following identification of property owners, they should be contacted and informed that a greenway is proposed for their property. This serves several purposes:

- It makes the property owner a part of the planning process, potentially initiating a relationship between the property owner and the greenway program.
- This relationship leads to better communication, enabling the property owner to stay informed of progress and enabling the property owner to let greenway program staff know of the owner's plans for the property.
- In some cases, the property owner may be able to incorporate the planned greenway into the plans for the use of the property, thereby bringing advantages to both the greenway program and the property.
- Awareness of greenway plans may result in the property owner informing the greenway program of any plans to sell the property, providing an opportunity for purchase of the required land before the property changes hands. In some

Engaging property owners who are adjacent to a proposed greenway in the planning and design process is an important aspect of land acquisition. It helps build understanding and rapport for what can become a very contentious issue.

Photo Credit: Don Kostelec

Exhibit 5-1: Degree of Likely Advantages/Disadvantages for Various Land Acquisition Methods.

Note: These are qualitative measures of likely outcomes.

Land Acquisition Method	Range of Uses	Time to Complete	Complexity	Legal Exposure	Expense
1. Fee Simple Acquisition	●	⊙	●	●	○
2. Acquisition by Non-Profit Foundation	●	⊙	⊙	⊙	●
3. Negotiated Sale	●	○	○	●	⊙
4. Bargain Sale	●	●	⊙	●	⊙
5. Option/First Right of Refusal	●	○	⊙	⊙	⊙
6. Easement Purchase	⊙	⊙	⊙	⊙	●
7. Shared Easement	○	⊙	○	⊙	●
8. Donation	●	○	●	⊙	●
9. Required Dedication of Property or Easements	●/⊙	●	●	⊙	●
10. Eminent Domain of Property or Easements *	●/⊙	○	○	○	○

Key: ○=Poor / Difficult; ⊙=Moderate; ●=Good / Favorable

* *Use of eminent domain is not proposed as a tool for greenways land acquisition.*

cases, the property owner may be willing to provide property for a greenway after seeing progress on other segments or seeing the use of greenways by friends and neighbors.

- If the property owner adamantly refuses to consider the location of a proposed greenway on the property, alternate routes can be identified early at a savings of time and money.

Communication with property owners can provide valuable insight into which of the acquisition strategies identified below is best suited for the acquisition of a particular property.

Methods of Acquisition

The purchase of property required for a greenway is the most direct and effective way to obtain the land needed for greenway development. Prior to undertaking the purchase of property, an understanding of the various options for property purchase and the availability of funds to consummate the purchase are necessary. An overview of the most common methods of purchasing property for greenway development is provided below.

1. Fee Simple Acquisition. Possibly the least complicated, but often the most expensive method for acquiring property for a greenway is the fee simple acquisition (purchase) of the property. In this method the greenway program purchases the title, with all rights, to the property at the fair market value. The first step in determining the fair market value of the property is identification of the property required for the greenway.

Due to the linear nature of greenways, typically only a portion of the owner's property is required. Thus a survey of the route determines the amount of owner's property required, indicates the boundaries and the

acreage of the property being purchased, and is used to determine the value of the property via an appraisal. Because greenways are often located adjacent to rivers, streams, ponds or lakes the land may be valued higher than property not fronting a water feature. It may also be unbuildable due to flood plain restrictions.

In addition to the cost of the property, other costs associated with purchasing property may include a survey, appraisal, negotiated relocation costs and closing costs. When the acquisition is complete the property is owned outright by the greenway program sponsor, an arrangement that provides the broadest possible legal range of allowable activities on the property, but the new owner also incurs full liability and maintenance responsibilities. Although an important strategy and one that must be considered, the non-recoverable costs associated with fee simple acquisition of property make this an expensive option. Reserving the use of fee simple purchase for key parcels and for properties that cannot be acquired in any other way will extend the limited funds available to most greenway programs.

2. Acquisition by Non-Profit Foundation. An approach used by many greenway programs is the establishment of a non-profit foundation to raise funds for property acquisition and to purchase property, a potential role for Connect Buncombe or its partners. The foundations, when properly established, are tax-exempt, which is critical to the success of foundations. Donations and contributions to the foundations typically can be deducted from the taxes of those persons who contribute, which make them more successful in raising funds than a government entity. In addition, some funding sources will provide funds to foundations but will not provide them to local governments.

Donations of land made to foundations also are tax-exempt, making the foundations more successful in negotiating the purchase of properties. The flexibility of foundations in negotiating the purchase of property is heightened by the fact that they are not bound to the same limitations as local governments. Also, some property owners are more comfortable in negotiating with a foundation than with a government agency.

3. Negotiated Sale. Under this option the price for the property is negotiated and an agreement is reached to purchase at a price below the fair market value. Numerous factors come into play during this process, with the key one being that the property owner must be willing to negotiate.

An understanding on the part of the property owner that the property needed for the greenway is worth less than the balance of the owner's property and/or the greenway brings certain benefits to the balance of the property may motivate the property owner to negotiate. Factors to consider in a negotiated sale include :

- Property adjacent to a river or creek is often designated as a flood hazard area, which limits its development potential and could prohibit development of the property. Due to these limitations on development the property value is often lessened.
- Rivers and named creeks and streams that are classified as trout waters or that flow into trout waters are required to have stream buffers. These stream buffers, defined as areas of natural and undisturbed vegetation, are a minimum of 25 feet from the top of the bank on both sides of the water body. The prohibition of

Walking a property that is subject to some type of acquisition for a greenway can provide insight for property owners and designers about specific concerns related to the proposed greenway.

Photo Credit: Don Kostelec

development associated with the required stream buffers may be an opportunity for negotiating the purchase price of the land needed for a greenway. The challenge with the stream buffer is that the construction of an impervious trail (greenway) within the buffer is also restricted; however, the purchase price of any land inside the buffer may be lower than the price beyond the 25-foot buffer.

- It has been shown that the construction of greenways increases the value of properties located adjacent to the greenways. An argument can be made that since the construction of a greenway will increase the value of the adjacent property, the price of the property on which the greenway will be constructed should be reduced in acknowledgment of the increase in value the greenway will bring to the adjacent property. Many developments that are planned or underway during the planning of greenways have provided land required for greenways at a reduced cost in acknowledgment of the value the greenway brings.

Negotiating with a property owner requires patience, an understanding of the real estate market, a love of greenways, and a knowledge of the financial implications of providing land at a negotiated price. Possession of the skills and time required to negotiate the sale of a property is key to the success of this approach.

4. Bargain Sale. In this case, the asking price of a property is reduced in response to some characteristic of the property that is perceived as affecting the value of the property. The factors that may result in a property being offered at a bargain price are varied, and could include:

- Need of the owner(s) to obtain funds quickly;
- Burdening of the property with challenges such as the need for an environmental clean up, which the owners do not want to undertake; or
- Limited development potential of the property due to its size, access, etc.
- Tax advantage to the owner.

Opportunities for a bargain sale are infrequent and the agency charged with the responsibility for acquiring property for the development of greenways should be prepared to act on these opportunities when they become available. The identification of properties required for greenway development during the initial greenway planning efforts and continued contact with the property owners are essential to knowing when properties may be available through a bargain sale.

Having the flexibility to acquire properties when they are available and hold them for greenway construction at a later date are key to being able to take advantage of these opportunities. That flexibility requires the ability to raise capital, maintain a reserve fund or obtain credit quickly to make an acquisition.

5. Option/First Right of Refusal. In some cases, the property owner may not wish to sell the property required for greenway development at a time compatible with the phasing schedule identified in the greenway plan. The owner may, however, be willing to consider the sale of the property at a future date. In these situations, the alternative of an option to purchase the property at some future date or a first right of refusal should be considered. Although similar, these two methods have differences that make them unique.

An option for the purchase of a property acknowledges that the owner (optioner) will sell the property to

the greenway program (optionee) at some agreed upon time or upon the completion of an identified action. A formal and legally binding agreement establishes all the parameters for the option and identifies the time when the option will be exercised, at which time the purchase will be completed.

At the time of the signing of the option agreement the optionee provides a monetary payment, which is held in a trust account, payable to the optioner. This payment is a demonstration of the commitment of the optionee to purchase the property and its acceptance by the optioner is a demonstration of their commitment to sell the property at the price and time stated in the agreement. The payment typically is credited toward the purchase price of the property.

A first right of refusal is an agreement entered into between the prospective purchaser of the property and the prospective seller. This agreement differs from an option in that it does not commit the owner to sell the property nor does it commit the greenway program to purchase it. In its most basic form, a first right of refusal is an agreement whereby the owner commits to make the potential purchaser aware that the property will be sold and provide the potential purchaser with the right to purchase the property before it is made available to others. Upon notification of the plans to sell the identified property, the potential purchaser makes a decision whether to enter into a contract for the purchase of the property. The agreement may or may not include the exchange of money or other considerations and may or may not have a time limit assigned to it.

6. Easement Purchase. Law defines easement as an interest in land owned by another that entitles its holder to a specified limited use or enjoyment, such as the right to cross the land or locate facilities on it. An easement provides the right to use the land of another for a specified purpose, as distinguished from the right to possess that land. An easement agreement permits the use of a property for a specific purpose.

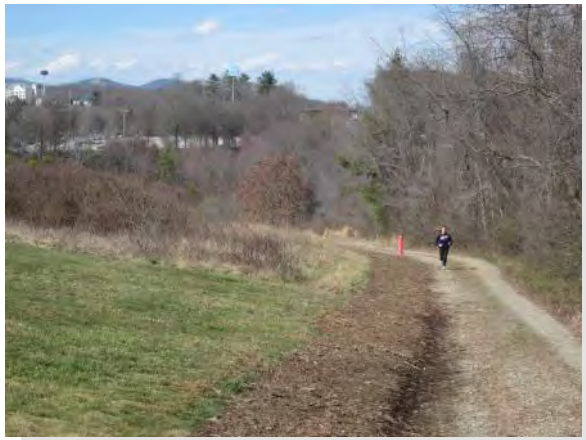
The acquisition of an easement to locate, construct, and maintain a greenway should be explored in an effort to reduce the cost of obtaining property. Rather than acquiring all the rights to a property, with the ability to use the property for any legal purpose, the acquisition of an easement limits the use of the property. The value of an easement typically is significantly less than the fee simple value of the property in recognition of the limits on the use of the property imposed by the easement agreement.

Easements obtained for greenway are considered express easements, as the terms are set forth in a written agreement. The easement agreement entered into for a greenway should specify adequate room for the construction and maintenance of the greenway. The agreement may specify an easement of a certain width to permit the greenway's construction, with a lesser width identified for the greenway's permanent easement. The agreement may also establish a time period within which construction must be initiated.

In addition to the usual provisions addressing the right to construct and maintain a greenway, an easement agreement often addresses the rights and responsibilities of the grantor and the grantee. The grantor may retain the right to pass over the easement, to locate certain utilities within or across the easement, or to use the amount of acreage located within the easement for the purposes of calculating the density of development permitted by land development ordinances applicable to the

Farmers have an interest in preserving their land for future generations and are sometimes willing to negotiate easements for use of land along streams and rivers for greenways while agricultural operations remain on-site.

Photo Credit: Don Kostelec



Easements & Greenways

"The easement agreement entered into for a greenway should specify adequate room for both the construction *and* maintenance of the greenway."

- Buncombe County Greenways & Trails Master Plan

property on which the easement is located.

The grantee may be charged with certain responsibilities, such as maintaining the greenway and keeping it free of debris and litter, along with the right to use the easement for a greenway. Standards for hours of use, lighting, signage, fencing and other provisions addressing greenway design, construction, and use may be established by an easement.

7. Shared Easements. Land on which a greenway route is proposed is sometimes encumbered by an existing easement, most commonly for the location of utilities. During the planning of a greenway, all utility easements located within the trail corridor should be explored for the feasibility of locating the greenway within the existing utility easements.

Sanitary sewer easements (photo at left as an example) are the easements most commonly shared by greenways, but any easement that permits the location of a trail could be the potential location of a greenway. Because the use of the property is limited by an existing easement, it may be easier and less expensive to obtain an additional easement for the greenway. Due to the specificity of easement agreements in identifying the use of an easement and limiting the use of the easement to that identified in the agreement, an additional easement will have to be obtained for the location of the greenway.

Negotiations with the property owner will be necessary to obtain the additional easement required for the greenway. The holder of the existing easement will also have to be involved in the negotiations, as their use of the easement may necessitate certain standards or restrictions on the use of the property encumbered by the easement.

Discussions with utility providers and others who hold significant easements within the greenway planning area should be undertaken early in the planning process in an effort to obtain a general agreement for the shared use of their easements. A general agreement would provide the assurance that the easement could be used, provided the property owner permits an additional use, and establishes the standards and conditions that must be met for the shared use of the easement.

Many municipalities in Buncombe County have signed an agreement with the Metropolitan Sewerage District (MSD) permitting the shared use of their sewer easements for the construction and maintenance of greenways. It identifies the rights and responsibilities of MSD and of the local government constructing the greenway.

Where possible, efforts should be made to cooperate with utility providers and others in the acquisition of initial easements required for the location of greenway trails. Cooperation during the initial negotiations for obtaining easements can save all involved time and money.

Rather than having to negotiate separately with the property owner for the two easements (one to permit the placement of utilities and another to permit greenway construction), the complete easement package can be presented at one time. The personnel costs incurred in identifying and negotiating the needed easements and the legal costs incurred in preparing and recording the easements can be shared rather than duplicated. The property owner and the entities sharing the easement have a better understanding of their rights and responsibilities. This

approach is better suited for developing areas where utility infrastructure is being planned and/or installed.

Communication with all utility providers should be initiated in an effort to identify plans for infrastructure improvements and extensions. Opportunities for sharing easements, and the costs incurred in obtaining these easements, should be pursued. Agreements, whether written or verbal, to work together to provide a complete infrastructure system that includes utilities and greenways, should be reached with all utility providers.

Conservation easement are also a valuable tool in pursuing greenways and trails. Chapter 11 Implementation addresses partnerships in acquiring conservation easements and the Buncombe County Land Conservation Board has also been successful in obtaining these types of easements. A key component in using conservation easements is understanding which easements are best suited for greenways and which are best kept in a current state, such as a preference to keep a conservation easement natural or pristine.

8. Donation of Property. The purchase of property or easements for greenways may be the only option in some cases, but other less expensive options should be explored first in an effort to extend the limited funds available for greenway development. Efforts to obtain donation of easements and/or property for greenways should be given high priority. While the costs of negotiating the donation and the potential legal fees involved are incurred in this approach, significant property costs are avoided.

As stated, contact with property owners early in the greenway planning effort is important in efforts to obtain property/easement donations. Concerns that the property owner may have regarding the construction and/or use of the greenway should be addressed completely.

The ability to receive favorable tax benefits as a result of the donation of the easement and/or property may be the deciding factor in an owner deciding whether or not to make a donation.

The generosity of the property owner in making a donation should be recognized by naming a section of the greenway in honor of the donor, by placing their name in a prominent location on the greenway and in publications and in other ways agreeable to the donor.

The establishment of a properly designated nonprofit foundation, or the partnering with an existing one, should be accomplished early in the greenway program. In addition to the tax benefits a foundation can offer, as noted earlier in this Chapter it can also provide more flexibility in negotiating the acquisition of easements and property.

9. Required Dedication of Property or Easements. The requirement by a local government that land identified in an adopted plan for the location of a greenway be dedicated as a condition of the development of that property is becoming more common. This requirement typically is part of the open space standards found in the land development ordinance for the local jurisdiction. Open space standards require a certain amount of land within a property being developed or redeveloped be set aside as open space to meet the recreation needs of the future residents or users of the proposed development.

The standards can require that land identified as a greenway route be dedicated to the local jurisdic-

Once property is secured and greenways are in place, it is important to remind users to honor the wishes of adjacent property owners whose land they are passing through.

Photo Credit: Don Kostelec

Many communities require new development to dedicate land planned for greenways as part of the plan review and approval process.

tion and that the area be counted toward the open space requirement for the proposed development. The local jurisdiction (county or city/town) would be responsible for constructing and maintaining the greenway but would not incur the expense of purchasing the property. An understanding on the part of the property owner/developer of the benefits of having a greenway located within the development that would connect to other uses and destinations in the community should offset any concerns about the required dedication of the property. An additional benefit is that the greenway would be constructed and maintained by the local government.

The City of Asheville requires the provision of open space on some developments, and requires that land identified as a greenway route on any plan adopted by the City be dedicated as part of the development approval process. The requirement appears to be accepted and has had positive results for the City's greenway program. No other towns in Buncombe County have such requirements. Amending these policies across the county to include greenways could pose a chance for partnership between the cities, towns and County.

Acceptance of the requirement for dedication of property for greenway construction as a part of the development standards in Buncombe County will require the education of property owners and developers of the benefits of greenways. This acknowledgment, combined with the request of potential residents and tenants for greenways, will lessen the backlash against such a requirement. In an effort to make the dedication of land for a greenway more palatable to the property owner/developer, the provision of an incentive for dedicating the land may be considered.

The incentive could be in the form of increased density for the project (e.g. density bonus), a reduction in application and permit fees, or related items that benefit the owner/developer. As with any requirement, those affected by it should be made aware of it early and involved in the process of establishing the standard. The potential of such a standard in extending the success of the County's greenway program and in making greenways a part of new development makes this an option worthy of exploration.

10. Eminent Domain

The information presented herein provides an overview of the process but should not be considered as a recommendation of its use as a strategy for property acquisition.

The use of eminent domain casts a pall over the entire greenway program and makes other property owners less willing to consider the sale or donation of property for the greenway. The negative aspects of eminent domain make it a less than effective tool and one that is not recommended for use.

