CITY OF GASTONIA COMPREHENSIVE BICYCLE PLAN

ADOPTED JUNE 20, 2023

Integrated Mobility Division
N.C. DEPARTMENT OF TRANSPORTATION

GASTONIA NC
Great Place. Great People. Great Promise.

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ACKNOWLEDGEMENTS

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INTRODUCTION

Project Purpose

Safe and comfortable bicycle facilities are the foundation for a multimodal transportation network and sustainable development in the City of Gastonia. Using funding from the NCDOT Bicycle and Pedestrian Planning Grant Initiative, the City has developed this comprehensive bicycle plan to build on recommendations from previous planning efforts and align with future redevelopment areas. The City of Gastonia Bicycle Plan presented here identifies and prioritizes projects, policies, and programs that improve biking in the city.

A substantial portion of Gastonia residents lack transportation access. Strategic planning and prioritizing bicycle infrastructure and programming will help the City meet that critical need. Citywide, around 7% of households in Gastonia do not have a vehicle and nearly 17% of the city's population is in poverty. However, there are neighborhoods within Gastonia with higher portions of zero vehicle households and people in poverty.[1] Several census block groups across the city have at least 17% of households with no vehicle access. Other areas in Gastonia have at least 34% of households with no vehicle access. Large portions of the community have 31% of their population with incomes below the poverty line.[2] The rates of zero vehicle households and people in poverty are higher in Gastonia than statewide rates. Approximately 6% of households do not have a vehicle and 15% of people are experiencing poverty statewide.[3]

This plan provides support for the City's goals to:

- Support future redevelopment areas with quality bicycle infrastructure
- Increase connectivity in the greenway system
- Provide safe and comfortable non-automobile transportation options between and within neighborhoods

Bicycling plays a significant role in creating healthy, safe, and livable communities. It provides opportunities for affordable commuting, physical activity, and recreation. Bicycling can also serve as a "first mile, last mile" solution to connect people to other transportation modes, such as carpool or transit.

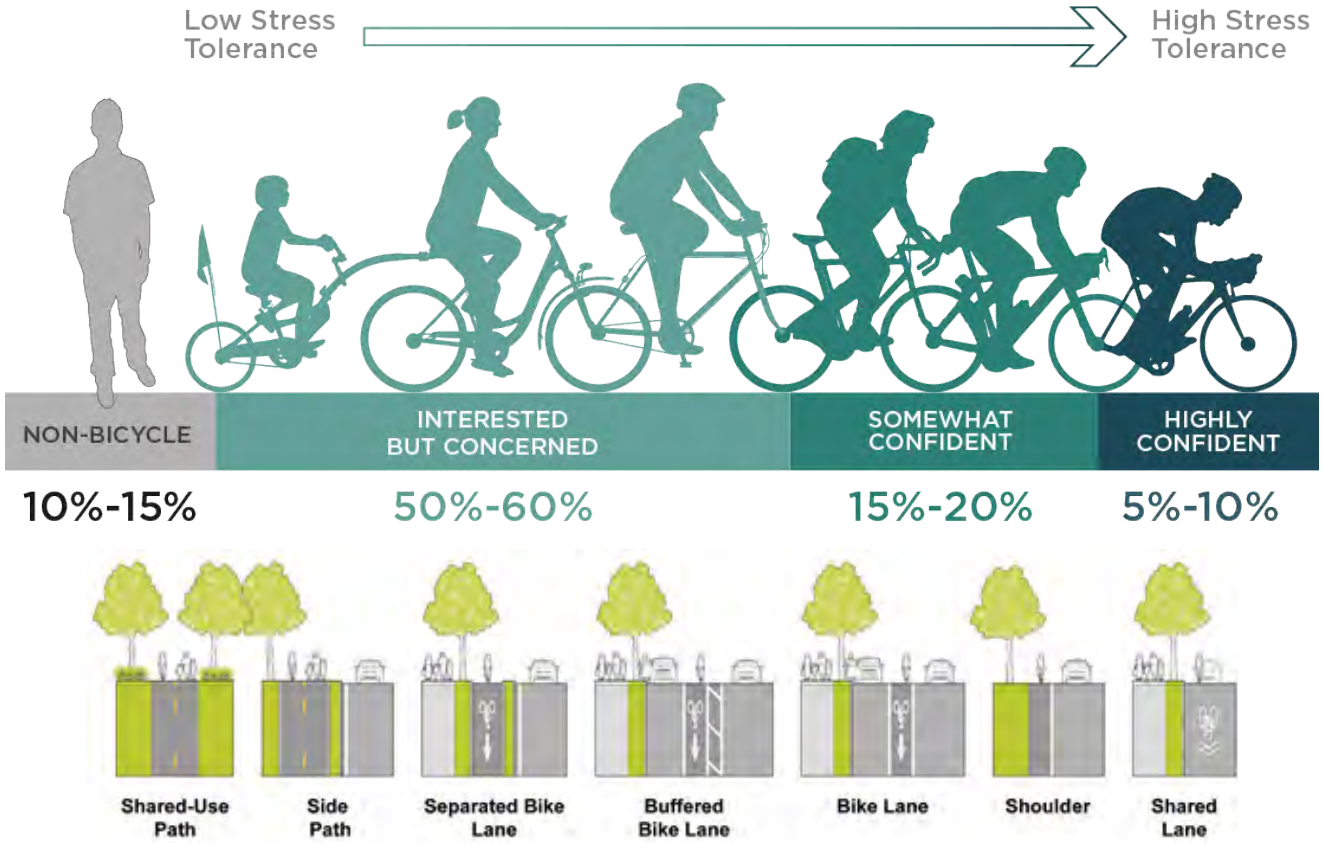
[1] 2019 American Community Survey (5-Year Estimates). U.S. Census Bureau. Prepared by Social Explorer, accessed April 14, 2022.
[2] Gaston-Cleveland-Lincoln Metropolitan Planning Organization, 14 November, 2018, Percentage of Population Under Poverty Line, from US Census data, North Carolina Department of Transportation Application for Bicycle and Pedestrian Planning Grant Funds – Fall 2019 Call for Proposals.
[3] 2019 American Community Survey (5-Year Estimates). U.S. Census Bureau. Prepared by Social Explorer, accessed April 14, 2022.

BICYCLE NETWORK DESIGN FOR ALL USERS

To support a safer, healthier, and more connected and accessible community, a bicycle network needs to be planned and designed with facilities that are comfortable for all types of riders. Cyclists who require low-stress bicycle facilities with low vehicle speeds and volumes and/or dedicated bicycle facilities make up a large percentage of potential bicyclists. Designing for these users will help expand safe and efficient bicycling throughout a community.

The Level of Traffic Stress (LTS) is a scoring system used to evaluate how comfortable a street is for different types of cyclists. Low-stress bicycle facilities that are located on streets with low speeds and volumes, or that are separated from traffic, will appeal to a larger number of users.

BICYCLE LEVEL OF TRAFFIC STRESS



Percentages of cyclist types are based on a study of adults living in the 50 largest U.S. metropolitan areas

Planning Process

Together, the project team, which included the City of Gastonia, Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO), the North Carolina Department of Transportation (NCDOT), and the Project Steering Committee (PSC), guided the development of this Plan through three phases.

First, the project team evaluated existing bicycling and transportation network conditions. Mapping annual average daily traffic and crash data enabled the team to gain a better understanding of Gastonia and Gaston County's unique contexts and conditions. During this phase, the team also reviewed relevant plans and projects to both identify where further support could improve Gastonia's bicycle facility network and to make sure this plan supports previous and existing work.

In phase two, the project team worked with the PSC and the public to develop the plan's goals and vision and identify key issues and opportunities to be addressed in the plan. Stakeholder outreach and public involvement in the form of an online public survey, interactive mapping, and public meetings solicited valuable feedback that enabled the project team to better serve the needs of the community.

To develop a proposed bicycle network that meets Gastonia's transportation needs, the project team examined all prospective bike facility corridors, including those identified by previous projects as well as areas noted during engagement with the public and the PSC. The project team then removed redundant paths and facilities and narrowed the prospective facility areas to the most feasible. Working with the project steering committee throughout this phase helped make sure the proposed network included the most important areas for Gastonia. Scoring and ranking these projects according to priority allowed the project team to create a realistic, useful, and appropriately sized bicycle network for the community. Prioritization also provides the City a clear path forward and a set of clear criteria for evaluation and performance measures.

In the final phase of the project, the team developed a draft of the Bicycle Plan. The plan was reviewed by the city, MPO, and PSC and presented to the community during Public Meeting #2. The plan was revised based on comments received and a final plan was submitted to NCDOT for review and approval. Upon NCDOT approval, the plan will be submitted to the City for adoption.

Vision & Goals

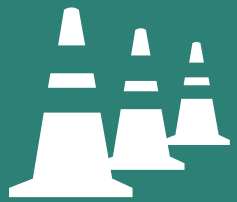
At the outset, the project team collaborated with the community and stakeholders to develop a vision and set of goals for the plan that are aligned with the Gastonia community's needs.

VISION

The City of Gastonia is a welcoming place to safely and comfortably bike to local destinations such as downtown, jobs, neighborhoods, and parks and trails. Cycling in Gastonia is an equitable and viable transportation option that contributes to the overall quality of life for residents and visitors.

GOALS

The following six goals provide a framework for developing recommendations for the Plan. These goals were also used to evaluate how well proposed projects achieve each of the goals.



SAFETY

Reduce the number and severity of crashes involving cyclists.

COMFORT

Support cycling as a safe, convenient, accessible, and desirable mode of transportation for people of all ages and abilities.

CONNECTIVITY

Create an interconnected network of bicycle facilities, greenways, and trails throughout the city with links to regional trail facilities and other modes of transportation.

ACCESSIBILITY

Improve connections between neighborhoods, jobs, and key destinations—such as downtown and employment areas—for residents and visitors.

COORDINATION

Incorporate cyclists' needs into development and redevelopment projects, including when retrofitting existing infrastructure.

EQUITY

Develop cycling infrastructure that connects to all population types, including underrepresented groups

PUBLIC ENGAGEMENT

A successful bicycle plan uses public input to meet the community's needs. The Project Steering Committee (PSC), a public survey, an online interactive map, as well as two public meetings provided the vital community feedback for this plan.

Project Steering Committee

The PSC guided the overall direction of the bicycle plan by providing input at key points during its development. Representatives from the City of Gastonia, Gaston County, GCLMPO, NCDOT, and the Carolina Thread Trail, as well as a selection of local stakeholders and citizens interested in bicycling served on the PSC.

The PSC met three times during the plan's development. The content discussed at each meeting is as follows:

PSC MEETING #1: MAY 2021

- Plan development overview
- Existing conditions
- Vision and goals
- Challenges and opportunities

PSC MEETING #2: AUGUST 2021

- Proposed bicycle network
- Project evaluation and prioritization
- Demonstration project (Garrison Boulevard) concepts

PSC MEETING #3: OCTOBER 2021

- Facility selection
- Program and Policy Recommendations
- Draft Plan

To provide valuable feedback on key elements of the plan, the PSC:

- Identified key words and themes for the plan's vision statement by participating in a virtual word cloud exercise
- Commented on the proposed goals
- Identified areas in need of bicycle facilities
- Suggested changes to the project prioritization criteria
- Considered designs for the demonstration project

Public Survey

A public survey asked community members about their biking behavior, where they like to bike, and what barriers keep them from biking. The survey also asked about biking destinations in Gastonia and what bicycle facility types the City should prioritize. The survey had 137 respondents and was open for comment from May 6 to June 7, 2021. Responses are summarized in **Figures 1–11**.

SURVEY RESPONSES

FIGURE 1: HOW OFTEN DO YOU RIDE A BIKE?

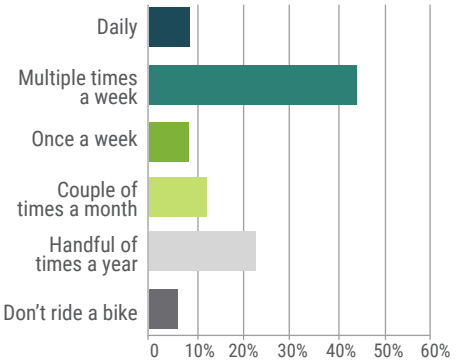


FIGURE 2: WHERE DO YOU TYPICALLY GO WHEN YOU RIDE A BIKE?

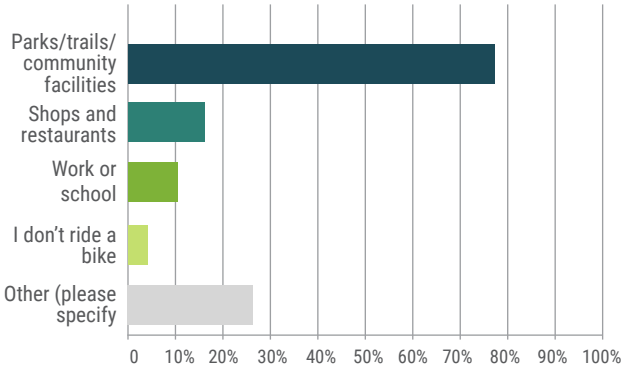


FIGURE 3: WHAT MOTIVATES YOU TO RIDE A BIKE?

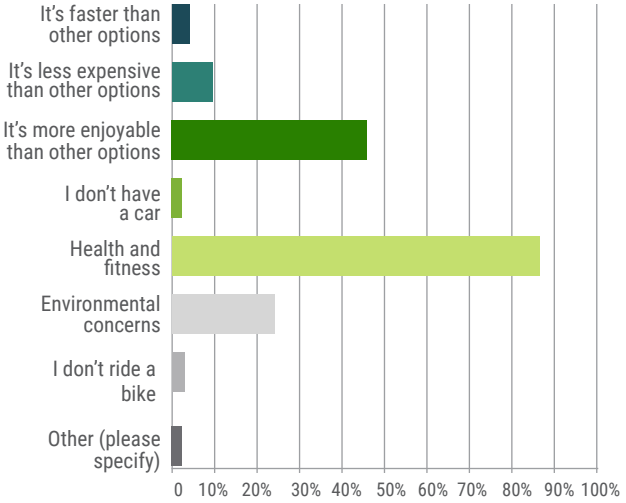


FIGURE 4: WHICH OF THE FOLLOWING BEST DESCRIBES YOU AS A BICYCLIST?

