



Cleveland County, North Carolina Rail Trail Master Plan

DRAFT February 2018



A Partnership between the Towns of Earl and Patterson Springs,
the City of Shelby and Cleveland County Government



Acknowledgments

Project Advisory Committee

Thank you to the following members of the project advisory committee:

- Max Hopper, Town of Earl
- Bobby Horton, Town of Patterson Springs
- Kerri Melton, Cleveland County
- Chris Martin, Cleveland County
- Jackie McSwain, NC DOT
- Jennipher Harrill, Small Business Owner
- David Royster, IV, Small Business Owner
- Justin Merritt, City of Shelby
- Shannon Porter, City of Shelby
- Madison Webber, Small Business Owner
- Jondra Harmon, Resident
- Dotty Leatherwood, CRMC-Cleveland
- Dr. Kassi Nicopoulos, Small Business Owner
- Lucas Shires, Cleveland County Planning Board

Public Participants

Thank you to the many area leaders and citizens for their enthusiasm and dedication to making trails in Cleveland County become a reality.

alta



PLANNING + DESIGN

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1. Background & Planning Process



PROJECT VISION

The *Cleveland County Rail Trail Implementation Master Plan* envisions a **safe off-street rail trail** for cyclists and pedestrians of **all ages and abilities** to utilize and enjoy for transportation and recreation from Shelby to the North Carolina-South Carolina state line. The rail trail will **complement ongoing and future community and economic development efforts throughout Cleveland County**, and will **strengthen physical and economic connections** between Shelby, Patterson Springs, and Earl, as well as existing parks, cultural and educational resources, and residential districts and neighborhoods near the trail. The trail will encourage Cleveland County to **become a healthier community and will increase the quality of life** of its residents. Additionally, the trail will **connect to other trail efforts**, including the First Broad River Trail and potential future trail along Hickory Creek.

PROJECT BACKGROUND

HISTORY

This project focuses on a 10.2-mile unused railroad corridor that stretches from the north side of Sunset Cemetery in Uptown Shelby to the North Carolina-South Carolina state line south of the Town of Earl.

The history of this small section of rail line dates back to the 1830s, when representatives from multiple southern states developed a plan for a rail connector between the Ohio River and the Atlantic seaboard.

In 1886, the plan finally launched with the establishment of the Charleston, Cincinnati & Chicago Railroad company. This railroad, which was also known as the 3-Cs or Triple Cs line, would connect coal and iron ore mines in Virginia and North Carolina from Ashland, Kentucky to Charleston, South Carolina. Construction began at Rutherfordton, North Carolina, and the Cleveland County section was completed by 1888.

The Panic of 1890 created financial trouble for the Triple Cs railroad, which was reorganized as the Ohio River & Charleston Railroad in 1893. Then, in 1898, the Cleveland County section was sold to the South Carolina & Georgia Extension Railroad Company. In 1899, Southern Railway expanded control over the line, and in 1902, gained a 999-year lease on it. In 1982, Southern Railway became Norfolk Southern, which maintains ownership over the rail line to this day.

As a potential rail trail, this corridor can connect to an existing rail trail in the City of Shelby at Grover Street and can also continue southward along the existing rail line towards Blacksburg, South Carolina. This corridor can also connect the City of Shelby to the Towns of Patterson Springs and Earl as well as numerous neighborhoods, schools, commercial districts, and other destinations within Cleveland County.

PROJECT CONTEXT

This project is part of a larger effort led by the City of Shelby and advocates from across Cleveland County to advance the conversion of the historic rail corridor into a rail trail. This process includes the development of a feasibility study to be submitted to Norfolk Southern as part of a request to lease or sell the corridor to one or more local stakeholder groups.

FIELD WORK & ANALYSIS

EXISTING CONDITIONS

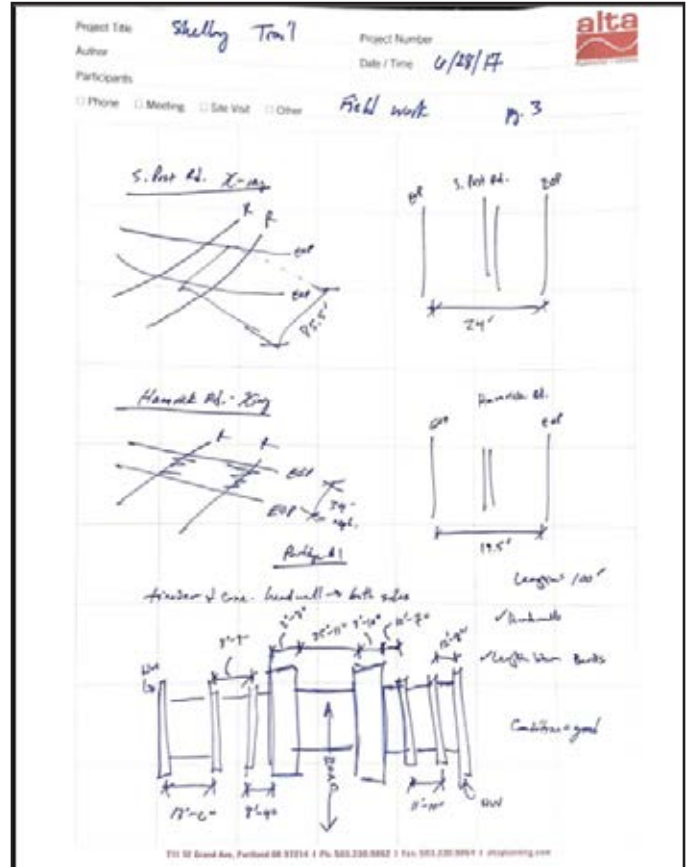
On June 28, 2017, members of the Alta team conducted a site visit to visually assess existing conditions along the rail line. The team walked most of the 10.2-mile corridor and performed a photo inventory of existing conditions. Additionally, the team measured features such as rail line widths and roadway intersection crossing distances.

The following pages detail some of the team's field work observations and analysis of existing conditions along the corridor.

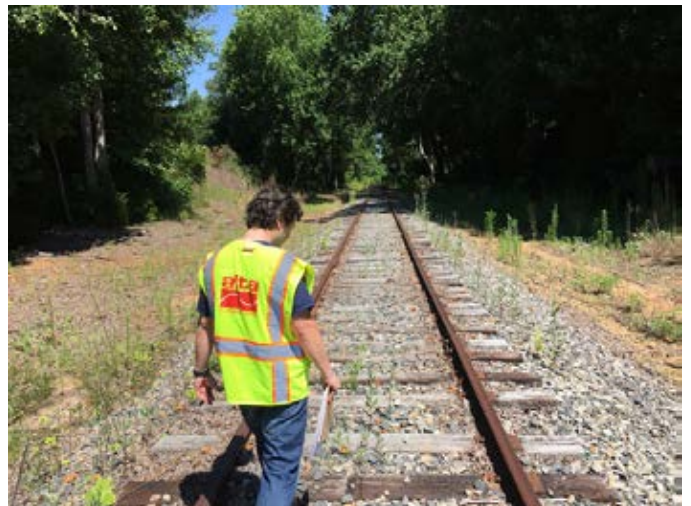
RAILROAD TRESTLE BRIDGES

Additionally, the Alta team visually inspected and measured three railroad trestle bridges, all of which are located in unincorporated Cleveland County between the City of Shelby and the Town of Patterson Springs.

The pages below provide a brief description of the physical condition of these three bridges. A more detailed analysis will be provided later in the planning process.



Field work notes.



Field work.

STATE LINE TO EARL

Heading northward from the state line to the core area of the Town of Earl, the rail corridor has a relatively level grade. Other than a large stack of used railroad ties near the state line, there are no potential structural hazards near the corridor. Most of the corridor parallels Bettis Road or Blacksburg Road.



Commercial buildings in Earl



Typical section near state line.



Typical crossing in Earl.



Used railroad ties near state line.



Typical section in Earl.

PATTERSON SPRINGS AREA

The rail corridor near and in the Town of Patterson Springs continues to have a level grade. Heading northward, the rail corridor parallels South Post Road through Patterson Springs before veering northwest into the countryside.



Section near Celanese.



Driveway crossing near Patterson Springs.



Typical section in Patterson Springs.



Typical section near Patterson Springs.



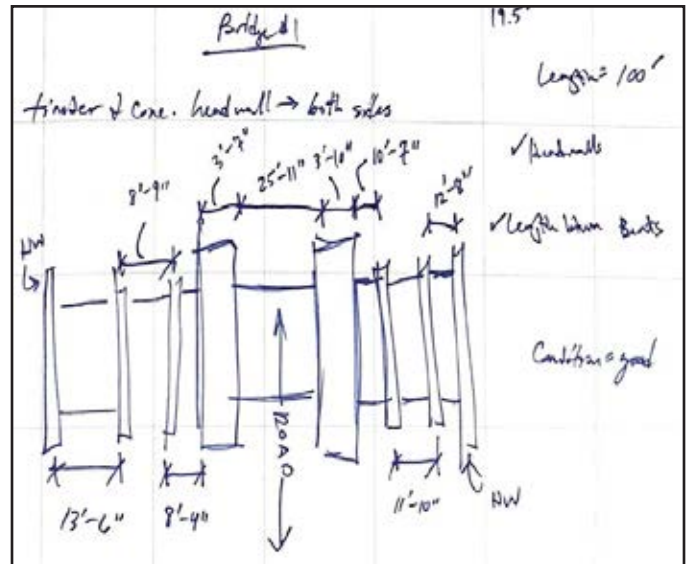
Crossing near Patterson Springs.

FIRST & SECOND RAILROAD TRESTLE BRIDGES

From the south, the first railroad trestle bridge crosses over Sulphur Springs Road. Based on a visual inspection of this bridge, it appears to be in good condition. The second railroad trestle bridge near the intersection of Christopher Road shows evidence of scouring behind its headwalls. Otherwise, the second trestle bridge appears to be in good condition.



First rail trestle bridge.



Field work notes for first rail trestle bridge.



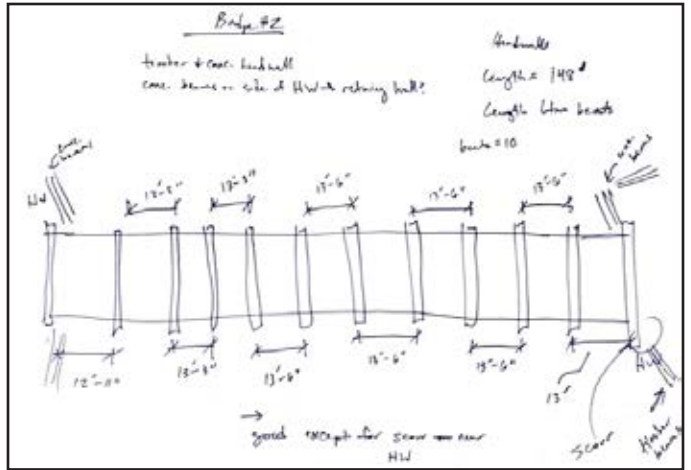
First rail trestle bridge.



First rail trestle bridge.



Second rail trestle bridge.



Field work notes for second rail trestle bridge.



Debris at second rail trestle bridge.



Scouring at second rail trestle bridge.



Second rail trestle bridge.

THIRD RAILROAD TRESTLE BRIDGE

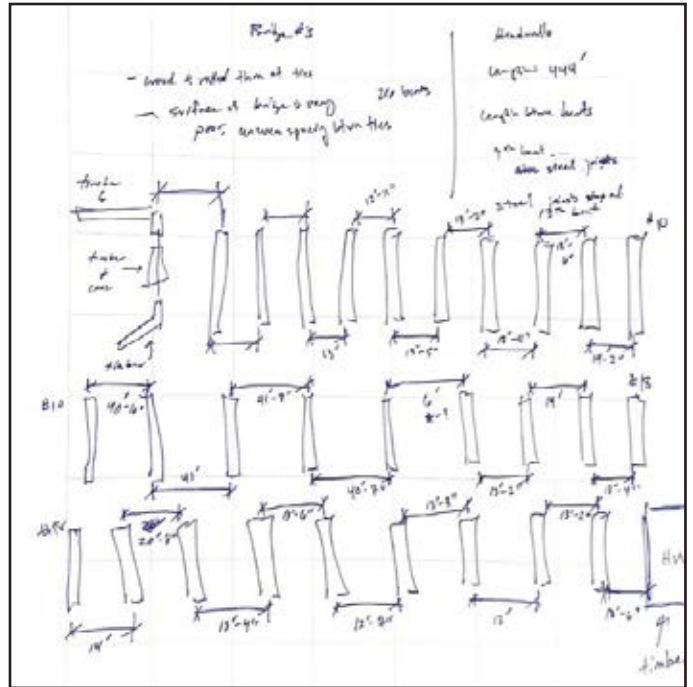
The third railroad trestle bridge, which crosses over Hickory Creek, exhibits several structural issues that require remediation. The wood is rotted thin at various ties and the surface of the bridge is very poor, with uneven spacing between ties.



Steel shims at third rail trestle bridge.



Third rail trestle bridge.



Field work notes for third rail trestle bridge.



Edge of third rail trestle bridge.



Rail, trestle and girders at third rail trestle bridge.

SOUTH SHELBY

From the south, the rail corridor parallels South Morgan Street. It has two major crossings, at Dekalb Street and Lafayette Street.



Dekalb Street crossing.



Typical section.



Morton Street crossing.



Dekalb Street crossing.



Morton Street crossing.

SOUTH MORGAN STREET

From the south, the rail corridor continues to parallel South Morgan Street towards Uptown Shelby.



Corridor parallel to S Morgan Street .



Railroad bridge over US 74.



Corridor parallel to South Morgan Street near Historic Depot.



Corridor parallel to S Morgan Street .



Corridor parallel to S Morgan Street at City Farmers Market building.

UPTOWN SHELBY

From the south, the rail corridor parallels South Morgan Street into Uptown Shelby. From Uptown, the corridor continues to the northern edge of Sunset Cemetery.



W Marion Street intersection at City Pavilion.



W Marion Street intersection at City Pavilion.



W Sumter Street bridge over rail corridor.



W Marion Street intersection at City Pavilion.



Sunset Cemetery.

PUBLIC INPUT PROCESS

PROJECT ADVISORY COMMITTEE

Throughout the master planning process, the Alta team worked closely with the Project Advisory Committee (see Acknowledgements page) for list of members), a group of community leaders and stakeholders who provided direction and input for the overall project and process. This collaboration included multiple in-person meetings, emails, telephone calls, and documents with the Committee.

PROJECT GOALS

The advisory committee identified the following project goals for the rail trail:

- Leverage the rail trail to improve public health and quality of life in Cleveland County
- Utilize the rail trail as a platform for economic development, with a special focus in Uptown Shelby and the core areas of Patterson Springs and Earl.
- Provide opportunities for active recreation and an alternative transportation corridor for Cleveland County residents

PUBLIC PLANNING WORKSHOP

On September 19-21, 2017, the Alta team conducted a planning workshop to gather input from the public and develop a framework for the rail trail plan. The team met with dozens of local citizens in an open house format in two county locations and developed project recommendations on-site.

Over 80 individuals participated in the public planning workshop, providing ideas and suggestions on maps, responding to a project questionnaire, and sharing feedback with members of the Alta team. On the third day of the workshop, the Alta team presented preliminary concepts to the project advisory committee.


COME JOIN US!

CLEVELAND COUNTY NC RAIL TRAIL MASTER PLAN MEETINGS

September 19-21

Tuesday (9/19) - 12pm-2pm and 5pm-7pm
Thursday (9/21) - 9am-11am at
No 3 Volunteer Fire Department
2326 Blacksburg Rd, Grover, NC 28073

Wednesday (9/20) - 11am-1pm and 5pm-7pm at
Don Gibson Theater
318 South Washington St, Shelby, NC 28150



For a complete schedule please visit the city website: www.cityofshelby.com
or contact Carol Williams: Carol.Williams@cityofshelby.com • 704-484-6600

Share your ideas for planning the rail-trail in Cleveland County!!

Planning workshop flyer



Advisory Committee members provide input on corridor opportunities

PUBLIC INPUT POSTER 1

The Alta team used an input board to ask the public to describe the potential rail trail in three words. Responses to this question are displayed in the word cloud below.

The most common words include “Healthy,” Community,” “Family,” “Growth,” “Fitness,” and “Tourism.” Each of these words are directly connected to the project vision statement, which focuses on public health, quality of life, and economic development.



Public input poster 1



Public input board responses

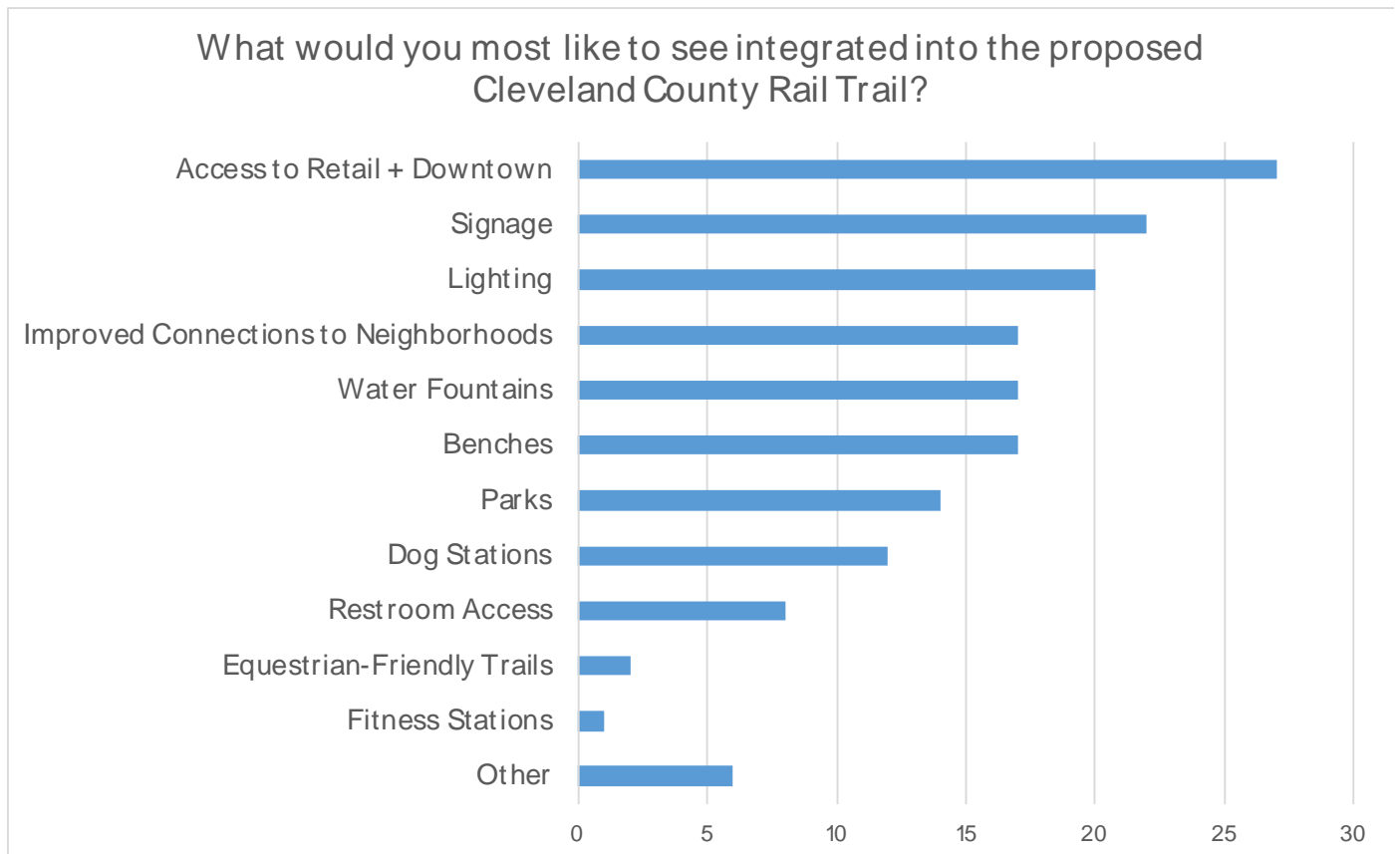
PUBLIC INPUT POSTER 2

During the planning workshop, the Alta team provided multiple opportunities for the public to provide input regarding preferred amenities for the proposed rail trail. Aggregated responses to this question, “What would you most like to see integrated into the proposed Cleveland County Rail Trail?” are displayed in the chart below.

The most popular responses indicated on the poster include connections to retail, residential, and downtown districts as well as amenities such as lighting, water fountains, benches, and signage that would make the rail trail a relaxing, easy-to-enjoy facility.



Public input poster 2



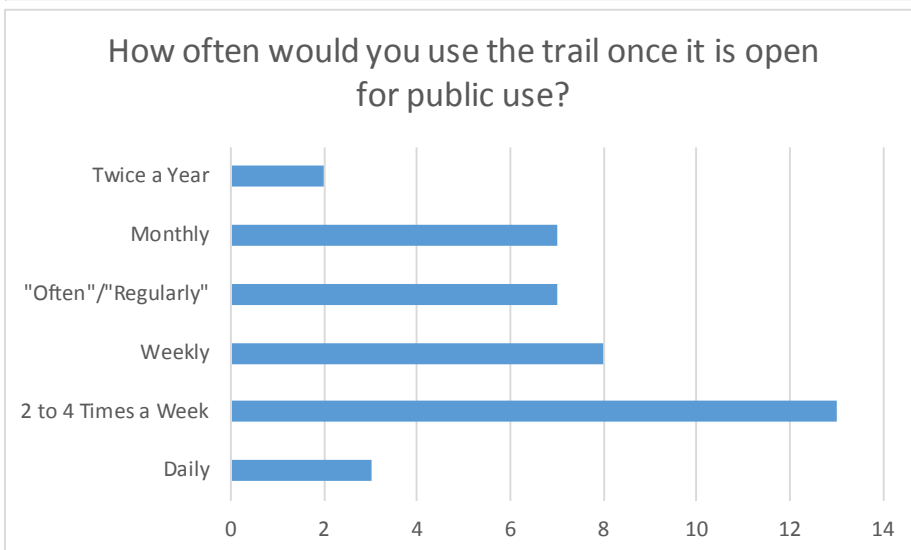
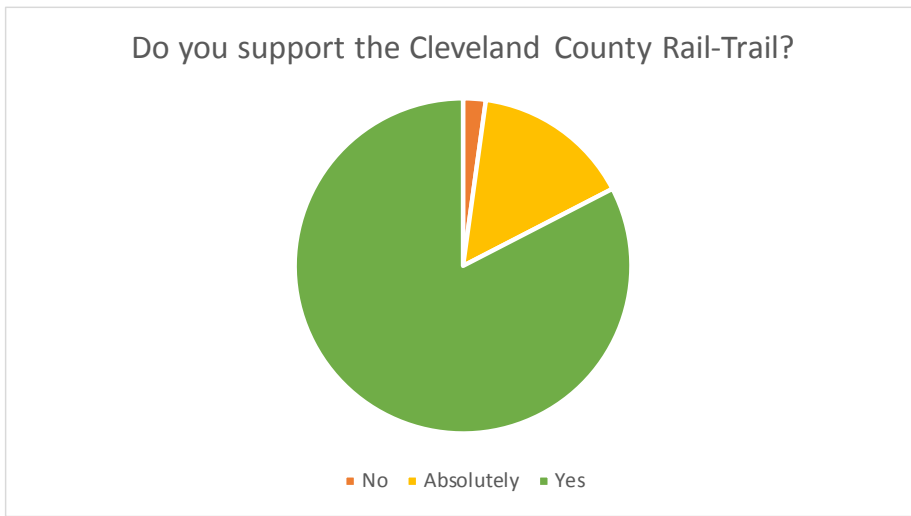
Public input board responses

SURVEY QUESTIONNAIRE

During the planning workshop, the public was asked to complete a questionnaire. Over sixty individuals provided responses to the five questions posed in the instrument. Participants seem to have been a self-selecting group of trail supporters, as only respondent indicated opposition to a potential rail trail. Respondents also indicated a relatively high frequency of future trail use (“2 to 4 times a week” was the most common reply) when asked how often they would use the trail once open for public use.



Public input questionnaire



SURVEY QUESTIONNAIRE

The public input questionnaire asked respondents what types of improvements they would most like to see along the trail. The most common responses were benches and sitting areas, water stations, restrooms, and a high-quality but uncomplicated look and feel to the trail.



Questionnaire responses



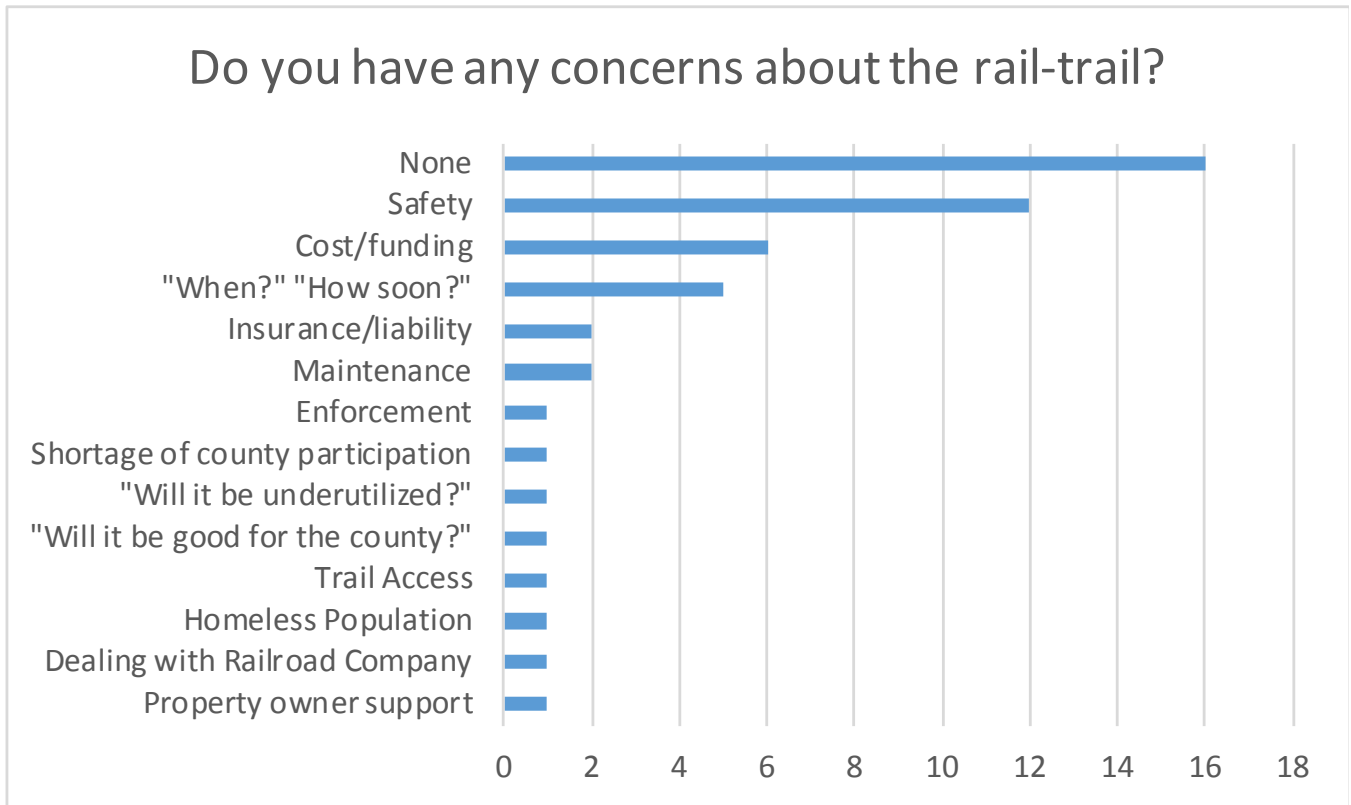
Public input questionnaire

SURVEY QUESTIONNAIRE

The public input questionnaire asked respondents what concerns (if any) they have about the rail trail. The most common response was “none,” followed by “safety” and “cost/funding.” The issue of safety along the trail was one that was also mentioned in many of the one-on-one conversations that the Alta team had with members of the public.