The use of eminent domain for greenway property acquisition has been opposed by several stakeholders and citizens throughout the development of the Greenways & Trails Master Plan.

The complexities of carrying out the eminent domain process correctly, the legal costs associated with it, and negative implications of using this process make it a strategy that should not be used for the acquisition of property for a greenway. As stated previously, this overview is provided only as information and is not an endorsement of this process.

Fee in Lieu Requirement

Local governments that require the dedication of land identified in an adopted plan for the location of a greenway as a condition of development approval often have a fee in lieu option that can be exercised by the developer. This option allows the developer to pay a fee in lieu of dedicating the land needed to meet open space and/or greenway requirements.

Within Buncombe County, the City of Asheville's open space requirements provide for payment of a fee in lieu and this program could be evaluated for guidance in establishing a similar program for the County. Funds acquired in this way can be spent on a variety of recreation projects, including the construction and maintenance of greenways. The requirements and realities associated with a fee in lieu option can make this option more complicated than the dedication of land. These requirements and realities range from the establishment of the value of the land that would otherwise be dedicated to strict guidelines for the expenditure of the funds received.

Fee in lieu programs typically establish the value of property as that identified in the property tax records of the county or other taxing jurisdiction in which the property is located. Given the changes in real estate values in recent years some developers may question the accuracy of property assessments done in 2008. An option should be provided that allows the value of the property to be established by a recent appraisal. Funds provided as fee in lieu should be deposited in a separate account established to assure that these funds are not mixed with general revenues.

Standards for the expenditure of the funds must be established to provide guidance for the use of the funds, and assurance that they are spent on items closely related to meeting the recreation and open space needs of County residents. The standards can identify specific projects or identify the types of projects on which the funds can be spent. Often the funds must be spent in the same geographic area as the development project providing the fee in lieu funds is located. Guidelines may also dictate that the funds be spent within an identified amount of time. Receipt and expenditure of the funds must be tracked closely, with funds spent on items identified as eligible expenses in the operating guidelines.

Due to the costs associated with the administration of a fee in lieu program, the "return on investment' is not as positive as it would be if the developer provided land for and constructed a segment of a greenway as part of the proposed land development project. A developer constructing a greenway as part of a new development project does not incur the mobilization costs associated with construction of a greenway only.

However, such a program can provide a source of funds for the construction and maintenance of greenways that would not otherwise be available and should be considered as a funding option for Buncombe County's greenway program.

Concerns about Eminent Domain

"The complexities of carrying out the eminent domain process correctly, the legal costs associated with it, and negative implications of using this process make it a strategy that should not be used for the acquisition of property for a greenway."

- Buncombe County Greenways & Trails Master Plan

Landowner Outreach Program

Acquisition of land for the corridors identified in this Plan will likely be one of the most challenging aspects of building an integrated greenway system. Feasibility studies such as the US 70/Swannanoa River Greenway identified nearly 130 landowners and the French Broad River/Hwy 251 Greenway study identified approximately 90 landowners in which land or an easement would be needed for a greenway.

Based on these studies, the sheer number of landowners that will need to be contacted will require a focused, well-orchestrated and well-managed landowner outreach effort. This effort will require a long-term commitment and dedicated funding sources for the vision of the connected greenway system to be realized.

The characteristics of land ownership can impact how the greenway is built, as the most desirable route might not be chosen during a plan or design process if major feasibility issues arise.

The land acquisition strategy should outline an approach to landowner outreach and serve as a guide for the identification of preferred properties for acquisition, acquisition ranking criteria, and a methodology for landowner outreach efforts. As part of the land acquisition strategy a Work Plan should be fully developed that includes six elements outlined below.

1. Research & Education. This element addresses the need to demonstrate to landowners that a cohesive vision is in place, that it is supported by a wide constituency, and that the project is likely to benefit the individual landowners directly. Sharing the comprehensive master plan and past corridor studies; examples of other greenways and their benefits; and research regarding liability, crime, and safety with landowners will help articulate this vision and address potential concerns.

Specific information and case studies to address the most common landowner issues should be collected and educational materials from the following sources should be utilized:

- Comprehensive Greenway Master Plan & Corridor Studies
  - Proposed route, including alternatives
  - Overall vision
  - Timeline for implementation
  - Stakeholder comments
  - Availability of funding
  - County and community commitment
- Examples of other greenways and their impacts on:
  - Property values
  - Health and recreation
  - Neighborhood pride
  - Crime
  - Safety
  - Other relevant anecdotes and stories

2. Ownership. A listing of landowner contacts along the greenway corridors will be necessary for communication and outreach work. The landowner database should be derived from the seven priority greenway corridors identified in this Plan. The database should prioritize landowners and identify preferred property/easement characteristics. The preferred properties are those that offer the greatest degree of connectivity including those that:

- Connect to the Wilma Dykeman RiverWay;
- Are located in key locations for a planned greenway such that without them, the corridor would be undesirable;
- Connect with neighborhood centers;
- Link existing and proposed state, regional, and local parks;
- Provide a link to other state, regional, and local trails;
- Connect scenic, historic, natural or educational resources, and recreational attractions; and/or
- Link natural areas to facilitate the movement of wildlife.

This database should also include potential public/private partnerships and local companies who have corporate sustainability plans who may want to participate in the development of the greenway system. The database should be integrated with other GIS protocols to ensure that other departments, most notably the County's Planning Department, are alerted to potential needs for greenways during the course of reviewing development applications or other planning-related permits.

3. Prioritization. Once the preferred property characteristics have been identified, acquisition ranking criteria can be applied to identify the highest priority properties within the focus corridor areas. The following ranking criteria should be utilized. The priorities provided are in order of highest to lowest for greenways and trails that:

- Close gaps to provide the greatest overall connectivity and usability of partially completed trails.
- Are threatened by development which would prohibit future greenway and trail development.
- Include lengthy trail sections occupied by a single landowner or several parcels owned along a corridor by a single landowner.
- Provide needed safety for trail users.
- Link public lands and/or lands with outstanding scenic, historic, natural or interpretive/educational values.
- Offer the greatest probability of being funded from grant sources.
- Accommodate the widest variety of single or shared use trail interests.
- Connect to existing regional and local trails, major parks, and natural areas, and neighborhood centers.
- Improve usability of existing trails through support facilities such as restrooms, parking, and access points.
- Provide access in or near areas under-served by trails or other facilities.
- Provide the greatest probability of supportive involvement by the public and interest groups that develop and maintain trails.

4. Coordination with County Leaders. This element addresses the need to make sure that feasible alternatives with land/easement acquisition issues and project design have been identified and analyzed for their ability to benefit the most citizens at acceptable costs. There may be a real need to be able to demonstrate this to reticent landowners.

If certain alternatives exist that minimize landowner opposition and accomplish the same goals of the greenway plan, they should be further explored and potentially implemented – especially if these alternatives could win landowner participation. Upon discussion with landowners, there will be a need to

Exhibit 5-2: Implementation Steps to Consider in a Landowner Outreach Program

Landowner Outreach Program Implementation

- Hire a real estate manager or hire a company to help focus on land acquisition needs within the Buncombe County Parks, Greenways and Recreation Services Department.
- Establish an annual budget allocation for greenway property acquisition independent of the project development or design process to allow for opportunistic purchases. This could include temporary purchase of properties placed on the market to secure an easement or right-of-way before a resale of the property.
- Act quickly to secure greenway easements or purchases when opportunities are available through development as such opportunities can be lost quickly and permanently.
- Develop a detailed and flexible Landowner Outreach Work Plan to guide all actions that include the identification for acquisition of preferred properties, acquisition ranking criteria, and a methodology for landowner outreach efforts.
- Develop an outreach campaign for the purpose of acquiring greenway through easements or fee purchase.
- Pursue policy changes that will require greenway easements to be provided or fee-in-lieu options for new development projects.
- Pursue state property tax reduction structure for greenway easement donations to allow for more landowners to qualify for state tax benefits.
- Pursue local county/city tax or economic benefits for donations for individuals, corporations and non-profit entities.
- Work through Connect Buncombe, the county's non-profit organization formed to help manage and fund greenways, to conduct major fund raising campaigns.
- Create a master agreement with MSD, NCDOT, and others to build a partnership in providing greenway easements when acquiring rights-of-way or easements.
- Create a core group that can coordinate and facilitate greenway easements including local and regional land trusts in partnership with Buncombe County serving as the easement holder for the greenway .
- Hire consultants as necessary to move the process forward. Outreach efforts that come from county officials are sometimes viewed skeptically and an outside professional can mitigate this concern.

coordinate with County leadership. A dedicated staff person, consultant, or committee can help facilitate landowner outreach and ensure effective communications occur.

5. Conduct Outreach and Education. The information gained from previous tasks can be presented to landowners within the greenway corridor. During outreach efforts it will be important to enhance dialogue with landowners by asking the specifics of any concerns they may have with the greenway project.

If alternatives explored address any of these concerns, this information should be presented to the County. Feasible alternatives should be pursued and implemented if it can be demonstrated that such alternatives are not too costly and that they will contribute to landowner willingness to participate in the project. Since outreach efforts will occur over a period of time, documenting outreach efforts will be an important aspect of this task.

Landowner communication should take place as part of a detailed communication campaign that utilizes a variety of tools. Direct personal communication is often the most effective but requires significant allocation of time and resources, which may be necessary for larger properties or owners with more potentially sensitive or substantive impacts.

This type of communication may require a combination of a County staff, outside consultants, and/or a landowner outreach committee to coordinate the effort. If a volunteer committee is to be included focused trainings should be provided prior to any direct communications occurring. It is beneficial to include a respected community leader or community members in face-to-face meetings with individual

landowners.

Direct mailing such as letters and surveys can be used to gauge landowner interest in "voluntary donations" of land for the greenway. A central communication hub (website or outreach coordinator) could be created where landowners can be directed to learn about upcoming outreach events, news, and used to attract people to social media sites.

Due to the number of landowners who will need to be engaged at various points during planning, design and property acquisition phases, Landowner Workshops should be conducted to provide updated information and help recruit champions to help facilitate future greenway acquisition. These workshops can be an effective method to gather support and ensure participation by landowners who already have an interest in greenways. Participating in local events held throughout the year is another way to reach a larger group of potential landowners and interested community members at one time.

6. Encouraging Participation. This element addresses the details and provides for resolution of landowner concerns – if possible. An authorized representative that can make decisions and enter into an agreement with landowners should be involved. This is where landowners need to know if their concerns have been addressed and options clearly understood for the various methods for providing access through their properties for a greenway. The goal is to have landowners clearly express their intention to participate in the greenway project. It will also be important during this process to understand the values and interests of the individual landowners. If negotiations become challenging it is recommended that the Best Alternative to a Negotiated Agreement (BATNA) be implemented. This approach can be used to ensure that deals are accurately valued, taking into account all considerations.

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Chapter 6: Programs

All kinds of people can use a greenway for a variety of reasons, whether to recreate, walk a dog, bird watch or simply meditate in a nature setting. While greenways should be designed appropriately for several uses, it is imperative that programs be developed or encouraged to promote use of the greenways for many users. Programming a variety of events and activities for greenways is also essential to increase usage of greenways.

A variety of policy changes and programs should also be implemented to cultivate and support a greenway-oriented mindset among residents and local partners. A greenway-oriented culture has several different characteristics, including the behavior of people when they are walking or biking, the attitude of of the community towards greenway users, and the role of government agencies and law enforcement in promoting safety. To address all of these elements, programs are often created to fit within the "three E's" of greenway, pedestrian and bicycle programming: Education, Encouragement, and Enforcement.

Education programs teach others about safe greenway behaviors, the benefits of walking and bicycling, and can assist people in feeling more comfortable when using greenways. Education programs can also be used to teach bicyclists and pedestrians how to interact safely with one another.

Encouragement programs, like education programs, can also teach about the benefits of walking and bicycling, and serve to promote walking and bicycle-friendly behavior through various activities and incentives.

Finally, enforcement programs provide the "teeth" of a safe and legal greenway environment. When law enforcement officers and other officials protect greenways and encourage use of them, this sends a clear message to users about safe activity. Other types of enforcement are covered in Chapter 7: Promoting Greenway Safety.

Such programs can help achieve the following:

- Educate the public as to the existence of a greenway and plans for future greenways;
- Increase tourism to Buncombe County which will enhance revenues.
- Encourage local residents to use the greenways for transportation rather than driving;
- Promote environmental education and stewardship of the natural environment;
- Promote physical fitness and mental health among all age groups and abilities;
- Provide recreational and cultural opportunities and new experiences;
- Help build a strong sense of community and neighborhood identity;
- Increase safety of the greenways by teaching people how to use the greenways as well as increase the number of users; and

Buncombe County is already blessed with a diverse set of programs that encourage use of existing greenways or could be utilized to promote use of future greenways. The concentration of non-profit groups, land conservancies, bicycle clubs, colleges and universities, sustainability-based organizations, and public agencies all contribute to utilization of greenways as well as the parks and any streams that are adjacent to them.

Programming Enhancements

Since greenways are relatively new in Buncombe County, there are some emerging opportunities in organized activities for certain user groups or areas of interest, including the following:

Buncombe County's Parks, Greenways & Recreation Services Department already conducts and participates in numerous programs, such as the Senior Games, that utilize existing facilities and are perfect for staging at or near greenway corridors.

Photo Credit: Buncombe County

Buncombe County's Fishing Derby for Kids is an example of a recreational program where groups already engaged in other programs, such as Trout Unlimited, are well-suited to provide resources to support such events at little or no cost to government agencies.

Photo Credit: Buncombe County

- Health care facilities and retirement communities are major potential users for therapeutic reasons, which is an opportunity for new programs for elderly and disabled groups;
- Art along the greenways, including physical art as well as the performing arts, can be increased;
- Safety programs and signage for greenways educating people about greenway etiquette and rules is needed; and
- New programs and activities for youth.

General Recommendations for Greenway Programming

These recommendations are based on feedback from the stakeholder groups and surveys, as well as research from other communities. General recommendations for programming include:

- Balance the need for the greenways to protect the environment as well as provide recreation and cultural opportunities;
- Be inclusive and provide specific age-related activities and activities for multiple generations as well as for other user groups, such as people with health issues;
- Tie in greenway programs with nearby facilities such as parks, schools, health care services, retirement homes, commercial areas, and other nodes by incorporating amenities and informational signage;
- Assist organizations who wish to sponsor events by providing information, calendar listings, and technical assistance;
- Develop a website for the greenways showing trails, activities, safety information, Trail Watch information, and links to other greenway-related information;
- Provide brochures and maps for the greenways showing walking, bicycling, horseback riding and canoe/kayak opportunities. Develop a reference map that shows a system of secondary trails that reflects important neighborhood-level connections. These maps and brochures can be available at trailheads, as well as local libraries, community centers, schools, retirement centers, and other gathering places;
- Consider food vendors, from vendor carts, or trucks to "sit-down" businesses along the greenway to sell drinks, snacks, sunscreen, and other items; and
- Develop a program of continuing education for elected officials, agency staff, developers and designers/engineers to learn strategies for managing the greenways and any streams along greenways.

Specific Greenway Program Recommendations

Exhibit 6-1 on the following pages contain specific greenway programming recommendations that correspond to the categories of the existing programs profiled in this Chapter. The recommendations are intended to build upon existing programs and fill programming gaps.

Exhibit 6-1: Programming Recommendations

Environmental Education & Stewardship

- Preserve wild areas adjacent to the greenways for passive recreation and nature enjoyment and do ecological stewardship projects including stream cleanups, invasive plant removal, and tree plantings;
- Provide outdoor classrooms with educational programs about the flora, fauna, geology, hydrology, water quality, and cultural resources. Tie programs in with North Carolina's education curriculum. Develop partnerships with schools and colleges, particularly those with environmental studies classes and programs, to assist with water quality sampling, stream monitoring, and other activities;
- Develop interpretive trails with signage to facilitate discussion on ecological and environmental issues, put identification tags on plants, and provide guided nature tours;
- Develop smartphone apps and QR codes for greenways to supplement signage including information about the environmental history and issues;
- Allocate space for community gardens and support efforts to create new ones such as at the Buncombe County Sports Park and along the Hominy Creek Greenway;
- Hold Earth Day and other environmental events on the greenways;
- Educate adjacent property owners concerning the effects of exotic invasive plants on the native plant habitat value and encourage removal of exotic plantings.

Greenway clean-up days can engage youth and other groups in environmental stewardship activities that draw attention to the importance of trails in a natural setting.

Recreation/Health & Wellness

- Host or support other organization's efforts to promote walks, running, bicycle or recumbent trike rides , canoe and kayak trips, in-line skating, segway trips, equestrian rides, and skateboarding. Tailor recreation programs to different ages and ability groups;
- Encourage support groups such as cancer, diabetes, rehabilitation groups, and others to do activities on the greenway;
- Hold public health programs, promotions, and incentives, such as Lighten Up for Life and Bike-to-Work and Walk-to-Work Days;
- Coordinate with the Healthy Living Opportunities Map with Buncombe County. Create a link to the map on the Parks and Greenways Department website.
- Host walks/runs for charity or awareness such as March of Dimes Walk, Crop Walk, Relay for Life, National Trails Day;
- Allocate space and encourage studios to hold yoga and tai chi classes;
- Promote blueways and picnic and camping areas accessible only by boat. Provide boat access to the river with parking and put-in areas;
- Sponsor fishing programs clinics and provide accessible piers;
- Provide natural play opportunities for children and adults along greenways with "loose parts" (sand, stones, play parts); consider sitting areas for parents;
- Support activities that will connect new groups of users, especially low- and moderate income residents, with the greenways and rivers. Provide information and programming that encourages novices to try out new activities, at little or no cost and in settings that feel comfortable and safe;
- Provide residents access to equipment such as bikes, in-line skates, canoes, and kayaks through rentals, bike share programs, or donations of new or recycled equipment;
- Support bicycling by providing bicycle parking/storage, bike racks on buses, and bicycle maintenance clinics;
- Organize dog-related activities and create dog parks near the greenways;
- Construct a mini terrain park for young or inexperienced riders to learn how to ride mountain bikes and BMX bikes.
- Promote nature walks, stroller days and play dates for children younger than school age.

