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Integrated Mobility Division
N.C. DEPARTMENT OF TRANSPORTATION

Crowders Mountain Paved Trail Feasibility Study

City of Gastonia
NCDOT IMD

June 25th, 2025

Steering Committee

NCDOT

Hart Evans
 Alex Rotenberry
 Dean Ledbetter

**Catawba Lands Conservancy /
 Carolina Thread Trail**

Jane Love
 Bret Baronak

City of Gastonia

Andy Stahr
 Jason Thompson
 Quentin McPhatter
 Rusty Bost
 Robert Cloninger

Gaston County

Juan Garcia
 Michael Applegate

**Gaston-Cleveland-Lincoln
 Metropolitan Planning
 Organization**

Julio Pardes

**NC Division of Parks and
 Recreation**

Dave Head
 Glen George

Prepared For:



**Bret Baronak, Carolina Thread
 Trail Director**
 2400 Park Road, Suite 1
 Charlotte, NC 28203



Sushil Nepal, Planning Director
 150 S. York Street
 Gastonia, NC



**Hart Evans, Statewide Planning
 & Programming Manager**
 1 S. Wilmington St.
 Raleigh, NC 27699

Prepared By:



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Acronym	Definition
AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ACS	American Community Survey
ADA	Americans with Disabilities Act
AFP	Accessibility for Parks
BCBSF	Blue Cross Blue Shield Foundation
BIL	Bipartisan Infrastructure Law
CLUP	Comprehensive Land Use Plan
CMAQ	Congestion Mitigation and Air Quality
CRP	Carbon Reduction Program
CTP	Comprehensive Transportation Plan
DA	Direct Allocation
FHWA	Federal Highway Administration
GCLMPO	Gaston-Cleveland-Lincoln Metropolitan Planning Organization
GHG	Greenhouse Gas
GTS	Great Trails State

Acronym	Definition
HOA	Home Owners Association
HQW	High Quality Waters
HUD	U.S. Department of Housing and Urban Development
IMD	Integrated Mobility Division
LAPP	Locally Administered Projects Program
LWCF	Land and Water Conservation Fund
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
MUP	Multiuse Path
NCDNCR	North Carolina Department of Natural and Cultural Resources
NCDOT	North Carolina Department of Transportation
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places

Acronym	Definition
ORLP	Outdoor Recreation Legacy Partnership
PARTF	Parks and Recreation Trust Fund
PROWAG	Public Right-of-Way Accessibility Guidelines
ROW	Right-of-Way
RPO	Rural Planning Organization
RTP	Recreational Trails Program
STBG	Surface Transportation Block Grant
STI	Strategic Transportation Investments
STIP	State Transportation Improvement Program
TAP	Transportation Alternatives Program
TDI	Transportation Disadvantage Index
UDO	Unified Development Ordinance
UPWP	Unified Planning Work Program
ZSR	Z. Smith Reynolds Foundation

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Section 1 // Executive Summary

Crowders Mountain Paved Trail Feasibility Study

1.1 // Study Overview

The Carolina Thread Trail is a regional network of paved and unpaved greenways, multi-use paths, sidewalks, and blueways (paddle trails) connecting 15 counties in North Carolina and South Carolina. The Carolina Thread Trail Master Plan for Gaston County Communities was adopted in 2009. In light of the City of Gastonia’s newly planned 140-acre Linwood Springs Park near Crowders Mountain State Park and adoption of the City of Gastonia Comprehensive Bicycle Plan (2023), the Gastonia-Crowders Mountain Paved Pathways Feasibility Study has re-evaluated the Carolina Thread Trail segment located in the City of Gastonia connecting Crowders Mountain State Park and downtown Gastonia. The study has been led by the NCDOT IMD, the Carolina Thread Trail (led by Catawba Lands Conservancy), and the City of Gastonia in collaboration with the NC Division of Parks and Recreation, Crowders Mountain State Park, Gaston County, and GCLMPO.

The alternatives evaluated for recommendation were developed through a combination of individual trail segments, divided at structures, features, intersections, and natural breaks within the study area. Combining the segments in various ways resulted in sets of alternatives for each side of the future Linwood Springs Park, i.e. five western alternatives for connecting Crowders Mountain State Park and the future Linwood Springs Park, and four eastern alternatives for connecting Linwood Springs Park to downtown Gastonia. These alignments became the alternatives under evaluation. The evaluation criteria are based on a combination of study considerations, feedback from the public and steering committee members, outcomes of previous studies and plans, and data collection throughout the planning stages of the project.

The recommended alternative segments on each side of the study area meet within the future Linwood Springs Park, using facilities from the park’s master plan, and together create the entire recommended alternative for the Gastonia-Crowders Mountain Paved Pathways Feasibility Study.

1.2 // Recommended Alternative

Using the future Linwood Springs Park as a central connection point, this study identified and evaluated individual alternatives for the west side of the study area (from Crowders Mountain State Park to Linwood Springs Park) and the east side of the study area (from Linwood Springs Park to downtown Gastonia). After evaluating the west side alternatives, West Alternative 1 (W-1) was recommended

for selection. W-1 is approximately 3.56 miles, primarily follows Crowders Creek on the south side, and generally adheres to the original Carolina Thread Trail segment adopted in 2009. This alternative is planned to begin just off of Linwood Road, at the Backside Trailhead inside Crowders Mountain State Park, and will terminate at the northern end of Linwood Spring Park, where the trail will connect to existing former golf cart paths. This alternative received the most support from the public due to the scenic user experience of being off-road and lack of proximity to heavy traffic volumes.

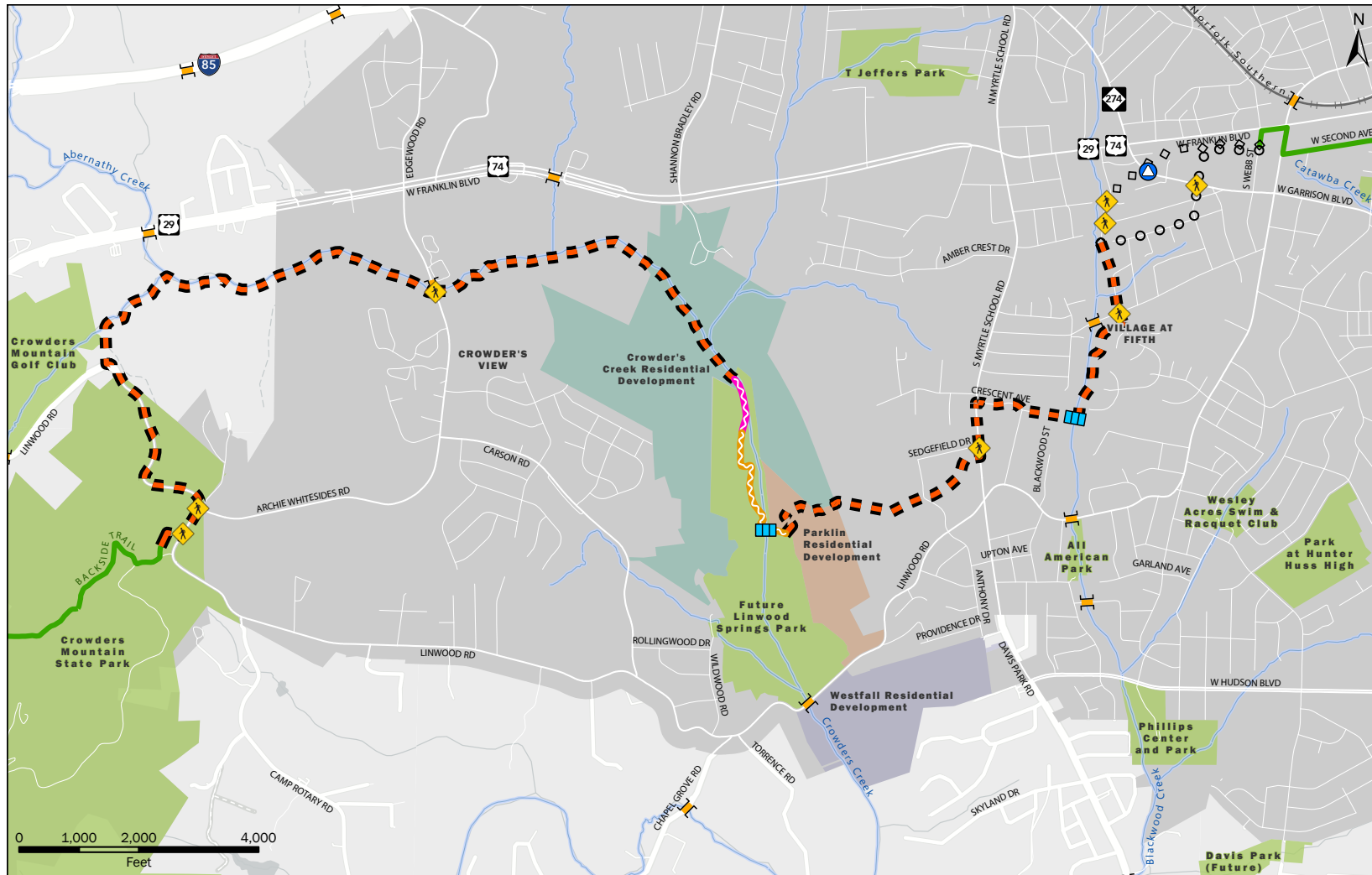
The recommended alternative on the east side of the study area is East Alternative 2 (E-2). Alternative E-2 is approximately 2.62 miles, using option A, or 2.64 miles utilizing option B, and would travel east from the central portion of Linwood Springs Park along an existing sanitary sewer easement, until meeting Learning Place where the trail will pass through a proposed family apartment complex, before reaching S. Myrtle School Road, where the trail turns north, and then east onto Crescent Avenue/White Lane. After crossing Blackwood Creek, the route would tie into the existing greenway at the Village at Fifth and continue north along Blackwood Creek. Near Parkdale Avenue, the route could use one of two options to connect to the existing Carolina Thread Trail segment along W. 2nd Avenue. This alternative also includes flexibility in accommodation for future development with A and B options for crossing W. Garrison Boulevard before connecting to the existing Carolina Thread Trail segment on W. 2nd Avenue in downtown Gastonia.

The combination of W-1 and E-2, plus the connection of Linwood Park, creates the overall recommended route for the Carolina Thread Trail to connect from Crowders Mountain State Park to the existing Carolina Thread Trail segment in downtown Gastonia. The overall recommended route is approximately 6.57 miles long and is shown in Figure 1 on the next page. As of June 2025, the anticipated construction cost to construct the trail in its entirety is approximately \$17,000,000 (See Appendix A). This cost subject to changes in future years.

Potential Surface Type Design

The recommended surface type for the alternative is a 10-foot asphalt shared-use path, 10-foot multiuse side path with a buffer along roadways, or a 6-foot wide sidewalk with a buffer along roadways. These new surface types can be combined with sections of existing sidewalk and on-road bicycle facilities.

Figure 1



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

RECOMMENDED ALTERNATIVE

- Recommended Alternative
- Option A
- Option B
- Connector to Linwood Springs Park
- Linwood Park Former Cart Path
- Existing Carolina Thread Trail
- DOT Bridge
- Pedestrian Bridge
- Pedestrian Crossing
- Garrison Blvd Culvert
- Stream
- Park
- City of Gastonia

1.3 // Public Involvement

Prior to this project, numerous planning initiatives by the City of Gastonia, Gaston County, and the Carolina Thread Trail provided opportunities for the public to learn and give feedback about the overall bicycle and pedestrian networks and specific facilities or corridors. For the Gastonia-Crowders Mountain Paved Pathways Feasibility Study, three steering committee meetings were held throughout the duration of this project. The steering committee informed many of the considerations and concerns surrounding the potential route alternatives and the nature of this project. A public meeting was held, open-house style, on Thursday, November 30, 2023, from 5 pm – 7 pm in Gastonia, NC at the Phillips Recreation Center. The purpose of the public meeting was to acquire feedback from the public regarding popular destinations, overall interest in the trail, as well as their preferences for alternatives and surface types. Feedback from the steering committee and public input assisted in the selection process for a recommended alternative.

Comments heard and collected at this meeting were generally supportive of the project as a multi-modal resource for Gastonia. Commenters showed a preference for west side alternatives W-1 and W-4 and east side alternatives E-1 and E-2. Comments indicated a preference for trails that provide a comfortable, pleasant experience, particularly those that travel through areas removed from roadways, such as those alongside Crowders Creek.

1.4 // Implementation Highlights

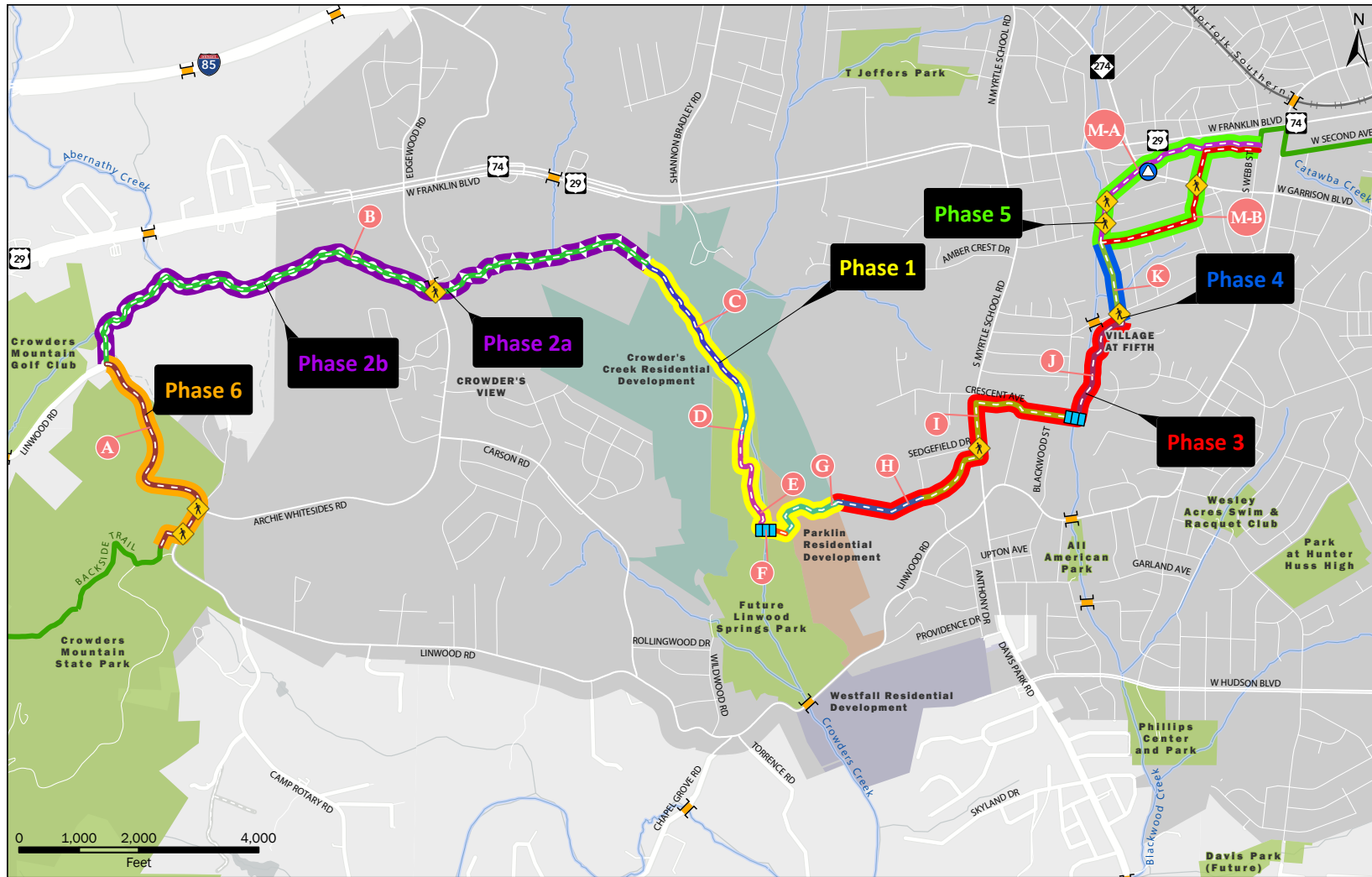
Phasing + Scenarios

To move from corridor identification to implementation, the study also considered what pieces of the corridor length might realistically be implemented at a time and in what approximate order. Implementation segments A-M were identified based on needs and characteristics such as ROW or easement acquisition, planned adjacent development, and logical connection points. Segments were then combined and sorted into phases, which are sequenced based on inputs such as estimated costs, concurrent development, and priority connections. Figure 2 on the next page illustrates the proposed implementation segments and phases.

Partners + Funding

The collaboration of interest groups, government agencies, stakeholders, and communities will be essential to the construction of the trail. Key partners include municipalities, state and local agencies, local businesses, non-profits, developers, and private landowners. Funding for the project could be assembled with a combination of federal and state grants administered by the FHWA, NCDOT, GCLMPO, or NC Division of Parks and Recreation; local funding and matching funds; and state funding through NCDOT's STIP.

Figure 2



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

RECOMMENDED IMPLEMENTATION PHASES

- | | | | | | |
|--|--------------------------------|--|------------------|--|----------|
| | Existing Carolina Thread Trail | | Stream | | Phase 1 |
| | DOT Bridge | | Park | | Phase 2a |
| | Pedestrian Bridge | | City of Gastonia | | Phase 2b |
| | Pedestrian Crossing | | | | Phase 3 |
| | Garrison Blvd Culvert | | | | Phase 4 |
| | | | | | Phase 5 |
| | | | | | Phase 6 |

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Section 2 // Introduction

Crowders Mountain Paved Trail Feasibility Study

2.1 // Overview + Study Goals

The Carolina Thread Trail is a regional network of paved and unpaved greenways, multi-use paths, sidewalks, and blueways (paddle trails) connecting 15 counties in North Carolina and South Carolina. The Carolina Thread Trail Master Plan, adopted in 2009, outlined this initiative for Gaston County and surrounding communities. The initiative has since been incorporated into various transportation plans including the more recently adopted City of Gastonia Comprehensive Bicycle Plan adopted in June 2023.

This plan, along with the development of the future Linwood Springs Park, inspired the re-evaluation of a proposed Carolina Thread Trail trail segment located in west Gastonia. This Gastonia-Crowders Mountain Paved Pathways Feasibility Study has re-evaluated the proposed Carolina Thread Trail segment located in the City of Gastonia, connecting the existing Carolina Thread Trail trail segment in Crowders Mountain State Park and the existing trail segment in downtown Gastonia. This feasibility study includes a development of cost estimates and an implementation plan for the construction of the recommended trail segment.

The feasibility study has been led by the NCDOT's IMD, the Catawba Lands Conservancy/Carolina Thread Trail, and the City of Gastonia in collaboration with the NC Division of Parks and Recreation, Crowders Mountain State Park, Gaston County, and GCLMPO.

Table 1 on the following page highlights the benefits of the proposed greenway.

Table 1

Study Goals

Project Benefit	Description
Connectivity/Accessibility	The Carolina Thread Trail segment, once constructed, will provide adequate paths for pedestrians and bicyclists. Currently, many of the roadways within the project's study area have sidewalks that exist solely in front of newer neighborhoods or need repair. There are trails with gaps between segments that exist without a clear destination. The Trail will provide adequate routes to various destinations of interest such as parks, schools, and neighborhoods.
Safety	Many of the roadways within the study area have AADT counts as high as 6,100 and speed limits as high as 45 mph. The speed and traffic volume contribute to a lack of safety for pedestrians and bicyclists who use these roads to get to their destination. Considering this, construction of the trail should minimize roadway crossings, crossings with driveways, and reduce the proximity of pedestrians and bicyclists to the roadways and traffic.
Environmental	There is rapid development happening in the City of Gastonia as employment opportunities and development attract residents from the neighboring Lincoln County as well as from the growth spreading from the Charlotte Region as residents look to settle in residential areas outside of the City of Charlotte. With the increase in population, there comes the increase in motor vehicles on roadways. Connecting the two existing segments of the Carolina Thread Trail will provide alternative modes of transportation and reduce the impact of vehicle emission on the environment.
Economic	Connecting the two existing segments of the Carolina Thread Trail will not only provide additional connectivity to places of employment but will be attractive to developers due to increased accessibility. It also increases attractiveness to residential areas. The trail will also contribute to the tourist industry within the city, attracting pedestrians and bicyclists traveling the Great State Trails through the state.
Equity	Within the study area, there are communities that have historically been underserved and underfunded. Specifically, the eastern part of the study area between Crowders Creek and downtown Gastonia, block groups exist with high percentages of low-income and zero-vehicle households. Construction of the trail will provide these communities with multi-modal transportation to access schools and parks and other destinations of interest.

2.2 // What Is a Feasibility Study?

A feasibility study bridges the gap between conceptual planning and programming of a project. It builds upon higher-level planning efforts and takes a comprehensive approach to identify possible route alternatives of multimodal corridors. The purpose of this type of study is to evaluate the technical feasibility of a project from a design, permitting, and constructability perspective. Input solicited from the local community and stakeholders helps guide the development of recommended routes. Preliminary cost estimates are generated for route alternatives to help inform further decision making, identify funding needs, and develop next steps for project implementation.

Study Goals:

- Evaluation of route alternatives connecting two existing Carolina Thread Trail segments through the examination of existing site conditions, constructability, and technical feasibility
- Connectivity between communities, parks, and commercial centers across the City of Gastonia
- Safety improvements for bicyclists and pedestrians
- Public input for the development of feasible alternatives
- Estimation of costs associated with the construction of potential alignments
- Identification of preferred alignment and development of an implementation plan along with funding opportunities

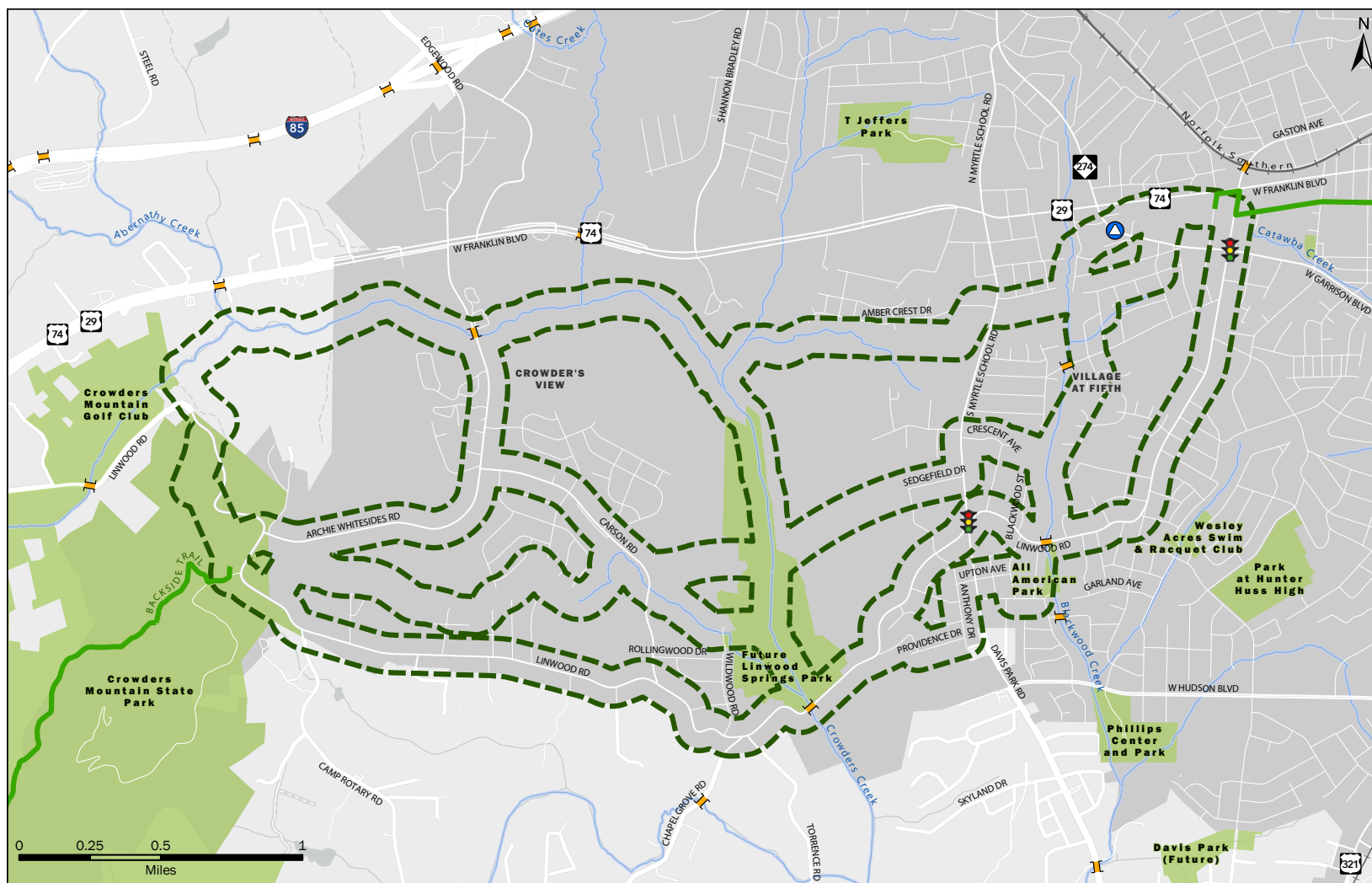
2.3 // Background + Site History

The GTS Plan is a strategic plan for building a network of shared-use paths, connecting communities and population centers while simultaneously creating opportunities for recreation, conservation, tourism, health, options in modes of transportation, and economic growth across all 100 counties in the state of North Carolina. There are several existing state trails that support the vision for further establishing a trails network across the state.

Much of the Carolina Thread Trail's Master Plan was incorporated into the vision of the GTS Plan. At the Linwood Road access to Crowders Mountain State Park, Crowders Mountain Trail and Backside Trail constitute an existing segment of the Carolina Thread Trail. The study area extends from this existing segment in Crowders Mountain State Park to the intersection of W. 2nd Avenue & Linwood Road (SR 1131) in downtown Gastonia where sharrows and sidewalks make up

another existing Carolina Thread Trail segment. In the center of the study area sits the future Linwood Springs Park, formerly a golf course, in which some of the existing concrete golf cart path will be incorporated into the Carolina Thread Trail alignment to connect the existing segments on either side of the study area. The existing gap in connection between the two existing Carolina Thread Trail segments is between five to eight miles, depending on the alternative route segments selected. Re-evaluating the original adopted Carolina Thread Trail segment connecting the state park and downtown to include Linwood Springs Park supports the initiative to improve connectivity between parks and communities.

Figure 3



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

STUDY AREA

- Feasibility Study Area
- Existing Carolina Thread Trail
- DOT Bridge
- Garrison Blvd Culvert
- Signalized Crossing
- Stream
- Park
- City of Gastonia

2.4 // Process + Project Schedule

- Existing Conditions: June 2023 – August 2023
 - » Data collection
 - » Site visit and field observations
 - » Steering committee meeting #1
 - » Human and natural environmental considerations
- Alternatives Development: August 2023 – November 2023
 - » Design criteria and typical sections
 - » Summary and map of alignment alternatives
 - » Opportunities and constraints analysis
 - » Steering Committee meeting #2
- Public Involvement: November 2023
 - » Previous public engagement summary
 - » Public Meeting
 - » Stakeholder feedback
- Recommendations: November 2023 – March 2024
 - » Evaluation criteria of route alternatives
 - » Decision matrix and scoring
 - » Cost estimates
 - » Preferred alternative alignment summary
- Implementation and Final Study: April 2024 – July 2025
 - » Summary of Implementation strategies
 - » Action Plan
 - » Funding resources
 - » Maintenance considerations
 - » Steering Committee meeting #3
 - » Refinement of alternatives
 - » Draft and final feasibility study

2.5 // Previous Planning Efforts

The City of Gastonia, the Carolina Thread Trail, and GCLMPO have completed previous planning efforts that include the Carolina Thread Trail as part of proposed bicycle and pedestrian networks. The trail alignment identified by the Carolina Thread Trail in the Carolina Thread Trail Master Plan for Gaston County Communities (2009) and included in the subsequent planning documentation follows the alignment of Crowders Creek in the area between Crowders Mountain State Park and downtown Gastonia. Through this study, potential alternative routes were considered that deviate from the Crowders Creek alignment in order to explore ways the trail could reach other areas, including the planned Linwood Springs Park.

The following is a list of the transportation plans that were reviewed as a part of this study:

- *Carolina Thread Trail Master Plan for Gaston County Communities (2009)*
- *Gaston County 2035 Comprehensive Land Use Plan (2016)*
- *Gastonia 2025 Comprehensive Plan (2011)*
- *Gastonia Comprehensive Bicycle Plan (2023)*
- *Gastonia Comprehensive Pedestrian Plan (2014)*
- *Gastonia Greenway Plan (2024)*
- *Gastonia Parks and Recreation Master Plan (2019)*
- *Garrison Boulevard Corridor Study (2023)*
- *GCLMPO 2050 Metropolitan Transportation Plan (Adopted 2022, Amended 2023)*
- *GCLMPO Comprehensive Transportation Plan (Adopted 2016, Amended 2018)*
- *Great Trails State Plan Final Study (2022)*

Table 2 summarizes the recommendations related to the study as a part of the previous planning efforts.

Table 2

Existing Plan	Recommendations Related to Gastonia-Crowders Mountain Paved Pathways Feasibility Study
<p>Carolina Thread Trail Master Plan for Gaston County Communities (2009)</p>	<p>The Carolina Thread Trail is a regional network of paved and unpaved trails and greenways, as well as blueways (paddle trails). Within the Carolina Thread Trail Master Plan for Gaston County Communities, the plan proposes the routes throughout Gaston County that will connect its communities to the overall network across the state. The plan identifies corridors for proposed segments for the Carolina Thread Trail as well as existing trails that can be incorporated into the network. The original adopted Carolina Thread Trail route connecting Crowders Mountain State Park and downtown Gastonia is identified in the Master Plan. More specifically, it is identified as a top priority segment due to the availability of land as well as overall support for the alignment. This original recommendation in the study area followed Crowders Creek towards the former Linwood Springs Golf Course, where it continued east across Myrtle School Road to Blackwood Creek near Parkdale Avenue, where it turned north along the creek to a tributary corridor carrying it east past Garrison Boulevard and the former Parkdale Mill site. Other corridors along the study area are identified in the Master Plan as other potential connections. This includes Archie Whitesides Road as well as Crowders Creek and Blackwood Creek.</p>
<p>Gaston County 2035 Comprehensive Land Use Plan (2016)</p>	<p>The purpose of the Comprehensive Land use Plan (CLUP) for Gaston County is to address potential opportunities and challenges for the county over the next two decades. According to the Plan, Gaston County is the fourth largest county in the Charlotte-Metro region with growth in the eastern part of the county being propelled by its proximity to Charlotte and development in the western part of the county increasing due to Cleveland County and industrial and commercial development. The residential area located between Crowders Mountain State Park and US 321 lacks connectivity to other areas of Gastonia and remains relatively rural. The public input collected as a part of the CLUP reflected citizens' desire for conservation and connectivity in the area.</p>
<p>Gastonia 2025 Comprehensive Plan (2011)</p>	<p>The 2011 City of Gastonia Comprehensive Plan outlines a strategy to improve transportation infrastructure while promoting safety, efficiency, and connectivity across the city. The plan emphasizes multimodal transportation, advocating for enhanced pedestrian, bicycle, and transit options to complement road improvements. It highlights the importance of integrating parks and recreational facilities into the transportation network, recognizing that greenways, trails, and parks contribute to a better quality of life. Specifically, the plan supports the completion of the Carolina Thread Trail as part of its vision to link parks and recreational areas through an interconnected transportation network.</p>

Existing Plan	Recommendations Related to Gastonia-Crowders Mountain Paved Pathways Feasibility Study
<p>Gastonia Comprehensive Bicycle Plan (2023)</p>	<p>Providing alternative modes of transportation is one of the priorities for creating a network of trails and greenways across the state. The City of Gastonia’s Bicycle Plan provides guidance for the implementation of a system and improvements that will allow residents and visitors to include bicycling as a mode of transportation. Currently, many routes connecting destinations for people on bicycles are not inviting and are generally perceived as unsafe. This discourages and inhibits bicycle usage. The plan’s goal is to create a system that increases safety, improves accessibility and connectivity between neighborhoods and popular destinations and the regional greenway network.</p> <p>As a part of the bicycle network, a shared use path is proposed along the existing Carolina Thread Trail alignment, Linwood Road, Crowders Creek, and Blackwood Creek, all of which are corridor segments in the project’s study area. The proposed shared use along Blackwood Creek and the eastern section of the original Carolina Thread Trail alignment are documented as being projects of high priority while Linwood Road is of medium priority and the Crowders Creek corridor and western section of the original Carolina Thread Trail alignment are low priority projects in the plan, due to lower residential and commercial densities.</p> <p>Garrison Boulevard is a major thoroughfare located at the northeastern part of the project study area. It received a high-level score of priority for on-road bicycling facilities. To address this part of the bicycle network prioritization, a road diet is being proposed to improve accessibility and safety and provide accommodations for bicyclists. This road diet begins at Linwood Road and extends along the boulevard east.</p>
<p>Gastonia Comprehensive Pedestrian Plan (2014)</p>	<p>The City of Gastonia's Comprehensive Pedestrian Plan aims to enhance health, safety, and quality of life by promoting walking as a safe and convenient mode of transportation. The plan outlines policies, programs, and infrastructure improvements, including a proposed network of greenways and trails designed to connect the entire city. This network is intended to integrate with county and regional trails, notably the Carolina Thread Trail.</p>
<p>Gastonia Parks and Recreation Master Plan (2019)</p>	<p>The 2019-2028 Gastonia Parks and Recreation Master Plan highlights the importance of integrating the Carolina Thread Trail into the city’s greenway and trail system, particularly emphasizing a connection from Crowders Mountain State Park into Gastonia. This plan supports regional connectivity and notes the Carolina Thread Trail as a key opportunity to link natural areas with urban centers, enhancing both recreational access, and eco-tourism potential. Expanding the greenway system is a strategic goal, aimed at improving access to parks (e.g. Linwood Springs District Park), schools (e.g. Forest Heights Elementary School), and neighborhoods. The Gastonia Parks and Recreation Master Plan encourages partnerships with organizations such as the Carolina Thread Trail, Gaston County, and local landowners to secure easements and funding for trail development. Moreover, the Carolina Thread Trail corridor is identified as a priority for future planning and investment, especially where it aligns with broader goals related to health, mobility, and environmental sustainability.</p>

Existing Plan	Recommendations Related to Gastonia-Crowders Mountain Paved Pathways Feasibility Study
<p>Gastonia Greenway Plan (2024)</p>	<p>The City of Gastonia Greenway System currently has about 6 miles of linear greenway. The greenways are the Avon Creek and Catawba Creek greenways and the Highland Rail Trail, which are a part of the Carolina Thread Trail for Gaston County. The map of the City of Gastonia Greenway Plan includes the proposed original alignment of the Carolina Thread Trail extending from the State Park to downtown Gastonia. The map also highlights the northern portion of Crowders Creek as a proposed greenway corridor along with the first segment of the original Carolina Thread Trail alignment that is on new location and extends from the State Park east to Crowders Creek. The entirety of Blackwood Creek corridor through the project study area is highlighted as a proposed greenway as well.</p>
<p>GCLMPO 2050 Metropolitan Transportation Plan (Adopted 2022, Amended 2023)</p>	<p>The GCLMPO 2050 MTP is a long-range transportation plan that defines the transportation network that will address traffic growth and land development patterns in the present year through the year 2050. It includes recommendations for highway improvements, bicycle and pedestrian use, public transportation, and freight based on population, traffic, and economic growth. The MTP lists Blackwood Creek Greenway in Horizon Year 2045 to be a shared use greenway to extend along Blackwood Creek from the Philips Center in Gastonia north to Walmart. This supports the inclusion of the Blackwood Creek corridor as a part of the study area for this project.</p>
<p>GCLMPO Comprehensive Transportation Plan (Adopted 2016, Amended 2018)</p>	<p>The CTP was a collaboration between the GCLMPO, NCDOT’s Transportation Planning Division, local counties and cities. Its efforts also included feedback from government officials as well as the public to inform transportation needs. The CTP identifies several corridors within the study area where improvements on existing facilities are needed or recommended facilities are warranted. One of these locations is Linwood Road, which is a major thoroughfare between Crowders Mountain State Park and downtown Gastonia, where on-road bicycle facilities are identified as needing improvement. There is potential for a preferred alternative along this road, and the CTP supports this potential improvement.</p> <p>Crowders Creek and Blackwood Creek are major corridors within the study area with the potential to be incorporated into potential alignment alternatives. Within the CTP, both creeks are recommended as corridors for a multi-use path, accommodating both bicyclists and pedestrians. The multi-use paths support the initiative to make North Carolina a GTS and create opportunities for recreation and conservation. Among other proposed new and improved trails, the CTP includes recommended MUPs along Blackwood Creek and Crowders Creek along the original Carolina Thread Trail proposed path.</p>
<p>Great Trails State Plan Final Study (2022)</p>	<p>The GTS Plan envisions connecting communities and population centers while simultaneously creating opportunities for recreation, conservation, tourism, health, options in modes of transportation, and economic growth. The Study included a steering committee, including Carolina Thread Trail staff, to assist in informing network development. The Study proposes a shared use path connection between Gastonia and Crowders Mountain State Park as a part of the GTS Network. The proposed route matches the recommendation from the 2009 Carolina Thread Trail Master Plan.</p>

Existing Plan	Recommendations Related to Gastonia-Crowders Mountain Paved Pathways Feasibility Study
<p>Garrison Boulevard Corridor Study (2023)</p>	<p>The existing conditions analysis for the Garrison Boulevard Corridor Study evaluates roadway and land use characteristics to inform the development of recommendations for improving multimodal safety and accessibility. The study area limits for this analysis are along Garrison Boulevard from Lineberger Park to the intersection with New Hope Road. The two Census Tracts that run parallel to the study area are home to over 3,000 residents and 3,500 jobs (2020 Census).</p> <p>The study mentions widening the existing sidewalks on the north side of Garrison Boulevard in order to offer the simplest and most cost-effective opportunity for improvements outside of the existing roadway. Consideration of a road-diet along Garrison Boulevard was also a key takeaway from the study, which could ultimately leave room for further bicycle and pedestrian accommodations.</p>

Table 3 highlights a summary of key state and local policies from NCDOT, Gaston County, and the City of Gastonia that may guide or influence the development of the Gastonia – Crowders Mountain Paved Pathways Project. Below is a list of policies reviewed:

- ASHTO Guide for the Development of Bicycle Facilities (2012)
- NCDOT Complete Streets Policy, 2019 (Agency: NCDOT)
- City of Gastonia UDO (Agency: City of Gastonia)
- NCDOT Roadway Design Manual, 2021 (Agency: NCDOT)

Table 3

Existing Policy	Relevance to Gastonia-Crowders Mountain Paved Pathways Feasibility Study
<p>City of Gastonia, Unified Development Ordinance</p>	<p>The City of Gastonia UDO promotes the health, safety, and welfare of its residents by responding consistently to development proposals. The ordinance supports the promotion of pedestrian use, as well as the community's vision for a comprehensive system of greenways and paths that support a high quality of life by providing recreational, health, environmental, economic, and connectivity benefits.</p> <p>Sidewalks are required to be a minimum of five feet in width along all streets. In specific zones, sidewalks shall be a minimum of seven feet in width. Where indicated on the Gastonia Greenway Plan, the Comprehensive Parks and Recreation Master Plan, and/or the CTP, a multi-use path shall be constructed in place of a required sidewalk. Sidewalks are required within residential developments with the exception of cul-de-sacs. Sidewalks may be required on both sides of the street if the speed limit is greater than 35 mph, has an AADT of greater than 8,000 vehicles per day, or is a part of a strategic pedestrian corridor. The greenstrip between back of curb and sidewalk should be a minimum of three feet. However, greenstrip requirements may be waived depending upon the topography, physical characteristics, presence of existing greenstrips, and design layout of the location.</p> <p>Multi-use paths shall adhere to standards for "shared use paths" in the most current version of the AASHTO Guide for the Development of Bicycle Facilities and to applicable requirements of the ADA. Access paths linking to the main path system shall be a minimum of seven feet wide. Along public greenways, park benches and trash receptacles shall be provided at a frequency of at least one per one-quarter mile and pet waste stations at a frequency of at least one per one-half mile, as conditions allow.</p>
<p>NCDOT Complete Streets Policy, 2019</p>	<p>The NCDOT Complete Streets Policy Update was adopted by the Board of Transportation in August 2019. This policy requires NCDOT to consider and incorporate multimodal facilities in the design and improvement of all transportation projects in North Carolina. Bicycle, pedestrian, and public transportation facilities that are in a published state, regional, or local plan and have been determined to have an existing or future need for multimodal facilities as part of the Complete Streets Review process, will be included as part of the proposed roadway project. Any multimodal facility that is determined to be needed as part of the complete streets review process but not identified in an adopted plan or study, will be included in the NCDOT project but may require a cost share with the local jurisdiction based on population threshold, which is outlined in The Complete Streets Implementation Guide. The policy also establishes maintenance responsibility for active transportation facilities. Bicycle, pedestrian, and transit improvements inside a municipal boundary are subject to local maintenance.</p>

Existing Policy	Relevance to Gastonia-Crowders Mountain Paved Pathways Feasibility Study
<p>NCDOT Roadway Design Manual, 2021 (Updated May 2023)</p>	<p>The Roadway Design manual provides general design information, design criteria, and plan preparation guidance for NCDOT roadways. Guidance on multimodal design elements can be referenced in Part 1, Chapter 4 Sections 4.14, 4.15, and 4.16. Guidance states that shared-use paths, often referred to as greenways, are paths physically separated from motor vehicle traffic and used by pedestrians, bicyclists, skaters, wheelchair users, and other nonmotorized users. Most shared-use paths are designed for two-way travel. Sidepaths are shared-use paths located immediately adjacent to and parallel to the roadway, or within the ROW. Sidepaths and other shared-use paths are wider than sidewalks, accommodating both bicyclists and pedestrians, and are used for both transportation and recreational uses. The width of a shared-use path may vary, based on expected user volumes and context.</p> <p>Minimum widths do not include graded areas or buffers on either side of the pathway.</p> <ul style="list-style-type: none"> • Desirable width – 12 to 14 feet • Minimum width – 10 feet; 8 feet in exceptionally constrained areas • Vertical clearance, minimum – 8 feet <p>Shared-use paths follow federal requirements for accessibility per the U.S. Access Board and the U.S. Department of Justice. Refer to the PROWAG Chapter 3 Section R302.5 and R302.6. Minimum requirements follow the 2010 American with Disabilities Act (ADA) Standards for Accessible Design. Refer to NCDOT Minimum Design Recommendations for Greenways for pavement design, when applicable. Refer to the AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities for more detailed information. For Pedestrian Roadway Crossing, refer to NCDOT Roadway Standard Drawings Std. Nos. 848.05 and 848.06 for detailed dimensions for pedestrian refuge islands, crossing islands at channelized right turn lane intersections, curb extensions and raised crossings.</p>
<p>AASHTO Guide for the Development of Bicycle Facilities (2012)</p>	<p>The AASHTO Guide for the Development of Bicycle Facilities, Fourth Edition 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. Guidance on the design of shared use paths can be reference in Chapter 5 Section 5.2.1. Guidance states that The minimum paved width for a two-directional shared use path is 10 ft. In very rare circumstances, a reduced width of 8 ft may be used. Wider pathways, 11 to 14 ft are recommended in locations that are anticipated to serve a high percentage of pedestrians (30 percent or more of the total pathway volume) and higher user volumes (more than 300 total users in the peak hour). Centerline stripes should be considered for paths that generate substantial amounts of pedestrian traffic. Possible conflicts between user groups must be considered during the design phase, as cyclists often travel at a faster speed than other users.</p>

- CATAWBA -
LANDS CONSERVANCY
.....
CAROLINA
THREAD TRAIL



Integrated Mobility Division
N.C. DEPARTMENT OF TRANSPORTATION

Section 3 // Considerations and Constraints

Crowders Mountain Paved Trail Feasibility Study

3.1 // Overview

Many planning level efforts were considered as a part of this feasibility study. Census data was used in the analysis of area demographics. GIS data was used in the analysis of existing conditions including natural and human environmental features as well as analysis of future transportation and development plans. A site visit was conducted to gain a better understanding of the study area to inform the development of potential alternatives based upon potential challenges and constraints observed on site. Stakeholder input was used to develop project benefits and evaluation criteria for determining alternative feasibility. The recommendations, implementation, and cost estimates outlined in the following chapters were informed by these considerations.