Public input questionnaire



Questionnaire responses

2. Recommendations

INTRODUCTION

The recommendations presented in this section reflect the primary goals of the project and public and stakeholder input: to create a safe rail trail through Cleveland County to encourage and promote bicycling, walking, and trail usage as recreation, transportation, and economic development.

The following sections provide recommendations as to what facilities Cleveland County and partners can feasibly implement to meet the goals of this project. This chapter also provides resources that will aid in the final design, contracting, permitting, and construction of the trail system.

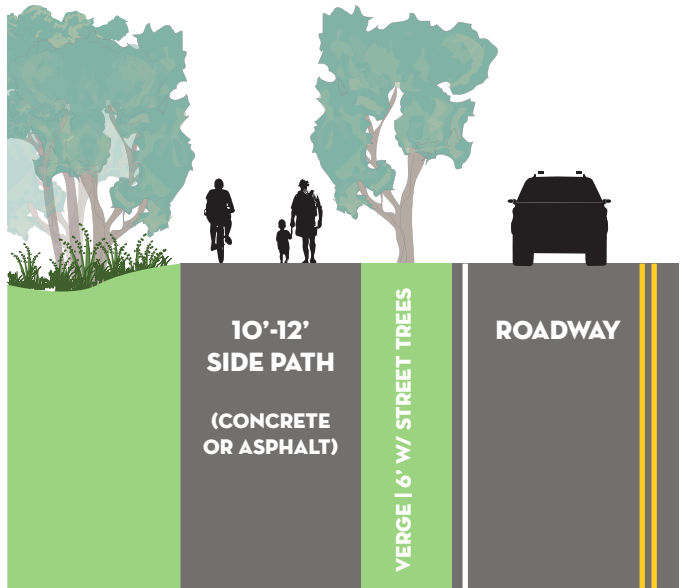
TRAIL TYPES

The recommended Cleveland County bicycle and pedestrian rail trail traverses a diverse range of environments, including Uptown Shelby, arterial roadway crossings, small town commercial districts, railroad trestle bridges, and scenic countryside. Due to the nature of these varied conditions, there will be a range of design solutions to accommodate safe bicycle and pedestrian facilities that fit within the existing context and utilize resources to the fullest potential.

Proposed improvements will utilize the following facility types:

SHARED-USE PATHS/GREENWAYS

Shared-use paths are completely separated from motorized vehicular traffic. They are generally constructed within undeveloped corridors, such as within parks, open spaces, waterways, or utility corridors, though they may be located within a roadway right-of-way. Shared-use paths are facilities built for bicycle and pedestrian traffic.



Shared-use Paths/Greenways

BRIDGES

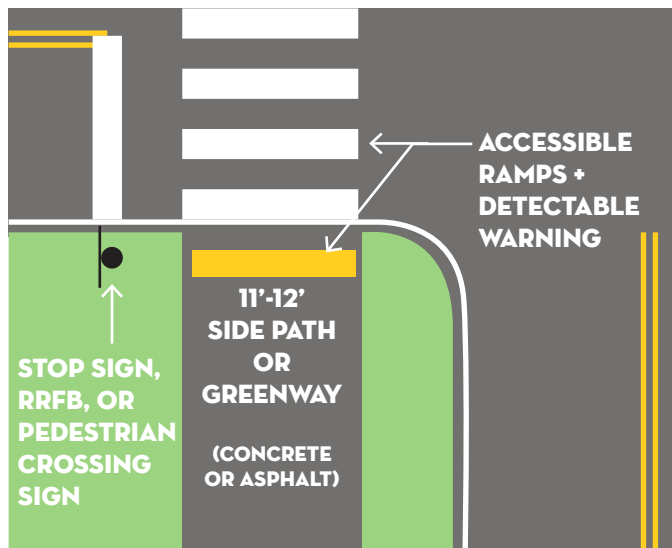
A bridge is a structure, including supports, erected over a depression (stream, river, chasm, canyon, or road) and having a deck for carrying trail traffic. If the structure is two feet above the surface, the bridge should have railings.



Greenway Bridge

INTERSECTIONS

Wherever possible, trail crossings should be separated from automobile traffic. At-grade crossings should be marked with signage, high visibility crosswalks, and flashing beacons where appropriate.



Typical facilities. Additional details can be found in the design guidelines section in the implementation chapter.

TRAIL ALIGNMENT

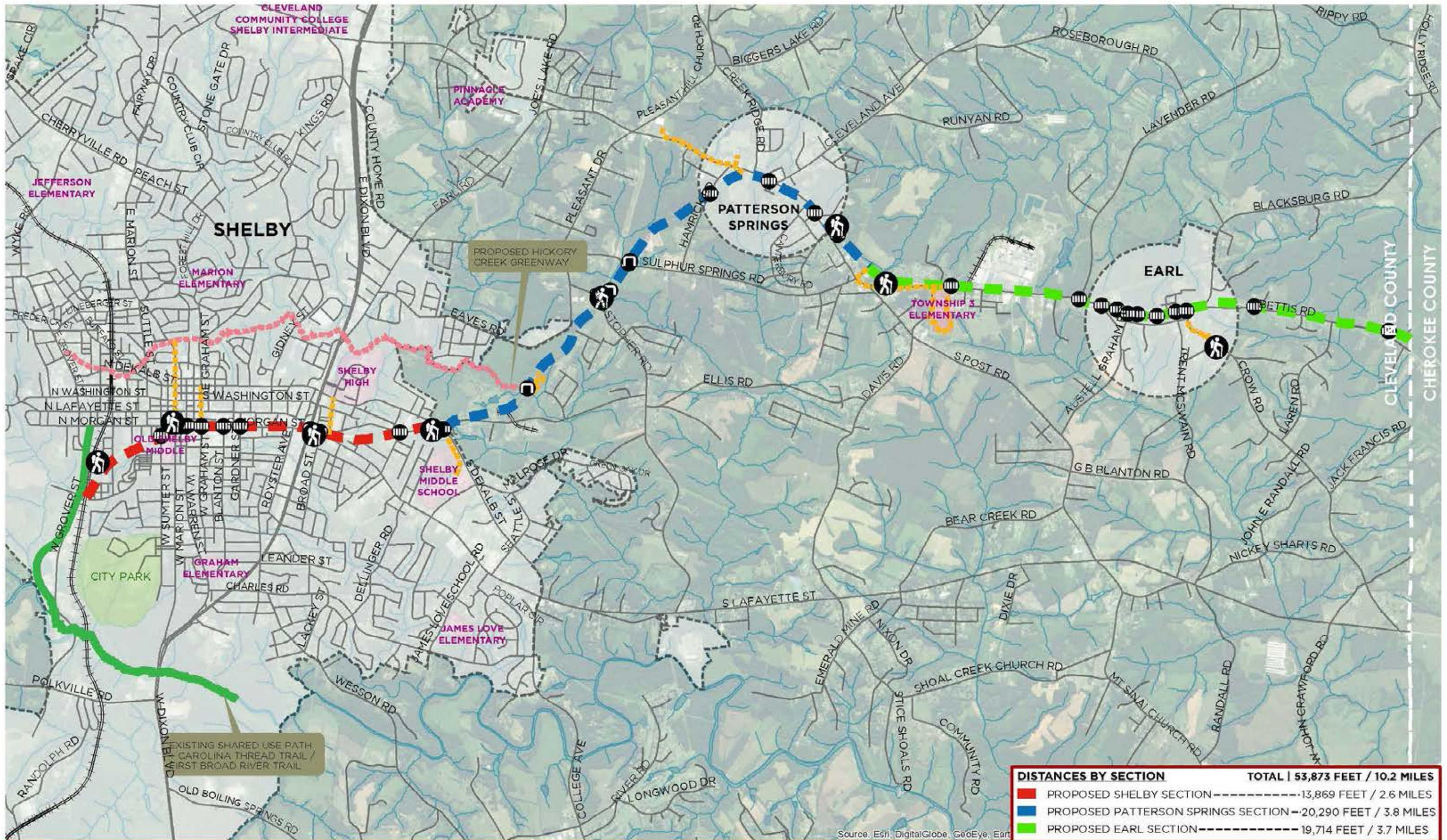
The trail network detailed in the following exhibits represent the framework for the proposed Cleveland County Rail Trail and its connectors.

RAIL TRAIL

The primary trail alignment follows an existing rail line and includes three proposed sections: Shelby; Patterson Springs; and Earl. This entire alignment spans 10.2 miles from the northern boundary of Sunset Cemetery in the City of Shelby to the North Carolina-South Carolina state line south of the Town of Earl. The primary trail alignment also intersects with the existing shared-use path on West Grover Street in Shelby as well as the planned Hickory Creek Trail.

SPUR CONNECTIONS

The trail network includes ten proposed spur connections, which total an additional 6.5 miles of bike and pedestrian facilities. These connections provide bicycle and pedestrian linkages to the following destinations: City Park; Uptown Shelby; Shelby High School; Shelby Middle School; a potential future trail along Hickory Creek; a grocery store, park, and commercial district in Patterson Springs; Township Three Elementary School; and Earl Town Hall. It should be noted that the facility types for spur connections are not specified in this plan.



CLEVELAND COUNTY RAIL TRAIL STUDY

- PROPOSED SHELBY SECTION
- PROPOSED PATTERSON SPRINGS SECTION
- PROPOSED EARL SECTION
- EXISTING SHARED USE PATH
- PROPOSED SPUR CONNECTION
- PLANNED SHARED USE PATH
- BRIDGE CROSSING IMPROVEMENT
- ROAD CROSSING IMPROVEMENT
- NEW TRAILHEAD LOCATION
- RAIL
- CITY LIMITS
- WATER BODY
- SCHOOL PROPERTY

0 0.5 1 Miles

NORTH

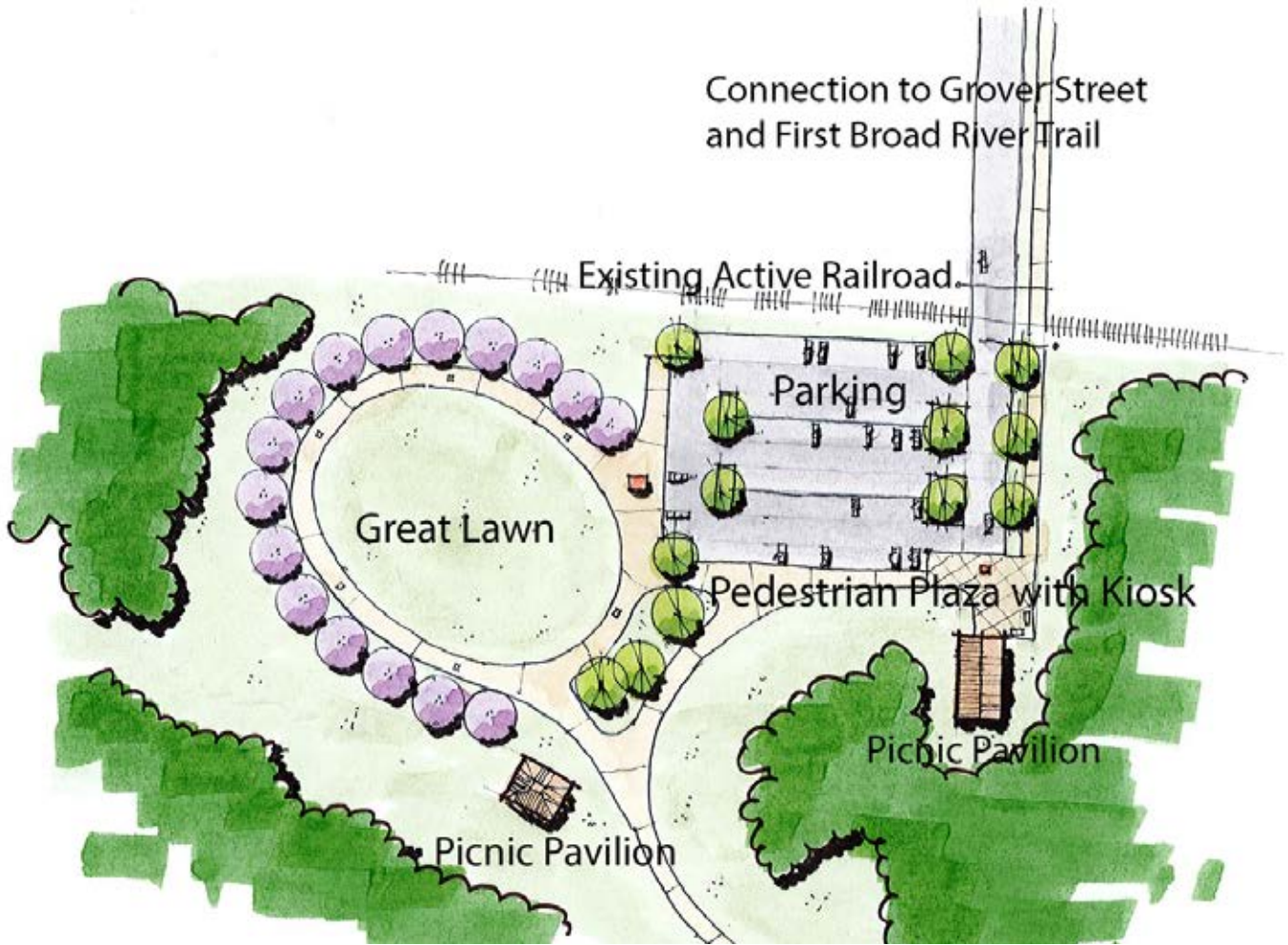
Overview

SHELBY SECTION 1: GROVER STREET TO UPTOWN

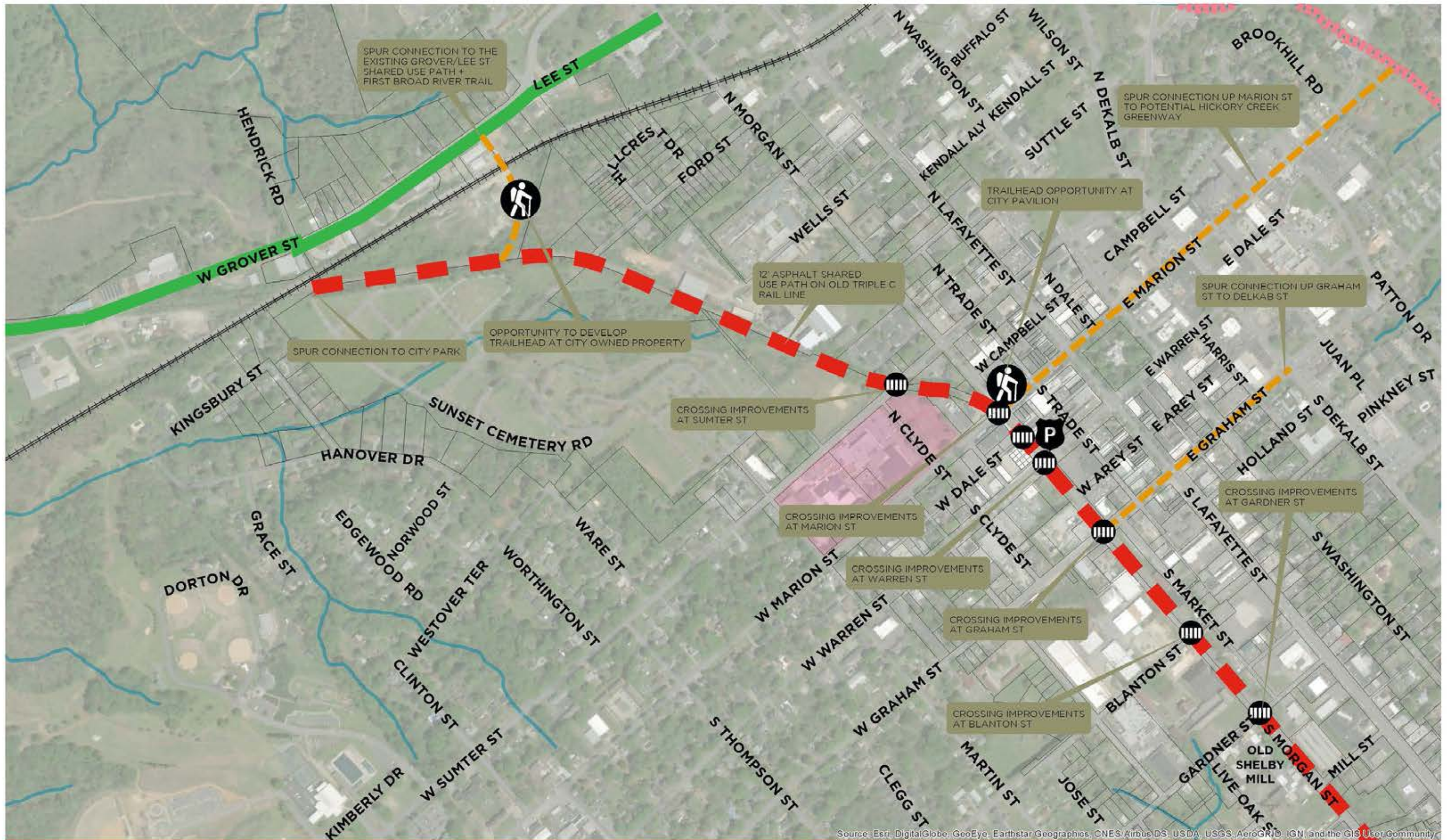
The northern terminus of the proposed rail trail is a conceptual Grover Street Trailhead (shown below) that could be located on City-owned property adjacent to Sunset Cemetery. The potential plan for this trailhead includes a parking lot, plaza and kiosk, picnic pavilions, and a connection between an existing side path on Grover Street and the proposed rail trail. (Note: This plan is conceptual only. The use of this land and design would be determined by the City of Shelby in the final design process.)

The rail trail continues along the edge of Sunset Cemetery and passes under West Sumter Street before emerging at West Marion Street across the City Pavilion, where an at-grade crossing provides an opportunity for a trailhead. From here, the trail follows South Morgan Street towards US 74.

Additional details are provided in the map on the facing page.



Conceptual Grover Street Trailhead The outline of the great lawn and walkways resemble the shape of a banjo or guitar.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLEVELAND COUNTY RAIL TRAIL STUDY

PROPOSED SHELBY SECTION	EXISTING SHARED USE PATH	BRIDGE CROSSING IMPROVEMENT	RAIL	 	NORTH
PROPOSED PATTERSON SPRINGS SECTION	PROPOSED SPUR CONNECTION	ROAD CROSSING IMPROVEMENT	SCHOOL PROPERTY		
PROPOSED EARL SECTION	PLANNED SHARED USE PATH	NEW TRAILHEAD LOCATION	WATER BODY		

SHELBY SECTION 1: CITY PAVILION TRAILHEAD

From the north, the rail trail emerges from a below-grade curve to an at-grade intersection at West Marion Street. This represents an opportunity for a new City Pavilion Trailhead, where a kiosk, map, interpretive and directional signage, landscaping, and connecting sidewalks will contribute to this key area in Uptown Shelby.



Existing conditions at future City Pavilion Trailhead site.



A new City Pavilion Trailhead will anchor one corner of an important intersection across from the City Pavilion. Key features of this trailhead include landscaping, signage, trail markings, and a kiosk designed to orient trail users and promote the trail as an amenity to be enjoyed by residents and visitors alike.

SHELBY SECTION 1: UPTOWN ECONOMIC DEVELOPMENT

As the trail parallels South Morgan Street south of West of Marion Street, it engages the historic Uptown railroad depot. This building, which is currently being used for storage, represents an economic development opportunity for Uptown Shelby. The photo rendering below shows one potential redevelopment concept for this significant property.



Existing conditions at historic railroad depot.



Potential redevelopment concept for historic railroad depot. This type of adaptive reuse project has proven successful along trails in communities similar in size to Shelby. The rail trail provides an opportunity for businesses located in the restored warehouse to directly engage trail users.

SHELBY SECTION 2: UPTOWN SHELBY TO DEKALB STREET

From the north, the Shelby rail trail section parallels South Morgan Street to the intersection of South Dekalb Street, where the Patterson Springs section begins. The Shelby section includes a pedestrian bridge over US 74 (shown below) as well as two major intersections (South Lafayette and South Dekalb Streets, which are detailed in the following pages). This section also includes spur connections to Shelby Middle and High Schools.

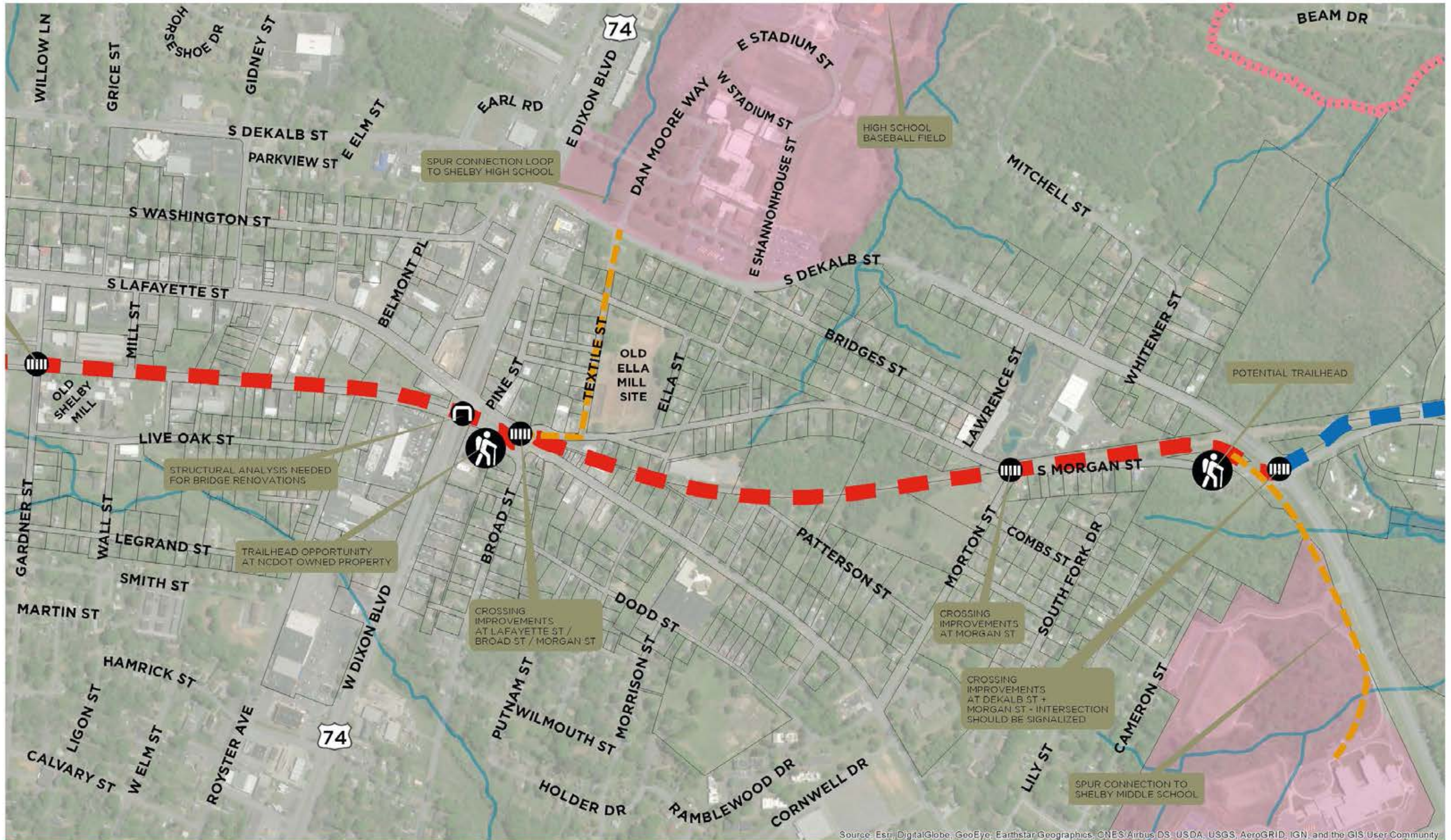
Additional details are provided in the map on the facing page.



Existing conditions at bridge over US 74.



Proposed improvements at bridge over US 74.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLEVELAND COUNTY RAIL TRAIL STUDY

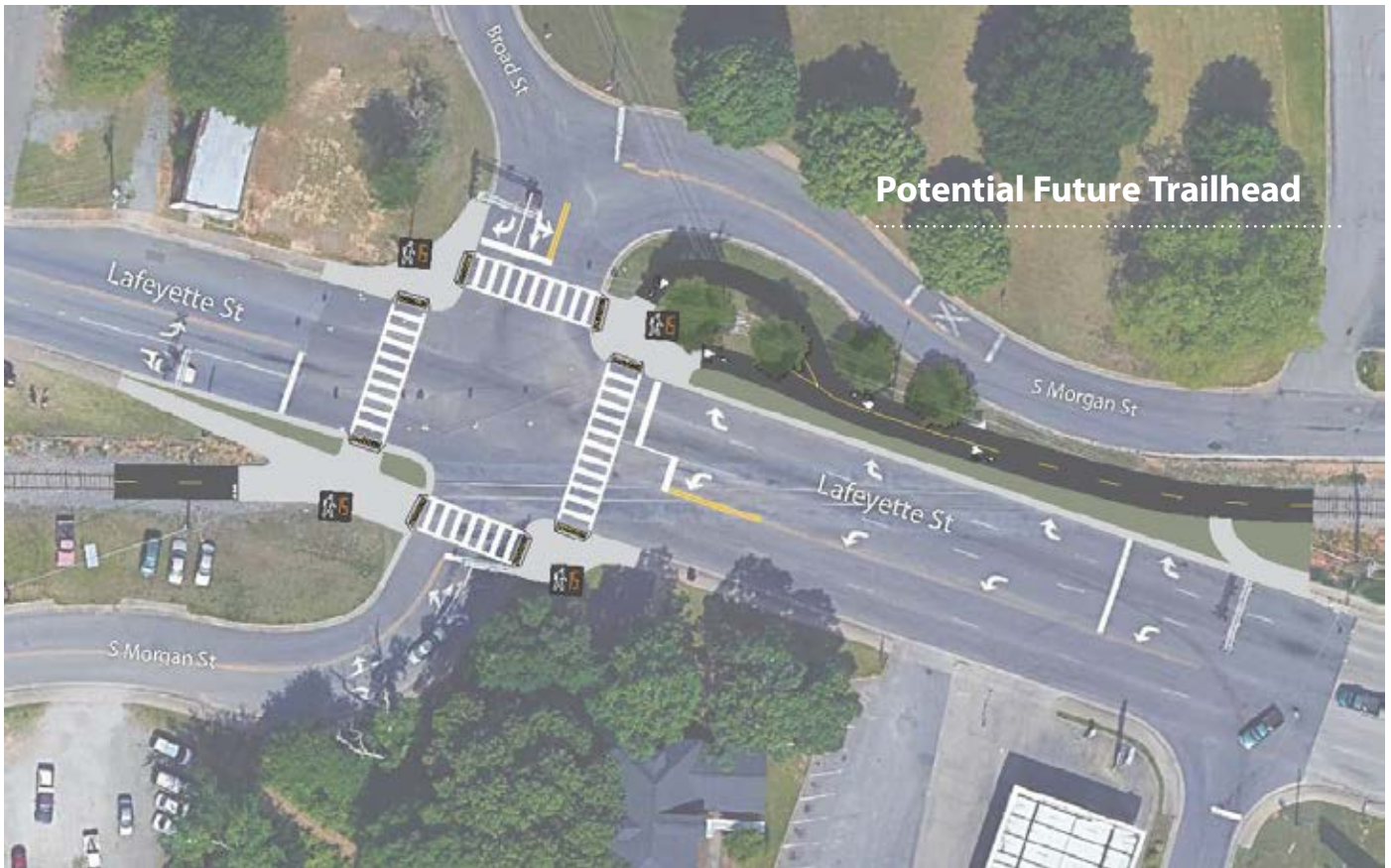
PROPOSED SHELBY SECTION	EXISTING SHARED USE PATH	BRIDGE CROSSING IMPROVEMENT	RAIL	 		
PROPOSED PATTERSON SPRINGS SECTION	PROPOSED SPUR CONNECTION	ROAD CROSSING IMPROVEMENT	PARCELS			
PROPOSED EARL SECTION	PLANNED SHARED USE PATH	NEW TRAILHEAD LOCATION	WATER BODY			
			SCHOOL PROPERTY			

SHELBY SECTION 2: LAFAYETTE STREET INTERSECTION

The rail trail crossing at South Morgan Street and South Lafayette Street complements an already-planned streetscape project for Lafayette Street. Key features of this intersection include a one-way loop for trail traffic on the west side of Lafayette Street as well a set of four improved crosswalks and signals at the main intersection. An additional opportunity for a trailhead on the NCDOT-owned property at the intersection of Broad Street and South Morgan Street.