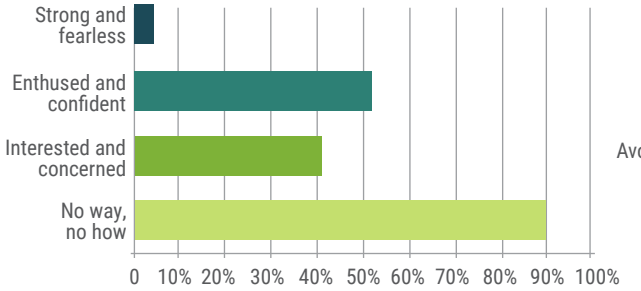


FIGURE 5: WHERE IS YOUR FAVORITE PLACE TO BIKE IN GASTONIA?

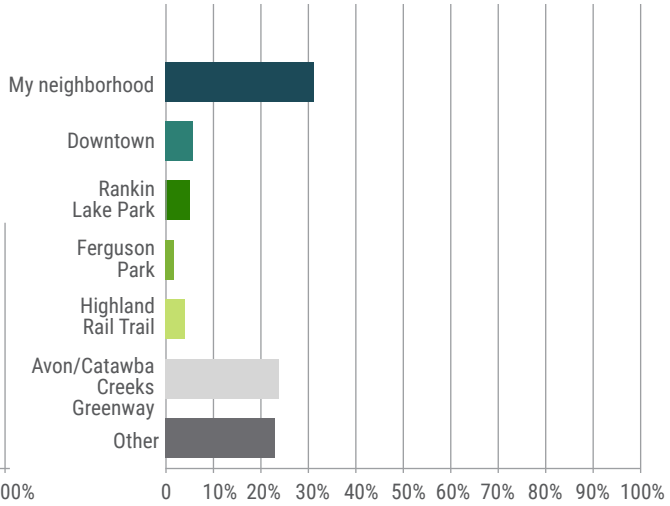


FIGURE 6: WHAT IS YOUR PREFERRED TYPE OF BICYCLE FACILITY?

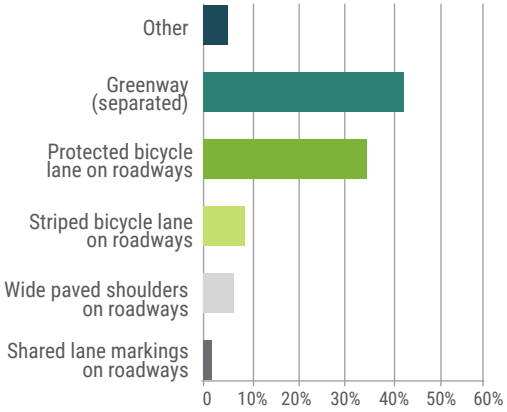


FIGURE 7: WHAT ARE THE BARRIERS THAT KEEP YOU FROM BIKING FOR MORE TRIPS?

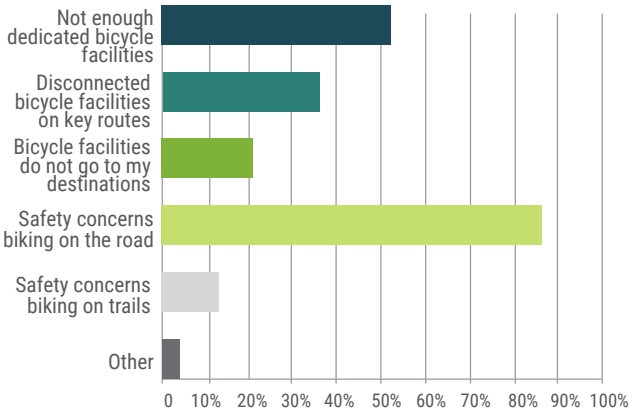


FIGURE 8: HOW WOULD YOU RATE THE OVERALL QUALITY OF THE EXISTING BICYCLE NETWORK IN GASTONIA?

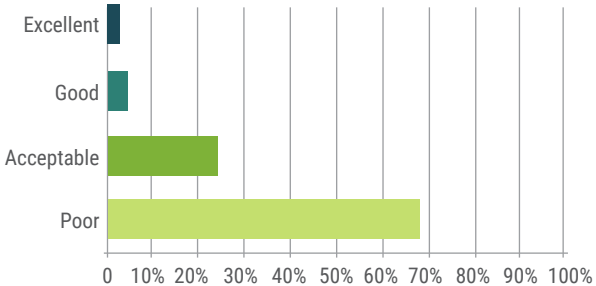


FIGURE 9: IN GENERAL, BIKING IN GASTONIA IS?

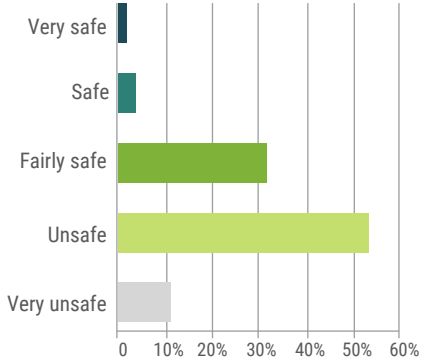


FIGURE 10: WHAT WOULD MAKE BIKING IN GASTONIA BETTER?

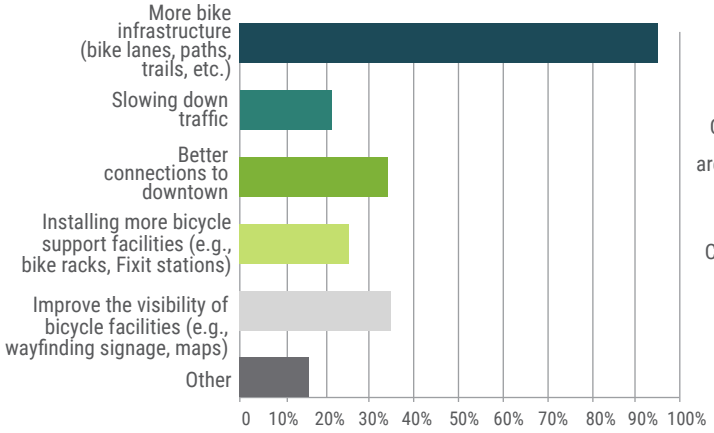
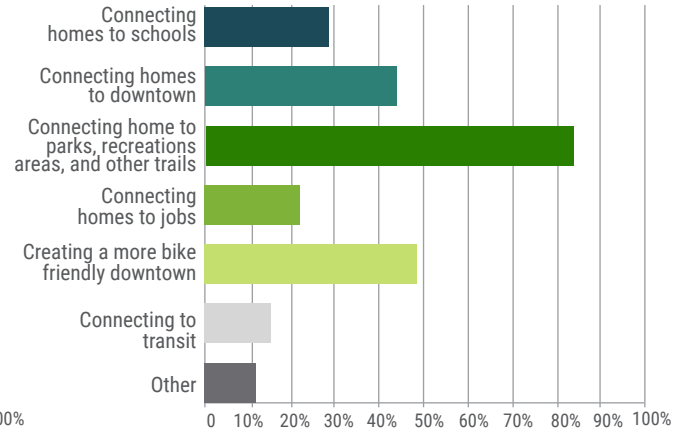


FIGURE 11: WHAT SHOULD BE THE HIGHEST PRIORITY FOR NEW BICYCLE FACILITIES?



KEY SURVEY TAKEAWAYS

Most survey respondents said they bike multiple times a week. Nearly 80% of people like to bike at a park, along trails, and in other community facilities. The biggest motivation for biking was health and fitness followed by enjoying biking more than other modes and environmental concerns. Most respondents considered themselves enthused and confident riders, but over 40% of people said they were interested in biking but had concerns. Respondents preferred greenways, shared use paths, and protected bicycle lanes over other facility types. Shared lane markings, or sharrows, were the least popular type of facility. People said that more bike infrastructure, improved wayfinding, and more network connections would greatly improve biking in the city. They also asked for the City to prioritize new bicycle facilities connecting existing parks and trails to downtown.

Gastonia's Top Barriers to Biking

1. Safety concerns about biking on the road
2. Not enough bicycle facilities
3. A disconnected bicycle network

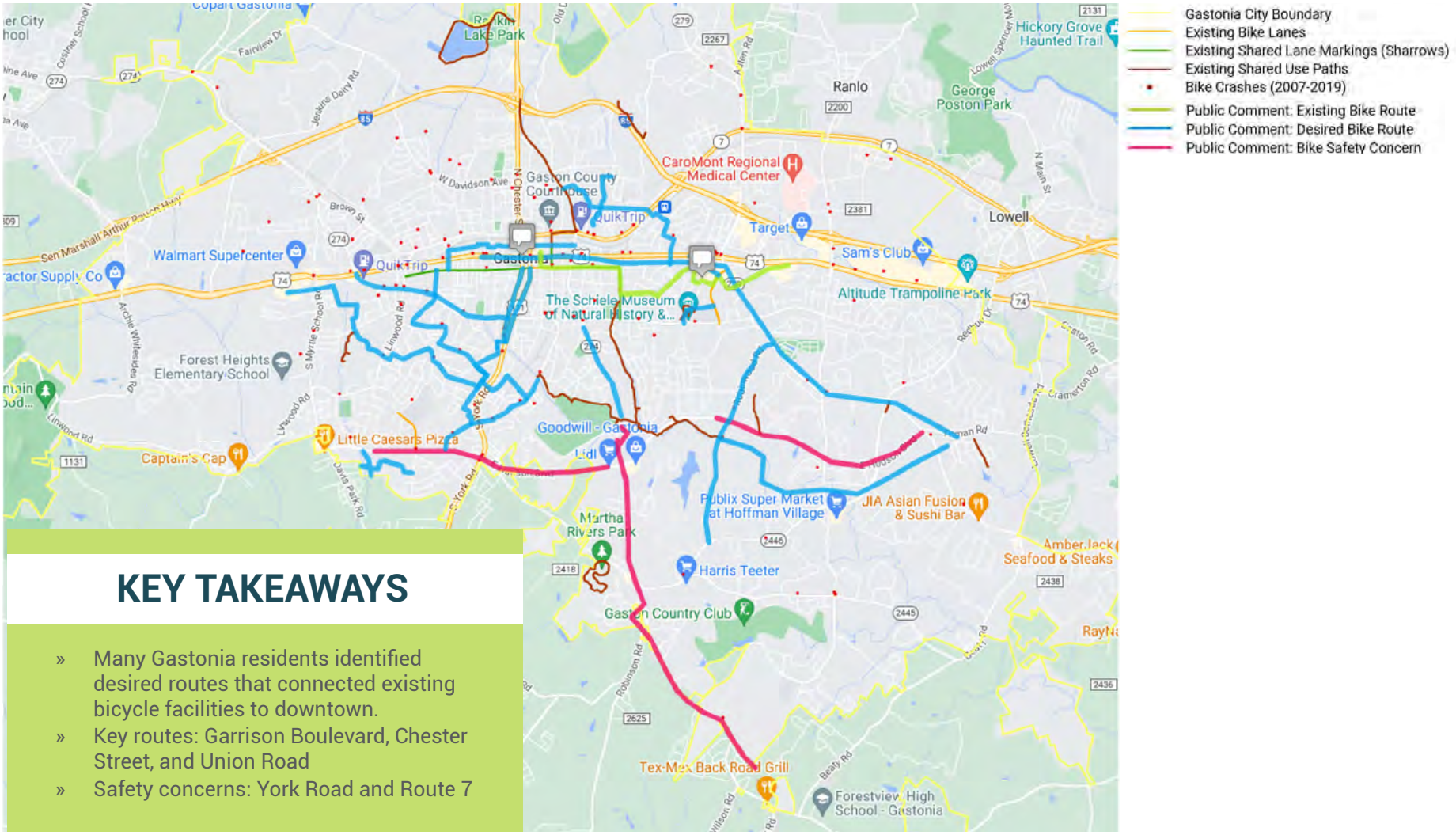
Nearly 80% of respondents said the existing bicycle network is poor, and over half said biking in Gastonia is unsafe.

Online Interactive Mapping

Community members identified locations of safety concerns for cyclists and marked desired bicycle facility locations using an online mapping tool. The map was open for public comment from May 6 to June 7, 2021 and received 33 comments, which are summarized in **Figure 12**.

ONLINE MAP COMMENTS

FIGURE 12: ONLINE MAP COMMENT SUMMARY



KEY TAKEAWAYS

- Many Gastonia residents identified desired routes that connected existing bicycle facilities to downtown.
- Key routes: Garrison Boulevard, Chester Street, and Union Road
- Safety concerns: York Road and Route 7

Public Meetings

Two public meetings presented the bicycle plan's development to gather input from the community on the vision, goals, and recommended bicycle network.