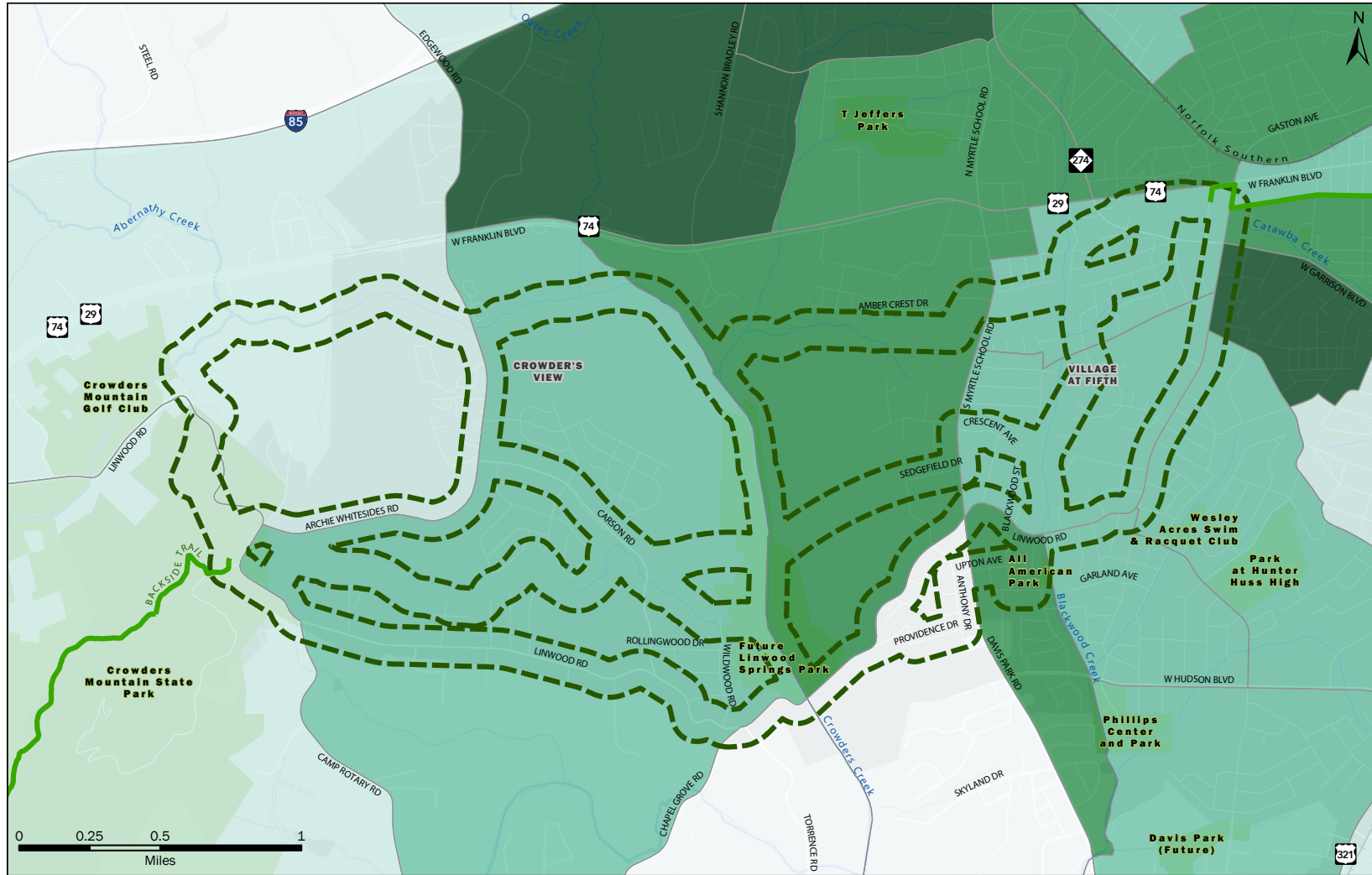
3.2 // Demographics

Community demographics play a large part in ensuring that the project's benefits and goals are being addressed. For this project, the data analyzed came from the 2020 ACS 5-year estimates (2016-2020) through the US Census Bureau. Specific to the project's study area, eight census tracts were analyzed. The total population of the City of Gastonia is 82,666. The total population of Gaston County is 234,215. The total population of North Carolina is 10,698,973.

Race/Ethnicity, Poverty, and Vehicle Availability

Within the study area, rates of racial and ethnic minority, poverty, and lower rates of vehicle access are generally higher toward Gastonia's downtown area, on the east side of the project study area. Maps illustrating the geographic distribution of these demographic characteristics are found in Figure 4 through Figure 6.

Figure 4



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

RACE

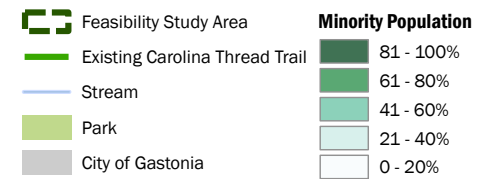
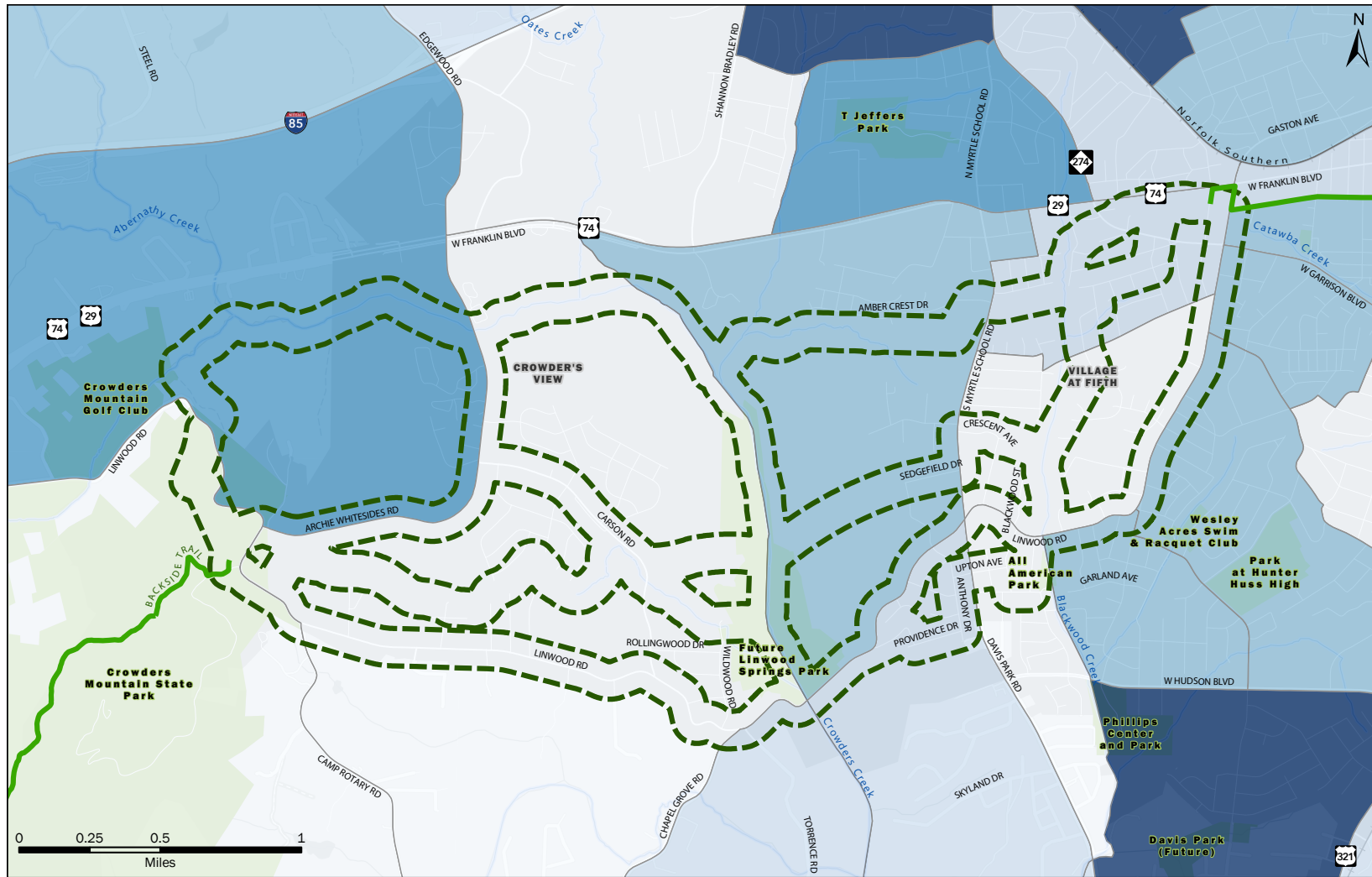


Figure 5

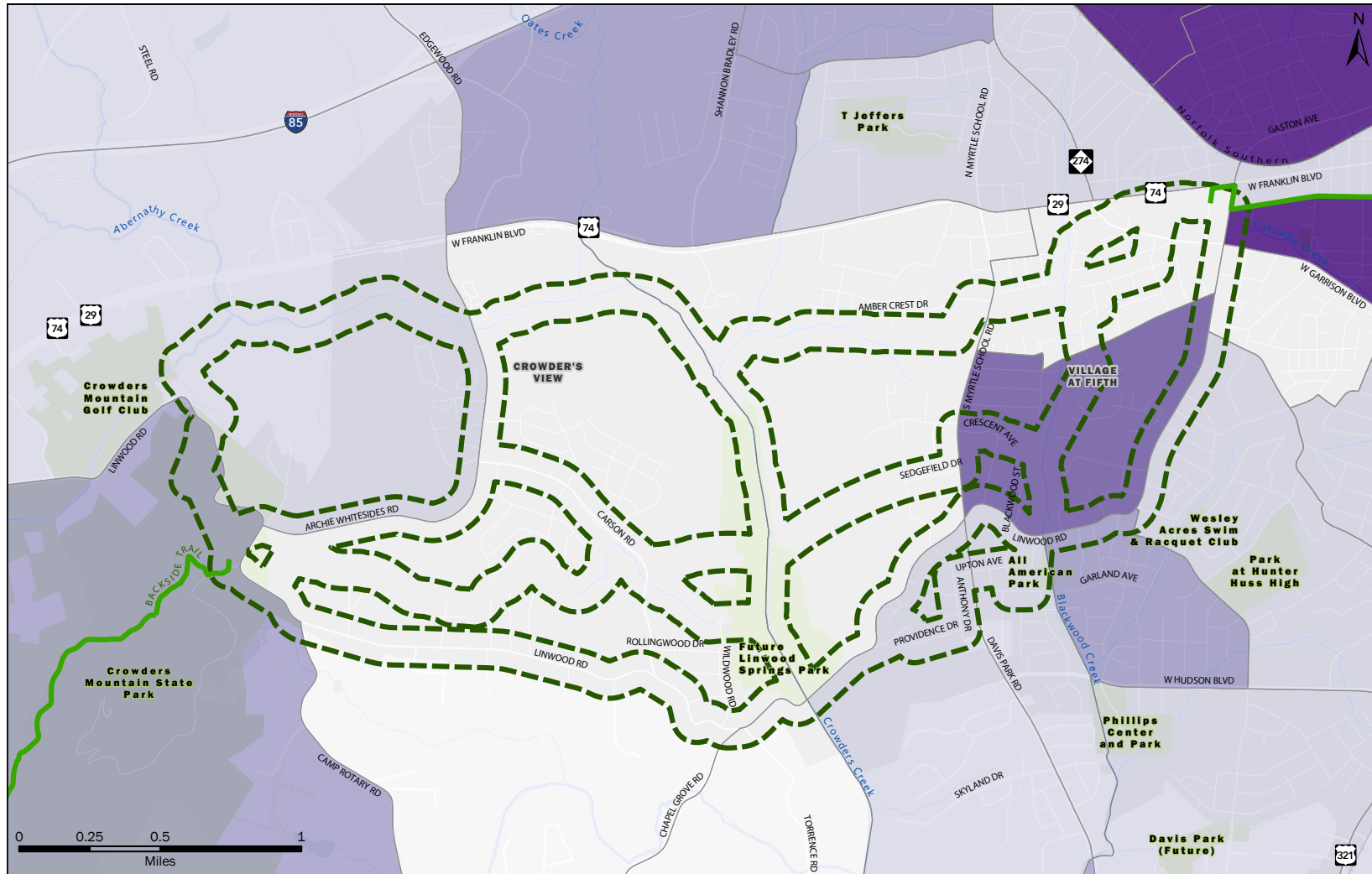


**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

POVERTY

- Feasibility Study Area
- Existing Carolina Thread Trail
- Stream
- Park
- City of Gastonia
- People in Poverty**
- Greater Than 50%
- 31 - 40%
- 21 - 30%
- 11 - 20%
- 0 - 10%

Figure 6



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

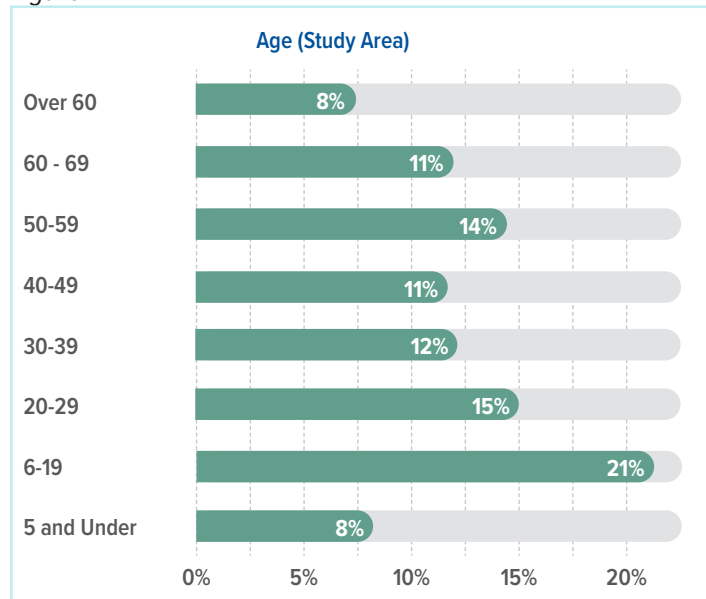
HOUSEHOLDS WITH NO ACCESS TO VEHICLES

- Feasibility Study Area
 - Existing Carolina Thread Trail
 - Stream
 - Park
 - City of Gastonia
- | Households Without Vehicle Access | |
|-----------------------------------|------------------|
| | Greater Than 20% |
| | 11 - 20% |
| | 6 - 10% |
| | 2 - 5% |
| | 0 - 1% |

Age

As shown in Figure 7, the 5 to 19 age group is the largest age group living within the study area at 21%. This is consistent with the overall population within the City of Gastonia with 17.7% of the population being between 6 and 19 years old. Over half of the population in the project area is under the age of 40 (56%).

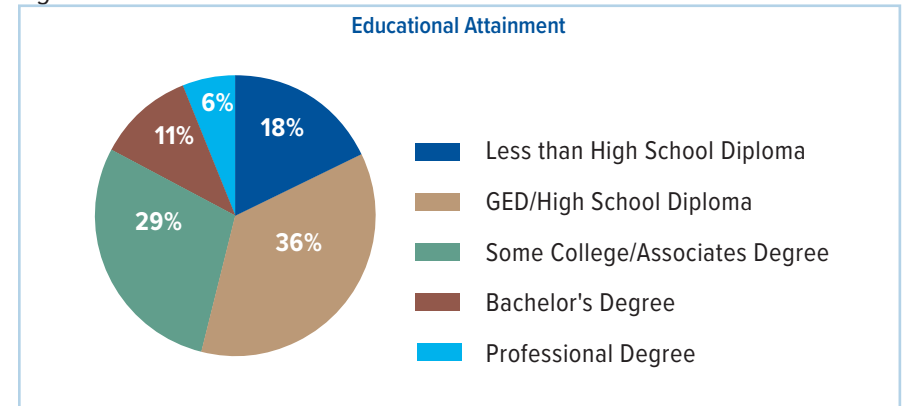
Figure 7



Educational Attainment

The majority of the population within the study area hold a GED or High School diploma (36%) or have completed some years of college or obtained an associate degree (29%). Bachelor’s degrees (11%) and professional degrees (6%) account for the least number of residents. Less than high school diploma (18%) falls between both groups. Figure 8 illustrates the study area population by level of educational attainment.

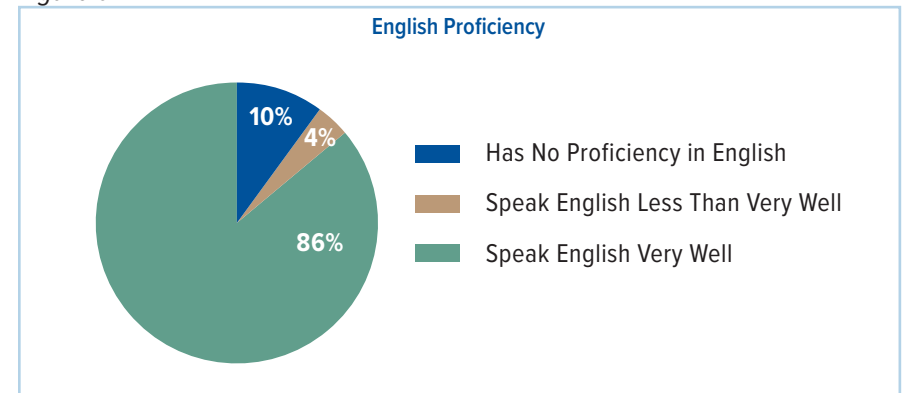
Figure 8



Language

Though the majority of residents within the study area report the ability to speak English very well, 14% of the population reported speaking English less than ‘very well,’ indicating a potential need for language assistance services. Those who speak English less than very well were important to include in the planning process. It’s also important to acknowledge this demographic because it impacts public outreach during preparation for the public meeting and collection of public input. Public outreach during the study was adapted based on this information. Flyers advertised the public meeting in both English and Spanish and were placed in a grocery store with a high Spanish-speaking customer base. Meeting information was also shared with the Latinos Aventureros en las Carolinas hiking group.

Figure 9



Commute

Most of the residents within the project study area use a car, truck, or van to commute to work each day (91%) and the second largest percentage of the population works from home (5%). One of the goals of the study is to encourage non-automobile modes of transportation through not only the presence of the trail but also by providing connections to popular destinations of interest, which includes places of employment. Currently, only 2% of workers walk to work and 0% of the population uses a bicycle to commute to work. Public transportation also contributed to the means of travel with 1% of workers choosing this mode of transportation to get to work.

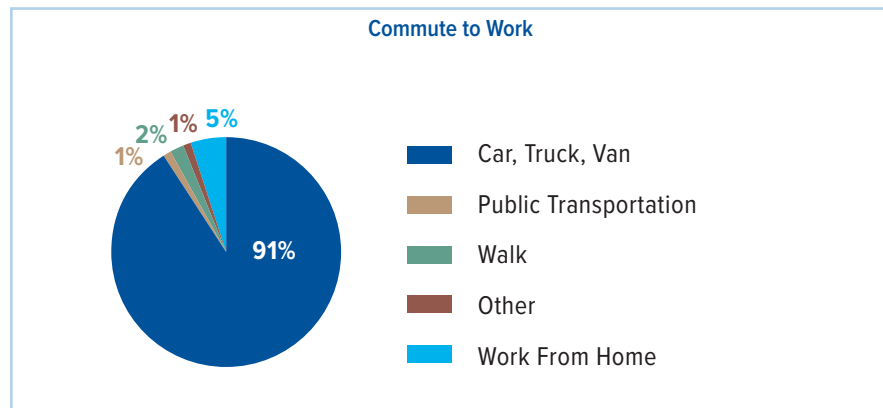


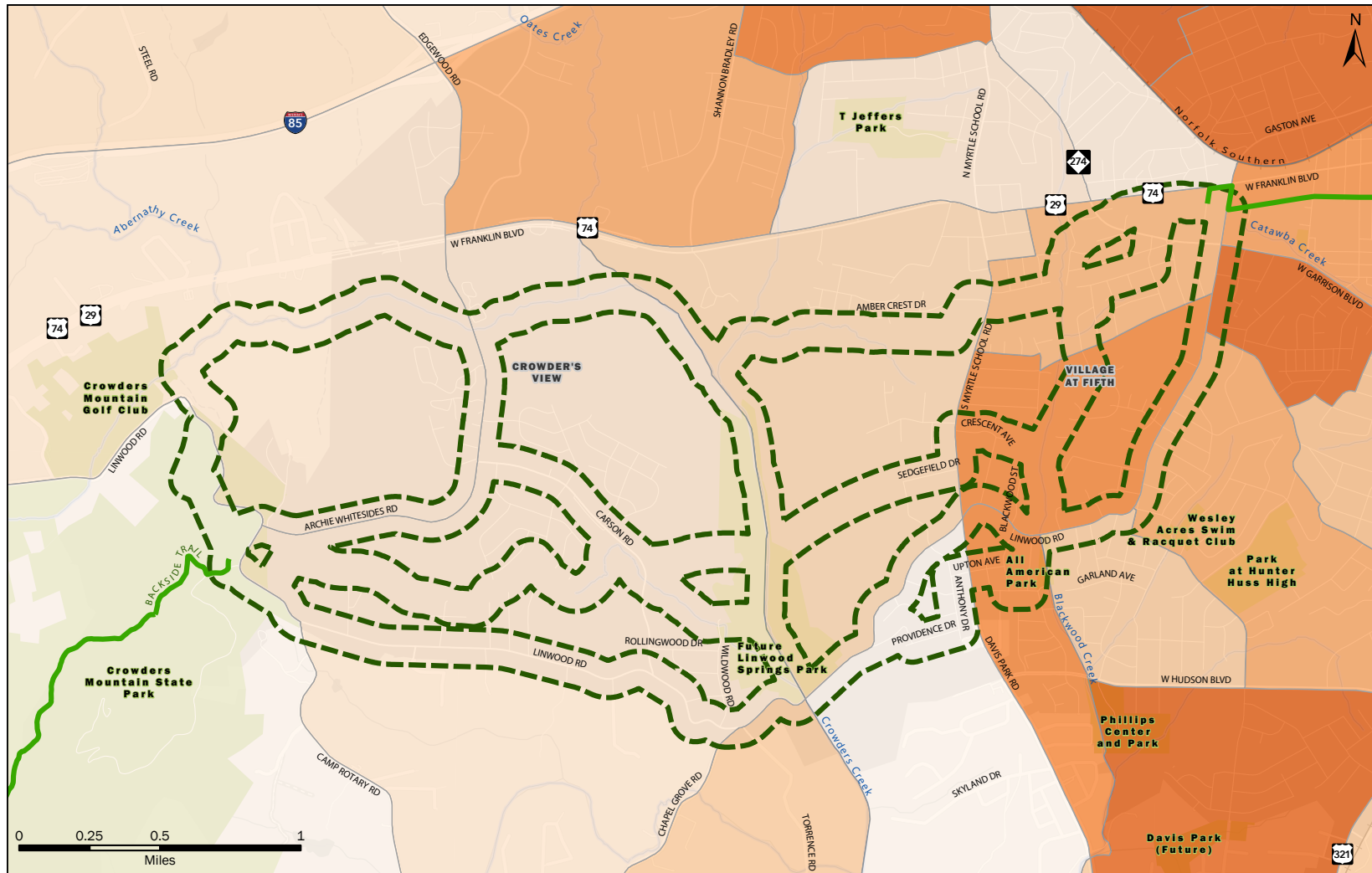
Figure 10

Transportation Disadvantage Index

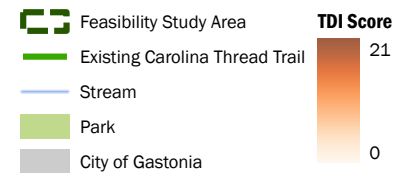
The TDI is a tool created by the NCDOT to measure equity impacts within a block group. The factors measured include age, race, income, vehicle availability, persons with disabilities, and persons with Limited English Proficiency. A composite score is calculated which summarizes the concentration of these factors, all of which are tied to or can contribute to barriers in accessing transportation. The score assigned to the block group is an indication of the likelihood that a group has a disadvantage when it comes to transportation; the higher the score, the greater the likelihood of there being a disadvantage. Statewide, TDI scores range from 0 (no transportation disadvantage) to 21 (very

high transportation disadvantage). The map in Figure 8 shows that the project study area contains block groups that range from a TDI of 10 to a TDI of 17.5, with higher TDI scores concentrated toward Gastonia’s downtown and toward the southeastern portion of the study area. The rates of transportation disadvantage within the study area for this project reinforce the value a multimodal transportation option would have in this community. Identifying TDI through the project study area allows for an evaluation of how different routes might serve those with higher rates of transportation disadvantage.

Figure 11



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**
TRANSPORTATION DISADVANTAGE INDEX (TDI)



3.3 // Natural Environment Considerations

Analyzing the natural environmental features in the study area is not only essential in determining the challenges and constraints during the development of alternatives but also contributes to meeting the project goals of conservation and recreation. Features such as Crowders Creek and Blackwood Creek can provide an opportunity for a pleasant setting and scenic natural views. At the same time, proximity to the creek introduces the potential for wetland encroachment or flooding risk within floodplains. These factors can influence project costs, design, and maintenance, and were considered while evaluating alternative routes.

The natural environmental characteristics considered during the study include the following, which are shown on maps in Figures 12 through 14:

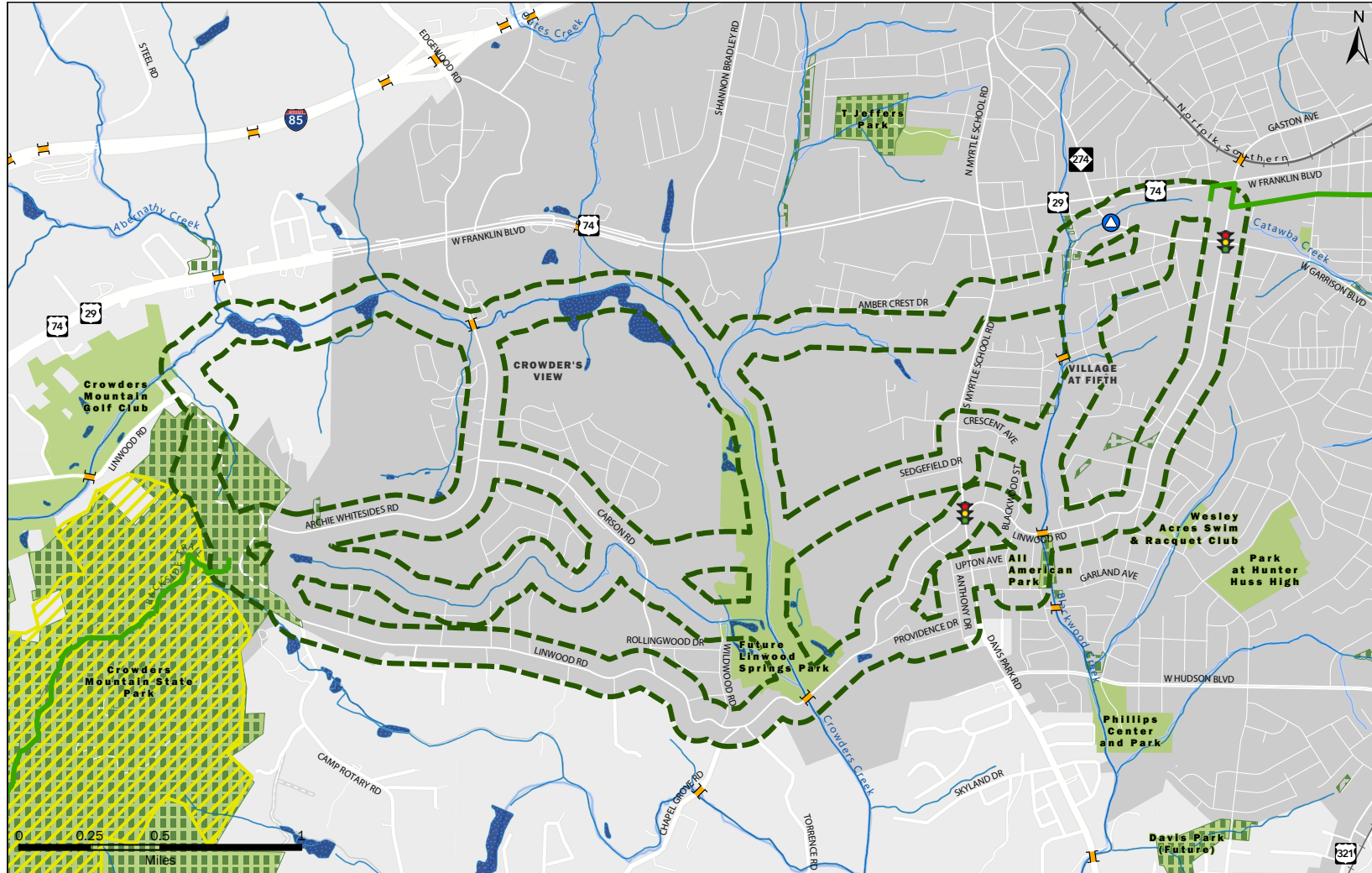
- Natural Environmental Features
 - » Wetlands – Impacts to these areas, where water covers soil for most of the year and which support unique biological habitats, are federally regulated. Activities that may impact wetlands require permits to ensure their protection, mitigate environmental damage, and maintain water quality.
 - » Natural Heritage Areas –The NC Natural Heritage Program (NCNHP) identifies and inventories these areas with special significance for biodiversity and works with partners to implement voluntary protections. Crowders Mountain State Park is identified as a Natural Heritage Area.
 - » Managed Areas – NCNHP also identifies conservation lands that are in permanent conservation and those that are managed by federal, state, local, and private entities
- Topography
 - » Depicting the shape, features, and elevation of the land’s surface through the study area allows for consideration of areas that would present engineering challenges or additional cost.
- Hydrology
 - » Figure 14 provides a more detailed view of the water features in the study area, including creeks, tributaries, and ponds. Floodplains (100 and 500 year) are shown to gain an understanding of areas that would experience periodic flooding, which would need to be accounted for during the project design process. Design to withstand flood conditions could include additional construction materials and/or structures such as bridges and boardwalks. The entire project area is within the Catawba River Basin.

The study area is not within a water supply watershed, nor does it contain trout waters or HQW as classified by the NC Division of Water Quality (DWQ).

Threatened and Endangered Species

No critical habitat for threatened and endangered species has been identified within the project study area; however, Gaston County is within US Fish and Wildlife (USFWS) consultation ranges for several species of plants and animals. These species include the following: Tricolored bat (*Perimyotis subflavus*) (proposed endangered), Bog turtle (*Glyptemys muhlenbergii*), Dwarf-flowered Heartleaf (*Hexastylis naniflora*), and Schweinitz’s Sunflower (*Helianthus schweinitzii*). During project development, any presence and potential effects to these species will need to be considered.

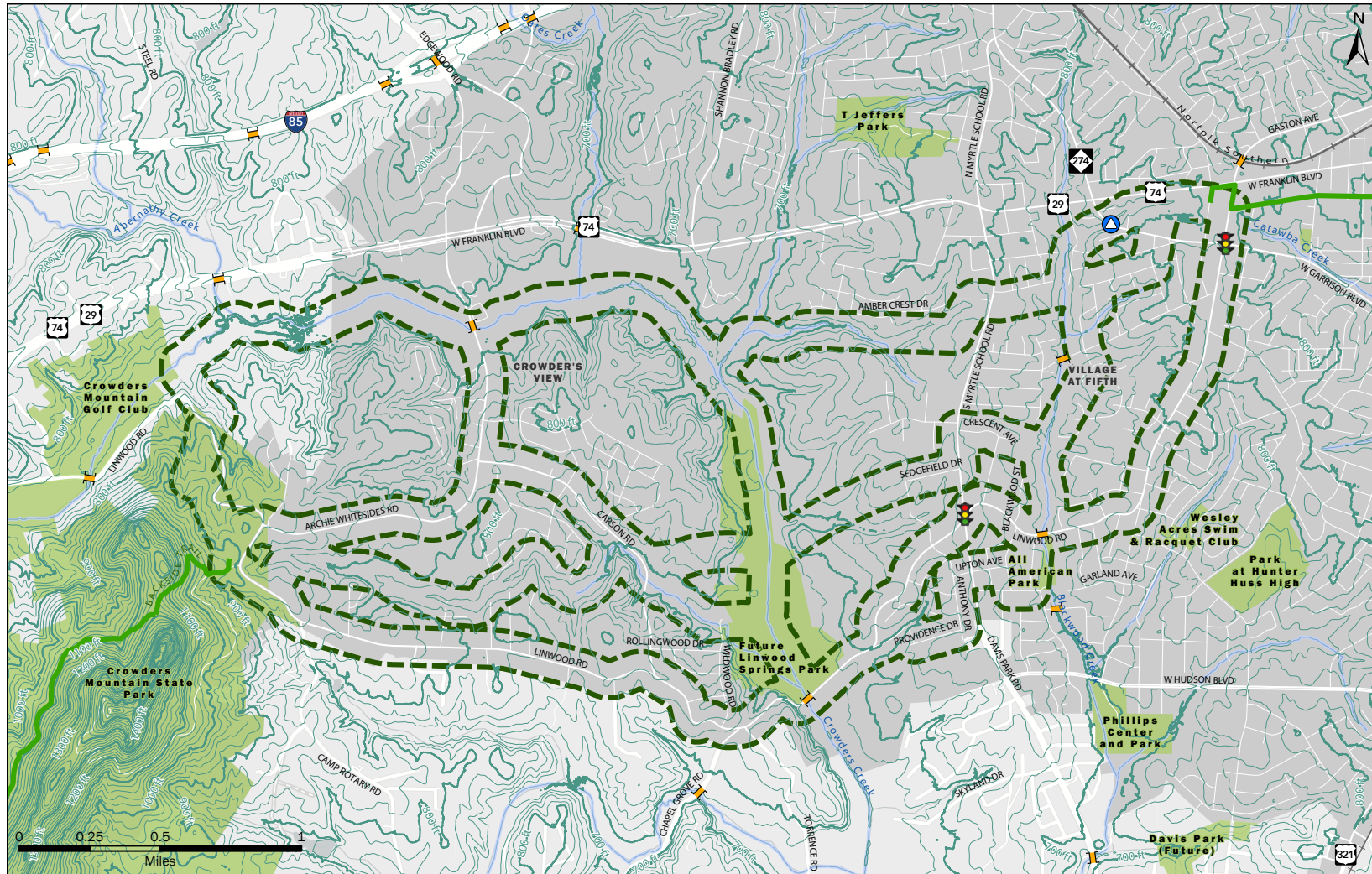
Figure 12



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**
NATURAL ENVIRONMENTAL FEATURES

-  Feasibility Study Area
-  Existing Carolina Thread Trail
-  Natural Heritage Area
-  Wetland
-  Stream
-  Managed Area
-  Park
-  City of Gastonia
-  Garrison Blvd Culvert
-  Signalized Crossing
-  Signalized Crossing
-  Signalized Crossing
-  DOT Bridge
-  DOT Bridge
-  DOT Bridge
-  DOT Bridge

Figure 13



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

TOPOGRAPHY











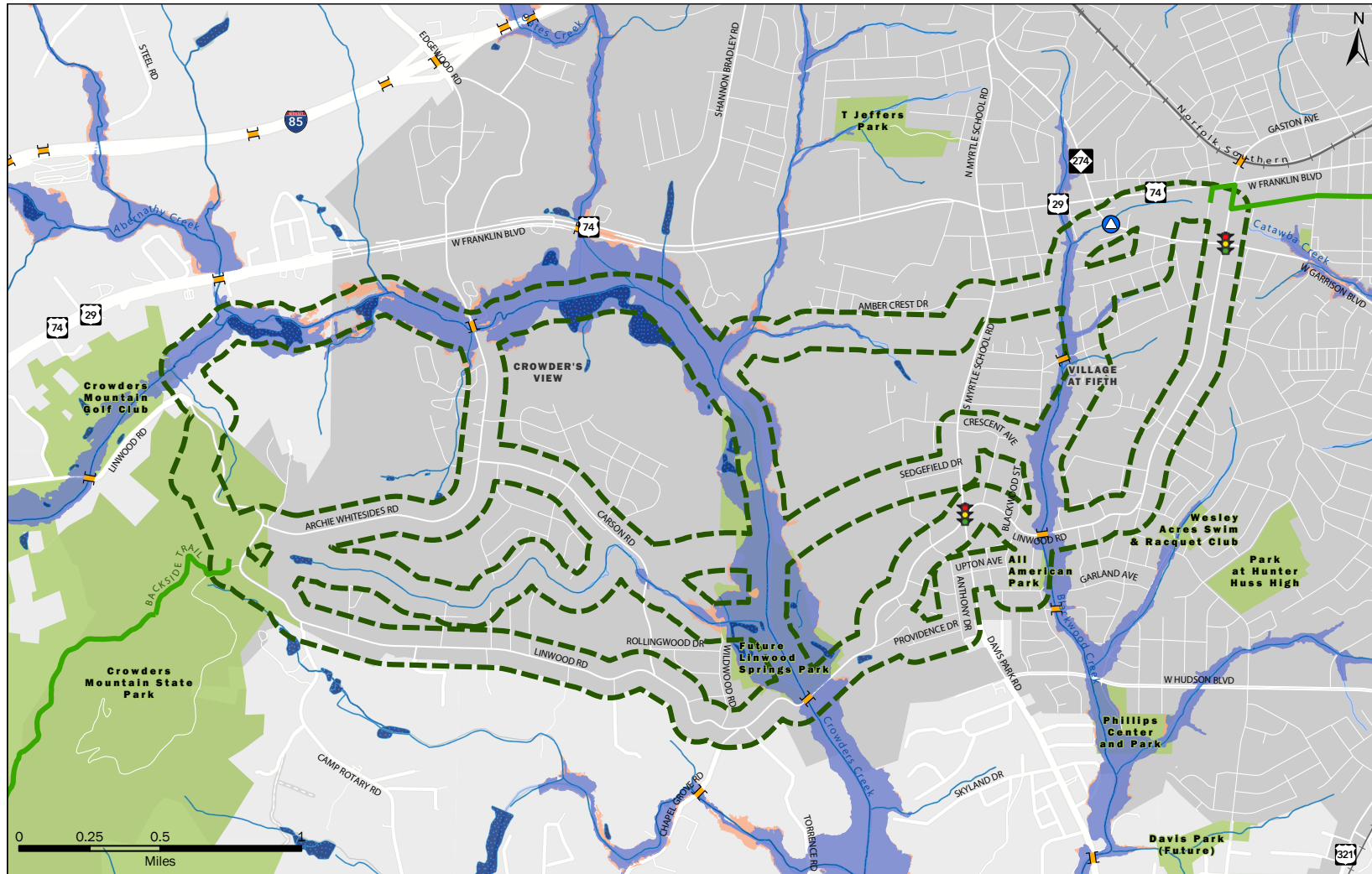
-  Feasibility Study Area
-  Existing Carolina Thread Trail
-  Topographic Contours 20 Feet
-  Topographic Contours 100 Feet
-  DOT Bridge
-  Garrison Blvd Culvert
-  Signalized Crossing
-  Stream
-  Park
-  City of Gastonia

Figure 14



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

HYDROLOGY

- | | | |
|--------------------------------|-----------------------|------------------|
| Feasibility Study Area | Garrison Blvd Culvert | Wetland |
| Existing Carolina Thread Trail | Signalized Crossing | Stream |
| DOT Bridge | 100 Year Floodplain | Park |
| | 500 Year Floodplain | City of Gastonia |

3.4 // Human Environment Considerations

In addition to evaluation of the natural environment in the study area, the presence of and potential impacts to elements of the human environment are also important to the study. These elements are displayed on maps in Figures 15 through 20, and include:

Human Environmental Features: As shown in Figure 15 on page 36, this map identifies important community features in the study area, including public services, emergency services, places of worship, schools, historic sites and boundaries. Also shown are pertinent infrastructure within the study area, including existing NCDOT vehicular bridges, signalized intersections, and several proposed future transportation projects. An existing culvert at Garrison Boulevard has also been included because this culvert has been considered for integration into the project.

Notably, the future Linwood Springs Park is featured in this and other maps in the study. This park is a central feature within the study area, both geographically and as an important future recreational amenity to which the City and Carolina Thread Trail expressed interest in connecting the greenway to. Linwood Springs Park will be a new city park on the site of a former golf course. The park's master plan includes the use of the internal network of golf cart paths. The initial phase of the park development includes repair of asphalt-paved trails, repair of existing bridges and recreational vehicle sites with water, sewer and power connections. There are also plans for: a dog park, an 18-hole disc golf course, fishing ponds, playgrounds, and sand volleyball courts. The groundbreaking on Linwood Springs Park happened in late 2023. The park would be expected to serve as an important trailhead for Carolina Thread Trail users because parking will be available on site. The proposed alternatives that connect through Linwood Springs Park assume that the existing and repaired golf cart paths within the park will be integrated into the Carolina Thread Trail path.

NCDOT Roadway Characteristics: The study area includes a combination of state-maintained NCDOT roadways and non-system roadways which are locally maintained. Generally, smaller neighborhood roads fall into the non-system classification. Currently, no projects listed on the STIP are within the study area. The nearest STIP projects are I-5985B (I-85 Widening) approximately $\frac{3}{4}$ mile north of the study area and U-5970 (US 321 /South York Road access management

improvements) approximately one mile southeast of the study area. The maps in Figures 15 through 20 illustrate available information about the NCDOT system roadways in the study area.

Speed Limits: This map provides an inventory of the speed limits along NCDOT roads through the study area. During alternatives analysis, this information allows for an understanding of what vehicular speeds cyclists and pedestrians may be near on certain routes. The study area includes major roadways with speed limits of 35 and 45 miles per hour.

AADT (Annual Average Daily Traffic): This map provides AADT counts for NCDOT roads through the study area and allows for an understanding of which roads are busiest when considering routing the trail.

Right of Way: This map gives an overview of the width of ROW on NCDOT-maintained roadways through the study area. This information could influence the cost and ease of implementation for alternatives that include roadside MUP segments.

Bicycle and Pedestrian Facilities: This map shows existing sidewalks, bicycle facilities, and greenways within the project study area.

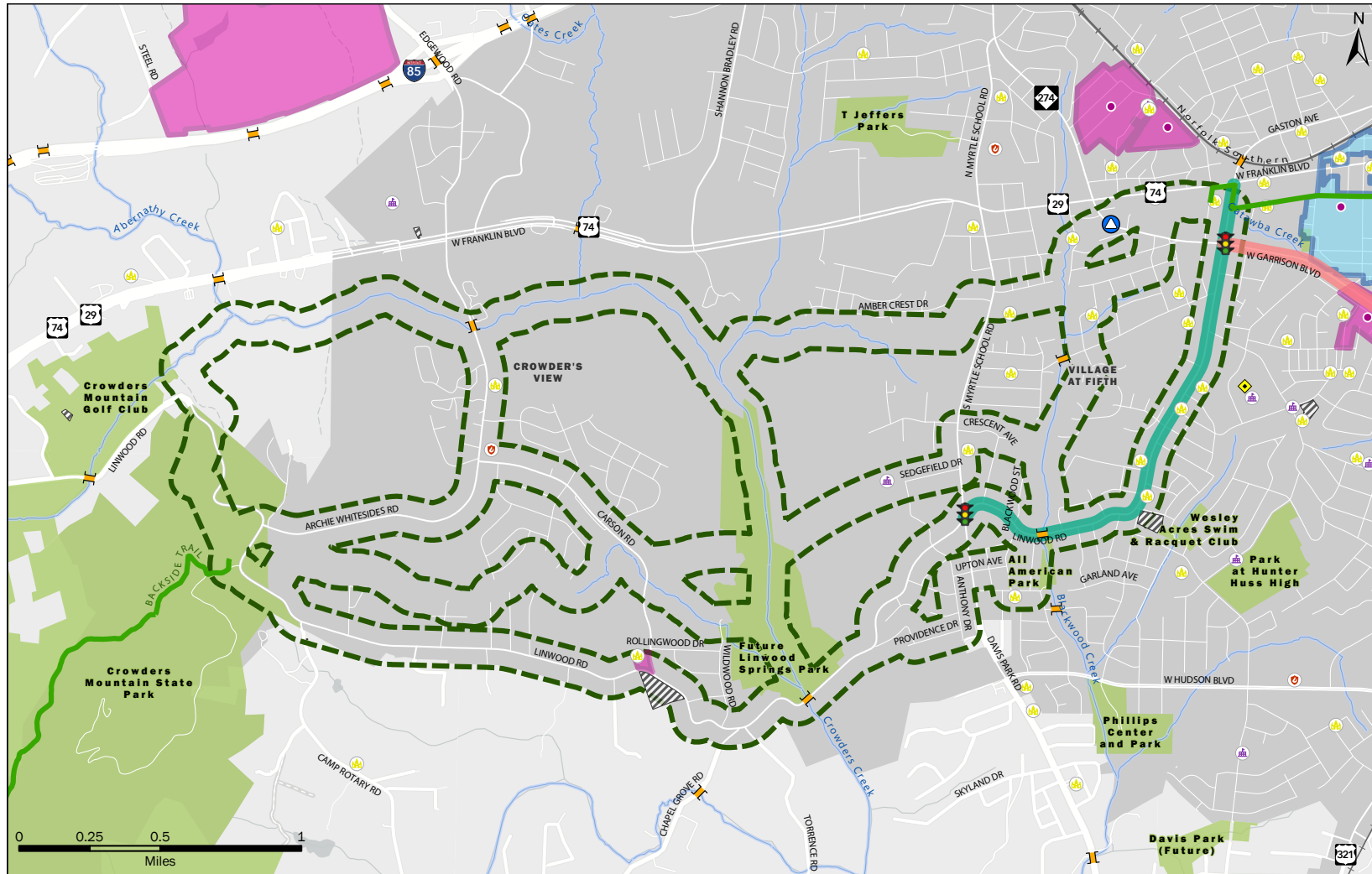
Existing Facilities: Between Crowders Mountain State Park and downtown Gastonia, the primary existing pedestrian accommodation is sidewalks. Myrtle School Road features 5-foot sidewalks on both sides of the roadway through the study area, and smaller segments of sidewalks can be found on some neighborhood roads and newer developments. One segment of existing neighborhood greenway is found in the Village at Fifth neighborhood. No dedicated bike lanes or shared use bicycle facilities are found within the study area.

Proposed Bicycle and Pedestrian Facilities: As shown in Figure 19 on page 40, this map depicts sidewalks, bicycle facilities, and greenways proposed as part of Gastonia and GCLMPO's planning documents, including the GCLMPO CTP, Gastonia Comprehensive Bicycle Plan (2023), Gastonia Comprehensive Pedestrian Plan (2014), and the Gastonia Greenway Plan (2024).

Right of Way Impacts and Property Ownership:

An important consideration when developing and evaluating potential routes for the Carolina Thread Trail is the impact to individual parcels and property owners. Each of the route alternatives considered would pass through or be adjacent to many parcels. The map in Figure 20 shows the parcels which intersect the study area. Few parcels within the study area are currently owned by the City of Gastonia. All American Park is owned by the City. The Future Linwood Springs Park is owned by NCDOT and on a long-term lease to the City. Crowders Mountain State Park is owned by the State of North Carolina. Several residentially-zoned parcels along S. Dixie Street are owned by the City of Gastonia.