Existing conditions at Lafayette Street crossing.



Proposed improvements at Lafayette Street crossing.

TYPICAL RAIL TRAIL SECTION

As the trail heads out of Uptown Shelby, the character of the corridor transitions from urban to rural. The photo rendering below shows some of the key design elements of this typical section: a ten-to-twelve-foot-wide asphalt paved trail with natural surface shoulders; landscaping improvements such as trees, shrubs, and flowering plants; and a split-rail fence to provide vertical separation between the trail and adjacent properties.



Existing conditions at typical rail trail section.



Proposed improvements at typical rail trail section.

PATTERSON SPRINGS SECTION 1: DEKALB STREET TO CHRISTOPHER ROAD

The Patterson Springs section begins at the Dekalb Street intersection and continues south over the 444-foot-long rail trestle bridge. A proposed trailhead is located at the intersection of Christopher Road. This section also includes a spur connection to the potential future greenway along Hickory Creek.

The Dekalb Street crossing (as shown in the plan below) includes a realignment of the rail trail into adjacent properties in order to create a short, safe crosswalk and staggered refuge on Dekalb Street.

Additional details are provided in the map on the facing page.



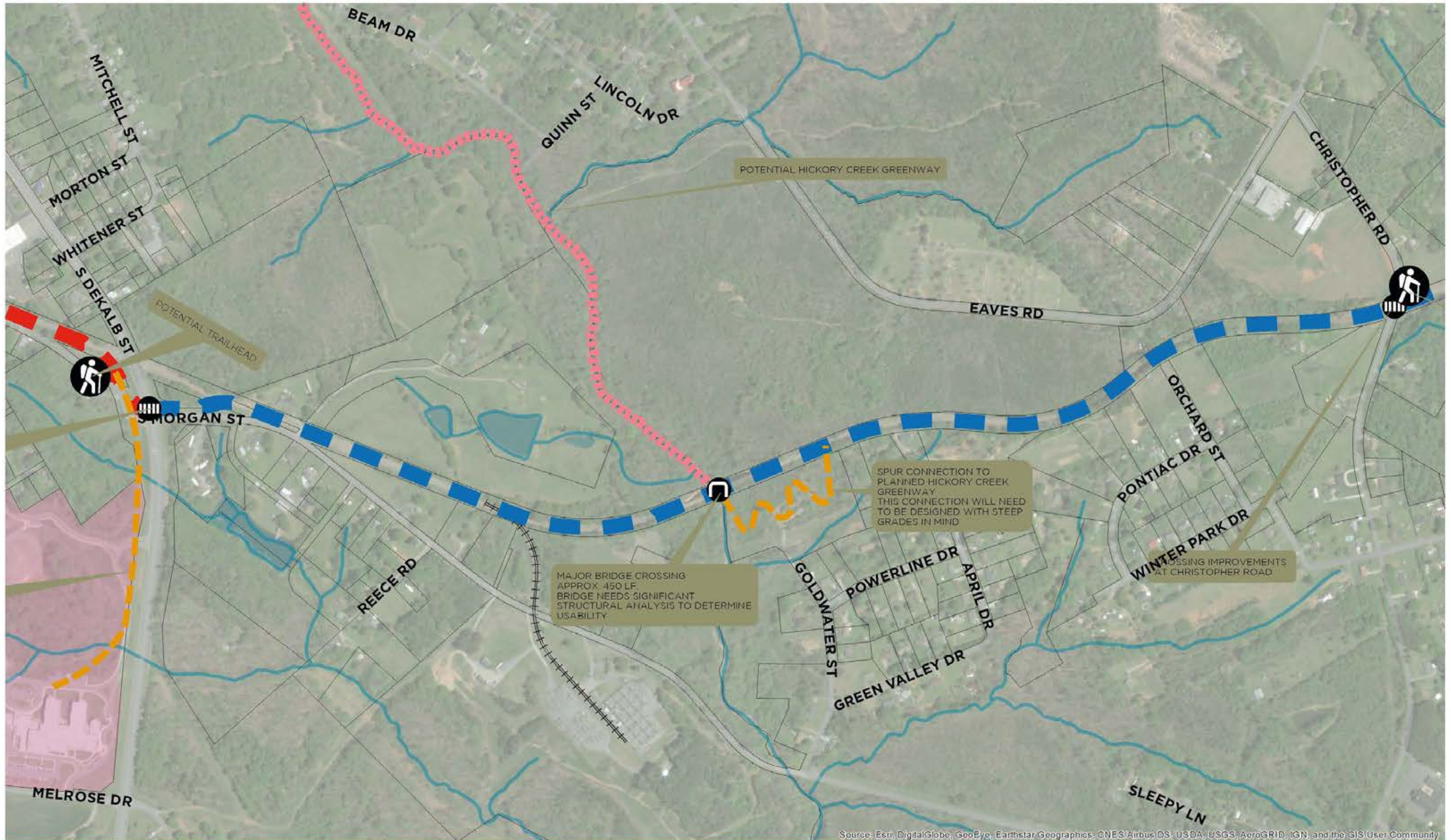
Existing conditions at South Dekalb Street crossing.



Proposed improvements at South Dekalb Street crossing.



Alternate crossing location at South Dekalb Street crossing.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLEVELAND COUNTY RAIL TRAIL STUDY

PROPOSED SHELBY SECTION	EXISTING SHARED USE PATH	BRIDGE CROSSING IMPROVEMENT	RAIL	Miles
PROPOSED PATTERSON SPRINGS SECTION	PROPOSED SPUR CONNECTION	ROAD CROSSING IMPROVEMENT	PARCELS	Feet
PROPOSED EARL SECTION	PLANNED SHARED USE PATH	NEW TRAILHEAD LOCATION	WATER BODY	NORTH
			SCHOOL PROPERTY	alta PLANNING + DESIGN

PATTERSON SPRINGS SECTION 2: CHRISTOPHER ROAD TO SOUTH POST ROAD

From Christopher Road, the rail trail moves south over two rail trestle bridges and then on to South Post Road in the heart of Patterson Springs. Although both of these bridges appear to be in good structural condition, an additional structural analysis will be required prior to project implementation.

A recommended spur connector heads east along South Post Road to a nearby grocery store.

Additional details are provided in the map on the facing page.



Existing conditions at rail trestle bridge 1.



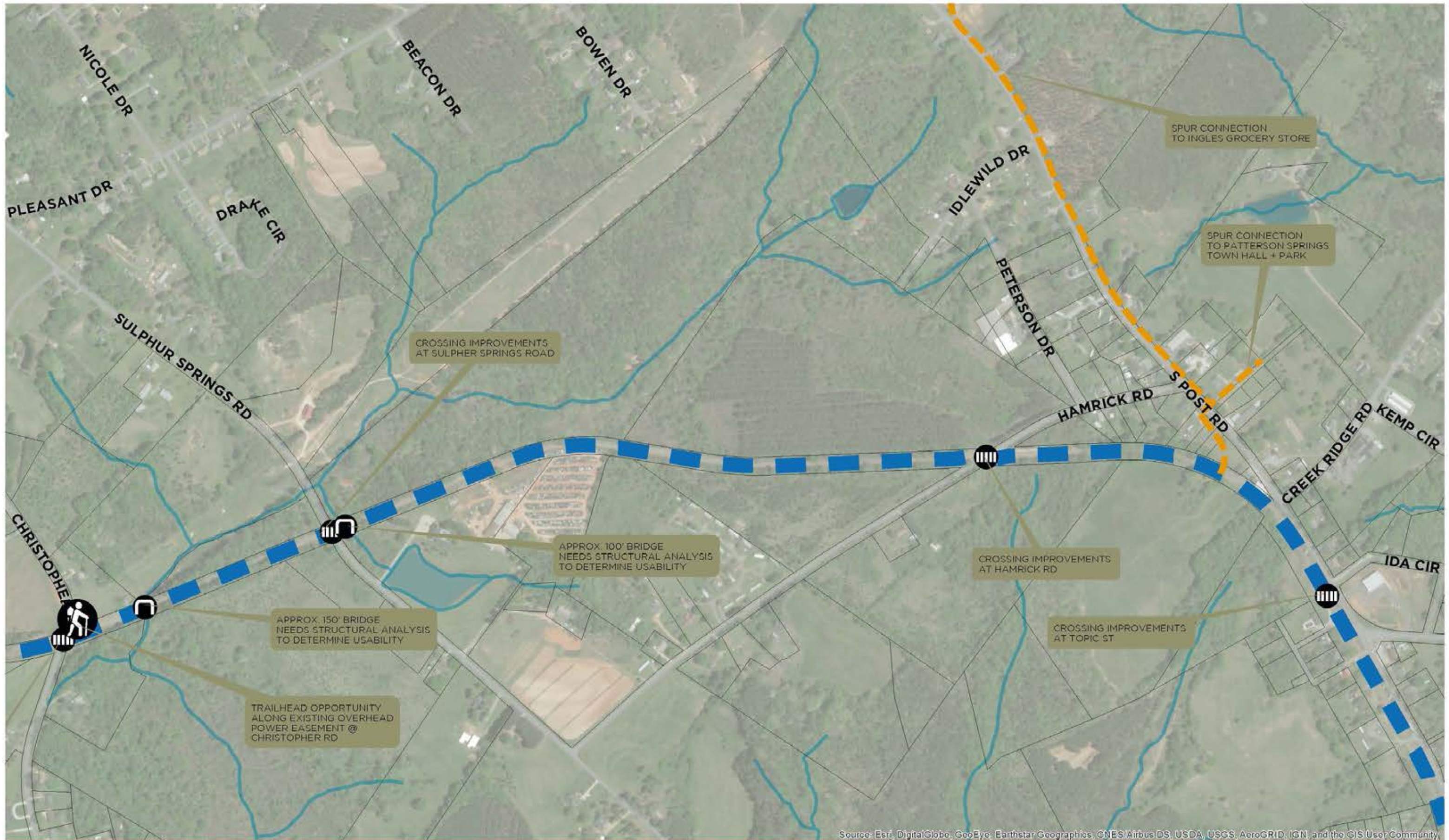
Existing conditions at rail trestle bridge 1.



Existing conditions at rail trestle bridge 2.



Existing conditions at South Post Road in Patterson Springs.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLEVELAND COUNTY RAIL TRAIL STUDY

PROPOSED SHELBY SECTION	EXISTING SHARED USE PATH	BRIDGE CROSSING IMPROVEMENT	RAIL	Miles	NORTH	alta PLANNING + DESIGN
PROPOSED PATTERSON SPRINGS SECTION	PROPOSED SPUR CONNECTION	ROAD CROSSING IMPROVEMENT	PARCELS	Feet		
PROPOSED EARL SECTION	PLANNED SHARED USE PATH	NEW TRAILHEAD LOCATION	WATER BODY	SCHOOL PROPERTY	Page 4 of 7	

PATTERSON SPRINGS SECTION 2 & EARL SECTION 1: SOUTH POST ROAD TO CELANESE

As the rail trail heads southward through Patterson Springs, the alignment closely follows the South Post Road corridor to the Celanese property. Two key trailhead locations exist in this section: one at Ellis Chapel Baptist Church; and another at or near the volunteer fire station near the intersection of South Post Road and Sulphur Springs Road. A spur connector would also connect the trail to a commercial hub, the fire station, and the Township Three Elementary School.

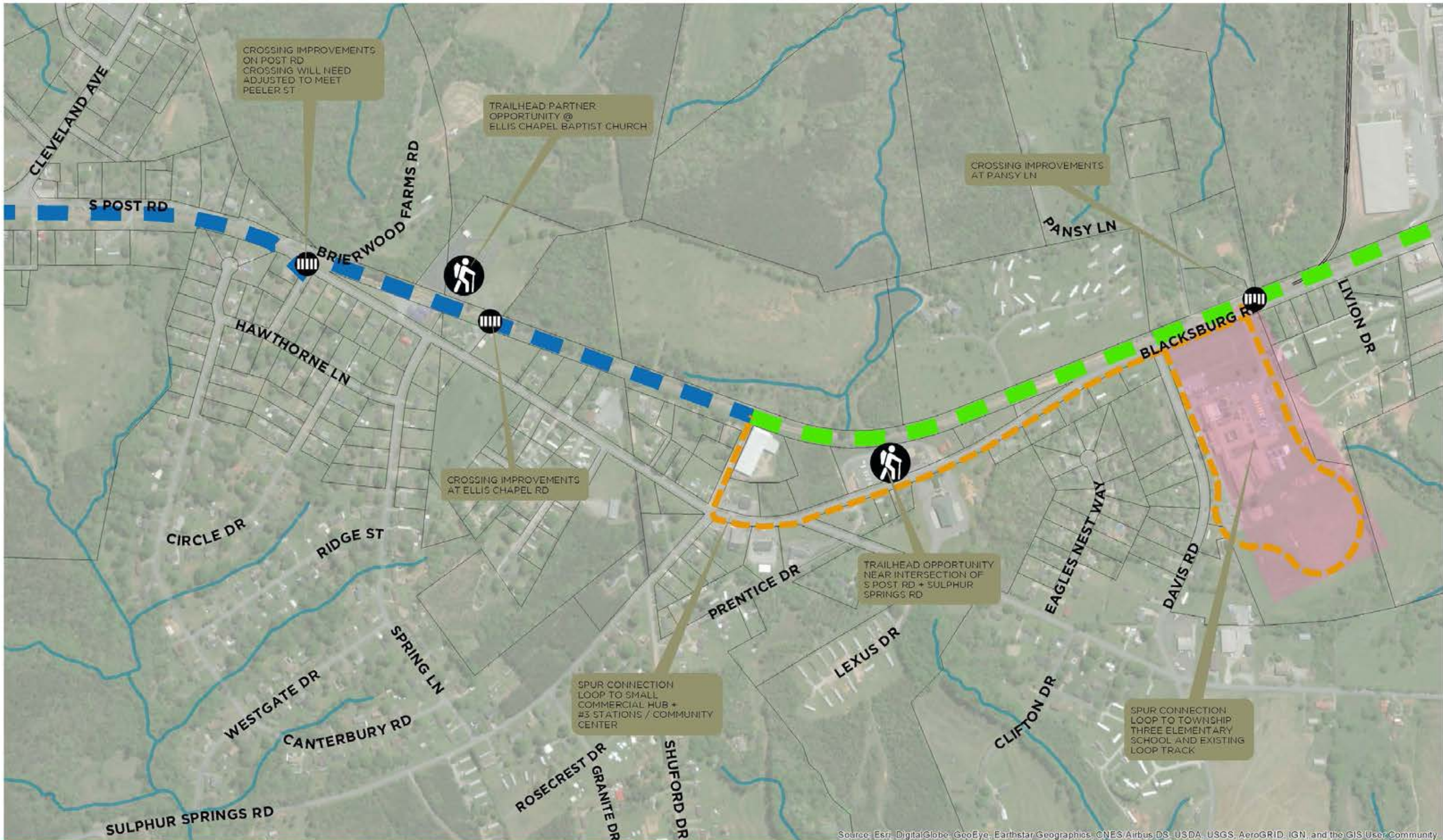
Additional details are provided in the map on the facing page.



Existing conditions at Ellis Chapel Baptist Church.



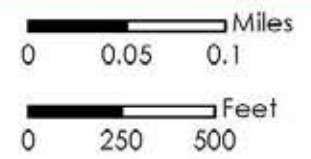
Existing conditions at Celanese.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLEVELAND COUNTY RAIL TRAIL STUDY

- | | | | |
|------------------------------------|--------------------------|-----------------------------|-----------------|
| PROPOSED SHELBY SECTION | EXISTING SHARED USE PATH | BRIDGE CROSSING IMPROVEMENT | RAIL |
| PROPOSED PATTERSON SPRINGS SECTION | PROPOSED SPUR CONNECTION | ROAD CROSSING IMPROVEMENT | PARCELS |
| PROPOSED EARL SECTION | PLANNED SHARED USE PATH | NEW TRAILHEAD LOCATION | WATER BODY |
| | | | SCHOOL PROPERTY |



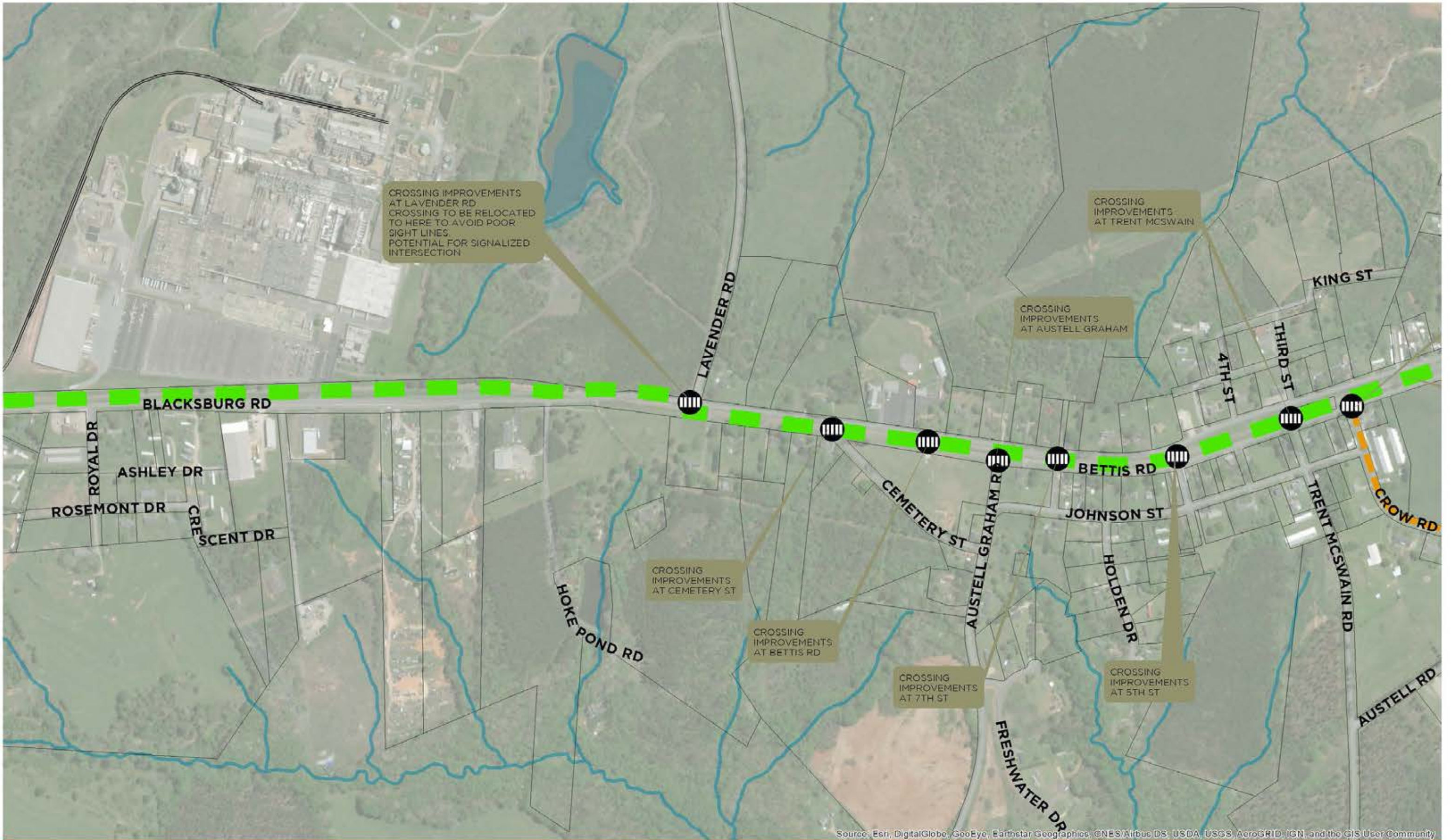
EARL SECTION 2: CELANESE TO CROW ROAD

The rail trail alignment runs south from the Celanese site to a potential trailhead at the intersection of Lavender Road. An additional trailhead opportunity exists at New Hope Baptist Church. As the trail nears the Town of Earl, it requires multiple intersection improvements across Blacksburg Road/Bettis Road.

Additional details are provided in the map on the facing page.



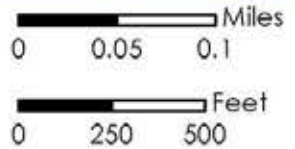
Existing conditions in Earl.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLEVELAND COUNTY RAIL TRAIL STUDY

- | | | | |
|------------------------------------|--------------------------|-----------------------------|-----------------|
| PROPOSED SHELBY SECTION | EXISTING SHARED USE PATH | BRIDGE CROSSING IMPROVEMENT | RAIL |
| PROPOSED PATTERSON SPRINGS SECTION | PROPOSED SPUR CONNECTION | ROAD CROSSING IMPROVEMENT | PARCELS |
| PROPOSED EARL SECTION | PLANNED SHARED USE PATH | NEW TRAILHEAD LOCATION | WATER BODY |
| | | | SCHOOL PROPERTY |



EARL SECTION 3: CROW ROAD TO STATE LINE

The southernmost section of the proposed rail trail extends from Crow Road to the North Carolina-South Carolina state line. This section includes three intersection improvements, one spur trail along Crow Road, and a proposed trailhead at Earl Town Hall.

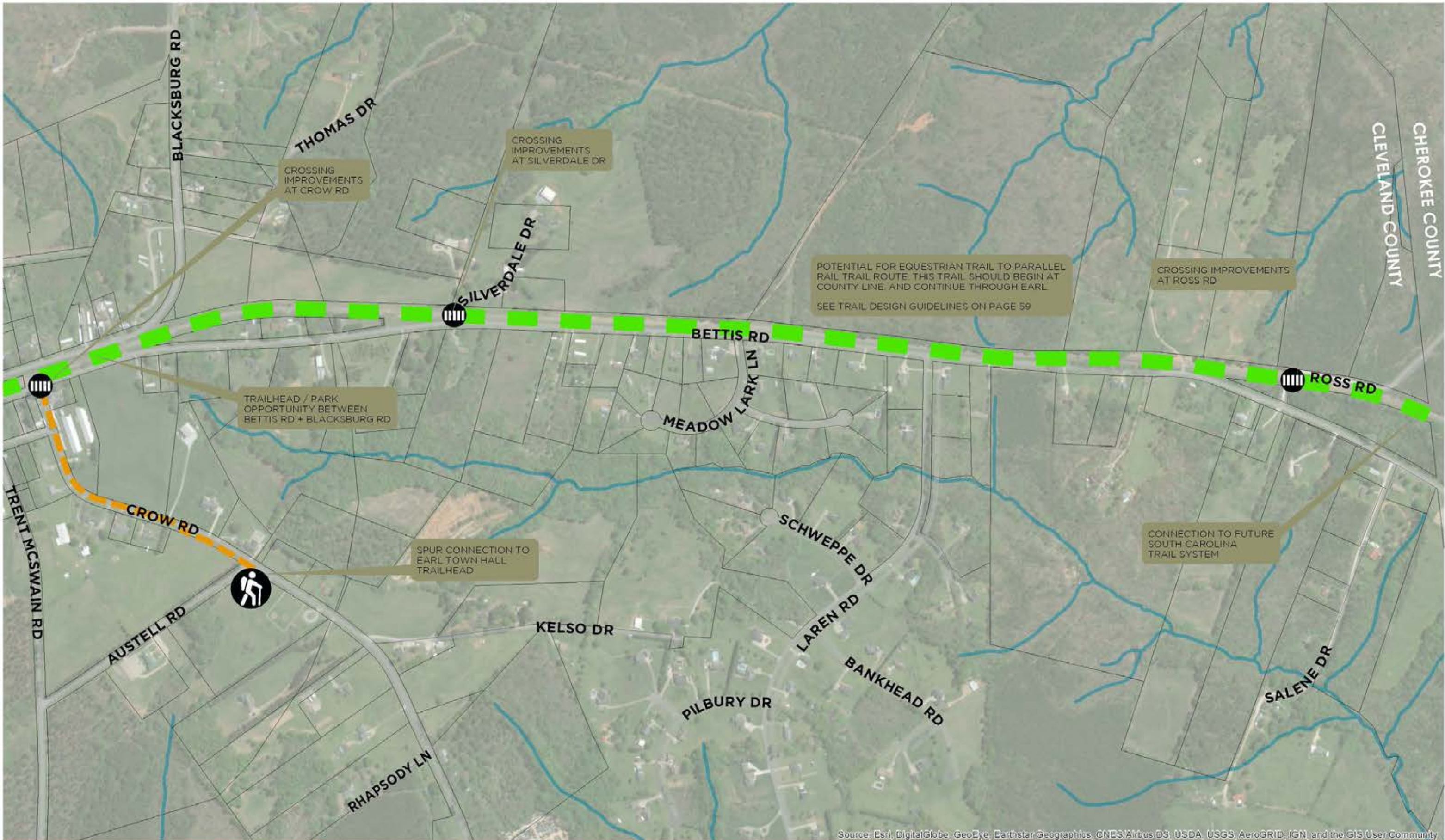
Additional details are provided in the map on the facing page.



Existing conditions at driveway crossing.



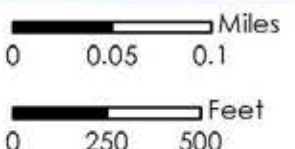
Existing conditions at Ross Road crossing.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CLEVELAND COUNTY RAIL TRAIL STUDY

- | | | | |
|------------------------------------|--------------------------|-----------------------------|-----------------|
| PROPOSED SHELBY SECTION | EXISTING SHARED USE PATH | BRIDGE CROSSING IMPROVEMENT | RAIL |
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| | | | SCHOOL PROPERTY |



3. Branding & Wayfinding

TRAIL BRANDING

Branding is a widely used term to describe the perception of a product or service in a target audience's mind. David Ogilvy, commonly known as the father of advertising, said it best— a brand is, “the intangible sum of a product's attributes.”

A rail trail is more than a physical facility; it is a *place*, a *destination* that people engage, enjoy, and share with their family, friends, and social media followers. Therefore, it is important for a trail to have an identity that includes all of the elements of a strong brand: a memorable name; specific fonts and typefaces; a color palette; an icon; and a tagline. Additionally, this brand identity should be extendable into marketing tools and environmental graphics such as signage and markers.