Exhibit 6-1 cont'd: Programming Recommendations

Cultural Resources

- Host cultural events such as story-telling , music, drama, dance, movie nights, and other performing arts. For example, the Food Lion Skate park hosted Dancers in the Bowl with laser light. Encourage groups such as Easel Rides (mobile art lab) and Art Attack to use the greenways for art performances and projects;
- Create spaces such as pocket parks for organized events with a reservation system for usage;
- Hold special events on the greenway such as Fourth of July or Christmas parades and organize a "greenway days" to celebrate the outdoors/local traditions;
- Consider parking needs, including bus parking for larger areas as well as restroom facilities;
- Develop a coherent system of wayfinding signage and identity for each community;
- Have a consistent logo throughout the greenway system which reflects the geography and history of an area. Consider joint logos in overlapping jurisdictions. Involve children by having a contest for naming the greenways and creating themes and logos;
- Interpret the local history and enhance community identity through sequential art and stories conveyed through sculpture, signage, murals, site furniture, paving patterns, and other design elements. Preserve and interpret historic artifacts such as the chimney along Reed's Creek greenway to reflect history;
- Create smartphone apps and QR codes for greenways to supplement signage, including indigenous music, cultural and environmental history;
- Encourage painting and other art classes to be held on the greenways.

Safety & Maintenance

- Encourage and support the creation of Community Watch groups to monitor the greenways;
- Promote programs to teach people bicycle safety, safe navigation to the greenways, and proper riding etiquette on the greenways. Set up a permanent bicycle safety course for groups and individuals to use;
- Support Safe Routes to School programs and expand into more school districts. Organize Walking School Bus or Bicycle Trains in which adults supervise children as they walk or ride their bikes to school. Promote "Walk- n-Wave" days to slow traffic and let drivers know that they share the streets with pedestrians. Children are given large foam hands for waving to drivers;
- Enforce 'pick-up-after-your dog' by signage and kiosks with bags;
- Set up Adopt-a-Trail, Adopt-A-Reach, and Greenway Clean-up Days for litter cleanups, weeding, and other maintenance along a specified trail segment and report any problems to the Greenways Program;
- Establish and maintain a list of projects for potential community volunteers. Create a list of single special projects that groups or individuals (such as Eagle Scouts) may be interested in doing, rather than on-going monitoring and maintenance responsibilities. Encourage school age and high school students as well as civic groups to do community service on the greenway, including planting, maintenance, and light construction.

Foliage along greenways can quickly become overgrown and obstruct safety features intended to inform users of obstacles. Adopt-a-Trail programs and Friends groups can provide trimming and other maintenance duties that don't require heavy equipment.

Chapter 7: Promoting Greenway Safety

People who are unfamiliar with greenways often fear they will attract crime and lower adjacent property values. Numerous studies have refuted this; in fact, greenways are generally safer than the communities surrounding them. There are many efforts communities can undertake to ensure greenways are safe.

Careful attention to the site planning and design of particular areas such as parking lots, trailheads, and restrooms is critical in reducing safety concerns, real or perceived. There is a balance between retaining or creating a natural setting that is safe while also preserving the naturalness of an area. Design strategies include allowing clear visual access, having appropriate lighting in key areas, providing multiple access and egress points, and organizing activities to increase the number of users and "eyes on the path".

Encouraging ownership of the greenway by involving the public in the planning process and educating them on the benefits of greenways, as well as presenting data illustrating the lack of crime and other problems is essential in gaining public support. Such public processes can often lead to an effective neighborhood watch program to monitor the greenway.

Buncombe County is establishing a a non-profit entity—Connect Buncombe, which is part of the Buncombe County Service Foundation—to perform volunteer services related to promoting safe use of greenways.

Greenway Safety Studies from Other Communities

A survey done in Cary, NC, in 1995 of residents living near three greenways gauged their satisfaction with the greenways and about any problems. There was a 75% response rate and most residents felt satisfied with the greenways and stated that problems were minimal. Studies in Mecklenburg County, NC; Denver; Seattle; Tampa; and other cities reported similar results showing less crime on greenways than the communities as a whole.

Two studies of crime statistics in Mecklenburg County show greenways have lower crime rates than the surrounding community. They found that most greenways provide a safer alternative than roads and attract local residents using the trails frequently. The first study was done in 1997 along the Mallard Creek Greenway comparing the incidence of crime with the surrounding police district and the city as a whole. The incidence of crime along the Mallard Creek Greenway and adjacent properties was nearly half that of the surrounding police district and only 12.7% of the countywide crime rate. Later, an extended study explored recent crime rates along all 14 greenways within Mecklenburg County between 2001 and 2003. The data suggest that greenway-adjacent properties do not incur greater risk of crime than other properties within the same neighborhood statistical area. On the contrary greenway-adjacent properties had lower crime rates 75% of the time.

Crime Prevention Through Environmental Design

Crime Prevention Through Environmental Design (CPTED) was authored in 1971 by C. Ray Jeffery, a criminologist at Florida State University, as he studied the relationship between the physical environment and the incidence of crime. His work was based on previous research studying how the built environment influences the rate of crime, including Jane Jacobs seminal The Death and Life of Great American Cities in 1961 and Oscar Newman's Defensible

For the safety of users, greenways that are constructed in constrained areas may necessitate the diversion of some users to connecting roadways or other trails, such as the connection to Carrier Park in West Asheville.

Photo Credit: Don Kostelec

Planned greenway corridors are oftentimes overgrown with weeds, trees and other foliage and need to be cleared not only for trail establishment but to promote safety and visibility along a route.

Photo Credit: Friends of Hominy Creek Greenway

Space in 1973.

Designing greenways using CPTED principles has the potential to reduce crime by focusing on three interrelated principles that comprise CPTED concepts and strategies: Natural Surveillance; Natural Access Control; and Territoriality (Exhibit 4-1).

People often express fear that potential greenways will attract people who will commit personal or property crimes. An effective strategy to gain resident support as well as to reduce crime is to get nearby residents involved in the planning, design, and upkeep of the greenway to help establish a sense of ownership.

A local example of residents taking ownership of a greenway is the Friends of Hominy Creek, which was created to help develop a master plan and oversee the future greenway. The group brainstormed about the design of the greenway as well as potential uses such as an outdoor stage for performances and a community garden.

Activity Support & Maintenance

Activity support encourages increased greenway use by programming activities for users of all ages and interests. This encourages legitimate uses of the park, and is especially effective when planned for time periods of lower usage. The more people there are on a trail, the safer it will be. Chapter 6: Programs provides more details on these options.

Consistent maintenance, just like with any park setting, will help keep the greenway safer by eliminating potential hiding places through the use of regular landscape clearing and pruning. Good maintenance of the trails and facilities demonstrates that the community cares about the space and will not easily tolerate criminal behavior. See Chapter 8 on Maintenance for further information.

Implementing CPTED

It is recommended that a systematic review of CPTED principles occur during the design and review of any greenway project. In Safety by Design: Creating a Safer Environment in Virginia, the Virginia Crime Prevention Association grouped questions in the following categories:

- **Designation**: What is the intended use of the area? What behavior is allowed?
- **Definition**: Are there physical limitations to the area or site? Are borders between the area and public spaces defined? Is it clear which activities are allowed where?
- **Design**: Does the physical environment safely and efficiently support the intended use?

The City of Tampa, Florida Greenways and Trails Master Plan recommends that each greenway and trail section, whether it is being newly built or enhanced, receive a CPTED review from Police Department staff trained in the principles of CPTED. The CPTED Review consists of the following five steps:

1. **Crime Analysis Review**: This information assists the police department in determining the type of crimes that are occurring on and around the trail.
2. **Demographics**: This information describes the nature of the population around the future trail.
3. **Land Use**: City planning departments, zoning boards, traffic engineers, and local neighborhood groups have information that describes and depicts the physical allocation and use of land in and around existing or proposed trail.
4. **Observations**: Officers conduct an actual review of the physical space that has been designated as a trail segment.
5. **Resident or User Interviews**: Officers conduct interviews with persons living near the proposed trail to determine their perspective on safety.

Exhibit 7-1: CPTED Concepts & Strategies

Natural Surveillance	Natural Access Control	Territoriality
Placement of physical features, activities, and people in a way that maximizes visibility and minimizes hidden and isolated areas. This allows users of a space to have views of their surroundings and of potential threats to their safety, making it more difficult for someone to perform a criminal act.	Methods to decrease the opportunity for criminal activity by creating a perception of risk for potential offenders and controlling access into and throughout a space. People can be physically guided through a space by strategic placement of entrances and exits, signage, fencing and other barriers, landscaping and lighting.	Use of physical features that express ownership and neighborhood context. People who feel a sense of ownership tend to use the trails more and monitor them for inappropriate behavior and maintenance problems. Potential offenders are discouraged when they feel inappropriate actions would be viewed and reported.
Natural Surveillance design strategies include: • Locate parking lots, picnic areas, trailheads, play areas, and restroom facilities near streets and other activity centers so they are easily observable; • When possible, locate trails near areas of park activity or at places where parks meet commercial or residential uses, or align them with active streets to make users more observable by others; • Cluster compatible activities to avoid conflict and to increase social observation; • Parking areas are more prone to crime. Incorporate lighting and do not erect solid fences which block visibility and hamper escape. Limit lighting only to parking areas and trailheads rather than along the entire trail unless greenway use at night is encouraged; • Provide an emergency telephone system at parking areas and along the trails such as those near UNC Asheville on the Reed Creek Greenway; • Position benches in areas where users have good views of surrounding areas; and • Maintain landscaping at least 5-feet from the edge of trail with a mowed strip or groundcover bordering the trail. Keep trees limbed up to 10-feet high and avoid using large and dense shrub masses.	**Natural Access Control** design strategies include: • Restrict access to parking areas with gates when parks are closed; • Provide clearly visible and lighted entries to park buildings such as restrooms and locate them in areas close to other activity areas. Clearly define paths between parking lots and other facilities. • Maintain at least 10-feet between greenways and wooded areas to offer long sight lines and distance from potential attacks; • Establish a clear separation between regional public trails and adjacent private property with landscaping, fencing or other screening treatments; • Throughout a trail system, and especially in isolated areas, provide clearly marked paths or exits that gives users egress options; • Through clearly marked and placed signage and gates, note the hours that the greenway is open to the public.	**Territoriality** design strategies include: • Incorporating certain facilities into a greenway provides cues about appropriate uses. For example, providing children's play areas encourages family use. • Clearly delineate between public and private property along the trail with the use of fencing, landscaping, paving, and other design features. • Reflect environmental and cultural context with elements such as gateways, signage, seating, art, paving patterns, and other features. • Provide clear directional and informational signage to orient users to the greenway layout as well as facilities along the greenway. Signs should clearly identify trail names, especially at intersections, as well as trail length and distances to facilities, location of emergency phones, and the characteristics of trails, such as wide paved trails or smaller isolated walking trails. Mile markers should be installed as well as indications of the trails intended use. • Post park rules at all access or gathering points in the park. Rules should clearly convey the acceptable uses and discourage unacceptable uses of the park.

Bicycle patrols provide flexibility in monitoring greenway activities. They can also be conducted through volunteer groups as a method of passive enforcement whereby volunteers are instructed to contact local authorities when they observe or think there is potential for criminal activity.

Photo Credit: Minnesota Public Radio

Upon completion of the review, officers recommend CPTED and security procedures that will minimize potential criminal activity on the trail and in the surrounding neighborhoods. These recommendations cover issues such as lighting, location of benches and rest stops, access to trails from roadways, and landscaping. These recommendations are incorporated into the final design of each segment. Buncombe County staff could follow a similar process in the review of greenways.

Law Enforcement & Patrols

In addition to the above CPTED principles, it is essential that either law enforcement or designated enforcement volunteers patrol greenway parking lots and trails. Bicycle patrols are particularly effective because they have more flexibility to monitor the entire greenway systems and their presence is a good crime deterrent.

Community Watch Programs

Many cities with a greenways system have groups and individuals who volunteer to patrol the trail and do special projects such as litter cleanups and tree plantings. In Boulder, Colorado, there are Greenways Walkers who frequent the greenways and are encouraged to pick up trash and report maintenance problems to the Street and Bikeway Maintenance hotline. The Midtown Greenway Coalition in Minneapolis has an organized Trail Watch with riders scheduled for two-hour evening shifts to ride the greenways to provide a friendly presence and report any incidents. Incentives are offered by local bicycle shops and restaurants to encourage people to volunteer. They also have an “Adopt a Greenway” Program with over fifty groups volunteering to help with litter cleanups and landscape planting and maintenance. Buncombe County could advocate and provide support for the formation of community watch groups that will monitor the greenways.

In some communities, social media is becoming an effective tool as a grassroots community relations vehicle for fighting crime. This was recently demonstrated in West Asheville where a string of home invasions inspired local residents to organize the West Asheville Watch using social media to communicate information on crimes that have occurred and how to stay safe. Having an online forum for greenway users to post safety information as well as to advertise events would be beneficial.

Safe Routes to Schools

Healthy Buncombe and the County’s Parks, Greenways and Recreation Services are managing programs to create safer ways for children to walk or ride to school to minimize risk, combat obesity, and decrease traffic congestion and pollution. The first Safe Routes to Schools program in the United States was adopted in the Bronx, NY in 1997 and has since spread throughout the country. A Safe Routes to School (SRTS) program is a school-based effort that involves young students, teachers, law enforcement officers and parents in the development of school safety and encouragement initiatives such as Walk to School Day, Walking Wednesdays, pedestrian safety assemblies, and bicycle rodeos.

While these programs can help engage children in safe walking behaviors and encourage more walking and healthier lifestyles, parents may have non-infrastructure concerns over the safety of their children particularly along greenway corridors where there may not be as many “eyes on the street”. Therefore, the principles of CPTED should be considered as SRTS programs are implemented and greenways constructed adjacent to school properties.

Black Mountain is one of six communities in North Carolina selected to complete a SRTS action plan. The action plan team is conducting analysis of existing conditions and prioritizing engineering solutions surrounding the study schools. The plan will guide the community and school system in the development of facilities and programs to encourage more children to walk or bike to school in a safer environment. This model should be expanded in Buncombe County so all schools can be studied and improved through the SRTS methodology and funding. Any schools near planned greenways should be prioritized for SRTS funding and coordinated with local SRTS action plans, with consideration of CPTED principles.

Sharing the Greenway

Physical safety of users is also a concern on greenways and trails due to a wide variety of user types, persons traveling at different rates of speed, and inexperienced users. Many users will perceive riding on designated bicycle paths as a safer alternative to riding on unmarked streets and roads; however, their skills in operating a bicycle and how other users respond to them can create safety concerns.

Offering instruction on how to safely bicycle on the greenway is important for people to learn proper riding techniques, greenway etiquette, safety awareness, and how to avoid collisions, especially at street or other trail intersections. Learning to navigate to the greenway along streets is important to help people feel confident and encouraged to use the greenways. Bicycle rodeos can be held to teach children how to safely ride a bicycle and learn the rules of the road. Campaigns advocating the use of helmets for all users should be a critical part of any bicycle safety program.

Buncombe County and its partners have been involved in various bicycle training courses, particularly through the League of American Bicyclists. The focus on road-riding skills within the training modules leaves a gap in the community in teaching proper skills and etiquette of bicycle riders and other users along greenway trails. It is recommended that the county work with its partners to develop a greenway-specific training module for users to be deployed through schools, scheduled training sessions and public awareness campaigns.

The interface of greenways with the street and highway system can also generate safety concerns among users if not designed properly. Even at the most well-designed locations, high volumes of vehicular traffic can become a deterrent for young users. It is important to consider how signage and markings help encourage safe use of all users, particularly at locations where greenways intersect with other greenways, trails or streets.

Community groups can be encouraged to help as crossing guards at the greenways. In the Brightmoor neighborhood of Detroit, citizens have effectively organized to act as crossing guards at busy intersections. As greenways develop in Buncombe County, neighborhood volunteers could be recruited to volunteer as crossing guards. At intersections deemed to be “busy” or potential problematic for pedestrians or bicyclists, there is already a precedence for this as many schools place crossing guards at busy intersections.

Buncombe County and its partners should work to develop greenways-specific training modules to promote safe usage and consideration of other users.

Organize a Training Program

Buncombe County and its partners could develop a training program for new volunteers, design and

Safe Routes for Seniors recognizes that older adults have physical and cognitive challenges when trying to walk or ride a bike. Greenways provide opportunities for physical activity and a place to conduct training programs to make seniors comfortable in using trails.

Photo Credit: Streetfilms.org

Chapter References

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planning professionals, contractors, and other partners who wish to design and construct trail facilities, work on maintaining trails, and conduct programs along the greenways. This promotes consistent design and management skills; ensures volunteers, designers and contractors are up to date on the latest rules, regulations and design standards; and promotes discussion of new design, maintenance and program ideas. The training program would provide educational opportunities and resources to educate people about greenways and make sure trails are constructed and maintained to a high standard of safety and accessibility. Since there is an increased reliance on volunteers, such a training program would help keep the volunteers safe as well as improve safety for trail users.