Public Meeting #1 (Virtual)

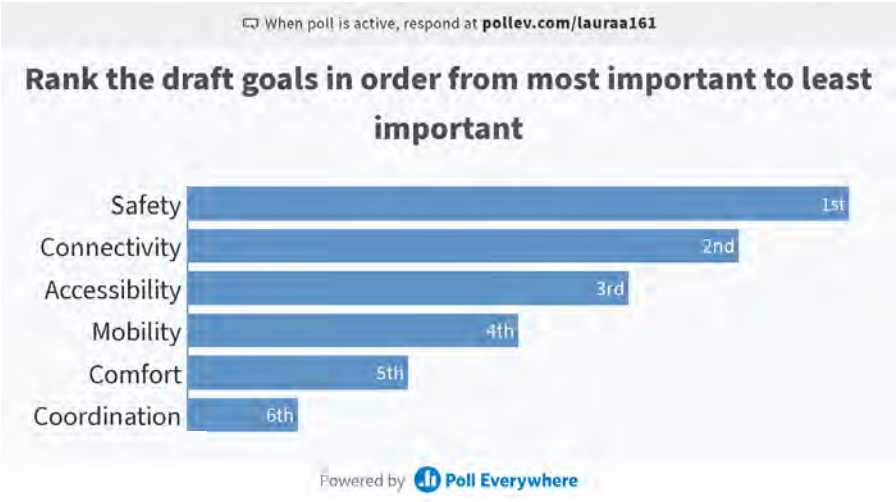
Date: June 2, 2021
Time: 5:30-7 PM

Agenda

- Project overview, including purpose and scope; schedule; and public-engagement plan
- Review of existing conditions, including previous plans and studies reviewed; maps of existing conditions; field observations; and challenges and opportunities
- Discussion of draft vision and goals, including feedback on how well they align with attendees' own visions

Key Takeaways

- Community members ranked safety, connectivity, and accessibility as the top priorities of the draft goals



Public Meeting #2 (In Person at Rotary Centennial Park)

Date: October 28, 2021
Time: 3-7 PM

Agenda

- Open house with display boards showing the project overview, vision, and goals; draft recommended bicycle network and facility types, and concept designs for Garrison Boulevard
- Verbal presentation of the Gastonia Bicycle Plan
- Question and Answer Session
- Online comment map provided for in-person and virtual feedback on the proposed bicycle network

Key Takeaways

- Community members recommended more separated bicycle facilities for roadways that they do not think are conducive to standard bike lanes or shared lanes

EXISTING CONDITIONS

Community Demographics

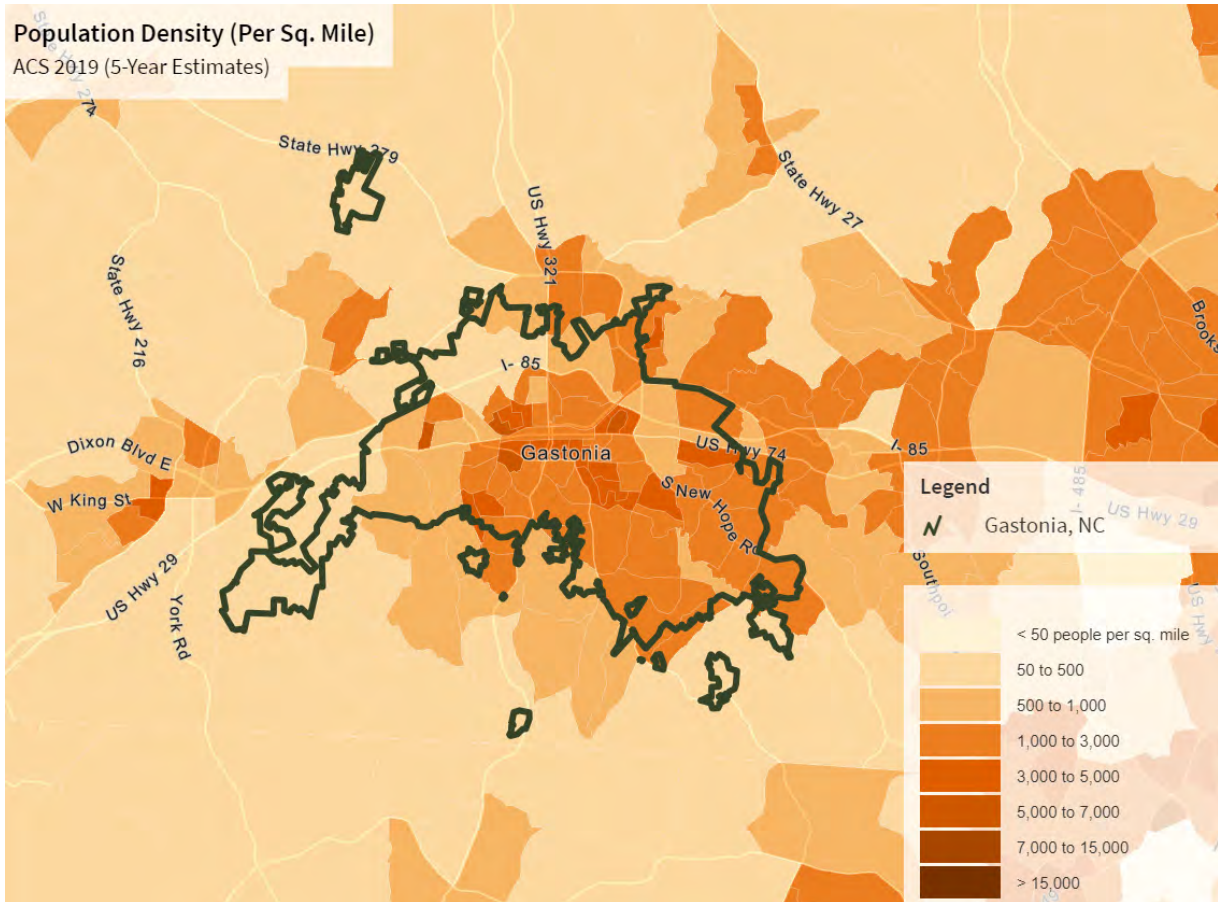
POPULATION & DENSITY

Gastonia is home to approximately 80,000 people, most of whom live in and around downtown. Generally, as shown in **Figure 13**, population density decreases farther away from Gastonia; however, density increases in the east toward Charlotte.

Gastonia has grown by 12% since 2010.

Source: US 2020 Census

FIGURE 13: POPULATION DENSITY PER SQUARE MILE



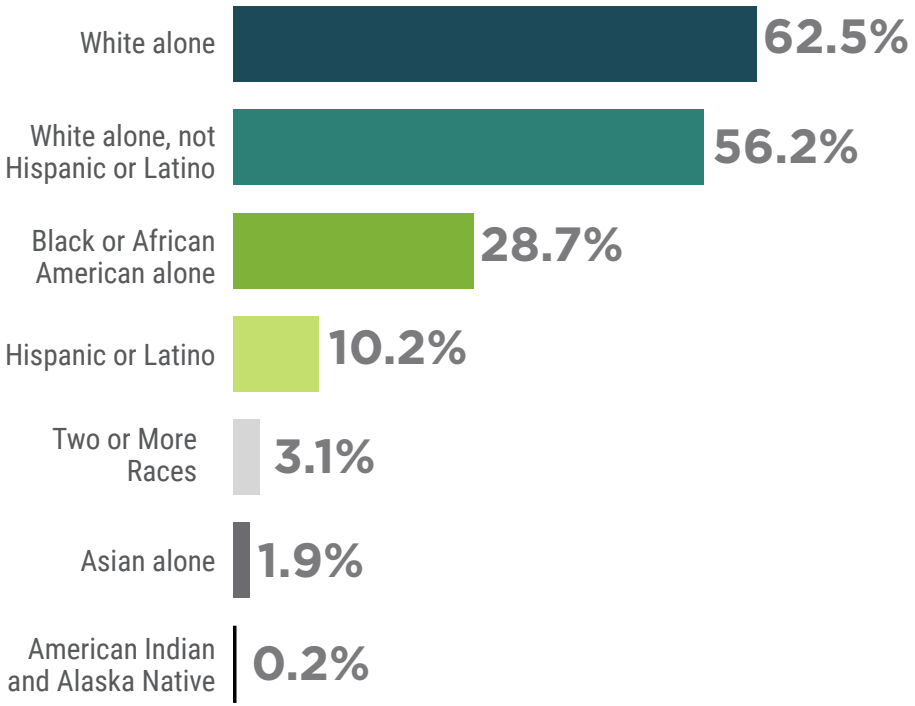
(Source: American Community Survey, 2019)

FIGURE 14: EMPLOYMENT & INCOME

Many Gastonia residents work outside the city. Approximately 36,000 people commute to Gastonia for work, and only about 9,000 people both live and work in the city. Many of Gastonia's major employment centers are downtown, but the CaroMont Regional Medical Center also serves as a key employer.[4]

The median household income in Gastonia is $49,460, significantly less than the statewide median household income of $57,341.[5] Median household income has increased 8.5% since 2010.

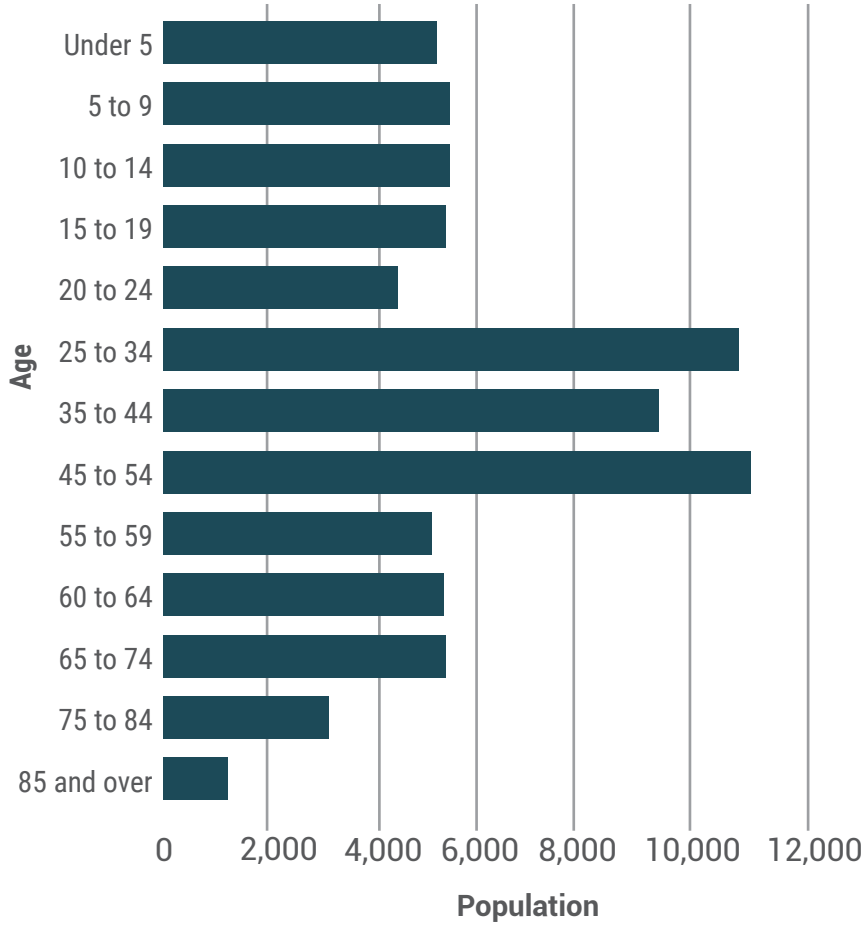
RACE & ETHNICITY



AGE

As shown in **Figure 15**, much of Gastonia's population is 25 to 54 years old. The median age for City residents is 38.4, slightly younger than the statewide median age of 39.1.

FIGURE 15: AGE DISTRIBUTION IN GASTONIA



(Source: American Community Survey, 2019)

4 A review of longitudinal employer-household dynamics (LEHD) data
5 2019 American Community Survey

Transportation Network Overview

Primary arterials, including Franklin Boulevard, NC-7, and York Road/Chester Street (US 321) comprise much of Gastonia's street network. Franklin Boulevard provides the main east-west connection throughout Gastonia and serves as the new main street for the city with significant commercial development. Most major roads, including in downtown, carry between 5,000 and 25,000 vehicles per day and have posted speeds of 35 and 45 mph. York Road/Chester Street (US 321) provides the north/south connection and also has significant commercial development. Many of Gastonia's roads that provide key connections throughout the city—like Garrison Boulevard (shown in **Figure 16**)—are multi-lane arterials with high-speeds and volumes that do not include dedicated bicycle facilities. Other key connectors, such as Davidson Avenue and parts of Dr. Martin Luther King Jr. Way (shown in **Figure 17**), are 2-lane roads with no shoulders and high speeds and volumes that are not conducive to bicycling. I-85 runs east-west through the northern part of Gastonia and provides regional access to the city with interchanges at York Road/Chester Street, NC-7, NC-279, and Cox Road.

Downtown Gastonia—generally bounded by Airline Avenue/Long Avenue to the north, Broad Street to the east, Second Avenue to the south, and Hill Street to the west—is laid out in a grid pattern and bisected by "the ditch" (shown in **Figure 18**), a sunken, east-west Norfolk Southern (NS) freight rail line with steep concrete embankments on either side. Downtown's north-south streets bridge over the ditch at Chester Street, York Street, Dr. MLK Jr. Way, and Broad Street.

FIGURE 16: GARRISON BOULEVARD

FIGURE 17: DR. MLK JR. WAY

FIGURE 18: "THE DITCH"

Gastonia Transit, the fixed-route bus network serving within city limits, has six routes, all of which pass through the downtown transfer terminal, the Bradley Station at Oakland Street and Main Avenue (shown in **Figure 19**), and radiate outwards. Gastonia Transit currently does not accommodate bicycles on buses and does not have bicycle racks on buses.

Figures 20–26 map key existing conditions data related to Gastonia's overall transportation network, including major thoroughfares and transit routes, recent bicyclist and pedestrian crashes, as well as existing traffic conditions, bicycle facilities, and key destinations.