A brand for the Cleveland County Rail Trail should be crafted to provide a name and graphic identity that will foster successful implementation. Branding should remain consistent throughout all materials, messaging, and representation of the trail. Over the coming years, a brand will lay the foundation for identifying funding partners, marketing strategies, target markets, and tactics that will attract investment to the communities along the trail and create a personality that will attract visitors. The trail and the brand will also be critical for tourism promotion in the county. The brand can also provide a cohesive, professional appearance for materials and public messaging that will enable trail supporters to secure implementation funding.

This chapter explores three preliminary brand identity concepts as well as one environmental graphics/wayfinding concept for the Cleveland County Rail Trail.

Note that a professional marketing/branding firm will need to be utilized to develop the trail brand and collateral materials further as public consensus on a brand is solidified.

TRAIL BRANDING EXAMPLES



Carolina Thread Trail logo and tagline.



Swamp Rabbit Trail logo and tagline.

BRANDING CONCEPT 1: SPINNING JENNY TRAIL

As part of a 2016 Uptown Shelby master plan led by Arnett Muldrow & Associates, an identity and logo for a potential rail trail was developed. This concept, the Spinning Jenny Trail, speaks to the textile heritage of Shelby and Cleveland County. The logo for the Spinning Jenny features a bicycle-in-profile icon that accompanies a serifed and script-based text treatment.



BRANDING CONCEPT 2: TRIPLE C TRAIL

The Alta team developed two preliminary brand concepts for the Cleveland County rail trail. The first concept, the Triple C Trail, is a nod to the original railroad line name for this corridor. The icon for this logo combines three “C”s inside a gear badge. A tagline, “Connecting Cleveland County NC” plays off of the Triple C name.



BRANDING CONCEPT 3: SILVER STRINGS TRAIL

The second concept, the Silver Strings Trail, features a name that builds on the musical and textile heritage of the county. A stringed gear icon evokes both stringed instruments as well as textile machinery and bicycle gears.



ENVIRONMENTAL GRAPHICS & MARKETING

In order to be more than a logo, a brand must be utilized in signage, pavement markings, maps, and marketing collateral. This usage will flesh out the brand identity and allow it to become an integral part of the overall identity of Cleveland County.



Branded pavement marking concept.

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Healthy living has never been so much fun!

Branded marketing collateral concept.

TRAIL WAYFINDING

A wayfinding system includes a toolkit of environmental graphics that orient, inform, direct, identify, and regulate actions and activities related to the rail trail. A wayfinding system concept for the Cleveland County Rail Trail is shown on the facing page. The various elements, which include trailhead markers and kiosks, directional signage, pavement markings, and maps, facilitate the trail user experience and reinforce the trail brand identity. The program adheres to a consistent, selective, and strategic manner so as not to clutter or dominate the visual character of the trails.

GATEWAY MONUMENTS

Municipalities often desire identification and a favorable image of their community. Gateway Monuments are typically any freestanding structure or sign that will communicate the name of a local entity. Gateway signs provide the first welcome to visitors while reinforcing community identity, pride, and sense of place. They should be integrated into the greater wayfinding plan in order to create a unified, welcoming, and legible system.



Gateway monuments should:

- Be a maximum of one Gateway Monument, visible from the traveled way, and placed at the appropriate approach to avoid distraction and visual clutter.
- Include the officially adopted town logo/seal, however this is not required.
- Be located well beyond the clear recovery zone or otherwise placed to minimize the likelihood of being struck by an errant vehicle (if along a roadway).
- Be kept clean, free of graffiti, and in good repair. Their care should be incorporated into City maintenance schedules prior to installation.
- Be developed and placed to require low or no maintenance to minimize exposure of workers and others to potential risks. Protective graffiti resistant coatings should be applied.
- Be composed of materials that are durable for the projected life span of the project.
- Be appropriate to the proposed setting and community context.
- Be in proper size and scale with its surroundings.

INFORMATIONAL COMPONENTS OF A COMPLETE WAYFINDING SIGNAGE SYSTEM

Orientation - provides an overview of the geographical context (example - Map Kiosk)

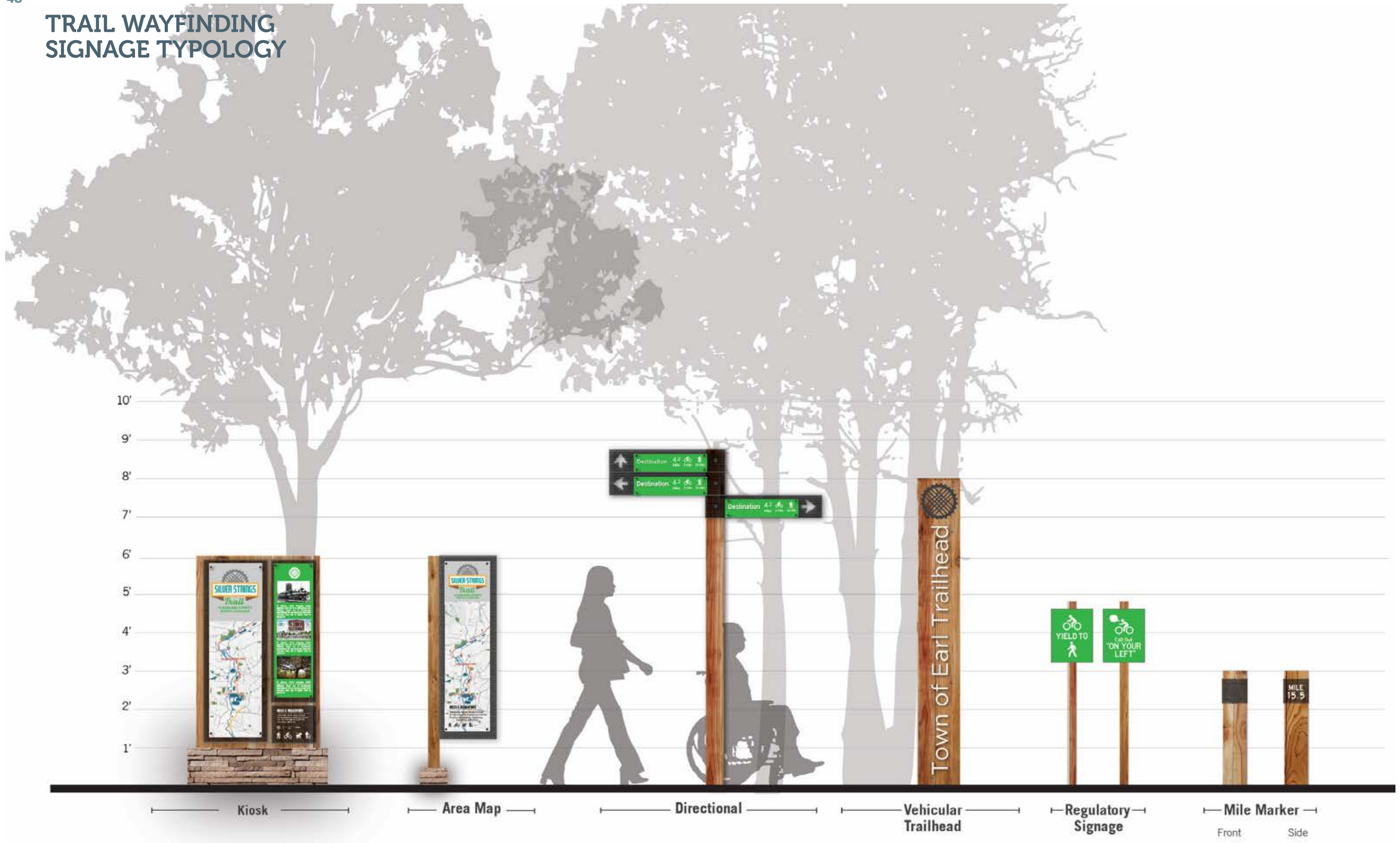
Informational - provides general or specific information about a place (example - Informational Kiosk)

Directional - the circulatory system of the trail (example - Trail Directional Sign)

Identification - first and foremost, identifies the Palmetto Trail but often may identify specific elements of the trail (example - Trailhead Monument)

Regulatory - describes the do's and don'ts of the trail or place along the trail (example - allowed trail uses or hour

TRAIL WAYFINDING SIGNAGE TYPOLOGY



DESTINATION/DIRECTIONAL SIGNS

The ability to navigate through a city is informed by landmarks, natural features, and other visual cues.

Wayfinding signs should indicate:

- Direction of travel.
- Location of destinations.
- Location of access points.

These signs increase users' comfort and accessibility to the trail network. Wayfinding signage can serve many purposes including:

- Helping to familiarize users with the trail system.
- Helping users and emergency responders identify locations, in case of emergency on trails.
- Helping users identify the best routes to destinations.
- Helping overcome a "barrier to entry" for people who do not use the trail system.
- Helps users find access points to the trail system.
- Wayfinding signs also visually cue motorists that they are driving near a trail corridor and should use caution. Signs are typically placed at key locations leading to and along routes, including the intersection of multiple routes.

REGULATORY SIGNS

Regulatory signs give a direction that must be obeyed, and apply to intersection control, speed, vehicle movement and parking. The examples below are types of regulatory signage.

- Smaller scale signs or plaques may be used for trail applications.
- See the MUTCD 9B for a detailed list of regulatory sign application and guidance.

ETIQUETTE SIGNAGE

Informing trail users of acceptable etiquette is a common issue when multiple user types are anticipated. Yielding the right-of-way is a courtesy and yet a necessary part of a safe trail experience. The message must be clear and easy to understand. The most common trail etiquette systems involve yielding of bicyclists to pedestrians.

- Trail etiquette information should be posted at access points and periodically along the trail.

INTERPRETIVE SIGNAGE

Interpretive displays provide trail users with information about the surrounding environment or site, wildlife, vegetation, history and the significance of cultural elements. Interpretive displays may also be combined with public art and sculpture opportunities along the trail.

- Consider the character of the trail and surrounding elements when designing these signs.
- Work with experts specific to the information you are conveying on the signs such as historians, ecologists, or artists.
- Separate interpretive signage panels from the main trail circulation so that users can stop and not impede traffic.
- Consider including interpretive signage at rest stops or areas of congregation.
- Panels must be ADA accessible.
- Consider use of technology for interpretation.

INFORMATIONAL KIOSKS AND MESSAGE CENTERS

Kiosks and message centers provide trails users with information to orient themselves, learn of areas of interest, read the rules and regulations of the trail system, and find the hours of operation.

- Install kiosks at each major and minor trailhead.
- The entire Cleveland County trail network, rules and regulations, and accessibility advisories should be included on each kiosk.
- When locating kiosks next to parking facilities, set the units back far enough from traffic and protect the support posts or structure with appropriately sized barriers.
- Provide ADA access using established guidelines for visual height, clearance, and surface type where kiosks are located.
- Evaluate the use of emerging technology options for implementation of greenway information and messages as part of the signage program.

4. Design Guidelines

APPLICABLE DESIGN GUIDELINES

STATE AND NATIONAL DESIGN GUIDELINES AND STANDARDS

At the state and national levels, there are existing guidelines that apply to shared-use paths, and pedestrian and bicycle facilities. While these documents are not absolute standards, many public agencies require projects to meet the guidelines as a minimum condition for key dimensions including slope, horizontal and vertical clearances, and surface condition, signage, and pavement markings. In addition, all applicable local design and construction standards will need to be followed. These key documents published by The American Association of State Highway and Transportation Officials (AASHTO), the U.S. Department of Transportation (USDOT), and others include:

AASHTO GUIDELINES FOR THE DEVELOPMENT OF BICYCLE FACILITIES

The most recent version of this nationally recognized document is the 4th Edition, dated 2012. The guide is described by AASHTO as follows:

This guide provides information on how to accommodate bicycle travel and operations in most riding environments. It is intended to present sound guidelines that result in facilities that meet the needs of bicyclists and other highway users. Sufficient flexibility is permitted to encourage designs that are sensitive to local context and incorporate the needs of bicyclists, pedestrians, and motorists.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

The 2009 Federal MUTCD includes Part 9: Traffic Controls for Bicycle Facilities, along with detailed guidelines for pedestrian facilities crossings, and is available on-line at: http://mutcd.fhwa.dot.gov/kno_2009.htm.

UNIVERSAL DESIGN/ADA ACCESS

Good universal design for city trails will ensure access for everyone no matter their physical abilities. In addition, all greenway paths and other trails that receive funding from state or federal sources must conform to the Americans with Disabilities Act (ADA) guidelines, and Public Rights of Way Accessibility Guidelines (PROWAG). The Federal Highway Administration publishes a guidebook entitled *Designing Sidewalks and Trails for Access*. Chapter 5, Trail Design for Access is the most relevant portion of the report and is available on-line at: https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/

OTHER SOURCES

Other sources reviewed for this Feasibility Study include:

- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities
- South Carolina Department of Transportation Highway Design Manual and Engineering Directive Memoranda
- FHWA Small Town and Rural (STAR) Multimodal Networks Guide



GENERAL DESIGN PRACTICES FOR PAVED GREENWAY TRAILS

The intent of greenway trail construction is to make open space available without damaging the qualities of the natural environment that are most valued and appreciated. Surfacing should be selected to support projected intensities of use and to enable multiple uses. Surfacing should also account for site topography, surface drainage, frequency of flooding, construction cost, and maintenance concerns.

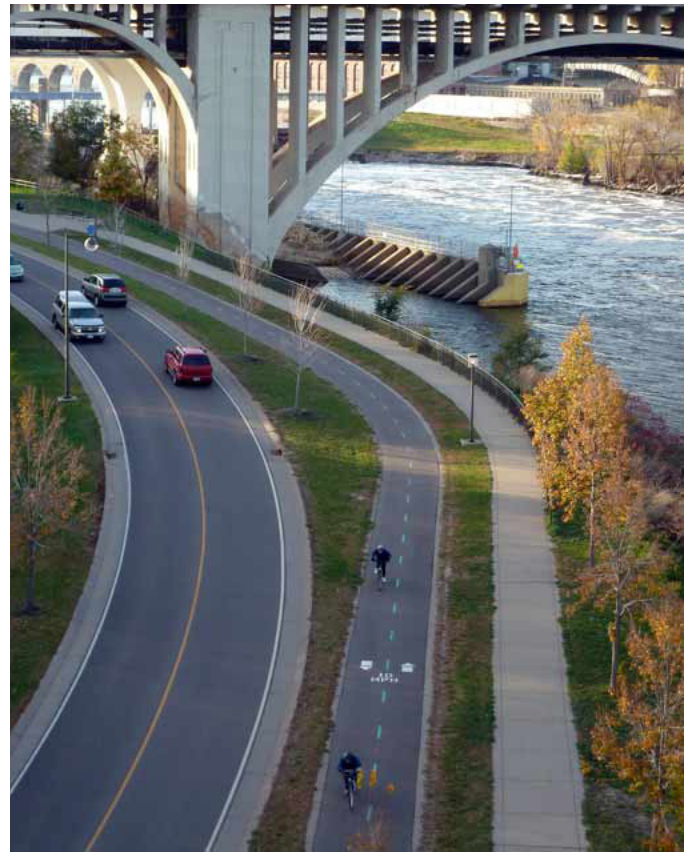
Key features of greenway trails include:

- Frequent access points from the local on-street transportation network.
- Directional signs to direct users within the greenway trail network.
- A limited number of at-grade crossings with streets or driveways.
- Providing easily accessible connections to destinations.
- Designing facilities that safely accommodate multiple user types.

GREENWAY TRAIL SURFACING TYPES

American Disabilities Act Accessibility Guidelines compliant greenway trails require paved surfaces, in most instances for access and ease of use. In limited cases, packed gravel fines can be used, where there is little to no topography. However, packed surfaces require much more maintenance effort and cost over time, and may not be desirable in the long term.

Asphalt tread surfaces have traditionally been used for greenway trails. Asphalt greenway trails offer substantial durability for the cost of installation and maintenance. Asphalt is popular with users for its smooth, continuous surface and has the benefit of lower cost, but requires more upkeep than concrete. As a flexible pavement, asphalt can also be considered for installing a paved greenway trail on grades steeper than 3 percent. If constructed properly on suitable sub-grade, asphalt has a life span of about half that of concrete, or 10-15 years.

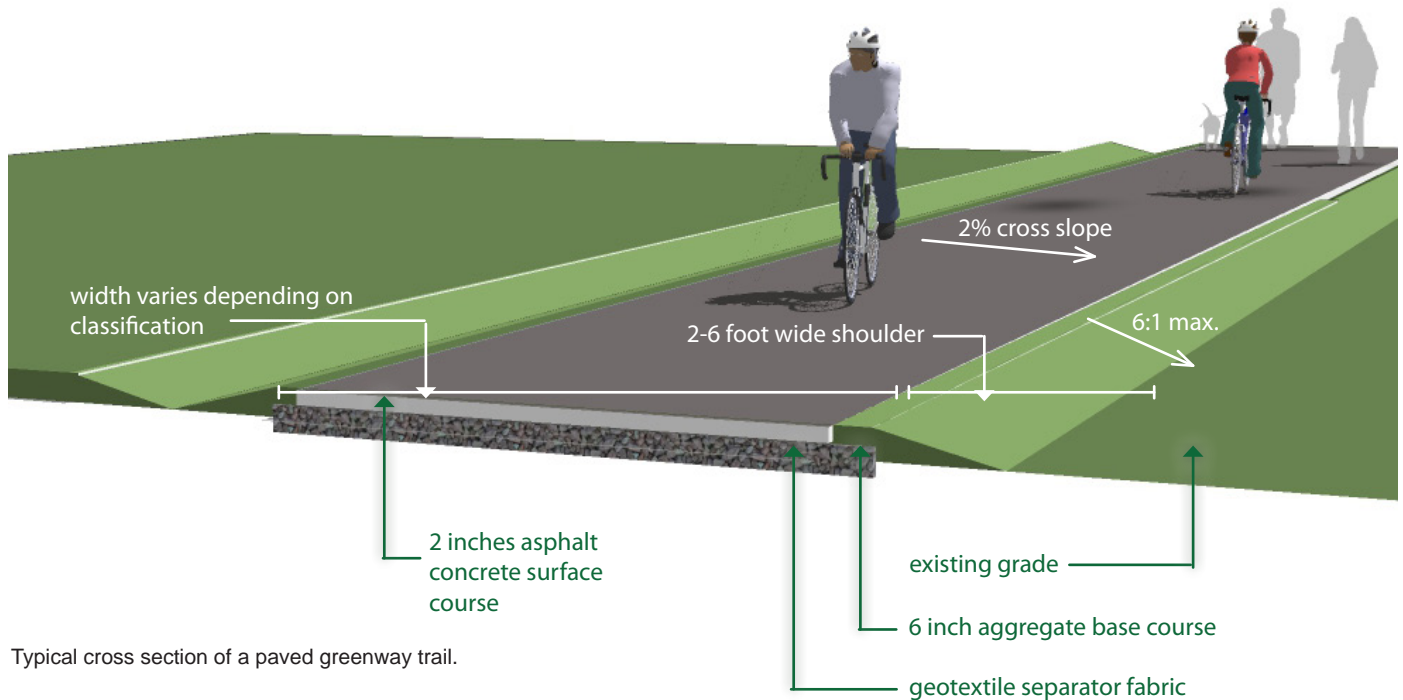


Example of a separated track for pedestrians; along West River Parkway, Minneapolis; photo by Stuart Macdonald, 29 Oct 2010; courtesy of American Trails

When properly constructed and maintained on a regular basis, concrete can last 25 years or more. The high cost of concrete is often the most limiting factor since it is one of the most expensive surfaces to install. It is recommended that concrete be used for its superior durability and lower maintenance requirements in areas prone to frequent flooding, and for intensive urban applications.

Permeable paving is twice the cost of asphalt to install and is only recommended in very special greenway trail applications under the following considerations:

- A maintenance schedule must be established for vacuuming debris after storm events (required to retain permeability)
- Only use permeable paving areas with proper drainage (not suitable in floodplain or areas with ponding or sedimentation)



Typical cross section of a paved greenway trail.

When determining surface type for greenway trails, consider topography, landscape position, and underlying soils. All surfaces have advantages and disadvantages, and each must be analyzed to determine which surface is appropriate in any given location.

GUIDANCE

Width

- Eight feet is the absolute minimum width allowed for a shared use greenway trail and is only recommended for low-volume Neighborhood Trails. AASHTO requirements for trails receiving federal funding is a minimum of ten feet in width.
- Ten feet is recommended in most situations and is adequate for moderate to heavy use on Greenway Collector Trails, Greenway Connectors, and Neighborhood Greenway Trails.
- Twelve feet in width is recommended for situations with high concentrations of multiple users. A separate track (5 feet minimum) can be provided for pedestrian use where right-of-way permits. Separated tracks are recommended for consideration on Cross City Greenway Trails only.

Lateral Clearance

- A 2 foot minimum shoulder on both sides of the greenway trail should be provided for all greenway trail classifications. An additional 4 feet of lateral clearance (total of 6 feet) is a standard for the installation of signage or other furnishings.
- Use 6 feet of shoulder in fill sections and 3 feet of shoulder in cut sections.
- If bollards are used at intersections and access points, they should be colored brightly and/or supplemented with reflective materials to be visible at night and spaced adequately (see Bollards guideline for more information).

Overhead Clearance

- Clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.
- Convex mirrors should be provided at blind corners and at the approaches to underpasses with poor sight lines.

Striping

- Striping should be used on greenway trails with anticipated heavy use or high concentrations of users.

Surface Grade

- Greenway trails should be designed to comply with ADAAG standards when possible (see Accessible Greenway Trail Design guideline section for more information).
- Provide a 2 percent cross slope from crown of trail in both directions to provide positive drainage off the trail as conditions allow.
- Provide a 48 inch safety rail for the following circumstances within 6 feet of the edge of pavement:
 - Slope is greater than or equal to 3:1 and drop of 6 feet
 - Slope is greater than or equal to 2:1 and drop of 4 feet
 - Slope is greater than or equal to 1:1 and drop of 1 foot
- It is recommended that concrete be used for its superior durability and lower maintenance requirements, specifically in areas prone to frequent flooding, since the hardness and jarring of this surface is not preferred by runners or cyclists. Saw cut concrete joints rather than troweled improve user experience.
- Proper trail foundation will increase the longevity of the trail. Two inches of surfacing material over six inches of base course gravel over geotextile fabric is recommended.



Materials

- Asphalt is the most common surface for greenway trails, offering substantial durability for the cost of installation and maintenance.

Summary of Path Type Design Guidelines

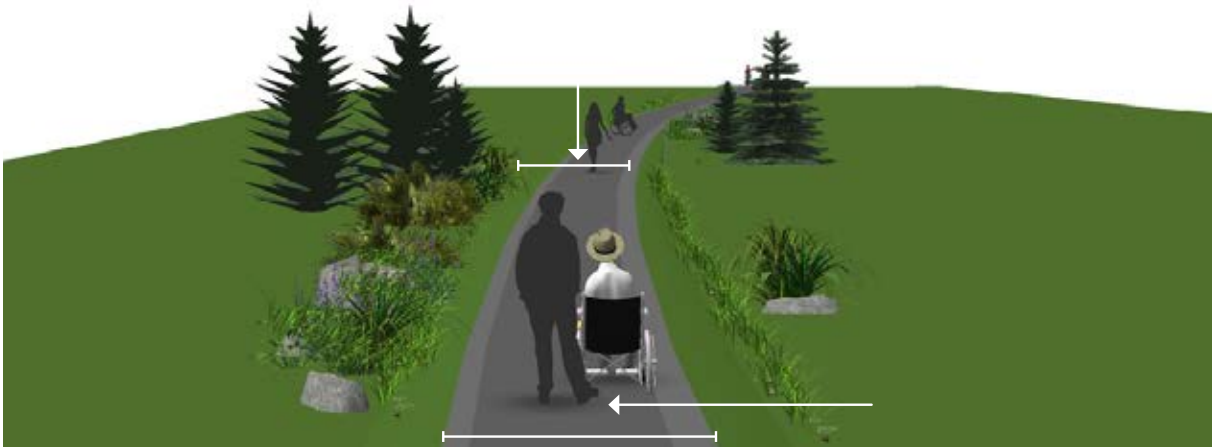
Path Type	Width	Longitudinal Slope	Cross Slope	Vertical Clearance	Material	Design Speed
Natural Surface Trail	18" - 10'	<5%	2%	8' - 10'	Bare Earth, Rock, Mulch	<5mph
Sidewalk	6' - 8'	<5%	0.5% - 2%	8' - 10'	Concrete	<5mph
Pedestrian Path	4' - 8'	<5%	0.5% - 2%	8' - 10'	Stabilized Decomposed Granite	<5mph
Shared Use Greenway	10' - 12'	<5%	2%	12'	Asphalt, Concrete	18 - 25mph
One-Way Bike Path	7' - 8'	<5%	2%	12'	Asphalt, Concrete	25mph
Two-Way Bike Path	14' - 16'	<5%	2%	12'	Asphalt, Concrete	25mph

ACCESSIBLE GREENWAY TRAIL DESIGN

The United States Access Board has approved American with Disabilities Act Accessibility Guidelines (ADAAG) for greenway trails and outdoor recreational access routes. Constructing greenway trails may have limitations that make meeting ADAAG and AASHTO guidelines difficult and sometimes prohibitive. Prohibitive impacts include harm to significant cultural or natural resources; a significant change in the intended purpose of the greenway trail; requirements of construction methods that are against federal, state, or local regulations; or terrain characteristics that prevent compliance.

Guidance

- Surface: Hardened surface such as asphalt, concrete, timber, compacted gravel
- Clear tread width: 36 inches minimum
- Tread Obstacles: 2 inches high maximum (up to 3 inches high where running and cross slopes are 5 percent or less)
- Cross Slope: 5 percent maximum
- Longitudinal slope must meet one or more of the following:
 - Five percent or less for any distance
 - Up to 8.33 percent for 200 feet max with resting intervals no less than 5 feet long and equal to the width of the trail at both ends.
 - Up to 10 percent for 30 feet max with resting intervals no less than 5 feet long and equal to the width of the trail at both ends.
 - Up to 12.5 percent for 10 feet max with resting intervals no less than five feet long and equal to the width of the trail at both ends.
- NOTE: If resting intervals are not located within the trail tread, adjacent resting interval clear widths must be 3 feet minimum.
- No more than 30 percent of the total greenway trail length may exceed a running slope of 8.33 percent.
- Passing Space: provided at least every 1,000 feet where greenway trail width is less than 60 inches.
- Signs: shall be provided indicating the length of the accessible greenway trail segment.
- Detectable pavement changes at curb ramp approaches should be placed at the top of ramps before entering roadways.
- Trailhead signage should provide accessibility information, such as trail gradient/profile, distances, tread conditions, location of drinking fountains, and rest stops.
- Provide one accessible parking space per every 25 vehicle spaces at trailheads.
- Greenway trail amenities, drinking fountains, and pedestrian-actuated push buttons should be placed no higher than 4 feet off the ground.