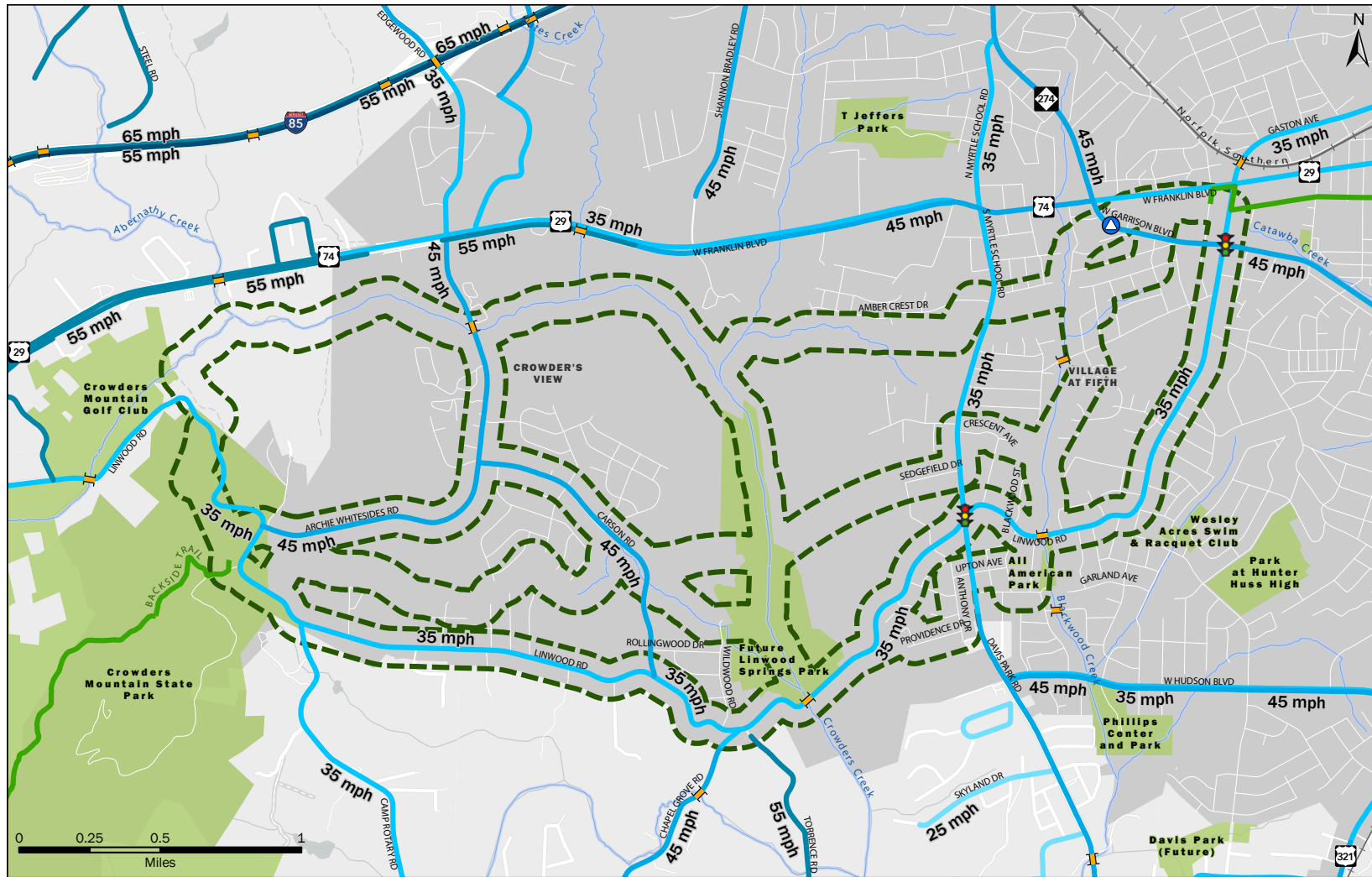
Figure 15



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**
HUMAN ENVIRONMENTAL FEATURES

- | | | | |
|--------------------------------|---------------------------------|-------------------------------------|--------------------------------|
| Feasibility Study Area | Place of Worship | State Listed Historic Site | State Listed Historic Boundary |
| Existing Carolina Thread Trail | Firestation | Linwood Modernization Project | Cemetery |
| DOT Bridge | School | Garrison Boulevard Road Diet | Stream |
| Garrison Blvd Culvert | Pre-Regulatory Landfill | National Register Historic Boundary | Park |
| Signalized Crossing | National Register Historic Site | City of Gastonia | |

Figure 16

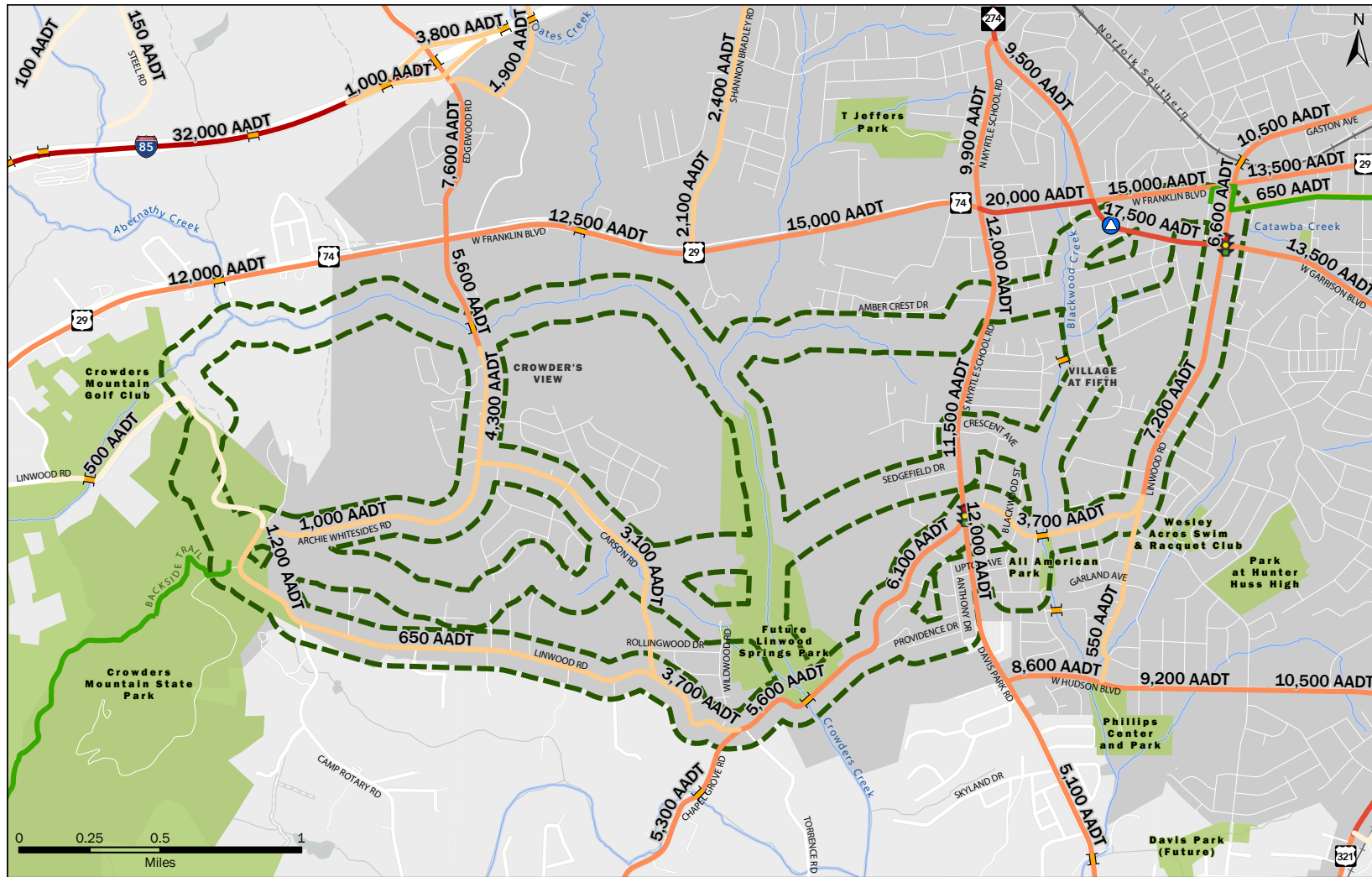


**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

SPEED LIMITS

- | | | |
|--------------------------------|------------------|---------------------|
| Feasibility Study Area | Stream | Speed Limits |
| Existing Carolina Thread Trail | Park | 60 - 65 mph |
| DOT Bridge | City of Gastonia | 50 - 55 mph |
| Garrison Blvd Culvert | | 40 - 45 mph |
| Signalized Crossing | | 30 - 35 mph |
| | | 15 - 25 mph |

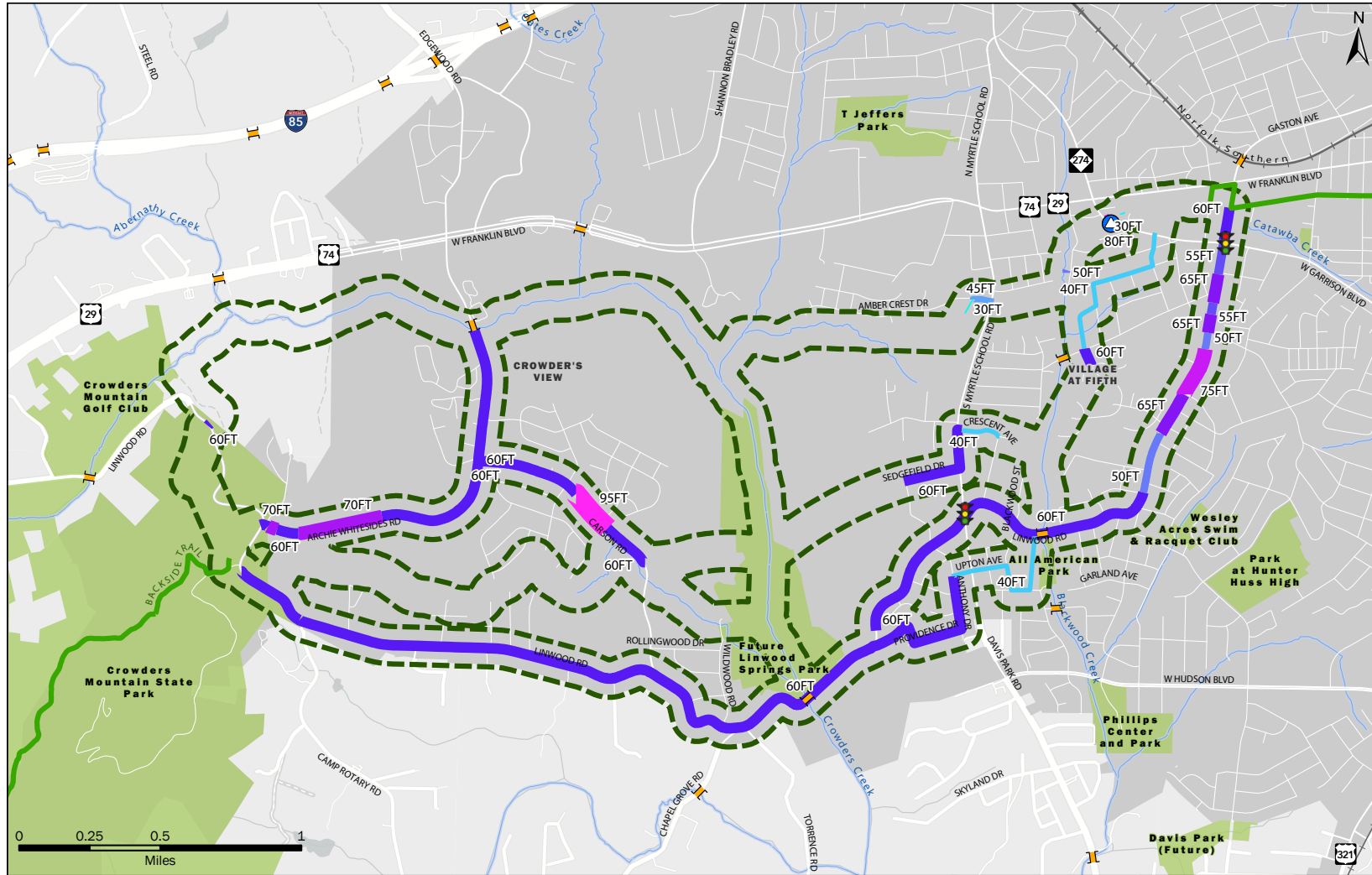
Figure 17



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**
ANNUAL AVERAGE DAILY TRAFFIC

- | | | |
|--------------------------------|------------------|------------------|
| Feasibility Study Area | Stream | 2021 AADT |
| Existing Carolina Thread Trail | Park | 25,001 - 35,000 |
| DOT Bridge | City of Gastonia | 15,001 - 25,000 |
| Garrison Blvd Culvert | | 5,001 - 15,000 |
| Signalized Crossing | | 501 - 5,000 |
| | | 0 - 500 |

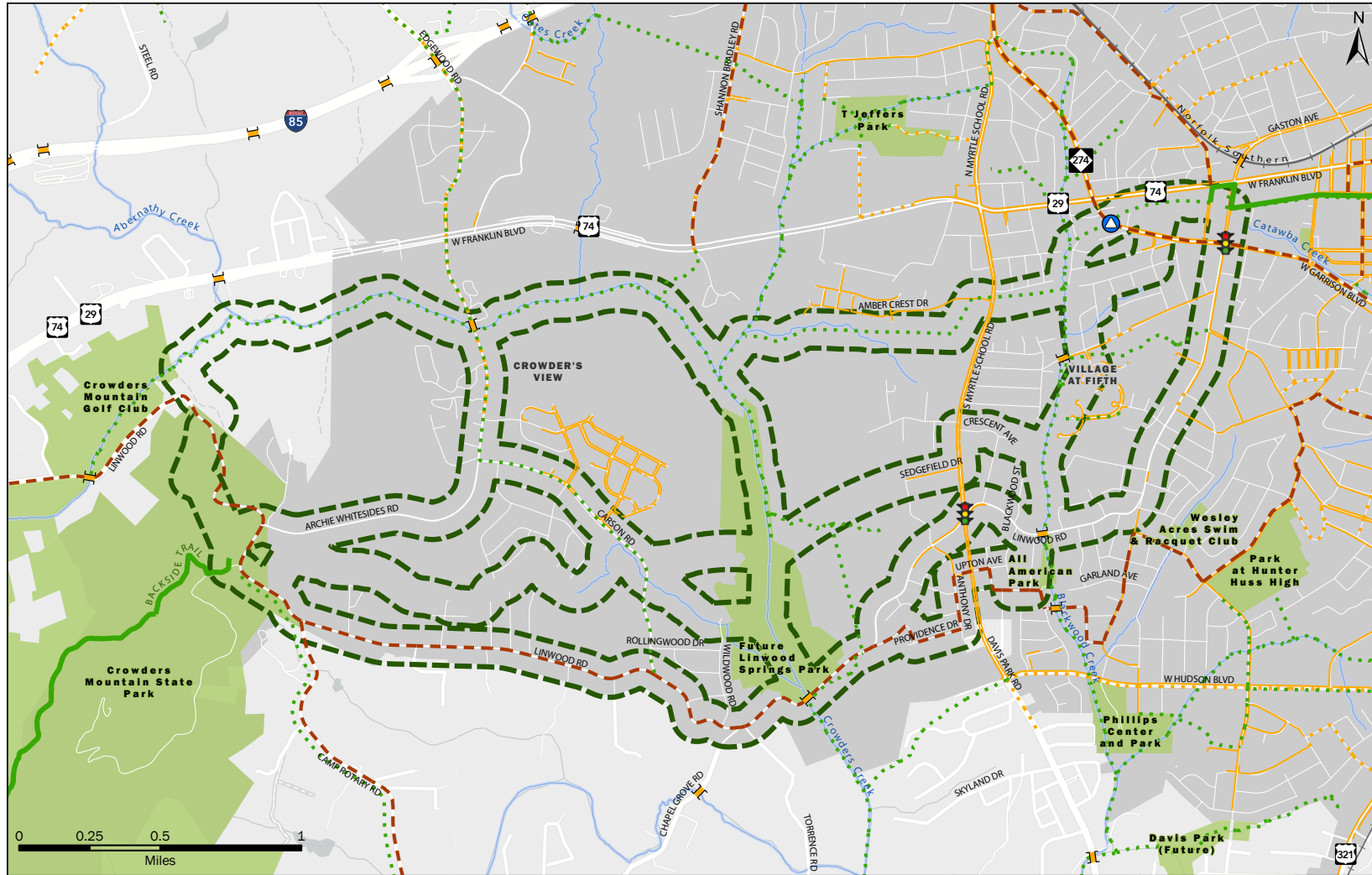
Figure 18



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**
RIGHT-OF-WAY (ROW)

- Feasibility Study Area
- Existing Carolina Thread Trail
- DOT Bridge
- Garrison Blvd Culvert
- Signalized Crossing
- Stream
- Park
- City of Gastonia
- ROW 30 Feet
- ROW 40 Feet
- ROW 45 Feet
- ROW 50 Feet
- ROW 55 Feet
- ROW 60 Feet
- ROW 65 Feet
- ROW 70 Feet
- ROW 75 Feet
- ROW 80 Feet
- ROW 95 Feet

Figure 19

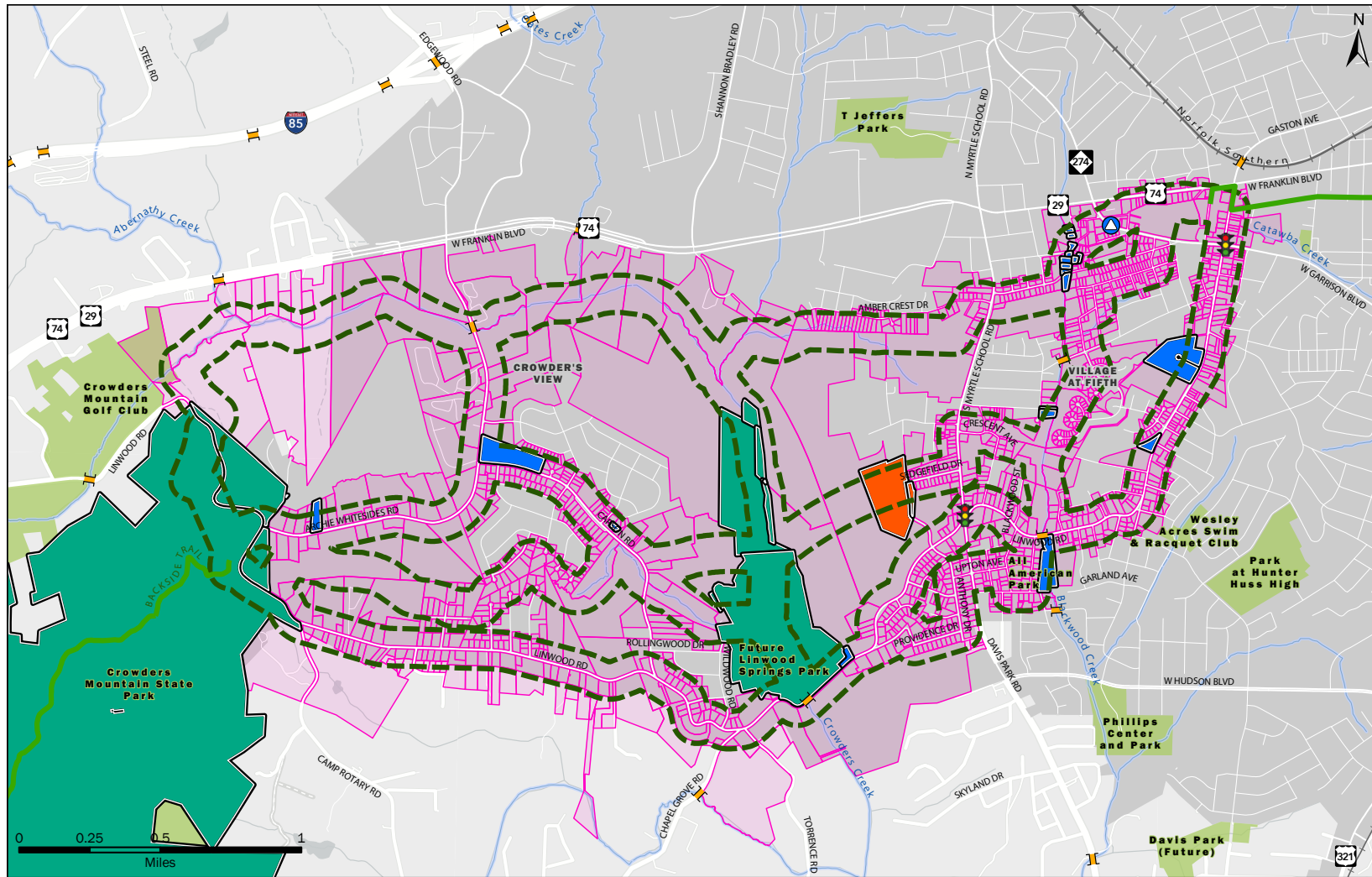


**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

BICYCLE AND PEDESTRIAN ACCOMMODATIONS

- Feasibility Study Area
- Existing Carolina Thread Trail
- Sidewalk - Existing
- Sidewalk - Recommended
- Multiuse Path - Recommended
- Bicycle Route - Needs Improvement
- DOT Bridge
- Garrison Blvd Culvert
- Signalized Crossing
- Stream
- Park
- City of Gastonia

Figure 20



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

STUDY AREA PARCELS

- Feasibility Study Area
- Existing Carolina Thread Trail
- DOT Bridge
- Garrison Blvd Culvert
- Signalized Crossing
- Stream
- Park
- City of Gastonia
- County Owned Parcel
- State Owned Parcel
- Parcel

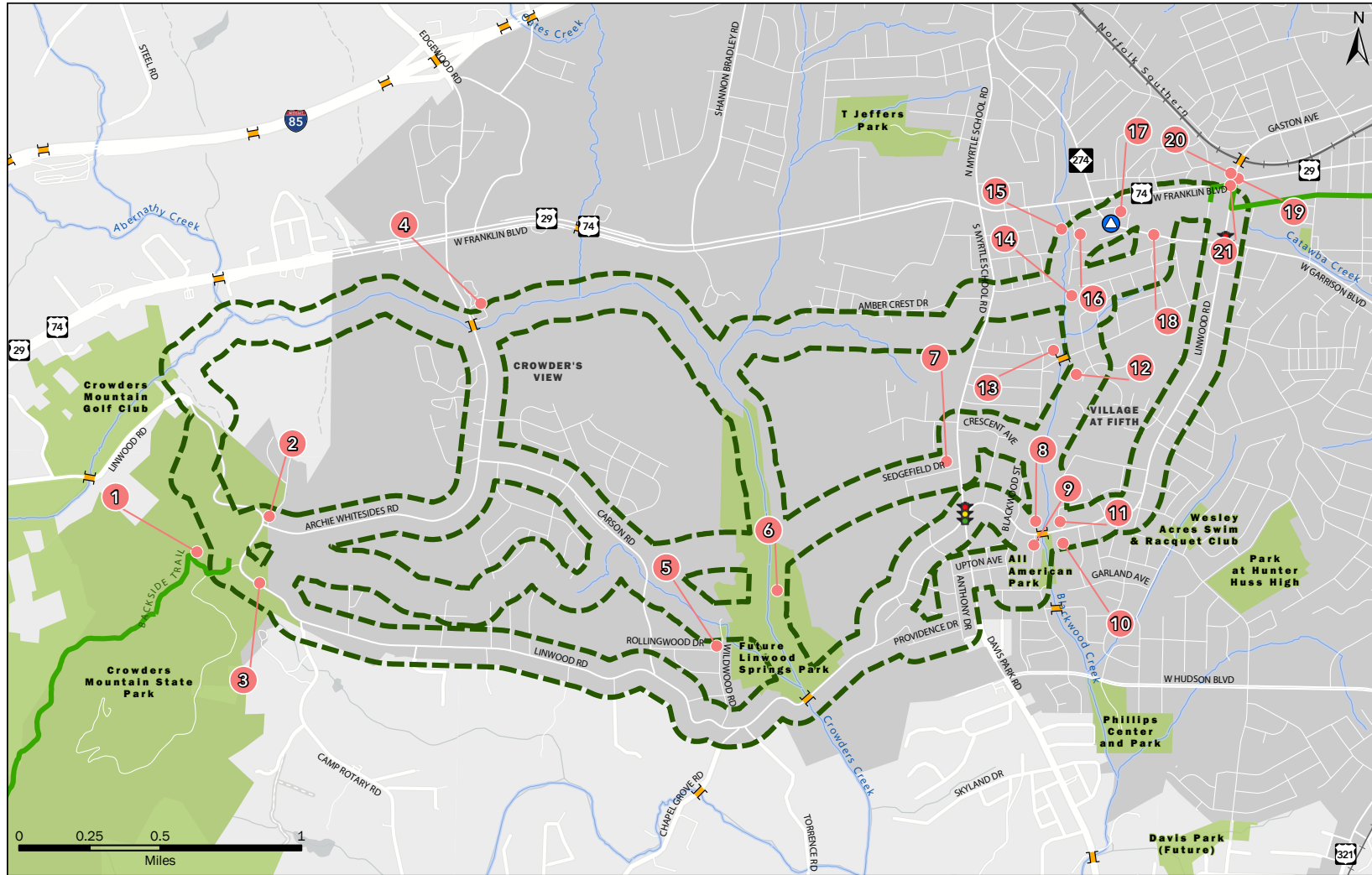
3.5 // Field Observations

Field observations are an integral part of the planning level process. They provide a better understanding of the study area to inform the development of potential alternatives based upon challenges and constraints observed on site.

A site visit in Gastonia was conducted on August 17, 2023, following the first Steering Committee meeting. A group made up of steering committee members, city staff, and consultants visited a handful of key areas within the study area and along various potential routes. The site visit allowed the study team to observe some of the opportunities and challenges to forming a greenway connection between downtown Gastonia and Crowders Mountain State Park. Along with gaining a better understanding of the setting and study area, some of the high-level observations included:










- If located along some of the proposed routes, the greenway might have to contend with roadway traffic with few existing signalized pedestrian crossings.
- Also on Linwood Road, winding alignment and some steep slopes could pose challenges.
- Several city-owned areas were observed and the potential for incorporating them into the alignments was discussed; these areas included All American Park and lots along S. Dixie Street.
- The former Parkdale Mill site was visited, and incorporating an option for connecting the greenway path near that property was discussed.

Figure 21



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

FIELD VISIT PHOTOS

-  Feasibility Study Area
-  Existing Carolina Thread Trail
-  Photo Location
-  DOT Bridge
-  Garrison Blvd Culvert
-  Signalized Crossing
-  Stream
-  Park
-  City of Gastonia



1. Trailhead at Backside Trail in Crowders Mountain State Park



2. Parking lot at Linwood Road entrance to Crowders Mountain State Park



3. Linwood Road near Archie Whitesides Road at Crowders Mountain State Park



4. Bridge on Archie Whitesides Road over Crowders Creek



5. Potential connection on Wildwood Road to future Linwood Springs Park



6. Cart path within future Linwood Springs Park



7. Existing sidewalk along S. Myrtle School Road



8. Blackwood Creek, north from Linwood Road



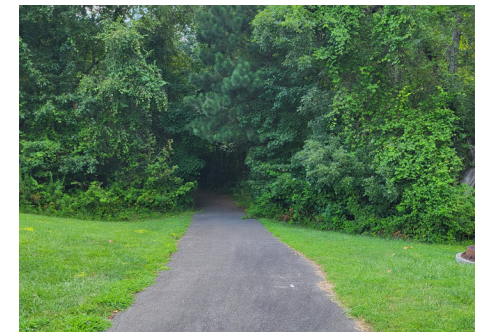
9. Bridge on Linwood Road over Blackwood Creek



10. Sewer easement along Blackwood Creek, south from Linwood Road



11. Sewer easement along Blackwood Creek, north from Linwood Road



12. Existing greenway in Village at Fifth neighborhood



13. Sewer easement along Blackwood Creek, north from W. Fifth Street



14. Sewer easement along Blackwood Creek from dead end of S. Dixie Street



15. City-owned properties at the end of S. Dixie Street



16. Ravine to S. Dixie Street from W. Garrison Boulevard



17. Ravine to W. Garrison Boulevard from S. Dixie Street



18. Existing sidewalk on W. Garrison Boulevard across from Parkdale Mill undeveloped site



19. Existing crosswalks and pedestrian signals at the intersection of Linwood Road and W. Franklin Boulevard



20. ADA pedestrian accommodations at the intersection of Linwood Road and W. Franklin Boulevard



21. Existing pedestrian signal at the intersection of Linwood Road and W. Franklin Boulevard

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CAROLINA
THREAD TRAIL



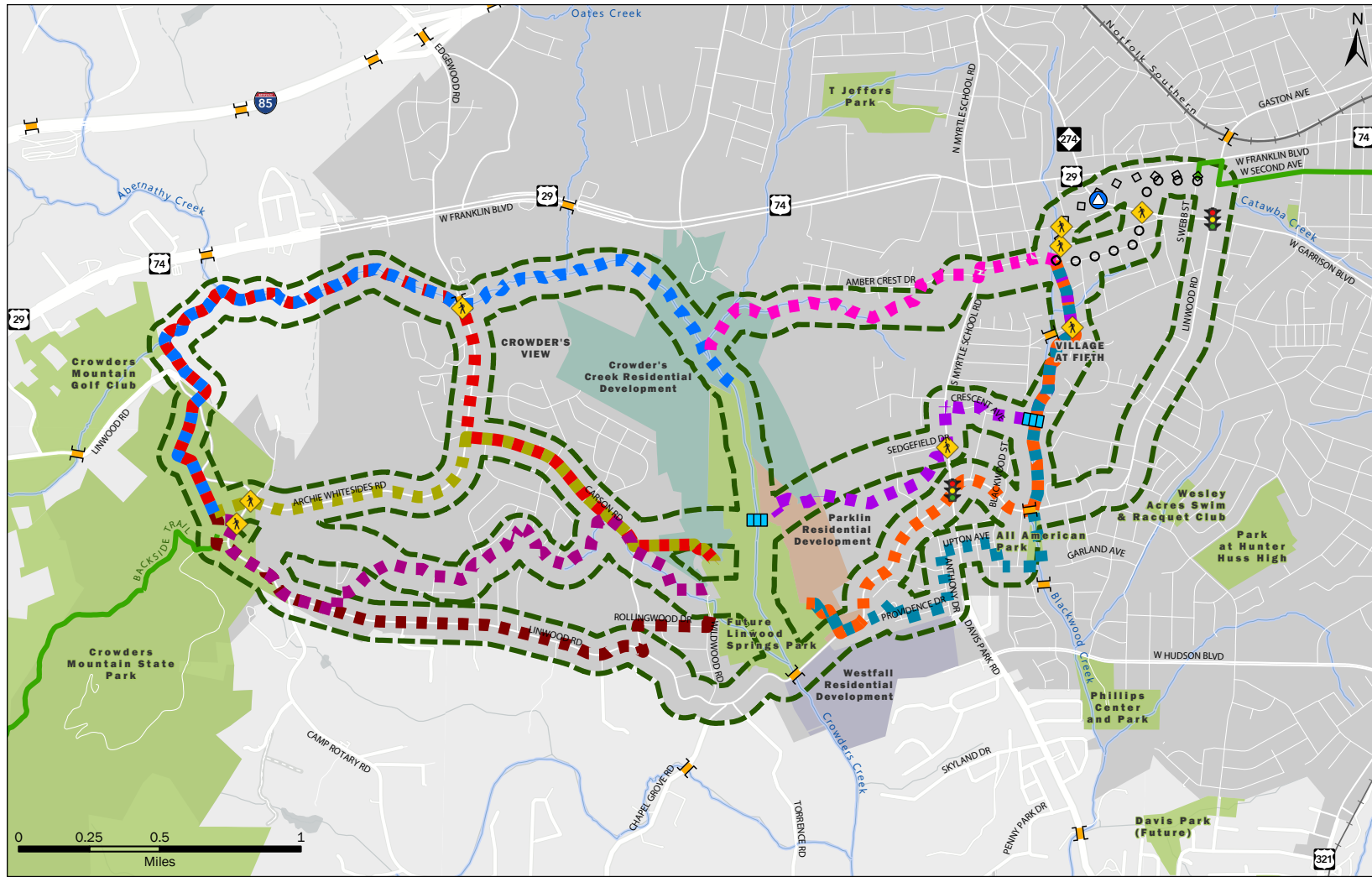
Integrated Mobility Division
N.C. DEPARTMENT OF TRANSPORTATION

Section 4 // Alternative Development

Crowders Mountain Paved Trail Feasibility Study



Figure 22



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

ALTERNATIVES

- | | | | |
|--------------------------------|---------------------|--------------------|--------------------|
| Feasibility Study Area | Signalized Crossing | West Alternative 1 | East Alternative 1 |
| Existing Carolina Thread Trail | DOT Bridge | West Alternative 2 | East Alternative 2 |
| Pedestrian Bridge | Stream | West Alternative 3 | East Alternative 3 |
| Pedestrian Crossing | Park | West Alternative 4 | East Alternative 4 |
| Garrison Blvd Culvert | City of Gastonia | West Alternative 5 | Option A |
| | | | Option B |

4.1 // Overview

The Carolina Thread Trail conducted this study to explore the potential realignment of its original route through the study area, as outlined in the Carolina Thread Trail Master Plan for Gaston County Communities (2009). The original route followed Crowders Creek to the former Linwood Springs Golf Course, then continued east across Myrtle School Road to Blackwood Creek near Parkdale Avenue. From there, the route turned north along Blackwood Creek and followed a tributary corridor eastward, passing Garrison Boulevard and the old Parkdale Mill site. The reconsideration of this route was prompted by the City of Gastonia's plans to develop the 140-acre Linwood Springs Park on the former golf course site, approximately two miles east of Crowders Mountain State Park. This new park became a focal point for evaluating alternative alignments in addition to the original route proposal. Since Linwood Springs Park is located roughly halfway between Crowders Mountain State Park and downtown Gastonia, the alternatives analysis could be broken into eastern and western halves. Alternatives were developed by combining various individual route segments that could be connected to create a contiguous path between Crowders Mountain State Park and Linwood Springs Park, and between Linwood Springs Park and downtown Gastonia. These eastern and western alternatives were evaluated and scored to establish a preferred alternative for each half which can be found in Section 6. Subsequently, the preferred eastern and western alternatives were combined to form an overall path between Crowders Mountain State Park and downtown Gastonia with a connection to Linwood Springs Park. The east and west alternatives are presented below, along with the evaluation process to arrive at the preferred alternative.

All Estimated Construction Costs are provided with cost information available as of May 2025 in the Appendix A, starting on page 102. Construction Costs do not include additional fees such as construction inspection, additional contingencies, ROW acquisitions, and fees associated with management of funding sources.

4.2 // Alternatives West of Linwood Springs Park

Alternative W-1






Alternative W-1 was the western portion of the proposed Carolina Thread Trail alignment adopted in 2009. Alternative W-1 extends north from Backside Trail at the Linwood Road Access in Crowders Mountain State Park, passing Crowders Mountain Golf Course and onto undeveloped land, following the south side of Crowders Creek. From there, W-1 extends east from Archie Whitesides Road and continues to follow Crowders Creek to the greenway in the planned Crowders Creek residential development. Within the residential development, W-1 continues along the development’s planned greenway into future Linwood Springs Park.

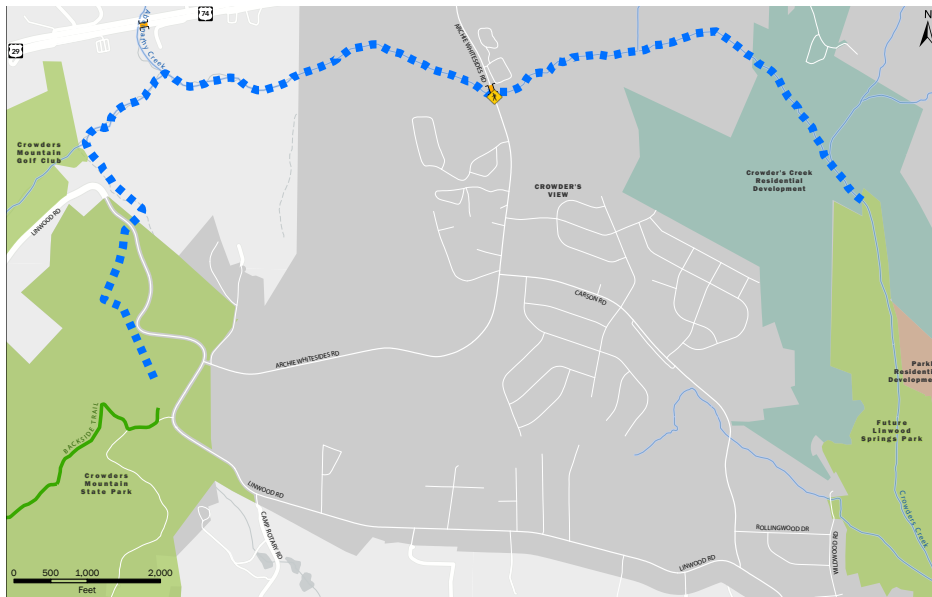
Note: In subsequent alternatives development, this segment was adjusted to connect to Crowders Mountain State Park in a different way, which is discussed in section 7.

Length: 3.56 miles

Estimated Construction Cost: \$8,000,000

Top Features and Considerations

	Natural setting away from motor vehicle traffic provides a peaceful experience, a chance to enjoy nature, and increased safety.
	Provides direct connectivity to the planned Crowders Creek residential development.
	Utilizes ~2,400 feet of greenway to be dedicated to the City from the future Crowders Creek residential development.
	Construction within floodplain along Crowders Creek has the potential for periodic flooding.
	ROW coordination with property owners on the south side of Crowders Creek would be required.



GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY

WEST ALTERNATIVE 1

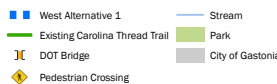
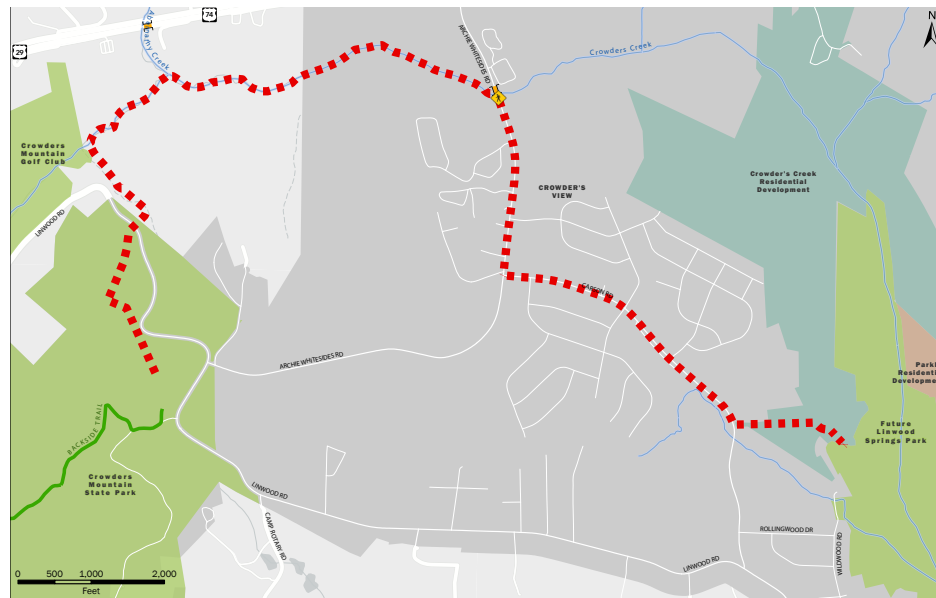


Figure 23

Alternative W-2

Alternative W-2 extends north from Backside Trail near the Linwood Road Access in Crowders Mountain State Park, passing Crowders Mountain Golf Course and onto undeveloped land, following Crowders Creek along the south side and onto Archie Whitesides Road. From there, W-2 continues south along the road to its intersection with Carson Road. The alignment then turns east onto Carson Road, following it to its intersection with the planned Crowders Creek residential development. W-2 follows the planned sidewalk within the development east to the future Linwood Springs Park.

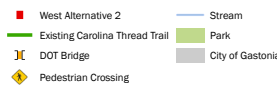
This alternative proposes one at-grade pedestrian crossing on Archie Whitesides Road in the vicinity of the bridge over Crowders Creek. The alternative proposes the trail be located on the east side of Archie Whitesides Road, accounting for planned pedestrian accommodations associated with adjacent planned residential development. This alternative proposes a 10-foot multiuse sidepath along the north side of Carson Road.



GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY

WEST ALTERNATIVE 2








Figure 24



Length: 3.51 miles

Estimated Construction Cost: \$9,160,000

Top Features and Considerations

	Natural setting away from motor vehicle traffic provides a peaceful experience, a chance to enjoy nature, and increased safety. Approximately half of W-2 is in a natural setting.
	Roadside setting in close proximity to traffic. Approximately half of W-2 is in a roadside setting. Archie Whitesides Road and Carson Road are both posted at 45 mph and have AADTs over 3,000.
	Provides direct connectivity to the planned Crowders Creek residential development.
	Approximately half of this segment would be on existing NCDOT ROW.
	Construction within floodplain along Crowders Creek has the potential for periodic flooding.
	ROW coordination with property owners on the south side of Crowders Creek would be required.
	A cluster of four mobile home parks is located along Archie Whitesides Road between Mountain Village Drive and Glennallen Drive, This proximity could benefit the community, but ROW acquisition could be required at these properties.




Alternative W-3

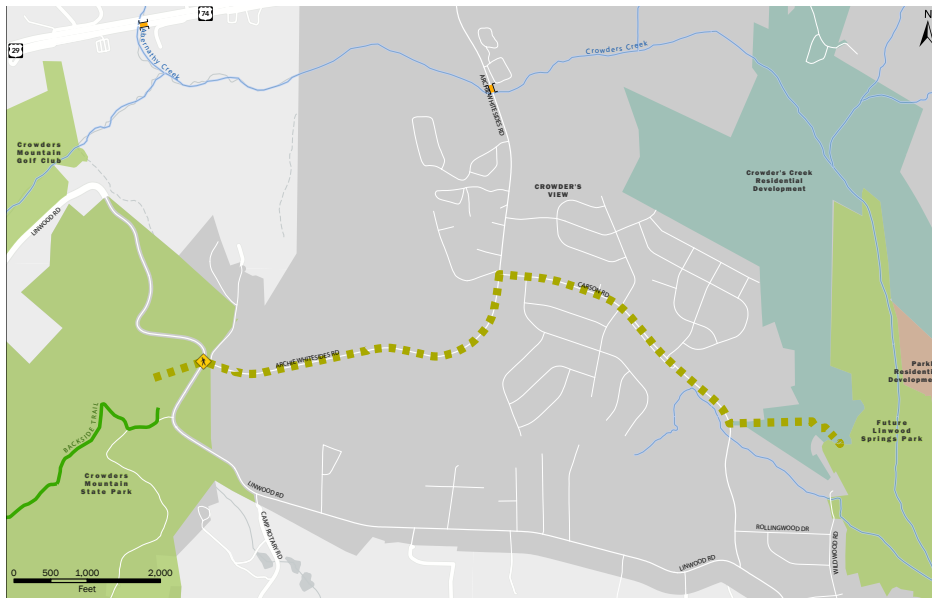
Alternative W-3 extends east from Backside Trail near the Linwood Road Access in Crowders Mountain State Park to Archie Whitesides Road, following the road east then north to its intersection with Carson Road. W-3 continues southeast as a 10-foot multiuse side path along Carson Road to its intersection with the planned Crowders Creek residential development. W-3 then follows the planned pedestrian accommodation within the development east to an access point on the west side of the future Linwood Springs Park. This alternative proposes one pedestrian crossing and pedestrian signal at the intersection of Linwood Road and Archie Whitesides Road and a second pedestrian crossing and pedestrian signal at the intersection of Archie Whitesides Road and Carson Road. The alternative proposes the trail be located on the south/east side of Archie Whitesides Road and on the north side of Carson Road. A side path would be installed along Archie Whitesides Road and Carson Road to accommodate pedestrians and cyclists.

Length: 2.2 miles

Estimated Construction Cost: \$5,870,000

Top Features and Considerations

	<p>Roadside setting in close proximity to traffic. Approximately half of W-2 is in a roadside setting. Archie Whitesides Road and Carson Road are both posted at 45 mph and have AADTs over 3,000.</p>
	<p>Provides direct connectivity to the planned Crowders Creek residential development.</p>
	<p>The majority of this segment would be on existing NCDOT ROW.</p>



GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY

WEST ALTERNATIVE 3

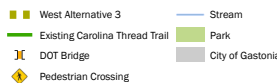
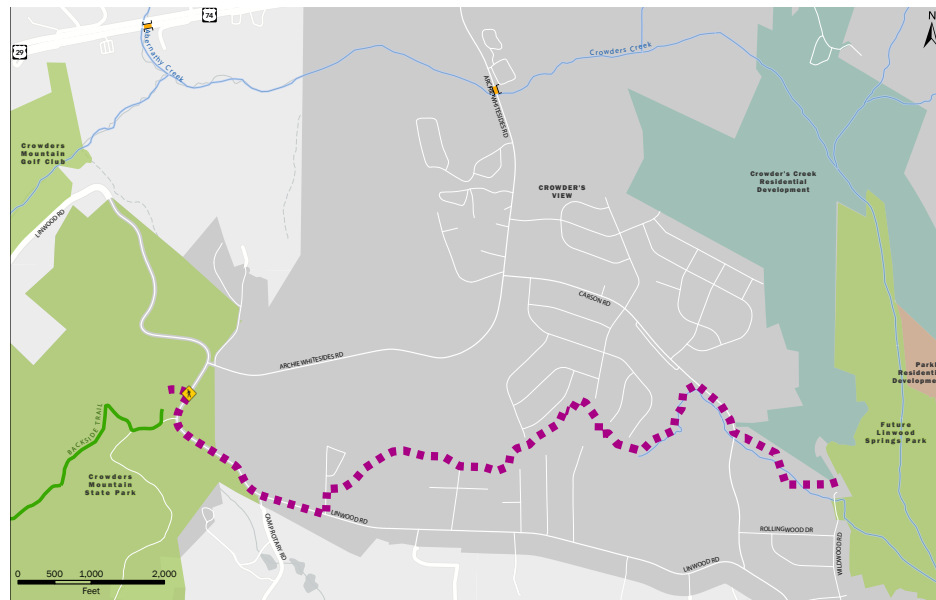


Figure 25

Alternative W-4

Alternative W-4 extends southeast onto Linwood Road from Backside Trail near the Linwood Road Access in Crowders Mountain State Park to the Linwood Road intersection with Brentwood Circle. The alternative would then turn north onto Brentwood Circle and continue beyond it to the sewer easement. W-4 follows the sewer easement through undeveloped land along Tributary R-4 east, crossing Carson Road, and continuing to an entrance into the west side of future Linwood Springs Park.