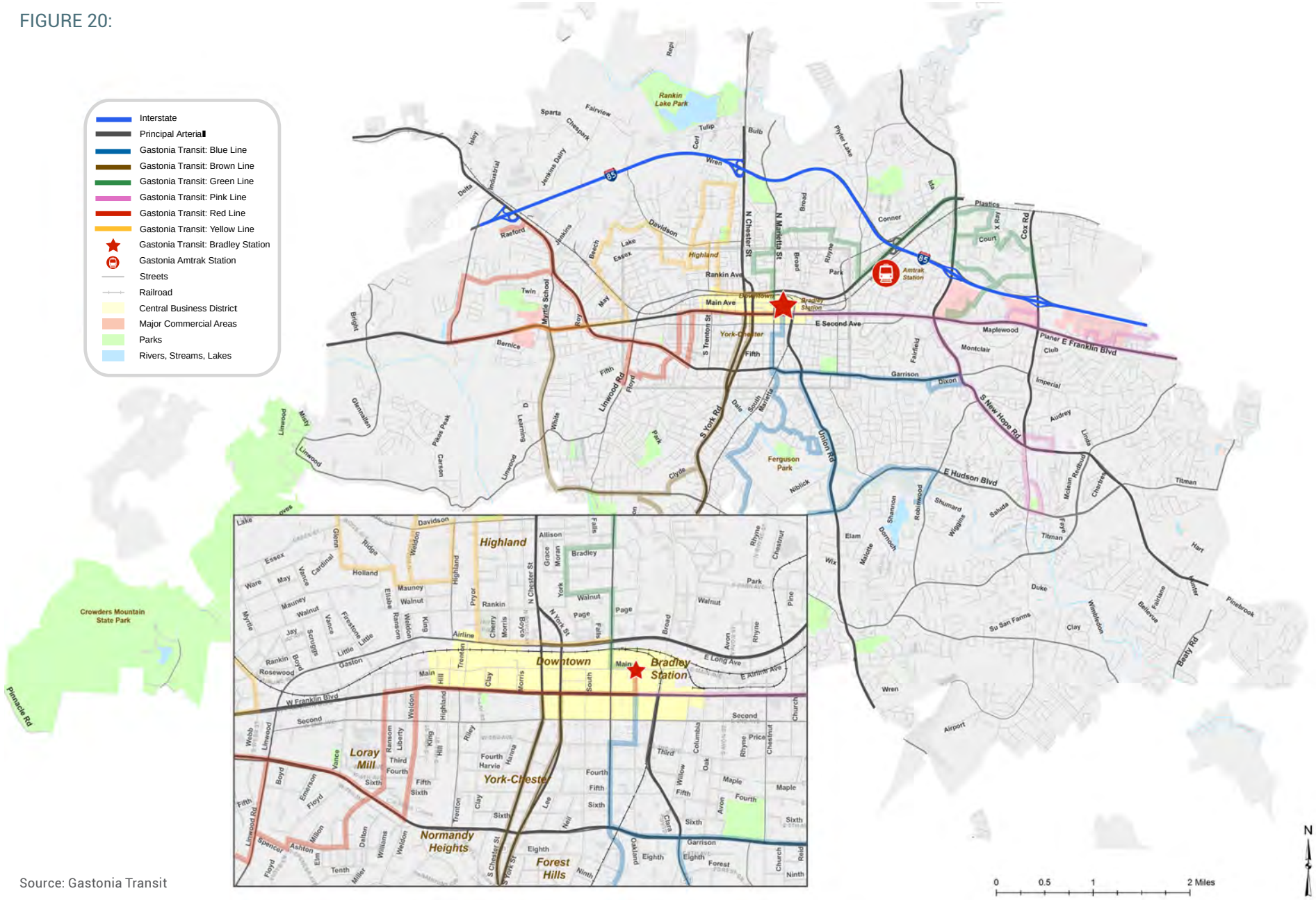
FIGURE 19: BRADLEY STATION

TRANSPORTATION TAKEAWAYS

- As the only interstate that runs through Gastonia, I-85 is a major thoroughfare within the City.
- Several principal arterials, that run both north-south and east-west, bisect Gastonia, such as US 74 (Franklin Blvd), US 321 (Chester St, York St, and York Rd), NC 274 (Bessemer City Rd & Garrison Blvd), and NC 279 (New Hope Rd).
- The Gastonia Transit system consists of six bus routes, all of which terminate at the Bradley Station in Downtown.
- Transit connections to other areas of Gaston County (Gaston College and Dallas) are provided by Central Transportation of Gaston County ("ACCESS") routes from Bradley Station.
- Amtrak provides daily train service to/from Gastonia on the Crescent line from New Orleans to New York City. Gastonia Station is located northeast of downtown off of NC-7.

TRANSPORTATION OVERVIEW

FIGURE 20:

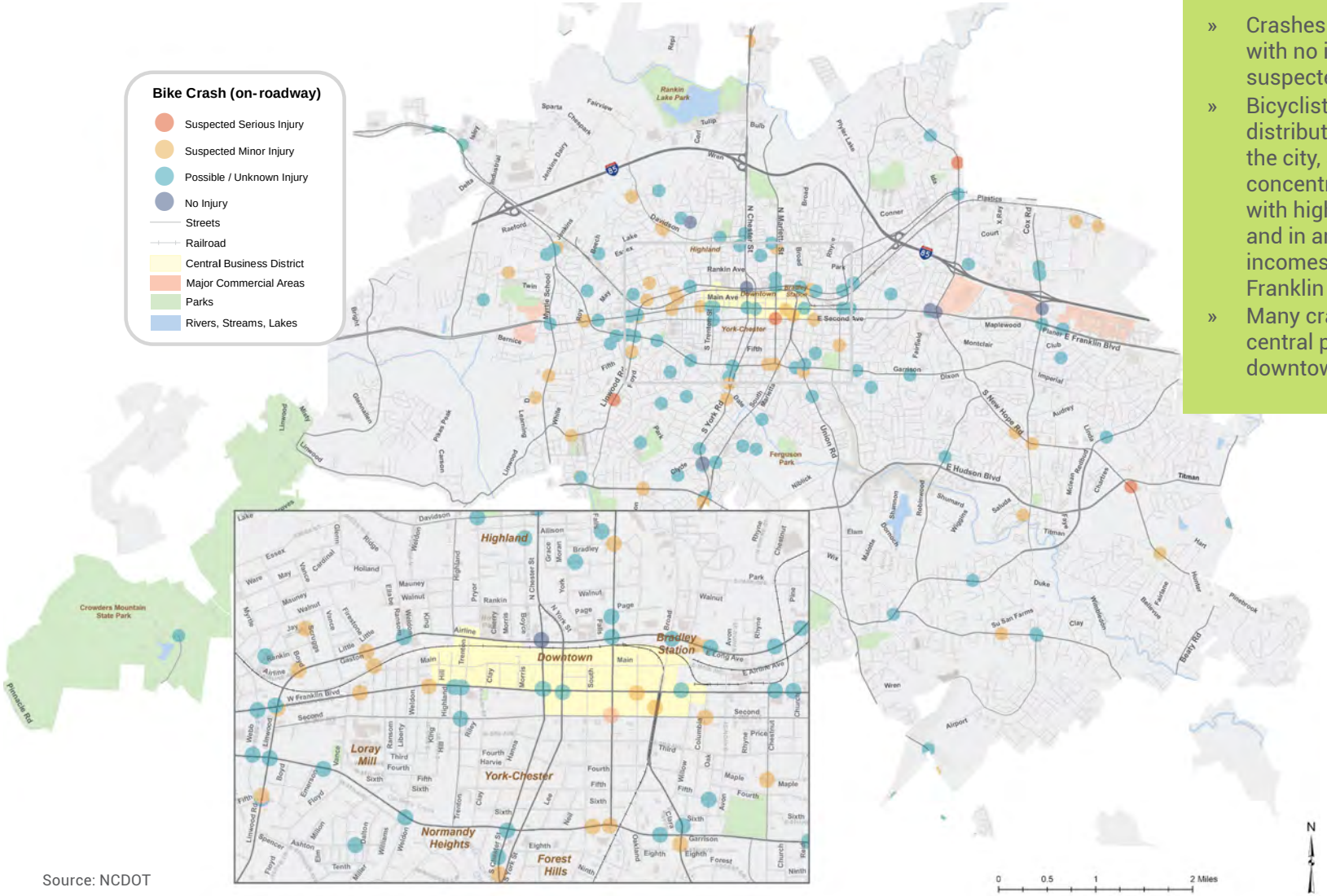


Source: Gastonia Transit

Safety

BICYCLIST CRASHES

FIGURE 21:



Source: NCDOT

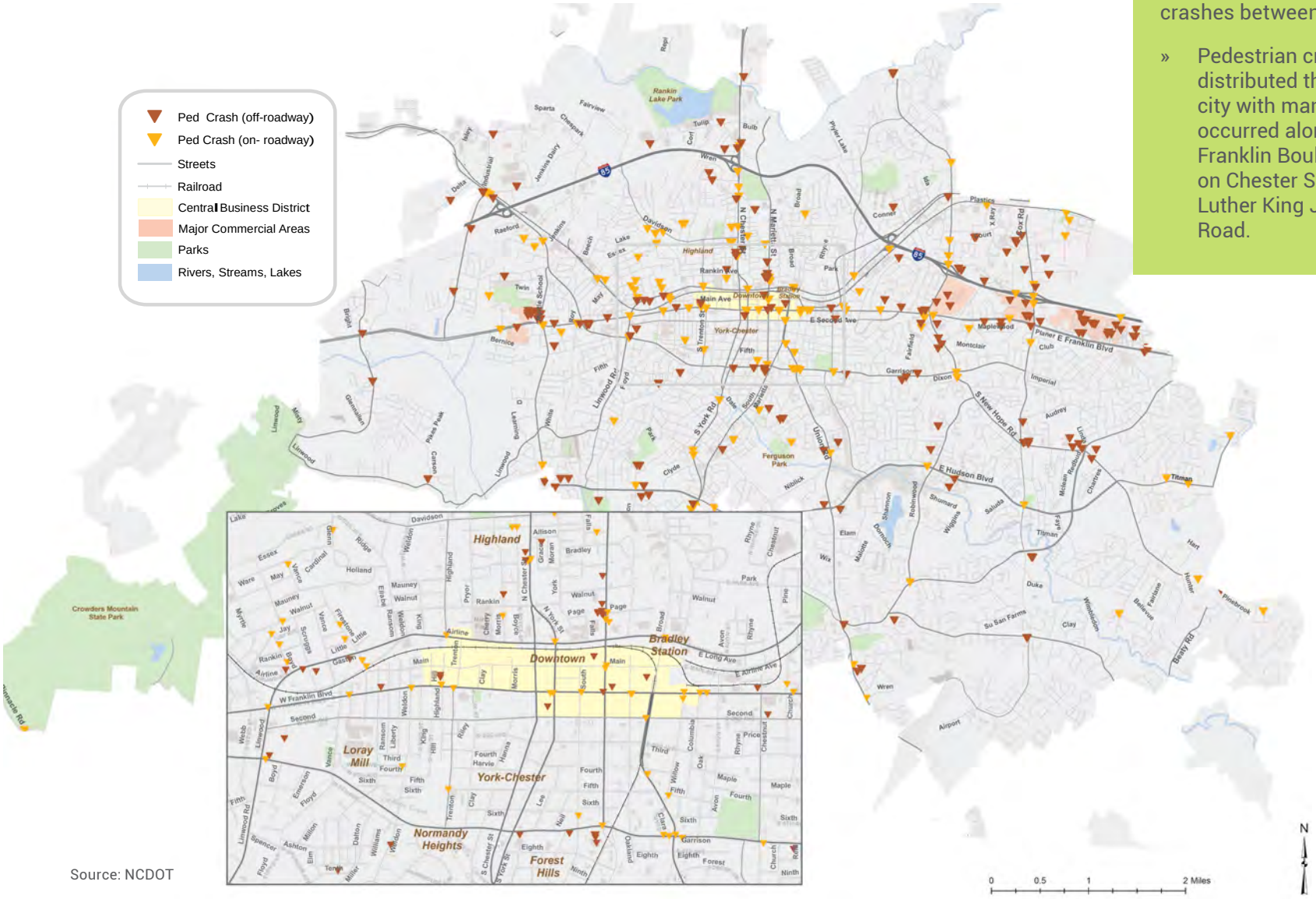
BICYCLE SAFETY TAKEAWAYS

For NCDOT-reported on-roadway bicyclist crashes between 2007–2019:

- Crashes ranged from those with no injuries to those with suspected serious injuries.
- Bicyclist crashes were distributed throughout the city, and many are concentrated around roads with higher vehicle volumes and in areas with low incomes, like East and West Franklin Boulevard.
- Many crashes occurred in the central part of the city and in downtown.