SHARED USE PATH DESIGN

Shared use paths are completely separated from motorized vehicular traffic and are constructed in their own corridor, or within an open-space area. Path design recommendations are listed below:

- The typical cross section is 10' wide minimum with 2' wide compacted single ground mulch shoulders
- The preferred cross section for areas of heavy use is 12' wide with 2' wide compacted single ground mulch shoulders
- On the overcrossings (bridges), 14' wide with 1' shoulders to separate pedestrian traffic.
- Steep grades should be avoided on any shared use path, with less than 5% as the recommended maximum gradient. Steeper grades can be tolerated for short distances (up to 30 feet).
- A 2% cross slope will resolve most drainage issues on a shared use path, except along cut sections where uphill water must be collected in a ditch and directed to a catch basin, where the water can be directed under the path in a drainage pipe of suitable dimensions. No sharp curves are anticipated along the path.
- Dashed center line striping shall be used along the path with constrained areas and sharp or blind curves having a solid line.
- The typical setback from edge of tread to obstructions shall be 3 feet, 2 foot minimum.
-
- The design speed for the shared use path should be 25 miles per hour. Speed bumps or other surface irregularities or obstacles should not be used to slow bicycles. Slower speeds may be posted for areas that have at least one of the following: higher typical user volumes, substandard pathway conditions, or equestrian usage.
- Stopping sight distance on horizontal curves and lateral clearance can be calculated using the equations in the American Association of State Highway and Transportation Officials Guide for the Development of Bicycle Facilities, 4th Edition (AASHTO).
- A twelve-foot vertical clearance should be maintained. This area should be free from tree limbs and any other obstructions that may interfere with pathway use. This clearance should be maintained at bridge under crossings. If the existing clearance is more than 12', the existing clearance shall be maintained or approval from the governing agency shall be obtained.
- The use of bollards is discouraged to avoid creating obstacles for bicyclists. Bollards, particularly solid bollards, have caused serious injury to bicyclists. Instead, design the path entry and use signage to alert pathway users that combustion engines are prohibited. In cases where bollards must be used, they should be installed to be removed or be flexible to allow passage of maintenance or emergency vehicles. Solid bollards should not be used at all.

EQUESTRIAN PATH DESIGN

Equestrian paths should be separated from vehicular traffic as well as other trail traffic. Therefore, a dedicated right-of-way and natural surface trail facility is required. In Cleveland County, the Earl section could be studied for a parallel equestrian trail facility.



Suggested Widths and Clearance For A Standard, Single-Track Horse Trail

Trail Element	Low Development	Medium Development	High Development
Tread Width	1.5 - 2 ft	3 - 6 ft	8 - 10 ft
Clearing Width (horizontal)	5.5 - 8 ft (Tread plus 2' to 3' each side)	9 - 12 ft (Tread plus 3' each side)	14 - 18 ft (Tread plus 3' each side)
Vertical Clearance	10	10 - 12 ft	10 - 12 ft

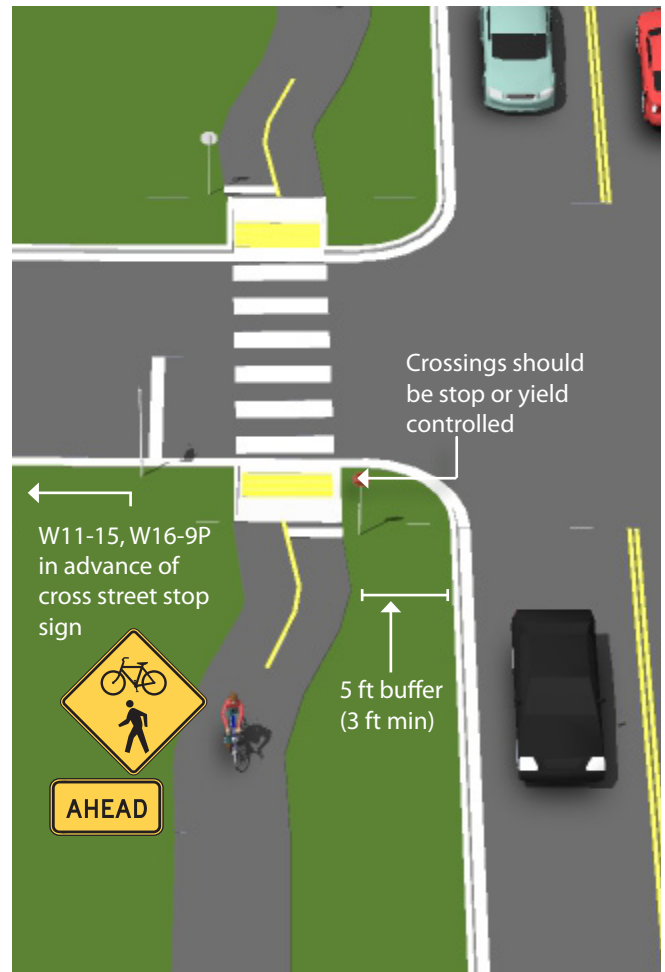
Source: USDA/FHWA Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds

DESIGN CONSIDERATIONS FOR GREENWAY TRAILS IN ROADWAY CORRIDORS

Greenway trails located within the roadway right-of-way (ROW) are typically classified as Greenway Connectors. Sometimes referred to as 'sidepaths,' they provide more comfortable widths than sidewalks and can accommodate multiple users when designed adequately.

Guidance

- This configuration works best along roadways with limited driveway crossings and with services primarily located on one side of the roadway, or along a riverfront or other natural feature. Not recommended in areas with frequent driveways or cross streets.
- A minimum of 10 feet wide is necessary for bicyclists to pass other users safely on sidepaths.
- A 5 foot or greater vegetated buffer between the sidepath and the roadway should be provided.
- At driveway entrances and other roadway crossings, appropriate regulatory and wayfinding signage and crossing treatments should be provided.
- In some cases, Greenway Connectors will transition from sidepaths to sidewalks or designated bicycle lanes. In the event that sidepaths merge onto streets, provide appropriate signage and pavement markings to help safe merging.
- Structures, such as retaining walls and bridges are not permitted in ROW and may only be used in special conditions.
- Depending on Average Daily Traffic (ADT) and design speeds, a clear recovery zone of 9 to 14 feet from the edge of travel lane to edge of greenway trail is required in roadway ROW.



BOLLARDS

Bollards are physical barriers designed to restrict motor vehicle access to greenway trails. Sometimes physical barriers are still ineffective at preventing access, and can create obstacles to legitimate greenway trail users. Alternative design strategies use signage, landscaping, and curb cut design to reduce the likelihood of motor vehicle access.

Bollards are effective in preventing unauthorized motor vehicle entry and should be utilized at all major access points and trail heads throughout the Cleveland County greenway system.

Guidance

- Bollards should be a minimum height of 40 inches and a minimum diameter of 4 inches.
- Bollards should be set back from the roadway edge a minimum of 20 feet.
- When more than one post is used, an odd number of posts spaced 6 feet apart is desirable.
- Posts should be permanently reflectorized for night time visibility and painted a bright color for improved daytime visibility.
- Striping an envelope around the post is recommended.
- Lockable, removable bollards allow entrance by authorized vehicles. Where used, the top of the mount point should be flush with the path surface.
- Flexible bollards and posts are designed to give way on impact and can be used instead of steel or solid posts.
- “No Motor Vehicles” signage (MUTCD R5-3) may be used to reinforce access rules.
- Vertical curb cuts should be used to discourage motor vehicle access.
- Consider targeted surveillance and enforcement at specific intrusion locations.

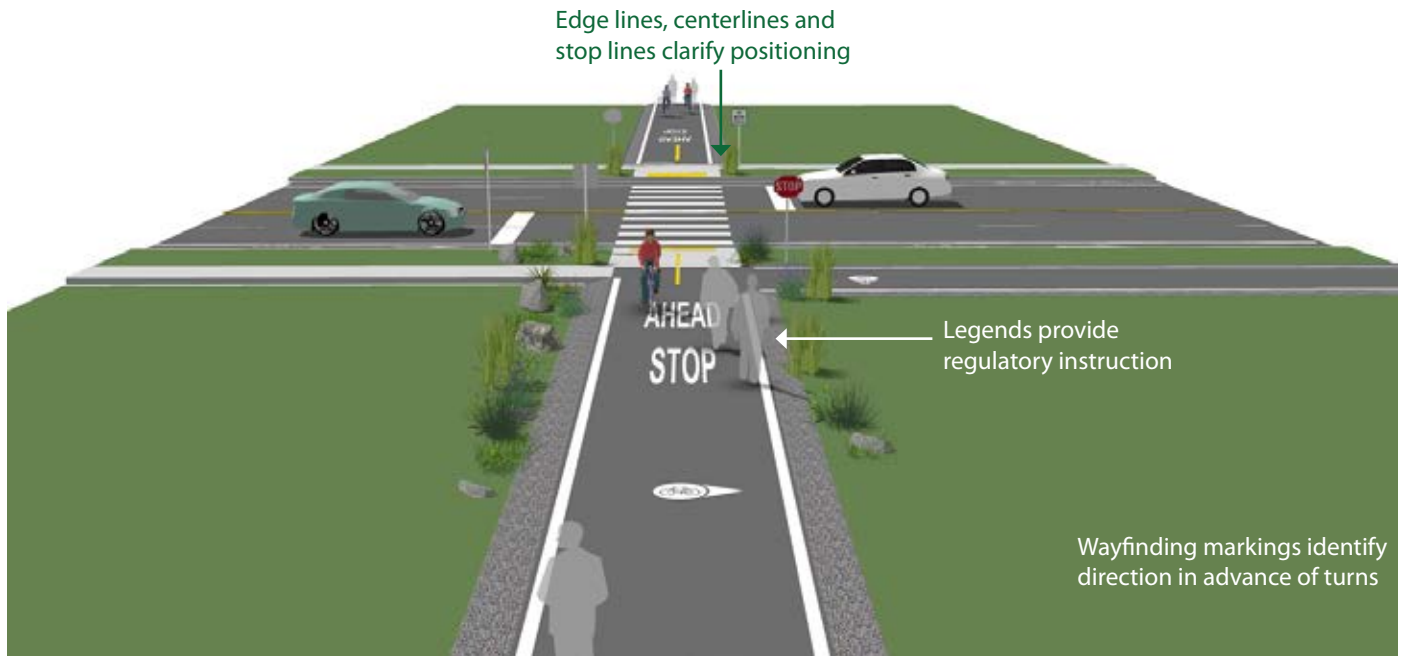


PAVEMENT MARKINGS

Pavement markings are commonly used to reinforce signs along a greenway trail, but they should not be used to replace signs altogether. Center line striping is the most common form of pavement marking, but warning, regulatory, and directional messages can be used. Use pavement markings sparingly and only where necessary to attract additional attention to a possible problem area.

Guidance

- Do not use pavement markings at critical stopping or turning points.
- High visibility thermoplastic material is the most durable and visible. Use white or yellow.
- Pavement markings to consider include “Stop,” “Yield,” and “Slow.”
- Place messages at greenway trail access points, prior to roadway intersections or bridges, or near intersections with converging greenway trails.
- When striping is required, use a 4 inch dashed yellow centerline stripe with 4 inch solid white edge lines.
- Solid centerlines can be provided on tight or blind corners, and on the approaches to roadway crossings.
- Non-slip or non skid pavement marking or striping materials should be used in all cases when trails are wet.
- Consider using at road intersections for road name identification.



ENVIRONMENTAL MANAGEMENT

Drainage and Erosion Control

Drainage and erosion control is necessary to maintain a stable greenway trail system and low maintenance facility. Excessive soil erosion near a greenway trail is usually the result of water collecting and flowing along the trail edge or onto the surface with enough volume and velocity to carry away soil. This results in a degraded greenway trail area and potential impacts to adjacent or downstream water resources. When managing stormwater along all Cleveland County trails, use dispersed infiltration systems such as vegetated swales, over engineered stormwater control structures such as storm drains, and catch basins for reduced maintenance and improved aesthetic.

Guidance

Paved Surfaces:

- A 2 percent cross slope will resolve most drainage issues on a paved greenway trail and should be used for both the tread and its shoulders. A maximum 1:6 slope is used for the shoulders although 2 percent is preferred. For sections of cut where uphill water is collected in a ditch and directed to a catch basin, water should be directed under the greenway trail in a drainage pipe of suitable dimensions.
- Following land contours helps reduce erosion problems, minimizes maintenance, and increases comfort levels on all greenway trail classifications.
- Provide low groundcover vegetation up to the edge of the greenway trail to prevent erosion on shoulders.

Natural Surfaces:

- Erosion will occur on natural surface greenway trails. Natural surface greenway trails should be designed to accommodate erosion by shaping the tread to limit how much erosion occurs and to maintain a stable walkway and tread. The goal is to outslope the greenway trail so that water sheets across, instead of down, its tread.

- Contour trails are also outsloped 5 percent from the face of the ridge to aid in sheeting water off the trail during rain events. These trails disperse and shed water in a non-erosive manner.
- Avoid fall line greenway trails when possible.
- Designing trails with rolling grades is the preferred way to build sustainable natural surface trails. “Rolling grade” describes the series of dips, crests, climbs, and drainage crossings linked in response to the existing landforms on the site to form a sustainable trail.
- Frequent grade reversals (grade dips, grade brakes, drain dips, or rolling dips) are a critical element for controlling erosion on sustainable trails. A general rule-of-thumb is to incorporate a grade reversal every 20 to 50 linear feet along the trail to divide the trail into smaller watersheds so the drainage characteristics from one section won’t affect another section.



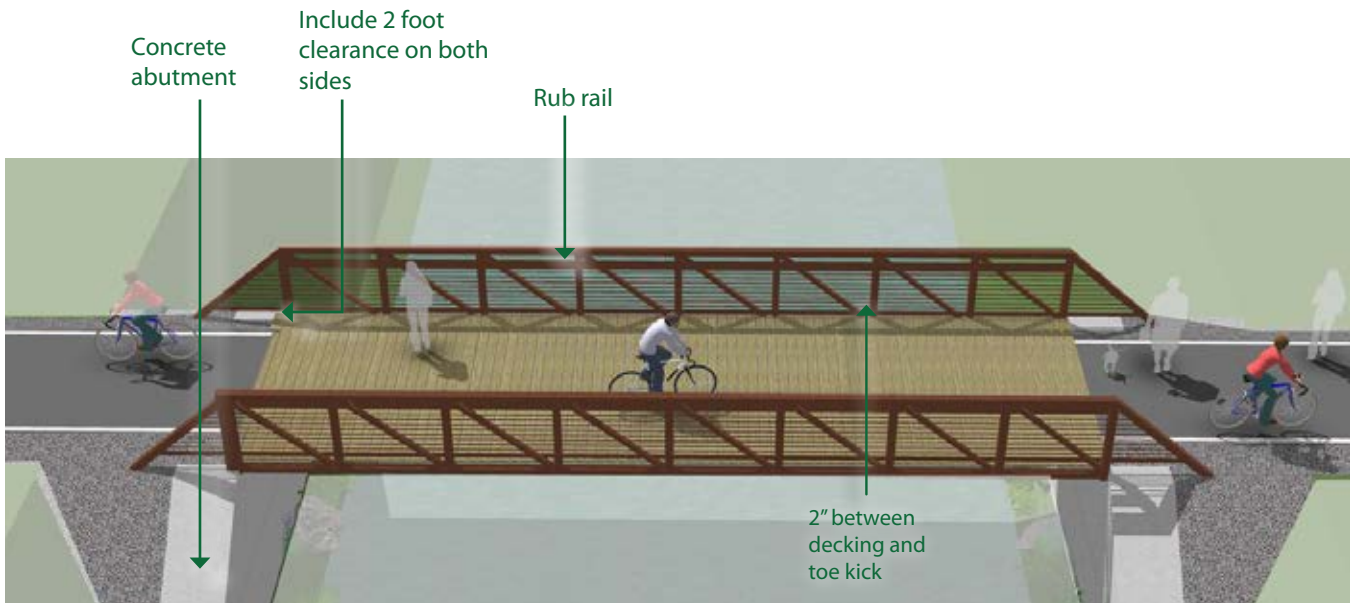
BRIDGES

Trail bridges are most often used to provide user access over natural features such as streams and rivers, where a culvert is not an option or the span length exceeds 20 feet. The type and size of bridges can vary widely depending on the greenway trail and specific site requirements. Bridges often used for greenway trails within the Cleveland County trail system include suspension bridges and prefabricated clear span bridges. When determining a bridge design for greenway trails, it is important to consider emergency and maintenance vehicle access.

Greenway trails that are poorly designed through water features can impact wetlands and streams, and become conduits for delivering sediments, nutrients, and pathogens to the watershed. Greenway trails that cross streams can exhibit bank and streambed erosion if not properly constructed.

Guidance

- The clear span width of the bridge should include 2 feet of clearance on both ends of the bridge approach for the shoulder.
- Bridge deck grade should be flush with adjacent greenway trail tread elevation to provide a smooth transition. Any gap between bridge deck and trail tread should be covered with steel plate.
- Railing heights on bridges should include a 42 inch minimum guard rail, and 48 inches where hazardous conditions exist.
- A minimum overhead clearance of 10 feet is desirable for emergency vehicle access. Maximum opening between railing posts is 4 inches.
- A greenway trail bridge should support 10 tons for 10 foot wide greenway trails, and 20 tons for wider than 10 feet for emergency vehicle access.
- Bridges along greenway trails that allow equestrian use should be designed for mounted unit loadings.
- When crossing small headwater streams, align the crossing as far upstream as possible in the narrowest section of stream channel to minimize impact.
- Greenway trail drainage features should be constructed to manage stormwater before the greenway trail crosses the watercourse.
- All abutment and foundation design should be completed and sealed by a professional structural engineer licensed in the State of South Carolina. All greenway trail bridges will require local building permits, stormwater and land disturbance permits, floodplain development permits, and FEMA approval. Length and height of the bridge cords are governed by the width of the floodway and impacts to the base flood elevation of streams.

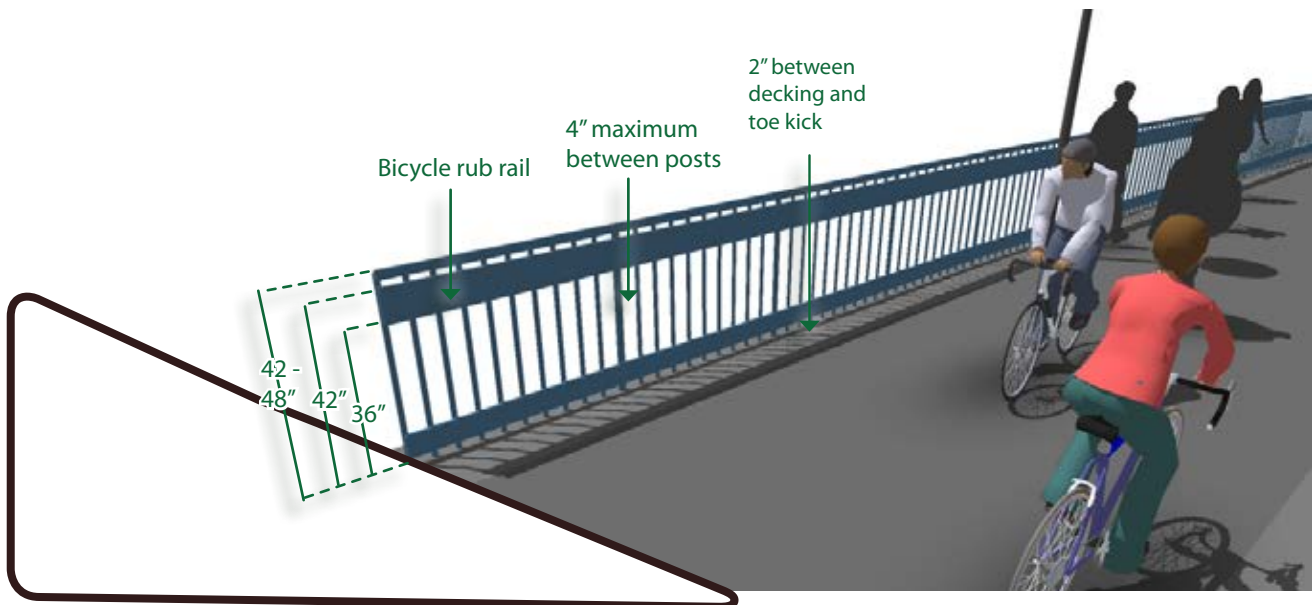


FENCING & RAILINGS

Railing and fences are important features on bridges, some boardwalks, or in areas where there may be a hazardous drop-off or incompatible adjacent land uses.

Guidance

- At a minimum, railings and fences should consist of a vertical top, bottom, and middle rail. Picket style fencing should be avoided as it presents a safety hazard for bicyclists.
- Railings should be at least 42 inches above the finished grade, and up to 48 inches where more hazardous conditions exist, such as a bridge over a highway.
- Openings between horizontal or vertical members on railings should be small enough that a 6 inch sphere cannot pass through in the lower 27 inches. For the portion of railing higher than 27 inches, openings may be spaced such that an 8 inch sphere cannot pass through.
- Use durable fencing and railing materials, such as vinyl or recycled plastic, for reduced maintenance and sustainability.
- The middle railing functions as a 'rub rail' for bicyclists and should be located 33 to 36 inches above the finished grade.
- Local, state, and/or federal regulations and building codes should be consulted to determine when it is appropriate to install a railing and comply with current standards.



INTERSECTIONS WITH ROADWAYS

At-grade roadway crossings can create potential conflicts between greenway trail users and motorists, however, well-designed crossings can mitigate many operational issues and provide a higher degree of safety and comfort for users. In most cases, at-grade greenway trail crossings can be properly designed to provide a reasonable degree of safety and can meet existing traffic and safety standards. Generally speaking, greenway trail facilities for bicyclists require additional considerations due to the higher travel speeds versus other greenway trail users.

Special consideration must be given when delineating at-grade greenway trail crossings. The sign types, pavement markings, and treatments will vary based on the roadway type the greenway trail crosses. Proper signage and pavement markings alerting greenway trail users of at-grade crossings must also be utilized. Care must be taken not to place too many signs at crossings lest they begin to lose their visual impact.



An example of an at-grade roadway intersection

INTERSECTIONS WITH OTHER GREENWAY TRAILS

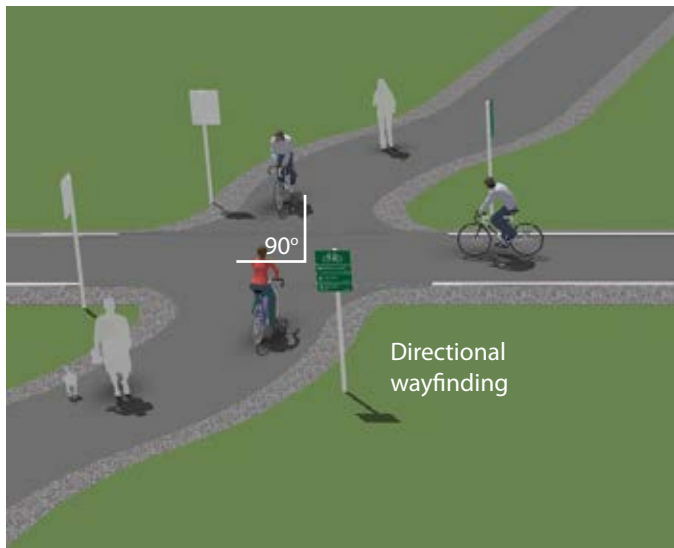
At the intersection of two greenway trails, users should be aware that they are approaching an intersection and of the potential for encountering different user types from a variety of directions. This can be achieved through a combination of regulatory and wayfinding signage and unobstructed sight lines.

Guidance

- Greenway trails should be aligned to intersect at 90 degree angles when possible.
- Sight lines should be clear for all users, as determined by expected user speeds.
- Consider off-setting the greenway trail intersection and creating two three-way intersections rather than one four-way intersection.

- Include directional signage at intersections.
- If a roundabout design is used, consider the use of landscaping with low growing (no more than 24 inches high) and minimally spreading native shrubs and groundcover that require little maintenance and provide clear sight lines.
- Other material can be used within roundabouts such as boulders and public art to discourage shortcut paths through the central island as long as clear sight lines under 36 inches are maintained.

Reorient angled crossings to approach at 90 degrees



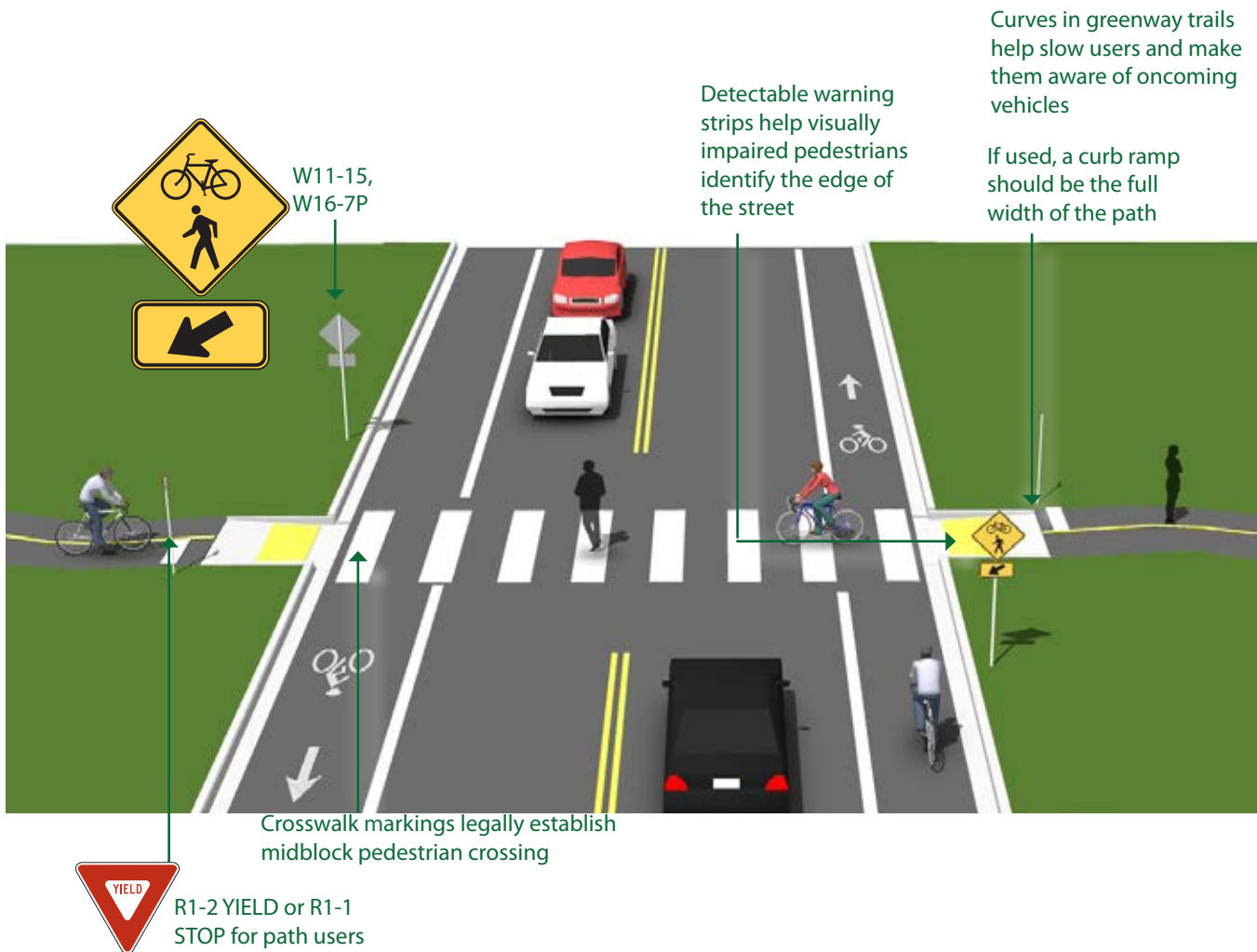
Trail roundabout



MARKED/UNSIGNALIZED CROSSINGS

A marked/unsignalized crossing typically consists of a marked crossing area, with signage and other markings to slow or stop traffic. The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, greenway trail traffic, use patterns, vehicle speed, road type, road width, and other safety issues such as proximity to major attractions.