This alternative proposes pedestrian crossings at the Linwood Road Access in Crowders Mountain State Park, one at the intersection of Linwood Road and Brentwood Circle, and a crossing of Carson Road just south of Adirondak Drive.



GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY

WEST ALTERNATIVE 4

Figure 26

Length: 2.5 miles

Estimated Construction Cost: \$7,360,000

Top Features and Considerations

	<p>Natural setting away from motor vehicle traffic provides a peaceful experience, a chance to enjoy nature, and increased safety. Approximately two thirds of W-4 is in a natural setting.</p>
	<p>Roadside setting in close proximity to traffic. Approximately one third of W-4 is in a roadside setting. Linwood Road is posted at 35 mph and has a relatively low AADT of 1,200, while Carson Road is posted at 45 mph and has an AADT of 3,100.</p>
	<p>Approximately one third of this segment would be on existing NCDOT ROW. This segment would make use of existing sewer line easement, reducing the amount of ROW acquisition needed. Agreements to use the easement will still be necessary.</p>
	<p>While this segment is proposed to run along a creek tributary for a distance, there is little floodplain surrounding the tributary, indicating a lower risk of flooding.</p>
	<p>ROW coordination with property owners on the south side of Crowders Creek would be required.</p>
	<p>Brentwood Mobile Home Park is located adjacent to the proposed alignment of this segment. This proximity could be a benefit to the community, but ROW acquisition would be required.</p>

Alternative W-5







Alternative W-5 extends southeast from Backside Trail near the Linwood Road Access to Crowders Mountain State Park onto Linwood Road. The alternative follows Linwood Road east to its intersection with Carson Road. W-5 then turns north onto Carson Road and into the Suburban Heights neighborhood at Rollingwood Drive across from Pisgah ARP Church Cemetery. It continues onto Rollingwood Drive east to Wildwood Road. It turns north onto Wildwood Road, following the roadway to a west side entrance into future Linwood Springs Park.

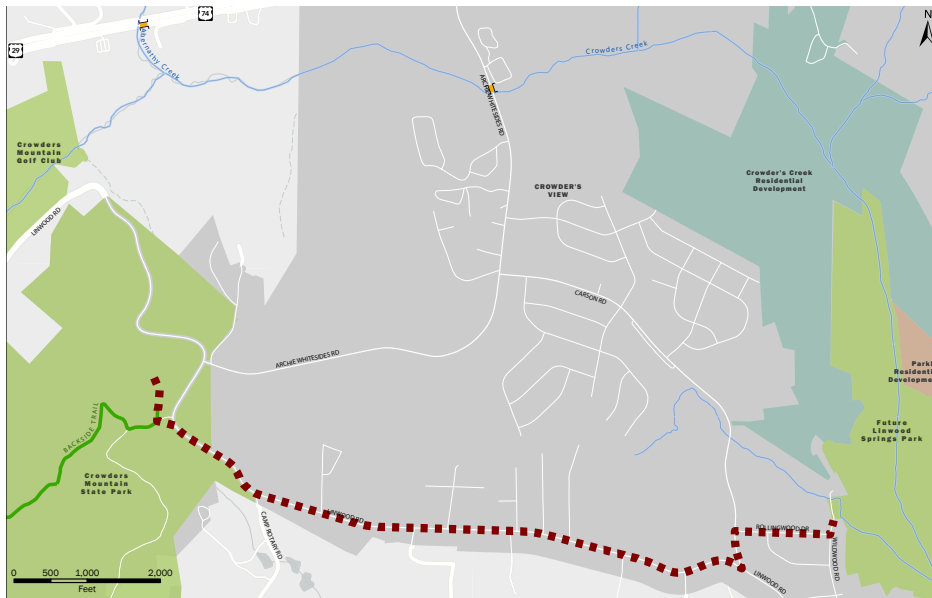
This alternative proposes the path be installed as a 10-foot multiuse side path on the north side of Linwood Road to avoid potential impacts to cultural resources, on the west side of Carson Road, and on the north side of Rollingwood Drive. This alternative also proposes one pedestrian crossing and signal at the intersection of Linwood Road and Carson Road and a second pedestrian crossing and pedestrian signal at the intersection of Carson Road and Rollingwood Drive.

Length: 2.12 miles

Estimated Construction Cost: \$8,460,000

Top Features and Considerations

	Provides direct connectivity to Suburban Heights neighborhood
	Roadside setting in close proximity to traffic. Linwood Road is posted at 35 mph and has a relatively low AADT of 1,200, while Carson Road is posted at 45 mph and has an AADT of 3,100.
	Approximately one third of this segment would be on existing NCDOT ROW.
	ROW coordination with property owners on the south side of Crowders Creek would be required.
	Pisgah ARP Church, a NRHP-listed property, is located on the north side of Linwood Road at the intersection of Linwood Road and Carson Road. Pisgah ARP cemetery is opposite the church on the south side of the roadway.
	Brentwood Mobile Home Park is located adjacent to the proposed alignment of this segment. This proximity could be a benefit to the community, but ROW acquisition would be required.



GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY

WEST ALTERNATIVE 5

Figure 27

4.3 // Alternatives East of Linwood Springs Park

W. 2nd Avenue Connection

A major connection point on the east side of the project corridor involves the crossing of W. Garrison Boulevard to meet up with the existing Carolina Thread Trail section beginning at W. 2nd Avenue. Early in the feasibility study, City officials expressed a desire for a degree of flexibility in the corridor alignment so that the trail could potentially react to reasonably foreseeable development in this area, such as the Parkdale Mill site, depending on various project development timelines. Where each alternative nears Garrison Boulevard, two route options for this connection were developed, and each of the four east side alternatives could use either of the two options.

Since each of the four eastern alternatives share these two options at the eastern terminus, the two options are described first, followed by the four alternatives that cover the remainder of the distance between Linwood Springs Park and W. 2nd Avenue.

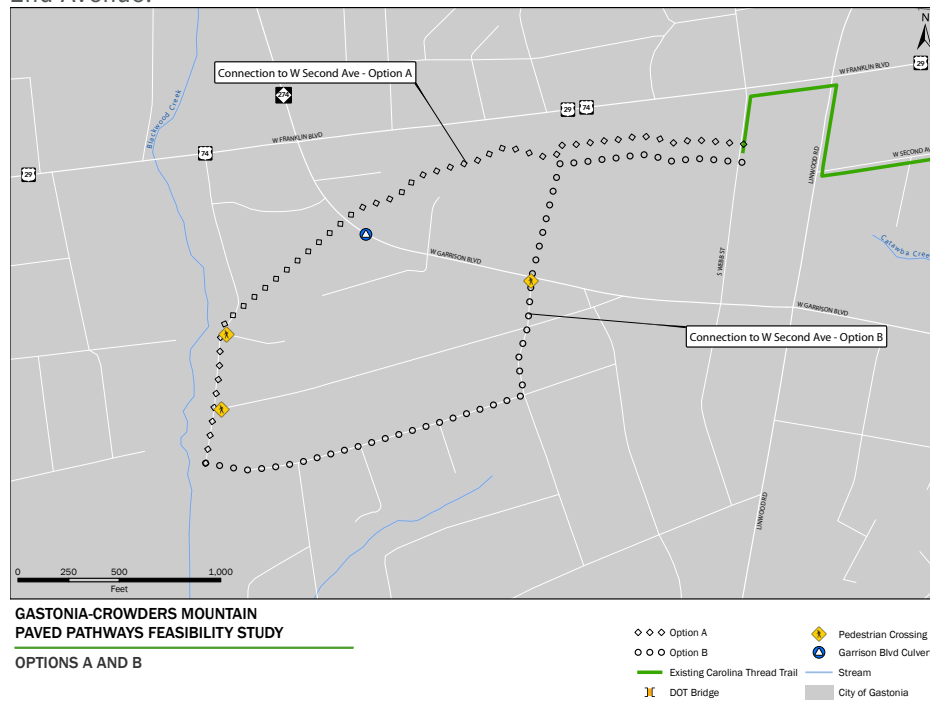


Figure 28

Connection to W. 2nd Avenue - Option A

Option A extends north along S. Dixie Street from its southern terminus to the edge of the parcel owned by Lovely Hill Baptist Church. From there, Option A extends northeast through undeveloped land, following the existing sewer easement. The route continues north along the easement and through the existing culvert underneath W. Garrison Boulevard. On the other side of W. Garrison Boulevard, the route continues northeast along the existing sewer easement onto undeveloped land terminating across from S. Gray Street behind Biggerstaff Furniture store. This option provides flexibility in the location of the proposed trail to enhance user experience and provide an additional way to cross the roadway while keeping bicyclists and pedestrians off road. However, culvert replacement would be necessary.

Length: 0.70 mile

Estimated Construction Cost: \$2,350,000

Pros	Cons
<ul style="list-style-type: none"> • Provides a scenic user experience by following sewer easement off road • Off road segment improves traffic safety 	<ul style="list-style-type: none"> • Portion of the trail is in close proximity to traffic • Property impacts

Connection to W. 2nd Avenue - Option B

Option B extends east from the southern terminus of S. Dixie Street east on W. McFarland Avenue turning north onto S. Gray Street. It continues to follow S. Gray Street north extending beyond the terminus of S. Gray Street and crossing W. Garrison Boulevard. The option continues north, terminating across from S. Gray Street behind Biggerstaff Furniture store. This option recognizes that there may be future opportunities to align the project with potential re-development of the former Parkdale Mill site. The option also proposes one pedestrian crossing and one signal where the alignment intersects W. Garrison Boulevard.

Length: 0.65 mile

Estimated Construction Cost: \$1,370,000

Pros	Cons
<ul style="list-style-type: none"> • Provides direct access to potential re-development site • Provides flexibility in alignment connection to 2nd Avenue in downtown Gastonia 	<ul style="list-style-type: none"> • Portion of the trail is in close proximity to traffic

Alternative E-1

Alternative E-1 extends northeast along the planned greenway within the planned Crowders Creek development from the Crowders Creek split with Tributary R-4 to the sewer easement north of the development. E-1 then follows the existing easement along Tributary R-4 east to Amber Crest Drive, turning north and crossing S. Myrtle School Road at the Parkdale Avenue intersection. The alternative continues east along Parkdale Avenue onto new location, crossing Blackwood Creek, at which point Option A or Option B could be used to connect to W. 2nd Avenue.



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**
EAST ALTERNATIVE 1

■ East Alternative 1
◇ Option A
◇ Option B
— Existing Carolina Thread Trail
⚡ DOT Bridge
⚡ Pedestrian Crossing
⚡ Garrison Blvd Culvert
— Stream
■ Park
■ City of Gastonia

Figure 29

Length: Option A: 1.6 miles | Option B: 2.15 miles

Estimated Construction Cost:

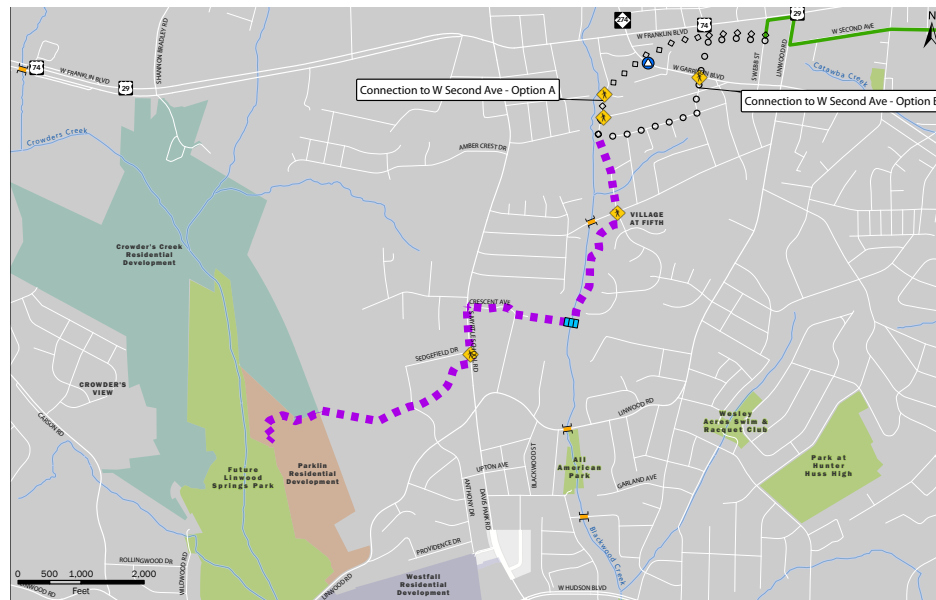
- With Option A: \$4,300,000
- With Option B: \$3,600,000

Top Features and Considerations

	Natural setting away from motor vehicle traffic provides a peaceful experience, a chance to enjoy nature, and increased safety.
	Approximately one third of this segment would be on existing NCDOT ROW.
	ROW coordination with property owners on the south side of Crowders Creek would be required.
	A mid-block crossing of Myrtle School Road at Ambercrest Drive would be required.
	A bridge to cross Blackwood Creek is required near the east end of Parkdale Avenue

Alternative E-2

Alternative E-2 extends east from the future Linwood Springs Park to the planned Parklin residential development following pedestrian accommodations within the development to the existing sewer easement, and following the easement east through the development, and onto undeveloped land. This sentence should be changed to: The alternative continues east, crossing Learning Place and passing through a proposed family apartment complex, before reaching S. Myrtle School Road, where the trail turns north, and then east onto Crescent Avenue/White Lane. E-2 continues east on new location, crossing Blackwood Creek, going north on existing greenway, continuing north across W. Fifth Avenue, and travels north up Blackwood Creek, until the point Option A or Option B could be used to connect to W. 2nd Avenue.



GASTONIA-CROWDERS MOUNTAIN PAVED PATHWAYS FEASIBILITY STUDY
EAST ALTERNATIVE 2
 Figure 30

- East Alternative 2
- ◇ Option A
- Option B
- Existing Carolina Thread Trail
- ⌘ DOT Bridge
- ▭ Pedestrian Bridge
- ⚡ Pedestrian Crossing
- ⚡ Garrison Blvd Culvert
- Stream
- Park
- City of Gastonia

Length: Option A: 2.62 | Option B: 2.64 miles

Estimated Construction Cost:

With Option A: \$8,770,000

With Option B: \$8,770,000

Top Features and Considerations



Natural setting away from motor vehicle traffic provides a peaceful experience, a chance to enjoy nature, and increased safety. Approximately half of this alternative is along Blackwood Creek.



Gaston County Schools owns the parcel where the former Forest Heights Elementary School building sits (1 Learning Place), opening the opportunity to coordinate with the county for the trail's use of part of this property.

Existing sidewalk on S. Myrtle School Road would save cost and expedite connection.

The developer of the proposed family apartment complex will be responsible for all construction costs associated with the 0.44-mile segment of the trail located within the parcel of the proposed complex.

This alternative makes use of the existing greenway at the Village at Fifth neighborhood. Coordination with the HOA would be required.



ROW would be required from property owners in the new location section in Segment 8.



At 1 Learning Place, the former Forest Heights Elementary school building is sited on a parcel owned by Gaston County Schools. The building currently hosts a virtual learning academy.



A mid-block crossing of Myrtle School Road at Sedgefield Drive would be required.



A bridge to cross Blackwood Creek is required near the east end of Crescent Ave.

Alternative E-3

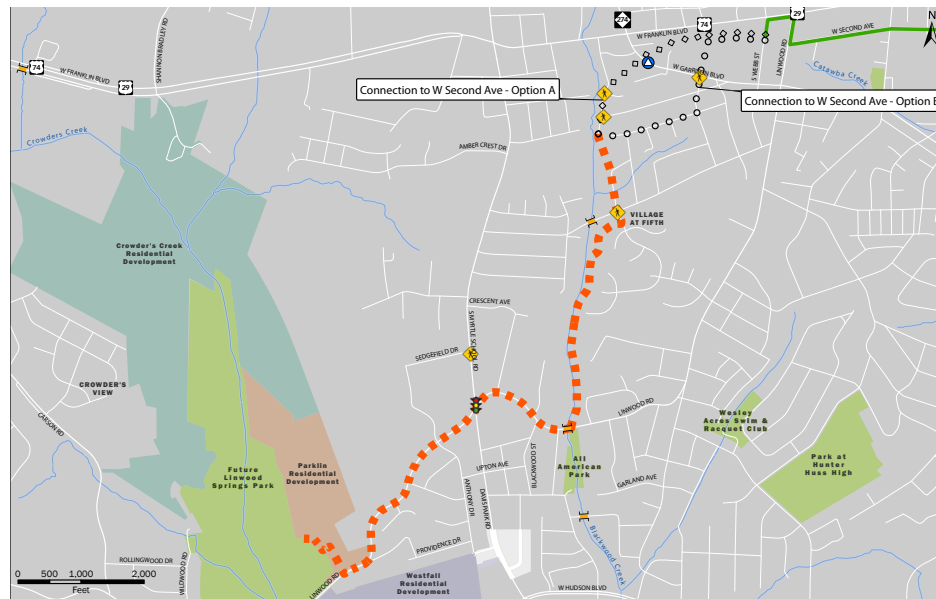
Alternative E-3 extends south from the planned Linwood Springs Park access onto planned pedestrian accommodations through the planned Parklin residential development to S. Linwood Road, following Linwood Road northeast to cross S. Myrtle School Road at a signalized intersection. The alternative then crosses the bridge over Blackwood Creek and turns north, following the existing sewer easement along Blackwood Creek to the existing greenway through the Village at Fifth neighborhood to Sherman Street. The alternative goes north along Blackwood Creek to near the western end of W. McFarland Street, at which point either Option A or Option B could be used to connect to W. 2nd Avenue.

Length: Option A: 2.11 miles | Option B: 2.15 miles

Estimated Construction Cost:

With Option A: \$7,050,000

With Option B: \$6,070,000



GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY

EAST ALTERNATIVE 3

Figure 31



Top Features and Considerations

	Approximately one mile of this alternative travels along Linwood Road in close proximity to traffic. Linwood Road is posted at 35 mph and has a relatively low AADT of between 5,600 and 6,100.
	Approximately one mile of this alternative is in a natural setting away from motor vehicle traffic provides a peaceful experience, a chance to enjoy nature, and increased safety.
	This alternative makes use of the existing greenway at the Village at Fifth neighborhood. Coordination with the HOA would be required.
	Widening the roadway's typical section to include a roadside MUP could require ROW coordination with property owners along Linwood Road.
	This alternative would provide a connection to All American Park.

Alternative E-4

Alternative E-4 extends south from the planned Linwood Springs Park access onto planned pedestrian accommodations through the planned Parklin residential development to S. Linwood Road to Lakewood Drive, east to Providence Drive, northeast along Providence Drive, north along Anthony Drive, east on Upton Avenue, south on Blackwood Street, east on Garland Avenue. Upon entering All American Park, the alternative follows an easement north along Blackwood Creek, connecting to existing greenway through the Village at Fifth neighborhood, then crossing W. Fifth Avenue and following Blackwood Creek north to near the western end of W. McFarland St., at which point either Option A or Option B could be used to connect to W. 2nd Avenue.



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**
EAST ALTERNATIVE 4

- East Alternative 4
- ◇ Option A
- Option B
- Existing Carolina Thread Trail
- ⌈ DOT Bridge
- ◇ Pedestrian Crossing
- Ⓜ Garrison Blvd Culvert
- Stream
- Park
- City of Gastonia

Figure 32

Length: Option A: 3.13 miles | Option B: 3.17 miles

Estimated Construction Cost:

With Option A: \$9,550,000

With Option B: \$8,580,000

Top Features and Considerations

	Approximately one mile of this alternative travels along Linwood Road in close proximity to traffic. Linwood Road is posted at 35 mph and has a relatively low AADT of between 5,600 and 6,100.
	Approximately one mile of this alternative is in a natural setting away from motor vehicle traffic provides a peaceful experience, a chance to enjoy nature, and increased safety.
	This alternative travels through All American Park, which is City-owned. This alternative makes use of the existing greenway at the Village at Fifth neighborhood. Coordination with the HOA would be required.
	Widening the roadway's typical section to include a roadside MUP could require ROW coordination with property owners along Linwood Road.
	This alternative would provide a connection to All American Park.

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LANDS CONSERVANCY

CAROLINA
THREAD TRAIL



Integrated Mobility Division
N.C. DEPARTMENT OF TRANSPORTATION

Section 5 // Public Involvement

Crowders Mountain Paved Trail Feasibility Study

5.1 // Previous Public Involvement

Public involvement is an essential part of the planning process. Prior to the Gastonia-Crowders Mountain Paved Pathways Feasibility Study, the development of various comprehensive, transportation, or master plans included community engagement and incorporated feedback that is pertinent to the current study. Along with the analysis of these plans, the feasibility study conducted a public meeting and held three steering committee meetings. The input received at these meetings contributed to the identification of the recommended alternative.

Carolina Thread Trail Master Plan for Gaston County Communities (Adopted January 2009)

Development of the master plan included four public listening sessions across the county, where more than 80 people attended and were asked a series of five questions to provide ideas for design guidelines and other Carolina Thread Trail activities. The top five active uses for trails were found to be biking, walking/running, hiking, horseback riding, and dog walking. Passive uses include safe transportation alternatives for those without a vehicle, educational opportunities/nature learning, emotional/spiritual/psychological benefits, and conservation. Crowders Mountain State Park, downtowns, public parks as well as schools were noted as being some of the top destinations that should be part of the Carolina Thread Trail System. Overall, attendees were eager to see the trail constructed but were concerned about cost, safety, and maintenance.

Within the county, two public open houses were held, with the goal of providing residents an opportunity to review preliminary concept routes of where the Carolina Thread Trail might cross Gaston County and offer their input. The Gaston County Planning Department also allowed interested parties to view the alternatives at their office. Survey input confirmed strong public support for eastern segments of the county that run north-south, along the rivers and connecting to population centers. Half of the respondents indicated that they live ¼ mile to 2 miles from a segment. The analysis further indicated that respondents favored segments that are closest to their place of residence.

Gastonia 2025 Comprehensive Plan (Adopted May 2011)

The City of Gastonia Planning department held public input sessions, information gathering activities and published a survey to gather input on how Gastonia should grow. Participants indicated that the most appealing features of the city

are its greenway infrastructure and scenic areas. Participants also highlighted the top priorities for new development to be single family housing, bike and greenway trails, as well as parks and open spaces. Other issues that were shared are that residential streets lacked sidewalks or street trees, and lack of open spaces, trees, and vegetation in non-residential developments.

Gaston County 2023 Comprehensive Land Use Plan (adopted September 2016)

The public outreach process involved hearing from the steering committee as well as from citizens through citizen input meetings. The steering committee served as a communication link between the planning process and the community they represented. They also reviewed planning documents and provided feedback. Ten citizen input meetings were held in various places throughout the County where attendees emphasized the importance of a bridge crossing in Southeastern Gaston County and additional things they wanted to see in the County:

- Better and safer transportation network
- Improved transportation, especially around US 321
- To preserve green space
- Connect disconnected areas of the County and increase river crossings
- Improved infrastructure, roads, and walkability
- Green preservation and road improvements, while retaining small town charm
- Improved connectivity to Charlotte

City of Gastonia Parks & Recreation Master Plan (Adopted August 2019)

Public engagement activities included a city-wide survey, stakeholder meetings, public workshops, as well as input from the Recreation Advisory Commission, Master Plan Committee and City Council. A City-wide survey gathered input from residents regarding their desires for parks and recreational facilities and programs. Most respondents indicated that driving was their primary mode of transportation, and that lack of information is their primary barrier to accessing open spaces and park programs. Respondents also highlighted safety concerns as another other barrier to accessing open spaces.

City of Gastonia Comprehensive Bicycle Plan (Adopted June 2023)

The planning process utilized a Project Steering Committee, a public survey, an online interactive map, and two public meetings to gather community feedback. A questionnaire asked community members about their biking behavior, their

destinations when biking, the barriers preventing them from biking, and also what bicycle facility types the City should prioritize. Many respondents indicated they bike multiple times a week with their top destinations being parks, trails, and community facilities. The top three barriers to biking are safety concerns about biking on the road, not enough bicycle facilities, and a disconnected bicycle network. Many respondents indicated that the types of bicycle facility they prefer are greenways and protected bicycle lanes on roadways. Community members ranked safety, connectivity, and accessibility as top priorities.

5.2 // Public Involvement in the Feasibility Study

Steering Committee

A Steering Committee was assembled and met three times during this study process. The Steering Committee consisted of representatives from the City of Gastonia, NCDOT, Gaston County, Carolina Thread Trail, NC Division of Parks and Recreation, and Gaston-Cleveland-Lincoln MPO. Each Steering Committee meeting provided an opportunity for participants to hear study updates and provide feedback on direction and progress. The feedback from the Steering Committee informed study considerations and prioritization recommendations.

Steering Committee Members

NCDOT

- Hart Evans, Statewide Planning and Programming Manager, NCDOT IMD
- Alex Rotenberry Senior Regional Planner, NCDOT IMD
- Dean Ledbetter, Division 12 Corridor Development Engineer, NCDOT Corridor Development

Carolina Thread Trail

- Jane Love, Community Coordinator
- Bret Baronak, Director

City of Gastonia

- Andy Stahr, Senior Administrative Services Coordinator
- Jason Thompson, Planning Director
- Quentin McPhatter, Assistant City Manager
- Rusty Bost, Director of Development Services, City of Gastonia
- Robert Cloninger, Division Manager of Field Operations

Gaston County

- Juan Garcia, Senior Transportation Planner
- Michael Applegate, Director, Gaston County Travel and Tourism

Gaston-Cleveland-Lincoln MPO

- Julio Pardes, Senior Transportation Planner

NC Division of Parks and Recreation

- Dave Head, Planning Program Manager, NC Parks
- Glen George, Park Superintendent, Crowders Mountain

Benesch

- Elise Bielen, Planning Group Manager, Benesch
- Jeff Ashbaugh, Landscape Architecture Group Manager, Benesch

Steering Committee Meeting #1

The first steering committee meeting was held on Thursday, August 17, 2023, at 1:00 pm at the Phillips Recreation Center in Gastonia, NC. Twelve out of 18 steering committee members were in attendance. The purpose of the meeting was to familiarize the members with the project to gain insight and feedback on the project's existing conditions, constraints and opportunities that may impact the study area. The meeting included a PowerPoint presentation and concluded with a site visit to the study area. The purpose of the site visit was to gain further insight into concerns and additional information for the development of project alternatives. Meeting attendees provided the following comments:

- Safety for users of the path as well as Crowders Mountain State Park should be taken into consideration when recommending an alternative.
- Connection to existing bicycle and pedestrian accommodations should be a key goal for the study.

- Rapid growth in population and development increases the need for bicycle and pedestrian accommodation and alternative modes of transportation throughout the city.
- Given the existing crowding at the Linwood Springs access to Crowders Mountain State Park, the parking lot there should not serve as a trailhead to this future trail.
- A pedestrian bridge within the upcoming Linwood Springs Park is probably the best place for the greenway to cross Crowders Creek.
- City-owned parcels on S. Dixie Street may have restrictions on the type of future use, due to the source of funding used to acquire the parcels (HUD).

Steering Committee Meeting #2

The second steering committee meeting was held on Tuesday, October 10, 2023, at 2:00 pm virtually via Microsoft Teams. Of the 18 steering committee members, sixteen were in attendance. The purpose of the meeting was to receive feedback regarding the approach to developing alternatives as well as the evaluation criteria for recommending an alternative. The meeting included a PowerPoint presentation describing analysis of the proposed alternatives and poll question concerning priority in evaluation criteria. Meeting attendees provided the following comments:

- Connectivity and cost estimates were voted the most important criteria for recommending an alternative.
- Proposing an alternative on a NCDOT bridge or roadway would ensure bicycle and pedestrian facilities were included in future bridge replacement and transportation projects.
- The committee discussed potential dates for a public meeting and decided the final week of November presented no conflicts with other city events.

Steering Committee Meeting #3

The third steering committee meeting was held on Thursday, June 20th, at 2:00 pm virtually via Microsoft Teams. Of the 18 steering committee members, eleven were in attendance. The purpose of the meeting was to go over the feedback received at the Nov. 30th public meeting, to share the alternatives evaluation that had occurred since gathering public input in addition to other data, and to discuss the outcomes of criteria scoring of alternatives. Meeting attendees provided the following feedback:

- State Park representatives had concerns about how W-1 enters Crowders

- Mountain State Park. The project team would follow up to refine that portion.
- One benefit W-1 has over W-4 is that part of W-1 would be constructed as part of the Crowders Creek development.
- Along E-2 there is the Virtual Learning Academy, which the Assistant City Manager suggested discussing with the school system regarding its potential to serve all the new development in the area.
- The direct access that E-2 provides to the Linwood Springs Park complements the approach the city has taken with developers in the area, ensuring park connections.
- Where E-2 crosses S. Myrtle School Road, there may be an opportunity for pedestrian refuge, as the two-way-left-turn lane is not needed for left turns right there.
- Regarding E-3, which follows Linwood Road, the city's transportation bond is relevant, as it supports a study of the Linwood Road and S. Myrtle School Road area.

During the meeting's discussions, the steering committee came to a consensus between the alternatives that had emerged with tied scores from the evaluation scoring process. Between W-1 and W-4, W-1 was preferred by the committee because it would impact fewer parcels than W-4. Between E-2 and E-3, E-2 was preferred because of the greater connectivity it offers to incoming development on the perimeter of Linwood Springs Park and the preferred off-road setting of the greenway compared to E-3.

5.3 // Public Meeting

The project team held an open-house public meeting on Thursday, November 30, 2023, from 5:00 pm to 7:00 pm in Gastonia at the Phillips Recreation Center, in the vicinity of the project study area. Flyers advertising the meeting (English and Spanish versions) were posted at various locations of significance throughout the study area as well as on various social media platforms held by Carolina Thread Trail, local bicycling clubs, communities, and groups of interest. A press release was posted on the City of Gastonia's website and covered by local news media.

The purpose of the meeting was to collect public input regarding overall interest in the trail as well as preferences for alignments and surface type. Three boards were on display at the meeting with one displaying the alternatives on the west side of the study area and two boards displaying the alternatives on the east side

of the study area. An overall map of the study area and alternatives encouraged attendees to provide additional information they thought important to the study. Attendees were provided with a handout summarizing the project's purpose and the overall study area. The handout included a comment sheet as well asking the following questions:

- Are you a City of Gastonia resident?
- Do you live, own property, or own a business in or near the study area?
- Do any of the alternatives touch your property or your business?
- How often do you walk, bike, or roll in Gastonia?
- How do you prefer to use trails/greenways?
- What destinations/purposes would you be interested in accessing from the path?
- Which West Side alternative do you prefer?
- Which East Side alternative do you prefer?

A copy of the handout and comment sheet can be found in Appendix B.



Figure 33

Overall, 25 members of the public attended the public meeting of which 14 completed comment sheets. Attendees expressed overall interest in the study and supported the implementation of a greenway. Of those submitting comment sheets, most are residents of the City of Gastonia and bicycle or walk on a weekly basis. Parks and shopping centers are the locations they would be most interested in accessing from the path. Regarding the project alternatives, the input collected is as follows:

- Alternatives W-1 and W-4 received the most support of the west side alternatives due to a preference for avoiding roadways and car traffic as well as a desire for more natural and scenic views. Attendees also noted these routes provided more direct access to the greenway network. Alternative W-5 received the least amount of support due to the majority of the trail being located along the roadway.
- Alternatives E-1 and E-2 received the most support of the east side alternatives due to safety concerns and additional connectivity to communities. Attendees preferred an off-street option and additional access to the greenway network.
- Attendees suggested considerations for connectivity to other greenways in the city and suggested sustainability and maintenance be taken into consideration when making a recommendation. Safety was also a concern when it came to the design of the recommended alternative, ensuring users don't feel isolated while on the path.
- Attendees suggested an extension to this trail that would follow the sewer easement east from the future Linwood Springs Park to Hudson and connect to Lineberger Park and the Sytz trail system near the Warlick YMCA southeast of downtown Gastonia via the Avon/Catawba Creeks Greenway.
- Attendees voted for a shared-use side path or shared-use greenway as their preferred facility type.



Receiving public input at the Public Meeting



Observing project alternatives at the Public Meeting



Discussing connections to future Linwood Springs Park at the Public Meeting



Discussing alternatives with the public at the Public Meeting

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Section 6 // Evaluation and Recommendations

Crowders Mountain Paved Trail Feasibility Study

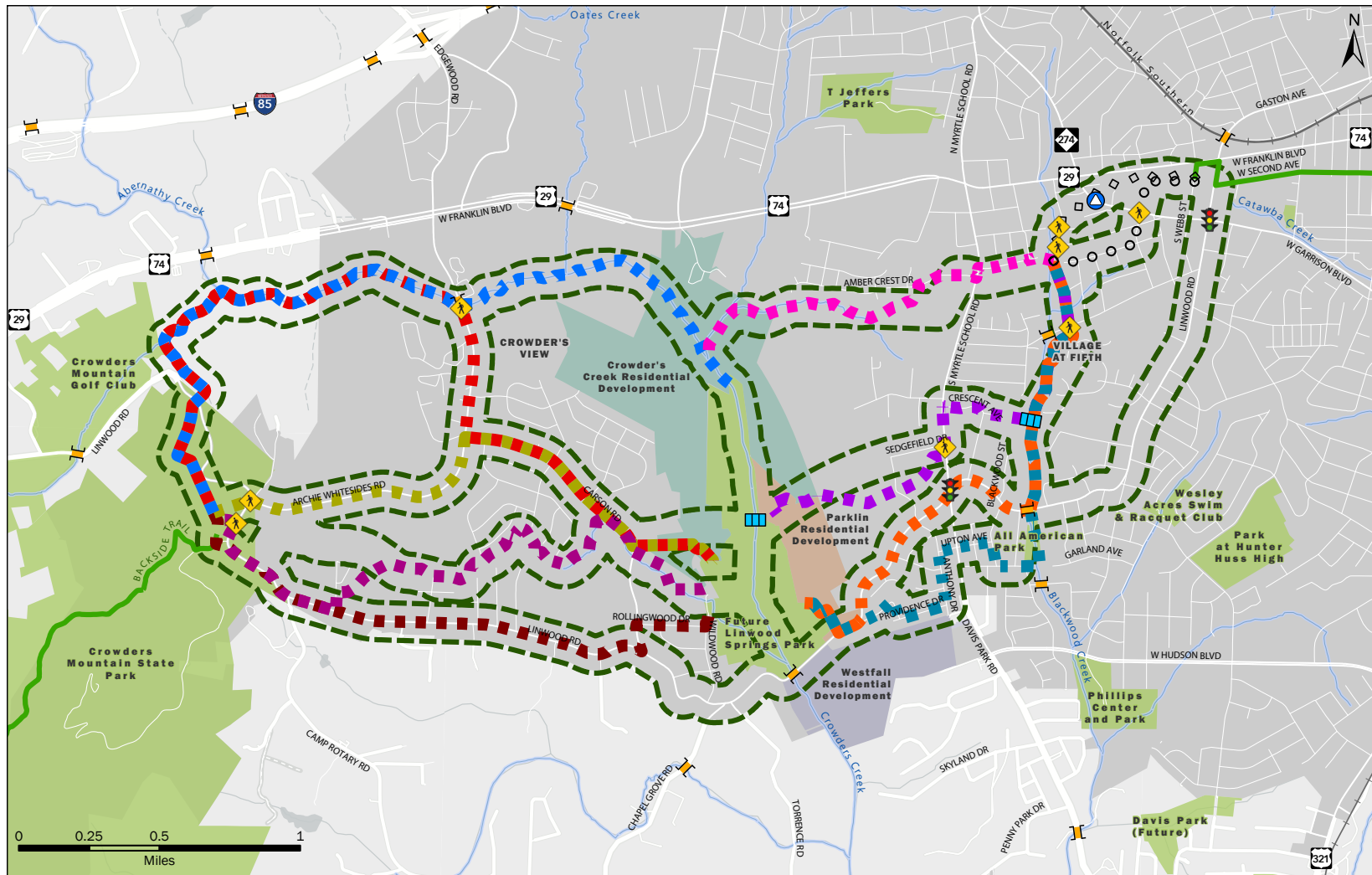
6.1 // Overview

As described in Section 2, the alternatives evaluated for recommendation were developed through a combination of individual trail segments, divided at structures, features, intersections, and natural breaks within the study area. Combining the segments in various ways resulted in sets of alternatives for each side of the future Linwood Springs Park, i.e. five western alternatives for connecting Crowders Mountain State Park and the future Linwood Springs Park, and four eastern alternatives for connecting Linwood Springs Park to downtown Gastonia. These alignments became the alternatives under evaluation. The evaluation criteria are based on a combination of study considerations, feedback from the public and steering committee members, outcomes of previous studies and plans, and data collection throughout the planning stages of the project.

The recommended alternative segments on each side of the study area meet within the future Linwood Springs Park, using facilities from the park's master plan, and together create the entire recommended alternative for the *Gastonia-Crowders Mountain Paved Pathways Feasibility Study*.

The following alternatives underwent the process of evaluation, with the western alternatives indicated by "W" names and eastern alternatives indicated by "E" names.

Figure 34



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

ALTERNATIVES

- | | | | |
|--------------------------------|---------------------|--------------------|--------------------|
| Feasibility Study Area | Signalized Crossing | West Alternative 1 | East Alternative 1 |
| Existing Carolina Thread Trail | DOT Bridge | West Alternative 2 | East Alternative 2 |
| Pedestrian Bridge | Stream | West Alternative 3 | East Alternative 3 |
| Pedestrian Crossing | Park | West Alternative 4 | East Alternative 4 |
| Garrison Blvd Culvert | City of Gastonia | West Alternative 5 | Option A |
| | | | Option B |

6.2 // Alternatives Evaluation

The alternatives were scored based upon how well they satisfied the evaluation criteria. One or more measures were applied for each criterion to quantify the desirability of the alternative. Each alternative was given a score of 0 = No/None, 1 = Low/Poor, 2 = Medium/Fair, or 3 = High/Good on each measure. The scores were then totaled to give the alternative an overall point score. The alternatives were ranked based on the overall point score, where the highest score reflected the most desirable alternative, and therefore, the alternative recommended.

The following criteria were used to evaluate the potential trail alignments.

Connectivity

The recommended alternative should prioritize connections to existing bicycle and pedestrian accommodations such as trails, sidewalks, bike lanes, and greenways. It should also provide connectivity to popular destinations of interest such as parks, schools, neighborhoods, and commercial centers.

An alternative was deemed more desirable in the criteria of connectivity depending upon the number of accessible destinations of interest and the number of connections to existing bicycle and pedestrian facilities. The greater the number of accessible destinations and the greater the number of connections to existing trail, the more desirable and higher the score granted to the alternative.

Equity

The recommended alternative should prioritize accessibility to low-income and historically underserved and underfunded communities.

The TDI, as described in Chapter 2, summarizes the concentrations of disadvantaged communities. Depending on the accessibility of the alignment for underserved communities, an alternative was deemed more desirable and given a higher score for the criteria of equity.

Traffic Safety

For the criteria of traffic safety, the recommended alternative should be an alignment that protects bicyclists and pedestrians with few roadway crossings and little proximity to roads with higher traffic volumes and higher posted speed limits. Public input received from the public meeting held in November 2023

reflected a desire for a trail alignment that was off road and furthest from traffic.

Alternatives that provided the most separation from motor vehicle traffic scored highest on the traffic safety criterion.

Environmental Impacts

The recommended alternative should have less environmentally damaging impacts to floodplains and water bodies.

The more desirable alternative had the fewest number of stream crossings and impacts to floodplains.

Costs

Estimated project cost must be considered, which is influenced by many factors including land acquisition, environmental impacts, bridge crossings, trail length, and surface type. Estimated costs are based on data available as of May 2025.

The alternative with the least cost was deemed a more desirable alternative than the others.

User Experience

The recommended alternative should meet the needs and desires of the bicyclists and pedestrians using the trail by providing a pleasant experience. According to public input, many users desire a trail located away from the noise and speeds of roadways and with a greater view of natural scenery.

The alternative with the least traffic volume and low speed as well as low proximity to roadways was deemed more desirable and granted a higher score.

Property Impacts

The recommended alternative should prioritize utilizing existing ROW, easements, and publicly owned property to reduce easement acquisition and property impacts. With fewer parcels impacted by the alignment, less time and money is needed for land transactions and coordination with property owners.

The more desirable alternative has a lower number of impacted parcels and was therefore given a higher score.

6.3 // Alternative Scoring and Selection

Based upon how well the alternative satisfied the factors that made up the individual criterion, the alternatives were given a score of

- 0 = No/None,
- 1 = Low/Poor,
- 2 = Medium/Fair,
- 3 = High/Good for each factor.



Table 4 shows the points assigned to each level within the criteria categories.



Table 4

Evaluation Criteria											
	Connectivity		Equity	Traffic Safety			Environmental Impacts		Cost	User Experience	Property Impacts
	Existing bike/ped facilities	Points of Interest	TDI of Intersected Block Groups	Speed Limit (mph)	AADT	Number of roadway crossings	Floodplains	Stream crossing	Cost Estimate (USD)	Off-road	Property Impacts
0 = None	None	None	Low	Over 35 mph	> 15K vehicles per day (vpd)	10+	High	10+	6M+	None	50+ parcels
1 = Poor	1 to 4	1 to 4	Medium	25 to 35 mph	5.1K-15K vpd	5 to 9	Medium	5 to 9	5M-5.9M	Low	35 to 49 parcels
2 = Fair	5 to 9	5 to 9	High	20 mph or less	50 - 5K vpd	1 to 4	Low	1 to 4	4M-4.9M	Medium	20 to 34 parcels
3 = Good	10 or more	10 or more	Very High	0 mph	< 50 vpd	0	None	0	Less than 4M	High	Less than 20 parcels

The scores on each measure were totaled to provide an overall score for each alternative. The highest point total identified the recommended alternative according to the evaluation criteria and its methodology. The following matrices summarize the scoring and ranking of each alternative.

Table 6

Evaluation Criteria - Point Totals													
West Side Alternatives	Connectivity		Equity	Traffic Safety			Environmental Impacts		Cost	User Experience	Property Impacts	Total Points	Ranking
	Existing bike/ped facilities	Points of Interest	TDI of Intersected Block Groups	Speed Limit (mph)	AADT	Number of roadway crossings	Floodplains	Stream crossing	Cost Estimate (USD)	Off-road	Property Impacts		
 West 1	1	1	0	3	3	2	0	3	2	3	2	20	1
West 2	2	1	0	0	2	2	1	3	0	2	1	14	5
West 3	1	1	0	0	2	2	3	3	3	0	1	16	3
 West 4	1	1	0	3	3	2	3	2	2	2	1	20	1
West 5	1	1	0	1	2	2	3	3	1	0	1	15	4

Evaluation Criteria - Point Totals													
East Side Alternatives	Connectivity		Equity	Traffic Safety			Environmental Impacts		Cost	User Experience	Property Impacts	Total Points	Ranking
	Existing bike/ped facilities	Points of Interest	TDI of Intersected Block Groups	Speed Limit (mph)	AADT	Number of roadway crossings	Floodplains	Stream crossing	Cost Estimate (USD)	Off-road	Property Impacts		
East 1	1	0	1	3	1	2	0	2	3	1	1	15	4
 East 2	2	1	2	1	1	2	2	2	1	1	2	17	1
 East 3	2	1	2	1	1	2	1	2	2	1	2	17	1
East 4	2	1	2	1	1	2	0	2	1	2	2	16	3

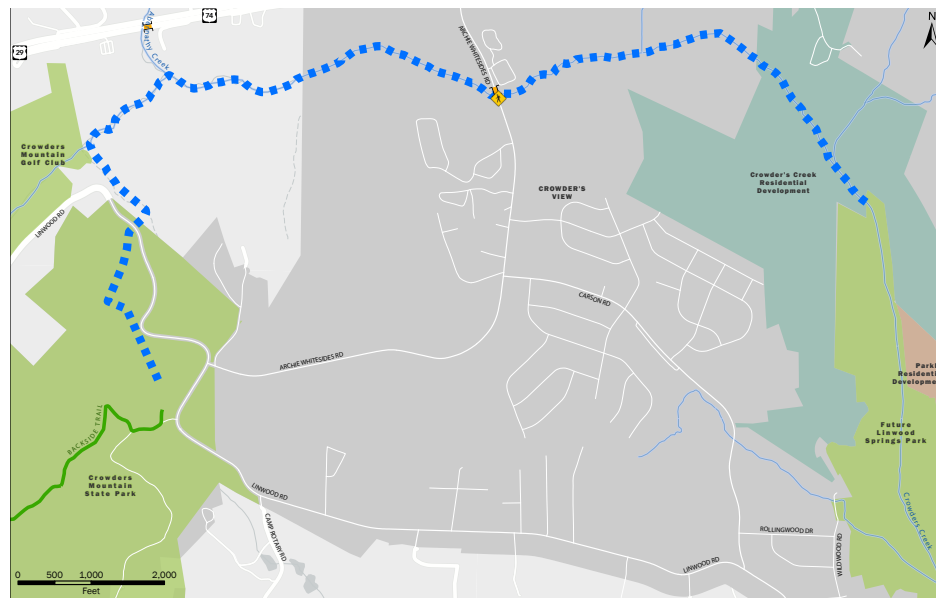
Evaluation Criteria - Point Totals													
Option	Connectivity		Equity	Traffic Safety			Environmental Impacts		Cost	User Experience	Property Impacts	Total Points	Ranking
	Existing bike/ped facilities	Points of Interest	TDI of Intersected Block Groups	Speed Limit (mph)	AADT	Number of roadway crossings	Floodplains	Stream crossing	Cost Estimate (USD)	Off-road	Property Impacts		
Option A	1	3	1	0	0	3	3	3	3	2	2	21	1
Option B	1	0	1	0	0	2	3	3	3	1	2	16	2

6.4 // Recommendation

West Side Alternative

After evaluating the alternatives, W-1 and W-4 each tied with a high score of 20 points. W-1's high total came primarily for its location away from roadways and along Crowders Creek, which resulted in high safety and user experience scores. Similarly, W-4 scored highly for safety and user experience for its location along a creek tributary.