PEDESTRIAN CRASHES

FIGURE 22:



Source: NCDOT

PEDESTRIAN SAFETY TAKEAWAYS

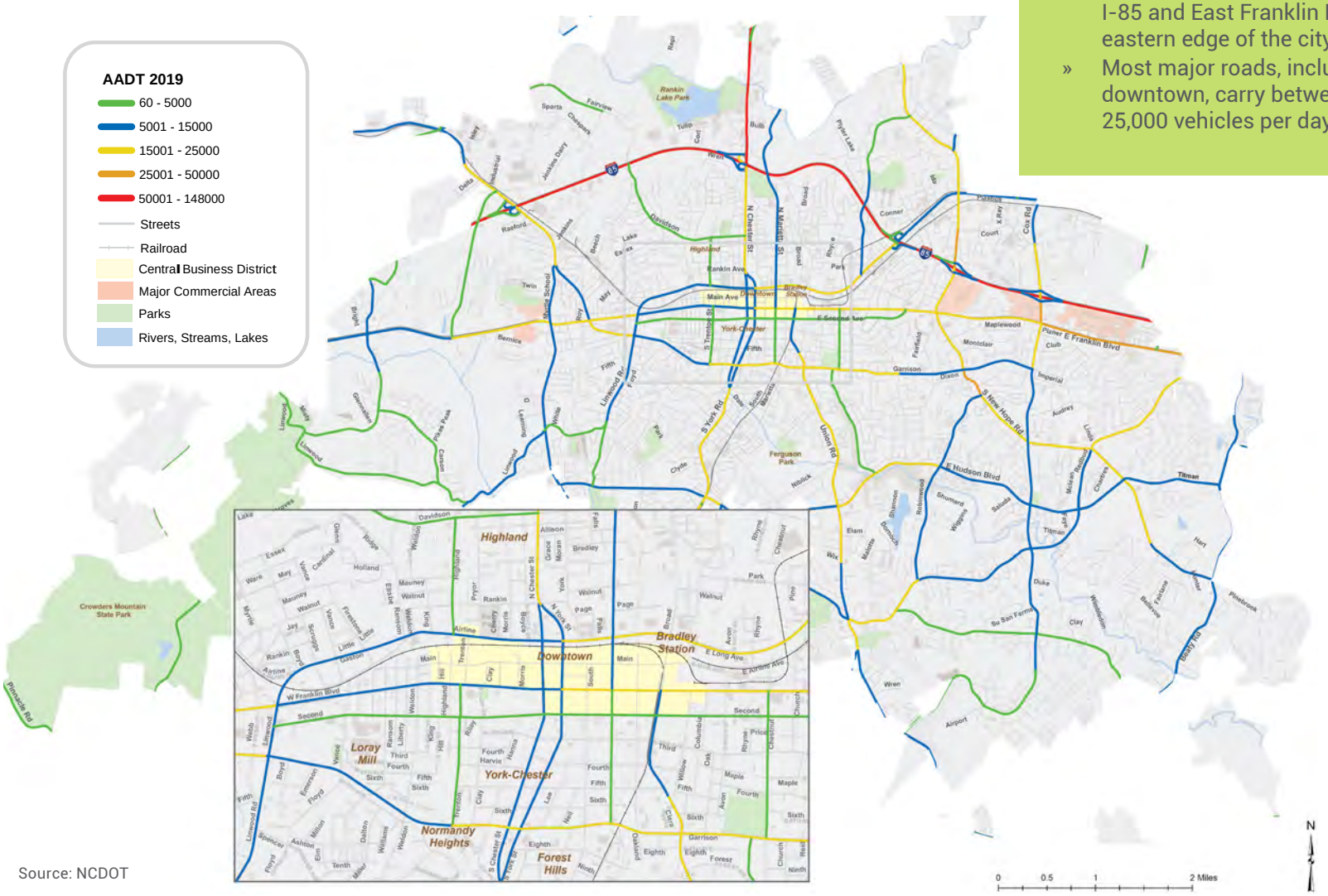
For NCDOT-reported on- and off-roadway pedestrian crashes between 2007–2019:

» Pedestrian crashes are distributed throughout the city with many, and many occurred along East and West Franklin Boulevard as well as on Chester Street. Dr. Martin Luther King Jr. Way, and Cox Road.

Bicycle Conditions

ANNUAL AVERAGE DAILY TRAFFIC

FIGURE 23:



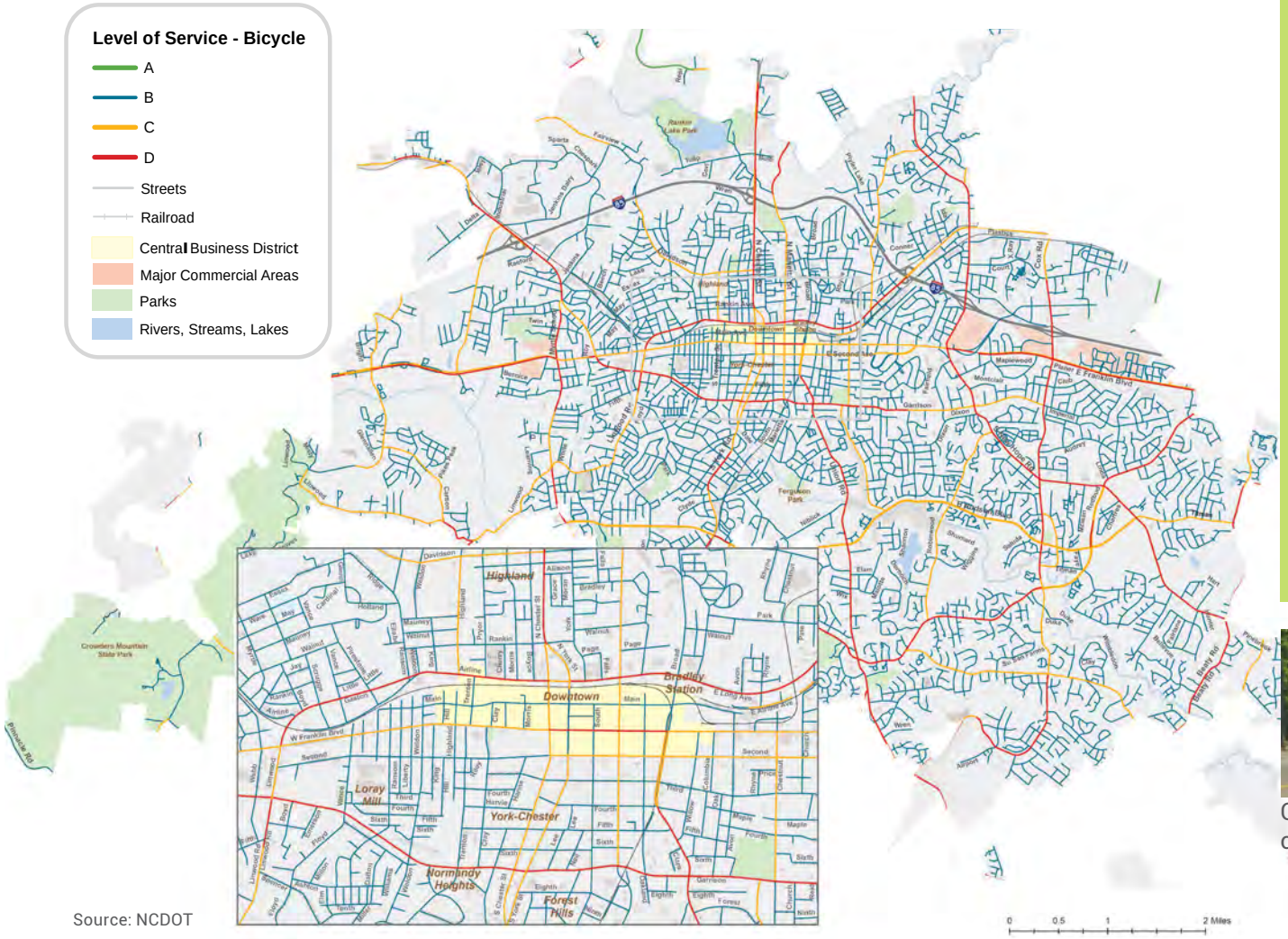
Source: NCDOT

TRAFFIC TAKEAWAYS

- The annual average daily traffic (AADT) for NCDOT-owned roads throughout the city ranges from 60 to 148,000 vehicles.
- The roads with the highest AADT include I-85 and East Franklin Boulevard at the eastern edge of the city.
- Most major roads, including those downtown, carry between 5,000 and 25,000 vehicles per day.

BICYCLE LEVEL OF SERVICE

BLOS Descriptions (NCDOT)	A	B	C	D
	Excellent bicycle environment	Good bicycle environment	Fair bicycle environment (acceptable to experienced and novice bicyclists)	Poor environment (acceptable to experienced bicyclists)



Source: NCDOT

BICYCLE CONDITIONS TAKEAWAYS

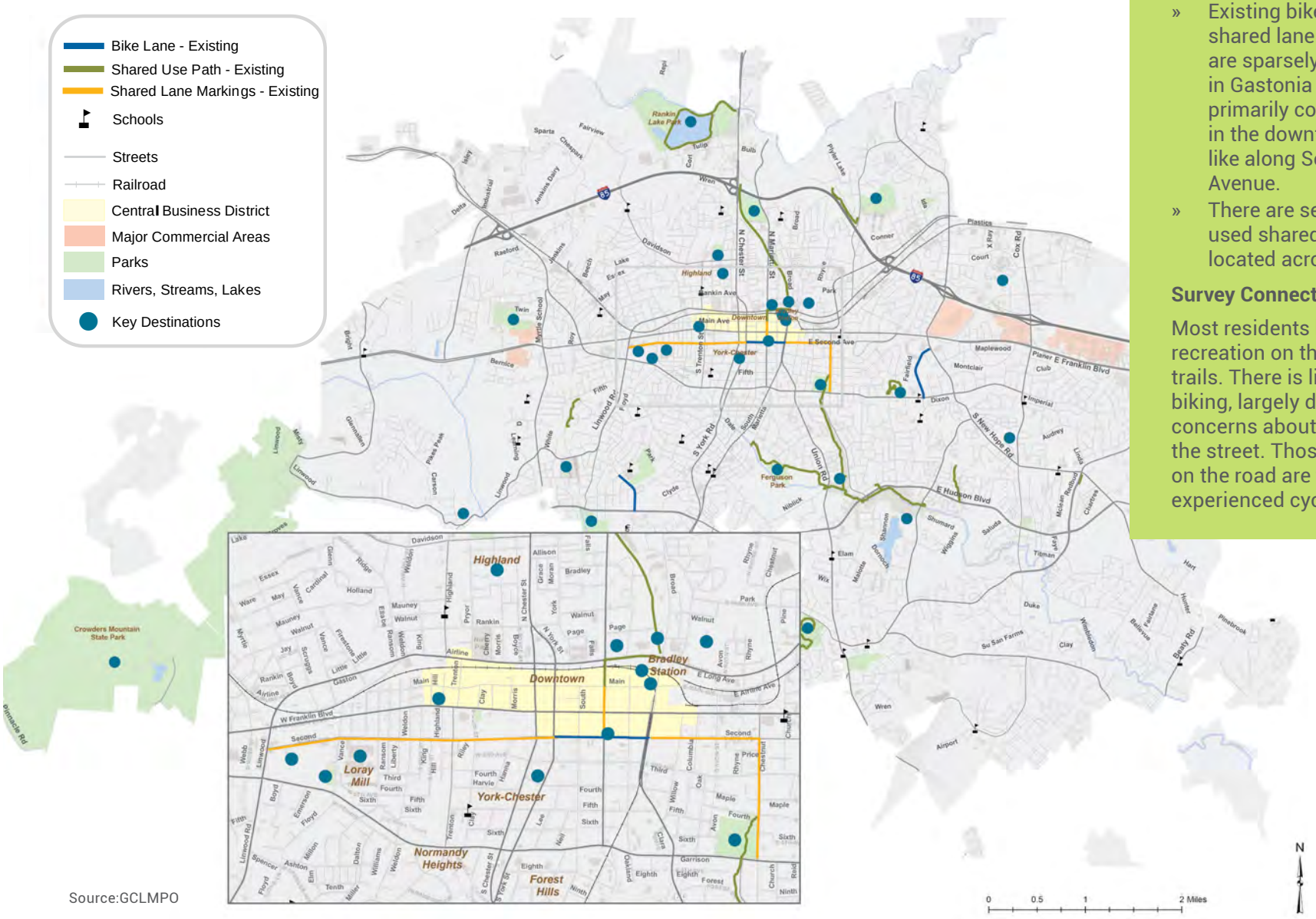
The bicycle level of service (BLOS) metric aims to measure the quality of cycling conditions for a specific roadway in terms of stress and safety. BLOS is calculated by looking at roadway factors such as roadway width, bike lane widths and striping combinations, traffic volume, pavement surface conditions, motor vehicles speed and type, and on-street parking. BLOS A is considered low-stress and generally comfortable for all bicyclists. Throughout Gastonia, very few streets provide optimal conditions for bicyclists at a BLOS A.

- BLOS A facilities are in more rural parts of the city, areas with less traffic and fewer safety concerns.
- Most local streets have a BLOS B, and higher-volume roads and major thoroughfares currently operate at a BLOS C or D—the least comfortable scores for cyclists.

Cyclist on Cox Road, which currently has a BLOS of D

EXISTING BICYCLE FACILITIES

FIGURE 25:



Source:GCLMPO

BICYCLE FACILITY TAKEAWAYS

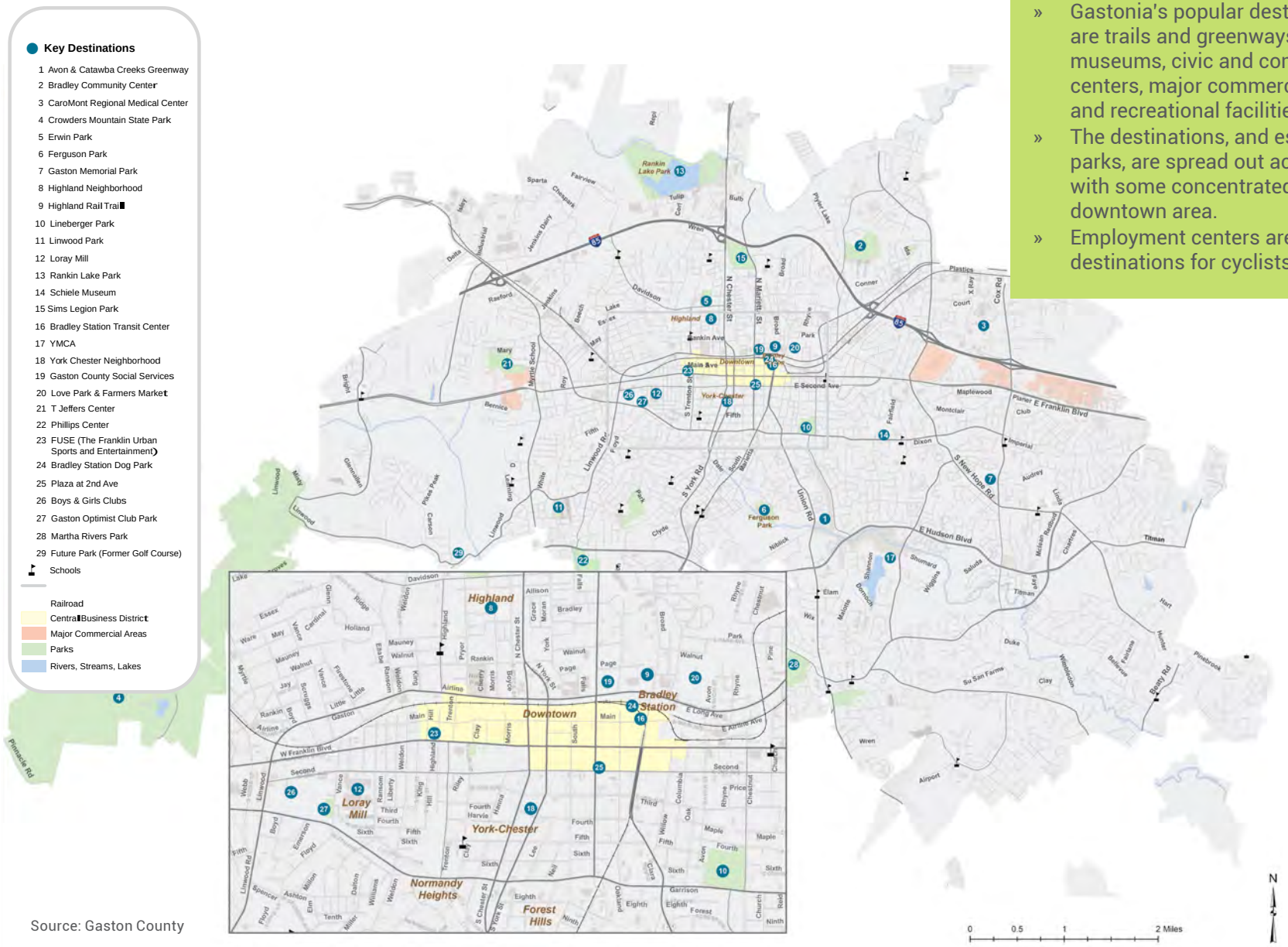
- Existing bike lanes and shared lane markings are sparsely located in Gastonia and are primarily concentrated in the downtown area, like along Second Avenue.
- There are several well-used shared use paths located across the city.