A model for a comprehensive program is the National Trails Training Program (NTTP) which is a forum of diverse trail organizations and federal agencies whose mission is to improve opportunities for training for the nationwide trails community. They provide an internet-based clearinghouse of information and resources and offer an array of courses ranging from trail construction to safety practices, and compliance with the Americans with Disabilities Act (ADA).

Within NTTP's website, there are specific forums addressing safety and accessibility. The Safe Trails Forum helps promote safety for users by offering education on improving the user experience through improved trail design and maintenance, understanding legal concerns and reducing liability, decreasing shared-use path conflicts, and reporting crime and accidents.

The Buncombe County greenways training could incorporate elements of the NTTP program and provide a link to their website on the Connect Buncombe and Buncombe County websites. Buncombe County could develop a standardized greenway curriculum to present background information to new volunteers, homeowners adjacent to new or proposed greenways, schoolchildren, designers and contractors, and other interested partners. Such a curriculum would include the definition and benefits of greenways and the vision for the Buncombe County Greenways Master Plan. Specific workshops related to construction, maintenance, and safety could be offered periodically. Buncombe County could develop an information clearinghouse that relates specifically to local greenway management topics. An assessment checklist could be developed for volunteers and others for ongoing greenway evaluation and maintenance.

An example of a greenways training program is the Georgia Trails and Greenways Program which focuses on unpaved trails. The Georgia Trails and Greenways office coordinates trainings on trail construction, trail maintenance and trail education.

Safe Routes for Seniors

As Safe Routes for Schools has been very successful in creating a safer pedestrian environment for children, another group that is more susceptible to pedestrian-related conflicts with cars is senior citizens. They tend to have more mobility difficulties and sensory changes as they age. By constructing greenways and connecting them to neighborhoods, we can provide increased opportunities for senior citizens to safely and comfortably experience the health benefits of walking and bicycling.The idea for Safe Routes for Seniors originated in New York City where they found senior pedestrians were killed at a disproportionate rate to other age groups.

They developed a Safe Routes for Seniors program which has dramatically reduced the number of deaths and injuries among senior pedestrians.

Chapter 9: The Economics of Greenways & Trails

The creation of a system of greenways and trails will require a significant investment from various sources, whether it be the private contributions of land or construction from private development actions, local capital improvement programs (CIP), or state and federal tax dollars procured from locally collected sales taxes. The communities that have undertaken these types of programs have had varied reasons for doing so: creation of a healthier lifestyle, attraction of businesses to the area, or to improve the transportation system by increasing options for users making short or moderate trips.

This chapter focuses on positive economic impacts from greenway and trail investments and how investments improve the tax base and business community. The section also summarizes the strategies that Buncombe County should emphasize to ensure a maximum return on investments in trail and greenway infrastructure. Finally, some key statistics are provided that will allow the estimation of the impact of trails on the local economy via studies that have utilized robust methods to arrive at estimates of benefits.

Several agencies and municipal governments have attempted to estimate economic impacts for existing greenways, trails that don't yet exist and alternatives analysis for different greenway design or route options. The resources used to develop this chapter were screened to identify the most robust analyses, relying where possible on academically rigorous methods and attempting to weed-out simplistic online survey-based extrapolations of user impact.

While these impacts are considered, the source, robustness, and inherent variation that render direct comparisons to other trails in other places difficult should also be recognized. One analysis of a 12-mile-long trail, for example, indicated a net annual loss of $36,000 and had no impact on revenues for three counties that the trail traversed. This report looked at only one trail that had been open for four years and did not control for other factors that may have impacted sales tax revenues.

In nearly every economic impact study, the results can be heavily influenced by the choice of externalities that are included or excluded from the impact model. "Externalities" refers here to economic factors that are not related to the cost of producing a good or service, or to the cost of a consumer purchasing the good or service.

For example, the value to air quality/emissions, mental health, physical health, and adjacent property values may be difficult to measure over time and are therefore easy to overlook or overestimate, depending on the orientation of the analyst. The recognition that these variations do occur is important when setting out to compare direct and indirect trail benefits to governments or individuals.

It is recommended that Buncombe County work with other regional partners to conduct a full-scale economic impact analysis related to the economic impacts of greenways; trails; bicycle facilities; bicycle/running shops; hotels, bed & breakfasts and motels; and related industries such as bicycle and outdoor equipment manufacturing. Any attempt to measure true local or regional economic impacts can only be accomplished through a substantial investment in a statistically-valid effort.

The Virginia Creeper Trail has become a model of capitalizing on the impacts a greenway has on a community. Several businesses are tailoring their marketing and branding efforts to draw trail users.

Photo Credit: Don Kostelec

"The next generation is very savvy about choosing where they'll live. They look carefully at quality of life factors like how much time they're going to spend in traffic commuting, ***if they can live near a park or hike and bike trail***, and whether a city's downtown stays awake after five."

— Rebecca Ryan, Founder of Next Generation Consulting, discussing traits of great cities (2009)

Methods for Estimating Greenway and Trail Infrastructure Benefits

Based on the review of major categories of spending above, it is apparent that developing a truly comprehensive economic input/output model of a multipurpose trail (e.g. a trail that accommodates bicycles and pedestrians) is a daunting task. Acquiring data, locating truly comparable cases for calibration, and assessing external influences such as marketing efforts or a trail's place within a larger, interconnected network of trails on the size of expenditures are tasks seldom within the capabilities of most governmental agencies.

Given typical time and budget constraints, an appropriate hybrid analysis method would use unitary estimates of revenue factors from established, similar trails to estimate direct costs; provide a summary of possible external influences that may affect revenue projections; and summarize ways that an agency and it's partners can maximize trail usage and increase revenues.

One methods for estimating impacts was researched and outlined by the University of Wisconsin-Madison and outlined below. Note there are three main types of economic effects: direct (jobs are created during construction, for example), indirect (suppliers of tools and materials increase output), and induced (money that is earned from the project is spent on unrelated goods and services).

1. Estimate the number of resident and non-resident users. Since these two groups have different levels and types of expenditures, it is important to calculate them separately. If possible, calculating the number of viable trail use days and types of activity (e.g., running, sight-seeing, special events) is desirable if expenditures for these breakouts are available. This figure should be in the format of a "days of use" value for each type of user and activity.

2. Calculate expenditures by type of activity and type of user. Each type of user and each type of trail user activity will have a different level of expenditure that has to be estimated. Further, each type of activity will incur costs in different categories of expenditure.

3. Calculate Total Economic Effects. The total effects are the sum of the individual products of all trail user activities multiplied by the costs of each activity. Additional economic impacts through indirect and induced activity (all of which are secondary effects) would have to be calculated separately and added to the total.

In order to acquire the data necessary to estimate the values for activity duration (person days) and expenditures per activity per day, a specialized survey is the best tool. However, in the absence of such a dedicated survey, comparisons from other studies conducted for similar trail projects or systems of trails (i.e., throughout a county) can be used, with caution. The National Household Transportation Survey (NHTS) can also provide information in this process, and is fairly recent relative to this writing (the last survey was conducted in 2009).

Monetizing the non-expenditure side of indirect and induced benefits of trail-dependent activity is particularly challenging. Many studies use a popular input-output model called IMPLAN to calculate indirect and induced effects of construction and maintenance actions for infrastructure development. The IMPLAN model is also attractive because it computes these values at the county level, and because

it also calculates the total person-years of jobs created by the activity. These values, while widely accepted in economic circles, do not account for any utility related to the facility after its construction and related maintenance activities.

Some indirect effects may be impossible to reliably monetize due to a lack of data. Health-related impacts of additional cycling, reduction in fuel consumption/ energy costs, job access, and other effects can still be reported anecdotally. The Buncombe County Greenways and Trails Master Plan is employing a rapid Health Impact Assessment to better define some such effects.

Indirect effects were a component of the 2004 report conducted by the North Carolina Department of Transportation on the economic effects of cycling in the Outer Banks region of North Carolina mentioned previously, which remains a benchmark study for the state on this topic. The range of economic impact from bicycling – between $15 million and $149 million – provides a good example of how the output of even a study utilizing direct survey data can spread over a wide range of possible outcomes.

Cost-benefit analysis is also sometimes conducted to estimate the value of the trail facility and compare it against the cost of right-of-way acquisition, construction, and long-term maintenance. The initial costs of design, right-of-way acquisition, and construction are one-time expenditures; the ongoing cost of maintenance is an additional cost comprising direct labor, fringe benefits, materials and equipment. The calculation of a benefit-cost ratio (BCR) to payback period (e.g., the number of years that it takes to "pay back" to the taxpayers the cost of the facility) are common metrics.

Fortunately, capturing costs is typically an easier task than calculating the benefits, since data is readily available on government expenditures through contracting, capital improvement program, and Comprehensive Annual Financial Reports (CAFRs) that are required to be prepared annually by municipalities in North Carolina.

Benefit Categories

Generally, trails can help foster events, spur local trips by commuters or exercise enthusiasts, or generally aid in the promotion of outdoor activities. A survey conducted by NCDOT summarizes cycling and walking statistics for just North Carolina while national parks and local parks and recreation departments may also conduct surveys of their users. Acquiring detailed, local data of this sort can be problematic, and estimates based on personal knowledge of the area obtained either directly or indirectly through interviews with local bicycle shop owners, hiking clubs, chambers of commerce or other local sources should be expected.

A survey of the Heritage Trail users in Pennsylvania indicated 64% of the trail users lived inside the county and 15% of the users lived more than one county away. Of those surveyed, 78% stated that cycling was their primary use of the trail. Just over 50% spent more than two hours on the trail, and 32% of the users stated that their use of the trail had influenced their decision to purchase bicycles or bicycle supplies.

Bottled water, candy, snacks, lunch at a trailside restaurant, and seeing a movie were cited as expenditure categories while actually using the trail.

Various categories of expenditure are commonly

Developers and businesses are finding that the market for residences near trails is growing. It was estimated that property values along the Cardinal Greenway in Muncie, Indiana, increased 9% shortly after its opening.

Photo Credit: Don Kostelec

Changing demand among visitors has prompted businesses to offer different amenities. This hotel in Ketchum, Idaho is located downtown, across the street from a spur of the region's well-connected multi-use trails system.

Photo Credit: Don Kostelec

recognized in economic impact analyses of cycling on a community. The ones that follow are fairly commonplace in national studies of economic impacts from trail and greenway construction and use and, with the exception of the indirect category, are benefits that few people would dispute, although the magnitude of the effect is much more open to debate and analysis.

It is for this last reason that the acquisition of local data through surveys and field observations are so important in determining the true impact of greenways or a trail system on economic outputs – not to mention benefits to human health through greater exercise.

Tourism and Tourist Expenditures. Western North Carolina is a popular destination for all types of tourists and an increase in people seeking active destinations is already seen in materials requested at bicycle shops, at facilities along the Blue Ridge Parkway and by visitors who patronize businesses located near rivers, streams and existing greenweays. People will orient their vacation selections toward places that offer quality running and cycling environments. Runners clubs like those sponsored by the American Volkssport Association (AVA) conduct 3,000 annual events in 50 states. The AVA has over 300 clubs, including the Asheville Amblers. A study of 6,000 people conducted in Colorado noted that 10% of those surveyed had taken a bicycle-related vacation within the State in the preceding year, spending $360 per person.

The same study indicated that out-of-state bicycle-oriented vacationers spent an average of $950 per trip. A similar study conducted by NCDOT for the northern Outer Banks stated that cycling accounted for 1,400 full-time equivalent (FTE) jobs annually and $60 million in revenues. Forty-three percent (43%) of people surveyed in that study cited cycling as a major factor in their decision to vacation in the Outer Banks.

Specialty Retailers. Serious runners, joggers, and walkers will often spend considerable money updating to the latest clothing and gear that they feel will give them a competitive edge or simply improves the way that they feel when the run or walk. A good pair of running shoes may retail for $120 or higher; specialty socks, shorts, shirts, packs, global positioning system (GPS) technology, and nutrition round out the ensemble.

Cycling enthusiasts are even greater consumers of retail goods. The market for higher-end road and mountain bikes has been growing for nearly a decade. These shops often custom-fit bicycle frames to their clientele, who typically pay in the range of $1,500 to $4,000 per bicycle. In some instances, accessory expenditures made at the time of sale of the bicycle purchase or subsequently often amount to a proportion of sales similar to the original bicycle purchase.

A study in Colorado stated that 755 jobs were based on supplying goods and services to Colorado-based cyclists on bicycle-related vacations in that state, generating/earning $10 million in annual income. In all cases, purchases lead to job creation and tax revenues for the municipality or county, including higher local sales taxes and income tax.

Event Expenditures. Event runners will usually arrive at least a day early for marathon and even half-marathon length runs. Likewise, cyclists from out-of-town usually will want to spend the evening to pre-

pare for a longer ride, and will certainly do so for multiple-day events. They also purchase repair-related equipment at local bike shops and food/entertainment as well as lodging. After the ride or run is complete, they and their friends will want to relax and enjoy the amenities of the host city in restaurants, bars, and shopping attractions. Registration fees for charity events and races are significant revenue sources, and are usually in the range of $25 to $75 per cyclist.

For example, The Ramble Run at Biltmore Park is expected to host over 1,000 runners for 5k (kilometer) and 10k runs, for example. Each participant will pay between $35 and $45, with teams registering for $125.

Construction and Maintenance. The planning, design and construction of trails and greenways requires professional skills, grading, laying of base and asphaltic courses, and initial as well as ongoing clearing of shrubs and trees. Certainly, the type of trail – on-road or off-road, casual or formal – makes a difference to the cost of construction and the duration and extent of related work efforts such as planning, design, construction, and maintenance. As with any other infrastructure investment, workers will need to purchase food and services, and perhaps short- or long-term lodging to complete the project. An unusual but compelling case is found in New York City, which has used a green jobs program to help rescue a number of urban youth as arborists through a seven-month training program that culminates in them becoming fully employed arborists for the City. Two other career tracks – community forestry and ecological restoration – are also available through the MillionTrees Training Program.

Indirect Benefits. This category of impact encompasses health effects of increased trail use/walking, improved mental benefits of exercising, reductions in mobile source emissions for trips that replace an automobile with a non-motorized mode of travel, new or expanded business opportunities that key on trail users and their needs, and the impacts to adjacent property values.

Obesity is also a financial drain on area resources, most notably healthcare and work absenteeism. A healthier lifestyle brought about, in part, by greenways can help reduce these costs in combination with other policies and programs.

While most studies that set out to find beneficial indirect impacts do find them, the areas (e.g., Portland, Oregon) that have embraced bike/pedestrian modes as part of an overall economic - if not cultural - development strategy have realized truly measurable benefits in terms of walking and biking mode share that siphon off automobile trips.

The impacts to property values – and hence public tax revenues assessed on property – through externalities also creates a conversation about economic benefits of greenways. Externality is an economic term meaning any effect that is outside of the direct inputs or outputs of an economic assessment. Considering the impacts of increased exposure, potential or perceived loss of privacy, littering, and trespassing is necessary in any discussion about the economic impacts of greenways and trails.

The debate created by proposals to construct greenways near existing residential communities will continue to draw many differing opinions, but the preponderance of evidence from the more ro-

Trails in Teton County, Wyoming create an annual economic impact of $18,000,000.

- Nadia Kaliszewski (2011) *"Jackson Hole Trails Project Economic Impact Study."*

bust scientific studies continues to support the position that green infrastructure either affects property values insignificantly or positively.

Exhibit 9-1 illustrates some of the relationships, or connectivity, between greenway and trail expenditures and other factors such as job creation and tax revenues. The recent announcement of the locating of the New Belgium Brewing plant in the River Arts District in Asheville, and the existing and planned greenways nearby being a major factor in that decision, is an example of how greenways can attract businesses.

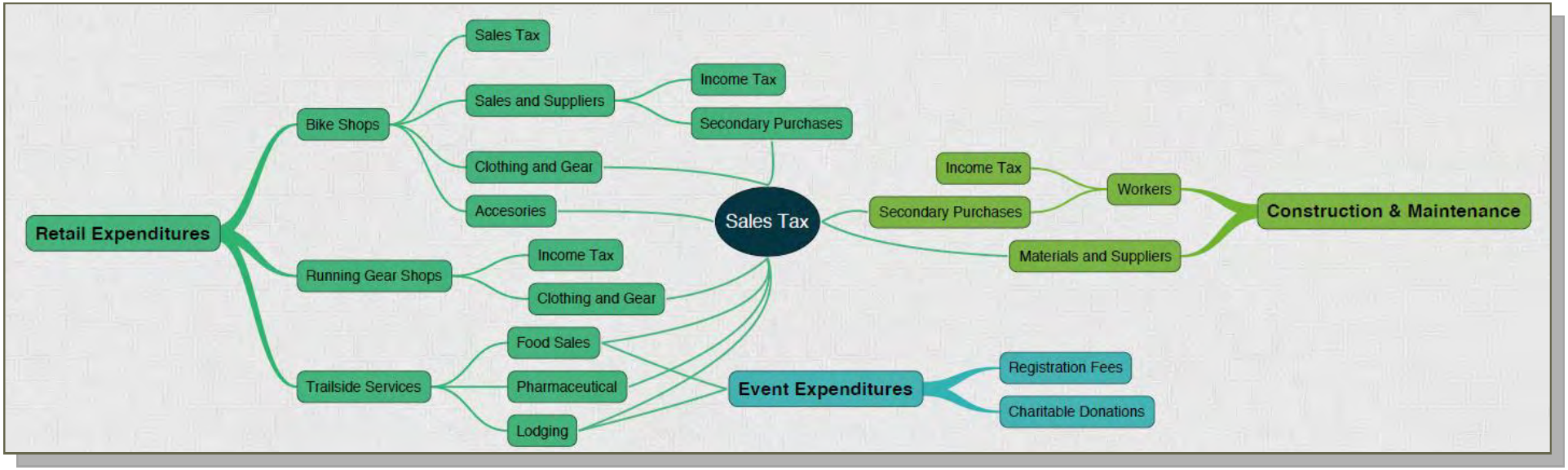
The complexities of the relationships are understated, particularly when long-term, indirect effects are accrued to the total benefit profile of a project. Even relatively small categories of expenditures can add up: the Colorado study mentioned earlier noted that 22,000 bicycle riders contributed to race and registration fees of $1.2 million in 1999.