W-1 and W-4 were also preferred by the public. Comparing the two alternatives, W-1 scored higher in user experience, resulted in fewer property impacts, and aligns with adopted transportation plans such as the City of Gastonia Comprehensive Bike Plan. The recommended alternative on the west side of the study area is West Alternative 1 (W-1).



GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY
WEST ALTERNATIVE 1

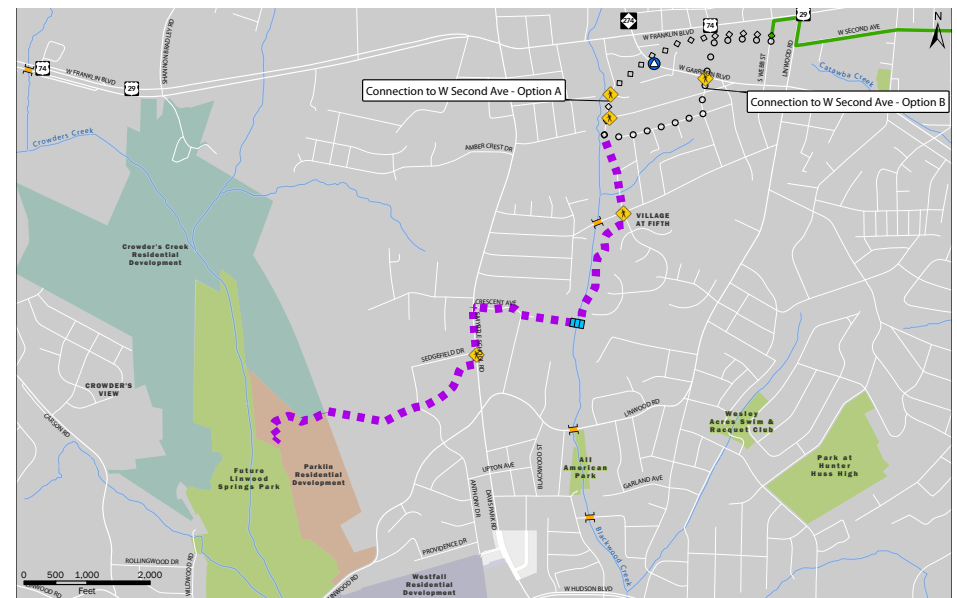
- West Alternative 1
- Existing Carolina Thread Trail
- DOT Bridge
- Pedestrian Crossing
- Stream
- Park
- City of Gastonia

Figure 35

East Side Alternative

E-2 and E-3 each tied with a high score of 17 based on the evaluation criteria. Between the two alternatives, E-2 would have fewer environmental impacts and E-3 provides connection to a greater number of existing households as well as employees. Consensus among the Steering Committee members was to favor E-2 over E-3 because of its better proposed user experience with more distance from the busy Linwood Road.

The recommended alternative on the east side of the study area is East Alternative 2 (E-2).



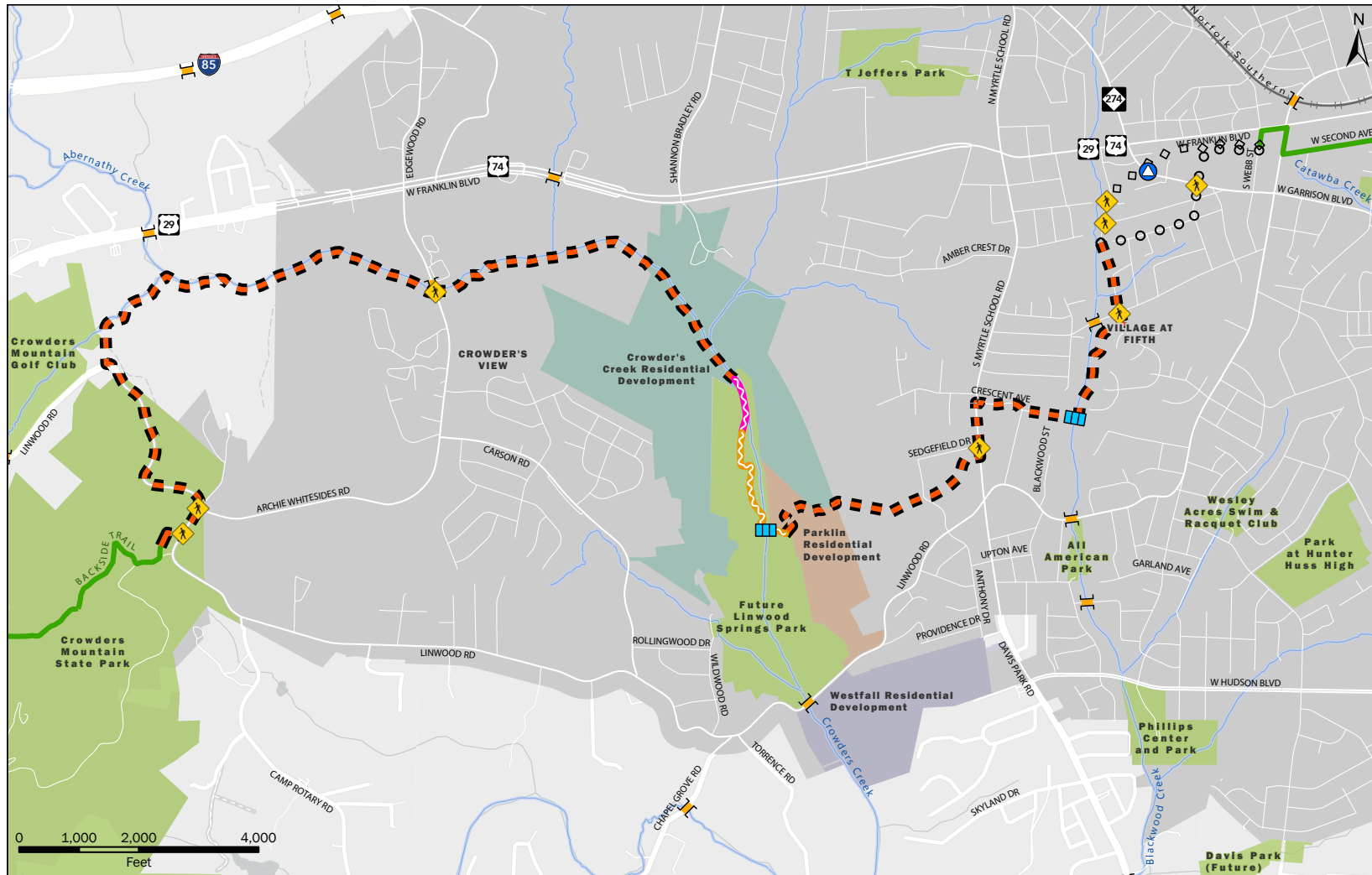
GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY
EAST ALTERNATIVE 2

- East Alternative 2
- ◇ Option A
- ◇ Option B
- Existing Carolina Thread Trail
- DOT Bridge
- Pedestrian Bridge
- Pedestrian Crossing
- Garrison Blvd Culvert
- Stream
- Park
- City of Gastonia

Figure 36

The combination of W-1 and E-2 creates the recommended route from Crowders Mountain State Park to the existing Carolina Thread Trail segment in downtown Gastonia for the Gastonia-Crowders Mountain Paved Pathways Feasibility Study. The combined contiguous recommended alternative is shown in Figure 37.

Figure 37



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

RECOMMENDED ALTERNATIVE

- Recommended Alternative
- Option A
- Option B
- Connector to Linwood Springs Park
- Linwood Park Former Cart Path
- Existing Carolina Thread Trail
- DOT Bridge
- Pedestrian Bridge
- Pedestrian Crossing
- Garrison Blvd Culvert
- Stream
- Park
- City of Gastonia

W-1 and E-2 connect to each other within the future Linwood Springs Park. The future park includes existing 6-foot paved asphalt cart paths from the site's former use as a golf course, including pedestrian bridges crossing Crowders Creek. The Master Plan for the park is under development as of the writing of this report. The park's development will include rehabilitation and restoration of areas of paved paths that are currently in disrepair, along with rehabilitation of several existing pedestrian bridges within the former golf course. The connection between W-1 and E-2 within Linwood Springs Park depends on the development and restoration of these elements and will incorporate them into the Carolina Thread Trail corridor.

The elements within the future Linwood Springs Park that will be incorporated into the trail are shown, including the existing concrete golf cart path (to be rehabilitated as needed), the existing footbridge to cross Crowders Creek (to be rehabilitated as needed), and the "Connector to Linwood Springs Park," which will be necessary to connect the existing concrete golf cart path to the paths developed by the Crowders Creek residential development to the north of the park.

6.5 // Recommended Alternative Pedestrian Crossings

- Linwood Road at Crowders Mountain State Park
 - » High visibility crossing
 - » Pedestrian-activated Signal
- Archie Whitesides Road at Linwood Road
 - » High visibility crossing
- Archie Whitesides Road at Crowders Creek
 - » High visibility crossing
 - » Pedestrian-activated Signal
- Myrtle School Road at Sedgefield Drive
 - » High visibility crossing
 - » Pedestrian-activated Signal
- 5th Avenue at Blackwood Creek
 - » High visibility crossing
 - » Pedestrian-activated Signal

- Garrison Avenue at Gray Street
 - » High visibility crossing
 - » Pedestrian-activated Signal



Figure 38: a high visibility crossing and a pedestrian-activated signal option.

6.6 // Potential Trail Enhancements and Community Features

To support a safe, engaging, and connected trail network, the following categories of improvements are recommended. These elements can be tailored to the unique context of each location and implemented incrementally based on feasibility, community input, and funding availability.

1. Wayfinding and Interpretive Signage

- Directional signage to nearby destinations such as parks, schools, neighborhoods, and commercial areas.
- Interpretive panels that highlight local history, cultural landmarks, and natural features.
- Educational signage about native wildlife, plant life, and environmental stewardship.
- Use of sidewalk symbols or painted trail markers to guide users to key destinations.

2. Community Identity and Placemaking

- Public art installations (e.g., murals, sculptures) that reflect local culture, history, or natural themes.
- Thematic design elements that reinforce a sense of place (e.g., creek- or textile-inspired motifs).
- Gateway features at key trailheads or intersections to create a welcoming and recognizable entrance.

3. Safety and Accessibility Enhancements

- Pedestrian refuge medians, curb extensions, or other crossing improvements to enhance safety.
- Visual cues such as planters, pavement treatments, or art to alert drivers to pedestrian activity.
- School zone enhancements, including child-friendly signage and traffic calming features.
- Consideration of pedestrian-activated signals or high-visibility crosswalks where warranted by traffic studies.

4. Recreational and Social Amenities

- Mini-plazas or pocket parks with shaded seating, art, and gathering spaces.
- Dog parks or fenced green spaces for off-leash recreation.
- Greenspaces with picnic tables, benches, and hammock poles to encourage relaxation and informal gatherings.
- Community bulletin boards for sharing local events, business promotions, and public notices.

5. Environmental and Scenic Features

- Creek overlooks or nature viewing platforms to connect users with the natural environment.
- Landscaping with native plants to support biodiversity, reduce maintenance, and enhance aesthetics.
- Integration of stormwater-friendly infrastructure such as rain gardens or permeable surfaces.

6. Connectivity and Trail Integration

- Signage and design elements that encourage exploration of nearby green spaces and trail extensions.
- Clear connections to existing sidewalks, bike routes, and public transportation.
- Flexible design strategies that allow for phased implementation and future expansion.

7. Amenities

- Basic amenities such as park benches and trash receptacles should be provided at regular intervals to support comfort and cleanliness along the trail. A general guideline is to include at least one bench and one trash receptacle per quarter mile, as conditions allow.
- Pet waste stations should be installed approximately every half mile to promote responsible pet ownership and maintain trail cleanliness.
- Placement of these amenities should consider visibility, accessibility, and maintenance logistics.

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Section 7 // Implementation

Crowders Mountain Paved Trail Feasibility Study

7.1 // Overview

Coordination between the City, the County, GCLMPO, the state, and local stakeholders will be essential to ensuring implementation of the paved path and its success in contributing to the Great State Trails initiative and connecting to the regional greenway network. A guide to this implementation follows with suggestions in how to build the greenway including potential scenarios and possible phasing within each of those scenarios.

One early step toward implementing the corridor will be for the *Carolina Thread Trail Master Plan for Gaston County Communities* to be amended by the Thread Trail and Gaston County to reflect the alignment. Additionally, the City of Gastonia and GCLMPO will incorporate the new alignment into planning documents via amendments or integration into future planning document updates.

7.2 // Phasing + Prioritization

Phasing, or constructing one or more pieces of the greenway corridor at a time rather than the entire extent all at once, is a practical approach to greenway corridor development. Phasing allows for practical considerations such as funding availability, environmental documentation and permitting, and necessary coordination with stakeholders and the public.

Development of the recommended phasing approach starts with identifying individual portions of the corridor with distinct characteristics and beginning and end points that might make sense to build in individual or combined project phases.

From west to east, the preferred greenway alignment has been broken into the following implementation segments and is pictured in Figure 39:

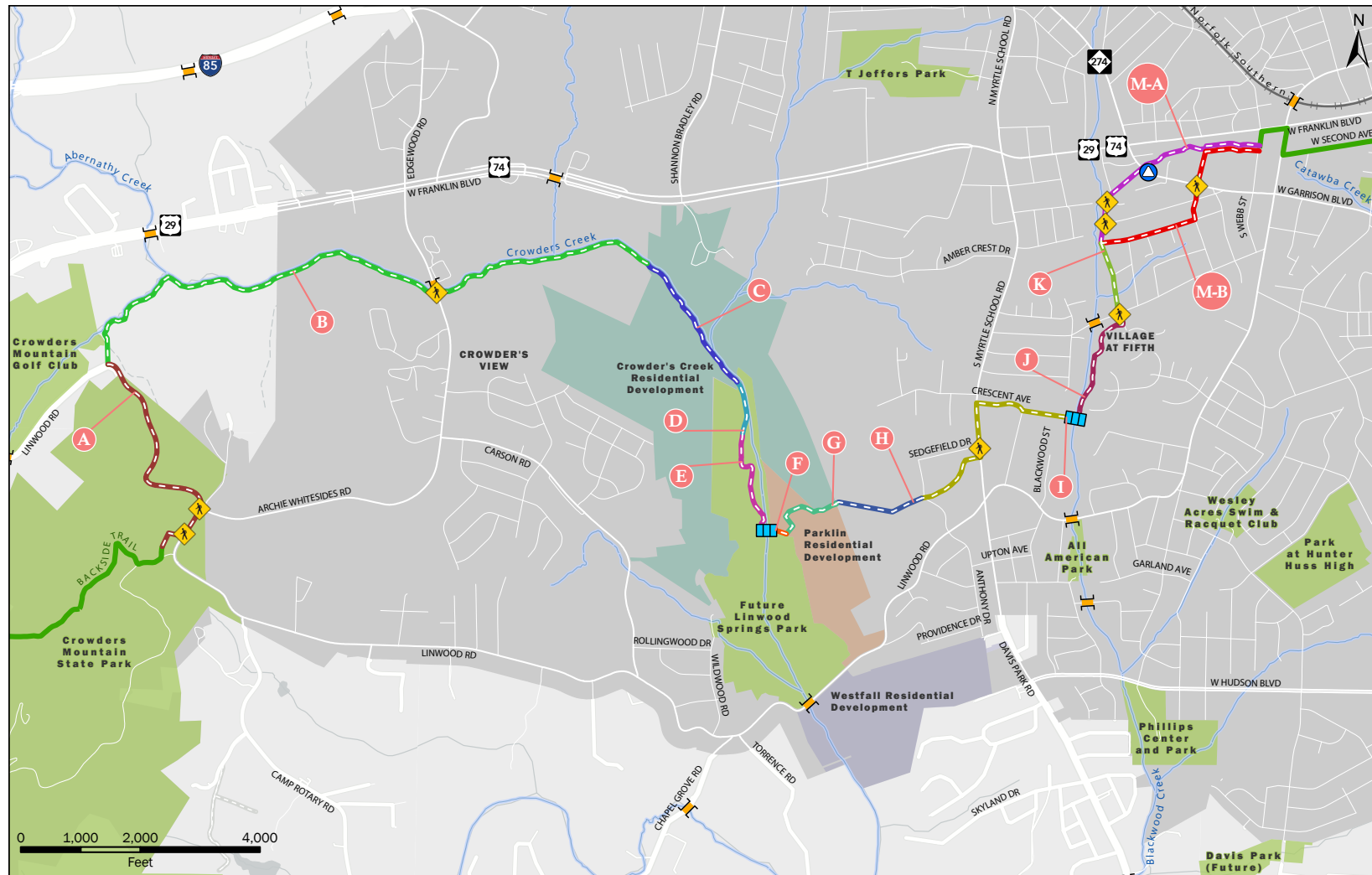
- A. Beginning at the Backside Trailhead, inside Crowder's Mountain State Park, MUP along Linwood Road
- B. Creekside path alongside Crowders Creek, starting east of Crowders Mountain Golf Club on Linwood Road, to Crowders Creek Residential Development
- C. Crowders Creek Development Portion
- D. North Connector to Linwood Springs Park
- E. Linwood Springs Park

- F. South Connector to Parklin Development
- G. Parklin Development Portion
- H. Parklin to Learning Place
- I. Learning Place to Blackwood Creek
- J. Existing Greenway in Village at 5th
- K. 5th Avenue to W. McFarland Ave
- M-A. Dixie Street to Garrison Boulevard Culvert ending at 2nd Avenue
- M-B. Parkdale Mill via McFarland Avenue and Gray Street ending at 2nd Avenue

Implementation Scenarios + Phasing Recommendations

It is recommended to build out the greenway in multiple phases, as seen in Figure 40, which can allow the City to pursue funding and pace trail development in a practical way. The recommended phases are developed such that the completion of each will add utility and extend not only the Carolina Thread Trail but also make valuable connections to existing and otherwise planned bike and pedestrian facilities.

Figure 39

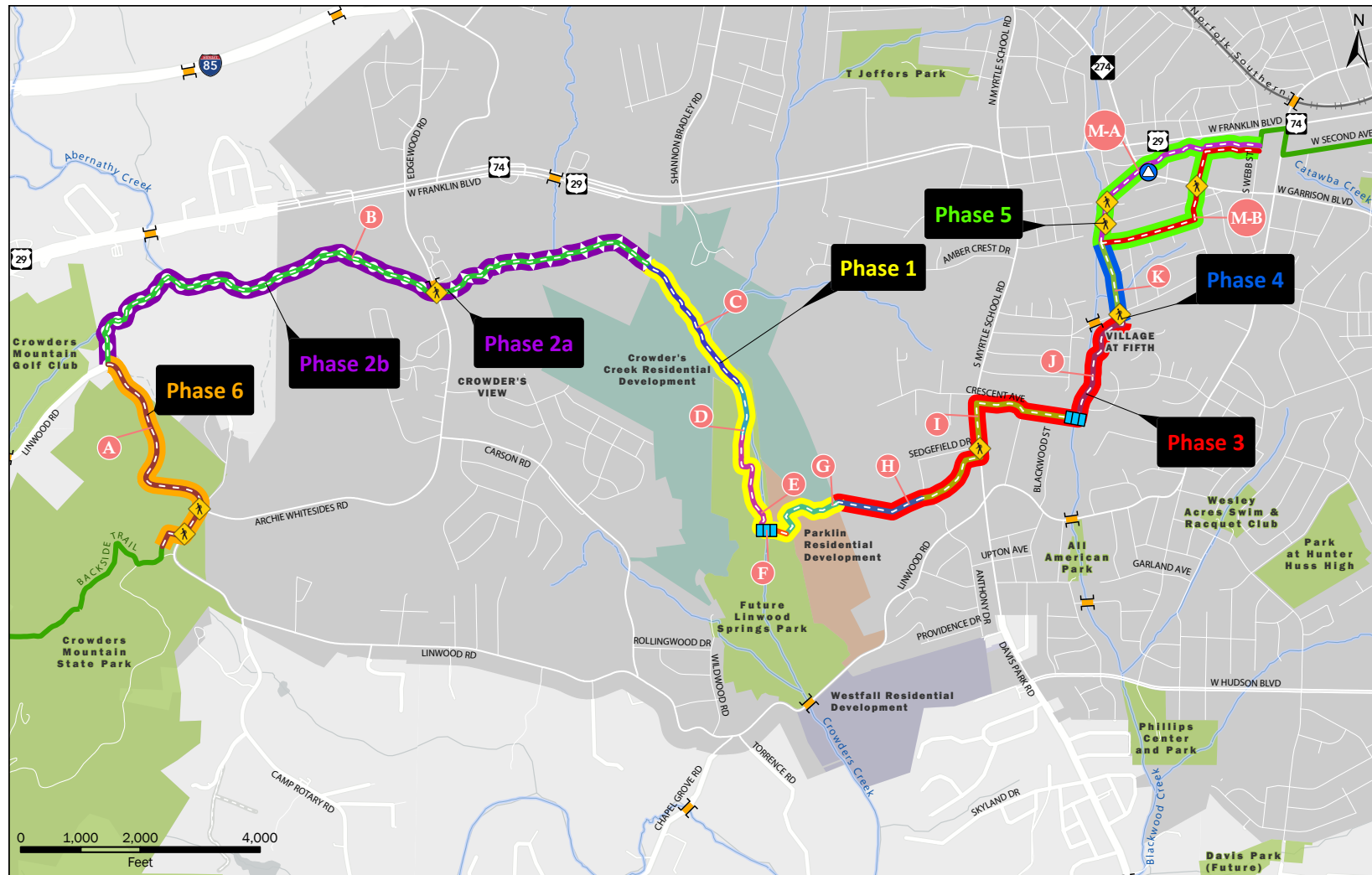


**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

RECOMMENDED ALTERNATIVE IMPLEMENTATION SEGMENTS

- Existing Carolina Thread Trail
- DOT Bridge
- Pedestrian Bridge
- Pedestrian Crossing
- Garrison Blvd Culvert
- Stream
- Park
- City of Gastonia

Figure 40



**GASTONIA-CROWDERS MOUNTAIN
PAVED PATHWAYS FEASIBILITY STUDY**

RECOMMENDED IMPLEMENTATION PHASES

- | | | | | | |
|--|--------------------------------|--|------------------|--|----------|
| | Existing Carolina Thread Trail | | Stream | | Phase 1 |
| | DOT Bridge | | Park | | Phase 2a |
| | Pedestrian Bridge | | City of Gastonia | | Phase 2b |
| | Pedestrian Crossing | | | | Phase 3 |
| | Garrison Blvd Culvert | | | | Phase 4 |
| | | | | | Phase 5 |
| | | | | | Phase 6 |

Phase 1

Phase 1 would comprise 1.33 miles of trail length and would work to leverage planned residential developments and the Linwood Park Development. It would include Segments C and G, which are incorporated into development plans, Segment E, which is included in the master plan for Linwood Springs Park, and Segments D and F, which would be needed to make the connections between the park paths and the development paths.

Segment C - Crowders Creek Development Portion

- Length: 0.48 mile
- Recommended Typical Section: New location asphalt paved MUP (10 foot wide) with a singular (6 foot wide) green strip shoulder between the path and Crowders Creek to the north. (Figure 41)
- Cost Estimate: Costs to be borne by the Crowders Creek developer
- Notes: Coordination with Developer will be required during final site design and construction to ensure compatibility with tying into paths on Linwood Springs Park parcel



Figure 41

Segment D and F - Linwood Park Connections

- Length: 0.17 mile (Segment D) and 0.06 mile (Segment F)
- Recommended Typical Section: Existing concrete golf cart paths (6-foot wide) shall remain in place with no immediate alterations. Future modifications could update these segments of trail to asphalt paved MUP (10-foot wide) with two (2 foot wide) green strip shoulders along both sides of the path.
- Cost Estimate: \$800,000
- Notes: These connector pieces will be required to bridge the gaps between the adjacent residential development parcels (Crowders Creek and Parklin) and existing pathways in the park. While not included in the first phase of park development, these connection pieces are expected to be incorporated into future park development.

Segment E - Linwood Park

- Length: 0.37 mile
- Recommended Typical Section: Existing concrete golf cart paths (6-foot wide) shall remain in place with no immediate alterations. Future modifications could update these segments of trail to asphalt paved MUP (10-foot wide) with two (2 foot wide) green strip shoulders along both sides of the path.
- Cost Estimate: Cost to be borne by future park development
- Notes: The Crowders Creek crossing will be done with planned rehabilitation of an existing bridge on the Linwood Springs Park property



Figure 42



Figure 43

Segment G - Parklin Development Portion

- Length: 0.25 mile
- Recommended Typical Section: New location concrete sidewalk (5 foot wide) with a singular (3 foot wide) green strip shoulder between the sidewalk and future roadway
- Cost Estimate: Costs to be borne by the Parklin developer
- Notes: Coordination with Developer will be required during final site design and construction to ensure compatibility with tying into paths on Linwood Springs Park parcel

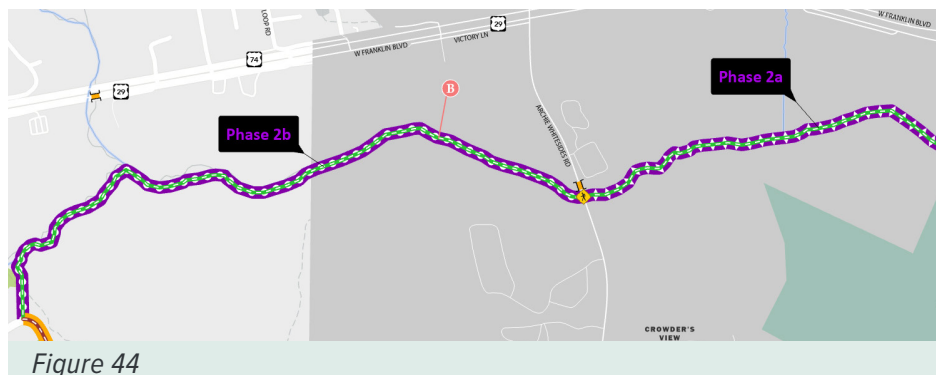


Figure 44

Phase 2

This section would add 2.06 miles of trail connected at the east side to Crowders Creek Development and to Crowders Mountain State Park to the west, and would intersect with Archie Whitesides Road. The GCLMPO CTP recommends a future MUP along Archie Whitesides Road, which would provide a useful network connection and trail access for residents and neighborhoods along Archie Whitesides Road, including a cluster of mobile home residents. An at-grade pedestrian crossing would be needed at Archie Whiteside Road, as the existing NCDOT vehicular bridge does not have the clearance available to bring the trail under the bridge.

Phase 2a - Segment B - Creekside Path from Linwood Road to Archie Whitesides Road

- Length: 0.74 mile
- Recommended Typical Section: New location asphalt paved MUP (10 foot wide) with a singular (6 foot wide) green strip shoulder between path and Crowders Creek to the north.
- Cost Estimate: \$1,820,000
- Notes:
 - » South side of Crowders Creek
 - » Trail construction must consider the location in the 100-year flood plain.

Phase 2b - Segment B - Creekside Path from Archie Whitesides Road to Crowders Creek Development

- Length: 1.32 mile
- Recommended Typical Section: New location asphalt paved MUP (10 foot wide) with a singular (6 foot wide) green strip shoulder between path and Crowders Creek to the north.
- Cost Estimate: \$3,240,000
- Notes:
 - » South side of Crowders Creek



Figure 45

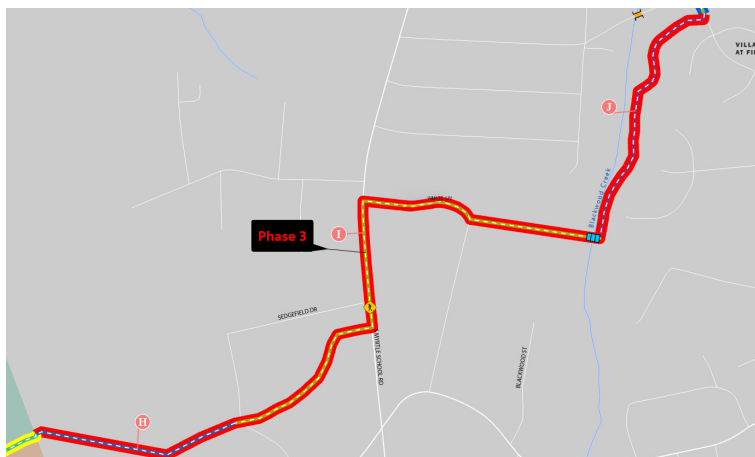


Figure 46

Phase 3

Phase 3 includes Segments H, I, and J and comprises 1.45 miles of pedestrian connection to establish a pedestrian path to Linwood Springs Park from points east. This segment would connect the park to existing sidewalks along Myrtle School Road, which extend to the north and south of the study area. This implementation phase will also include a multi-use path bridge over Blackwood Creek near the end of White Lane. On the east side of Blackwood Creek, the trail will tie into the existing neighborhood greenway that runs along the west/northwest of the Village at Fifth neighborhood. Sidewalks currently exist along the north side of Fifth Avenue, with the exception of a 0.2 mile gap between Hampton Street and S. Gray Street, which is identified by the GCLMPO CTP as a future need. This connection would bring trail access to those coming from pedestrian facilities on Myrtle School Road to the west and Linwood Road to the east.

Segment H - Parklin to Learning Place

- Length: 0.28 mile
- Recommended Typical Section: New location asphalt paved MUP (10 foot wide) with two (2 foot wide) green strip shoulders on each side of the path.
- Cost Estimate: \$1,080,000
- Notes:
 - » 1 Concrete curbs need to be added when trail meets 1 Learning Place
 - » Could provide school connectivity (former Forest Heights Elementary School building on Gaston County Schools property at 1 Learning Place)

Segment I - Learning Place to Blackwood Creek

- Length: 0.75 mile
- Recommended Typical Section: Beginning at Learning Place and ending at S. Myrtle School Road, the trail shall be a new location asphalt paved MUP (10 foot wide) with two (2 foot) green strip shoulders for 0.44 mile while traversing through the proposed family apartment complex. Following this section, the trail will utilize the existing sidewalk along S. Myrtle School Road for 0.17 mile, and then transition to a new location concrete sidewalk (6 foot wide) along White Lane for 0.14 mile
- Cost Estimate: \$1,800,000
- Notes:
 - » Will require residential ROW (if off-street facilities will be used) and neighborhood coordination
 - » Every existing concrete curb ramp will need to be replaced within this segment to meet today's ADA standards. Overall, between replacing concrete curb ramps and installing new concrete curb ramps, 10 concrete curb ramps will need to be installed in this section.



Figure 47



Figure 48

Segment J - Bridge over Blackwood Creek and Tie into Village at Fifth Neighborhood

- Length: 0.37 mile
- Recommended Typical Section: New location asphalt paved MUP (10 foot wide) with two (2 foot wide) green strip shoulders on both sides of the path with one bridge that is 89 feet long spanning across Blackwood Creek.
- Cost Estimate: \$2,160,000
- Notes:
 - » A high-visibility pedestrian crossing is necessary to cross the trail over Fifth Avenue.
 - » Coordination will be needed with the Village at Fifth HOA for the City and Carolina Thread Trail to gain access and come to maintenance agreement.

Phase 4

The segment would also connect to the proposed east-west MUP from Blackwood Creek to Linwood Road. At Fifth Avenue, a pedestrian crossing will be required. North of Fifth Avenue, the trail will continue on new location running along the east side of Blackwood Creek.

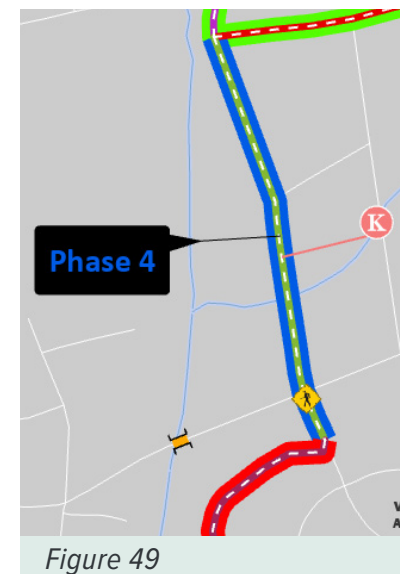


Figure 49

Segment K - Fifth Avenue to W. McFarland Avenue

- Length: 0.26 mile
- Recommended Typical Section: New location asphalt paved MUP (10 foot wide) with two (2 foot wide) green strip shoulders on each side.
- Cost Estimate: \$1,170,000
- Notes: There is approximately 170 feet of existing sidewalk that will be used in this segment and not replaced. Therefore, approximately 0.23 mile will need to be newly constructed/paved out of the 0.26 mile of this section
- The existing concrete curb ramp on W. 5th Avenue needs to be replaced and a new concrete curb ramp needs to be added where the new pavement will be laid across the street
- There is approximately 170 feet of existing sidewalk that will be used in this segment and not replaced. Therefore, approximately 0.23 mile will need to be newly constructed/paved out of the 0.26 mile of this section
- The existing concrete curb ramp on W. 5th Avenue needs to be replaced and a new concrete curb ramp needs to be added where the new pavement will be laid across the street.



Figure 50



Figure 51

Phase 5

Phase 5 connects the trail into downtown Gastonia and connects to the existing Carolina Thread Trail which runs along W. 2nd Avenue. This area is characterized by a denser road network made up of smaller neighborhood streets and W. Garrison Boulevard/NC 274, which connects W. Franklin Boulevard/US 74/US 29 and Linwood Road, continuing on as a major east-west corridor through Gastonia. Central in this area is the former Parkdale Mill site, which sits vacant and has the potential for future redevelopment. Two options were developed for this final connection. The City's future development plans and potential funding sources may factor into which option serves the needs of the trail best. Both options, A and B, are described below.

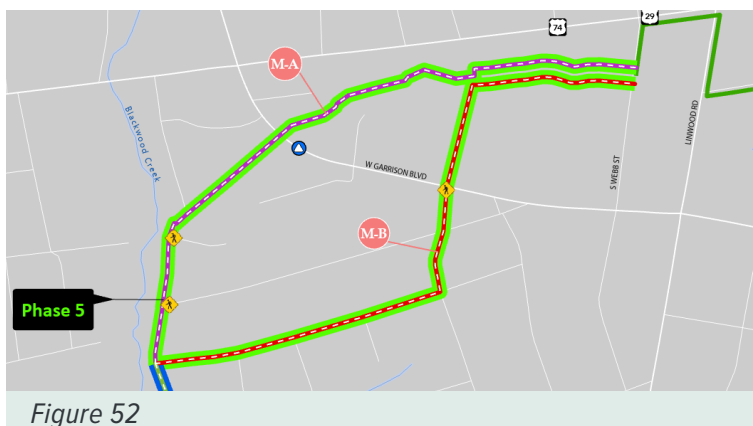


Figure 52

Segment M Option A - Dixie Street to Garrison Blvd Culvert

- Length: 0.70 mile
- Recommended Typical Section: New location concrete sidewalk (6 foot wide) along the north side of W. McFarland Avenue with a singular (3 foot wide) green strip shoulder between path and road.
- Cost Estimate: \$1,300,000
- Notes:
 - » A crossing of W. Garrison Boulevard may be necessary to avoid an at-grade pedestrian crossing and to maintain the natural setting for users. However, integrating the trail with the existing culvert must be studied and may not be possible without major changes to the culvert.

- » 9 concrete curb ramps will be needed at intersections and at end of path.

Segment M Option B - Parkdale Mill via McFarland Avenue and Grey Street

- Length: 0.65 mile
- Recommended Typical Section: New location concrete sidewalk (6 foot wide) along the east side of S. Dixie Street with a singular (3 foot wide) green strip shoulder between path and road.
- Cost Estimate: \$1,300,000
- Notes:
 - » McFarland Drive currently has no sidewalk or on Gray Street between McFarland Drive and Parkdale Avenue. A short segment of sidewalk is found on Gray Street between Parkdale Avenue and W. Garrison Boulevard. The road ends to the west at Blackwood Creek and has low traffic volumes. ROW could be needed from 20-25 property owners to add a sidewalk or MUP through this segment.
 - » 7 concrete curb ramps will be needed at intersections and at end of path.



Figure 53

Phase 6

This phase completes the connection from the Backside Trail trailhead at the Linwood Road access to Crowders Mountain State Park, and provides the final connection for the project. To minimize impacts to the state park, Segment A runs along the east side of Linwood Road. State property is situated on both sides of NCDOT's ROW through the majority of this segment. Several pedestrian crossings will be necessary to implement this MUP. First, a pedestrian crossing near the State Park entrance will bring users to the east side of Linwood Road. For safety, the crossing here will need to carefully consider vehicular sight lines through this curvy section of road. At the intersection of Archie Whitesides Road, a second pedestrian crossing will be needed.

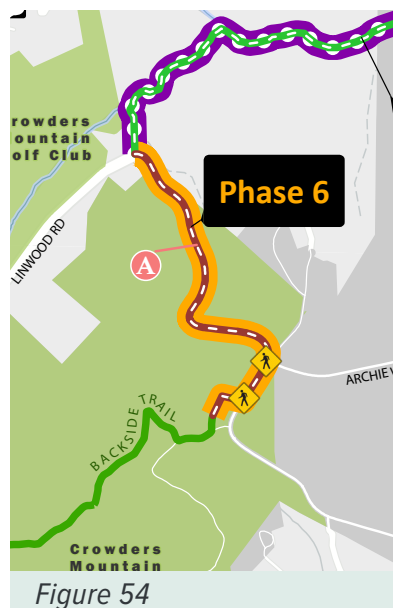


Figure 54

Segment A - MUP along Linwood Road

- Length: 0.85 mile
- Recommended Typical Section: New location asphalt paved MUP (10 foot wide) with a singular (6 foot wide) green strip shoulder between the path and road.
- Cost Estimate: \$2,940,000

Notes:

- » The design phase will determine whether the MUP addition will require land outside of NCDOT's existing 60-foot ROW along Linwood Road. The majority of the property on both sides of this segment is state-owned park property.
- » Coordination with NC State Parks will be essential in this phase of development. Bikes are not allowed on trails within park. There may be a need to include signage along the trail and at the trailhead to remind users to continue on foot if they wish to continue along the trail in the park.
- » The topography throughout the location of Phase 6 varies and will need to be taken into account during the design phase



Figure 55

7.3// Implementation Partners

There are many government agencies, stakeholders, and supporters that will need to collaborate to successfully construct the trail. The key partners and stakeholders are outlined below:

- City of Gastonia
- Gaston County
- NCDOT Division 12
- NCDOT IMD
- North Carolina Parks and Recreation
- Gaston-Cleveland-Lincoln Metropolitan Planning Organization
- GTS Coalition
- Carolina Thread Trail
- Crowders Mountain State Park
- Local businesses
- Developers
- Landowners

Partners

City of Gastonia

The City of Gastonia Planning Department is responsible for the short- and long-term plans of the city including land use, zoning, and economic development. The City of Gastonia is a key partner and will be the implementing agency for the alternative recommendation. The City has partnered with the Carolina Thread Trail in the past on several paved trail or sidewalk projects implemented by the city, including the funding of design and/or construction of several greenways. The City was also able to obtain and manage funding from a range of sources in these projects and other bicycle and pedestrian projects.

Gaston County

Gaston County adopted the Carolina Thread Trail Master Plan for Gaston County Communities in March 2009. An amendment to the master plan to reflect the recommendation of this study will need to be considered by the Gaston County Board of County Commissioners.

NCDOT Division 12

NCDOT Division of Highways is responsible for the planning and maintenance of the roadway and highway network throughout the state of North Carolina, one of

the largest highway networks in the nation. NCDOT has divided the state into 14 different highway divisions. Division 12 includes the following counties: Alexander, Iredell, Catawba, Lincoln, Cleveland and Gaston.

NCDOT IMD

NCDOT IMD administers state and local funds for bicycle and pedestrian programs as well as public transportation. The division's mission is to provide leadership for safe, affordable, and innovative multimodal transportation throughout North Carolina. IMD's core goals include eliminating transportation barriers and ensuring all North Carolinians have equal access to opportunities and services, ensuring all road users can travel safely by building streets fit for all and proactively correcting areas susceptible to crashes involving vulnerable road users, and offering a convenient network of multimodal choices to enhance the quality of life for all North Carolinian residents.

North Carolina Division of Parks and Recreation

The North Carolina Division of Parks and Recreation is dedicated to the conservation of natural areas and parks, the creation of safe and enjoyable outdoor recreation and activities, and the education of natural and cultural heritage across the state. It also supports trail and park planning and development projects through grant funding.

Gaston-Cleveland-Lincoln Metropolitan Planning Organization

GCLMPO is composed of 34 local governments tasked with planning transportation systems across the region. The transportation systems align with the growth and development of the region, connecting communities, moving goods and services, and providing multimodal systems of transportation, including bicycle and pedestrian modes of transportation. The MPO works with NCDOT and local governments to implement planning projects and advocate for funding.

Great Trails State Coalition

The GTS Coalition is a partnership between nonprofit organizations, local governments, and applicable industries and interest groups to increase investments in all trails throughout North Carolina, including hiking, biking, paddling and equestrian, paved or unpaved. Their goals include ensuring there is adequate funding for all trail types, making trails accessible for all North Carolinians and visitors, and ensuring North Carolina leverages federal funding

available for all trails. The 2022 GTS Plan proposes a network of trails that would connect all 100 counties throughout the state of North Carolina, investing in rural and urban areas, improving quality of life, economic development, and infrastructure benefits. To implement the proposed network of trails, the plan recommends additional feasibility studies, planning, design, and land acquisition for construction. The proposed Carolina Thread Trail linking Crowders Mountain State Park and downtown Gastonia can be found in the 2022 GTS Plan.

Carolina Thread Trail

The Carolina Thread Trail is a regional network of paved and unpaved greenways, multi-use paths, sidewalks, and blueways (paddle trails). The mission of the organization is to connect lives to nature. Carolina Thread Trail has been a part of numerous partnerships with local governments and organizations in the planning, designing, and construction of trails, often providing grants for these activities. Its Master Plan for Gaston County, adopted in 2009, proposed many trails throughout the City of Gastonia, some of which are a part of the alternatives evaluated for the feasibility study. An amendment to the Master Plan to reflect the recommendation of this study will need to be considered by the Thread Trail’s Board of Directors.

Crowders Mountain State Park

Crowders Mountain State Park is in Gaston County and offers activities such as hiking, paddling, fishing, picnicking, rock climbing, and bouldering. There are also tent sites for backpacking and amenities such as an amphitheater, auditorium, visitor center, and exhibits. The park has three access areas: Linwood Road, Sparrow Springs, and Boulders. Backside Trail at the Linwood Road Access Area is where the Carolina Thread Trail alignment would connect within the park.

Local Businesses and Private Landowners

Local businesses are destinations of interest the trail would provide access to. Private landowners would have additional multimodal transportation options that would be beneficial for the health and well-being of the public.

Developers

Where development occurs along a planned greenway, the city ordinance requires the developer to construct the greenway in a public easement. Developers are also required to include sidewalks at the frontage of the development.

7.4 // Funding Resources

The North Carolina General Assembly’s 2023-2025 budget allocated \$54.9 million to advance trail and greenway infrastructure in North Carolina. Below are several funding sources that could potentially be leveraged to provide the necessary dollars to plan, design, and/or construct bicycle, pedestrian, and greenway facilities. The following sources of funding have been instrumental in the successful development of bicycle and pedestrian networks in North Carolina communities. Funding sources are broken down into the following levels: federal, state, and local.

Strategic Transportation Investments

The STI law passed in 2013 with the intent to equip NCDOT to use funding efficiently and effectively to enhance infrastructure while advancing economic growth, job creation and a higher quality of life. STI law establishes the Strategic Mobility Formula (see table below), which allocates available funding based on data-driven scoring and local input. This Mobility Formula is used to develop the STIP. Area-specific weights are allowed; however, it requires the MPO, RPO and the NCDOT divisions within the region in question to unanimously agree on the area-specific weights. Stand alone bicycle and pedestrian projects can be funded within the STIP if they are scored high enough against other projects within the MPO and then as compared to other projects in the State. There is no guarantee of timing for a desired project to be included in a particular STIP year.

Table 7

Funding Category	Revenue Distribution	Description
Division Needs	30%	Revenue in this category is shared equally over NCDOT's 14 transportation divisions. Project scores are based 50 percent on data and 50 percent on rankings by local planning organizations and the NCDOT transportation divisions.

Funding Category	Revenue Distribution	Description
Regional Impact	30%	Projects on this level compete within regions made up of two NCDOT transportation divisions, with funding based on population. Data makes up 70 percent of the project scores in this category. Local rankings account for the remaining 30 percent.
Statewide Mobility	40%	Projects in this category are based 100 percent on data.

Federal Law requires a STIP at least every four years, and NCDOT updates the STIP every two years to ensure it accurately reflects the department’s current financial status. The 2024-2033 STIP is composed of 2,362 projects, 381 of which are for bicycle/pedestrian projects. It takes two years to develop the STIP program, and this effort is comprised of three steps: Strategic Prioritization, Programming and Scheduling, Draft STIP review and approval. The Strategic Prioritization phase is when NCDOT receives potential improvement projects to be scored and ranked at the statewide, regional and division levels based on approved criteria such as safety, congestion, benefit-cost and local priorities. These scores and other factors are used to determine whether a project receives funding.

Annually, the NCDOT IMD provides state funds to assist in meeting these match requirements. The amount available for state match is limited to the amount appropriated by the General Assembly. NCDOT can provide the 20% local match.

Locally Administered Projects Program

The LAPP is used by the GCLMPO to prioritize and program local transportation projects in the region that utilize federal funding such as CMAQ and TAP. These projects are funded using federal funding sources directly attributed to the region with a minimum 20% local match.

Federal Grants

Federal grants typically include a funding percentage and a local match

percentage, with most programs using an 80/20 (federal/local) split. The following federal grants may be applicable to the development of the paved trail network between Crowders Mountain State Park and Gastonia.

Transportation Alternatives Program

TAP is a program funded through the Federal Highway Trust Fund aimed at funding transportation-related alternatives, which can include trails, pedestrian and bicycle facilities, historic preservation, and other community enhancement projects.

Congestion, Mitigation, and Air Quality (CMAQ)

Congestion, Mitigation, and Air Quality (CMAQ) funding is a program that provides federal funding to projects that improve air quality, reduce emissions, and alleviate congestion by reducing vehicular traffic. The federal funding is provided to states for projects that adhere to the Clean Air Act and National Ambient Air Quality standards. On a statewide level, NCDOT administers the funds to NCDOT-driven projects.