Survey Connection

Most residents bike for recreation on the existing trails. There is little on-road biking, largely due to safety concerns about biking on the street. Those who bike on the road are typically experienced cyclists.

KEY DESTINATIONS

FIGURE 26:



Source: Gaston County

DESTINATION TAKEAWAYS

- Gastonia's popular destinations are trails and greenways, parks, museums, civic and community centers, major commercial areas, and recreational facilities.
- The destinations, and especially the parks, are spread out across the city, with some concentrated around the downtown area.
- Employment centers are frequent destinations for cyclists.

PREVIOUS PLANS & POLICY REVIEW

Previous Plans

The project team reviewed existing plans to identify useful recommendations and potential locations for bicycle improvements.

GCLMPO COMPREHENSIVE TRANSPORTATION PLAN

The Gaston-Cleveland-Lincoln Metropolitan Planning Organization's (GCLMPO) Comprehensive Transportation Plan (CTP), last amended in 2021, is a long-range plan to guide local governments and their representatives as they make regional transportation decisions over the coming decades. Local counties, towns, and NCDOT collaborated to align recommendations in the CTP with the region's current and future population as well as its economic conditions, traffic trends, and land development patterns.

Bicycle-related recommendations include:

- Identification of roadways in need of improved on-road bicycle facilities, including most of Gastonia's NCDOT roadways
- Proposed shared use paths

The CTP's recommendations serve as the foundation for the City of Gastonia Bicycle Plan as it is the most recent plan to identify much-needed improvements for bicycle infrastructure and because it incorporates previously proposed recommendations from older plans. **Figure 27** overlays the CTP's bicycle and shared use path corridors with Gastonia's key destinations, its ward plan areas (locations for small area plan development identified by the City), and the Carolina Thread Trail's adopted alignment. Together, these layers reveal where Gastonia needs improvements to its bicycle network. These layers also highlight planning efforts already underway that could be used to support implementation of a future bicycle network in the city.

GCLMPO 2050 METROPOLITAN TRANSPORTATION PLAN (2022)

The GCLMPO 2050 Metropolitan Transportation Plan (MTP) outlines a series of long-term, regional-scale infrastructure recommendations and improvements for the GCLMPO. Bicycle-related recommendations include 2025, 2035, 2045, and 2050 horizon year projects as well as a series of unfunded projects with unmet needs. Relevant projects under the 2025 and 2035 horizon years include:

2025 Horizon Year

- Phase 1 of the Highland Branch Greenway from Rankin Lake Park to Bulb Avenue

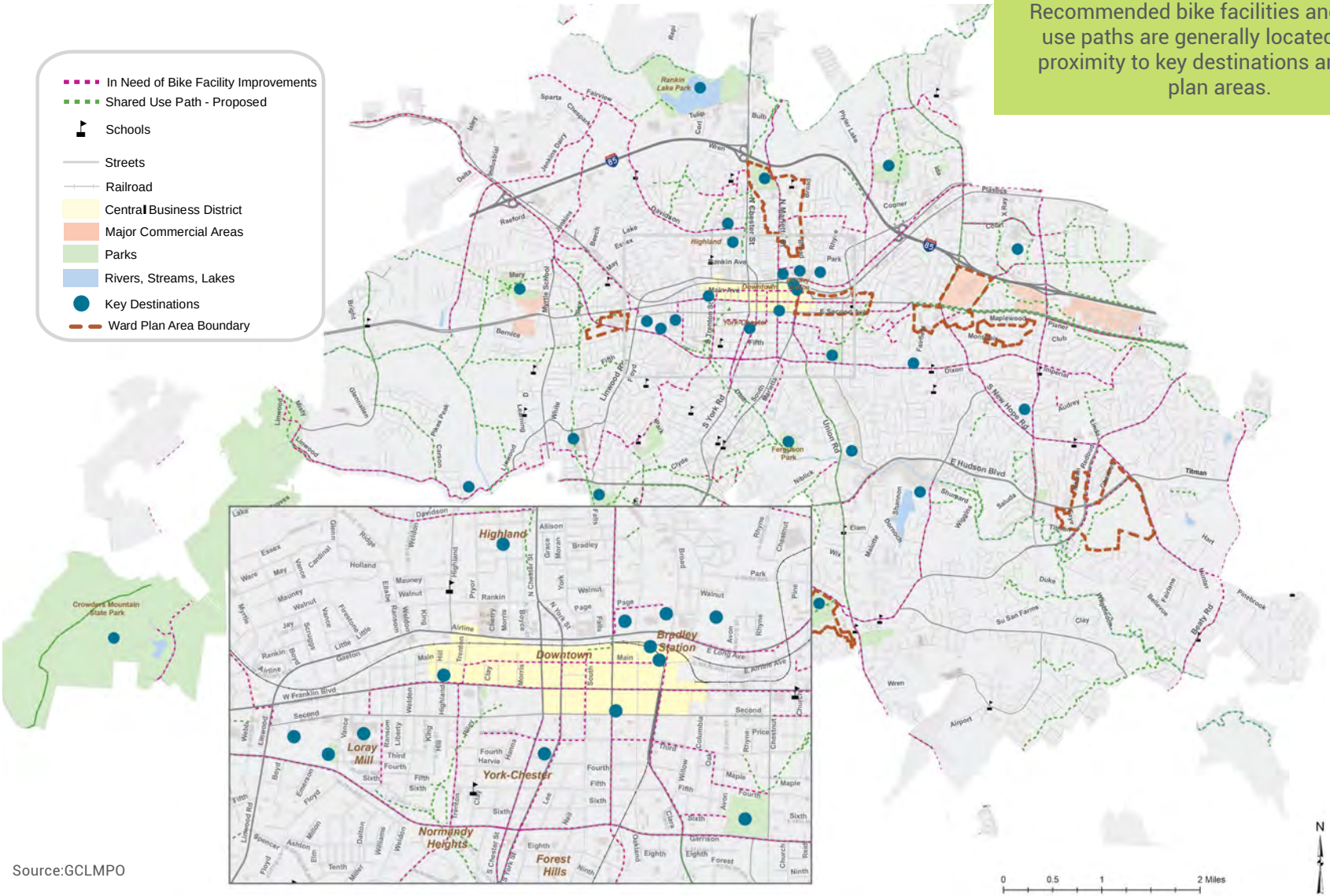
2035 Horizon Year

- Sidewalks and sharrows on Second Avenue from Church Street to South Belvedere Avenue
- Phase 1 of the Catawba Creek Greenway SE Extension from Robinwood Road to approximately 2,800 feet southeast of Robinwood Road

FIGURE 27: GCLMPO COMPREHENSIVE TRANSPORTATION PLAN RECOMMENDED BICYCLE AND SHARED USE FACILITIES

GCLMPO COMP. TRANSPORTATION PLAN TAKEAWAYS

Recommended bike facilities and shared use paths are generally located within proximity to key destinations and ward plan areas.



Source:GCLMPO

GCLMPO 2020–2029 METROPOLITAN TRANSPORTATION IMPROVEMENT PROGRAM

A subset of NCDOT's State Transportation Improvement Program (STIP), the GCLMPO's Metropolitan Transportation Improvement Program (MTIP) is a programmed list of fiscally-constrained projects.

Bicycle-related projects and their recommendations include:

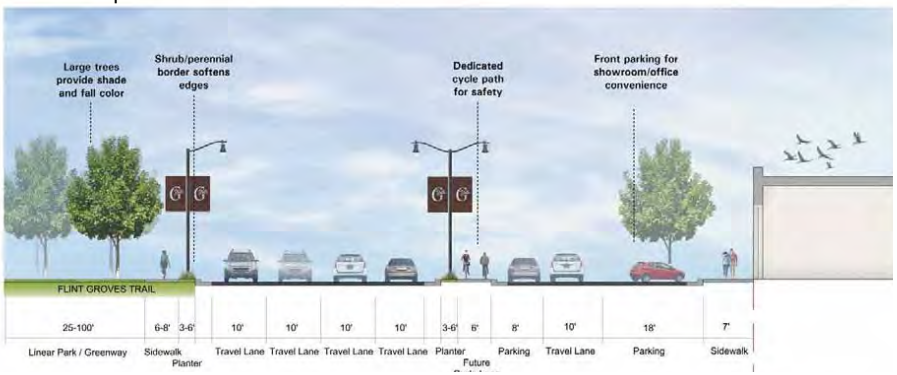
» Right-of-way U-5821: South New Hope Road widening from Titman Road to Union New Hope Road

The design currently includes 10-foot shared use paths on both sides of the road. Right-of-way is programmed in the first six years of the MTIP; construction is programmed in later years.

» I-5719: I-85 widening from US 321 to NC 273

All interchanges and overpasses along the project area—including four in Gastonia—will be re-constructed. NCDOT's Complete Streets policy will result in the inclusion of bicycle and pedestrian facilities on the interstate crossings, as these needs are described in the GCLMPO CTP. The design is underway with right-of-way funds and the initial year of construction funds programmed in the first six years of the MTIP. Both phases' programming continues into later years.

N. New Hope Rd. to I-85



GASTONIA STRATEGIC PLAN (2019-2021)

The City's Strategic Plan outlines its civic leadership and community goals for infrastructure investment, a healthy community, good government, economic vitality, community identity, and safety.

Bicycle-related recommendations include:

» Implement capital improvement projects, including bicycle and pedestrian improvements on Second Avenue and sidewalk and greenway extensions.
» Complete a citywide bicycle plan.
» Evaluate completion of the Greenway Master Plan and update plan as needed.

GASTONIA'S OTHER MAIN STREET: NC-7 CORRIDOR STUDY & PLAN (2018)

The NC-7 Corridor Study & Plan recommends new connections, street improvements, and redevelopment plans to improve the resiliency of Long Avenue/Ozark Avenue's (NC-7) economic, social, and environmental performance. The study envisions a rebranding of the NC-7 corridor as "Gastonia's Other Main Street" to reconnect Downtown Gastonia with neighborhoods to the north. The rebranding addresses a major divide that has developed between the northern and southern portions of the city due to the Norfolk Southern rail corridor and historic community neglect.

Bicycle-related recommendations include:

» Repurposing rail infrastructure, street right-of-way expansion, and vacant property assembly to create new extensions of the Carolina Thread Trail.
» Implementing the Flint Groves Trail, connecting to the existing Highland Rail Trail at NC-7 and Broad Street to the west and extending from New Hope Road to the South Fork Trail to the east.
» Creating a Green Line running along the Norfolk Southern rail corridor to increase attractiveness of frontage for redevelopment and to serve as a pedestrian and bicyclist connection to the Franklin Urban Sports & Entertainment (FUSE) District.
» Creating new pedestrian and bicyclist bridge connections to existing and proposed trails at key locations across existing rail infrastructure.

» Redesigning street sections along NC-7 to include raised-median bike lanes and on-street bike lanes, wider or new sidewalks, and improved landscaping.

FRANKLIN BOULEVARD CORRIDOR ACCESS AND ALTERNATIVE DEVELOPMENT MOBILITY STRATEGY (2016)

The Franklin Boulevard Access and Alternative Development plan recommends operational and capacity improvements along Franklin Boulevard and surrounding streets to accommodate existing and future corridor growth.