When space is available, using a median refuge island can improve user safety by providing pedestrians and bicyclists space to perform the safe crossing of one side of the street at a time. Locate markings out of wheel tread when possible to minimize wear and maintenance costs.



MEDIAN REFUGE ISLANDS

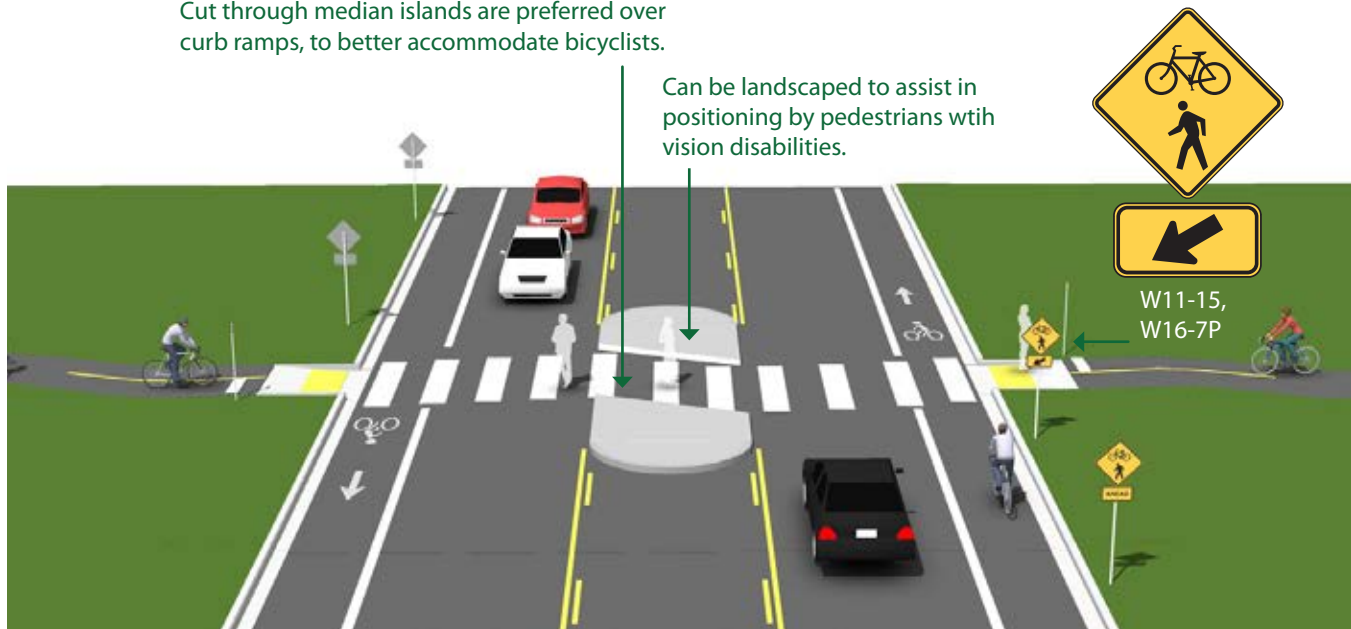
Median refuge islands are located at the mid-point of a marked crossing and help improve greenway trail user safety by directing crossing in one direction of traffic at a time. Refuge islands minimize user exposure by shortening crossing distance and increasing the number of available gaps for crossing.

Guidance

- Appropriate at signalized or unsignalized crosswalks.
- The refuge island must be accessible, preferably with an at-grade passage through the island rather than ramps and landings.
- If a refuge island is landscaped, the landscaping should not compromise the visibility of greenway trail users crossing in the crosswalk. Consider the use of landscaping with low growing, minimally spreading native shrubs and ground cover that require little maintenance and are no higher than 18 inches.
- Refuge islands may collect road debris and may require somewhat frequent maintenance.
- The approach nose should be highly visible.

Cut through median islands are preferred over curb ramps, to better accommodate bicyclists.

Can be landscaped to assist in positioning by pedestrians with vision disabilities.

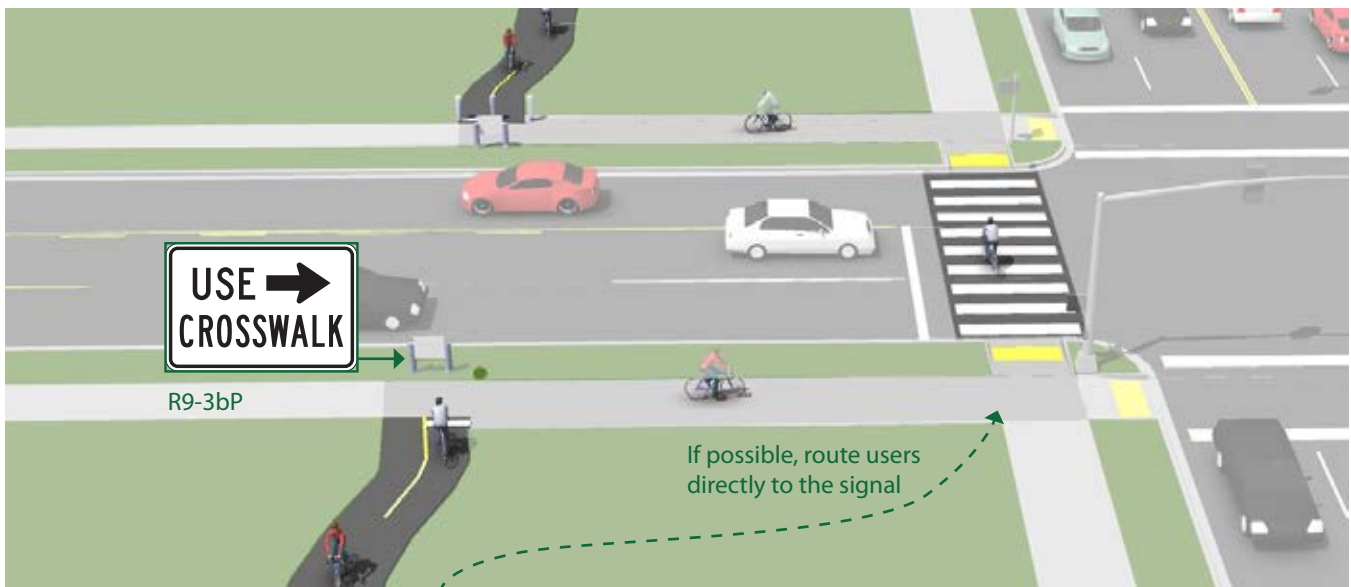


SIGNALIZED CROSSINGS

Signalized crossings provide the most protection for users through the use of a red-signal indication to stop conflicting motor vehicle traffic.

Greenway trail crossings within approximately 400 feet of an existing signalized intersection with crosswalks are typically diverted to the signalized intersection to avoid traffic operation problems when located so close to an existing signal.

If possible, route users to signalized crossing. If no crossings are in vicinity, use appropriate crossing treatment. Any signal or “hawk” specific to greenway crossings has to be evaluated to have met FHWA warrants for the appropriate control device.



CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)

Personal safety, both real and perceived, heavily influences a trail user's decision to use a trail and a community's decision to embrace a trail system. Proper design must address both the perceived safety issues (i.e., feeling safe or fear of crime) and actual safety threats (i.e., infrastructure failure and criminal acts). Creating a safe trail environment goes beyond design and law enforcement and should involve the entire community. The most effective and most visible deterrent to illegal activity on the trail and at the trailhead will be the presence of legitimate users. Getting as many "eyes on the corridor" as possible is a key deterrent to undesirable activity. CPTED is a proactive approach to deterring undesired behavior in neighborhoods and communities. CPTED is defined as "the proper design and effective use of the built environment that can lead to a reduction

in the fear and incidence of crime and an improvement in the quality of life." The basic premise of CPTED is that the arrangement and design of buildings and open spaces can encourage or discourage undesirable behavior and criminal activity. A report prepared for the National Institute of Justice noted that "physical features influence behavior" and the "[offenders] prefer to commit crimes that require the least effort, provide the highest benefits and pose the lowest risks." When all spaces have a defined use and the use is clearly legible in the landscape, it is easier to identify undesired behavior. The following 4 principals guide CPTED:

- Principle #1: Natural Surveillance
- Principle #2: Natural Access Control
- Principle #3: Territorial Reinforcement
- Principle #4: Maintenance



CPTED principals provide visibility to make trail users feel safe and deter crime.

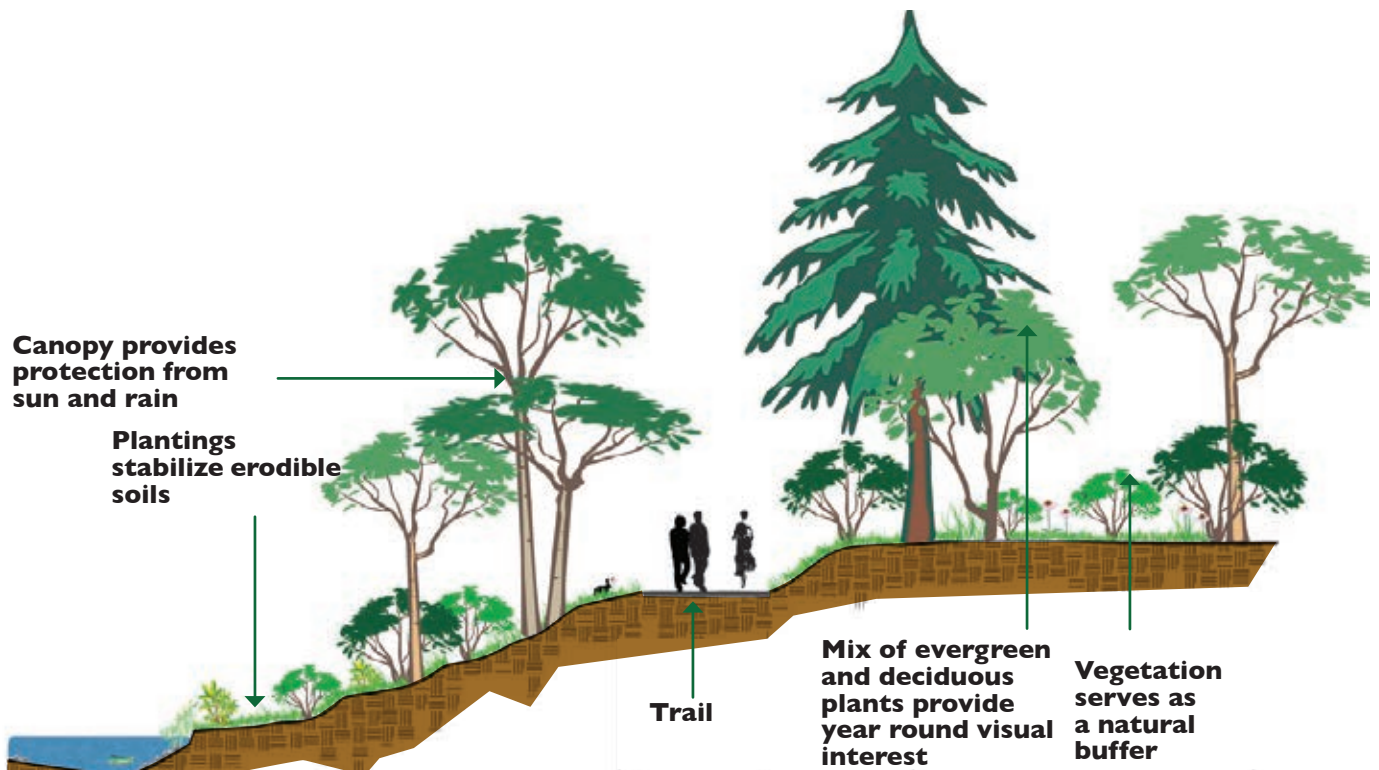


Diagram of landscaping and vegetative screening practices.

COMMUNITY ENGAGEMENT

Active and informed community members are a tremendous resource. Forming volunteer patrol groups, a trail ambassador program, and an Adopt-a-Pathway program would create strong community connections to the trail project. Volunteer patrol groups, such as the one in Anchorage, Alaska, have been used successfully to assist local government by reporting on trail conditions, picking-up litter, and filing safety reports. Trail ambassadors (see this link to a program in Pennsylvania: (<http://bit.ly/S8biPn>) for the Schuylkill River Heritage Area Trail Ambassadors) can provide guidance and interpretive services, organize trail rides or walks, carry informational material, and generally promote the trail. The Adopt-A-Trail program utilizes volunteers to provide general care and maintenance of trail. Community service organizations, school classes or clubs, church groups, and businesses are often looking for outlets to support the community. Adopting trails promotes land stewardship and physical fitness and helps build community connections.

FENCING

Fencing can serve as a key design element in a trail corridor to define trail edges and delineate between

public and private property. Fencing and access will be an especially important consideration when working with agencies such as the US Army Corps of Engineers in connecting to dike trails. Fencing installed along the trail corridor should be permeable, where feasible, to encourage natural surveillance opportunities along the trail. Where the trail is fenced for long stretches, intermittent openings should be located to allow trail users to enter and exit the trail. Access points to the trail should be at locations with good visibility from the surrounding neighbors. Fencing should also adhere to guidelines found in AASHTO bicycle and pedestrian guidelines described in the previous section.

LANDSCAPING/VEGETATIVE SCREENING

Landscaping that obstructs natural surveillance and allows entrapment areas or “hiding” places should be avoided.

- All groundcover and shrubs to be trimmed to a max. 36” above ground level height.
- Trees should be trimmed up to provide a minimum of 8’ of vertical clearance within the trail corridor.

- Hostile landscaping material (e.g. vegetation with thorns) can be used in strategic areas to discourage off-path use and eliminate entrapment areas. For example, Pyracantha, a native evergreen shrub with a dense thorny structure, provides a natural barrier and wildlife habitat.

LIGHTING

Adequate pedestrian-scaled lighting helps trail users observe their surroundings and respond to potential threats. Where lighting is installed on trails and pathways, the illumination should:

- Be adequate to identify a face up to 20 yards away.
- Have full cut-off fixtures to reduce light pollution.
- Provide uniform coverage, eliminating dark pockets.
- Provide good color rendition (the measure of light quality to replicate colors as viewed on a typical sunny day).
- Not be obstructed by tree canopies.

The use of metal halide or light emitting diode (LED) lamps are recommended, as they provide excellent color rendition. Color rendition is especially important when describing identifying features such as hair, clothing, and vehicle color. Light quality is as important as the quantity. Poor lighting, whether too bright or not bright enough, can diminish safety.

Lighting should respond to the conditions of the site and meet the minimum standards set forth by the Illuminating Engineering Society of North America (IESNA).

LITTER

Litter should be removed by staff or volunteer effort. Litter receptacles should be placed at access points, such as trailheads, and intersections with other access points. The trail should be patrolled for litter (not in receptacles) at least once a week and after any special events held on the trail.

TRAIL AMENITIES

When designing functional, attractive, and inviting trails, the small details matter. Elements such as lighting fixtures, public art, benches, and other amenities help create a unique identity for each trail. It is important that these details work together to create a complete experience for all users.

TRASH AND RECYCLING RECEPTACLES

Trash and recycle receptacles provide for proper maintenance and appearance of the trail system. For recycling receptacles, signage should be provided indicating what recyclables are accepted. Consider including educational signage about the importance of recycling and the environmental benefits.

Locate receptacles at each trailhead and each seating area (one per every one picnic table, one per every two benches).

In areas with adequate sunlight, consider compacting receptacles for trash and recyclables that use smart technology (such as Big Belly®).

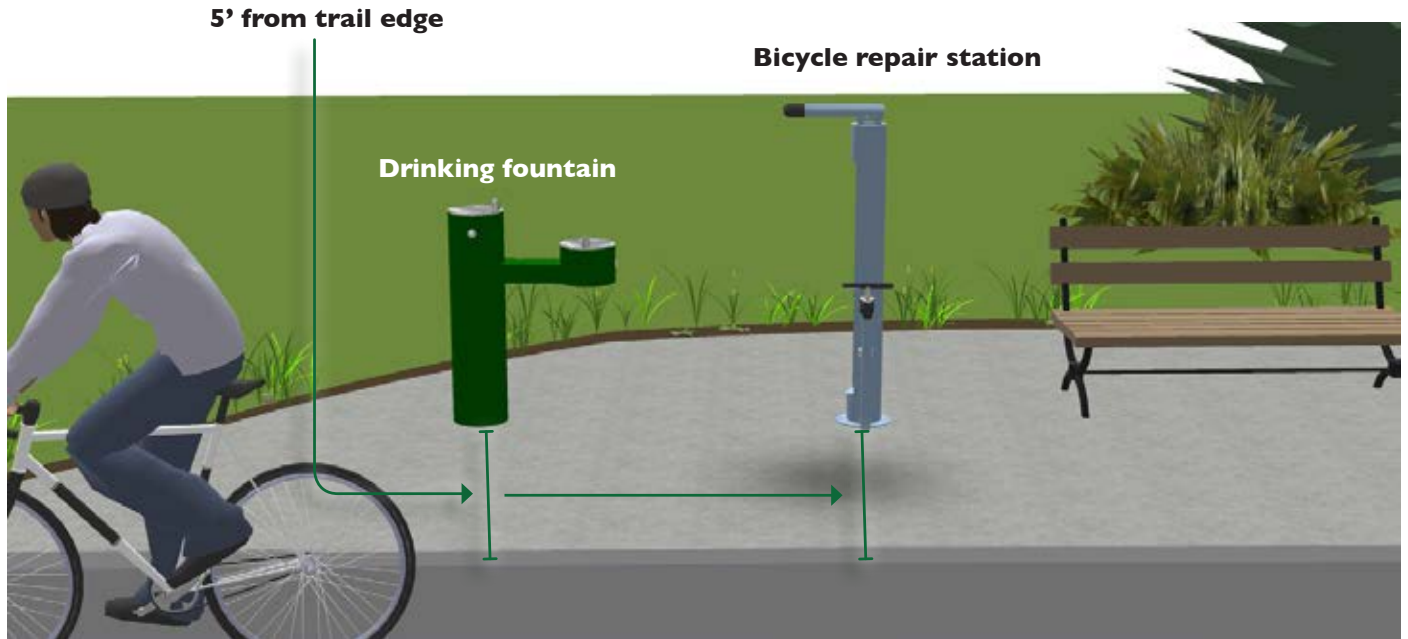
Placement of other receptacles will depend upon the location of concessions, facilities and areas of group activities.

Receptacles need to be accessible to maintenance personnel and trail users.

Receptacles should be selected using the following criteria:

- Expected trash/recycling amount
- Maintenance and collection program requirements
- Types of trail classification
- Durability
- Animal proof

Receptacles should be set back a minimum of 3 feet from the edge of the trail.



RESTROOMS

Public restrooms are one of the most critical building amenities because they need to be responsive to a wide range of human needs and abilities. Careful consideration should be given to a number of factors before locating restrooms, including available land, size of trailhead, existing restroom facilities within the system, utility availability, and user need.

Prior to undertaking any restroom building design, consultation with a structural and civil engineer, state building codes, health and safety codes, ADAAG and Public Rights-of-Way Accessibility Guidelines (PROWAG) standards, and local development codes (UDO) is required. The space required for each restroom building depends on the number of toilets to be provided.

Restrooms require considerable maintenance and service. Access to these resources should be a strong consideration when planning for restroom buildings.

- Local, state, and federal codes take precedence for all restroom facilities.
- Prioritize location of restrooms at trailheads within existing parks and review gaps for placement at other trailheads or locations within the system.
- Restroom structures should be located adjacent to vehicular access points for security, maintenance, and access to water and sewer (unless they are

self-composting).

- Restrooms should also make use of natural light and ventilation to the extent possible.
- Place bicycle parking close to restroom structures so that bicyclists do not impede trail access. Inadequate bicycle parking encourages informal propping of bicycles at or against restroom buildings.
- Provide restroom facilities that are durable and resistant to vandalism.
- Always provide restroom facilities outside of floodprone areas.
- Where other restroom facilities are available within the park and trail system, use wayfinding signage along trails to direct users appropriately.
- Composting toilets should be considered in remote areas or where utility connections are unavailable.

DRINKING FOUNTAINS

Drinking fountains provide opportunities for users to replenish fluids and potentially extend their trip. Access to City water service must be available. Review Regulatory Flood Protection Elevation prior to locating.

- Locate drinking fountains at least 5 feet from trail edge.

- Locate drinking fountains near restrooms, at trailheads, parks and other public gathering places along the trail.
- Standard and accessible fountains should be installed to accommodate all trail users.
- Consider grouping amenities together (seating, bicycle parking, drinking fountains, and bicycle repair stations) at a rest stop or comfort station. Drinking fountains should be placed on a well-drained surface (2 percent sloped concrete slab).
- Consider the use of durable and vandalism-resistant materials such as steel, or stone.
- Drinking fountains must be ADAAG compliant.

BICYCLE REPAIR STATIONS

Bicycle repair stations are small kiosks designed to offer a complete set of tools necessary for routine bicycle maintenance. Popular locations for placement include major or minor trailheads and rest stops along trails.

- Bicycle repair station tools are secured by high security cables, but will still be an attractive target for theft. Proper placement of kiosks in areas of high activity is one key strategy to reduce potential vandalism.
- Consider grouping repair stations together with other amenities (seating, bicycle parking, and drinking fountains) at a rest stop.

BICYCLE PARKING

Bicycle parking should be as convenient as the majority of automobile parking and should be easily accessible from the associated trail. Entrances and exits should be designed to minimize conflict with trail user traffic patterns.

Bicycle parking should be located on a hardscape surface and not be located directly in front of other trail amenities. Ideal rack location should be parallel along the trail approach. Parking should be located no more than 25 feet from ingress/egress and at least 5 feet from the edge

of trail to avoid traffic conflict. Location should be highly visible.

Consideration should be given to avoid emergency ingress/egress, service access, and vehicular conflict areas.

- Locate bicycle racks at restrooms, select trailheads, points of interest, and rest stops.
- The bicycle rack should support the bicycle in at least two places, preventing it from falling over.
- The bicycle rack should allow locking of the frame and one or both wheels with a U-lock.
- When installing racks on concrete surfaces, use 3/8 inch anchors to plate mount. Shim as necessary to ensure vertical placement.
- When installing racks on pavers or other non-stable surfaces, embed into base. Core holes no less than 3 inches in diameter and 10 inches deep.
- Ensure the rack is securely anchored to ground.
- Consider bicycle racks that resist cutting, rusting, and bending or deformation.

SEATING

Seating along trails provides a place for users to rest, congregate, contemplate, or enjoy art, nature, and interpretive elements. Benches can be designed to create identity along the trail or be strictly utilitarian. Picnic tables provide places for trail users to congregate for meals or to relax.

- Locate benches and other site furniture a minimum of 3 feet from the edge of the trail.
- Locate benches along the trail where appropriate, or where there is a demand by users. Providing seating at one mile gaps is the goal. Seating within 1/2 mile of trailheads is recommended.
- Provide benches and picnic tables in areas that provide interesting views, are close to an interpretive element, and offer shade or shelter from seasonal winds.

- Drainage should slope away from the bench and the trail.
- Locate benches a minimum of 4 feet from restrooms and drinking fountains and a minimum of 2 feet from trash and recycling receptacles, lighting poles, and sign posts.
- Wheelchair access should be possible at some picnic tables and alongside benches. Provide access with a hardened surface such as concrete or asphalt.
- Seating should be securely anchored to the ground. Consider durable materials or native materials such as boulders that are vandalism-resistant.



North Carolina Art Museum Park



Temporary organic art sculpture along Reedy Creek Trail in Raleigh

PUBLIC ART AND SCULPTURE

Public art engages the community through artists' work and creates a memorable experience for trail users. Art and sculpture can create an identity for particular trails and strengthen the emotional connection between trails and their users. Depending on the scale and form, it can become an "event" in itself and serve as a public attraction.

Public art can be aesthetic and/or functional, and double as sitting or congregational areas. Memorable installations can act as landmarks and serve as valuable wayfinding tools. Public art can be a device for telling a compelling and memorable story about the trail and area history.

- Artists can be commissioned to provide art at one or multiple locations throughout the trail network.
- When appropriate, artists could be engaged as part of the corridor planning and development process.
- Artists should be encouraged to produce artwork in a variety of materials for sites along the corridor.
- When appropriate, consider developing greenway furnishings and amenities with artistic intent. Key locations such as turns or landscape changes could be areas to highlight through the inclusion of public art. Consider how to provide continuity between elements while maintaining the unique styles of multiple artists.
- Provide art displays on trails with anticipated high use and user exposure.
- Consider community based art and temporary installations.

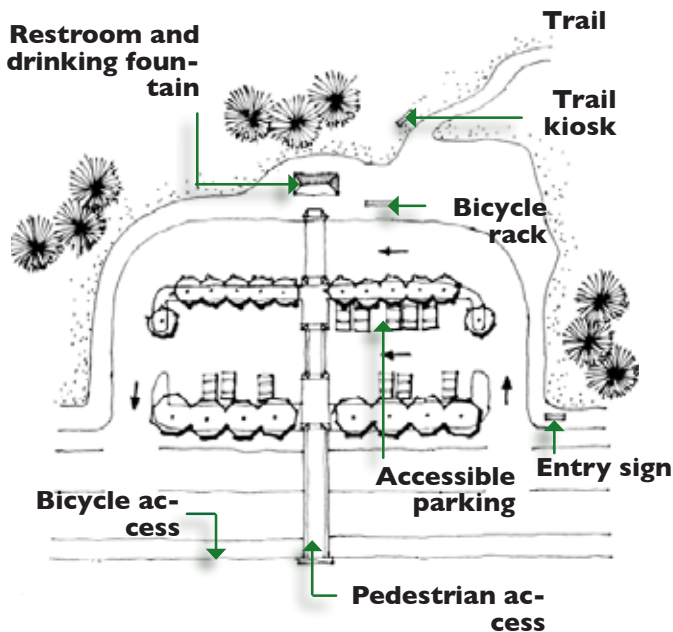


Diagram of amenities at a major trailhead.

TRAILHEADS

Trailheads provide essential access to the trail system and can include many amenities in one location: automobile parking, bicycle parking, restrooms, drinking fountains, trash and recycle receptacles, dog waste stations, bicycle repair stations, and trail wayfinding and informational signage.

There is no prescription for the frequency of trailheads. Conduct user counts, vehicle counts, and surveys across the trail network at peak hours of use to determine parking demand. Consider locating trailheads with consideration to other available public facilities or through partnerships with owners of existing parking areas. When

locating trailheads in or adjacent to neighborhood streets, work with property owners to install no parking signs if desired, and to minimize impacts during construction and daily use.

MAJOR TRAILHEADS

Major trailheads should be established near large residential developments, commercial developments, and transportation nodes, making them highly accessible to the surrounding community and to the trail system. A major trailhead could include all of the items mentioned previously plus additional facilities, such as shelters, picnic areas, and extensive parking.

- Major trailheads can provide parking for 10-40 vehicles, depending on availability of land and anticipated level of use of the trail.
- Consider 300 to 350 square feet for each parking space.
- Major trailheads will typically have a large paved parking lot that can accommodate passenger vehicles and large vehicles year round. Consider locating larger lots in existing disturbed areas to minimize environmental impacts.
- Major trailheads should provide emergency and maintenance vehicle access and turnaround.
- Place ADA accessible parking spaces near the site's accessible route, at a rate of one accessible space per 25 standard spaces. Parking spaces and access aisles should not exceed 2 percent slope in any direction.

- Parking lot surfaces should never exceed 5 percent slope in any direction.
- Where major trailheads are located near neighborhoods, provide user access from local streets crossing the trail. Where trails cross neighborhood streets, “No Parking” signs may be desirable to minimize impact on the neighborhood.
- Reduce the visual intrusion of large parking areas by using vegetative screening.
- Consider one-way vehicle circulation within parking areas to minimize road width.
- Refer to current setbacks and other requirements within the zoning ordinance.