Recreational Trails Program Grant

The RTP is a \$1.5-million federal grant program designed to help states provide and maintain recreational trails for both motorized and non-motorized recreational trail use such as trail/greenway renovation, land acquisition for trail purposes, building a new trail or greenway, and planning, legal, environmental, and permitting costs. Administered by the U.S. Department of Transportation’s FHWA, the intent of the RTP is to help fund trails and trail-related recreational needs at the State level.

Carbon Reduction Program

The CRP was established through the BIL, also known as the Infrastructure Investment and Jobs Act of 2021. The program is administered through the FHWA and provides \$6.4 billion in formula funding over a five-year period. This program provides funds for projects that reduce carbon dioxide (CO2) emissions from the transportation sector. According to the 2005-2018 North Carolina GHG Inventory, the transportation sector accounts for 35.9% of the greenhouse gas emissions. Sixty five percent of the state’s CRP funds are obligated to projects based on population size, while thirty five percent can be obligated on projects anywhere in the state. CRP funds may be obligated for projects that support the reduction of transportation emissions, including, but not limited to– [except as noted, § 11403;

23 U.S.C. 175(c)(1)]

- a project described in 23 U.S.C. 149(b)(4) to establish or operate a traffic monitoring, management, and control facility or program, including advanced truck stop electrification systems;
- a public transportation project eligible under 23 U.S.C. 142;
- a transportation alternative (as defined under the Moving Ahead for Progress under the 21st Century Act [23 U.S.C. 101(a)(29), as in effect on July 5, 2012]), including, but not limited to, the construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other nonmotorized forms of transportation.

Funding match: projects require a 20% non-federal match. The estimated annual CRP funding for FY2024 is \$1.283B, FY2025 - \$1.309B, and FY2026 - \$1.335B.

Link: <https://www.transportation.gov/priorities/climate-and-sustainability/carbon-reduction-program>

Land and Water Conservation Fund

The LWCF is a funding source of the U.S. Department of the Interior for outdoor recreation development and land acquisition by local governments and state agencies. In North Carolina, the program is administered by the Department of Natural and Cultural Resources. The LWCF provides up to dollar-for-dollar matching grants to local governments for acquisition, development, or a combination of both. Local governments may also apply for funding to renovate existing LWCF parks.

The Outdoor Recreation Legacy Partnership

The ORLP Program is a subset of the federal LWCF's "state-side" grants. The purpose of the program is to provide grants to counties and municipalities with a population of 30,000 or greater to acquire and/or develop public lands for outdoor recreation purposes consistent with the purposes of LWCF. Eligible activities include acquisition of lands and waters or interests in lands and water for public outdoor recreation or development of basic outdoor recreation facilities to serve the general public.

Accessibility for Parks Grants

The AFP program provides \$10 million for parks and recreation grants to benefit children and veterans with disabilities in North Carolina. Local governments, including some public authorities, are eligible to apply for the matching grants.

The program is administered through the N.C. Division of Parks and Recreation and the North Carolina PARTF.

Surface Transportation Block Grant (Direct Allocation) [STBG-DA]

The Surface Transportation Block Grant program provides flexibility funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminal. STBG requires that planning projects be identified in the STIP and be consistent with the Long-Range Statewide Transportation Plan and MTP. STBG projects eligible planning purposes must be reflected in the statewide work program or Metropolitan UPWP. Under the STBG program, there is STBG-DA and STBG-SA.

- STBG-DA provides flexible funding that may be used for projects to preserve and improve the conditions and performance on any Federal-aid highway; bridge and tunnel projects on any public road; pedestrian and bicycle infrastructure; and transit capital projects, including intercity bus terminals.
- STBG-SA provides funding for a variety of projects such as pedestrian and bicycle facilities; construction of turnouts; overlooks and viewing areas; community improvements such as historic preservation and vegetation management; environmental mitigation related to storm water and habitat connectivity; recreational trails; safe routes to school projects; and vulnerable road user safety assessments.

Under the STBG program, eligible activities include:

- Maintenance and restoration of existing recreational trails, pedestrian, and bicycle projects in accordance with 23 U.S.C. 217 as amended by the BIL including modifications to comply with accessibility requirements under the ADA), and the Safe Routes to School Program under 23 U.S.C. 208 as amended by the BIL.
- The addition or retrofitting of structure or other measures to eliminate or reduce crashes involving vehicles and wildlife.
- Projects to enhance travel and tourism

Federal Share: The federal share is 80%. For projects on the Interstate System, the federal share increases to 90%. The estimated annual STBG funding for

FY2024 is \$14.394B, FY2025 - \$14.682B, and FY2026 - \$14.976B.

Link: <https://www.fhwa.dot.gov/specialfunding/stp/>

State Grants

NC Division of Parks and Recreation Trust Fund PARTF Program

PARTF provides 1:1 matching grants to local governments for parks and recreational projects to serve the public. PARTF is the primary source of funding for building and renovating facilities and buying land for new and existing parks.

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

Great Trails State Program

The GTS Program funded \$25 million through a competitive grant program for new trail development and extension of existing trails, including paved trails, greenways, and natural surface trails for biking, hiking, walking, equestrian use, and paddling. The fund is administered by the NCDNCR. While there is no guarantee of future funding through this program, the program should be monitored for the addition of future funding cycles.

Link: <https://www.ncparks.gov/about-us/grants/great-trails-state-program>

Private and Non-profit Grants

Carolina Thread Trail Regional Trail Implementation Grant Program

CarolinaThread Trail periodically offers grant funding with the goal of helping communities plan and implement trail projects along the Carolina Thread Trail. In the past, project types eligible for Carolina Thread Trail funding have been trail construction, trail project design, land acquisition, detailed corridor planning, and canoe/kayak launch construction.

Link: <https://www.carolinathreadtrail.org/resources/grant-program-funding-sources/>

The Blue Cross Blue Shield Foundation

The BCBSF supports initiatives that promote health and wellness, including outdoor activities like trail building. Their grant programs are designed to improve community health, and they recognize that access to outdoor spaces encourages physical activity, which in turn leads to better overall health outcomes. The foundation often supports local projects that aim to improve public health

infrastructure. This includes grants to community organizations, municipalities, or nonprofits involved in building or maintaining walking, hiking, or biking trails.

Link: <https://www.bcbsncfoundation.org/overview-and-opportunities/>

Z. Smith Reynolds Foundation

The ZSR, based in North Carolina, provides grants that aim to improve the quality of life for residents through various community-based initiatives. ZSR grant programs support projects that align with environmental sustainability, community development, and health promotion, which can include trail building initiatives. The Foundation supports local, regional and/or statewide efforts that: prevent and mitigate the impacts of climate change; ensure healthy air and water quality and water quantity; promote access to the green economy; address the impact of environmental hazards on human health; and protect significant ecosystems while meeting the growth demands of the state in environmentally sound ways.

Link: <https://www.zsr.org/grants-programs>

Bank of America Charitable Foundation

The BoA Charitable Foundation issues grant opportunities in line with core values of health, removing barriers to employment, affordable housing, and neighborhood revitalization, including the creation or restoration of open space and parks.

Link: <https://about.bankofamerica.com/en/making-an-impact/charitable-foundation-fundings>

Local Funding

The City of Gastonia could designate local funding resources such as bonds, taxes, and funding from the capital improvement program to assist in funding this project and meet local matching fund requirements.

- CATAWBA -
LANDS CONSERVANCY

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CAROLINA
THREAD TRAIL



Integrated Mobility Division
N.C. DEPARTMENT OF TRANSPORTATION

Section 8 // Safety and Maintenance

Crowders Mountain Paved Trail Feasibility Study

8.1 // Overview

Maintaining greenways is essential to ensuring their long-term viability within the network. Regular upkeep reduces overall costs over time and enhances safety, offering a more enjoyable trail experience compared to greenways that have suffered from neglect and require extensive rehabilitation. Proactive maintenance practices also help extend the lifespan of greenways, promote positive interactions with adjacent landowners, and encourage community involvement in their preservation.

This plan outlines a comprehensive strategy for greenway maintenance, including the creation of a structured maintenance plan to allocate funding and responsibilities effectively across different jurisdictions. The plan should be reviewed and updated annually to integrate new insights and adapt to changing policies, standards, and maintenance priorities.

8.2 // Operations & Management Agreements

The City of Gastonia will be responsible for maintaining trail segments located within its municipal boundaries. For areas outside the city limits, the designated maintenance lead(s) have yet to be determined. These responsibilities may fall to one or more state agencies, but a decision should be made soon, as clearly defined maintenance roles are often a requirement for securing grant funding.

O&M Strategies and Actions

The goal of an O&M plan is to ensure the trail remains clean, safe, accessible, and enjoyable for users. These plans outline the specific tasks, policies, and programs that will be carried out by designated partners to operate and maintain the trail system. O&M encompasses both daily upkeep and long-term repairs, and begins with thoughtful design, durable construction, and a comprehensive management framework. Ongoing involvement from community members, local businesses, developers, and other stakeholders is essential to the trail's long-term success.

Routine Maintenance: This includes the day-to-day upkeep necessary to keep trails clean, safe, and functional. Tasks typically involve sweeping, removing trash and debris, replacing signs, controlling weeds, trimming trees and shrubs, and clearing snow or ice. It also covers small-scale repairs like patching cracks, filling potholes, or fixing damaged benches and other furnishings.

Remedial Maintenance: This type of maintenance addresses more serious issues, such as repairing or replacing major trail components that have been significantly damaged or worn out over time. Some tasks, like repainting, resealing asphalt, or updating signage, may be scheduled every 5 to 10 years. Larger projects—such as repaving long trail sections, rebuilding after a flood, stabilizing eroded slopes, or replacing bridges—are less frequent and should be included in long-term capital improvement plans.

Seasonal Maintenance: These are tasks performed as needed based on seasonal conditions. Crews should promptly remove fallen leaves, sediment from flooding, snow, and ice to ensure trail safety. Wet leaves, in particular, can be hazardous, so high-use areas should receive extra attention during the fall and winter months.

Life Cycle of Built Facilities

Trail infrastructure has a limited lifespan, which depends on environmental conditions, usage, and maintenance. The infrastructure's durability depends on factors such as environmental conditions, frequency of use, and the level of maintenance they receive. The chart below outlines the typical expected lifespan for key components of a trail system:

Infrastructure Component	Life Cycle
Asphalt Trail	10-20 years
Concrete Trail	25-35 years
Gravel Trails	5-10 years
Wood Bark Trails	2-3 years
Wood Boardwalk Trails	7-10 years
Steel Bicycle and Pedestrian Bridge	15-20 years
Asphalt Parking Lot	10-12 years
Crosswalks	3-5 years
Greenway Signage	7-10 years
Park Bench	7-10 years
Trash Receptacles	7-10 years
Wood Bollards	5-7 years
Metal Bollards	15-20 years

Adopt-a-Trail

Adopt-a-Trail initiatives help preserve the environmental and visual quality of trails by encouraging community involvement and fostering a sense of ownership. Through this program, individuals, businesses, trail users, and local organizations can actively contribute to the care and upkeep of trail areas. Volunteers collaborate with local agency staff on a variety of maintenance tasks, such as:

- Removing exotic invasive plants
- Sweeping paved trails
- Planting flowers and other vegetation
- Reporting safety concerns, illegal dumping, injured or dead wildlife, storm damage, and other issues
- Spreading mulch or gravel
- Picking up litter
- Raking leaves
- Removing graffiti or refreshing murals

Trail Ambassador Programs

Trail Ambassadors serve a distinct role from Adopt-a-Trail volunteers. Rather than focusing on maintenance, Ambassadors act as friendly, informed trail stewards—providing a visible presence to enhance safety, assist users, and encourage responsible trail use. They often patrol in pairs and wear identifiable clothing to signal their role.

These volunteers are typically assigned to cover the entire trail corridor and may be equipped with communication devices. In some communities, Ambassadors are even formally recognized or deputized. They are trained in first aid, possess detailed knowledge of the trail system and nearby amenities, and are well-versed in the area's natural and cultural features.

Like other volunteer programs, Trail Ambassadors undergo orientation and training, commit to scheduled shifts, and may be required to sign liability waivers. Many use bicycles to efficiently cover longer trail segments during their service.

Crime Prevention Through Environmental Design

Across the U.S., many trail managers apply crime prevention through environmental design principles when planning, building, and maintaining trails. According to the National Crime Prevention Institute, applying crime prevention

through environmental design involves designing and using the built environment in ways that can reduce both crime and the fear of crime, while also enhancing quality of life.

The core idea behind crime prevention through environmental design is that safety can be built into a community from the beginning. By involving law enforcement, architects, urban planners, landscape designers, and community members, environments can be shaped to encourage safe behavior and discourage criminal activity. For trails, this means regular users should feel secure, while potential offenders should see the area as too risky for illegal activity.

Crime prevention through environmental design works by influencing the decisions people make before committing a crime. Its strategies are grounded in three main principles:

- Natural Surveillance – Designing spaces to increase visibility and the likelihood of being seen.
- Natural Access Control – Guiding movement and limiting access to reduce opportunities for crime.
- Territorial Reinforcement – Using physical design to express ownership and encourage community responsibility.

Natural Surveillance

Natural surveillance enhances the likelihood of detecting suspicious activity by increasing visibility along trails and public spaces. This is achieved by strategically arranging physical elements, activities, and people to ensure clear sightlines and encourage positive interactions among legitimate users. The goal is to make potential offenders feel observed and limit their escape options. Key design strategies include:

- Leverage nearby roads and passing vehicles as informal observers.
- Design landscaping to maintain visibility, especially near main and potential entry points.
- Use low, see-through fencing that minimizes visual obstruction while still serving its purpose.
- Plan lighting carefully to eliminate blind spots and ensure critical areas—such as walkways, stairs, entrances, parking lots, playgrounds, recreational zones,

storage, and waste areas—are well-lit. Avoid overly bright lights that cause glare or deep shadows, which can impair visibility. Lower-intensity lighting may be more effective when used with multiple fixtures.

- Install lighting at appropriate heights along pedestrian paths to illuminate faces, aiding in recognition and deterrence.
- Supplement natural surveillance with technological and organizational tools like CCTV cameras to enhance monitoring capabilities.

Surveillance increases the threat of apprehension by taking steps to increase the perception that people can be seen while using a trail. Natural surveillance occurs by designing the placement of physical features, activities, and people in such a way as to maximize visibility and foster positive social interaction among legitimate users of public space. Potential offenders feel increased scrutiny and limitations on their escape routes. Natural surveillance design features include:

- Use adjacent roadways and the passing vehicular traffic as a surveillance asset.
- Create landscape designs that provide surveillance, especially in proximity to designated points of entry and opportunistic points of entry.
- Use the shortest, least sight-limiting fence appropriate for the situation.
- When creating lighting design, avoid poorly placed lights that create blind-spots for potential observers and miss critical areas. Potential problem areas should be well-lit: pathways, stairs, entrances/exits, parking areas, children's play areas, recreation areas, storage areas, and dumpster and recycling areas.

Natural Access Control

Natural access control helps reduce crime by clearly distinguishing between public and private areas. This is achieved through strategic design elements like the placement of entrances and exits, fencing, lighting, and landscaping to guide movement and restrict access.

- Designate a single, easily recognizable entry point.
- Plant low, thorny shrubs to deter entry into restricted zones.
- Use waist-high, picket-style fences to manage access and promote visibility.
- These natural methods work alongside mechanical systems and operational procedures to enhance overall security.

Natural Territorial Reinforcement

Natural territorial reinforcement is a design strategy that enhances safety and encourages positive social behavior by clearly defining space and fostering a sense of ownership. When environments are intentionally structured to distinguish between public, semi-public, and private areas, they signal that the space is cared for and monitored—making it less inviting to unwanted activity. This strategy strengthens safety by encouraging people to take psychological ownership of the spaces they use. When boundaries between public and private areas are clearly marked, individuals are more likely to feel responsible for those spaces and take action to maintain them. At the same time, these defined spaces make it easier to recognize when someone doesn't belong, helping to deter unwanted behavior through increased visibility and social awareness. Territorial cues can be established through thoughtful use of buildings, fences, pavement, signage, lighting, and landscaping. These elements communicate boundaries and convey that a space is actively used and maintained. Assigning specific users or groups to previously unclaimed areas can also reinforce this sense of control and stewardship.

To support natural territorial reinforcement, the following strategies are recommended:

- Maintain properties and landscaping to reflect active use and care, signaling that the space is regularly observed.
- Incorporate trees and greenery in residential areas. Contrary to some traditional assumptions, research shows that tree-lined spaces are perceived as safer, more attractive, and more likely to be used.
- Restrict private activities to clearly defined private zones to avoid confusion and reinforce spatial boundaries.
- Display security signage at access points to deter unauthorized access and reinforce the perception of surveillance.
- Avoid institutional fencing such as cyclone or razor-wire, which can suggest neglect and reduce the perceived presence of caretakers.
- Host regular events or activities in shared spaces encourages consistent, positive use, draws more people into the area, and reinforces the perception that the space is cared for and actively observed.

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Section 9 // Next Steps

Crowders Mountain Paved Trail Feasibility Study

Section 9.1 // Moving Forward



INITIAL ACTION

Step 1

Approve Trail Study

To enhance its competitiveness for grant opportunities, the City of Gastonia should formally adopt the trail study. Following adoption, city leaders should identify key partners who can play a vital role in advancing the project and offering technical support. These partners should be invited to participate in any upcoming partnership meetings pertaining to the proposed trail.

At a minimum, the partnership should include representatives from the City of Gastonia, NCDOT, the Catawba Lands Conservancy/ Carolina Thread Trail, and the NCDNCR. One of these local partners should ideally take the lead in organizing and facilitating these meetings.

EARLY ACTIONS

Step 2

Complete Required Environmental Study

An environmental study is necessary to accurately identify and confirm environmental constraints on the ground. A private environmental consultant would carry out this study, and the results would be submitted to NCDOT Division 12 for review. Funding for this study would need to be secured by the project partners.

Step 3

Develop a 10%

Schematic Design and Cost Estimate, Get Public Input

A 10% Planning and Engineering Construction Document set is recommended for both Phase 1 and Phase 2, including updated cost estimates. This preliminary set typically outlines the trail alignment, limits of disturbance, environmental constraints, and proposed amenities.

Once these plans are ready for release, it is important to keep the public informed about the project's progress. Community engagement should focus on key design considerations such as buffer widths, visibility of nearby homes, and the use of design strategies to reduce environmental impacts, particularly those related to wetlands and stormwater management.

Step 4

Continued Public Engagement, Take the Revised 10% Design Back to the Public

Once the plans are compiled, make them accessible to the public—either by publishing them online or hosting a final open house to share information. To build on the momentum of previous engagement efforts, consider the following steps:

Expand Partnerships:

Continue strengthening relationships with existing supporters and invite new partners to join the effort. This includes user groups, local boards, advisory committees, and other community organizations.

Promote the Trail Through Marketing and Media:

Share positive stories about the trail's benefits for the region. Collaborate with local media and use social media platforms to spread awareness and keep the community informed.

Engage the Public and Adjacent Landowners:

Maintain a visible presence at community events to keep the public informed. Proactively reach out to neighboring landowners to listen to their concerns and provide accurate, timely updates to prevent misinformation.

Receive Support from Public Officials:

Encourage supportive elected officials to act as ambassadors for the project, helping to educate and influence their peers.

Additional public engagement can occur after the environmental study and 10% design are complete.

TRAIL DEVELOPMENT ACTIONS

Step 5

Determine the Project Manager and Management Partners

Before applying for any grants, it is important to designate a project manager to oversee the final design and construction phases. At the same time, the City should confirm which partners will be responsible for long-term management and maintenance. While NCDOT may assist with project management, the City of Gastonia is expected to maintain trail segments within its jurisdiction.

The broader partnership should convene with all relevant stakeholders to determine who is willing to manage specific sections of the trail corridor. These responsibilities will eventually need to be formalized through a Memorandum of Understanding (MOU), as outlined in Step 8.

Step 6 Pursue a Local Funding Match

Most grant programs require a matching contribution of 20–30%. To meet this requirement, the City of Gastonia and its partners should explore a variety of funding sources. These may include community fundraising efforts, support from private foundations, allocations from the City’s general fund, or working with state legislators to secure appropriations through the state budget. Achieving this match will require a coordinated and sustained effort among all involved partners.

Step 7 Apply for Grants for Phase Complete Design and Engineering and Construction or Pursue Full Design in the Interim While Waiting for Grant Awards

To advance this phase of the project, the City should pursue larger-scale grants that cover the full scope of work, including surveying, 100% design, ROW acquisition (or lease coordination with relevant agencies), permitting, and construction.

Before applying for these grants, it is essential to complete Steps 7 and 8, which involve confirming project management roles and formalizing maintenance responsibilities. This phase includes developing a survey, securing all necessary permits, and preparing Plans, Specifications, and Estimates (PS&E) for construction. Required permits may include those related to environmental impacts, site access, construction activities (e.g., grading, erosion control, fill use), and accessibility.

A design development consultant should be contracted to complete the Phase 1 PS&E, ensuring the plans meet the standards required for construction funding. For example, if federal transportation funds are used, the PS&E must comply with USDOT, FHWA, and NCDOT design requirements. These documents will need to be reviewed and approved by local, state, and federal agencies.

A separate workflow should be established for completing PS&E for each project phase. Once design is finalized, a refined cost estimate should be developed.

Section 7 of this report outlines potential funding sources from federal, state, local, and private entities. While some federal grants may cover both design and construction, projects are more likely to be funded if they demonstrate design readiness, some level of environmental review, and a high degree of preparedness. Keep in mind that federal funding can take 6 to 12 months to be contracted.

Step 8 Complete an Operations and Management Plan with a Maintenance Budget, and MOU Between Partners

Operations and maintenance are often overlooked due to the complexities involved in trail acquisition, funding, and construction. However, it is strongly recommended that the partnership outlined in Step 1 begin addressing these responsibilities in 2025. Effective operations, maintenance, and management are essential to the long-term success of every trail segment. Trails are vital public assets and part of the community’s green infrastructure. There is sometimes a misconception that trails require minimal upkeep or can be managed informally, this is not the case. Trails demand regular attention—daily, weekly, and monthly—as well as a structured maintenance plan to ensure they function as intended. Within its jurisdiction, the City of Gastonia is expected to serve as the primary managing entity. For areas outside city limits, state agencies will likely take the lead—such as NCDNCR for portions within Crowders Mountain State Park and NCDOT for segments located within state ROW.

Step 9 Bid, Award, and Construction of Phase

Once design and funding are secured, the next step is to solicit and award a construction contract for each project phase. Typically, a consultant will prepare the bid package. The sponsoring agency, depending on the funding source, will manage the bidding process and oversee the contract award. This process can take three to eight months, depending on the agency’s review and approval timeline. After the contract is awarded, the selected construction contractor will be assigned a specific number of working or calendar days to complete the trail. Construction times will vary given the constraints and distances each trail segment poses.

If the project is funded through federal sources, all federal procedures, requirements, and timelines must be followed, which can extend the overall schedule.

ONGOING OPERATIONS

Step 10

Host a Groundbreaking Ceremony

For each project phase, partners should collaborate to organize a groundbreaking ceremony. These events are an opportunity to recognize and celebrate the contributions of everyone involved in making that phase a success. Be sure to invite all key stakeholders, including elected officials, especially those who may be less familiar with or supportive of the trail segments in their area, this can help build broader support for future phases.

Ceremonies can vary in scale, but it is important to invite local media, arrange for interviews with key participants, and document the event through photos or video. These efforts help raise public awareness and reinforce the value of the project within the community.

Step 11

Hold a Ribbon Cutting Ceremony

After construction is complete, host a ribbon-cutting ceremony to officially open the new trail segment. Invite all key partners and contributors to celebrate the milestone and take the opportunity to recognize those responsible for on-going operations and maintenance. Including a community walk or bike ride can help engage the public and build excitement. Be sure to invite local media, arrange interviews with stakeholders, and document the event to promote continued support for the trail.

Step 12

Implement Trail Programming and Events to Celebrate and Activate the Trail

The trail will serve as an exceptional setting for community programming and events, some of which could generate revenue to help offset operations, maintenance, and management costs. In addition to recreational use, the trail can serve as an outdoor classroom, providing opportunities for people of all ages to explore local history, experience natural environments, and engage with cultural landmarks that reflect the heritage of the region.

Trail user counts and surveys are examples of methods to evaluate trail performance.

Just as cities invest in streets and parks, trails require thoughtful management and upkeep to serve the public well and foster community pride.

Step 13

Evaluate the Performance of the Trail

The partnership should collaboratively assess how the trail is being used and how well it's performing. For instance, if transportation funding supported the project, the evaluation should consider how effectively the trail segment offers an alternative to car travel for specific trips. If the segment was designed with a focus on environmental education, the review should examine how well it meets the educational needs of school groups. These evaluations can begin within the first year after the trail is officially opened to the public.

Action Plan

Steps/Actions	Organization(s)	Resources Needed	Time Frame
INITIAL ACTION			
1. APPROVE STUDY			
Jurisdictions present to regulating board for approval	<ul style="list-style-type: none"> City of Gastonia Carolina Thread Trail 	Staff needed to present to regulating board	Summer 2025
EARLY ACTIONS			
2. COMPLETE THE REQUIRED ENVIRONMENTAL STUDY (ALL PHASES)			
Environmental Baseline Survey, ground-truthing, and delineation of wetlands.	Private consultant to perform study and submit to NCDOT Division 12	<ul style="list-style-type: none"> Staff time May need consultant for 10% design, cost estimates, and further public engagement efforts 	On-going
3. 10% SCHEMATIC DESIGN, COST ESTIMATE, PUBLIC INPUT (ALL PHASES)			
Refined alignments include refined cost estimates, limits of disturbance, environmental constraints, and amenities.	City of Gastonia to lead City portions, partner lead TBD on non-City portion	<ul style="list-style-type: none"> Staff time May need consultant for 10% design, cost estimates, and further public engagement efforts 	On-going
4. CONTINUED PUBLIC ENGAGEMENT			
Continue to build partners, marketing and communications of the trail, public and landowner engagement	City of Gastonia to lead GCLMPO to assist	<ul style="list-style-type: none"> Staff time Communication experts within organization 	On-going
<p><i>A NOTE ABOUT REMAINING PHASES ACTIONS AND TIMELINE</i> <i>Steps 5 through 13 will be repeated for all the remaining phases. The City of Gastonia will lead much of the development of the trail; however, collaboration with partners will be needed.</i></p>			
TRAIL DEVELOPMENT ACTIONS (REPEAT FOR REMAINING PHASES)			
5. DETERMINE PROJECT MANAGER & PARTNERS FOR PHASE			
Partners meet to designate a project manager to oversee final design and construction and confirm maintenance roles.	Gastonia to lead their section of trail, coordinate with NCDOT	Staff time	On-going; beginning now, in place by Phase 1 construction

Steps/Actions	Organization(s)	Resources Needed	Time Frame
6. PURSUE A LOCAL FUNDING MATCH			
Secure local match through sources such as private donations or general fund.	City of Gastonia to work with GCLMPO and NCDOT; Carolina Thread Trail may also be able to assist	Construction funding	On-going; beginning now, remaining phases would occur within 3-5+ years from now
7. APPLY FOR FUNDING FOR PHASE			
Pursue federal, state, and local grant funding for trail construction.	City of Gastonia to lead and identify lead for non-City segment potentially working with consultant	Staff time (or consultant) for grant writing	Secure within 2026-2029, if possible, remaining phases would occur 3-5+ years from now
8. COMPLETE OPERATIONS AND MAINTENANCE PLAN, AND MOU BETWEEN PARTNERS			
All partners should participate in completion of an operations & maintenance plan including a MOU between partners.	All partners to coordinate	Staff time	Complete by time construction begins (completion of step 11)
9. BID, AWARD, AND CONSTRUCT PHASE			
Bid, award, and construct.	City of Gastonia to coordinate on portion within city limits, lead for outside city limits TBD.	Staff time and funding in place to complete construction.	TBD
ONGOING OPERATIONS			
10. & 11. GROUNDBREAKING & RIBBON-CUTTING CEREMONIES			
Groundbreaking ceremony	City of Gastonia to coordinate with all participating partners	Staff time	TBD
12. & 13. PROGRAMMING AND PERFORMANCE EVALUATION			
Program the trail and evaluate performance	City of Gastonia and NCDNCR to determine what kind of programming and evaluations may occur on their sections	<ul style="list-style-type: none"> Staff time Funding for programming 	TBD

Organizational Framework for Implementation

LEAD AGENCY: CITY OF GASTONIA/CAROLINA THREAD TRAIL*

- Lead coordination with partners on the trail development process.
- Continue public outreach, engagement, and communication for the project.
- Pursue trail funding opportunities, including ways to leverage funds across federal, state, local, private, and non-profit sources.

*GASTONIA LEADS SECTION IN MUNICIPAL BOUNDARY - LEADERSHIP TBD FOR OUTSIDE CITY LIMITS

IMPLEMENTATION TEAM

- Made up of many of the partners listed below; Meet quarterly to advance plan implementation.
- Coordinate on environmental permitting, 10% and complete design.
- Seek funding for operations and implementation of Phase 1 trail.

BOARDS, COMMISSIONS, AND COMMITTEES

These groups could provide letters of support to local officials for project funding (to be used in grant applications) and by helping communicate the benefits of trails to the public (featured in Chapter 1). Example groups could include:

- Various advisory committees to Gastonia’s City Council
- Charlotte Regional Partnership
- Gaston County Parks & Recreation Advisory Board
- Gaston County Planning Board
- Gaston County Health & Human Services
- GCLMPO

KEY PROJECT PARTNERS

- GCLMPO & NCDOT IMD: Work with the City and their partners to help identify a funding strategy for trail ROW.
- NCDOT: Incorporate proposed trail alignments from this study in NCDOT projects, especially for trail-roadway crossings and trail connections within NCDOT rights-of-way. Explore a partnership with NCDOT Division 12 to possibly manage certain portions/phases of the trail.
- GTS Coalition: Add this trail corridor to the map and list of trail projects in North Carolina that are Investment Ready; consider advocating for this project in upcoming rounds of GTS Program grant funding.
- GTS Plan (NCDOT-IMD): Update the trail alignment in New Hanover County to reflect this study and identify this corridor as a priority in plan updates.
- GCLMPO: Coordinate with project partners on funding opportunities; incorporate and prioritize the trail alignment in this study within long range transportation plans.
- Carolina Thread Trail: Work with partners to find funding, advocate to elected officials, aid in grant writing, and provide technical assistance.
- NCDNCR: Provide feedback in future phases of design, coordination during construction, and support through the State Trails office.

PRIVATE PARTNERSHIPS

- Local businesses, economic development advocates, and tourism promoters should recognize the benefits of a complete trail corridor; help promote project funding; and capitalize on increased business as trail segments are complete.
- Consultants should provide guidance to project partners on project development, trail design, funding applications, and trail construction services.
- Major employers should recognize the quality-of-life benefits that trails bring; support the development of the trail through letters of support; and promote the trail as a means of talent recruitment and retention.

PEER COMMUNITIES

- The City should build relationships and learn from neighboring communities also working on trails, such as its neighbor, Gaston County. Participate in GTS Coalition meetings to stay on top of funding opportunities.

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Appendix

Crowders Mountain Paved Trail Feasibility Study

Project | Crowders Mountain Paved Trail Feasibility Study

Route: Segment A Phase: 6
 Description: Beginning at the Backside Trailhead, inside Crowder's Mountain State Park, side path alongside Lindwood Road
 Typical Section: 10-foot Roadside MUP with (1) 6-foot Shoulder

Conceptual

Client: **Carolina Thread Trail**

CONSTR. COST
\$2,100,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser Reviewed By: Laura Fisher

	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 60,607.50	\$ 60,607.50
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	2.7	Acre	\$ 45,000.00	\$ 121,500.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	Earthwork				
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	3,700	CY	\$ 25.00	\$ 92,500.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	Drainage				
8	Drainage Existing Location	0.85	Miles	\$ 150,000.00	\$ 127,500.00
	Pavement (Asphalt or Concrete)				
9	Fine Grading	6,050	SY	\$ 3.00	\$ 18,150.00
10	New Pavement	5,500	SY	\$ 85.00	\$ 467,500.00
	Erosion Control				
11		3.0	Acres	\$ 75,000.00	\$ 225,000.00
12	Miscellaneous (10% Strs & Util)				\$ -
13	Miscellaneous (40% Roadway)				\$ 485,000.00

Length: 0.85 Mile	Contract Cost	\$ 1,758,000.00
	E. & C. 16%	\$ 342,000.00
	Construction Cost	\$ 2,100,000.00

Note: This estimate does not contain Utility Relocation or Right of Way costs.

1. Cost estimates do not include funds for easement or ROW acquisition.
2. Cost estimates do not include utility relocation costs.
3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Project | Crowders Mountain Paved Trail Feasibility Study

Route: Segment B Phase: 2A & 2B
 Description: Creekside path from Crowders Mtn. Golf Club on Linwood Road, to Crowders Creek Residential Development
 Typical Section: 10-foot Roadside MUP with (1) 6-foot Shoulder

Conceptual

Client: **Carolina Thread Trail**

CONSTR. COST
\$4,600,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser Reviewed By: Laura Fisher

	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 134,169.50	\$ 134,169.50
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	6.5	Acre	\$ 45,000.00	\$ 292,500.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	Earthwork				
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	8,900	CY	\$ 25.00	\$ 222,500.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	Drainage				
8	Drainage Existing Location	2.06	Miles	\$ 150,000.00	\$ 309,000.00
	Pavement (Asphalt or Concrete)				
9	Fine Grading	14,630	SY	\$ 3.00	\$ 43,890.00
10	New Pavement	13,300	SY	\$ 85.00	\$ 1,130,500.00
11	Erosion Control	7.0	Acres	\$ 75,000.00	\$ 525,000.00
12	Miscellaneous (10% Strs & Util)				\$ -
13	Miscellaneous (40% Roadway)				\$ 1,073,000.00

Length: 2.06 Miles

Contract Cost	\$	3,891,000.00
E. & C. 16%	\$	709,000.00
Construction Cost	\$	4,600,000.00

Note: This estimate does not contain Utility Relocation or Right of Way costs.

1. Cost estimates do not include funds for easement or ROW acquisition.
2. Cost estimates do not include utility relocation costs.
3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

For A 35,922
For B 64,078

Project | Crowders Mountain Paved Trail Feasibility Study
 Route: Segment C Phase: 1
 Description: CC Developer Portion
 Typical Section: 10-foot Roadside MUP with (1) 6-foot Shoulder

Conceptual

Client: **Carolina Thread Trail**

CONSTR. COST
\$1,400,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser
 Reviewed By: Laura Fisher

	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 39,011.50	\$ 39,011.50
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	1.6	Acre	\$ 45,000.00	\$ 72,000.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	Earthwork				
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	2,100	CY	\$ 25.00	\$ 52,500.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	Drainage				
8	Drainage Existing Location	0.48	Miles	\$ 150,000.00	\$ 72,000.00
	Pavement (Asphalt or Concrete)				
9	Fine Grading	3,410	SY	\$ 3.00	\$ 10,230.00
10	New Pavement	3,100	SY	\$ 85.00	\$ 263,500.00
	Erosion Control				
11		2.0	Acres	\$ 75,000.00	\$ 150,000.00
12	Miscellaneous (10% Strs & Util)				\$ -
13	Miscellaneous (40% Roadway)				\$ 312,000.00

Length: 0.48 Mile

	Contract Cost	\$ 1,132,000.00
	E. & C. 16%	\$ 268,000.00
	Construction Cost	\$ 1,400,000.00

- Note: This estimate does not contain Utility Relocation or Right of Way costs.**
1. Cost estimates do not include funds for easement or ROW acquisition.
 2. Cost estimates do not include utility relocation costs.
 3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
 4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
 5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
 6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Project | Crowders Mountain Paved Trail Feasibility Study
 Route: Segment D Phase: 1
 Description: North Connector to Linwood Springs Park
 Typical Section: 10-foot Roadside MUP with (2) 4-foot Shoulders

Conceptual

Client: **Carolina Thread Trail**

CONSTR. COST
\$700,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser
 Reviewed By: Laura Fisher

	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 19,665.00	\$ 19,665.00
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	0.6	Acre	\$ 45,000.00	\$ 27,000.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	Earthwork				
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	700	CY	\$ 25.00	\$ 17,500.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	Drainage				
8	Drainage Existing Location	0.17	Miles	\$ 150,000.00	\$ 25,500.00
	Pavement (Asphalt or Concrete)				
9	Fine Grading	1,100	SY	\$ 3.00	\$ 3,300.00
10	New Pavement	1,000	SY	\$ 85.00	\$ 85,000.00
	Erosion Control				
11	Erosion Control	1.0	Acres	\$ 75,000.00	\$ 75,000.00
12	Miscellaneous (10% Strs & Util)				\$ -
13	Miscellaneous (40% Roadway)				\$ 157,000.00

Length: 0.17 Mile

Contract Cost	\$	571,000.00
E. & C. 16%	\$	129,000.00
Construction Cost	\$	700,000.00

- Note: This estimate does not contain Utility Relocation or Right of Way costs.**
1. Cost estimates do not include funds for easement or ROW acquisition.
 2. Cost estimates do not include utility relocation costs.
 3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
 4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
 5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
 6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Project | Crowders Mountain Paved Trail Feasibility Study

Route: Segment F Phase: 1
 Description: South Connector to Parklin Development
 Typical Section: 10-foot trail with (2) 4-foot Shoulders

Conceptual

Client: **Carolina Thread Trail**

CONSTR. COST
\$500,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser Reviewed By: Laura Fisher

	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 11,978.50	\$ 11,978.50
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	0.2	Acre	\$ 45,000.00	\$ 9,000.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	Earthwork				
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	300	CY	\$ 25.00	\$ 7,500.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	Drainage				
8	Drainage Existing Location	0.06	Miles	\$ 150,000.00	\$ 9,000.00
	Pavement (Asphalt or Concrete)				
9	Fine Grading	440	SY	\$ 3.00	\$ 1,320.00
10	New Pavement	400	SY	\$ 85.00	\$ 34,000.00
	Erosion Control				
11		0.3	Acres	\$ 75,000.00	\$ 18,750.00
12	Miscellaneous (10% Strs & Util)				\$ -
13	Miscellaneous (40% Roadway)				\$ 96,000.00

Length: 0.06 Mile

Contract Cost	\$	348,000.00
E. & C. 16%	\$	152,000.00
Construction Cost	\$	500,000.00

Note: This estimate does not contain Utility Relocation or Right of Way costs.

1. Cost estimates do not include funds for easement or ROW acquisition.
2. Cost estimates do not include utility relocation costs.
3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Project | Crowders Mountain Paved Trail Feasibility Study
 Route: Segment G Phase: 1
 Description: Parklin Developer Portion
 Typical Section: 6-foot Sidewalk with (1) 3-foot Shoulder

Conceptual

Client: **Carolina Thread Trail**

CONSTR. COST
\$700,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser Reviewed By: Laura Fisher

#	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 17,935.00	\$ 17,935.00
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	0.4	Acre	\$ 45,000.00	\$ 18,000.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	<u>Earthwork</u>				
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	1,000	CY	\$ 25.00	\$ 25,000.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	<u>Drainage</u>				
8	Drainage Existing Location	0.25	Miles	\$ 150,000.00	\$ 37,500.00
	<u>Pavement (Asphalt or Concrete)</u>				
9	Fine Grading	0	SY	\$ 3.00	\$ -
10	New Pavement	0	SY	\$ 85.00	\$ -
11	6" Concrete Sidewalk (originally 4", likely need to change price here)	1,470	SY	\$ 60.00	\$ 88,200.00
	<u>Erosion Control</u>				
12		0.4	Acres	\$ 75,000.00	\$ 30,000.00
13	Miscellaneous (10% Strs & Util)				\$ -
14	Miscellaneous (40% Roadway)				\$ 143,000.00

Length: 0.25 Mile

Contract Cost	\$	521,000.00
E. & C. 16%	\$	179,000.00
Construction Cost	\$	700,000.00

Note: This estimate does not contain Utility Relocation or Right of Way costs.

1. Cost estimates do not include funds for easement or ROW acquisition.
2. Cost estimates do not include utility relocation costs.
3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Project | Crowders Mountain Paved Trail Feasibility Study
 Route: Segment H Phase: 3
 Description: Parklin to Learning Place
 Typical Section: 10-foot trail with (2) 4-foot shoulders

Conceptual

Client: Carolina Thread Trail

CONSTR. COST
\$900,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser Reviewed By: Laura Fisher

	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 24,880.50	\$ 24,880.50
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	0.9	Acre	\$ 45,000.00	\$ 40,500.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	<u>Earthwork</u>				
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	1,200	CY	\$ 25.00	\$ 30,000.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	<u>Drainage</u>				
8	Drainage Existing Location	0.28	Miles	\$ 150,000.00	\$ 42,000.00
	<u>Pavement (Asphalt or Concrete)</u>				
9	Fine Grading	1,870	SY	\$ 3.00	\$ 5,610.00
10	New Pavement	1,700	SY	\$ 85.00	\$ 144,500.00
11	<u>Erosion Control</u>	1.0	Acres	\$ 75,000.00	\$ 75,000.00
12	Miscellaneous (10% Strs & Util)				\$ -
13	Miscellaneous (40% Roadway)				\$ 199,000.00

Length: 0.28 Mile

Contract Cost	\$	722,000.00
E. & C. 16%	\$	178,000.00
Construction Cost	\$	900,000.00

Note: This estimate does not contain Utility Relocation or Right of Way costs.

1. Cost estimates do not include funds for easement or ROW acquisition.
2. Cost estimates do not include utility relocation costs.
3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Project | Crowders Mountain Paved Trail Feasibility Study
 Route: Segment I
 Description: Learning Place to Blackwood Creek
 Typical Section: 6-foot Sidewalk with (1) 3-foot Shoulder

Phase: 3

Conceptual

Client: Carolina Thread Trail

CONSTR. COST
 \$1,500,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser

Reviewed By: Laura Fisher

	Description	Quantity	Unit	Price	Amount
	Mobilization				
1	Construction Surveying	1	LS	\$ 42,404.00	\$ 42,404.00
		1	LS	\$ 150,000.00	\$ 150,000.00
2	Clearing and Grubbing	1.5	Acre	\$ 45,000.00	\$ 67,500.00
3	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	Earthwork				
4	Unclassified Excavation	0	CY	\$ 17.00	\$ -
5	Borrow Excavation	2,500	CY	\$ 25.00	\$ 62,500.00
6	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	Drainage				
7	Drainage Existing Location	0.75	Miles	\$ 150,000.00	\$ 112,500.00
	Pavement (Asphalt or Concrete)				
8	Fine Grading	2,860	SY	\$ 3.00	\$ 8,580.00
9	New Pavement	2,600	SY	\$ 85.00	\$ 221,000.00
10	6" Concrete Sidewalk	1,100	SY	\$ 60.00	\$ 66,000.00
	Erosion Control				
11		2.0	Acres	\$ 75,000.00	\$ 150,000.00
12	Miscellaneous (10% Strs & Util)				\$ -
13	Miscellaneous (40% Roadway)				\$ 339,000.00

Length: 0.75 Mile

Contract Cost	\$	1,230,000.00
E. & C. 16%	\$	270,000.00
Construction Cost	\$	1,500,000.00

Note: This estimate does not contain Utility Relocation or Right of Way costs.

1. Cost estimates do not include funds for easement or ROW acquisition.
2. Cost estimates do not include utility relocation costs.
3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Project | Crowders Mountain Paved Trail Feasibility Study

Route: Segment J Phase: 3
 Description: New Bridge over Blackwood Creek to Existing Greenway in Village at Fifth
 Typical Section: 10-foot trail with (2) 4 foot Shoulders

Conceptual

Client: **Carolina Thread Trail**

CONSTR. COST
\$1,800,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser Reviewed By: Laura Fisher

	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 57,338.00	\$ 57,338.00
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	1.1	Acre	\$ 45,000.00	\$ 49,500.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	Earthwork				
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	1,500	CY	\$ 25.00	\$ 37,500.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	Drainage				
8	Drainage Existing Location	0.37	Miles	\$ 150,000.00	\$ 55,500.00
	Pavement (Asphalt or Concrete)				
9	Fine Grading	2,420	SY	\$ 3.00	\$ 7,260.00
10	New Pavement	2,200	SY	\$ 85.00	\$ 187,000.00
	Erosion Control				
11	Erosion Control	1.0	Acres	\$ 75,000.00	\$ 75,000.00
	Structures				
12	Pedestrian Bridge 10' x 115'	1,150	SF	\$ 500.00	\$ 575,000.00
	Miscellaneous				
13	Miscellaneous (10% Strs & Util)				\$ 58,000.00
14	Miscellaneous (40% Roadway)				\$ 229,000.00

Length: 0.37 Mile

Contract Cost	\$ 1,491,000.00
E. & C. 16%	\$ 309,000.00
Construction Cost	\$ 1,800,000.00

Note: This estimate does not contain Utility Relocation or Right of Way costs.

1. Cost estimates do not include funds for easement or ROW acquisition.
2. Cost estimates do not include utility relocation costs.
3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Project | Crowders Mountain Paved Trail Feasibility Study
 Route: Segment K Phase: 4
 Description: 5th Avenue to W. McFarland Avenue
 Typical Section: 10-foot trail with (2) 4-foot Shoulders

Conceptual

Client: Carolina Thread Trail

CONSTR. COST
\$900,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser Reviewed By: Laura Fisher

#	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 24,164.00	\$ 24,164.00
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	0.9	Acre	\$ 45,000.00	\$ 40,500.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
Earthwork					
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	1,100	CY	\$ 25.00	\$ 27,500.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
Drainage					
8	Drainage Existing Location	0.26	Miles	\$ 150,000.00	\$ 39,000.00
Pavement (Asphalt or Concrete)					
9	Fine Grading	1,760	SY	\$ 3.00	\$ 5,280.00
10	New Pavement	1,600	SY	\$ 85.00	\$ 136,000.00
Erosion Control					
11	Erosion Control	1.0	Acres	\$ 75,000.00	\$ 75,000.00
12	Miscellaneous (10% Strs & Util)				\$ -
13	Miscellaneous (40% Roadway)				\$ 193,000.00

Length: 0.26 Mile

Contract Cost	\$	701,000.00
E. & C. 16%	\$	199,000.00
Construction Cost	\$	900,000.00

Note: This estimate does not contain Utility Relocation or Right of Way costs.