Relevant recommendations include:

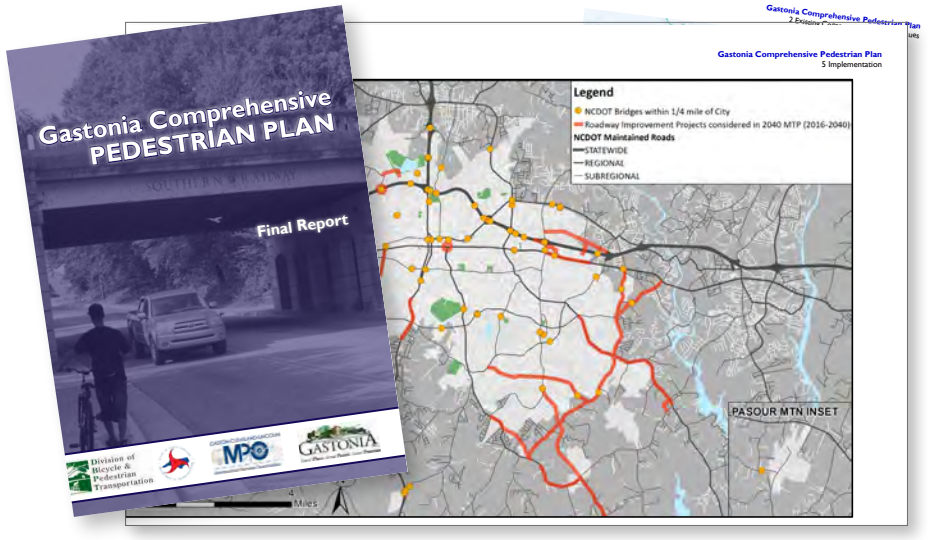
» Taking advantage of connectivity opportunities, including new road connections through Gastonia's key commercial developments east of Cox Road as well as between I-85 and Franklin Boulevard. These new connections provide opportunities for low-stress bike routes, or even dedicated bike facilities, to be included in the design. This recommendation would grant cyclists access to major commercial areas while helping them avoid high-stress roads like Franklin Boulevard.

GASTONIA COMPREHENSIVE PEDESTRIAN PLAN (2014)

The Gastonia Comprehensive Pedestrian Plan aims to improve health, safety, and quality of life for residents and visitors by supporting walking as a safe, convenient, and a desirable mode of transportation. The plan identifies policies, programs, and infrastructure improvements that would improve the pedestrian experience in the city.

Bicycle-relevant recommendations include:

» Proposing a network of greenways and trails that would ultimately connect the entire city. This proposed network would also connect to county and regional trails like the Carolina Thread Trail. When the plan was adopted, there were around 8 miles of existing trails and 60 miles of proposed trails within Gastonia. These trails align with those recommended in the 2011 Gastonia 2025 Comprehensive Plan.



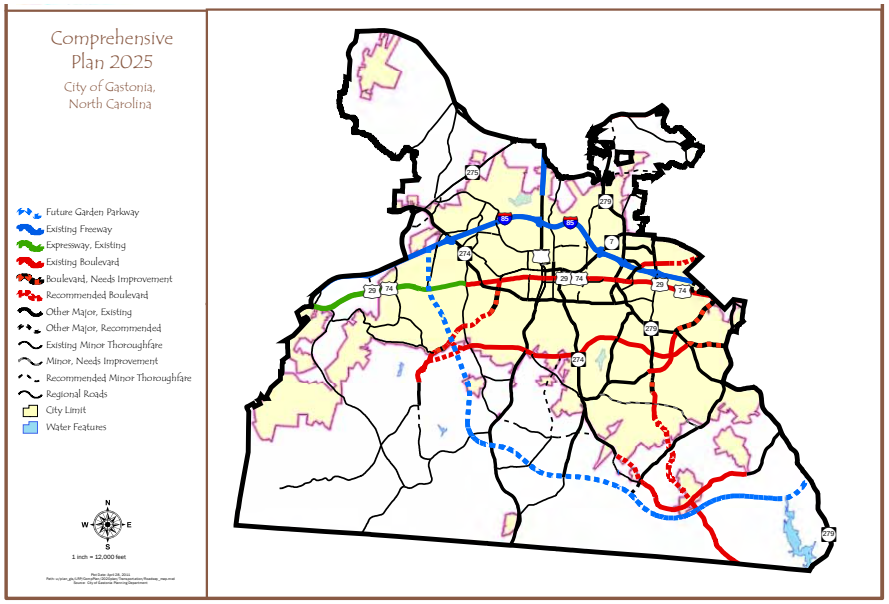
» Lowering the city-wide speed limit (currently 35 mph) and/or speed limits in areas with high-pedestrian demand or potential.

» Evaluating locations to right-size streets by implementing changes like lane/road diets and curb extensions. The plan also recommends utilizing reclaimed areas for buffers and green strips, sidewalk widening, bike lanes, etc. The plan identifies potential improvement locations throughout.

» Developing and adopting a complete streets policy in line with National Complete Streets Coalition guidelines, including a vision, applicability to all users and projects, exceptions, network connectivity for all modes, design criteria, context sensitivity, performance standards, and next steps.

LORAY VILLAGE AREA PLAN (2014)

The Loray Village Area Plan outlines a series of public and private strategies for the redevelopment and revitalization of the Historic Loray Mill area, including the Loray Mill Village and West Franklin Boulevard corridor, which is traditionally considered Gastonia's "Main Street". The plan includes strategies for housing and neighborhood, commercial and corridor, transportation, police and law enforcement, parks and recreation, and public works. Relevant transportation improvements center around a reconfiguration of the six-lane Franklin Boulevard to better accommodate pedestrians and bicyclists. Bicycle lanes were proposed



on Franklin Boulevard and bike accommodations were proposed on Second Avenue, which parallels Franklin one block to the south.

Bicycle-related recommendations include:

» Extending the proposed on-street Second Avenue bicycle-pedestrian corridor along West Second Avenue from Downtown, through the Historic Loray Mill, and to Linwood Rd. This proposal also adds sharrows along Second Avenue to connect the route to the Carolina Thread Trail system. The proposed sharrows differ from the bike lanes proposed in the 2010 Downtown Streetscape & Public Realm Plan. *Note that bike accommodations have been made based on recommendations from both the Loray Village Area Plan and the Downtown Streetscape & Public Realm Plan. A cross-section from the streetscape plan that included bike lanes has been applied to a portion of Second Avenue (York Road to Broad Street). Other segments—west of York Road and east of Broad Street until Chester Street—have sharrows due to limited pavement widths and right-of-way constraints.*

» Sharrows and sidewalks have been used to create a mainly on-street trail connector from Clay Street at the York Chester Middle School walking track to the Loray Mill Village and Optimist Park.

GASTONIA 2025 COMPREHENSIVE PLAN (2011)

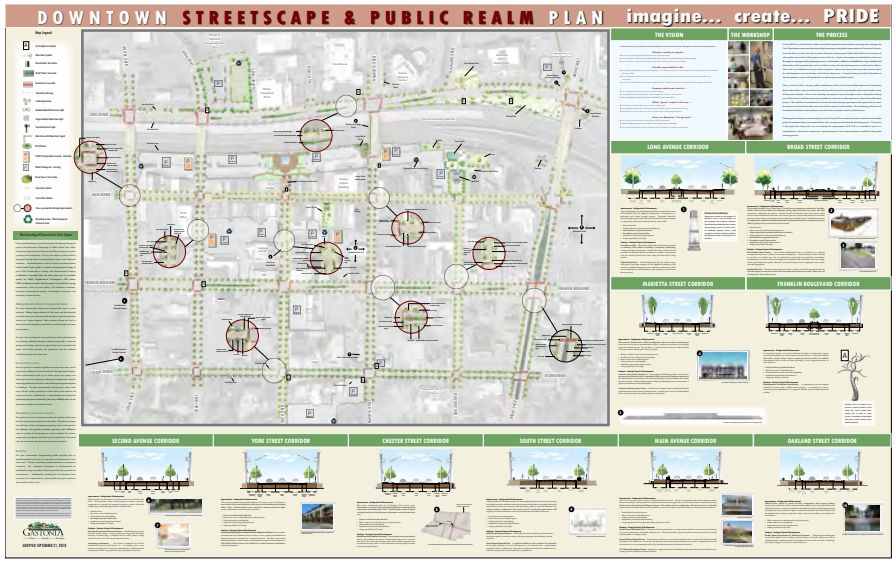
The Gastonia 2025 Comprehensive Plan provides a planning framework to guide the City of Gastonia's growth in several key areas: growth patterns and directions; economic development; human resources development; regional planning; utilities and urban services; transportation and land use patterns; environmental quality; open spaces, parks and recreation; neighborhoods; the Center City; and community appearance and identity. The comprehensive plan identifies greenways and biking infrastructure as vital parts of Gastonia's future and proposes several greenways throughout Gastonia that would connect the entire city and make connections with county and regional trails.

Bicycle-related recommendations include:

» Making a comprehensive map of potential greenway connections.

» Expanding the Highland Rail Trail greenway in Center City, running along the Norfolk Southern rail line from Long Avenue to Rankin Lake Road.

» Integrate existing and proposed greenways with crossings at key intersection along Franklin Boulevard (US 29/74) to increase access and connection.

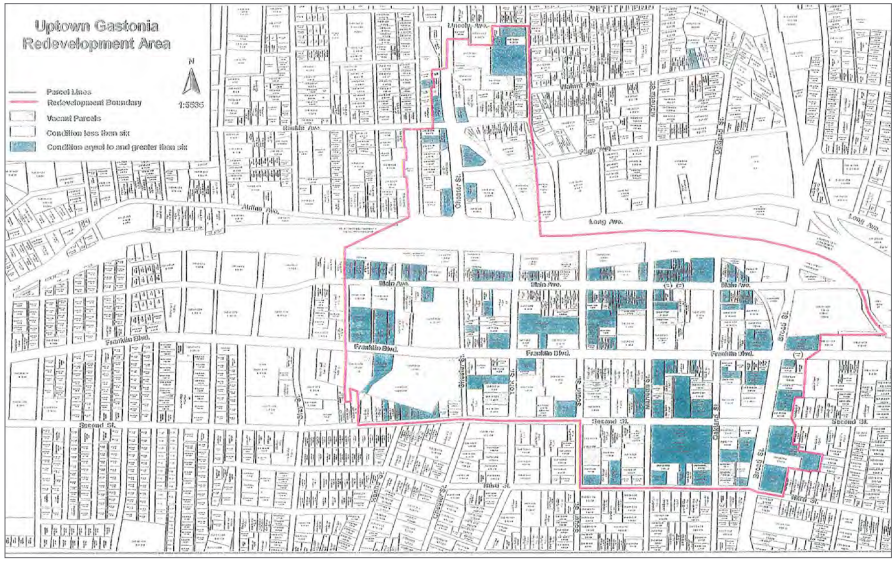


GASTONIA DOWNTOWN STREETSCAPE & PUBLIC REALM PLAN (2010)

The Downtown Streetscape & Public Realm Plan provides a visual framework for a series of infrastructure and landscaping recommendations to improve Downtown Gastonia's civic space. The plan emphasizes efforts to make alternative modes of transportation more viable.

Bicycle-related recommendations include:

» Adding striped bike lanes in some locations, including on Broad Street and Second Avenue, to serve as greenway connections



DOWNTOWN GASTONIA MASTER PLAN (1999)

The Downtown Gastonia Master Plan outlines a framework for revitalizing Downtown Gastonia to improve physical character, public and private investment and development, community infrastructure, and quality of life.

Bicycle-related recommendations include:

» Increasing resident access by improving connections from downtown to the Highland neighborhood, York Street (increasing safety with a pedestrian bridge), the greenway/bikeway system, the Firestone mill, and the York/Chester neighborhood.

Current Bicycle Programs and Policies

The project team reviewed current programs and policies to assess how existing efforts support bicycling in Gastonia. The team reviewed land use and development regulations in the City's existing Code of Ordinances and Unified Development Ordinance (UDO), had conversations with City staff, and assessed community needs and concerns as communicated through stakeholder interviews, survey responses, and public meetings. While many elements of the City of Gastonia's policies are supportive of bicycle-friendly development and bicyclists in the community, the City could strengthen several areas of policy regarding bicycle parking standards and general references to bicyclist conduct, while it continues to formalize interdepartmental coordination on infrastructure planning and working with community partners on programs and events.

This section briefly reviews the findings of the program and policy assessment. The following findings were used to develop this plan's program and policy recommendations:

- Some sections of Gastonia's Code of Ordinances, specifically chapter 6 (Vehicles, Traffic, and Trains), would benefit from amended language that encourages people to feel comfortable riding their bikes on Gastonia's streets and is consistent with North Carolina state law. Current language is overly prescriptive, difficult to enforce, and poses an undue burden on law enforcement.
- The City of Gastonia's infrastructure reimbursement agreement standards do not include bike lanes and shared use paths as desired municipal infrastructure, missing an opportunity for developers to include these facilities in site plan design.
- The UDO does not require bicycle parking facilities in larger developments.
- The City has several successful examples of repurposing roadway infrastructure within the existing right-of-way to accommodate bicycle lanes (e.g., Second Avenue, Burtonwood Drive) and, similarly, narrowing vehicular travel lanes (e.g., Lynhaven Drive) to make room for new bike lanes.
- The City installs bicycle racks throughout Gastonia but does not have a formalized application or procedure for requesting one.
- The City's buses do not currently accommodate bicycles, nor do all transit stops have bike racks.
- The MPO published a bicycle map, which features relevant bicycling laws and safety tips. However, the City of Gastonia does not have a bicycle map focused on the local bicycle network.
- While the City has a process for community-led speed hump installation and speed limit reductions, it does not have an overall policy to address traffic calming that would result in lower speed streets that are conducive to low-stress bicycling.
- Gastonia's Police Department has a bicycle fleet, but it does not schedule regular patrols in the Central District. Bicycle patrols are conducive to developing positive rapport with the community and are ideal for special events, concerts, and parades downtown as well as for general patrol of residential neighborhoods and parks.
- The City currently partners with GCLMPO and Safe Routes to School, which provides an opportunity to encourage more bicycling.
- Residents can request a new street light by submitting a petition from residents who live on the street

RECOMMENDED BICYCLE NETWORK

Bicycle Network

POTENTIAL PROJECT CORRIDORS

To identify potential project corridors for the City's bicycle network, the project team combined the following:

- High-stress streets based on existing bicycle level of service (BLOS) (high stress defined as a BLOS of C or worse)
- Corridors identified during public involvement
- The adopted Carolina Thread Trail alignments
- Corridors with previous recommendations for bicycle and greenway improvements from GCLMPO, NCDOT, and local projects