Exhibit 9-1 also illustrates the main components of economic impact from trail infrastructure investments: retail expenditures, construction and maintenance expenditures, and event-related expenditures. Externalities such as health benefits (e.g., reduced expenditures on health care and prescriptive treatments) and reductions in pollution or traffic congestion are not included in the majority of economic impact studies and are challenging to quantify for proposed trails.

Maximizing the Economic Benefits from Greenway and Trail Construction

A number of recommendations can help to improve the return on investment (ROI) from green infrastructure programs and projects. Supporting facilities with educational and encouragement programs, such as those outlined in other chapters of this Plan, help to

Exhibit 9-1: Relationship Between Greenways & Trails-related Expenditures and Other Factors



ensure that the economic benefits cited previously come to fruition.

1. Ensure that existing marketing materials incorporate bicycling, jogging, and other outdoor amenities that can be accessed or enhanced by trail connections. Many agencies, including the Chamber of Commerce develop marketing brochures, websites, and videos and then distribute them to various markets. Having relevant content included in these brochures is a low-cost way of making sure that the "brand" of the trail system is included in the overall marketing scheme for the region; make sure that the Connect Buncombe website link is shown on websites that list resource information for the area. An example of providing good content from a non-trail site is found at the Asheville Chamber of Commerce website, which devotes a page to bicycling and links to a long list of cue sheet for routes around Asheville.

2. To market the benefits of greenways and trails you have to know what they are. As already explained, the acquisition of data for all kinds of trail use is critical, not only for determining the benefits but also for marketing the activity. The NCDOT "Pathways to Prosperity" document is an excellent example of a study summary that is both beautiful and easy to read while imparting key statistics. Hence, conducting a brief annual survey, or making sure that greenway-related questions are included in the economic surveys conducted by business groups or local governments, is crucial. Over time, charting the increase in greenway usage and expenditures can provide key information to prioritizing new facilities and programs to support trail investment.

3. Focus on connecting to complimentary land uses. Since off-road trails typically connect destinations along a stream bank, residential uses predominate. Using short pathways or trails to reach businesses and commercial centers as well as parks and schools greatly increases the transportation utility of the facility. When siting a new trail, considering how the adjacent land uses could support trail users – or how redeveloped property could support them – is important.

4. Create trail maps. The most useful dedicated resource for trail joggers and cyclists is a map plus cue sheet that explains the route and its hazards, destinations, and scenic resources. Creating these maps that can be easily downloaded and printed from the Internet is an important consideration when considering formatting. Also, make sure that each map includes information about where to go for more information. Maps can also be placed at kiosks, trailheads and in stores near the greenways.

5. The Alleghany Trail Alliance has published a good reference tool for "capturing trail-based tourism." This document lists a number of additional ways that municipalities and counties can work to enhance the popularity, utility, and economic and social benefits of trails:

- **Leadership is important.** Leaders that keep the trail system in front of prospective businesses and developers can carry a pro-greenway and trail message much farther in some circles than can town or county governmental staff. Some of the most important leaders – or catalysts – of successful trails and trail systems came from outside the sponsoring agency.
- **Follow the Plan.** This Plan creates a number of recommendations that should be put into place

The popularity of the greenway system in Boise, Idaho (called the Greenbelt) has generated a magazine based on the famed trail system. The publication has articles on businesses close to the trail system and human interest stories on users and those inspired by the Greenbelt.

Photo Credit: Don Kostelec

as funds allow. Don't be discouraged if every recommendation can't be implemented right away – keep at it consistently and change will happen.

- **Create Private Resources**. Recruit those providers of goods and services necessary to accommodate runners, cyclists, hikers and casual users of the trail system.
- **Work with Law Enforcement**. Work frequently and well with local law enforcement personnel, who can be your biggest ambassadors to potential trail users as well as a source of well-being for existing trail users.
- **Design Matters**. The design of the trail system and nearby businesses, including lighting, building facades/displays, building materials and landscaping create a very clear message about whether it is safe and worthwhile to walk or bike to a place. Gateway treatments and providing supportive designs for connecting links between trails and important destinations within ½-mile (e.g., downtown businesses, schools, and parks) are critical to generating more trail usage.
- **Provide Clear Directions**. Consistent trail signage and directional information to key destinations as well as restrooms, water fountains, assistance, and camping are important to help out-of-town guests get around, as well as to help children and the elderly feel secure on a trail system.
- **Promote Trail-Oriented Events**. Organizing events that make use of the trails are becoming ever more popular. Don't leave out walking associations, "mud run" events, and disc golfing as possibilities, including the more typical marathon, half-marathon, shorter races, and charity rides/races. Running and cycling groups are usually very enthusiastic organizers, but may need just a little direction and coordination at the outset to make an event a reality.

Chapter 8: Maintenance & Operations

Greenways present both opportunities and challenges for upkeep, day-to-day operations and long-term evaluation as it relates to maintaining a system in a state of good repair. Other public infrastructure such as sewer systems, water systems, roads and parks require a higher degree of specialized attention as regular maintenance is pursued. Greenways can be managed through partnerships with non-governmental entities.

As noted previously in this Plan, there is a great spirit of volunteerism and programs throughout Buncombe County that help promote and encourage use of greenways. This same spirit can also help Buncombe County and municipalities conduct some routine and quick response maintenance procedures. The vision of Connect Buncombe is to establish an entity that can tap volunteer resources to manage certain types of maintenance and operation programs. This is particularly important for a larger geographical areas such as a county where mobilization of resources, most notably people and small equipment, can be difficult for small tasks or in remote areas when a minor maintenance issue needs to be addressed.

Of equal importance are the partnerships through mechanisms such a Memorandum of Understanding (MOU), with non-profits, other municipalities, homeowners associations, and private businesses that can help support maintenance and operation activities.

Objectives of Maintenance & Operations

Chapter 4: Design Features focuses on elements of the greenway system that promote safety, ensure access for persons of all abilities and help set design and construction standards for the greenway system. Many of the design strategies were developed with a long-term maintenance perspective that recognizes good design and construction practices, which will defray future maintenance costs.

The primary objectives of maintaining and operating a greenway system should be to:

- **Preserve Existing Investment**: Greenways are one of many visible public investments that should be viewed as an asset to the County and municipalities in the same manner as the County Courthouse, a City Hall, an amphitheater or a school. A well-maintained asset is fundamental to fiscal stewardship and ensuring usability of that asset over a long period of time. The outlay of resources for the initial construction of trails, pathways, amenities, access points, parking lots, signage and lighting also requires consideration of how these investments will be preserved.
- **Protect Habitat & Environment:** Greenways and trails by nature are desired in areas that promote or enhance natural environments, even in their most urban settings. The degradation of a greenway or walking trail can adversely impact the quality of the surrounding habitat and environment that it was meant to protect and negatively impact public opinion of the benefits of that trail.
- **Safeguard Public Safety**: Maintenance involves both the trail infrastructure and the environment around it, both of which can greatly impact the safety and the perception of safety for users. The lush landscape of Western North Carolina leads to fast rates of growth for foli-

Maintenance of greenways is a critical element of any greenway program. Simple features, such as the movable signs shown above, help inform users of potential conflicts on the trail ahead.

Photo Credit: Don Kostelec

The combination of a wet climate, winter freeze/ thaw cycles, and tree roots can create significant damage to greenways, causing potential safety hazards for all users.

Photo Credit: Don Kostelec

age, which can overtake trails, block safety-related signage, and create an "enclosed" feeling where users may not feel safe. The environment also impacts the trail surface as root heaves create tripping hazards for users while encroachment of trailside grasses and shrubs can degrade the edge of pavement or shorten the effective width of the trail and create user conflicts. Stormwater runoff can compromise the integrity of the trail base and natural surface trails can be washed away during major storms, both creating unexpected conditions for users.

Considering Context

Trimming foliage on and around greenways, sweeping sediment from the trail, and fixing cracks before they become safety hazards are the greenway equivalent of applying lube to a bicycle chain, putting air in the tires and adjusting brake cables. Delaying action on any or all of them seriously compromises the integrity of the trail and sets forth a cycle of degradation that can quickly result in the need to completely repave or rebuild a trail.

Making the case to funding sources, elected officials and partners on the importance of preventive maintenance can be difficult. Fixing cracks does not warrant a ribbon cutting. Sweeping a trail once a month won't win any awards. Some volunteers won't always see it as the best way to spend their time.

But it must be made clear to decision makers that maintenance on a new greenway trail begins soon after it is built and is directly tied to operations. Grass needs to be mowed, the first rainstorm can wash newly settled dirt or gravel over the trail, or a tree may fall and block the trail. Some of these maintenance needs can be planned for while others require methods of reporting maintenance needs, response policies and clearly defined roles for maintenance participants.

Importance of Design. Even when the economy was in better shape the financial needs of public agencies were not being met with existing resources. This inevitably led to investment decisions on greenways in many communities that looked at the cost of the project while making tradeoffs in design to reflect revenues. This is a part of doing business and building a greenway system; however, the design and construction of greenways is a critical facet of protecting the asset well into the future.

The many trails that have been converted from former railroad beds typically fare better in terms of life cycle maintenance costs because the original railroad bed was built with a deep base of aggregate materials below the tracks to promote efficient drainage and limit encroachment from roots and foliage. Rails-to-trails also have some type of gravel shoulder extruding beyond the width of the pavement that protects the integrity of the trail surface.

As addressed in Chapter 4: Design Features, the base of the trail is fundamental to maintaining its long-term viability, as it was with railroads and as it is with other road building techniques. Asphalt is a material that performs best when its pliability is maximized. Asphalt can withstand freeze and thaw cycles better than concrete. It is also cheaper to build than concrete and easier to replace or repair. The pliability of asphalt is best preserved through weight transfer, which roadways gets from heavy traffic volumes and large vehicles—neither of which are functions that greenways serve or promote.

The design features related to base and materials, as

well as some type of shoulder treatment are intended to bolster the strength of the asphalt and offset the negative effects that come with a lack of weight loads on the pavement. Over the life of the greenway this reduces maintenance costs and lessens the need to completely repave or overlay the trail as frequently.

Different Settings. There was strong support among Buncombe County citizens for greenways and trails in natural settings to be built with natural surfaces, such as crushed gravel (gravel fines), mulch, or dirt. There are several maintenance advantages that come with natural surface trails, most notably replacement costs and less influence of tree roots on the trail surface. Runners prefer them to paved trails. There are also several challenges, such as erosion, encroachment of trailside vegetation, muddy or poorly-draining sites and concerns over user conflicts and accessibility in high use areas.

Communities that want to protect or enhance a rural feel, promote equestrian use or simply prefer a more natural feeling with their trails should be made aware of the potential challenges that come with being able to maintain those trails, particularly in remote settings. This does not and should not mean that a default position should be to pave the trail. Rather, a different set of expectations should be established for how the County, municipalities and other partners can address maintenance needs.

In some settings, stream and river buffer requirements may require a natural surface trail. More reliance may need to be placed on volunteers to inspect the trails, report major problems and conduct maintenance activities than with trails in more urban or transitional settings.

Access & Detours. It can be frustrating for greenway users to come upon trail maintenance that restricts their use of the trail or does not have a suitable alternative route. Identifying and assigning detour routes are difficult with greenway trails, particularly in rural areas where on-street bike routes or sidewalk alternatives do not exist.

Luckily, most pedestrians can walk around a maintenance impediment and bicyclists may be able to walk their bike around a temporary obstacle. Individuals with mobility impairments are not as fortunate and attempts should be made to erect advance warnings for all users so they can choose whether or not to use that trail during the time of maintenance activities. Users can also be alerted via text messages, social media and web site announcements.

Materials, Supplies & Equipment. Relying upon a diverse set of partners and agencies to properly maintain greenways requires consideration of access to materials and supplies needed for maintenance, as well as reliability of equipment. Labor may be easy to come by but continued support from volunteers and partners is best sustained by consistent access to the supplies needed to perform various maintenance duties. A County staff person or a contracted service is also needed to coordinate and manage volunteer efforts.

For many regular maintenance activities, Buncombe County may be able to keep enough inventory on-hand to address most needs. However, equipment such as small earthmovers, mowers and large trimming equipment may be used sporadically and may already be owned by cities or other departments within the County. Finding a way to achieve economies of scale in the purchase and maintenance of such equipment will help maximize efficiency and

Where possible, detour routes should be designated and signed during construction or maintenance activities.

Photo Credit: Don Kostelec

allow resources to be focused on greenway system expansion, encouragement programs or other maintenance activities.

Planning for Maintenance. Maintenance must be standard practice. As the greenway system grows it will become increasingly important to define maintenance roles for the many entities involved. This means setting aside specific funding amounts in the County's annual budget, examining maintenance and life-cycle costs in the specific design of trail segments, understanding maintenance expectations when new developments construct a public use trail, and incorporating a maintenance element into future corridor planning.

Using Technology. Communication between greenway users and those in charge of maintenance is greatly enhanced by the use of established and emerging technologies. Social media outlets will allow the County and its partners to report maintenance activities that can disrupt travel or recreational plans for greenway users. Interpretive GIS software can also be used. Cities and counties are developing mobile phone applications that allow citizens to report maintenance problems such as potholes, street light outages, and clogged storm drains. A similar effort could be conceived for reporting on greenway maintenance issues.

Maintenance & Operations Participants

The maintenance efforts of the Buncombe County greenway system will have many partners playing a role including the County's Parks, Greenways & Recreation Services Department, the Greenway Commission, Connect Buncombe, other County departments, municipal public works and transportation departments, North Carolina DOT, and community service organizations.

Exhibit 8-1 characterizes various maintenance activities by typology and the most likely responsible party for conducting the activity. The typologies identified are:

- **Spot or Incident Maintenance** activities are unplanned and occur in response to a particular reported problem, event or incident. In most greenway settings these will be the resulting impacts or damage from storms, floods or snowstorms.
- **Regular Maintenance** consists of programmed or continuous activities that occur at logical intervals based on the characteristics of the greenway. Trail inspection, trimming, sweeping, and clean-up activities are examples of regular maintenance activities.
- **Long-Term Maintenance** requires major planning and budgeting for what are oftentimes very specific projects such as major pavement repair, re-building, erecting new signage or replacing major structures such as bridges or culverts.

Exhibit 8-2 illustrates a sample maintenance schedule that considers these typologies and the type of maintenance activities.

Exhibit 8-1: Partners & Potential Responsibilities in Maintenance Activities

Types of Maintenance & Operations Activities	Parks, Greenway & Recreation Services, Municipal Parks Depart-ments, Contractors	Connect Buncombe Volunteers, Other Contract Organizations	Facilities Maintenance, Municipal Public Works, Transportation Departments, Contractors
Spot / Incident: Occurs as necessary or warranted.	• Citizen Response • Low Water Crossing / Warning Signs • Major Debris Removal • Securing Temporary Signage • Identify Detours • Information Dissemination • Special Events Policies & Permitting • Lighting Replacement	• Citizen Response • Spot Improvement & Incident Reporting • Water New Vegetation • Minor Debris Removal • Placing Temporary Signage • Information Dissemination • Special Event Monitoring / Support	• Asphalt Spot Patches • Major Debris Removal • Graffiti Control • Parking Lot Repair • Major Debris Removal
Regular: Programmed or continuous at logical intervals based on features and their needs.	• Scheduling Major Maintenance Tasks • Trail Edge / Path Weed Treatment • Major Mowing & Trimming • Trash Disposal • Plant & Trim Trees • Stock, Clean Amenities • Rotary/Machine Sweeping • Bollards / Bollard Locks • Sign Replacement • Mapping • Volunteer Training • Accident & Incident Tracking • Pest Management	• Trail Inspection & Condition Surveys • Scheduling Minor Maintenance Tasks • Minor Mowing & Trimming • Removing noxious weeds • Trail Shoulder / Borrow Ditch Clean-up • Trash Collection • Planting Shrubs, Grasses & Flowers; Mulch Planting Beds • Locking / Securing Trailheads & Access Points • Hand Tool Sweeping • Volunteer Training Support • Accident & Incident Monitoring	• Asphalt Crack Sealing / Seal & Cover • Shoulder Protection & Maintenance • Large Scale Vegetation Removal • Dust Management • On-Street Sidewalk & Connecting Route Maintenance
Long-Term: Requires major planning, budgeting and coordination for anticipated investments or major initiatives.	• Fence & Structure Paint / Maintenance • Trail Location Signage / Wayfinding • Major Amenities Procurement & Replacement • Habitat / Environmental Maintenance & Control • Secure Funding	• Benches & Table Paint / Maintenance • Support / Pursue Funding	• Asphalt Seal & Cover / Overlay • Centerline Striping / Crosswalk Markings • Street Location Signage & Lighting • Bridge inspections & Maintenance • Fencing & Railing • Drainage / Borrow Ditches, Culverts

Exhibit 8-2: Sample Maintenance Schedule

Tasks	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Basic Maintenance												
Inspection & conditions survey				✓						✓		
Graffiti removal	As needed throughout the year											
Hand tool sweeping		✓		✓	✓	✓	✓	✓	✓	✓		✓
Major mowing & trimming					✓	✓	✓	✓	✓			
Machine Sweeping	✓			✓			✓			✓		
Planting shrubs, grasses & flowers				✓	✓					✓		
Plant, trim trees				✓	✓					✓		
Shoulder / borrow ditch clean-up	As needed or annually											
Trail edge, shoulder, gravel path weed control			✓			✓			✓			
Trash collection & disposal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water new vegetation				✓	✓	✓				✓		
Weed control & pest management				✓		✓		✓		✓		
Substantial Maintenance												
Asphalt patching	As needed, fall and spring											
Asphalt crack sealing				✓								
Painting	As needed year around; Every 10 years for major structures & amenities											
Overlay	Once every 20 years											
Shoulder / borrow ditch protection & maintenance					✓							

Facility Inventory

A critical component of any maintenance plan is to know the condition and location of various items such as signs, benches, and markers. The trail condition record of activity is also helpful in planning future maintenance and monitoring schedule requirements.