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2. Cost estimates do not include utility relocation costs.
3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Project | Crowders Mountain Paved Trail Feasibility Study
 Route: Segment Option M-A Phase: 6
 Description: Dixie Street to Garrison Boulevard Culvert ending at 2nd Avenue
 Typical Section: 6-foot Sidewalk with (1) 3-foot Shoulder

Conceptual

Client: **Carolina Thread Trail**

CONSTR. COST
\$1,000,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser
 Reviewed By: Laura Fisher

	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 28,560.00	\$ 28,560.00
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	0.9	Acre	\$ 45,000.00	\$ 40,500.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	<u>Earthwork</u>				
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	1,700	CY	\$ 25.00	\$ 42,500.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	<u>Drainage</u>				
8	Drainage Existing Location	0.70	Miles	\$ 150,000.00	\$ 105,000.00
	<u>Pavement (Asphalt or Concrete)</u>				
9	Fine Grading	0	SY	\$ 3.00	\$ -
10	New Pavement	0	SY	\$ 85.00	\$ -
11	6" Concrete Sidewalk	2,470	SY	\$ 60.00	\$ 148,200.00
	<u>Erosion Control</u>				
12		1.0	Acres	\$ 75,000.00	\$ 75,000.00
13	Miscellaneous (10% Strs & Util)				\$ -
14	Miscellaneous (40% Roadway)				\$ 228,000.00

Length: 0.70 Mile		Contract Cost	\$ 829,000.00
		E. & C. 16%	\$ 171,000.00
		Construction Cost	\$ 1,000,000.00

- Note: This estimate does not contain Utility Relocation or Right of Way costs.**
1. Cost estimates do not include funds for easement or ROW acquisition.
 2. Cost estimates do not include utility relocation costs.
 3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
 4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
 5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
 6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Project | Crowders Mountain Paved Trail Feasibility Study

Route: Segment Option M-B Phase: 6
 Description: Parkdale Mill via McFarland Avenue and Gray Street ending at 2nd Avenue
 Typical Section: 6-foot Sidewalk with (1) 3-foot Shoulder

Conceptual

Client: **Carolina Threat Trail**

CONSTR. COST
\$1,000,000

Date: 4/17/2025

Prepared By: Benesch
 Requested By: NCDOT IMD
 Priced By: Dalton Kaiser Reviewed By: Laura Fisher

	Description	Quantity	Unit	Price	Amount
1	Mobilization	1	LS	\$ 27,295.00	\$ 27,295.00
2	Construction Surveying	1	LS	\$ 150,000.00	\$ 150,000.00
3	Clearing and Grubbing	0.8	Acre	\$ 45,000.00	\$ 36,000.00
4	Supplemental Clearing and Grubbing	1	Acre	\$ 10,000.00	\$ 10,000.00
	Earthwork				
5	Unclassified Excavation	0	CY	\$ 17.00	\$ -
6	Borrow Excavation	1,600	CY	\$ 25.00	\$ 40,000.00
7	Removal of Existing Pavement Asphalt	0	SY	\$ 10.00	\$ -
	Drainage				
8	Drainage Existing Location	0.65	Miles	\$ 150,000.00	\$ 97,500.00
	Pavement (Asphalt or Concrete)				
9	Fine Grading	0	SY	\$ 3.00	\$ -
10	New Pavement	0	SY	\$ 85.00	\$ -
11	6" Concrete Sidewalk	2,290	SY	\$ 60.00	\$ 137,400.00
	Erosion Control				
12		1.0	Acres	\$ 75,000.00	\$ 75,000.00
13	Miscellaneous (10% Strs & Util)				\$ -
14	Miscellaneous (40% Roadway)				\$ 218,000.00

Length: 0.65 Mile

Contract Cost	\$ 792,000.00
E. & C. 16%	\$ 208,000.00
Construction Cost	\$ 1,000,000.00

Note: This estimate does not contain Utility Relocation or Right of Way costs.

1. Cost estimates do not include funds for easement or ROW acquisition.
2. Cost estimates do not include utility relocation costs.
3. Cost estimates are based on 2020 dollars and should be adjusted for inflation to year of construction.
4. The cost estimate is based on a conceptual plan and does not reflect actual quantities that will be known as design progresses.
5. The cost estimate is based on typical unit prices and does not account for unknown conditions that may be known to the Consultant at the time of this estimate but are unknown to Benesch at this time.
6. The cost estimate assumes that all work will be performed during normal business hours with no premium time required.

Segment	Length	Cost	Developer Responsibility	With Escalation Construction only	With Escalation Project Cost
A	0.85	\$ 2,100,000.00		\$ 2,940,000.00	\$ 4,175,820.00
B	2.06	\$ 4,600,000.00		\$ 5,060,000.00	\$ 7,514,100.00
B - Phase2a	0.74	\$ 1,652,427.18		\$ 1,817,669.90	\$ 2,699,239.81
B - Phase2b	1.32	\$ 2,947,572.82		\$ 3,242,330.10	\$ 4,814,860.19
C	0.48		0.48 \$1,400,000.00		
D	0.17	\$ 700,000.00		\$ 770,000.00	\$ 1,425,600.00
E	0.37		0.37		
F	0.06	\$ 500,000.00		\$ 525,000.00	\$ 1,069,200.00
G	0.25	\$ 700,000.00	sidewalk	\$ 735,000.00	\$ 1,395,900.00
H	0.28	\$ 900,000.00		\$ 1,080,000.00	\$ 1,918,620.00
I	0.75	\$ 1,500,000.00	sidewalk& MUP	\$ 1,800,000.00	\$ 3,059,100.00
J	0.37	\$ 1,800,000.00	includes bridge	\$ 2,160,000.00	\$ 3,629,340.00
K	0.26	\$ 900,000.00		\$ 1,170,000.00	\$ 2,263,140.00
Choose one					
M-A	0.7	\$ 1,000,000.00	sidewalk	\$ 1,300,000.00	\$ 2,346,300.00
M-B	0.65	\$ 1,000,000.00	sidewalk	\$ 1,300,000.00	\$ 2,346,300.00
Total	6.57	\$ 14,000,000.00		\$ 16,770,000.00	\$ 27,371,520.00

5% increase/calendar year
assume \$25k/month for CEI

\$3k/parcel for appraisal
\$150-200k for engineering support during construction

Estimated Project Budget

Federal Reimbursement %	80%		
Local Match %	20%		
# of Years Between Project Funding Award and Construction Start (Yr)	2.0		
Construction Duration (Months)	6		
# of inspectors needed (Ea)	1.0		
Construction Estimate Amount (\$)	\$ 500,000		
NCDOT System Charges(%)	10%		
	Total Costs	Federal Amount	Local Amount
PE	\$ 75,000	\$ 60,000	\$ 15,000
GESC LAP Management	\$ 25,000	\$ 20,000	\$ 5,000
ROW	\$ 100,000	\$ 80,000	\$ 20,000
Utility	\$ 10,000	\$ 8,000	\$ 2,000
Contingency-PE-ROW (10%)	\$ 21,000	\$ 16,800	\$ 4,200
Construction Estimate	\$ 550,000	\$ 440,000	\$ 110,000
Construction CEI	\$ 120,000	\$ 96,000	\$ 24,000
Construciton Engineering Support	\$ 10,000	\$ 8,000	\$ 2,000
Contingency-CON (10%)	\$ 68,000	\$ 54,400	\$ 13,600
NCDOT Charges	\$ 78,320	\$ 62,656	\$ 15,664
PE Reimbursed	\$ 110,000	\$ 88,000	\$ 22,000
ROW/UTL Reimbursed	\$ 121,000	\$ 96,800	\$ 24,200
CON Reimbursed	\$ 826,320	\$ 661,056	\$ 165,264
Est Total Project Budget	\$ 1,057,320	\$ 845,856	\$ 211,464

Other Funding % Options		
70%	60%	
30%	40%	
3.0	2.0	
6	6	
1.0	1.0	
\$ 500,000	\$ 500,000	
10%	10%	
Total Costs	Federal Amount	Local Amount
\$ 75,000	\$ 52,500	\$ 22,500
\$ 25,000	\$ 17,500	\$ 7,500
\$ 100,000	\$ 70,000	\$ 30,000
\$ 10,000	\$ 7,000	\$ 3,000
\$ 21,000	\$ 14,700	\$ 6,300
\$ 575,000	\$ 402,500	\$ 172,500
\$ 150,000	\$ 105,000	\$ 45,000
\$ 10,000	\$ 7,000	\$ 3,000
\$ 68,000	\$ 47,600	\$ 20,400
\$ 72,380	\$ 50,666	\$ 21,714
\$ 550,000	\$ 330,000	\$ 220,000
\$ 150,000	\$ 90,000	\$ 60,000
\$ 10,000	\$ 6,000	\$ 4,000
\$ 68,000	\$ 40,800	\$ 27,200
\$ 60,540	\$ 36,324	\$ 24,216
\$ 110,000	\$ 66,000	\$ 44,000
\$ 121,000	\$ 72,600	\$ 48,400
\$ 875,380	\$ 612,766	\$ 262,614
\$ 838,540	\$ 503,124	\$ 335,416
\$ 1,106,380	\$ 774,466	\$ 331,914
\$ 1,069,540	\$ 641,724	\$ 427,816

zero

if not LAP then zero

Public Meeting

Are you interested in expanding bicycle and pedestrian connections in Gastonia?

Carolina Thread Trail has partnered with the City of Gastonia and the North Carolina Department of Transportation to study potential routes for a bicycle and pedestrian connection between Downtown Gastonia and Crowders Mountain State Park that includes the planned Linwood Springs Park.

Come learn about the study and provide your input on the routes under consideration.

This open house meeting will not have a formal presentation, but project team members will be there to answer questions about the study and collect your input.



When: Thursday, November 30, 2023
5:00 – 7:00 p.m.

Where: Phillips Recreation Center Training Room
2031 Echo Lane, Gastonia, NC 28052

Reunión Pública

¿Estás interesado en ampliar las conexiones para bicicletas y peatones en Gastonia?

Carolina Thread Trail ha asociado con la Ciudad de Gastonia y el Departamento de Transportación de Carolina del Norte (NCDOT) para estudiar rutas potenciales para una conexión de bicicletas y peatones entre Downtown Gastonia and Crowders Mountain State Park que incluye el nuevo planificado Linwood Springs Park.

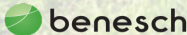
Venga a conocer el estudio y ofrezca su opinión sobre las rutas bajo consideración.

Esta reunión de puertas abiertas no tendrá una presentación formal, pero los miembros del equipo del proyecto estarán ahí para responder preguntas sobre el estudio y recopilar sus comentarios.



Cuándo: Jueves, el 30 de Noviembre, 2023
5:00 – 7:00 p.m.

Dónde: Phillips Recreation Center Training Room
2031 Echo Lane, Gastonia, NC 28052





Welcome!

Gastonia – Crowders Mountain Paved Pathways Feasibility Study

Thursday, November 30th 2023
Phillips Center, Training Room
5:00 – 7:00 pm

Your input is important to our study!

While you're here, please:

- Grab a handout
- Leave a comment
- Make your mark: Let us know what routes you do or do not like. Feel free to mark up our maps!

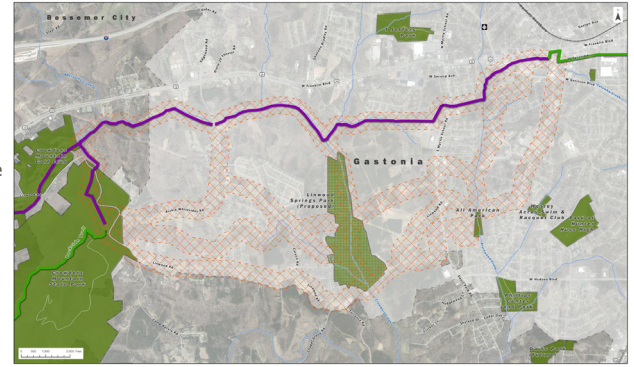
There is no formal presentation at this open-house informational meeting.



About the Study

Carolina Thread Trail has partnered with the City of Gastonia and the North Carolina Department of Transportation to study potential routes for a bicycle and pedestrian connection between Downtown Gastonia and Crowders Mountain State Park that includes the planned Linwood Springs Park.

The *Carolina Thread Trail Master Plan for Gaston County Communities* (2009) identified the initial proposed alignment for the Thread Trail on the west side of Gastonia, shown in purple on the map. Additional routes under consideration during this study area shown by the hatched area.



What Is A Feasibility Study?

A feasibility study bridges the gap between conceptual planning and programming of projects (funding acquisition).

This feasibility study includes:

- Development of project goals
- Identification of existing conditions
- Cost estimates
- Alternative recommendation
- Implementation strategies

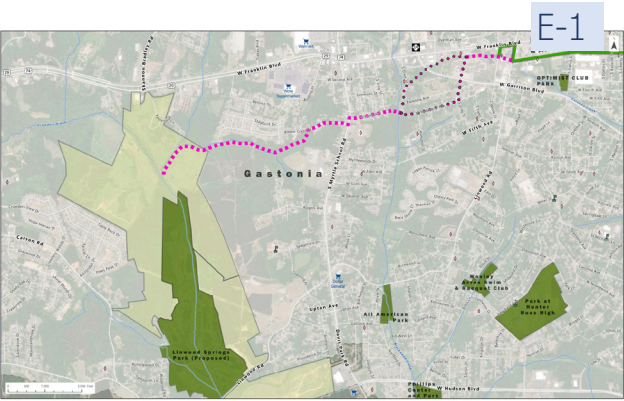


The Carolina Thread Trail is a regional network of trails, greenways, and blueways in North and South Carolina that aims to connect communities to recreational opportunities and a variety of points of interest.

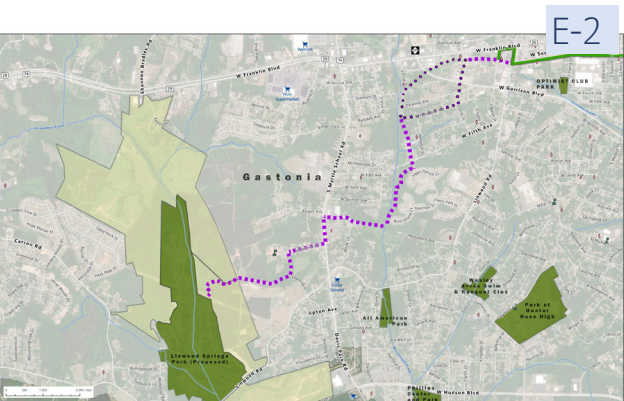


East Side Alternatives

Alternative E-1 would continue from the juncture of Crowders Creek and its tributary, following the tributary eastward using sanitary sewer easements. The route would use Amber Crest Drive, cross Myrtle School Road, and continue east using Parkdale Ave. After crossing Blackwood Creek, the route could use one of two options to meet up with the existing Thread Trail segment along W. Second Avenue.

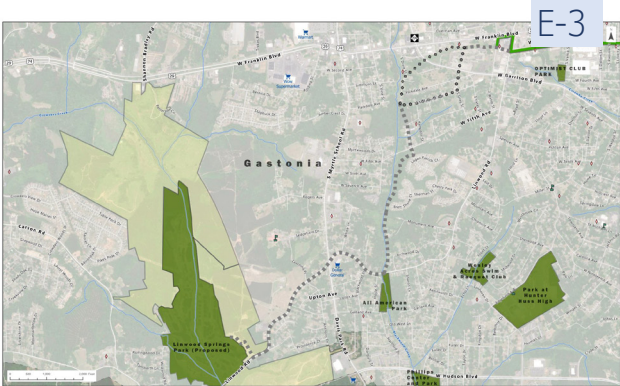


Alternative E-2 exits Linwood Springs Park through the north side of the planned Parklin subdivision, then travels east through undeveloped land along sanitary sewer easement. The route would meet with Sedgefield Drive heading east, head north along Myrtle School Road for approx. 700 feet, then use Crescent Ave./White Lane traveling east. After crossing Blackwood Creek, the route would tie into the existing greenway at the Village at Fifth subdivision, cross W 5th Avenue and continue north along Blackwood Creek. Near Parkdale Ave., the route could use one of two options to meet up with the existing Thread Trail segment along W. Second Avenue.

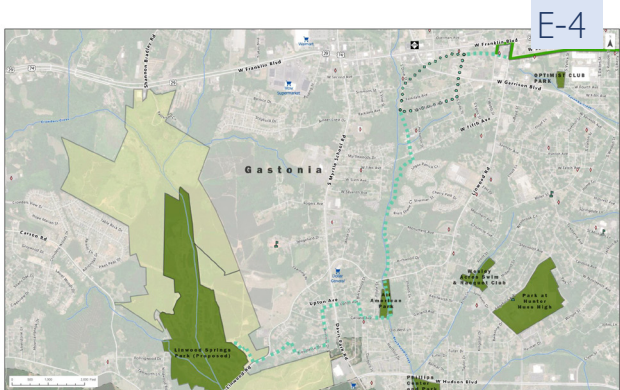


East Side Alternatives (continued)

Alternative E-3 would exit Linwood Springs Park using a neighborhood greenway and sidewalks through the planned Parklin subdivision to Linwood Road. The route would then travel along Linwood Road until meeting with Blackwood Creek, where it would turn north and travel along the creek, tying into the existing greenway at the Village at Fifth subdivision, cross W 5th Avenue and continue north along Blackwood Creek. Near Parkdale Ave., the route could use one of two options to meet up with the existing Thread Trail segment along W. Second Avenue.



Alternative E-4 would exit Linwood Springs Park using a neighborhood greenway and sidewalks through the planned Parklin subdivision to Linwood Road. The route would cross Linwood Road, using Lakewood Dr., Providence Dr., and Anthony Dr., crossing Davis Park Road at Upton Ave. East of Davis Park Road, the route uses Upton Ave, Blackwood St., and Garland Ave. The route then crosses Blackwood Creek and turns north traveling through All American Park and continuing north along Blackwood Creek. tying into the existing greenway at the Village at Fifth subdivision, cross W 5th Avenue and continue north along Blackwood Creek. Near Parkdale Ave., the route could use one of two options to meet up with the existing Thread Trail segment along W. Second Avenue.



West Side Alternatives

W-1



Alternative W-1 travels north out of Crowders Mountain State Park, then follows Crowders Creek eastward. Just north of Linwood Springs Park, the route would shift south to connect to the new park at the park’s north side. The path would consist of a paved 10 ft trail, with the potential need for footbridges and/or boardwalks in areas prone to flooding.

W-2



Alternative W-2 starts the same as W-1, traveling north out of CMSP and eastward along Crowders Creek. This route then follows Archie Whitesides Road to the south before turning and following Carson Road east. The path would enter the planned Crowders Creek subdivision from the west, following neighborhood sidewalks and greenway through common open space before entering Linwood Springs Park.

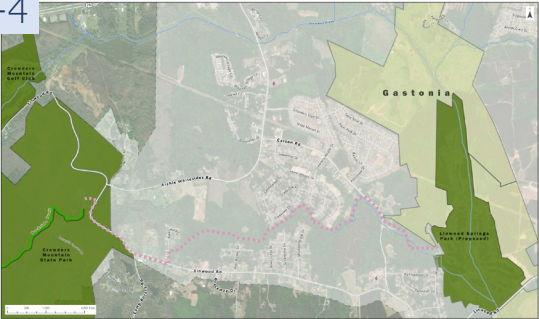
W-3



Alternative W-3 leaves CMSP, crosses Linwood Road, and follows Archie Whitesides Road, turning onto Carson Road to continue eastward. The path would enter the planned Crowders Creek subdivision from the west, following neighborhood sidewalks and greenway through common open space before entering Linwood Springs Park.

West Side Alternatives (continued)

W-4



Alternative W-4 would depart CMSP, cross Linwood Road, and follow sanitary sewer easement along a tributary of Crowders Creek, through largely undeveloped land.

W-5



Alternative W-5 departs CMSP and follows Linwood Road eastward. At Carson Road, the proposed route would turn north, then east on Rollingwood Drive to the north end of Wildwood Drive, where the path would enter Linwood Springs Park.

Facility Types

Depending on the route chosen, The Carolina Thread Trail may use several different facility types between CMSP and Downtown Gastonia. **What facilities do you like best for walking and cycling?**

Shared Lane with Sidewalk

Bike Lane with Sidewalk

Shared-Use: Sidepath

Shared-Use: Greenway

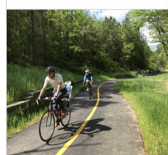


Travel Lane 4' | Side-Walk

Travel Lane 5'-7' | Side-Walk

Travel Lane 3'-5' | 10'-12'

10'-12'



Place stickers in the boxes of your choice



West Side Alternatives

W-1

Alternative W-1 travels north out of Crowders Mountain state park, then follows Crowders Creek eastward. Just north of Linwood Springs Park, the route would shift south to connect to the new park. The path would consist of a paved 10 ft trail, with the potential need for footbridges and/or boardwalks in areas prone to flooding.

W-2

Text describing this alt

W-3

Text describing this alt

W-4

Text describing this alt

W-5

Text describing this alt

**PUBLIC HEARING
STAFF REPORT
File # 202100505
GPC Hearing Date: September 8, 2022
City Council Hearing Date: September 20, 2022**

OWNER: Multiple Owners
APPLICANT: Julie Lowe – Crowder Creek Holdings, LLC.
PROPOSED ZONING ACTION: Rezoning from RS-12 and I-2 to PD-TND
LOCATION: Property is located south of W. Franklin Boulevard between Archie Whitesides Road and S. Myrtle School Road
TRACT SIZE: 285.22 acres
WARD: 6
PLANNING COMMISSION VOTE: **Recommendation to approve (5-2 Wilson, Stewart)**

EVALUATION:

On September 8, 2022, the Gastonia Planning Commission voted (5-2) to approve the rezoning request. This vote was less than three-fourths majority, therefore, this case automatically goes to City Council for a new hearing and consideration.

Site Description and Background

The applicant is requesting to rezone the property to PD-TND (Planned Development – Traditional Neighborhood Development). The subject property is currently zoned RS-12 (Single-family Residential District, minimum 12,000 sq. ft. lots) and I-2 (General Industrial). The property is currently vacant and wooded. The applicant has submitted a site plan (see attached).

The request would consist of a combination of 100,000 sq. ft. of commercial development (including office and retail space), 360 multi-family units and a maximum of 500 single family attached and detached housing. The access points being proposed are from W. Franklin Boulevard and Carson Road.

Proposed zoning conditions:

- 1. MUP to be constructed along “Crowders Creek”. Pursuant to Section 9.18.3 (Multiuse Paths: Greenways and Street-Side Paths) of the City of Gastonia’s UDO: Multi-use paths shall be located in accord with the Gastonia Greenway Plan, the Comprehensive Parks and Recreation Master Plan, and/or the GCLMPO Comprehensive Transportation Plan (CTP).

- 2. Install the multiuse path (or boardwalk if soil conditions dictate), in accord with specified design standards, in a dedicated public right-of-way or easement, as part of the development process.
- 3. Traffic calming measures to be installed in cooperation with Land Development.
- 4. The project shall be developed in conformance with the rezoning plan and obtain Technical Review Committee (TRC) final approval.
- 5. The site plan and architectural elevations must meet 8.1.10, 8.1.11, 8.1.13, and 8.1.17 of the Unified Development Ordinance.
- 6. Swales or other stormwater measures shall not be located in required buffers.
- 7. All other specifications and general provisions shall be met as required by the City of Gastonia Unified Development Ordinance including any errors/missing or incorrect labels on the rezoning conceptual plan.
- 8. In no instance shall the zoning conditions exempt a project from other development requirements.

Adjoining Properties and Land Use Trends

The subject property is surrounded by Residential and Industrial zoning and uses. The Crowders View neighborhood is located southwest of the property. The current zoning to the east of the subject property is RS-8. North of the subject property is zoned I-2. The future Linwood Public Park will be located south of the property.

Available Public Facilities

Water and sewer is available to serve the property.

Consistency with Adopted Plans

The Future Land Use Map in the 2025 Comprehensive Plan indicates **residential** use for the subject property.

Conclusion

The applicant has requested a rezoning to PD-TND in order to develop mixed use neighborhood development consisting of retail and office space as well as single-family attached and detached housing. Based on the 2025 Comprehensive Plan, zoning conditions, and conditional rezoning, **staff recommends that the request be approved as presented.**

Jason Thompson, AICP
Planning Director

Statement of consistency and reasonableness (motion to approve): The proposed zoning is consistent with the 2025 Comprehensive Plan and will result in the potential development of a residential use. The City Council considers an affirmative vote to be reasonable and in the public’s interest.

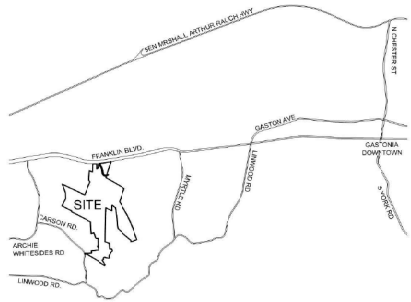
Statement of consistency and reasonableness (motion to deny): The City Council considers an affirmative vote to not be reasonable and to not be in the public interest.

CONDITIONAL REZONING
CROWDERS CREEK
 PETITIONER: CROWDERS CREEK HOLDINGS, LLC.
 GASTONIA, NORTH CAROLINA
 DATE: 08/04/2022

CHAPTER INDEX

Sheet Number	Sheet Title
RD00	COVER SHEET
RD01	EXIST'ING CONDITIONS
RD02	PARCEL MAP
RD03	PARCEL OWNER INFO
RD04	TECHNICAL DATA SHEET
RD05	TREE PRESERVATION AREA AND OPEN SPACE AREA
RD06	CONCEPTUAL MASTER PLAN
RD07	ARCHITECTURAL RENDERING
RD08	DEVELOPMENT STANDARDS

VICINITY MAP



N.T.S

PROJECT TEAM

APPLICANT
 CROWDERS CREEK HOLDINGS, LLC
 2520 SELWYN AVENUE, SUITE 650
 CHARLOTTE, NC 28209
 734.774.7175
 CONTACT NAME: JULIE LOWE

LANDSCAPE ARCHITECT | CIVIL ENGINEERING
 LANDESIGN
 223 NORTH GRAMM STREET
 CHARLOTTE, NC 28202
 734.333.6326
 CONTACT NAME: RICHARD PETERSHEIM, DANNY BJEMORE

LAND USE ATTORNEY
 ROBINSON BRADSHAW
 131 N. TRYON ST., SUITE 1900
 CHARLOTTE, NC 28246
 734.377.6341
 CONTACT NAME: JOHN H. CARMICHAEL

CROWDERS CREEK
 LD PN 1021130
 COVER SHEET



LandDesign.

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PROJECT
CROWDERS CREEK
 NEIGHBORHOOD DEVELOPMENT
 GASTONIA
 NORTH CAROLINA
 PETITIONER: CROWDERS CREEK HOLDINGS, LLC.

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DESIGNED BY: RP
 DRAWN BY: YD
 CHECKED BY: RP

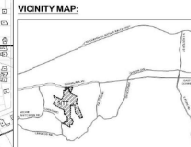
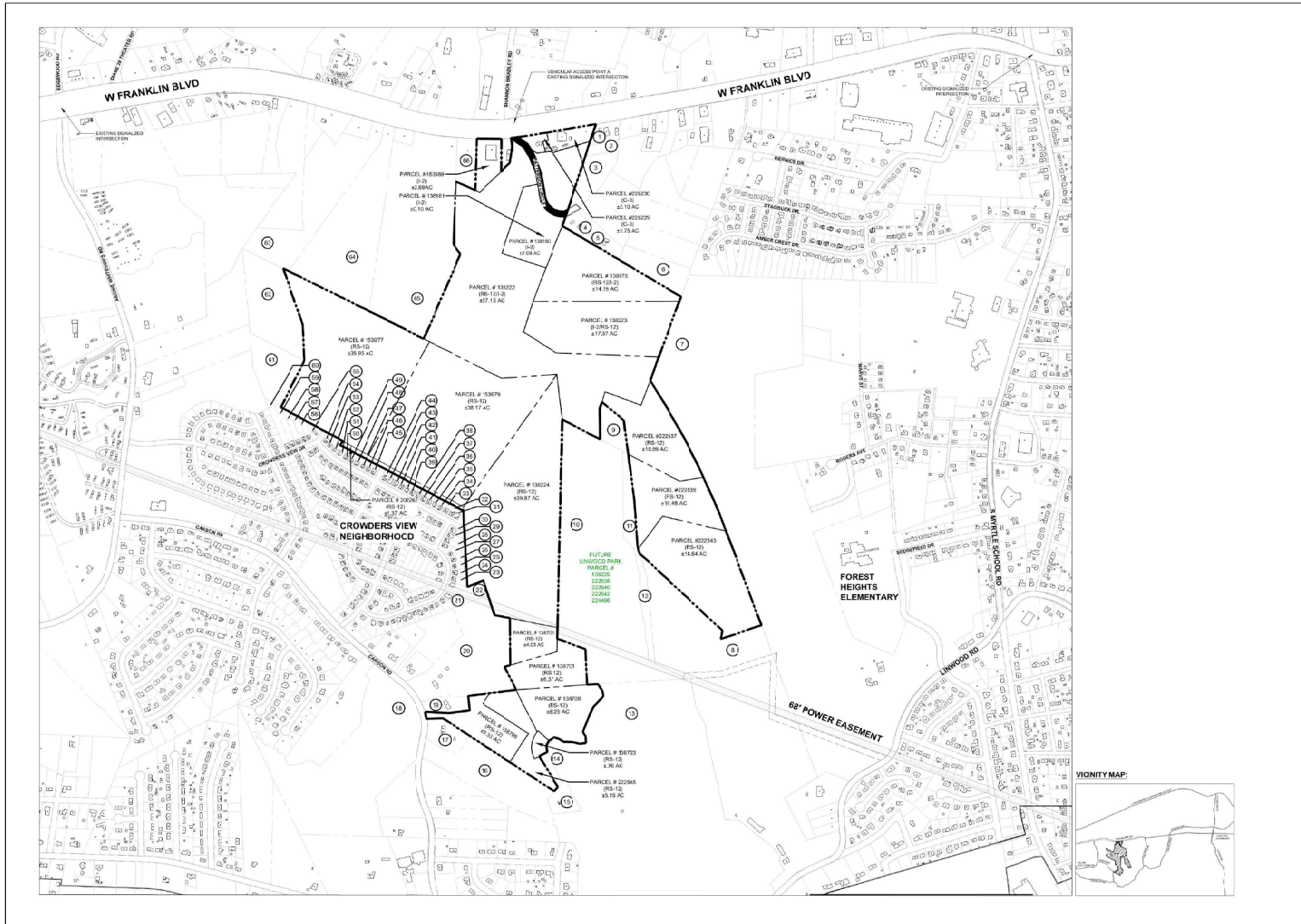
SCALE NORTH

VERT: N/A
 HORZ: 1" = 1200'



SHEET TITLE
PARCEL MAP

SHEET NUMBER
 RZ-02





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NEIGHBORHOOD DEVELOPMENT
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DESIGNED BY: RP
 DRAWN BY: YD
 CHECKED BY: RP

SCALE NORTH

VERT: N/A
 HORZ: 1" = 1200'



SHEET TITLE

PARCEL OWNER INFORMATION

SHEET NUMBER

RZ-03

PARCEL OWNER INFORMATION						
ID	PARCEL NO.	CURRENT OWNERS	ADDRESS	DB & PG	ZONING	PROPERTY USE
1	38076	FUTNAM VIRGINIA	3001 W FRANKLIN BLVD GASTONIA, NC 28052	0862-0544	C-3	COMMERCIAL IMPROVED
2	38076	FUTNAM VIRGINIA		0704-0118	I-2	INDUSTRIAL IMPROVED
3	38076	SMITH MARTHA P FUTNAM DEAN A		2021E-0817	I-2	INDUSTRIAL IMPROVED
4	138091	STEWART HANK R	3107 W FRANKLIN BLVD GASTONIA, NC 28052	1414-0368	I-2	RESIDENTIAL IMPROVED
5	38388	DAVIDSON MISTY D	3102 WFRANKLIN BLVD GASTONIA, NC 28052-0009	3452-0888	I-2	RESIDENTIAL IMPROVED
6	38087	ALEXANDER JANICE		2748-0553	RS-12	RESIDENTIAL (VACANT)
7	221715	DOCKERY PROPERTIES LLLP C/O JAY/D DOCKERY	2632 LINWOOD RD GASTONIA, NC 28052	4702-1380	RS-12	RESIDENTIAL IMPROVED
8	228765	HOFFMAN JACOE HUNTER	2906 LINWOOD RD GASTONIA, NC 28052	4937-1057	RS-12	RESIDENTIAL IMPROVED
9	222538	N C DEPT OF TRANSPORTATION		4744-2033	RS-12	EXEMPT IMPROVED
10	38225	N C DEPT OF TRANSPORTATION		4565-0327	RS-12	EXEMPT IMPROVED
11	222540	N C DEPT OF TRANSPORTATION		4744-2033	RS-12	EXEMPT IMPROVED
12	222542	N C DEPT OF TRANSPORTATION		4744-2033	RS-12	EXEMPT IMPROVED
13	224166	N C DEPT OF TRANSPORTATION		4555-327	RS-12	EXEMPT IMPROVED
14	222540	N C DEPT OF TRANSPORTATION		4744-2033	RS-12	EXEMPT IMPROVED
16	138711	N C DEPT OF TRANSPORTATION	1668 WILDWOOD RD GASTONIA, NC 28052	1352-0338	RS-12	RESIDENTIAL IMPROVED
16	38800	ASHWORTH CAROLYN C 12 S CARSON EDWARD S SHARON W 1/2		4749-1076	RS-12	RESIDENTIAL (VACANT)
17	38079	ASHWORTH CAROLYN CARSON	807 CARSON RD GASTONIA, NC 28052	4749-1076	RS-12	RESIDENTIAL IMPROVED
18	54555	PISGAH ASSOCIATE REFORMED PRES		3563-0938	RS-12	EXEMPT IMPROVED
19	212520	CARSON EDWARD S CARSON SHARON	837 CARSON RD GASTONIA, NC 28052	4234-3061	RS-12	RESIDENTIAL IMPROVED
20	214103	ASHWORTH CAROLYN CARSON CARSON EDWARD JOHN	837 CARSON RD GASTONIA, NC 28052	9150-1412	RS-12	RESIDENTIAL IMPROVED
21	213332	DUNBAR JANICE A	3236 Pikes Peak DR GASTONIA, NC 28052	4894-1057	RS-8	RESIDENTIAL IMPROVED
22	213333	NEAL JARISA N	3242 Pikes Peak DR GASTONIA, NC 28052	4895-1848	RS-8	RESIDENTIAL IMPROVED
23	213334	JONES CHRLES S & JONES AMBER Y	3248 Pikes Peak DR GASTONIA, NC 28052	4392-2140	RS-8	RESIDENTIAL IMPROVED
24	213333	MERCER-CRISTOPHER MERCER SHANTE	3254 Pikes Peak DR GASTONIA, NC 28052	5009-2378	RS-8	RESIDENTIAL IMPROVED
25	213332	MCCLELLAND LINDA L MCCLELLAND S HAWN C	3280 Pikes Peak DR GASTONIA, NC 28052	4433-1941	RS-8	RESIDENTIAL IMPROVED
26	213631	TRAPP DARIN	3288 Pikes Peak DR GASTONIA, NC 28052	4391-1816	RS-8	RESIDENTIAL IMPROVED
27	213330	CSMA BLT LLC	3272 Pikes Peak DR GASTONIA, NC 28052	4933-1929	RS-8	RESIDENTIAL IMPROVED
28	213328	GILMORE WILLIAM	1012 POCONO DR GASTONIA, NC 28052	4831-2046	RS-8	RESIDENTIAL IMPROVED
28	213327	BITTLE JESSE	1009 POCONO DR GASTONIA, NC 28052	4851-1751	RS-8	RESIDENTIAL IMPROVED
30	213326	JYER DAWNELL	1009 POCONO DR GASTONIA, NC 28052	4925-0086	RS-8	RESIDENTIAL IMPROVED
31	213323	MEHTA PRIYANSHEE MEHTA NISHANT	3272 TABLE ROCK DR GASTONIA, NC 28052	4795-2438	RS-8	RESIDENTIAL IMPROVED
32	213304	FLOWE ANGELO J	3300 TABLE ROCK DR GASTONIA, NC 28052	4821-1080	RS-8	RESIDENTIAL IMPROVED
33	213323	PHIFER ROBIN E JR PHIFER ANITRA NAS H	3306 TABLE ROCK DR GASTONIA, NC 28052	4863-0972	RS-8	RESIDENTIAL IMPROVED
34	213322	A J REB A TAYLOR SEVO-ABLE TR	3312 TABLE ROCK DR GASTONIA, NC 28052	4712-1487	RS-8	RESIDENTIAL IMPROVED
35	213621	KENDRICK RANDY KENDRICK PAMELA	3318 TABLE ROCK DR GASTONIA, NC 28052	4374-0556	RS-8	RESIDENTIAL IMPROVED
38	211997	BRIDGES RONLD BRIDGEBENITA SUGH	3324 TABLE ROCK DR GASTONIA, NC 28052	4343-1548	RS-8	RESIDENTIAL IMPROVED
37	211996	OGRE DEREK JAMAR SORE GASHILL	3330 TABLE ROCK DR GASTONIA, NC 28052	4734-1720	RS-8	RESIDENTIAL IMPROVED
38	211999	FARON DEBORAH MIKAL SMITH ANTOINE	3336 TABLE ROCK DR GASTONIA, NC 28052	5055-0535	RS-8	RESIDENTIAL IMPROVED
39	211700	SFR JV-1 2020-T BORROWER LLC	3342 TABLE ROCK DR GASTONIA, NC 28052	5070-0228	RS-8	RESIDENTIAL IMPROVED

PARCEL OWNER INFORMATION						
ID	PARCEL NO.	CURRENT OWNERS	ADDRESS	DE & PG	ZONING	PROPERTY USE
40	211701	WILLIAMS MICHAEL J CHAMBERS CHRIS	3348 TABLE ROCK DR GASTONIA, NC 28052	4850-1743	RS-8	RESIDENTIAL IMPROVED
41	211702	RLOA COREY CHRISTIAN	3354 TABLE ROCK DR GASTONIA, NC 28052	5088-1717	RS-8	RESIDENTIAL IMPROVED
42	211703	BADAWI MICHEL BADAWI LEBRA	3380 TABLE ROCK DR GASTONIA, NC 28052	6118-2383	RS-8	RESIDENTIAL IMPROVED
43	211704	WHITESIDE HADSSAN NIAM	3388 TABLE ROCK DR GASTONIA, NC 28052	4559-0193	RS-8	RESIDENTIAL IMPROVED
44	210471	WATSON PA N	3372 TABLE ROCK DR GASTONIA, NC 28052	4289-0482	RS-8	RESIDENTIAL IMPROVED
45	210472	CASTRO STEVEN CASTRO WILLIAM	3400 TABLE ROCK DR GASTONIA, NC 28052	4721-0754	RS-8	RESIDENTIAL IMPROVED
46	210473	JEFFRIES MIRAFE B	3408 TABLE ROCK DR GASTONIA, NC 28052	4643-0603	RS-8	RESIDENTIAL IMPROVED
47	210474	JH4 PROPERTY NORTH CAROLINA LP	3412 TABLE ROCK DR GASTONIA, NC 28052	4732-1111	RS-8	RESIDENTIAL IMPROVED
48	210475	SFR JV-1 2020-T BORROWER LLC	3418 TABLE ROCK DR GASTONIA, NC 28052	5140-1359	RS-8	RESIDENTIAL IMPROVED
49	210476	MILLER BERYL M	3424 TABLE ROCK DR GASTONIA, NC 28052	4298-0187	RS-8	RESIDENTIAL IMPROVED
50	210477	PECHE CHRISTOPHER DE LA ROSA CLAUDIA G CABRERA	3430 TABLE ROCK DR GASTONIA, NC 28052	5088-1359	RS-8	RESIDENTIAL IMPROVED
51	210478	BATES ANTHONY BATES RINTA	3438 TABLE ROCK DR GASTONIA, NC 28052	4282-1921	RS-8	RESIDENTIAL IMPROVED
52	210479	SFR JV-1 2019-T BORROWER LLC	3442 TABLE ROCK DR GASTONIA, NC 28052	5070-0288	RS-8	RESIDENTIAL IMPROVED
53	210480	2018-T H BORROWER LP	3448 TABLE ROCK DR GASTONIA, NC 28052	4978-0433	RS-8	RESIDENTIAL IMPROVED
54	210481	ALONSO CHRISTINA	3454 TABLE ROCK DR GASTONIA, NC 28052	4941-0631	RS-8	RESIDENTIAL IMPROVED
56	210482	SHUM KIN LAM CHU-SHUM JOYCE W	3529 CROWDERS VIEW DR GASTONIA, NC 28052	4938-2411	RS-8	RESIDENTIAL IMPROVED
57	210483	DEJESUS RAMON GALARZA LIGNETTE E	3542 CROWDERS VIEW DR GASTONIA, NC 28052	5134-0779	RS-8	RESIDENTIAL IMPROVED
57	210484	HORTON MONIQUE	3548 CROWDERS VIEW DR GASTONIA, NC 28052	5188-1792	RS-8	RESIDENTIAL IMPROVED
58	210485	HENSLEY ZACHARY HENSLEY JELSEY	3552 CROWDERS VIEW DR GASTONIA, NC 28052	4858-1974	RS-8	RESIDENTIAL IMPROVED
59	210486	CAGLE COREY D	3558 CROWDERS VIEW DR GASTONIA, NC 28052	4276-2203	RS-8	RESIDENTIAL IMPROVED
60	210487	BARNES JAMES M BARNES DIANE M	3564 CROWDERS VIEW DR GASTONIA, NC 28052	4241-1854	RS-8	RESIDENTIAL IMPROVED
61	153978	MOORE WILLIAM R MOORE SERALDINE		1866-0774	RS-12	RESIDENTIAL (VACANT)
62	199228	JENKINS CAMILLA B		3335-0201	RS-12	RESIDENTIAL (VACANT)
63	153845	FOX RUSSELL	3415 WFRANKLIN BLVD GASTONIA, NC 28052	2616-0042	I-2, RS-12	INDUSTRIAL IMPROVED
64	153845	FOX RUSSELL	3407 WFRANKLIN BLVD GASTONIA, NC 28052	2616-0039	I-2 / RS-12	INDUSTRIAL IMPROVED
65	153880	PATTERSON BILLY KEITH	3301 W FRANKLIN BLVD GASTONIA, NC 28052	4880-1458	I-2 / RS-12	INDUSTRIAL IMPROVED
66	153858	LTE INC	3331 W FRANKLIN BLVD GASTONIA, NC 28052	4341-1667	I-2	INDUSTRIAL IMPROVED

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 PETITIONER: CROWDERS CREEK HOLDINGS, LLC.