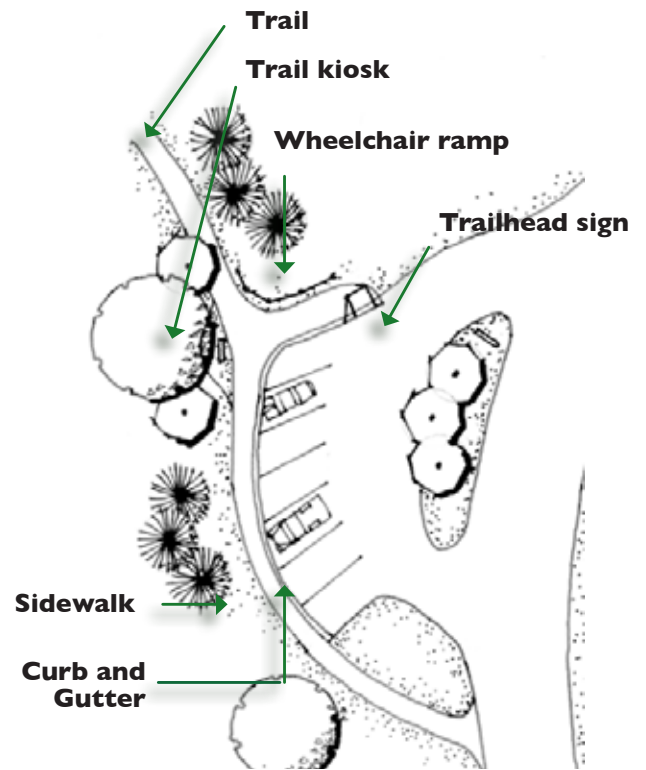


Diagram of amenities at a minor trailhead.

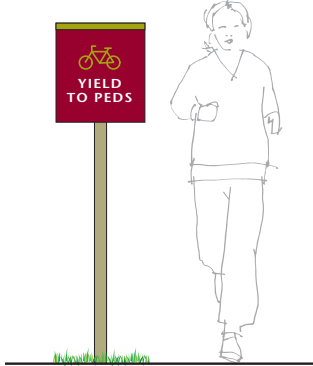


Example Wayfinding Signage - Destinations

MINOR TRAILHEADS

Minor trailheads are trail access points with very minimal infrastructure. They can occur at parks and residential developments. Some minor trailheads could include a small parking lot for five to six passenger vehicles. In addition to vehicle parking, minor trailheads may include drinking fountains, benches, trash and recycling receptacles, an information kiosk, and signage about the trail network.

- Minor trailheads can provide parking for up to ten vehicles. The parking area may be asphalt or gravel, as long as ADA requirements are met
- Minor trailheads should provide emergency and maintenance vehicle access.
- Minor trailheads should be ADA accessible and provide at least one accessible space near the accessible route.
- Provide adjacent wayfinding signage that directs trail users to minor trailheads.



Etiquette Signage



Example Trail kiosk Walnut Creek Trail

5. Estimated Use & Benefit Analysis

INTRODUCTION

This memo contains an economic impact analysis of the proposed rail trail in Cleveland County, North Carolina. The analysis estimates the number of bicycle and pedestrian trips that take place near the trail alignment, approximates the corresponding reduction in vehicle trips and vehicle-miles travelled (VMT), and assesses the potential health-, environmental-, and transportation-related benefits that might accrue if the proposed rail trail was constructed. In total, it is estimated that the proposed rail trail could generate \$20,770,000 in annual health, environmental, and transportation benefits.

METHOD

This economic impact analysis uses a standard method for calculating health-, environmental-, and transportation-related benefits. All projections are based on the most recent five-year estimates from the American Community Survey (ACS), which are then extrapolated through the use of various multipliers derived from national studies and quantified in terms of monetary value where appropriate. Other data sources are noted in the tables.

MULTIPLIERS

Multipliers were developed through an analysis of the relationship between two or more model inputs (such as the number of vehicle-miles reduced) and associated model outputs (such as the cost of road maintenance per every vehicle-mile travelled). The model used for this study includes over 50 multipliers in order to extrapolate daily, monthly, and annual trip rates, trip distance, vehicle trips replaced, emission rates, physical activity rates, and other externalities linked to an increase in bicycling and walking trips and to a decrease in motor vehicle trips.

LIMITATIONS

The primary purpose of the analysis is to enable a more informed policy discussion on whether and how best to invest in the proposed rail trail in Cleveland County, North Carolina. Even with extensive primary and secondary research incorporated into the impact analysis model, it is impossible to accurately predict the exact impacts of various factors. Accordingly, all estimated benefit values are rounded and should be considered order of magnitude estimates, rather than exact amounts.

DEMAND

To understand the potential demand for the proposed rail trail, count data at four similar trails in North Carolina and South Carolina were analyzed (**see Table 1**). The average number of daily bicyclists per mile of trail at the three trails with available count data one year after construction (Swamp Rabbit Trail, Brevard Greenway, and American Tobacco Trail) was 219, and the average number of pedestrians per mile was 78. The proposed rail trail, including existing segments, would total approximately 18.6 miles in length. If the proposed rail trail experienced in its first year the same number of bicyclists per mile as the average of the three examined trails with one-year post-construction data, there would be **an estimated 4,000 bicyclists per day** (rounded to nearest thousand). If the proposed rail trail experienced in its first year the same number of pedestrians per mile as the average of the three examined trials with one-year post-construction data, there would be **an estimated 1,000 pedestrians per day** (rounded to nearest thousand).

Trail (Location)	Year (Year Post-construction)	Length	Estimated Daily Bicyclists (per mile)	Estimated Daily Pedestrians (per mile)	Estimated Total Daily Users (per mile)	Estimated Total Annual Users (per mile)	Source
Swamp Rabbit Trail (Greenville County, SC)	2013 (Year 3)	19.9 miles	17,590 adjusted (884)	3,925 adjusted (197)	21,972 (1,104)	501,236 (25,188)	Reed, Julian A. Swamp Rabbit Trail: Year 3 Findings . Greenville Health System. (2014).
	2012 (Year 2)	19.9 miles	13,756 adjusted (691)	3,566 adjusted (179)	17,719 (890)	403,323 (20,267)	Reed, Julian A. Swamp Rabbit Trail: Year 2 Findings . Greenville Health System. (2013).
	2011 (Year 1)	19.9 miles	12,446 adjusted (625)	3,008 adjusted (151)	15,751 (792)	359,314 (18,056)	
Duck Trail (Duck, NC)	2016 (Year 2)	6.0 miles	avg. weekday 470 (78)	avg. weekday 553 (92)	avg. weekday 1,023 (171)	N/A	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Duck Trail Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway (Brevard, NC)	2016 (Year 2)	5.0 miles	weekday 36 (7)	weekday 99 (20)	weekday 135 (27)	N/A	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year Two . North Carolina Department of Transportation (2016).
	2015 (Year 1)	5.0 miles	weekday 52 (10)	weekday 186 (37)	weekday 238 (48)	N/A	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year One . North Carolina Department of Transportation (2016).
American Tobacco Trail (Durham, NC)	2016 (Year 2)	22.0 miles	weekday 492 (22)	weekday 855 (39)	weekday 1,347 (61)	N/A	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year Two . North Carolina Department of Transportation (2016).
	2015 (Year 1)	22.0 miles	weekday 479 (22)	weekday 983 (45)	weekday 1,462 (66)	N/A	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year One . North Carolina Department of Transportation (2016).
Average per mile (Year 3, 1 example)			844	197	1,104		
Average per mile (Year 2, 4 examples)			200	83	287		
Average per mile (Year 1, 3 examples)			219	78	302		

Table 1: Trail Counts at Similar Facilities

BENEFITS SUMMARY

PHYSICAL ACTIVITY

30%

OF LOCAL ADULTS
DON'T GET ENOUGH
PHYSICAL ACTIVITY



IMPLEMENTATION
COULD LEAD TO

176k

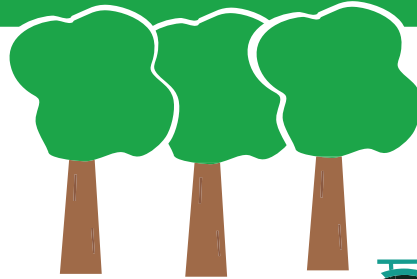
MORE HOURS OF
EXERCISE PER YEAR

MILES OF BIKING & WALKING

THROUGH

7.6 mil

MORE MILES BIKED &
WALKED PER YEAR



...enough to travel across North Carolina 45,000 times

HEALTHCARE COSTS

RESULTING IN

\$2.8 mil

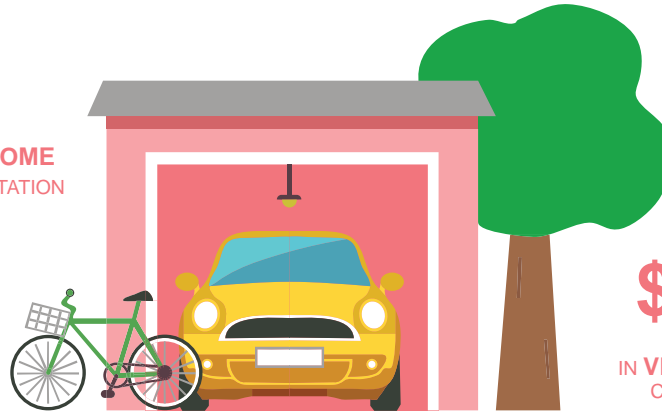
IN HEALTHCARE COST SAVINGS



HOUSEHOLD VEHICLE OPERATION COSTS

32%

OF CLEVELAND CO.'S
HOUSEHOLD INCOME
GOES TO TRANSPORTATION

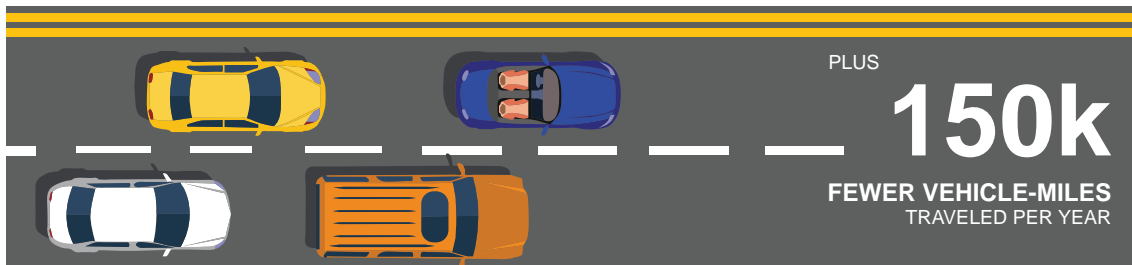


IMPLEMENTATION
COULD LEAD TO

\$600k

IN VEHICLE OPERATION
COST SAVINGS PER YEAR

VEHICLE-MILES TRAVELED



...the equivalent of 5 households no longer travelling by personal auto each year

TOTAL BENEFITS

TOTALING

\$21 mil

IN **BENEFITS** PER YEAR



TRANSPORTATION BENEFITS

The most readily-identifiable benefits of the recommended project list derive from their use as a connection between activity centers and residences. While no money may change hands, real savings can be estimated from the reduction costs associated with congestion, vehicle crashes, road maintenance, and household vehicle operations.

TRANSPORTATION CALCULATIONS

In addition to overall demand for bicycling and walking along the proposed rail trail, a review of survey data at similar trails in North and South Carolina provided insight into potential future trip patterns and spending behaviors.

The average trip purpose of trail users on the Duck Trail (Year 2), Brevard Greenway (Year 1 and Year 2), and American Tobacco Trail (Year 1 and Year 2) was 87 percent recreation, 3 percent commute, and 11 percent utilitarian (see **Table 2**). If demand for the rail trail one-year post-construction was 4,000 bicyclists and 1,000 pedestrians per day and users of the proposed rail trail traveled for the same trip purposes of the average Duck Trail, Brevard Greenway, and American Tobacco Trail user, there would be an estimated 4,300 people bicycling and walking for recreation, 200 bicycling and walking for commute purposes, and 500 people bicycling and walking for utilitarian purposes on the proposed rail trail each day. Extrapolated by the 214 days of sunshine in nearby Charlotte, North Carolina, there would be **an estimated 856,000 annual bicycle and 214,000 annual pedestrian trips per year** on the proposed rail rail (1,070,000 total trips per year).

Trail (Location)	Primary Trip Purpose (Percent of Surveyed Users, Number of Responses)			Source
	Recreation	Commute (school/work)	Utilitarian	
Duck Trail, Year 2 (Duck, NC)	74%, 389	2%, 13	23%, 122	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Duck Trail Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 2 (Brevard, NC)	92%, 221	2%, 5	8%, 13	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 1 (Brevard, NC)	86%, 232	3%, 8	11%, 30	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year One . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 2 (Durham, NC)	90%, 1,799	3%, 59	7%, 135	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year Two . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 1 (Durham, NC)	92%, 2,187	4%, 84	5%, 114	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year One . North Carolina Department of Transportation (2016).
Average	87%	3%	11%	

Table 2: Primary Trip Purpose

The average trip distance of trail users on the Duck Trail (Year 2), Brevard Greenway (Year 1 and Year 2), and American Tobacco Trail (Year 1 and Year 2) was 5.2 miles for people bicycling, walking, jogging, and running (see **Table 3**). If the proposed rail trail offsets 150,000 motor vehicle trips per year and those motor vehicle trips would otherwise be the same distance as the average trip on the Duck Trail, Brevard Greenway, and American Tobacco Trail, then the proposed rail trail would help offset 780,000 vehicle-miles per year. Research suggests that for every one vehicle-mile offset, a region can expect to save an average of \$0.14 in road maintenance costs, \$0.77 in motor vehicle operating costs, \$0.20 in collision costs, and \$0.08 in congestion-related costs.⁶ If these per mile values are applied to the estimated 780,000 vehicle-miles offset by the proposed rail trail per year, then the region would save **an estimated \$109,000 in annual roadway maintenance costs, \$600,000 in annual motor vehicle operating costs, \$156,000 in annual collision costs, and \$62,000 in annual congestion-related costs.**

Trail (Location)	Travel Mode on Trail in Miles (Number of Survey Responses)				Source
	Bicycle	Walk	Jog/Run	All Modes	
Duck Trail, Year 2 (Duck, NC)	5.2 (180)	2.2 (204)	3.5 (130)	3.5 (519)	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Duck Trail Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 2 (Brevard, NC)	5.3 (28)	2.3 (125)	3.7 (45)	3.4 (238)	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 1 (Brevard, NC)	3.8 (71)	2.1 (135)	3.5 (59)	2.9 (266)	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year One . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 2 (Durham, NC)	13.6 (765)	3.1 (554)	5.6 (600)	8.1 (1,936)	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year Two . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 1 (Durham, NC)	13.1 (804)	3.3 (624)	6.6 (794)	8.0 (2,248)	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year One . North Carolina Department of Transportation (2016).
Average	8.2	2.6	4.6	5.2	

Table 3: Average Trip Distance

If the proposed rail trail experiences an estimated 1,070,000 total trips per year and maintains a similar percent of commute and utilitarian trips as the average primary trip purpose of the Duck Trail, Brevard Greenway, and American Tobacco Trail, then approximately 150,000 annual bicycle and pedestrian trips on the proposed rail trail would be for commute or utilitarian purposes. Bicycle and pedestrian trips for commute and utilitarian purposes are likely to replace motor vehicle and transit trips, suggesting that the proposed rail trail would help offset an estimated 150,000 motor vehicle trips per year (see **Table 4**).

	Estimated Values
Annual Vehicle-Miles Traveled Reduced	150,000
Reduced Traffic Congestion Costs	\$62,000
Reduced Vehicle Collision Costs	\$156,000
Reduce Road Maintenance costs	\$109,000
Household Vehicle Cost Savings	\$600,000
Total Vehicle Cost Savings	\$927,000

Table 4: Annual Transportation Benefits

The average mode of transportation that trail users on the Duck Trail (Year 2), Brevard Greenway (Year 1 and Year 2), and American Tobacco Trail (Year 1 and Year 2) took to the trail was 22 percent bicycling, 51 percent driving, and 28 percent walking (see **Table 5**). If travel behavior on the proposed rail trail is similar to the average travel behavior on the Duck Trail, Brevard Greenway, and American Tobacco Trail, then roughly half of the estimated 1,070,000 annual bicycle and pedestrian trips would induce a motor vehicle trip to the proposed rail trail, or (approximately 535,000 new motor vehicle trips per year).

Trail (Location)	Mode to the Trail (Percent of Surveyed Users, Number of Responses)			Source
	Bicycle	Motor Vehicle	Walk	
Duck Trail, Year 2 (Duck, NC)	33%, 166	1%, 6	66%, 332	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Duck Trail Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 2 (Brevard, NC)	20%, 47	68%, 164	12%, 29	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 1 (Brevard, NC)	17%, 43	69%, 180	14%, 36	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year One . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 2 (Durham, NC)	19%, 355	57%, 1,087	24%, 452	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year Two . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 1 (Durham, NC)	19%, 417	59%, 1,322	22%, 484	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year One . North Carolina Department of Transportation (2016).
Average	22%	51%	28%	

Table 5: Mode to Trail

The average distanced traveled to the Swamp Rabbit Trail by trail users was 8.71 miles (see **Table 6**). If an estimated 535,000 annual users of the proposed rail trail arrive by motor vehicle and the average distance of their trips is 8.71 miles, then the proposed rail trail would induce an estimated 3,799,000 in additional annual vehicle-miles traveled to the proposed rail trail. This economic impact analysis includes environmental benefits and excludes environmental costs of the proposed rail trail. For a full accounting of benefits and costs in a future analysis, the induced motor vehicle demand, resulting vehicle-miles traveled, and motor vehicle emissions would need to be taken into account.

Trail (Location)	Average Distance to Trail from Residence of Trail Users (Number of Survey Responses)			Source
	Year 1	Year 2	Year 3	
Swamp Rabbit, Year 3 (Greenville County, SC)	8.71 miles (45)	7.74 miles (181)	7.65 miles (183)	Reed, Julian A. Swamp Rabbit Trail: Year 3 Findings . Greenville Health System. (2014).

Table 6: Distance to Trail

HEALTH BENEFITS

The implementation of a well-designed, connected trail system in Cleveland County, North Carolina would encourage a shift from energy-intensive modes of transportation such as cars and truck to active modes of transportation such as bicycling and walking. This economic impact analysis evaluated and quantified the estimated increase in bicycling and walking trips, the estimated increase in hours of physical activity, and the annual savings resulting from reduced healthcare costs.

HEALTH CALCULATIONS

The average percent of trail users' exercise met by using the Duck Trail (Year 2), Brevard Greenway (Year 1 and Year 2), and American Tobacco Trail (Year 1 and Year 2) was 46% for people bicycling, 49 percent for people walking, jogging, or running, and 47 percent overall (see **Table 7**). According to the County Health Rankings, a joint project of the University of Wisconsin's Population Health Institute and the Robert Wood Johnson Foundation, 30 percent of Cleveland County, North Carolina adults 20 years and over reported no leisure-time physical activity. If 30 percent of the estimated 856,000 annual bicycle trips (257,000 bicycle trips) and 214,000 annual pedestrian trips (64,000 pedestrian trips) were taken by Cleveland County adults that previously engaged in no leisure-time physical activity and if those new trips comprised the same percent of exercise undertaken by trail users on the Duck Trail, Brevard Greenway, and American Tobacco Trail, then **an estimated 118,000 annual bicycle trips and 31,000 annual pedestrian trips on the proposed rail trail would be contributing to new physical activity among Cleveland County residents.**

Trail (Location)	Exercise Met by Using the Trail over the Past 14 Days (Percent of Surveyed Users, Number of Responses)			Source
	Bicycle	Walk, Jog, Run	All	
Duck Trail, Year 2 (Duck, NC)	47%, 163	46%, 317	46%, 483	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Duck Trail Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 2 (Brevard, NC)	38%, 67	44%, 165	42%, 232	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 1 (Brevard, NC)	46%, 52	47%, 168	47%, 221	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year One . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 2 (Durham, NC)	47%, 731	53%, 1,099	50%, 1,844	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year Two . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 1 (Durham, NC)	50%, 695	54%, 1,288	52%, 2,003	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year One . North Carolina Department of Transportation (2016).
Average	46%	49%	47%	

Table 7: Percent of Exercise Met by Using the Trail over the Past 14 Days

The average duration of trips along the Duck Trail (Year 2), Brevard Greenway (Year 1 and Year 2), and American Tobacco Trail (Year 1 and Year 2) was 75 minutes for bicycle trips, 56 minutes for walking trips, and 62 minutes overall (see **Table 8**). If the estimated 118,000 annual bicycle trips and 31,000 annual pedestrian trips on the proposed rail trail contributing to new physical activity among Cleveland County residents matched the average trip duration along the Duck Trail, Brevard Greenway, and American Tobacco Trail, then the proposed-rail trail would contribute to **an estimated 8,850,000 annual minutes of new bicycle exercise and 1,736,000 annual minutes of exercise from walking, jogging, and running.**

Trail (Location)	Average Duration of Users' Trip (Percent of Surveyed Users, Number of Responses)			Source
	Bicycle	Walk, Jog, Run	All	
Duck Trail, Year 2 (Duck, NC)	58 minutes, 178	52 minutes, 334	54 minutes, 517	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Duck Trail Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 2 (Brevard, NC)	57 minutes, 68	54 minutes, 170	53 minutes, 238	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 1 (Brevard, NC)	89 minutes, 69	53 minutes, 190	62 minutes, 260	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year One . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 2 (Durham, NC)	87 minutes, 759	57 minutes, 1,150	69 minutes, 1,923	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year Two . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 1 (Durham, NC)	83 minutes, 805	66 minutes, 1,443	72 minutes, 2,274	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year One . North Carolina Department of Transportation (2016).
Average	75 minutes	56 minutes	62 minutes	

Table 8: Trip Duration

If an estimated 5,000 unique trail users frequent the proposed rail trail each day (4,000 bicyclists and 1,000) pedestrians and if approximately half of those trail users' exercise takes place on the proposed rail trail (46 percent of bicyclists' exercise met on the trail and 49 percent of pedestrians' exercise), then approximately 2,000 people per day would get their exercise from the proposed rail trail. The Centers for Disease Control and Prevention (CDC) suggest that the annual healthcare, worker's compensation, and productivity costs prevented from regular physical activity is approximately \$1,400 per person.¹⁰ If 2,000 people are get regular physical activity from the proposed rail trail and decrease their likelihood of incurring healthcare expenses and missing work, then the region is estimated to gain **an estimated \$2,800,000 in healthcare and productivity costs savings per year.**

According to National Highway Traffic Safety Administration, for each vehicle-mile reduced, a region can expect to prevent \$0.02 in Particulate Matter-, \$0.01 in Nitrous Oxides-, and \$0.02 in Carbon Dioxide-related cleanup. If the proposed rail trail were to contribute to the reduction of 150,000 vehicle-miles traveled per year, the region could expect to save \$3,000 in Particulate Matter-, \$2,000 in Nitrous Oxides-, and \$3,000 in Carbon Dioxide-related clean-up each year. See **Table 9** for a summary of the estimated annual health benefits for the proposed rail trail.

	ESTIMATED VALUES
Annual Bicycle Trips	856,000
Annual Miles Bicycled ¹	7,019,000
Annual Walk Trips	214,000
Annual Miles Walked ²	556,000
Annual Hours of New Physical Activity	176,000
Annual Healthcare/Productivity Cost Savings ³	\$2,800,000
Total Vehicle Emission Costs Reduced	\$8,000

Table 9: Annual Health Benefits

ECONOMIC BENEFITS

The average percent of trail users that were not from the area surrounding the trail was 48 percent for the Duck Trail (Year 2), Brevard Greenway (Year 1 and Year 2), and American Tobacco Trail (Year 1 and Year 2). If there are 1,070,000 users of the proposed rail trail and it experienced the same percent of non-local trail users as Duck Trail, Brevard Greenway, and American Tobacco Trail, then **an estimated 514,000 non-local trail users would use the proposed rail trail each year.**

The average length of stay by non-local trail users at the Duck Trail (Year 2) was 8 days (see **Table 10**). If the estimated 514,000 annual non-local trail users of the proposed rail trail stayed near the trail for a more conservative estimate of two days per person per trip, then the proposed rail trail would contribute to **an estimated 1,028,000 annual person-days from trail visitors.**

Trail (Location)	Trip Point of Origin (Percent of Surveyed Users, Number of Responses)		Non-local Length of Stay (Number of Responses)	Source
	Local	Non-local		
Duck Trail, Year 2 (Duck, NC)	5%, 24	95%, 499	8 days, 411	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Duck Trail Year Two. North Carolina Department of Transportation (2016).
Brevard Greenway, Year 2 (Brevard, NC)	70%, 165	30%, 72	N/A	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year Two. North Carolina Department of Transportation (2016).
Brevard Greenway, Year 1 (Brevard, NC)	57%, 151	43%, 112	N/A	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year One. North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 2 (Durham, NC)	64%, 1,219	36%, 699	N/A	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year Two. North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 1 (Durham, NC)	66%, 1,374	34%, 697	N/A	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year One. North Carolina Department of Transportation (2016).
Average	52%	48%	8 days	

Table 10: Trip Point of Origin and Length of Stay

The average expenditures of trails users on the Duck Trail (Year 2), Brevard Greenway (Year 1 and Year 2), and American Tobacco Trail (Year 1 and Year 2) was \$26 at restaurants, \$38 for grocery stores, \$60 at retail establishments, \$29 for entertainment, and \$48 for bicycle rental (see **Table 12**). If the estimated 1,028,000 annual person-days of non-local trail users purchased goods at the same rate as Duck Trail, Brevard Greenway, and American Tobacco Trail users, then the proposed rail trail would contribute to an estimated \$6,415,000 in annual restaurant spending, \$5,469,000 in annual grocery store spending, \$4,318,000 in annual retail spending, \$298,000 in annual entertainment spending, and \$535,000 in annual bicycle rental spending, for a total in **\$17,035,000 in estimated annual trail-related spending from non-local trail users**. These estimates assume the availability of such goods and services.

Trail (Location)	Average Expenditure (Percent of Surveyed Users, Number of Responses, Average Expenses)					Source
	Restaurant	Grocery	Retail	Entertainment	Bicycle Rental	
Duck Trail, Year 2 (Duck, NC)	31%, 510, \$40	16%, 509, \$70	12%, 510, \$68	2%, 510, \$73	3%, 510, \$63	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Duck Trail Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 2 (Brevard, NC)	21%, 239, \$25	15%, 238, \$28	8%, 239, \$37	<1%, 239, \$6	2%, 239, N/A	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year Two . North Carolina Department of Transportation (2016).
Brevard Greenway, Year 1 (Brevard, NC)	37%, 217, \$20	19%, 216, \$32	7%, 216, \$47	<1%, 217, \$10	2%, 217, \$70	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: Brevard Greenway Year One . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 2 (Durham, NC)	19%, 1,833, \$15	8%, 1,834, \$31	3%, 1,835, \$73	1%, 1,835, \$22	0%, 1,835, \$25	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year Two . North Carolina Department of Transportation (2016).
American Tobacco Trail, Year 1 (Durham, NC)	20%, 1,927, \$21	13%, 1,920, \$28	5%, 1,923, \$73	1%, 1,924, \$36	0%, 1,925, \$48	Evaluating the Economic Impact of Shared Use Paths in North Carolina, Technical Memorandum: American Tobacco Trail Year One . North Carolina Department of Transportation (2016).
Average	26%, \$24	14%, \$38	7%, \$60	1%, \$29	1%, \$52	

Table 11: Average Expenditures

TOTAL BENEFITS

In total, residents living near the proposed rail trail experience an estimated \$30,512,000 in health-, environmental-, and transportation-related benefits per year. **Table 12** summarizes all calculated benefits.