Buncombe County has been working to develop a set of master GIS files showing the location of various amenities, which creates an ideal depository for the inventory of various elements of the greenway and trails system. Before greenway system development begins in earnest, Buncombe County should organize a database for signs, amenities, bridges, culverts, and pavement condition to assist in the annual maintenance review.

The database can be updated as maintenance tasks are complete, used to project budgetary needs, and inform volunteers of what types of activities are short-term needs. The database can also be used to assess performance of the greenway system and provide feedback for planning, design and construction of new trails. Emerging smartphone, GPS and GIS technologies offer an efficient means toward developing such an inventory and volunteers can be used to conduct certain functions of the inventory.

This facilities inventory should include:

- **Design characteristics**, such as length, width, pavement type, and year constructed;
- **Surface condition**, including pavement condition, date of last inspection and photo at last inspection;
- **Usage by mode and characteristics**, such as pedestrians, bicyclists, equestrians, etc.;
- **Sign inventory**, including type of sign, location, trail location, and date installed;
- **Amenities and their location**, such as benches, bicycle racks, trail markers and piers; and
- **Bridge and culvert database**, including location, date of last inspection and condition.

Volunteer patrols can also take note of conditions and users on greenways and trails to be used in a facilities inventory.

Photo Credit: Don Kostelec

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Chapter 10: Action Steps for Implementation

The Buncombe County Greenways and Trails Master Plan included a comprehensive evaluation and identification of needs for projects, programs and policies. Collectively, when implemented, these initiatives are intended to realize a regional, connected greenways and trail system.

Adoption of the Plan signifies an interest among Buncombe County's leaders to take the input generated by citizens, communities and organizations within the region and transfer it into meaningful action.

Plans are by nature long-range and leave County leaders, staff and partners with a lot of discretion to define how they implement the Plan. This plan is not prescriptive and its recommendations are advisory, not sacrosanct. It should be allowed to evolve over time. Things change and the findings of the Greenways and Trails Plan in 2012 could require reconsideration as influences evolve, the County grows, new opportunities emerge, constraints arise and policies change.

Action Steps

With Buncombe County's greenway system in its naissance there are several actions to be undertaken over the next one to five years, five to 10 years, and 10 to 20 years. The amount of resources allocated to implement the recommendations of this Plan will determine when certain projects, programs or policies are realized.

This chapter contains 10 major action steps that emerged from the major themes of the Plan. They are intended to help guide development of the proposed greenways network and create a supportive program and policy environment for greenways and trails throughout Buncombe County.

These action steps are not in priority order. Rather, the Action Steps for Implementation should be reviewed and prioritized on an annual basis with the Greenways & Trails Commission, the Land Conservation Advisory Board, representatives of cities and towns in Buncombe County, County management and the County Commissioners.

The purpose of this review is to set forth a 12-month or two-year strategy for Parks, Greenways & Recreation Services to help guide how they pursue grants, what they request for annual budget allocation, how they interact with neighborhoods and organizations, and how they engage non-profits, land conservancies, schools and other partners.

Some of the Action Steps are ambitious and will require significant efforts beyond designing and constructing greenways. If it determined, for example, that a three-year or five-year period should be devoted almost exclusively to construction, then the tradeoffs among other Action Steps should be evaluated to determine the impacts of such a focus and which partners might be willing to help carry out other Action Steps.

Beyond Implementation

At some point in the future this Plan will be outdated. Most long-range plans require some type of revision approximately 10 years after adoption unless major actions or requirements change these assumptions. The Plan can evolve by incorporating its findings into other planning efforts undertaken by the County, cities and towns, and partners. Land use plans, small area plans, transportation plans, infrastructure/utility plans and strategic plans should consider how they influence greenways and trails and the findings of this plan.

Asheville's Glenn's Creek Greenway is an example of a matured greenway that represents several facets of sound implementation strategies. Destinations along the route are easily accessible, multi-modal transportation connections are prevalent, and a key regional stakeholder, UNC Asheville, conducts day-to-day maintenance and trail patrol.

Cultivate Existing Partnerships & Identify New Partners

Build upon the momentum created by Connect Buncombe and the Greenways Please campaign to formalize existing partnerships and pursue new partners with public and private sector interests.

Engaging different organizations in fundraising efforts can be challenging, as some will desire short-term marketing-based partnerships while others may become long-term contributors to volunteer, land acquisition, or construction efforts. It's important to cultivate these relationships among a diverse set of partners to maintain and create momentum for greenways and trails.

There already exists tremendous energy among the public, private and non-profit sectors in Buncombe County to pursue greenways. This was evident through the Connect Buncombe / Greenways Please campaign that ran concurrently with the Greenways and Trails Master Plan. This built upon efforts by cities and towns, organizations such as RiverLink and the YMCA, and businesses along the rivers and existing greenways, who have been promoting programs and investments in greenways.

Other communities across the United States have built partnerships that diversify the foundation of support for greenways and trails. Places such as Greenville, SC, have found willing partners in the health sector. Chattanooga, TN, and the Trust for Public Land partnered to preserve properties as places to construct greenways or connect via greenways. Pittsburgh, PA, engaged a multi-faceted team of partners and landowners to fund long-distance trail construction and rails-to-trails conversions. During the Greenways Please campaign Buncombe County found willing partners in a local ice cream shop and local coffee roaster, showing that partners can come from many different business sectors.

The Connect Buncombe effort is poised to create a network of volunteers and organizations who can pursue funding and provide some level of maintenance and management of the greenways system. Other partners such as non-profits, niche markets, and major employers also have a role to play.

Identify Strategic Grant Opportunities

Work with County leaders, non-profits, local and regional governments, and major employers to methodically identify the most appropriate funding sources for new projects and programs.

Since greenways serve both a recreational and transportation function, as well as provide access to rural areas, natural areas, schools, parks and neighborhoods, this diversity makes greenways and programs that support them an eligible expenditure through a variety of sources. Non-profit organizations, foundations, state grants and federal funding are available for a variety of program and project investments. Many require some level of local contribution, or match, to leverage the grant.

While greenways present many opportunities, it is important to be strategic in how funding is pursued. Some sources of funding have application and reporting requirements that necessitate many hours of staff time to organize an application. This can equate to thousands of dollar of personnel resources just to pursue the grant. Projects funded through federal sources have less dollar-for-dollar buying power due to more stringent design requirements, reporting standards, environmental analysis and administrative fees applied to the grant from state agencies responsible for overseeing the grant program. To strategically identify and pursue the best grants for the best projects and programs, Buncombe County should:

- Seek input from non-profits, cities and towns, state agencies, and other partners on which funding sources best fit the project or program being pursued.
- Organize annual funding meetings with cities, towns and non-profits to avoid having several communities or agencies compete for the same funding source.
- Identify organizations, individuals or companies that can provide “soft match”—typically through human resources or land dedication—where allowable through funding sources.
- Recognize that partnerships and volunteers are not free and not always easy to manage.
- Take advantage of funding sources for programs and marketing.

Secure Local Funding Commitments

Identify available funding through Buncombe County's annual budget for implementation of the Greenways & Trails Master Plan. Coordinate programs and projects investment with cities and towns.

The efforts to develop a countywide greenway system begins with a commitment of funding via the County's annual budget to conduct a variety of tasks related to building the greenway system, ensuring its usage and promotion, coordinating volunteer efforts, and maintaining the system. Greenways, and the many efforts that support them, are an emerging role for Buncombe County. The County is urbanizing with notable growth around existing communities. This urbanization leads to an expectation among residents and businesses for certain type of services, including greenways.

Adoption of this plan does not require any specific level of funding allocation for greenways. That is for County leaders and Commissioners to determine in consideration of other funding needs. The level of effort County staff provides for greenways is dependent upon this funding and the degree to which partnerships (addressed in Action Step #3) are utilize to maximize and build upon the County's commitment.

Short-term strategies for securing local funding commitments can include:

- Annual allocation of funding for staff, programs, projects & maintenance.
- Strategies for use of General Obligation Bonds for major greenway investments.
- Develop a Memorandum of Understanding of funding expectations with local governments and partners.
- Identify where shared use of facilities for greenways and trails management and maintenance can be located in coordination with cities and towns.

Long-term funding strategies could include:

- Dedicated funding source, via specialized revenue sources as allowed by law.
- Pursue partnerships for maintenance and land acquisition with state agencies such as State Parks, utilities and the Department of Transportation.

Create a Landowner Outreach Program

Develop strategies along with a robust program to maintain consistent contact with landowners adjacent to planned greenways as the County and its partners work toward acquiring property for greenways.

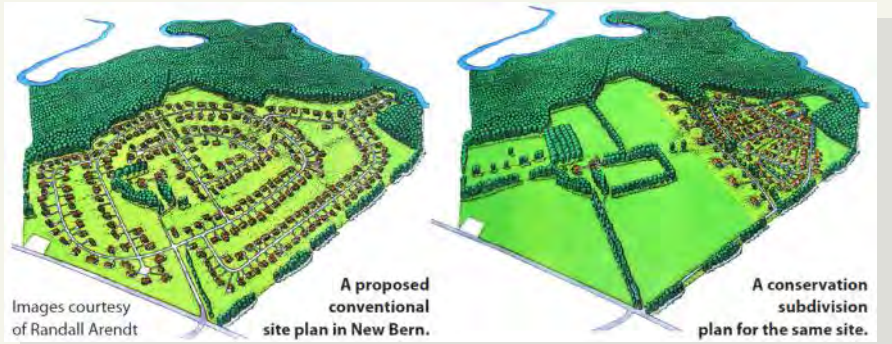
The number of landowners that are likely to be engaged as the County plans for and implements the Priority Corridor identified in this plan will require, as detailed in Chapter 5, a focused, well-orchestrated and well-managed landowner outreach effort. This effort will require a long-term commitment and potentially a partnership with the real estate community. Six elements were identified to create a comprehensive landowner outreach program.

1. **Research & Education.** This element addresses the need to demonstrate to landowners that a cohesive vision is in place, is supported by a wide constituency, and how the project can benefit the landowner.
2. **Ownership.** A listing of landowner contacts along the greenway corridors will be necessary for communication and outreach work. It is also valuable to identify properties along Priority Corridors when they go on the market for sale and create a right-of-way account to acquire properties as they come up for sale.
3. **Prioritization.** Acquisition ranking criteria can be applied to identify the highest priority properties within the focus corridor areas.
4. **Coordination with County Leaders.** This element addresses the need to make sure that feasible alternatives with land/easement acquisition issues and project design have been identified and analyzed for their ability to benefit the most citizens at acceptable costs.
5. **Conduct Outreach and Education.** The information gained from previous tasks can be presented to landowners within the greenway corridor. During outreach efforts it will be important to enhance dialogue with landowners.
6. **Encouraging Participation.** Engaging landowners early and offering regular dialogue with them can help when the acquisition process begins and allay fears about how greenways are designed and constructed.

Pursue Conservation via Ordinances & Alliances

Update conservation subdivision ordinance & Develop Memoranda of Understanding (MOU) with area land conservancies to define potential roles in pursuing land acquisition that promote connectivity.

The County's land conservation program is a highly successful program that has resulted in the preservation of thousands of acres of open space throughout Buncombe County. Currently, the program is designed to protect large tracts of land meeting specified criteria. Connections among these large tracts currently are not assigned high priority. However, there is a need to connect the open spaces with natural corridors that provide a link for both human and wildlife movement. This need will grow as the County continues to urbanize. An expansion of the land conservation program's mission, to include preserving connections among the open spaces in the County, would benefit all users of the open spaces.



Another recommended change would revise the administration of the option for conservation subdivisions permitted in steep slope areas. Currently, the focus is on the conservation of large tracts of open space within subdivisions. Pathways for walking and running, such as would be provided by greenways, are identified as passive recreation areas and are limited to no more than 5% of the conserved area. The revision of this policy to identify greenways as a permitted use within conserved areas and permitting greenways to be dedicated to the County for maintenance and operation would promote development of greenways in new subdivisions.

Land conservancies can help play a role via a formal alliance with the County that:

- Identifies appropriate roles for the County and conservancies.
- Is tailored to the context of each conservancy.
- Delineates types of land that are for protection vs. lands for public use.
- Creates opportunities for agricultural preservation & agritourism.
- Outlines a strategy for land banking for future greenway corridors.

THE TRUST for PUBLIC LAND

RIVER LINK

Protecting the World's Oldest Mountains
SOUTHERN APPALACHIAN HIGHLANDS CONSERVANCY

Amend Ordinances to Support Greenways

Adopt new and revised ordinances related to requirements for dedication of land along planned greenways through new development, floodway protection, and conservation subdivisions.

Adoption of new and revised ordinances will be necessary to implement the policy changes recommended throughout the Plan.

Development Requirements. One of the strategies was the requirement that land be set aside for, and, in some cases, greenways constructed as part of land development by private developers. The revision of ordinances establishing the standards for land development should be pursued to address the dedication of land for greenways and, where appropriate, the construction of greenways. Buncombe County's subdivision ordinance currently sets standards for the provision of open space in subdivisions located on steep slopes, but it neither establishes general standards for open space nor does it identify greenways as meeting open space standards.

Fee in Lieu. Buncombe County should establish a fee in lieu option to the provision of open space and construction of greenways. Such an option allows developers to pay a fee in lieu of providing open space or other identified required amenities within a development. The fees can be used for land acquisition for, construction of, and/or maintenance of greenways, as well as other activities related to the identified purpose of the open space.

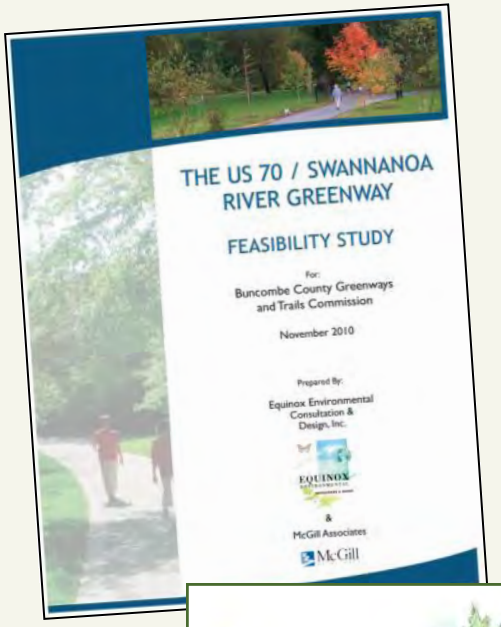
Floodwater Protection. Amendment of the County's flood protection ordinance is recommended to encourage greenways within floodways. Incentives can be provided to property owners who allow the location of greenways within floodways. Ordinances prohibiting paved greenways within required stream buffers should be revised to permit hard surfaced greenways if best management practices and low impact development techniques are used to reduce the impact of stormwater runoff.

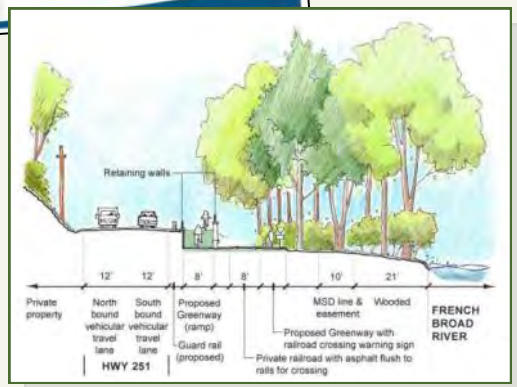
Complete Streets. In devising a Complete Streets policy, the County's ordinances should be revised to require construction of pedestrian facilities as part of new development in areas with urban density. Greenways should be identified as an option for providing pedestrian facilities. Ordinance changes can assist in addressing the challenge of funding greenway development.

Conduct Detailed Plans for Priority Corridors

Develop corridor-specific plans similar to the US 70/Swannanoa River Greenway and French Broad River/NC 251 Feasibility Studies along the five new Priority Corridors identified in the Plan.

Prior to the Greenways & Trails Master Plan, Buncombe County conducted detailed feasibility studies for the US 70 / Swannanoa River Greenway and the French Broad River / NC 251 Greenway. Each of these corridors connect to the planned Wilma Dykeman RiverWay, which underwent a detailed corridor study adopted in 2004. These studies provide the foundation for detailed design efforts by analyzing the placement of the planned greenway by conducting field work, evaluating terrain and constraints, identifying the types of landowners present in the corridor, and defining preliminary cost estimates of construction.