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DESIGNED BY: RP
 DRAWN BY: YD
 CHECKED BY: RP

SCALE NORTH

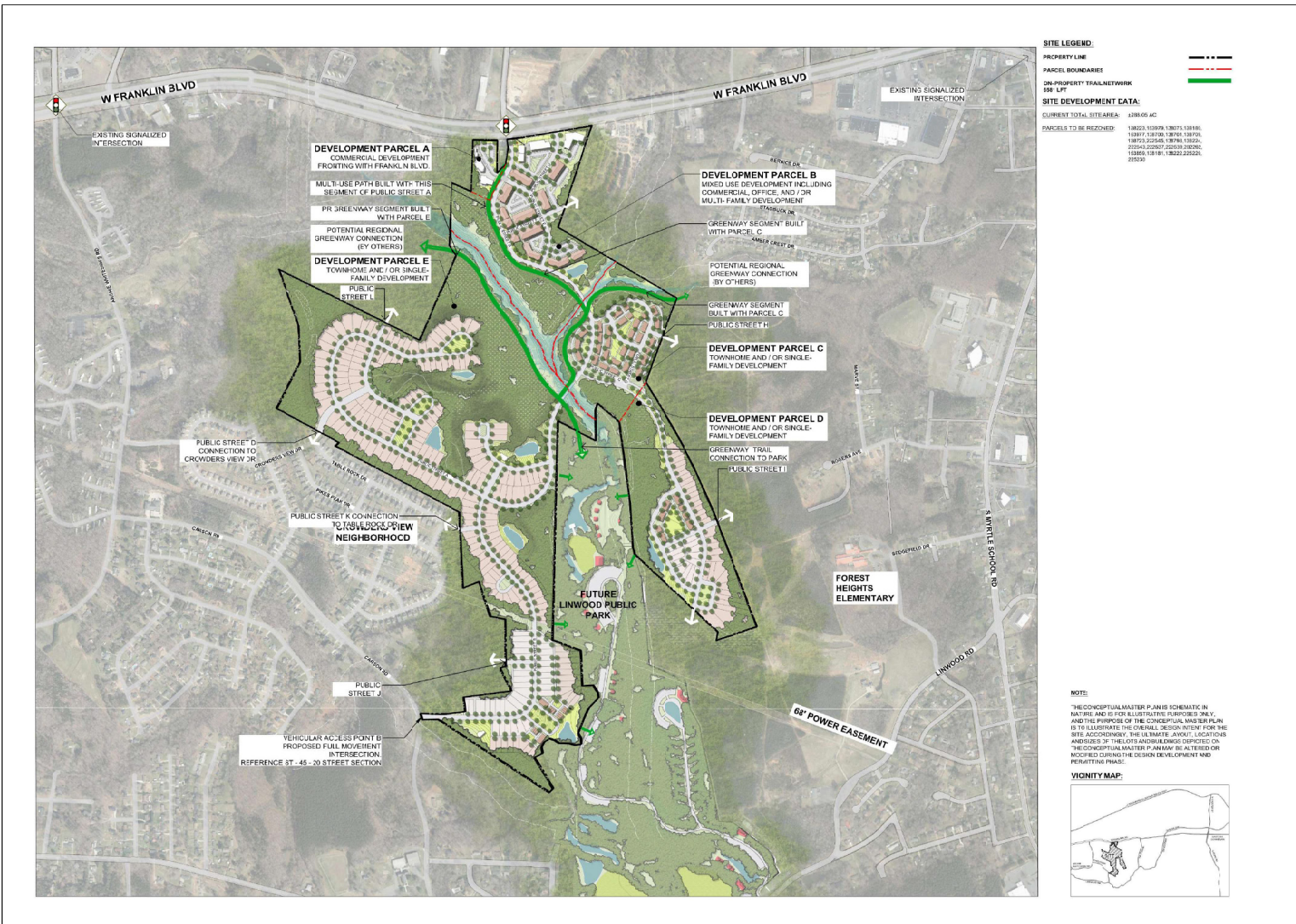
VERT: N/A
 HORZ: 1" = 1200'



SHEET TITLE
**TREE PRESERVATION AREA AND
 OPEN SPACE AREA**

SHEET NUMBER
RZ-06

SITE LEGEND:
 PROPERTY LINE
 PARCEL BOUNDARIES
 ON-PROPERTY TRAIL NETWORK
 80% LIFT
SITE DEVELOPMENT DATA:
 CURRENT TOTAL SITE AREA: 428806 SQ
 PARCELS TO BE REZONED:
 13823, 13309, 13073, 13156,
 13097, 13130, 13070, 13159,
 13873, 22254, 13076, 13824,
 20764, 22267, 22218, 20266,
 13360, 13181, 13823, 22222,
 20250



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04	CONDITIONAL REZONING	08/04/2022

DESIGNED BY: RP
 DRAWN BY: YD
 CHECKED BY: RP

SCALE NORTH

VERT: N/A
 HORZ: 1" = 1200'

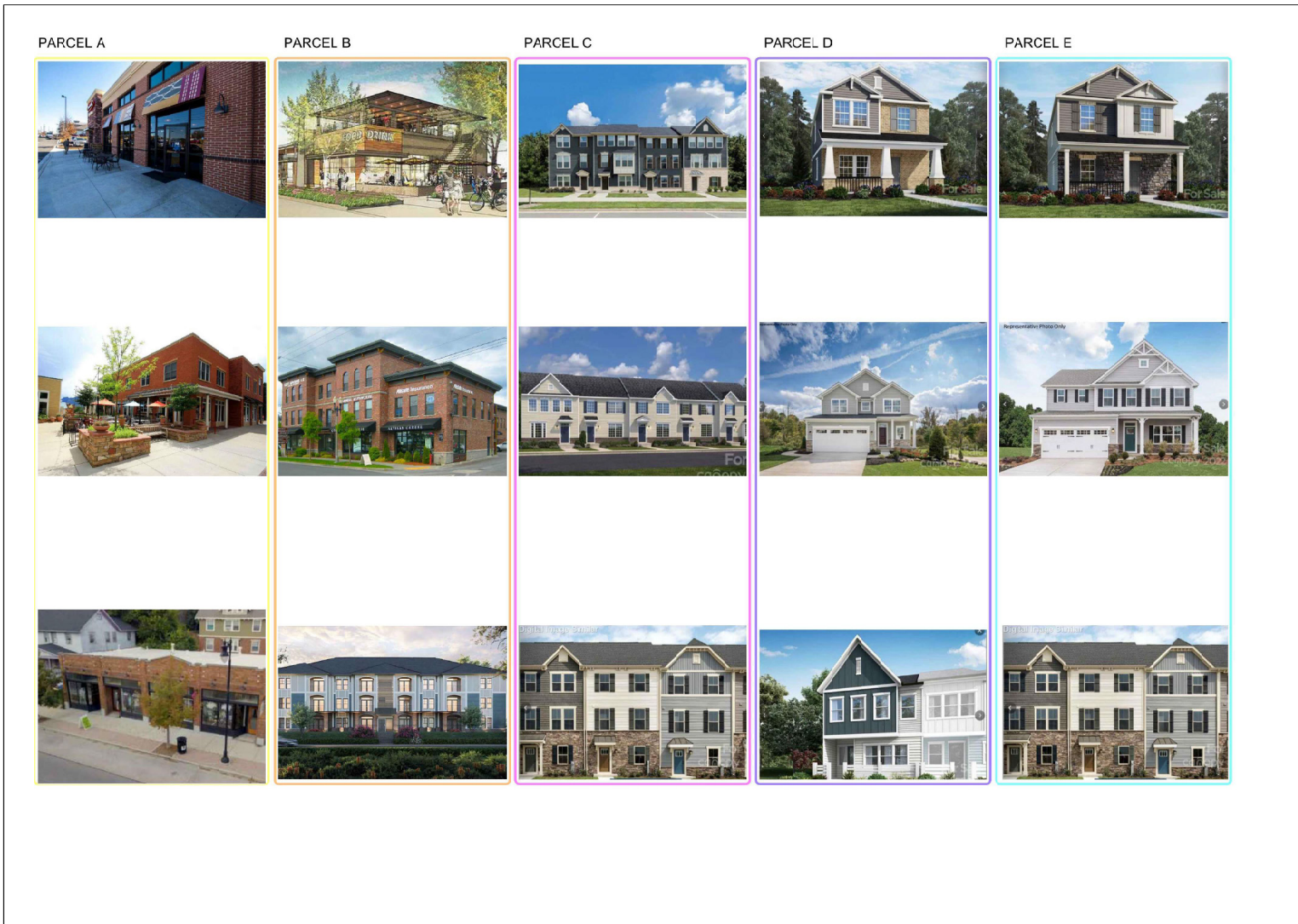


SHEET TITLE

STREET SECTIONS

SHEET NUMBER

RZ-07



LandDesign.

223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

SEAL

NOT FOR CONSTRUCTION

PROJECT

CROWDERS CREEK

NEIGHBORHOOD DEVELOPMENT

GASTONIA
NORTH CAROLINA

PETITIONER: CROWDERS CREEK HOLDINGS, LLC.

LANDDESIGN PROJ.#

1021130

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
01	CONDITIONAL REZONING	12/10/2021
02	CONDITIONAL REZONING	04/08/2022
03	CONDITIONAL REZONING	07/26/2022
04	CONDITIONAL REZONING	08/04/2022

DESIGNED BY: RP
DRAWN BY: YD
CHECKED BY: RP

SCALE NORTH

VERT: N/A
HORZ: 1" = 1200'



SHEET TITLE

DEVELOPMENT STANDARDS

SHEET NUMBER

RZ-08

DEVELOPMENT STANDARDS

August 04, 2022

I. GENERAL PROVISIONS

- A. These Development Standards, the Existing Conditions Sheet, the Parcel Map Sheet, the Parcel Owner Information Sheet, the Technical Data Sheet, the Tree Preservation Area and Open Space Sheet, the Conceptual Master Plan, and the Architectural Imagery Sheet and other graphics set forth on attached Sheets RZ-00 through RZ-08 form the rezoning plan collectively referred to as the "Rezoning Plan," associated with the Rezoning Application filed by Crowders Creek Holdings, LLC ("Applicant") to accommodate a multi-use development on an approximately 280.0-acre site located on the south side of West Franklin Boulevard, east of the intersection of West Franklin Boulevard and Ashby-Windsor Road, which site is more particularly depicted on the Rezoning Plan (hereinafter referred to as the "Site"). The Site is comprised of those tax parcels identified on Sheet RZ-04 of the Rezoning Plan.
- B. For enforcement purposes, the Site is divided into five Development Parcels that are delineated on the Technical Data Sheet as Development Parcel A, Development Parcel B, Development Parcel C, Development Parcel D and Development Parcel E. Any reference herein to the Site shall be deemed to include Development Parcel A, Development Parcel B, Development Parcel C, Development Parcel D and Development Parcel E unless otherwise noted herein.
- C. Pursuant to this Rezoning Application, the Applicant is requesting that the Site be rezoned to the Planned District ("PD") - Traditional Neighborhood Development ("TND") conditional zoning district to establish a multi-use, Traditional Neighborhood Development on the Site.
- D. The development and use of the Site will be governed by the Rezoning Plan, these Development Standards and the applicable provisions of the City of Gastonia Unified Development Ordinance ("UDO"), including the applicable TND provisions.
- E. Set on as Sheet RZ-06 of the Rezoning Plan is a Conceptual Master Plan that depicts one scenario for the development of the Site. The Conceptual Master Plan is submitted in more detail for illustrative purposes only, and the purpose of the Conceptual Master Plan is to illustrate the overall design intent for the Site. Accordingly, the ultimate layout, location and sizes of the development depicted on the Conceptual Master Plan may be altered or modified during the design development and permitting phase.
- F. This TND shall be considered to be a planned/defined development.
- G. Administrative amendments to the Rezoning Plan may be requested pursuant to Section 5.1.6.1 of the Ordinance.

10/10/2023 2:39:00PM

2. PERMITTED USES/DEVELOPMENT LIMITATIONS

A. Development Parcel A and Development Parcel B

- (1) Subject to the limitations set out below in paragraph (2), that portion of the Site designated as Development Parcel A may only be devoted to the uses set out below, together with any incidental or accessory uses associated therewith that are permitted under the Ordinance in a TND.
 - (a) Any one-residential use or uses permitted by right, permitted by right with supplemental regulations, permitted with a conditional zoning fee allowed under Section (1) in Section 8.1.12.2.3 of the Ordinance and permitted with a conditional zoning with supplemental regulations in a TND.
 - (b) Any one-residential use or uses permitted by right, permitted by right with supplemental regulations, permitted with a conditional zoning fee allowed under Section (1) in Section 8.1.12.2.3 of the Ordinance and permitted with a conditional zoning with supplemental regulations in a TND.
 - (c) Any one-residential use or uses permitted by right, permitted by right with supplemental regulations, permitted with a conditional zoning fee allowed under Section (1) in Section 8.1.12.2.3 of the Ordinance and permitted with a conditional zoning with supplemental regulations in a TND.
 - (d) Multi-family dwelling units.
 - (e) A lota maximum of 100,000 square feet of gross floor area devoted to the non-residential uses described above in paragraphs 2.A.(1)(a) and 2.A.(1)(b) may be developed on Development Parcel A and Development Parcel B. The allowed non-residential gross floor area shall be allocated between Development Parcel A and Development Parcel B by Applicant.
 - (f) A lota maximum of 150 multi-family dwelling units may be developed on Development Parcel B. This density is permitted under Section 8.1.10.A.2 of the Ordinance absent the rezoning request is a conditional zoning request.

B. Development Parcel C

- (1) Subject to the limitations set out below in paragraph (2), that portion of the Site designated as Development Parcel C may only be devoted to single family detached townhome dwelling units and/or single family detached dwelling units and to any incidental or accessory uses associated therewith that are permitted under the Ordinance in a TND.

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- (2) A lota maximum of 150 dwelling units (whether single family attached (townhome) dwelling units or single family detached dwelling units) may be developed on Development Parcel C.

C. Development Parcel D and Development Parcel E

- (1) Subject to the limitations set out below in paragraphs (2) and (3), that portion of the Site designated as Development Parcel D and Development Parcel E may only be devoted to single family detached dwelling units and/or single family attached (townhome) dwelling units and to any incidental or accessory uses associated therewith that are permitted under the Ordinance in a TND.
 - (2) A lota maximum of 150 dwelling units (whether single family detached dwelling units or single family attached (townhome) dwelling units) may be developed on Development Parcel D and Development Parcel E. The number of dwelling units developed on each of these Development Parcels shall be determined by Applicant, provided, however, that the total number of dwelling units developed on the combined Development Parcel D and Development Parcel E does not exceed 150.
 - (3) Notwithstanding anything contained herein to the contrary, a maximum of 88 single family attached (townhome) dwelling units may be developed on Development Parcel D and Development Parcel E.

3. DIMENSIONAL STANDARDS/SETBACK DEVELOPMENT STANDARDS

- A. The development of the Site shall comply with the applicable dimensional standards of the Ordinance.
- B. Single family detached development shall comply with the applicable provisions of Section 8.1.11 of the Ordinance.
- C. Single family attached (townhome) development shall comply with the applicable provisions of Section 8.1.17 of the Ordinance.
- D. Multi-family development shall comply with the applicable provisions of Section 8.1.10 of the Ordinance.

4. TRANSPORTATION AND PARKING

- A. Vehicular access shall be as generally depicted on the Rezoning Plan. The placement and configuration of the vehicular access points are subject to any minor modifications required to accommodate final site and construction plans and designs and to any adjustments required for approval by the City of Gastonia and/or the North Carolina Department of Transportation ("NCDOT").
- B. The alignment and location of the internal public streets, internal public alleys, internal private alleys, internal private drives and vehicular circulation areas are subject to minor

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- modifications during the permitting process to accommodate final site and construction plans and designs and to accommodate changes in traffic patterns and any adjustments required for approval by the City of Gastonia and/or NCDOT.

- C. The intent is for the proposed development to utilize the R2DD street sections and the relevant section typologies shall be applied to the relevant public streets, public alleys and private alleys within the Site. Public streets, public alleys and private alleys types shall be further defined and refined for the Site during the permitting process.
- D. The number of vehicle parking spaces located on the Site shall meet the requirements of the Ordinance.

5. ARCHITECTURAL AND DESIGN STANDARDS

- A. The maximum height of any building developed on Site shall be governed by the Ordinance.
- B. Single family detached dwelling unit shall comply with the applicable architectural requirements of Section 8.1.11 of the Ordinance.
- C. Single family attached (townhome) dwelling units shall comply with the applicable architectural requirements of Section 8.1.17 of the Ordinance.
- D. Multi-family buildings shall comply with the applicable architectural requirements of Section 8.1.10 of the Ordinance.
- E. Streetscape Treatment Sidewalks
- F. Development of the Site shall comply with the streetscape and sidewalk requirements of the Ordinance.
- G. Tree Save/Open Space
- H. As noted above in paragraph 1.F. this TND is a planned/defined development. Accordingly, the tree save and open space requirements shall be calculated and satisfied over the entire Site, rather than within each Development Parcel or within each individual building site or lot. As a result, each Development Parcel or each individual building site or lot shall not be required to meet the tree save and open space requirements provided that the Site as a whole meets such tree save and open space requirements.

6. GREENWAY TRAIL/SMALL-SCALE PATH

- A. Subject to the approval of the City of Gastonia any other applicable governmental agencies, Applicant shall construct and install within and through Development Parcel E a greenway trail from the southern boundary of Development Parcel E to Development Parcel C common boundary line within future Linwood Park as generally depicted on

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Sheet RZ-04 of the Rezoning Plan (the "Development Parcel E Greenway Trail"). Notwithstanding the foregoing, the actual and ultimate location of the Development Parcel E Greenway Trail shall be determined in conjunction with the City of Gastonia during the permitting process. The Development Parcel E Greenway Trail shall be constructed in accordance with the City of Gastonia's greenway trail standards, and the Development Parcel E Greenway Trail shall be constructed and installed prior to the issuance of a certificate of occupancy for the 225+ dwelling unit constructed on Development Parcel D under Development Parcel E. In the event that Applicant cannot obtain all approvals and permits required to construct and install the Development Parcel E Greenway Trail, then Applicant shall have no obligation to construct and install the Development Parcel E Greenway Trail.

B. Subject to the approval of the City of Gastonia any other applicable governmental agencies, Applicant shall construct and install within and through Development Parcel C and a portion of Development Parcel E a greenway trail from the eastern boundary of Development Parcel C to the Development Parcel E Greenway Trail as generally depicted on Sheet RZ-04 of the Rezoning Plan (the "Development Parcel C Greenway Trail"). Notwithstanding the foregoing, the actual and ultimate location of the Development Parcel C Greenway Trail shall be determined in conjunction with the City of Gastonia during the permitting process. The Development Parcel C Greenway Trail shall be constructed in accordance with the City of Gastonia's greenway trail standards, and the Development Parcel C Greenway Trail shall be constructed and installed prior to the issuance of a certificate of occupancy for the 100th dwelling unit constructed on Development Parcel C. In the event that Applicant cannot obtain all approvals and permits required to construct and install the Development Parcel C Greenway Trail, then Applicant shall have no obligation to construct and install the Development Parcel C Greenway Trail.

C. The Development Parcel E Greenway Trail and the Development Parcel C Greenway Trail shall be privately maintained by Applicant until such time that these greenway trails are connected to the City of Gastonia's public greenway trail system. At such time that the Development Parcel E Greenway Trail and the Development Parcel C Greenway Trail are connected to the City of Gastonia's public greenway trail system, Applicant shall dedicate and convey to the City of Gastonia the Development Parcel E Greenway Trail and the Development Parcel C Greenway Trail and sufficient area adjacent to each greenway trail to accommodate the maintenance of those greenway trails by the City of Gastonia.

D. Applicant shall construct and install a 10-foot wide multi-use path along the western side of Dupont of Public Street A that is more particularly depicted on Sheet RZ-04 of the Rezoning Plan.

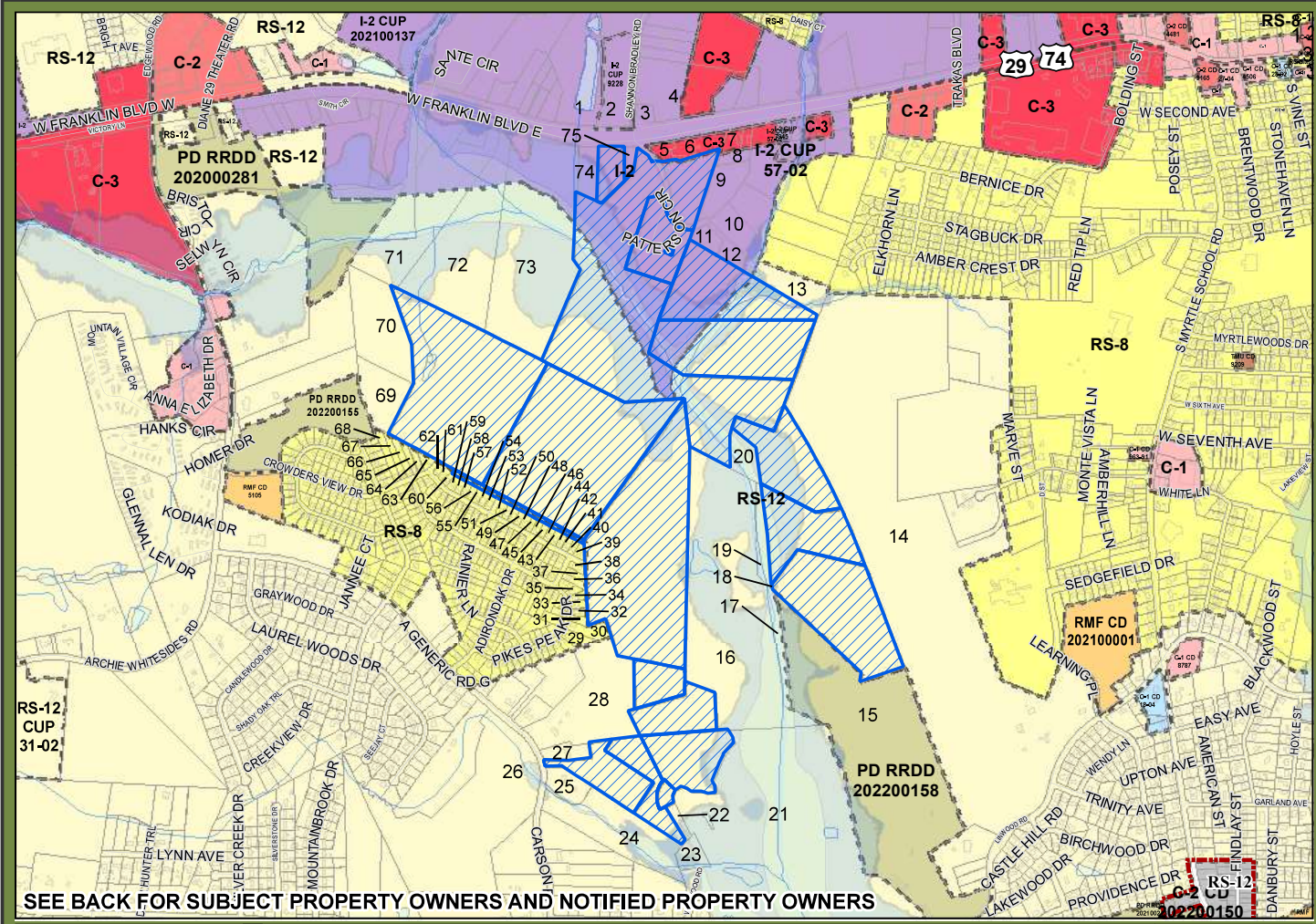
9. POTENTIAL CONNECTIONS TO FUTURE LINWOOD PARK

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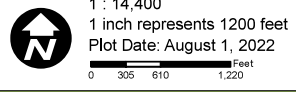


Applicant: Crowders Creek Holdings, LLC
Owner: Multiple Owners (see back for list)
Planning Comm Hearing: August 18, 2022
Request: RS-12 & I-2 to PD TND
Ward: 6
Total Tract Size: approx. 285.22 acres
Parcel ID #: 138180, 153859, 202262, 138181, 153977, 138224, 222537, 222539, 222543, 138700, 138701, 138709, 138723, 138798, 222545, 138222, 138223, 138075, 153979

Subject Property

- Legend**
- AP Airport
 - C-1 Light Commercial
 - C-2 Highway Commercial
 - C-3 General Commercial
 - CBD Central Business District
 - I-U Urban Industrial
 - I-1 Light Industrial
 - I-2 General Industrial
 - C-1 Office
 - OLC Office/Light Commercial
 - O-M Medical Office
 - PD IRD Planned District Infill Res Devt
 - PD PRD Planned District Planned Res Devt
 - PD RRDD Planned District Revised Res Devt District
 - PD PUD Planned District Planned Unit Devt
 - PD TND Planned Dist Traditional Neighborhood Devt
 - RLD Residential Low Density
 - RS-12 Residential 12000sqft lots
 - RS-8 Residential 8000sqft per lot
 - R-A Rural Agricultural
 - RMF Residential Multi-Family District
 - SP State Park District
 - TMU Transitional Mixed Use
 - UMU Urban Mixed Use District
 - City Boundary
 - Floodway
 - 100yr Flood Zone
 - 500yr Flood Zone
 - Streams
 - Lakes
 - Rivers
 - Buildings
- Gaston County Zoning**
- RS-12

Note: For a complete elaboration of zoning classifications, see the Unified Development Ordinance or contact the City of Gastonia Planning Department at (704) 854-6652.



SEE BACK FOR SUBJECT PROPERTY OWNERS AND NOTIFIED PROPERTY OWNERS

Application
PLMAC202100505

I, _____, hereby certify that all mail notices, in the absence of fraud, were mailed to all affected and adjoining property owners on _____, 2022.



PLMAC202100505**SUBJECT PROPERTY OWNERS**

R P ANTHONY JR IRR CHILDREN TR
 ANTHONY FARM LLC
 CROWDERS CREEK HOLDINGS LLC
 MCGILL ANN HEIRS & OTHERS MCARTER DONALD 13%
 MCGILL ANN M HEIRS OF & ANTHONY WE JR
 HARRIS KATHRYN HOLT ANTHONY
 HAWKINS EDWINA ANTHONY
 BARRETT JAMES MARK & BARRETT TERESA H
 CROWDERS VIEW PROPERTIES LLC
 W E ANTHONY FARMS C/O JULIAN MCGILL
 BAUMRIND VERNON E & WINGET CONNIE MILLER

PROPERTY OWNERS NOTIFIED

1. ABSHER FLOWERS POST 9337 VFW
 2. POWELL MYRTLE H
 3. MCELVEEN MILDRED M
 4. MCELVEEN MILDRED
 5. CAMPBELL JAMES DAVID III & CAMPBELL FALON
 6. DUNAWAY MARY FRANCES
 7. PUTNAM VIRGINIA
 8. PUTNAM VIRGINIA
 9. SMITH MARTHA P & PUTNAM DEAN A
 10. SMITH MARTHA P
 11. STEWART HANK R

12. DAVIDSON MISTY D
 13. ALEXANDER JANICE
 14. DOCKERY PROPERTIES LLLP C/O DAVID DOCKERY C/O BETTY M
 15. HOFFMAN JACOB HUNTER
 16. N C DEPT OF TRANSPORTATION R/W DEPT
 17. N C DEPT OF TRANSPORTATION R/W DEPT
 18. N C DEPT OF TRANSPORTATION R/W DEPT
 19. N C DEPT OF TRANSPORTATION R/W DEPT
 20. N C DEPT OF TRANSPORTATION R/W DEPT
 21. N C DEPT OF TRANSPORTATION R/W DEPT
 22. N C DEPT OF TRANSPORTATION R/W DEPT
 23. CAROLINA WATER SERVICE INC
 24. ASHWORTH CAROLYN C ½ & CARSON EDWARD & SHARON W 1/2
 25. ASHWORTH CAROLYN CARSON
 26. PISGAH ASSOCIATE REFORMED PRES
 27. CARSON EDWARD J & CARSON SHARON
 28. ASHWORTH CAROLYN CARSON & CARSON EDWARD JOHN
 29. DUNBAR JANICE A
 30. NEAL JARISA N
 31. JONES CHARLES A II & JONES AMBER W
 32. MERCER CHRISTOPHER & MERCER SHANTE
 33. MCCLELLAND LINDSAY L & MCCLELLAND SHAWN C
 34. TRAPP DARIN
 35. CSMA BLT LLC C/O FIRSTKEY HOMES LLC
 36. GILMORE WILLIAM
 37. BITTLE JESSE
 38. DYER DAWNELL
 39. MEHTA PRIYANSIBEN & MEHTA NISHANT
 40. FLOWE ANGELO J
 41. PHIFER ROBIN E JR & PHIFER ANITRA NASH
 42. ALFRED A TAYLOR REVOCABLE TR
 43. KENDRICK RANDY & KENDRICK PAMELA
 44. BRIDGES ROANLD & BRIDGES ENITA SUGIH
 45. GORE DEREK LAMAR & GORE CASHELL
 46. FARON DEBORAH MIKEAL & SMITH ANTOINE
 47. SFR JV-1 2019-1 BORROWER LLC C/O TRICON AMERICAN HOMES LLC
 48. WILLIAMS MICHAEL J & CHAMBERS CHARIS

49. RUDA COREY CHRISTIAN
 50. BADAWI MICHEL & BADAWI DEBRA
 51. WHITESIDE HASSAN NIAM
 52. WATSON PIA N
 53. CASTRO STEVEN & CASTRO WILLIAM
 54. JEFFRIES MIRAFEB
 55. IH4 PROPERTY NORTH CAROLINA LP C/O INVITATION HOMES-TAX DEPT
 56. SFR JV-1 2020-1 BORROWER LLC C/O TRICON AMERICAN HOMES LLC
 57. MILLER BERYL M
 58. PECHE CHRISTOPHER & DE LA ROSA CLAUDIA G CABRERA
 59. BATES ANTHONY & BATES RENTA
 60. SFR JV-1 2019-1 BORROWER LLC C/O TRICON AMERICAN HOMES LLC
 61. 2018-2 IH BORROWER LP C/O INVITATION HOMES
 62. ALONSO CHRISTINA
 63. SHUM KIN LAM & CHIU-SHUM JOYCE W
 64. DEJESUS RAMON & GALARZA LIZNETTE S
 65. HORTON MONIQUE
 66. HENSLEY ZACHARY & HENSLEY KELSEY
 67. CAGLE COREY D
 68. BARNES JAMES M & BARNES DIANE M
 69. MOORE WILLIAM R & MOORE GERALDINE
 70. JENKINS CAMILLA B
 71. FOX RUSSELL C/O 1ST CHOICE HOUSING INC
 72. FOX RUSSELL C/O 1ST CHOICE HOUSING INC
 73. PATTERSON BILLY KEITH
 74. LTE INC C/O LISA ELLIOTT
 75. SHOOK FAMILY REAL ESTATE LLC



TREE PRESERVATION INSET SCALE: 1"=150'

MULTI-FAMILY DEVELOPMENT GUIDELINES (SECTION 8.1.10)

- MULTI-FAMILY DEVELOPMENT MUST BE SERVED BY A PUBLIC WATER AND SEWER SYSTEM.
- MINIMUM BUILDING HEIGHT SHALL BE UNDERLYING ZONING DISTRICT.
- MINIMUM LOT SIZE SHALL BE 10,000 SQUARE FEET.
- COMMON OPEN SPACE - IN ALL ZONING DISTRICTS EXCEPT FOR CBD, TLU AND UMI, THE FOLLOWING AMOUNT OF COMMON OPEN SPACE SHALL BE PROVIDED:
 - LESS THAN TEN (10) UNITS: NO OPEN SPACE REQUIRED.
 - TEN TO TWO HUNDRED (200) UNITS: EIGHT HUNDRED (800) SQUARE FEET PER UNIT.
 - ANY ADDITIONAL UNITS OVER TWO HUNDRED (200): FOUR HUNDRED (400) SQUARE FEET PER UNIT.
 - AT LEAST SEVENTY-FIVE (75) PERCENT OF THE OPEN SPACE SHALL BE PROVIDED ON SPACES REFERRED TO AS OPEN SPACE, THE STANDARDS AND TYPE OF OPEN SPACE SHALL BE IN ACCORDANCE WITH SECTION 8.1.11 OPEN SPACE.
- APPROVAL PROCESS:

AREA OF TRACED LESS THAN TWO (2) ACRES.	NO REQUIRED PERMITS.	APPROVAL PROCESS: ADMINISTRATIVE APPROVAL.
TWO (2) ACRES OR MORE LOCATED IN THE TLU, UMI OR UJ ZONING DISTRICT.	YES FOR CBD.	PLANNING COMMISSION AND/OR CITY COUNCIL.
TWO (2) ACRES OR MORE, ALL OTHER DISTRICTS.	NO REQUIRED PERMITS.	APPROVAL PROCESS: ADMINISTRATIVE APPROVAL.
- OFF-STREET PARKING REQUIREMENTS - PARKING SHALL BE PROVIDED IN ACCORDANCE WITH CHAPTER 18 HEREIN.
 - REQUIRED PARKING SPACES: 54 - PHASE 1, 91 - PHASE 2 (1.5/UNIT)
 - PROVIDED PARKING SPACES: 84 (BL, B ACC), PHASE 1, 93 (BL, C, ACC), PHASE 2
 - BUFFER REQUIREMENTS - BUFFER SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 11.3.2 BUFFER YARD REQUIREMENTS.
- MULTI-FAMILY BUILDING DESIGN STANDARDS:
 - ALL MULTI-FAMILY APARTMENT BUILDINGS LOCATED WITHIN TWO HUNDRED (200) FEET OF A PUBLIC STREET SHALL BE ORIENTED PARALLEL WITH THE FACED YARD. NOTE: THE ABOVE REFERENCE ORIENTATION REQUIREMENTS SHALL BE WAIVED IF SCREENED BY THE FORM OF A TYPE B OR C BUILDING. IN ALL ZONING DISTRICTS, THE ADMINISTRATOR SHALL HAVE THE AUTHORITY TO WAIVE OR MODIFY THE ABOVE REQUIREMENTS IF THE ADMINISTRATOR DETERMINES THAT THE SUBJECT PROPERTY WOULD MAKE MEETING THE REQUIRED WIDTH IMPRACTICAL OR UNDESIRABLE.
 - FRONT BUILDING LINES SHALL BE A MINIMUM OF FIVE (5) FEET BEHIND INTERNAL STREETS AND SIDEWALKS. THE FT SETBACK SHALL BE PLACED ALONG THE ENTIRE LENGTH OF THE BUILDING EXCEPT AT BUILDING ENTRANCES (WITH AT LEAST ONE (1) SETBACK PER BK (5) LINEAR FEET, FOR BUILDINGS THAT DO NOT PROVIDE OPEN PORCHES AND PATIOS ALONG AN ELEVATION FROM THE INTERNAL STREETS AND SIDEWALKS. THE FRONT BUILDING LINE MAY BE A MINIMUM OF ZERO (0) FEET.
 - NO OFF-STREET PARKING SPACES MAY BE PLACED IN FRONT YARD UNLESS A TYPE B OR HIGHER CORNER OR END UNIT IS PROVIDED. THE SETBACK SHALL BE PLACED ALONG THE ENTIRE LENGTH OF THE OFF-STREET PARKING SPACES IN THE FRONT YARD.
 - MULTI-FAMILY APARTMENT BUILDINGS SHALL PROVIDE A MINIMUM OF TEN (10) FEET BETWEEN THE SIDES OF ALL CONSECUTIVE BUILDINGS PLUS AN ADDITIONAL FIVE (5) FEET OF SEPARATION FOR BUILDINGS TWO STOREYS AND GREATER IN CO. TWO (2) AND UMI ZONES THE PROVISION OF MULTI-FAMILY SUPPLEMENTAL REGULATIONS 8.1.11 OPEN SPACE A MINIMUM OF 30 IN WIDTH. FOR BUILDINGS TALLER THAN TWO (2) STOREYS THE MINIMUM WIDTH SHALL BE INCREASED TO THE EQUAL TO THE HEIGHT OF THE TALLEST BUILDING PLUS 10 IN CO. AND TLU ZONES ATTACHED SINGLE FAMILY HOMES SHALL SET BACK A MIN OF 5' FROM A FRONTING SIDEWALK. PROVIDE A MINIMUM OF TEN (10) FEET BETWEEN THE SIDES OF ANY TWO (2) ATTACHED SINGLE FAMILY HOMES. THE REAR SETBACK SHALL BE INCREASED TO SEVENTY-FIVE (75) FEET IF THE UNITS ARE TO BE DECREASED TO FIFTY (50) FEET. THE ENTIRETY OF THE REAR YARD AND THE SIDE YARD UP TO THE REAR PACKAGE OF THE BUILDING SHALL BE FENCED TO A MINIMUM HEIGHT OF 5'.
 - FRONT SETBACKS: FRONT SETBACKS SHALL BE COMPLETELY GRADE MAINT OR BRICK. SIX (6) FEET FACE BRICK OR STUCCO. ON AN INTERNAL STREET APPROVED BY THE ZONING ADMINISTRATOR, FRONT SETBACKS FOR DETACHED SINGLE-FAMILY HOMES THAT HAVE UNPROTECTED PARKING SHALL SET BACK ALL PORTIONS OF A BUILDING USED FOR PARKING, WHETHER ATTACHED, DETACHED, ENCLOSED OR OPEN. A MIN OF 20' FROM A FRONTING SIDEWALK. ALL ATTACHED SINGLE-FAMILY HOMES THAT HAVE A COMBINE FRONTAGE TOTAL OF 50' OR LESS IN WIDTH SHALL BE ACCESSED AND PARKED FROM THE REAR YARD. THE FRONT SETBACK SHALL BE AS THE TOTAL OF THE BUILDING FACE. ATTACHED SINGLE-FAMILY HOMES, ATTACHED SINGLE-FAMILY DUPLEX AND DETACHED SINGLE-FAMILY HOMES SHALL BE FENCED TO A MINIMUM HEIGHT OF 5' FROM THE FRONT YARD. SUPPLEMENTAL REGULATIONS 8.1.11 OPEN SPACE A MINIMUM OF 30 IN WIDTH MEASURED FROM BUILDING FRONT YARD TO FOLLOW SIDEWALK.
 - TRASH DUMPSTERS SHALL BE SCREENED IN ACCORDANCE WITH SECTION 11.4. OPEN AIR STORAGE AND SOLID WASTE DUMPSTER SCREENING. NO DUMPSTERS SHALL BE PLACED IN THE FRONT YARD SETBACK.
 - THE PRIMARY PEDESTRIAN ENTRANCE TO THE BUILDING SHALL BE FROM THE FRONT YARD SIDEWALK.
 - AT LEAST FIFTY (50) PERCENT OF THE FRONT ELEVATION OF THE MULTI-FAMILY APARTMENT BUILDING SHALL BE CLAD WITH BRICK, ROCK, DECORATIVE BLOCK, APPROVED STUCCO AND OTHER PERMITTED MASONRY MATERIALS AS DETERMINED BY THE ZONING ADMINISTRATOR OR APPROVAL BODY IN INSTANCES WHERE A SPECIAL USE PERMIT OR CONCEPTUAL ZONING REVIEW IS REQUIRED. BUILDINGS LOCATED IN THE CBD AND UMI WILL FOLLOW THE DESIGN STANDARDS FOR THOSE DISTRICTS. BUILDINGS LOCATED IN TLU ZONES SHALL FOLLOW THE DESIGN STANDARDS OF THE CBD AND UMI ZONES. ATTACHED SINGLE-FAMILY HOMES, ATTACHED SINGLE-FAMILY DUPLEX AND DETACHED SINGLE-FAMILY HOMES SHALL FOLLOW THE DESIGN STANDARDS OF THE CBD AND UMI ZONES. FLAT ROOFED BUILDINGS IN A C-2 ZONE SHALL FOLLOW THE REQUIREMENTS OF THE CBD AND UMI ZONES.
 - FOR MULTI-FAMILY APARTMENT BUILDINGS GREATER THAN ONE HUNDRED (100) FEET LONG, THERE SHALL BE NO UNINTERRUPTED WALL LENGTH EXCEEDING SEVENTY-FIVE (75) FEET. AN INTERRUPTION SHALL CONSIST OF A CHANGE IN PLACE OR MORE THAN ONE FOOT OF A CHANGE IN TEXTURE/MATERIALS. MULTI-FAMILY APARTMENT BUILDINGS LOCATED IN THE CBD AND UMI WILL FOLLOW THE DESIGN STANDARDS FOR THOSE DISTRICTS. BUILDINGS LOCATED IN TLU ZONES SHALL FOLLOW THE DESIGN STANDARDS OF THE CBD AND UMI ZONES.
 - FOR MULTI-FAMILY APARTMENT BUILDINGS THAT HAVE A LENGTH GREATER THAN ONE HUNDRED (100) FEET, ONE INTERRUPTION SHALL BE REQUIRED WITHIN THIRTY (30) FEET ON EITHER SIDE OF THE CENTER OF THE BUILDING. MULTI-FAMILY APARTMENT BUILDINGS LOCATED IN THE CBD AND UMI WILL FOLLOW THE DESIGN STANDARDS FOR THOSE DISTRICTS. BUILDINGS LOCATED IN TLU ZONES SHALL FOLLOW THE DESIGN STANDARDS OF THE CBD AND UMI ZONES.
 - EACH EXTENSION FRONT DOOR THAT PROVIDES ACCESS TO AN INDIVIDUAL UNIT OR ANY SHARED DOOR (E.G. A DOOR THAT PROVIDES ACCESS TO MORE THAN ONE UNIT FROM THE EXTENSION) SHALL HAVE A DOOR THAT FORMS THE PREDOMINANT ASPECT OF THE BUILDING FRONTAGE. THE DOOR SHALL BE CONSTITUTE AT LEAST FIFTEEN (15) PERCENT OF THE FRONT PACKAGE OF EACH APARTMENT UNIT. BUILDINGS LOCATED IN THE CBD AND UMI WILL FOLLOW THE DESIGN STANDARDS FOR THOSE DISTRICTS. BUILDINGS LOCATED IN TLU ZONES SHALL FOLLOW THE DESIGN STANDARDS OF THE CBD AND UMI ZONES. MULTI-FAMILY APARTMENT BUILDINGS LOCATED IN A C-2 AND UMI ZONES ARE EXEMPT.
 - AT LEAST ONE GROUND ENTRANCE TO EVERY DWELLING SHALL BE LOCATED WITHIN A WALKING DISTANCE OF ONE HUNDRED (100) FEET TO THE PARKING AREA WITHIN THE DEVELOPMENT DEBATED TO SERVE THAT DWELLING.
 - SEWALINK REQUIREMENTS - REFER TO SECTION 8.1.1.
 - GREENSTRIP REQUIREMENTS - REFER TO SECTION 8.1.2.

NUMBER OF UNITS	RESIDENTIAL - MULTIFAMILY	BEREDROOMS PER HOME	FLOW (GAL PER DAY)	TOTAL FLOW (GPD)
13	384	2,086	1,386	1,386
14	2	240*	5,760	5,760
12	3	360*	4,320	4,320
AMENITY CENTER				
AVERAGE PERSON PER DAY		FLOW GAL/PERSON	TOTAL FLOW (GPD)	
20		15*	280	
TOTAL ESTIMATED PROJECT FLOW (GPD): 13,166				

NUMBER OF UNITS	RESIDENTIAL - MULTIFAMILY	BEREDROOMS PER HOME	FLOW (GAL PER DAY)	TOTAL FLOW (GPD)
18	3	360*	4,320	4,320
17	2	240*	4,080	4,080
17	3	360*	4,320	4,320
TOTAL ESTIMATED PROJECT FLOW (GPD): 14,520				

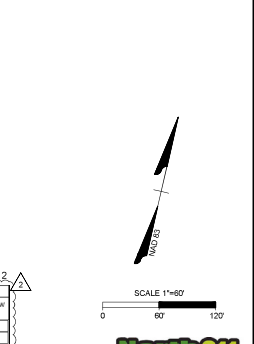
*FLOW RATES BASED ON IGA NCA0027 DESIGN CRITERIA

SITE INFORMATION

- PROPERTY AREA: AREA = 148,485 SF (3.35 ACRES)
 PHASE 1 = 148,485 SF (3.35 ACRES)
 PHASE 2 = 23,242 SF (0.53 ACRES)
- NUMBER OF UNITS (PHASE 1): 48 UNITS (14 UNPROTECTED 1 BEDROOM, 12 UNITS (960 SF), 2 UNITS (14 UNPROTECTED 2 BEDROOM, 24 UNITS (960 SF))
- NUMBER OF UNITS (PHASE 2): 52 UNITS (14 UNPROTECTED 1 BEDROOM, 18 UNITS (960 SF), 2 UNITS (14 UNPROTECTED 2 BEDROOM, 18 UNITS (1,100 SF))
- EXISTING ZONING: RMF (C2)
 PROPOSED ZONING: RMF (C2)
- SETBACKS: BUILDINGS FRONT - 5' SIDE - 10' (25' LEARNING PL) REAR - 10'
- FLOORPLAN: NOT APPLICABLE
- PARKING REQUIREMENTS: MIN. 1.75 SPACES PER UNIT (NOHFA) MAX. 2 SPACES PER UNIT (CARTON)
- PHASE 1 PARKING SPACES PROV. 84 (1.75 SPACES/UNIT)
 PHASE 2 PARKING SPACES PROV. 91 (1.75 SPACES/UNIT)
 PHASE 2 PARKING SPACES PROV. 93 (INCLUDES 8 ACCESSIBLE SPACES)
 REQUIRED C.O.D.: 50,000 SF (500 SF/UNIT) (2,400 SF - PH 1, 4,600 SF - PH 2)
- BUILDING HEIGHT: 10 MIN. BEHIND SIDEWALK
- NOTES:
 1. BUILDING MATERIALS, COLOR PALETTE, ETC. WILL NEED TO BE SUBMITTED AND IN COMPLIANCE WITH 8.1.10 OF THE UOD.
 2. REZONING WOULD NEED TO BE CONDITIONAL DUE TO THE NUMBER OF UNITS PER ACRE.
 3. SEE SECTION 8.1.10 MULTI-FAMILY DEVELOPMENT STANDARDS FOR MORE INFORMATION.
 4. TREE SURVEY AND REMOVAL PLAN WILL APPLY. SEE CHAPTER 20 IN GASTON COUNTY CODE OF ORDINANCES FOR MORE INFORMATION.
 5. EACH BUILDING WILL BE SERVED BY A SINGLE DOMESTIC WATER METER.
 6. WATER METER FEES AND SYSTEM DEVELOPMENT FEES WILL APPLY.
 7. EACH FDC IS REQUIRED TO BE LOCATED WITHIN 100 FEET OF A FIRE HYDRANT.
 8. TREE HYDRANTS SHALL BE SPACED NO FURTHER THAN 500 FEET APART.
 9. THE INTERNAL PEDESTRIAN CONNECTION BETWEEN THE PHASES WILL BE FURTHER EVALUATED DURING THE SITE PLAN REVIEW PROCESS TO ASSESS THE METEOROLOGICAL AND ENVIRONMENTAL IMPACTS. THE ADMINISTRATOR MAY EVALUATE THE IMPACTS TO CONFIRM THE REQUIREMENT FOR A PEDESTRIAN CONNECTION IF THE PEDESTRIAN CONNECTION IS TO BE CONSTRUCTED. THE TIME OF THE LOCATION AND DESIGN WILL BE FURTHER REVIEWED AND DETERMINED DURING THE SITE PLAN REVIEW PROCESS. THE TIME OF THE CONSTRUCTION FOR EACH PHASE OF THE PEDESTRIAN CONNECTION SHALL OCCUR DURING THE APPROPRIATE PHASE.

TREE PRESERVATION CALCULATIONS

- SITE ACRES: 0.91 ACRES (2)
- REQUIRED TREE PRESERVATION: 1.68 ACRES (18% OF TOTAL SITE AREA)
- PROVIDED TREE PRESERVATION: 2.0 ACRES (19.5% OF TOTAL SITE AREA)
- UNDISTURBED TREE SAVIE AREA: 138,951 SF
- COMMON OPEN SPACE: 238,242 SF



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1. CONTRACTOR SHALL FOLLOW ALL LOCAL, STATE AND FEDERAL REGULATIONS AND ORDINANCES THAT APPLY TO THE PROJECT.
 2. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES.
 3. ALL NECESSARY UTILITIES SHALL BE LOCATED AND MARKED PRIOR TO CONSTRUCTION.
 4. ALL NECESSARY UTILITIES SHALL BE PROTECTED AND MARKED PRIOR TO CONSTRUCTION.
 5. ALL NECESSARY UTILITIES SHALL BE PROTECTED AND MARKED PRIOR TO CONSTRUCTION.

SHEET ISSUE

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	03/11/2025
2	CONTRACTOR REVIEW	03/11/2025
3	ISSUED FOR PERMIT	03/11/2025

TIMMONS GROUP
 1100 W. HARRIS STREET, STE. 100
 CHARLOTTE, NORTH CAROLINA 28202
 PH: (704) 366-1100
 FAX: (704) 366-1101

M+A
 24 SOUTH BROOKE STREET
 FOND DU LAC, WISCONSIN 54937
 PH: (920) 926-8170
 FAX: (920) 926-8170
 matt@madesigninc.com

COMMONWEALTH COMPANIES
 24 SOUTH BROOKE STREET
 FOND DU LAC, WISCONSIN 54937
 PH: (920) 926-8170
 FAX: (920) 926-8170

FAMILY APARTMENTS FOR: ENCLAVE AT FOREST HEIGHTS
 100 LEARNING PLACE
 GASTONIA, NC 28052

JOB NUMBER: 2024.XX
 REZONING PLAN
RZ-100