	Estimated Values
Annual Transportation Benefits	\$927,000
Annual Health Benefits	\$2,808,000
Annual Economic Benefits	\$17,035,000
Total Annual Benefits	\$20,770,000

Table 12: Total Annual Benefits

OTHER BENEFITS

In addition to transportation, health, and economic benefits, the proposed rail trail could also influence local businesses and adjacent property values. While these benefits are less generalizable and would require additional analysis to assess their applicability to the proposed rail trail, below is a discussion about the available research on each topic as it relates to trail development.

BUSINESS IMPACTS

The section of this memorandum on economic impacts discussed potential expenditures of non-local trail users on food, entertainment, retail, and bicycle rentals based on a review of spending habits of trails within the region. While difficult to quantify, additional research suggests that there may be additional economic impacts of trails, greenways, and other bicycle and pedestrian infrastructure not fully captured by direct spending. “Evaluating Active Transport Benefits and Costs” (2017) includes a literature review of economic development spurred by bicycle and pedestrian infrastructure, finding that there may be a significant positive association between pedestrian access to jobs and labor productivity, non-motorized facility construction tends to create more employment and regional business activity than other transportation capital projects, and that active transportation-related tourism tends to provide greater economic benefits per mile of travel than other forms of tourism. “The Economic Significance of Bicycle-Related Travel in Oregon” (2013) documented the economic impacts of bicycle-related travel throughout Oregon and found that it supported 4,600 jobs and contributed to \$102 million in annual earnings. In addition, bicycle-related travel in Oregon generated local and state tax receipts (lodging taxes, motor fuel, and travel-generated state income tax) of nearly \$18 million in 2012. “The Outdoor Recreation Economy” (2017), created for the an outdoor recreation promotional group, found that outdoor recreation contributed to \$887 billion in consumer spending per year, 7.6 million American jobs, \$65.3 billion in annual federal tax revenue, and \$59.2 billion in state and local tax revenue.

PROPERTY VALUES

Several studies conducted over the last two decades found that trails and greenways can have a positive impact of urban and suburban property values of residences near the facilities. “The Impact of Greenways on Property Values: Evidence from Austin, Texas” (2005) conducted an analysis of a greenbelt and found that there were property value premiums in two of three neighborhoods studied for residences within a half-mile but not directly adjacent to the greenbelt. “Impact of Bike Facilities on Residential Property Prices” (2016) studied high-quality bicycle infrastructure in Portland and found that distance to bicycle infrastructure and the extensiveness of the infrastructure were both positive and statistically significant contributors to property prices for all property types. “The Relative Impacts of Trails and Greenbelts on Home Price” (2007) analyzed the impacts of trails on home prices in San Antonio, Texas and found that trails were associated with roughly 2 percent price premiums and trails with greenbelts were associated with 5 percent price premiums. “The Impact of the Little Miami Scenic Trail on Single Family Residential Property Values” (2008) studied a rail trail in Miami, Florida and found that close proximity to the rail trail adds value to single family residential properties. While the exact impact of the proposed rail trail is unknown, these four studies suggest that it might have positive impact on residential property values.

6. Plan Implementation

INTRODUCTION

The Alta team worked with the project advisory committee to develop a plan implementation strategy. A summary of potential acquisition strategies and funding mechanisms are outlined. Cost estimates are provided for the three main trail sections.

PROPERTY ACQUISITION

There are many different ways to secure trail right-of-way for greenway systems. The two primary routes for acquisition are as follows:

FEE SIMPLE PURCHASE

This is a common method of acquisition where a local government agency or private greenway manager purchases property outright. Fee simple ownership conveys full title to the land and the entire “bundle” of property rights including the right to possess land, to exclude others, to use land, and to alienate or sell land.

EASEMENT PURCHASE

This type of acquisition is the fee simple purchase of an easement. Full title to the land is not purchased, only those rights granted in the easement agreement. Therefore the easement purchase price is less than the full title value.

COST ESTIMATES

The Alta Team generated cost estimates for the three primary sections of the rail trail alignment: Shelby, Patterson Springs, and Earl.

The cost for the **2.6-mile Shelby section is estimated at \$1,424,000**. This section includes an upfit of the old rail bridge over US 74 as well as nine road crossing improvements and three trailheads.

The cost for **the 3.8-mile Patterson Springs Section is estimated at an amount \$3,954,000**. This section includes three bridges (which accounts for nearly half of its estimated construction cost) as well as five road crossing improvements and two trailheads.

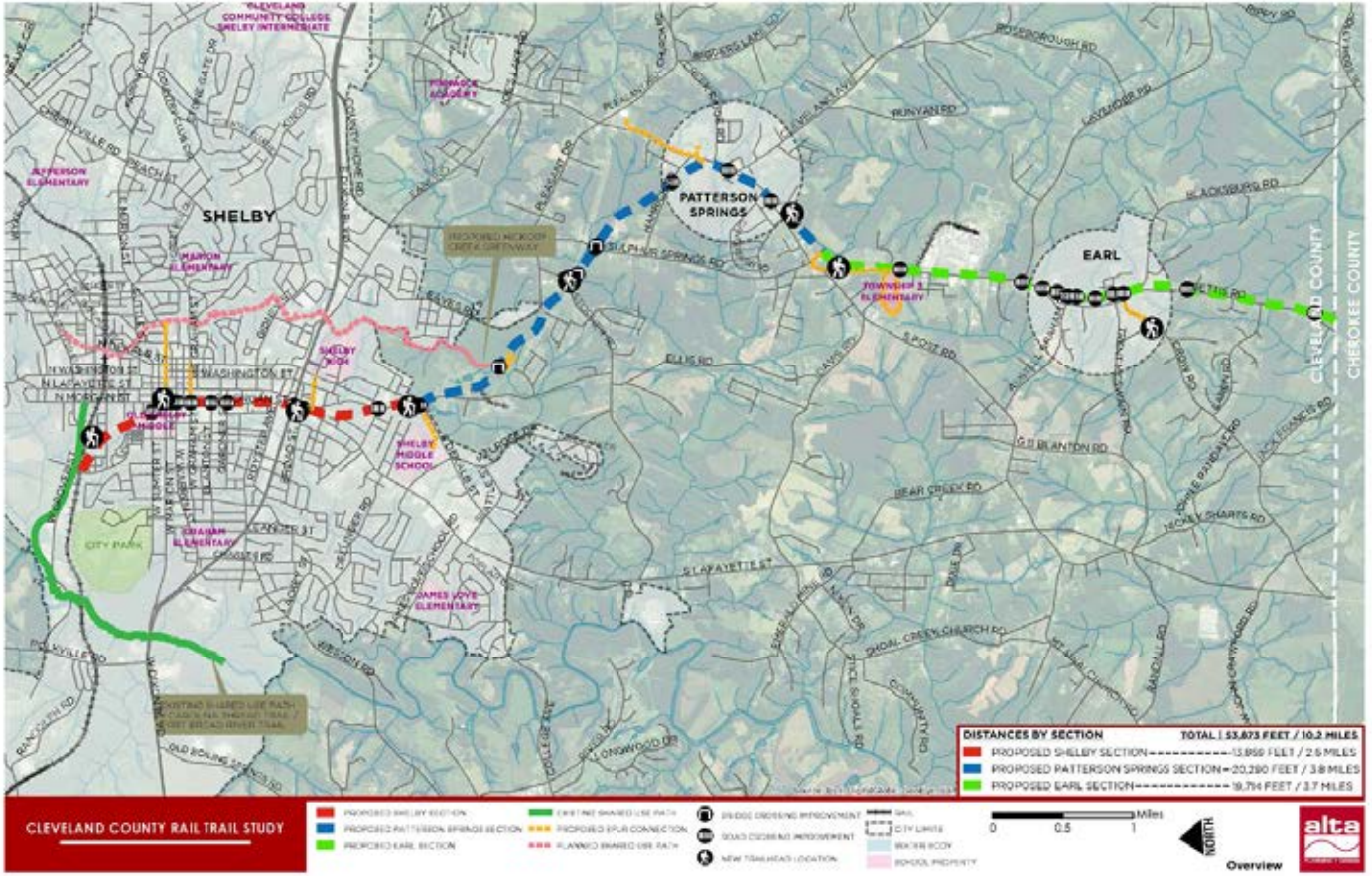
The cost for **the 3.7-mile Earl section is estimated at an amount of \$1,472,000**. This section includes twelve road crossing improvements and three trailheads.

The total estimated project cost for the entire 10.2-mile rail trail is estimated at a cost of \$6,850,000.

Costs are in 2017 dollars and reflect typical design and construction costs from other similar projects, including the following items:

- Earthwork, demolition, clearing & erosion control; intersections/crossings, walls, signage; bridges; mobilization, traffic control, and a 15% contingency.

PROJECT SECTIONS



OVERVIEW OF FUNDING SOURCES

Due to the cost of most construction and trail development activities, it may be necessary to consider several sources of funding, that when combined, would support these costs. This section outlines sources of funding at the federal, state, and local government levels and from the private sector. The following descriptions are intended to provide an overview of available options and do not represent a comprehensive list. Funding sources can be used for a variety of activities, including planning, design, implementation and maintenance. It should be noted that this section reflects the funding available at the time of writing. The funding amounts, fund cycles, and even the programs themselves are susceptible to change without notice.

FEDERAL FUNDING SOURCES

Federal funding is typically directed through State agencies to local governments either in the form of grants or direct appropriations, independent from State budgets, where shortfalls may make it difficult to accurately forecast available funding for future project development. Federal funding typically requires a local match of approximately 20%, but there are sometimes exceptions; the American Recovery and Reinvestment Act stimulus funds did not require a match. The following is a list of possible Federal funding sources that could be used to support construction of many trail improvements. Most of these are competitive, and involve the completion of extensive applications with clear documentation of the project needs, costs, and benefits.

MOVING AHEAD FOR PROGRESS IN THE TWENTY-FIRST CENTURY (MAP-21)

The largest source of federal funding for bicycle and pedestrian is the US DOT's Federal-Aid Highway Program, which Congress has reauthorized roughly every six years since the passage of the Federal-Aid Road Act of 1916. The latest act, Moving Ahead for Progress in the Twenty-First Century (MAP-21) was enacted in July 2012 as Public

Law 112-141, and has been extended several times since then. The Act replaces the Safe, Accountable, Flexible, Efficient Transportation Equity Act – a Legacy for Users (SAFETEA-LU), which was valid from August 2005 - June 2012.

MAP-21 authorizes funding for federal surface transportation programs including highways and transit. It is not possible to guarantee the continued availability of any listed MAP-21 programs, or to predict their future funding levels or policy guidance. Nevertheless, many of these programs have been included in some form since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, and thus may continue to provide capital for active transportation projects and programs.

There are a number of programs identified within MAP-21 that are applicable to bicycle and pedestrian projects, such as the Recreational Trails Program and Safe Routes to Schools.

TRANSPORTATION ALTERNATIVES

Transportation Alternatives (TA) is a new funding source under MAP-21 that consolidates three formerly separate programs under SAFETEA-LU: Transportation Enhancements (TE), Safe Routes to School (SR2S), and the Recreational Trails Program (RTP). These funds may be used for a variety of pedestrian, bicycle, and streetscape projects including sidewalks, bikeways, multi-use paths, and rail trails. TA funds may also be used for selected education and encouragement programming such as Safe Routes to School, despite the fact that TA does not provide a guaranteed set-aside for this activity as SAFETEA-LU did.

Average annual funds available through TA over the life of MAP-21 equal \$81.4 million nationally, which is based on a two percent set-aside of total MAP-21 allocations. Note that state DOT's may elect to transfer up to 50 percent of TA funds to other highway programs, so the amount listed on the website represents the maximum potential funding. Remaining TA funds (those monies not re-directed to other highway programs) are disbursed through a

separate competitive grant program administered by NCDOT. Local governments, school districts, tribal governments, and public lands agencies are permitted to compete for these funds.

HIGHWAY SAFETY IMPROVEMENT PROGRAM

MAP-21 doubles the amount of funding available through the Highway Safety Improvement Program (HSIP) relative to SAFETEA-LU. HSIP provides \$2.4 billion nationally for projects and programs that help communities achieve significant reductions in traffic fatalities and serious injuries on all public roads, bikeways, and walkways. MAP-21 preserves the Railway-Highway Crossings Program within HSIP but discontinues the High-Risk Rural roads set-aside unless safety statistics demonstrate that fatalities are increasing on these roads. Bicycle and pedestrian safety improvements, enforcement activities, traffic calming projects, and crossing treatments for non-motorized users in school zones are eligible for these funds.

SURFACE TRANSPORTATION PROGRAM (STP)

The Surface Transportation Program (STP) provides states with flexible funds which may be used for a variety of highway, road, bridge, and transit projects. A wide variety of pedestrian improvements are eligible, including trails, sidewalks, crosswalks, pedestrian signals, and other ancillary facilities. Modification of sidewalks to comply with the requirements of the Americans with Disabilities Act (ADA) is also an eligible activity. Unlike most highway projects, STP-funded pedestrian facilities may be located on local and collector roads which are not part of the Federal-aid Highway System. 50 percent of each state's STP funds are allocated by population to the MPOs; the remaining 50 percent may be spent in any area of the state.

FEDERAL TRANSIT ADMINISTRATION ENHANCED MOBILITY OF SENIORS AND INDIVIDUALS WITH DISABILITIES

This program can be used for capital expenses that support transportation to meet the special needs of older adults and persons with disabilities, including providing access to an eligible public transportation facility when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs.

FEDERAL COMMUNITY DEVELOPMENT BLOCK GRANT

Community Development Block Grant (CDBG) funds are allocated through the States to local municipal or county governments for projects that enhance the viability of communities by providing decent housing and suitable living environments and by expanding economic opportunities, principally for persons of low and moderate income. The program provides communities with resources to address a wide range of unique community development needs.

Beginning in 1974, the CDBG program is one of the longest continuously run programs at HUD. The CDBG program provides annual grants on a formula basis to 1209 general units of local government and States. Federal CDBG grantees may use Community Development Block Grants funds for activities that include (but are not limited to): acquiring real property; reconstructing or rehabilitating housing and other property; building public facilities and improvements, such as streets, sidewalks, community and senior citizen centers and recreational facilities; paying for planning and administrative expenses, such as costs related to developing a consolidated plan and managing Community Development Block Grants funds; provide public services for youths, seniors, or the disabled; and initiatives such as neighborhood watch programs.

ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANTS

The Department of Energy's Energy Efficiency and Conservation Block Grants (EECBG) may be used to reduce energy consumptions and fossil fuel emissions and for improvements in energy efficiency. Section 7 of the funding announcement states that these grants provide opportunities for the development and implementation of transportation programs to conserve energy used in transportation including development of infrastructure such as bike lanes and pathways and pedestrian walkways. Although the current grant period has passed, more opportunities may arise in the future.

RIVERS, TRAILS, AND CONSERVATION ASSISTANCE PROGRAM

The Rivers, Trails and Conservation Assistance Program (RTCA) is a National Parks Service (NPS) program providing technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program provides only for planning assistance—there are no implementation funds available. Projects are prioritized for assistance based on criteria including conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments. This program may benefit trail development in South Carolina locales indirectly through technical assistance, particularly for community organizations, but is not a capital funding source.

STATE FUNDING SOURCES

The following is a list of possible State funding sources that could be used to support construction of many pedestrian and bicycle improvements in Cleveland County.

SURFACE TRANSPORTATION PROGRAM

The Surface Transportation Program (STP) provides states with flexible funds which may be used for a variety of highway, road, bridge, and transit projects. A wide variety of pedestrian and bicycle improvements are eligible, including on-street bicycle facilities, off-street trails, sidewalks, crosswalks, pedestrian and bicycle signals, parking, and other ancillary facilities. Modification of sidewalks to comply with the requirements of the Americans with Disabilities Act (ADA) is also an eligible activity. Unlike most highway projects, STP-funded pedestrian and bicycle facilities may be located on local and collector roads which are not part of the Federal-aid Highway System. Fifty percent of each state's STP funds are sub-allocated geographically by population. These funds are funneled through NCDOT to the MPOs in the state. The remaining fifty percent may be spent in any area of the state.

HIGHWAY SAFETY IMPROVEMENT PROGRAM

MAP-21 doubles the amount of funding available through the Highway Safety Improvement Program (HSIP) relative to SAFETEA-LU. HSIP provides \$2.4 billion nationally for projects and programs that help communities achieve significant reductions in traffic fatalities and serious injuries on all public roads, bikeways, and walkways. Infrastructure and non-infrastructure projects are eligible for HSIP funds. Pedestrian and bicycle safety improvements, enforcement activities, traffic calming projects, and crossing treatments for active transportation users in school zones are examples of eligible projects. All HSIP projects must be consistent with the state's Strategic Highway Safety Plan.

Pedestrian and bicycle strategies identified in the 2014 Draft SHSP include engineering bike lanes, sidewalks and shared-use paths, especially where supported by crash data, educational programs and targeted enforcement.

LOCAL GOVERNMENT FUNDING SOURCES

Local funding sources that would support trail facility project construction should be explored to support Cleveland County active transportation projects.

GENERAL FUND

The General Fund is often used to pay for maintenance expenses and limited capital improvement projects. Projects identified for reconstruction or re-pavement as part of the Capital Improvements list should also incorporate recommendations for bicycle or pedestrian improvements in order to reduce additional costs.

LOCAL BOND MEASURE

Local bond measures, or levies, are usually general obligation bonds for specific projects. Bond measures are typically limited by time based on the debt load of the local government or the project under focus. Funding from bond measures can be used for engineering, design and construction of trails, greenways, and pedestrian and bicycle facilities. In 2012, voters in Austin, Texas approved a \$143 million bond measure to fund a variety of mobility and active transportation projects. A project paid for with a bond measure will need to be repaid through a designated revenue stream such as parking revenues or other user fees.

STORMWATER UTILITY FEES

Stormwater charges are typically based on an estimate of the amount of impervious surface on a user's property. Impervious surfaces (such as rooftops and paved areas) increase both the amount and rate of stormwater runoff compared to natural conditions. Such surfaces cause runoff that directly or indirectly discharges into public storm drainage facilities and creates a need for stormwater management services. Thus, users with more impervious surface are charged more for stormwater

service than users with less impervious surface.

The rates, fees, and charges collected for stormwater management services may not exceed the costs incurred to provide these services. The costs that may be recovered through the stormwater rates, fees, and charges includes any costs necessary to assure that all aspects of stormwater quality and quantity are managed in accordance with federal and state laws, regulations, and rules. Open space may be purchased with stormwater fees, if the property in question is used to mitigate floodwater or filter pollutants.

SYSTEM DEVELOPMENT CHARGES/DEVELOPER IMPACT FEES

System Development Charges (SDCs), also known as Developer Impact Fees, represent another potential local funding source. SDCs are typically tied to trip generation rates and traffic impacts produced by a proposed project. A developer may reduce the number of trips (and hence impacts and cost) by paying for on- or off-site pedestrian improvements that will encourage residents to walk (or use transit, if available) rather than drive. In-lieu parking fees may be used to help construct new or improved pedestrian facilities. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical in avoiding a potential lawsuit.

IN LIEU OF FEES

Developers often dedicate open space or greenways in exchange for waiving fees associated with park and open space allocation requirements in respect to proposed development. These types of requirements are presented within local municipal codes and ordinances.

UTILITY LEASE REVENUE

A method to generate revenues from land leased to utilities for locating utility infrastructure on municipally owned parcels. This can improve capital budgets and

support financial interest in property that would not otherwise create revenue for the government.

BUSINESS IMPROVEMENT AREA OR DISTRICT (BIA OR BID)

Trail development and pedestrian and bicycle improvements can often be included as part of larger efforts aimed at business improvement and retail district beautification. Business Improvement Areas collect levies on businesses in order to fund area-wide improvements that benefit businesses and improve access for customers. These districts may include provisions for pedestrian and bicycle improvements, including as wider sidewalks, landscaping and ADA compliance.

SALES TAX

Local governments that choose to exercise a local option sales tax use the tax revenues to provide funding for a wide variety of projects and activities.

PROPERTY TAX

Property taxes generally support a significant portion of a local government's activities. However, the revenues from property taxes can also be used to pay debt service on general obligation bonds issued to finance open space system acquisitions. Because of limits imposed on tax rates, use of property taxes to fund open space could limit the municipality's ability to raise funds for other activities. Property taxes can provide a steady stream of financing while broadly distributing the tax burden. In other parts of the country, this mechanism has been popular with voters as long as the increase is restricted to parks and open space. It should be noted that other public agencies compete vigorously for these funds, and taxpayers are generally concerned about high property tax rates.

TAX INCREMENT FINANCING (TIF)

Tax Increment Financing is a tool to use future gains in taxes to finance the current improvements that will create those gains. When a public project (e.g., shared use trail) is constructed, surrounding property values generally increase and encourage surrounding development or redevelopment. The increased tax revenues are then dedicated to support the debt created by the original public improvement project.

FUNDS FROM PRIVATE FOUNDATIONS & ORGANIZATIONS

Many communities have solicited trail infrastructure funding assistance from private foundations and other conservation-minded benefactors.

THE ROBERT WOOD JOHNSON FOUNDATION

The Robert Wood Johnson Foundation was established in 1972 and today it is the largest U.S. foundation devoted to improving the health and health care of all Americans. Grant making is concentrated in four areas: To assure that all Americans have access to basic health care at a reasonable cost To improve care and support for people with chronic health conditions To promote healthy communities and lifestyles To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs.

REI GRANTS

REI is dedicated to inspiring people to love the outdoors and take care of the places they love. REI focuses philanthropic efforts on supporting and promoting participation in active volunteerism to care for public lands, natural areas, trails and waterways. This focus engages a full spectrum of REI resources to mobilize communities around outdoor stewardship. The store teams cultivate strong partnerships with local non-profit organizations that engage individuals, families and entire communities in outdoor volunteer stewardship.

REI stores use their public visibility, staff support and online communication tools to connect people to the stewardship opportunities hosted by their partners. These store resources thereby drive customers' attention, awareness and involvement in support of partner programs and needs. REI also supports local partners financially with grant funding. The grants program begins with nominations from store teams who select the local non-profits with whom they've developed enduring and meaningful partnerships. Nominated partners are then invited to submit applications for grant funding. REI grants provide partner organizations with the resources to organize stewardship activities and get volunteers involved.

WALMART STATE GIVING PROGRAM

The Walmart Foundation financially supports projects that create opportunities for better living. Grants are awarded for projects that support and promote education, workforce development/ economic opportunity, health and wellness, and environmental sustainability. Both programmatic and infrastructure projects are eligible for funding. State Giving Program grants start at \$25,000, and there is no maximum award amount. The program accepts grant applications on an annual, state by state basis.

THE RITE-AID FOUNDATION GRANTS

The Rite Aid Foundation is a foundation that supports projects that promote health and wellness in the communities that Rite Aid serves. Award amounts vary and grants are awarded on a one year basis to communities in which Rite Aid operates. A wide array of activities are eligible for funding, including infrastructure and programmatic projects.

BANK OF AMERICA CHARITABLE FOUNDATION

The Bank of America Charitable Foundation is one of the largest in the nation. The primary grants program is called Neighborhood Excellence, which seeks to identify critical

issues in local communities. Another program that applies to greenways is the Community Development Programs, and specifically the Program Related Investments. This program targets low and moderate income communities and serves to encourage entrepreneurial business development.

THE TRUST FOR PUBLIC LAND

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land for human enjoyment and well being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities.

NATIONAL TRAILS FUND

American Hiking society created the National Trails Fund in 1998 as the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting, and maintaining foot trails in America. The society provides funds to help address the \$200 million backlog of trail maintenance. National Trails Fund grants help give local organizations the resources they need to secure access, volunteers, tools and materials to protect America's cherished public trails. To date, American Hiking has granted more than \$240,000 to 56 different trail projects across the U.S. for land acquisition, constituency building campaigns, and traditional trail work projects. Awards range from \$500 to \$10,000 per project.

- Projects the American Hiking Society will consider include: Securing trail lands, including acquisition of trails and trail corridors, and the costs associated with acquiring conservation easements.
- Building and maintaining trails that will result in visible and substantial ease of access, improved hiker safety, and/or avoidance of environmental damage.

- Constituency building surrounding specific trail projects, including volunteer recruitment and support.

THE CONSERVATION ALLIANCE

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to protect wild and natural areas. Grants are typically about \$35,000 each. Since its inception in 1989, The Conservation Alliance has contributed \$4,775,059 to environmental groups across the nation, saving over 34 million acres of wild lands. The Conservation Alliance Funding Criteria:

- The Project should be focused primarily on direct citizen action to protect and enhance our natural resources for recreation.
- The Alliance does not look for mainstream education or scientific research projects, but rather for active campaigns.
- All projects should be quantifiable, with specific goals, objectives, and action plans and should include a measure for evaluating success.
- The project should have a good chance for closure or significant measurable results over a fairly short term (one to two years).
- Funding emphasis may not be on general operating expenses or staff payroll.

PEOPLE FOR BIKES

The People For Bikes Community Grant Program provides funding for important and influential projects that leverage federal funding and build momentum for bicycling in communities across the U.S. These projects include bike paths and rail trails, as well as mountain bike trails, bike parks, BMX facilities, and large-scale bicycle advocacy initiatives.

Since 1999, they have awarded 272 grants to non-profit organizations and local governments in 49 states and the

District of Columbia. The investments total nearly \$2.5 million and have leveraged \$650 million in public and private funding.

LOCAL TRAIL SPONSORS

A sponsorship program for trail amenities allows smaller donations to be received from both individuals and businesses. Cash donations could be placed into a trust fund to be accessed for certain construction or acquisition projects associated with the greenways and open space system. Some recognition of the donors is appropriate and can be accomplished through the placement of a plaque, the naming of a trail segment, and/or special recognition at an opening ceremony. Valuable in-kind gifts include donations of services, equipment, labor, or reduced costs for supplies.

CORPORATE DONATIONS

Corporate donations are often received in the form of liquid investments (i.e. cash, stock, bonds) and in the form of land. Municipalities typically create funds to facilitate and simplify a transaction from a corporation's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented. Such donations can improve capital budgets and/or projects.

PRIVATE INDIVIDUAL DONATIONS

Private individual donations can come in the form of liquid investments (i.e. cash, stock, bonds) or land. Municipalities typically create funds to facilitate and simplify a transaction from an individual's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented. Such donations can improve capital budgets and/or projects.

FUNDRAISING / CAMPAIGN DRIVES

Organizations and individuals can participate in a fundraiser or a campaign drive. It is essential to market the purpose of a fundraiser to rally support and financial backing. Often times fundraising satisfies the need for public awareness, public education, and financial support.

LAND TRUST ACQUISITION AND DONATION

Land trusts are held by a third party other than the primary holder and the beneficiaries. This land is oftentimes held in a corporation for facilitating the transfer between two parties. For conservation purposes, land is often held in a land trust and received through a land trust. A land trust typically has a specific purpose such as conservation and is used so land will be preserved as the primary holder had originally intended.

VOLUNTEER WORK

Residents and other community members are excellent resources for garnering support and enthusiasm for a greenway corridor or pedestrian facility. Furthermore volunteers can substantially reduce implementation and maintenance costs. Individual volunteers from the community can be brought together with groups of volunteers from church groups, civic groups, scout troops and environmental groups to work on greenway development on special community workdays. Volunteers can also be used for fund-raising, maintenance, and programming needs.