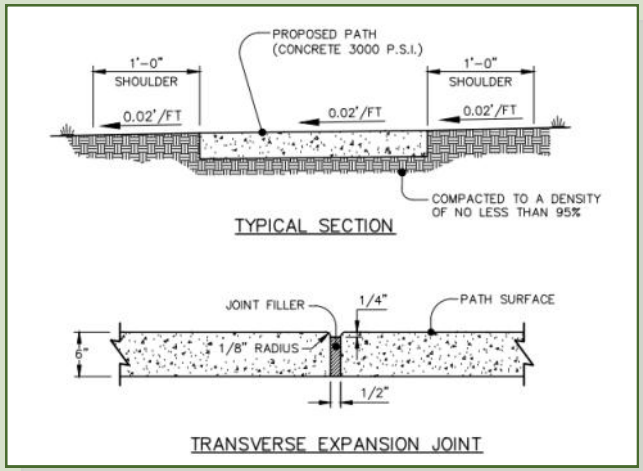
The Greenways & Trails Master Plan identifies five new Priority Corridors that should undergo a similar study. These studies typically require some level of preliminary design and identification of features such as bridge, access points, trailheads, parking areas, types of amenities specific to the corridor, and other structures. If for purposes of making strategic land purchases, pursuing grant funding for design, or placing requirements upon a developer for constructing a greenway, then a planning-based feasibility study should be conducted. These types of studies typically range from $40,000 to $70,000 per corridor. If implementation is more imminent or a funding source is identified for construction, this may necessitate a full design effort, which can cost up to $200,000, depending on the length of the corridor.

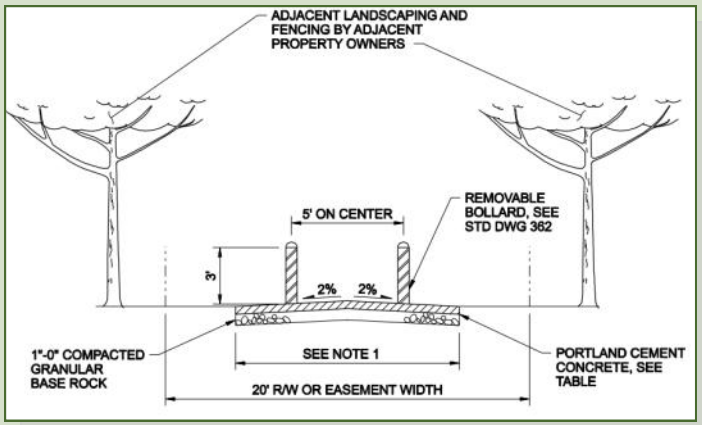
Buncombe County should be partnering with cities and towns for funding and outreach when these corridors cross municipal boundaries. In developing these studies, the County should:

- Prioritize the five priority corridors for study once funding is available;
- Be proactive in meeting with funding partners, MSD, NCDOT, French Broad River MPO, the Blue Ridge Parkway, utilities, and others; and
- Integrate these studies with the Landowner Outreach Program.

Develop Standards & Specifications for Greenways

Work with cities and towns to develop a common set of design standards and specifications to be applied to new greenway construction to ensure consistent construction standards and maintainability.





Greenways are safer and require less maintenance when they are designed, not just built. The complexities in building greenways along rivers and streams, in areas with steep terrain, or through areas constrained by the built environment, necessitate the establishment of a set of design standards. Greenways and trails in different settings require very different design considerations to account for the environment in which they are built and differing requirement for universal accessibility. Municipalities have standards and specifications that establish how streets, stormwater systems, water lines, sewer lines, culverts, bridges and other infrastructure is constructed. A similar set of standards and specification for greenways will help promote consistent design that is compliant with prevailing design standards and across jurisdictional boundaries.

It is recommended that Buncombe County along with the cities and towns partner to develop a set of greenway– and trail-specific design standards. These standards would be adopted by each government agency to help guide how greenways and trails are constructed and ensure consistency in basic design parameters across jurisdictions. This should include:

- Design specification for typologies, bridges, tunnels, railings, materials, amenities, parking areas, bicycle parking and signage;
- Accessibility standards to comply with the Americans with Disabilities Act (ADA) and associated Accessibility Guidelines;
- Common street interface / intersection designs;
- Crime Prevention Through Environmental Design (CPTED) principles; and
- Methods for documenting design exceptions when these design standards cannot be met due to constrains in the natural or built environment.

Organize a Greenways Training Program

Develop a training program for new volunteers and partners who wish to work on maintaining trails, conducting programs along the greenways and constructing some facilities.

Working with partners and the National Trails Training Program (NTTP) to develop a greenway-specific curriculum will help volunteers, design and planning professionals, contractors , and other partners who wish to design and construct trail facilities, work on maintaining trails, and conduct programs along the greenways. The training program would provide educational opportunities and resources to educate people about greenways and make sure trails are constructed and maintained to a high standard of safety and accessibility. Since there is an increased reliance on volunteers, such a training program will help keep volunteers safe as well as improve safety for trail users.

The Georgia Trails and Greenways Program office coordinates trainings on trail construction, trail maintenance and trail education. They offer Trail School with courses on Design and Layout; Construction and Maintenance, and Crew Leader training programs. The Program has also funded trail signs, maps and other efforts.

Items to include in a training program include:

- Assessment checklist
- Procedures to ensure consistent application
- Skills for:
  - Maintenance
  - Accessible greenways and trails maintenance
  - Bicycle & pedestrian facility maintenance
  - Trailhead / parking area facility maintenance
- Training support for developers, design professionals, surveyors and contractors.

Photo: Asheville Greenworks

Evaluate Performance

Understand the degree to which greenways and trails are playing a role in the region by regularly collecting data on usage, economic impact, environmental impacts and program implementation.

A greater degree of emphasis is being placed on evaluating and documenting how well projects, programs and policies related to greenways are performing. In some cases, requirements for measuring performance of an investment come from funding sources or policy makers who oversee funding programs. Below are several categories of methods to evaluate greenways and trails investment. Whether or not they are required by a funding source or by law, it is good practice to be tracking measure such as these to help provide documentation for grant pursuits, confidently showcase the benefits of the system to the public, and help evaluate how and where future investments are made. Partners, volunteers and the Greenways Commission can assist in collecting some of this information and the ability to collect some measures may not be possible in the short-term.

Greenways & Trails Performance Measures

Facilities

- Miles of greenways & trails
- New miles of greenways & trails
- Residents within 1-mile of access points
- Corridor Plans completed
- Connectivity of other bike/ped facilities, river access, recreational opportunities, closing gaps
- Change in costs over time

Funding / Resources

- Annual allocation / contributions
- Staff time
- Number of funding partners
- Grants pursued / awarded
- Number of volunteer hours

Usage / Participation

- User counts, by mode, user type
- Program participants
- Members of Connect Buncombe
- People engaged through public outreach
- Economic impacts
- Presentations to neighborhood groups, businesses, schools, etc.
- Participants in education, encouragement & training activities
- Adopt-a-Greenway partners
- Safe Routes to Schools

Others

- Acreage preserved for future use, environmental & agricultural conservation
- New jobs located near greenways
- Change in health factors (long-term)

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Appendix I: Greenway Cost Estimating & Funding

Estimating the costs of greenway in a planning context is an inexact science as construction timelines are undefined and materials costs can fluctuate month-to-month. Further, the details of design and property acquisition for greenways can vary greatly once analysis is conducted to determine an exact alignment and identify appropriate amenities, gateway treatments, inclusion of parking areas, and the like. Cost estimating in a planning context is akin to the accuracy of the 10th day of a 10-day weather forecast—determining how much materials will costs in 10 or 20 years is inherently inaccurate, even with the most precise estimating tools.

Therefore, the unit costs outlined in this Appendix are intended to provide a snapshot of costs to identify an order of magnitude for planned greenways.

Greenway Features that Impact Cost

A greenway is typically located within the floodplain of a river or stream, taking advantage of land that is usually relatively flat and undeveloped. In this setting, several variables that can impact the ultimate cost and may not be identifiable at a planning level:

- A greenway can be designed and constructed "at grade" so that runoff sheet flows across it. It is not always possible, however, and a drainage system may be required.
- Addressing handicap accessibility, terrain and adjacent land use can change dramatically along a single trail.
- A typical paved cross section includes a two-inch thick surface layer of hot mix asphalt above a six-inch thick layer of aggregate base course. As an alternative, a four-inch thick layer of concrete may be used. Concrete is generally more expensive, however it can be constructed in colder temperatures than asphalt and is more durable. Other surface types can also be used.
- Steep banks of some locations may mandate the use of retaining walls. Typical areas where this may be common are: areas where a roadway is close to a stream or river; narrow shelves built for existing utility easements; and areas close to existing structures.
- Amenities may be desirable along a greenway. Fishing piers and observation platforms generally consist of wooden structures with an appearance similar to a residential deck and built adjacent to a water body. Other features may include benches, garbage cans, playgrounds and fitness stations.

Cost Impacts of Stormwater Management & Wetlands Impacts

Stormwater treatment will be required in accordance with the County's Stormwater Ordinance and contribute greatly to the overall cost of a project. Notably, a low density project is defined as a project that has no more than 24 percent built upon area. Current standards require treatment consistent with a low impact development approach and require features such as vegetated swales, pervious pavements, bioretention or rain gardens, as well as others. A high density project is defined as a project that has more than 24 percent built upon area. Current standards require that runoff rates be controlled and drawn down over 48-120 hours as well as be treated to remove 85% of total suspended solids (a water quality measure).

High density project features can include constructed wetlands, wet and dry detention basins, underground storage, infiltration devices and proprietary treatment methods. The project definition will depend on the size of the property being developed as well as current and future uses. Stormwater treatment for a high density project will be significantly more expensive than for a low density project.

As greenways are typically built within floodplains it should be anticipated that permitting will be required for various environmental reasons. These may include wetlands and streams impacts, flood studies and no-rise certifications. Wooden boardwalks or pre-manufactured bridges can be used to minimize disturbances to environmentally sensitive areas without significantly affecting an alignment.

Estimating Costs

When evaluating costs it is important to note that the cost of asphalt typically increases at a much faster rate than inflation. As such, the North Carolina Department of Transportation's Asphalt Price Index is the best reference to track costs. If wetlands and streams are impacted, a major cost will be mitigation. These costs are set by the NC Ecosystem Enhancement Program and are adjusted annually. Exhibit A-1 summarizes baseline costs for various features of greenway construction. These are generated for the first Working Paper as informational and will be refined as the Plan progresses to include other surface materials and other desired amenities.

Funding Strategies

Funding can be divided into four categories: local, state, federal, and private funding. Buncombe County should explored a variety of sources in order to take maximum advantage of the funds that are available.

Local Funding. Buncombe County does not have a dedicated budget line item for greenway and trail construction that is available each and every year to a known (minimum) amount. Programming projects in

Exhibit A-1: Greenway Estimated Expenses
(includes Grading, 6" thick Aggregate Base Course and Surface Course)

Construction Elements	Unit	Unit Price	Unit	Unit Price
10' wide Greenway Trail (2" thick asphalt surface course)	LF	$30	mile	$160,000
10' wide Greenway Trail (4" thick concrete surface course)	LF	$62	mile	$330,000
The following items will vary depending on each specific location.				
Site Specific Construction Items				
Drainage (cross culverts at 300' intervals)			mile	$16,000
Retaining Wall	SF	$25		
Fence (split rail)	LF	$12		
Stormwater Treatment			mile	$48,450
Amenities				
Fishing Pier	Each	$14,000		
Observation Platform	Each	$11,000		
Boardwalk	LF	$300		
Site Preparation (including permits and design above typical expenses)				
NC EEP - Stream mitigation	LF	$350		
NC EEP - Non Riparian Wetland mitigation	Acre	$46,000		
NC EEP - Riparian Wetland mitigation	Acre	$64,000		
Environmental Permitting	Each	$15,000		
Utility Pole Relocation	each	$10,000		

SF = Per Square Foot
LF = Per Linear Foot

Factors that will affect future costs:

- Asphalt prices ($588 per ton as of December 2011)
- Inflation, Labor and Land Costs

an uncertain financial environment makes prioritization of projects more challenging. More importantly, the budget item should be available to quickly match grant or other sources of funds that require a cash match. Other locally-driven sources include benefit assessment districts, various bonding instruments, or work with private developers to either require or cost-share in various improvements including right-of-way dedication and construction costs.

State and Federal Funding Options. The amount of state and federal funds available to local governments for all kinds of improvements has generally shrunk in real dollar terms, as fuel taxes that are normally indexed have been frozen at the state level in recent years.

Grants and Non-Profit Sources. While grants have certainly taken similar hits generally as other revenue sources, most of the ones that were important five or ten years ago are still around. Many of these are used to protect property or stream buffers for environmental preservation purposes, but greenway and trail facilities are often still viable components of grant-related projects. Coordinating volunteer and non-profit groups, perhaps to help maintain and even construct “soft” trails, should not be overlooked as an increasingly important role for organizations.

The following tables describe in more detail the specific financing sources that are the most likely to yield positive results for the County, although it is not all-inclusive and the availability or rules of some sources are changing on a near-constant basis. A volunteer coordinator position working in Buncombe County would not only coordinate volunteer and non-profit agencies to work together to optimize their functionality, but also take a lead role in pursuing grant funding in a coordinated fashion.

Estimates for Greenway Priority Corridors

Estimating costs for greenways that are not likely to be built until many years in the future is an inexact science. The best methods for estimating costs these costs is to use present-year unit costs (as of December 2011 published data) and assigning basic costs for paving and preparation/grading of the land for greenways. The estimates below are for the five new Priority Corridors identified in the Plan.

THESE ESITMATES DO NOT INCLUDE FACTORS SUCH AS:

- LAND ACQUISITION which can be very high and sometimes represent a cost higher than construction. They cannot be known until a detailed design effort is complete.
- BRIDGES, RETAINING WALLS AND OTHER STRUCTURES, which can be 40-50% of a project costs. They cannot be known until a corridor feasibility study or detailed design effort is complete.
- MAINTENANCE AND OPERATIONS COSTS, which are typically tied into an annual budget allocation. They vary by trail surface, trail location and environmental factors.

Estimates for the planned US 70 / Swannanoa River Greenway and NC 251/French Broad River Greenway contain more detailed estimates for bridges and retaining wall. These estimates are contained within those study documents. Estimates for the Wilma Dykeman RiverWay were not calculated due to the nature of that planned corridor, which includes significant roadway investments.

These estimates vary on a per-mile cost basis due to assumptions related to trail width and trail surface based on design typologies recommended through field evaluation. Those details in terms of segment typologies are contained in the detailed GIS files developed for Buncombe County as a result of this study.

Priority Corridors identified for this Plan	Length (approx. miles)	Trail-Only Construction Estimates
Weaverville / Reems Creek Greenway Corridor	17	$ 3,500,000
Hominy Creek Greenway Corridor	10	$ 4,000,000
Bent Creek Greenway Corridor	8	$ 4,500,000
Lake Julian Greenway Corridor	19	$ 7,000,000
Reynolds Greenway Corridor	3	$ 600,000

Corridors Already Studied*	Length (approx. miles)	Feasibility Study Construction Estimate
US 70 / Swannanoa River Greenway Corridor	19	$ 10,300,000
NC 251 / French Broad River Greenway Corridor	15	$ 9,400,000

* These corridor studies contained more detailed analysis along several segments of each greenway, resulting in a more refined cost estimate that included bridges, retaining walls and other structures.

Source	Eligibility	Description	Project Type	More info
Municipal and County Bonds	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	Revenue, general obligation, special assessment and GARVEE bonds are used by various government entities – after a public referendum approving the bond proposal – to construct a variety of transportation improvements.	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity Other	NC G.S. 159-43 through 159-79 (GO Bonds)
Property Tax	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	Property taxes are the primary source of revenue for city and county governments and are used as part of their general funds. There is partnership potential in the use of these funds among the county, cities and towns.	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity Other	NC G.S. 150 § 161.7
County Sales Tax	■ County Cities / Towns Non-Profits ■ Transit Operators School Districts Other:	Any sales tax increase would require a popular referendum vote by the population of Buncombe County. Most counties (83) have the same 2% sales tax rate as Buncombe; 17 have 8% with Mecklenburg at 8.25% due to a .5% transit sales tax already in place.	Greenway Bicycle Pedestrian Amenities ■ Connectivity Other	NC Department of Revenue
Municipal or County Service (Business Improvement) District	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	Cities can form special tax improvement districts for downtowns; counties may apply them anywhere. In both cases, infrastructure is the intended use, which may include transportation projects including sidewalks.	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity Other	NC G.S. 160A-535 § 153A-300
Tax Increment Financing (TIF)	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	Generally encouraging redevelopment, TIFs (and synthetic TIFs) use marginal property value increases to pay off debt from private infrastructure investment.	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity Other	NC G.S. 159C-103

Source	Eligibility	Description	Project Type	More info
Occupancy Tax	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	Buncombe has a fairly typical hotel occupancy tax rate of 4%, in a range of 3% to 6% in almost every county. Uses are very broad as long as they are not applied to the construction of another hotel.	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities Connectivity Other	NC G.S. 153A-155 § 160A-215
Spot Safety, Hazard Elimination & Small Urban Project (NCDOT)	■ County ■ Cities / Towns Non-Profits Transit Operators ■ School Districts Other:	The NCDOT sponsors these three programs through the NC Highway Safety Improvement Program. The Spot Safety program focuses on smaller ($250,000 or less) projects and mentions pedestrian facilities by name. Small urban funds are a similar source, but not often used for trails projects.	■ Greenway ■ Bicycle ■ Pedestrian Amenities ■ Connectivity ■ Other: Intersections	NCDOT Highway Safety Improvement Program
Powell Bill Funds	County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	This program is paid to municipalities for the purposes of maintaining or constructing local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways and sidewalks that connect to greenways within municipal boundaries.	Greenway ■ Bicycle ■ Pedestrian Amenities ■ Connectivity Other: Grade Crossing Closures	NCDOT Powell Bill Program
Conservation Tax Credits	■ County ■ Cities / Towns ■ Non-Profits Transit Operators School Districts ■ Other: State	Persons donating their land through conservation easements for public trails (among other uses) can receive up to $250,000 or 25% of the fair market value of the land conserved. Credits are not transferable to new property owners.	■ Greenway Bicycle Pedestrian Amenities Connectivity Other:	One North Carolina Naturally Conservation Tax Credit; NC G.S. 113A-231

Source	Eligibility	Description	Project Type	More info
Land and Water Conservation Fund	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts ■ Other: Tribal	The LWCF program is managed by NCDENR for acquiring land at a single site with grants up to $250,000 for permanent outdoor recreation uses.	■ Greenway Bicycle Pedestrian Amenities Connectivity ■ Other: Land	LWCF Overview by NC Division of Parks and Recreation
North Carolina Recreational Trails Program Grant	■ County ■ Cities / Towns ■ Non-Profits Transit Operators School Districts Other:	NCDENR manages a trails grant program with amounts up to $75,000 with a 25% match requirement. All grants are matched 1:1 with cash, donated property value, or in-kind services.	■ Greenway Bicycle Pedestrian Amenities Connectivity ■ Other: Land	North Carolina Recreational Trails Program Grant General Information
Clean Water Management Trust Fund	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	The CWMTF can be used to plan and design greenways or acquire land (fee simple or conservation easement) for them in riparian areas ONLY. Construction costs are not eligible, but utilities are allowed in the corridor.	■ Greenway Bicycle Pedestrian Amenities Connectivity ■ Other: Land	Clean Water Management Trust Fund
Community Development Block Grant Program	■ County ■ Cities / Towns ■ Non-Profits Transit Operators School Districts Other:	CDBG funds have been used to construct trail projects, such as the Boulding Branch Greenway in High Point, NC. Amounts are typically between $50,000 and $200,000. Projects should benefit low- and moderate-income persons.	■ Greenway ■ Bicycle ■ Pedestrian Amenities ■ Connectivity Other:	CDBG Information Website
Parks and Recreation Trust Fund	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other: Public Authority	NCDENR also matches the venerable PARTF grants, but these go to trail projects only infrequently as they are associated with parks facilities. The matching requirement is 50/50 in cash (no in-kind services) but land value can be used in lieu of cash.	■ Greenway Bicycle Pedestrian Amenities Connectivity ■ Other: Land	NC Parks and Recreation Trust Fund Website

Source	Eligibility	Description	Project Type	More info
State Transportation Improvement Program Projects (NCDOT)	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other: Tribal	NCDOT funds projects both incidental to highway construction / widening and independent bicycle/pedestrian projects based on established project selection criteria. Approval of metropolitan or rural planning organizations is required.	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity ■ Other: Land	NCDOT Bicycle and Pedestrian Transportation Funding Information
Payment-in-Lieu Fees	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	Communities may choose to allow developers to pay a fee for future improvements required by the government that the development is located within instead of constructing the improvement. Note that private developers can often construct more for less money than their public sector counterparts due to mobilization and other costs.	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity ■ Other: Land	Buncombe County would need to address this through an ordinance.
Foundation Grants	■ County ■ Cities / Towns ■ Non-Profits Transit Operators School Districts Other: Non-Profit Organizations	Like other grants, foundations issue funds for projects that meet specific requirements – and they are highly competitive. Deadlines, submission requirements, degree of interagency collaboration desired, and match characteristics vary greatly.	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities Connectivity ■ Other: Education	Bikes Belong International Mountain Biking Association Rails-to-Trails Pigeon River Trust Fund
Safe Routes to Schools	■ County ■ Cities / Towns Non-Profits Transit Operators ■ School Districts Other:	SRTS funding is distributed by NCDOT for the purpose of funding education programs, school-based audits that lead to infrastructure improvements within two miles of an elementary or middle school.	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity ■ Other: Education	www.saferoutesinfo.org

Appendix II: Existing Programs in Buncombe County

The following list is a sample of how the greenways in Buncombe County and Asheville are currently being used (some are not on a greenway but along a nearby river or park). These were identified during a scanning process for the program elements of the Plan. They are not intended to represent all programs, agencies and organizations supporting greenways.

Environmental, Education & Stewardship

- RiverLink: organizes river and stream cleanups and restoration; has 4 active brownfields and employing phytoremediation for documentation and replication purposes; hosts numerous events along the greenways; uses greenways and parks as outdoor classrooms and setting for river-related events; developed design guidelines for greenway and river access; host adopt a greenway and adopt a stream programs; have 66 adopt a stream teams and 12 adopt a greenway teams; sells one-foot sections of greenway to use the money to pay for trails; established land trust focused on small parcels, riparian buffers and steep bluffs; land banking efforts are being used for greenways; acquired easements along the Swannanoa River through Azalea Road area.
- Asheville Greenworks: organizes litter cleanups. Worked with youth groups on the Waller tract to rid the area of invasive plants;
- Friends of Hominy Creek: sponsors clean-ups of the greenway and creek;
- Black Mountain Recreation and Parks Department : maintains a community garden near greenway at Recreation Park in Black Mountain. There are future plans for garden along the Hominy Creek Greenway.
- Black Mountain Elementary School: held Earth Day event with greenway focus, including all 275 elementary students for Flat Creek Greenway.;
- Owen High School uses stretch along Swannanoa river for biological study;
- Montreat College: Students at Montreat designed conceptual signs for greenway system;
- Boy / Girl Scouts Groups: organizes clean-ups and maintenance;
- Trout Unlimited : assists with some RiverLink events along the greenways. Hosts fishing events at Recreation Park and Lake Tomahawk in Black Mountain;
- Warren Wilson College: hosts cleanups and service days which sometimes focus on riparian areas. Professors take class field trips along river;
- Audubon Society: sponsors bird watching trips;
- RiverLink through partnership with Progress Energy: Used elements of wetland areas of Carrier Park to develop education package of tools for a local elementary school and installed boardwalks.
- Progress Energy: Donated land for first greenway in Asheville.

Recreation, Health & Wellness

- Healthy Buncombe, Eat Smart/Move More: provides information about where people can walk and bicycle in Buncombe County, including along the greenways;
- City of Asheville: holds the annual Mountain Sports Festival held at Carrier Park and other races at Carrier Park;
- Asheville Greenways Commission: planning guided walks along the greenway;
- Asheville Track Club : sponsors races along greenways and hold trainings at Carrier Park;
- RiverLink: host health-themed events along the greenways; presenting sponsor for the Outdoor Adventure Guide that lists greenways and recreations spots in WNC;
- National Trails Day: sponsors hikes along greenways;
- Asheville Hiking Meet-Up Group s : organizes hikes along greenway;
- Black Mountain Parks and Recreation Department: held a National Trails Day event for new greenway. Uses Oaks Trail for Valentine run and high school cross country races;
- Carolina Mountain Club: schedules hikes along greenway;
- Asheville on Bikes: hold rides that have focal points related to existing or planned greenways;
- Bike Gang: Triathlon used greenways (bike, float, drink);
- SORBA: Organizes numerous activities related to mountain biking.
- Blue Ridge Bike Club: leads novice rides on greenways;
- Army Reserve: trains at Carrier Park;
- Care Partners: uses greenways and French Broad River Park for persons in their physical rehabilitation programs.;
- RiverLink: Promotes active transportation modes to access river events;
- Individuals: use the greenways for walking, running, bicycling, walking with a baby stroller, in-line skating, skateboarding, and fishing.

Cultural

- Black Mountain Primary School – built boats to float in Flat Creek along the greenway;
- Town of Black Mountain: holds sculpture stroll along Lake Tomahawk;
- River Arts District: holds a Studio Stroll two times a year;
- Riverlink: hosted an outdoor sculpture exhibit in the park;
- City of Asheville: sponsors Easel Riders (mobile art lab);
- Black Mountain: a Buddhist group did a walking meditation by the community garden along the greenway trail.

Safety

- Buncombe County Parks, Greenways, and Recreation Department: have held bike safety classes for kids and County employees;
- Safe Routes to Schools: promotes physical activity among children and hosts annual walk to school events;
- Healthy Buncombe/Blue Ridge Bike Club: sponsors bicycle rodeos for children.

Appendix III: Detailed Results of 2011 Plan Survey—

1. Greenways and Trails are designated for bicycling, walking and similar uses along corridors that connect natural areas, parks, cultural attractions, neighborhoods, schools, community destinations and commercial areas. How often do you use greenways or trails in Buncombe County?

	Response Percent	Response Count
Almost every day	15.0%	77
Once or twice a week	19.8%	102
Two or three times per week	15.9%	82
Once or twice a month	**24.1%**	**124**
Less than once a month	15.7%	81
Never	9.5%	49
	answered question	**515**
	skipped question	**0**

2. Buncombe County, along with its partners throughout the region, is conducting a Greenway & Trails Master Plan. This survey is the first step in public involvement as we generate key themes and ideas for the plan. We will be conducting specific community outreach throughout Buncombe County to gather more ideas. We also want to gather input from visitors to the region. (NOTE: Maximize your screen for full view.) Please tell us where you live in Buncombe County. If you do not live in Buncombe County, please indicate from where you visit us.

	Response Percent	Response Count
Arden	6.1%	29
Asheville	**58.6%**	**277**
Avery Creek	0.8%	4
Barnardsville	2.5%	12
Biltmore Forest	0.2%	1
Black Mountain	10.4%	49
Candler	3.0%	14
Enka	1.3%	6
Fairview	3.0%	14
Leicester	2.5%	12
Montreat	0.0%	0
Skyland	1.1%	5
Swannanoa	3.0%	14
Weaverville	5.1%	24
Woodfin	2.5%	12
Other --or -- I do not live in Buncombe County (please specify)		34
	answered question	**473**
	skipped question	**42**

3. Do you think more greenways and trails will benefit these community factors?

	Yes	No	Response Count
Quality of Life	**97.1% (475)**	2.9% (14)	489
Recreational Opportunities	**98.0% (478)**	2.0% (10)	488
Property Values	**94.8% (453)**	5.2% (25)	478
Community Health & Fitness	**97.3% (474)**	2.7% (13)	487
Economic Development & Tourism	**92.5% (443)**	7.5% (36)	479
Community Appearance	**96.9% (469)**	3.1% (15)	484
Community Connectivity	**94.7% (460)**	5.3% (26)	486
More Commuting Options	**89.7% (428)**	10.3% (49)	477
Help Attract & Retain Businesses	**88.1% (413)**	11.9% (56)	469
Improve the Environment	**95.0% (460)**	5.0% (24)	484
		answered question	**491**
		skipped question	**24**

4. Please indicate the type of activities for which you or your children have used a greenway or trail in Buncombe County:

	Response Percent	Response Count
Walking / running	**95.1%**	**446**
Bicycle riding	73.6%	345
Mountain biking	33.3%	156
Walking pets	50.1%	235
Commuting to work	21.7%	102
Going to school	7.7%	36
Stroller / Kids exercise	22.2%	104
Shopping trips	10.0%	47
Nature observation	63.8%	299
Skateboarding / Inline skating	5.3%	25
Horseback riding	1.5%	7
Winter recreation (cross-country skiing / snowshoeing)	11.7%	55
Other (please specify)		30
answered question		**469**
skipped question		**46**

5. Do any of these issues deter you or your family from using greenways and trails? You may answer more than one.

	Response Percent	Response Count
No greenway or trail nearby	**64.4%**	**278**
Greenway / trail doesn't go where I want to go	48.6%	210
Greenway/trail is a dead-end	37.7%	163
Route is too indirect	13.2%	57
Lack of time	12.0%	52
Hazards or obstructions (e.g. uneven pavement, puddles)	9.3%	40
Too secluded / lacks visibility	9.5%	41
Not enough connections to get to the greenway	52.1%	225
No lighting / too dark	11.8%	51
Intersects a street that is uncomfortable to cross	10.9%	47
Don't know where the greenways or trails are located	28.9%	125
No separation between pedestrians and bicyclists	9.3%	40
Don't feel safe	9.0%	39
Lack of signage	11.8%	51
Other (please specify)		38
answered question		**432**
skipped question		**83**

6. What amenities would you like to see along greenways & trails (limit 5)?

	Response Percent	Response Count
Parking areas at trailheads	52.9%	245
Bus connections to trailheads	25.1%	116
Volunteer-led tours	3.9%	18
Rest areas / shelters	20.3%	94
Picnic tables	22.5%	104
Directional signage / mile markers	43.8%	203
Bicycle / rollerblade rental	8.4%	39
Bicycle parking / Lockers	17.9%	83
Restrooms	46.0%	213
Benches / Gathering Spaces	30.9%	143
Horseback riding amenities	1.3%	6
Performance space	5.6%	26
Interpretive / educational signage	21.0%	97
Drinking water	45.8%	212
Native trees & shrubs	**57.0%**	**264**
Wildlife benefits such as nesting boxes and wetlands	50.3%	233
Community gardens	31.3%	145
Pet clean-up / water stations	34.3%	159
Dog parks	13.6%	63
Trash cans	47.5%	220
Food & beverage concessions	2.6%	12
Fishing access	11.0%	51
Other (please specify)		39
answered question		**463**
skipped question		**52**

7. What characteristics are vital in developing a quality greenways / trails system and encouraging you and your family to use it?

	Not Vital	Not Sure	Vital	Very Vital	Rating Average	Response Count
More greenways and trails	3.5% (16)	2.2% (10)	24.8% (115)	**69.5% (322)**	3.60	463
More sidewalk connections to greenways	8.0% (36)	10.5% (47)	34.2% (153)	**47.3% (212)**	3.21	448
More bike lane / route connections	8.9% (40)	10.5% (47)	28.6% (128)	**51.9% (232)**	3.23	447
Better maintenance	10.7% (45)	30.1% (126)	**44.2% (185)**	15.0% (63)	2.63	419
More marked pedestrian crossings	17.2% (72)	29.4% (123)	**37.6% (157)**	15.8% (66)	2.52	418
More lighting	31.2% (130)	**32.6% (136)**	27.3% (114)	8.9% (37)	2.14	417
More benches or rest areas	**36.7% (152)**	30.7% (127)	25.1% (104)	7.5% (31)	2.03	414
Better directional signage	18.0% (75)	27.4% (114)	**40.6% (169)**	13.9% (58)	2.50	416
More information about the pathways	11.4% (50)	17.4% (76)	**47.1% (206)**	24.0% (105)	2.84	437
More landscaping on the greenways / trails	33.0% (135)	**33.3% (136)**	26.4% (108)	7.3% (30)	2.08	409
More visibility / less secluded	**33.6% (136)**	31.6% (128)	25.7% (104)	9.1% (37)	2.10	405
More things to do along the greenway	**57.2% (233)**	28.0% (114)	10.6% (43)	4.2% (17)	1.62	407
Accommodations for horseback riding	**76.3% (305)**	19.3% (77)	3.5% (14)	1.0% (4)	1.29	400
Public art / contests	**55.7% (226)**	24.4% (99)	17.2% (70)	2.7% (11)	1.67	406
				answered question		467
				skipped question		48

8. What are the top three (3) destinations IN YOUR NEIGHBORHOOD that you would like to access by walking or riding a bicycle along a greenway or trail? Please be specific.

	Response Percent	Response Count
Destination 1	100.0%	363
Destination 2	87.3%	317
Destination 3	66.1%	240
answered question		363
skipped question		152

9. What are the top five (5) destinations and points of interest ACROSS BUNCOMBE COUNTY that you would like to walk or ride a bicycle via a greenway or trail? Please be specific.

	Response Percent	Response Count
Destination 1	100.0%	328
Destination 2	89.9%	295
Destination 3	81.4%	267
Destination 4	64.6%	212
Destination 5	51.2%	168
answered question		328
skipped question		187

10. What type of greenway or trail surface would you prefer?

	Response Percent	Response Count
Asphalt	**27.9%**	**119**
Concrete	4.0%	17
Fine-grained gravel	19.2%	82
Wood chips	9.1%	39
Natural earth	20.4%	87
Recycled material	19.4%	83
answered question		**427**
skipped question		**88**

11. Which are your top three (3) places you think greenway connectivity should be a priority?

	Response Percent	Response Count
Schools	27.5%	119
Parks	45.5%	197
Businesses	18.5%	80
Other greenways / trails	**68.6%**	**297**
Residential areas	26.6%	115
River / stream corridors	49.9%	216
Natural areas	31.2%	135
Athletic fields / complexes	9.0%	39
Historic sites	6.2%	27
Public buildings	3.7%	16
Transit routes	16.6%	72
Scenic vistas / Ridge tops	12.2%	53
Other (please specify)		28
answered question		**433**
skipped question		**82**

13. If YES, how would you like to volunteer?

	Response Percent	Response Count
Trail guide / interpretive patrol	18.4%	49
Litter patrol	43.2%	115
Plant trees	**51.5%**	**137**
Clean-up after storms	50.4%	134
Help build improvements	44.4%	118
Volunteer at trail events	45.9%	122
Teach trail etiquette	18.8%	50
Safety patrol	10.5%	28
answered question		**266**
skipped question		**249**

12. Buncombe County has formed a "Friends" group with the Connect Buncombe intitiative to help manage and maintain the greenways and trails system. Would you consider becoming a trail volunteer?

	Response Percent	Response Count
Yes	**61.6%**	**273**
No	38.4%	170
answered question		**443**
skipped question		**72**