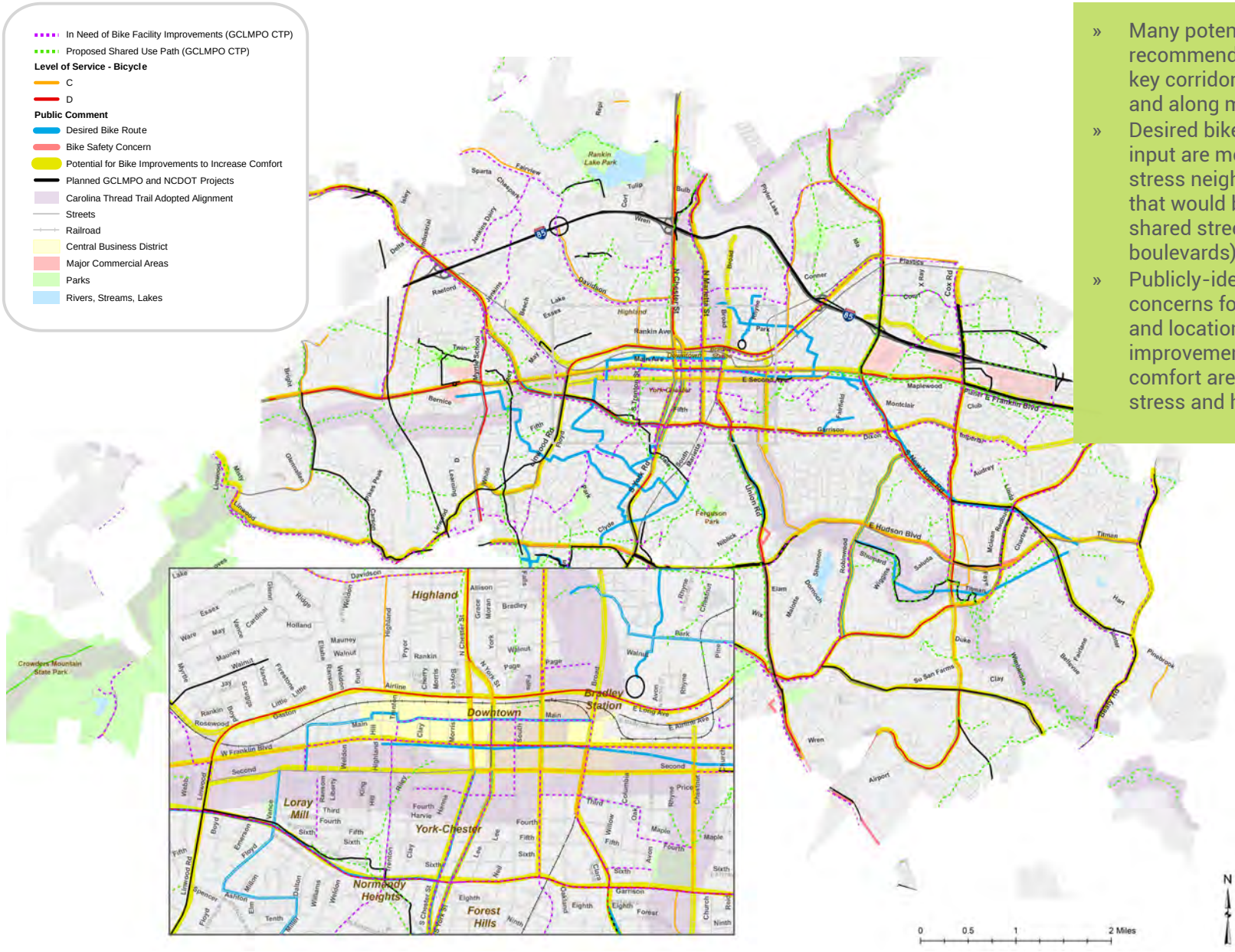
Existing and proposed greenways are a vital part of the Gastonia bike network. However, access to this off-road system is limited due to high-stress streets that create barriers for people biking to the greenways. The proposed projects focus on expanding the existing greenway network and providing connections to the greenways through the road network both in the form of on-road facilities where appropriate and via shared-use paths adjacent to the roadway.

Figure 28 summarizes the potential project corridors identified through this process.

The proposed projects focus on expanding the existing greenway network and providing roadway connections to the greenways

Greenways are linear parks that offer convenient, safe, accessible opportunities for recreation, fitness and non-motorized access to important destinations. They may be paved or unpaved facilities.

FIGURE 28: POTENTIAL PROJECT CORRIDORS



POTENTIAL PROJECT CORRIDORS TAKEAWAYS

- Many potential project corridor recommendations overlap, with key corridors found in Downtown and along major thoroughfares.
- Desired bike routes from public input are mostly along lower stress neighborhood streets that would be more conducive to shared street facilities (e.g., bike boulevards).
- Publicly-identified safety concerns for bicyclists and location where bike improvements would increase comfort are mainly along higher stress and higher volume streets.

PROPOSED BICYCLE NETWORK

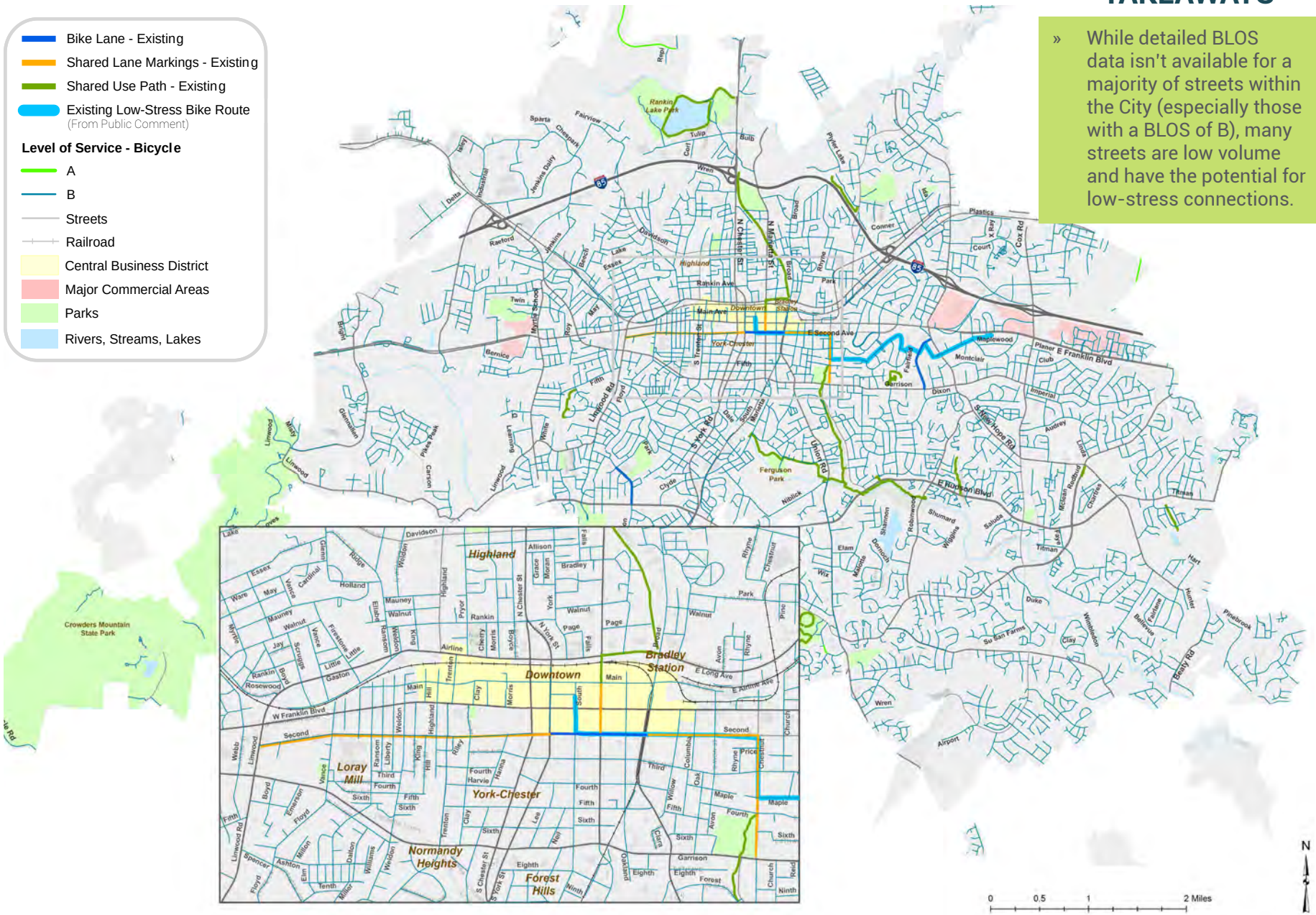
To develop the proposed bicycle network, the project team reviewed potential project corridors for opportunities to implement dedicated facilities within existing rights-of-way. Then, the team refined those corridors based on alignment feasibility and existing conditions such as roadway geometry characteristics and surrounding land uses. To simplify the proposed network, the team then removed redundant routes where multiple potential bicycle facilities were close to one another.

The team also reviewed challenges and opportunities within Gastonia's street network, such as roads with high potential for reconfiguration as well as streets that could be low-stress bicycle facilities with minimal changes to the roadway. These potential low-stress streets are based on the Bicycle Level of Service (BLOS) metric and provide an opportunity to expand Gastonia's bicycle network without significant infrastructure investments.

Many of the desired routes for planned bicycle facilities would need to be on roads that are too high-stress for in-road facilities. In these cases, shared use paths are recommended adjacent to those streets.

Figures 29 and 30 provide an overview of the potential low-stress neighborhood streets and overlay the proposed bicycle network in relation to these potential low-stress streets.

FIGURE 29: POTENTIAL LOW-STRESS NEIGHBORHOOD STREETS



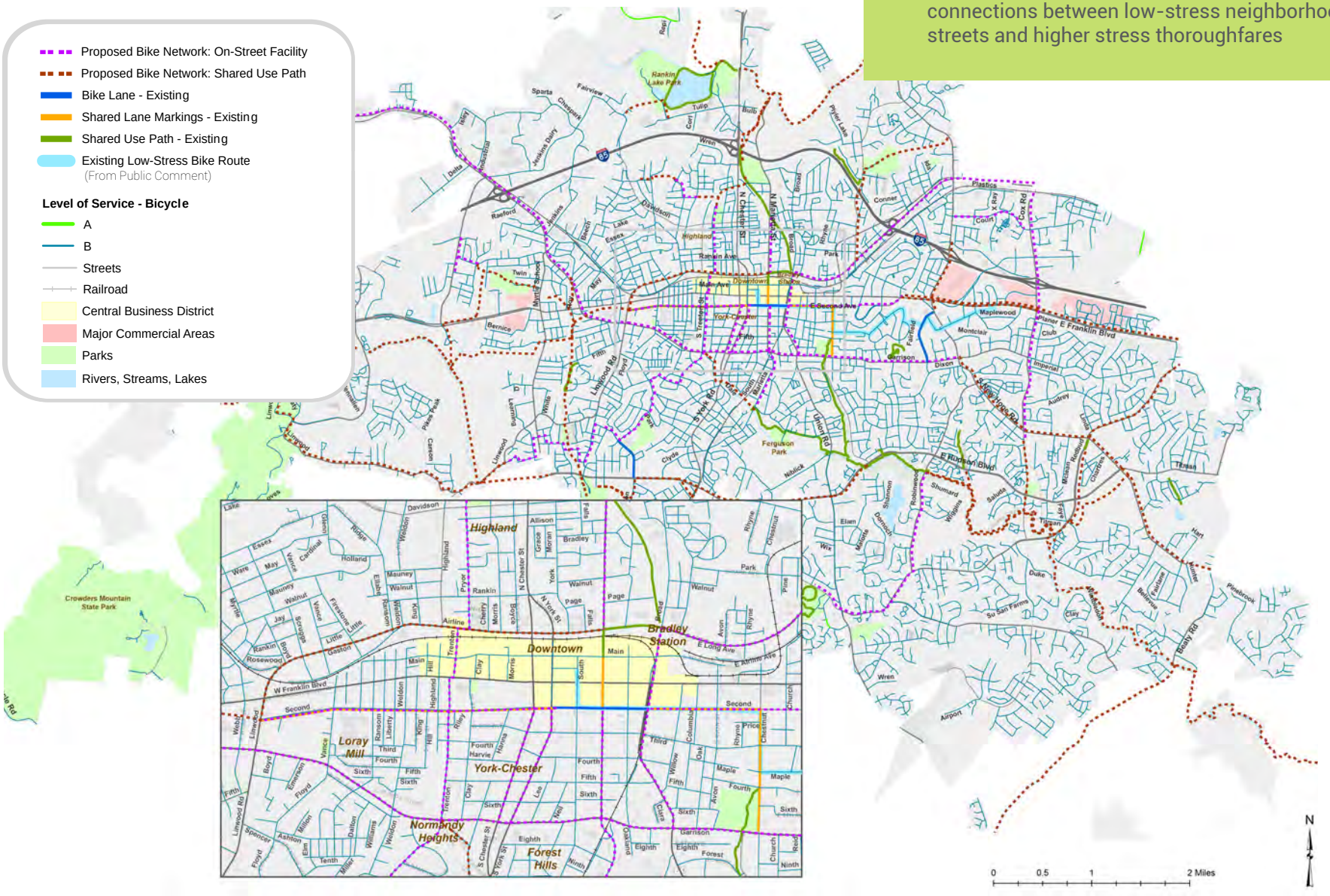
LOW STRESS STREETS TAKEAWAYS

» While detailed BLOS data isn't available for a majority of streets within the City (especially those with a BLOS of B), many streets are low volume and have the potential for low-stress connections.

FIGURE 30: PROPOSED BIKE NETWORK AND POTENTIAL LOW-STRESS NEIGHBORHOOD STREETS

PROPOSED NETWORK TAKEAWAYS

» The proposed bike network provides key connections between low-stress neighborhood streets and higher stress thoroughfares



Proximity of bicycle facilities to vulnerable populations, including areas with high percentages of non-white populations; zero-car households; and people living in poverty were carefully considered when developing the proposed bicycle network. **Figures 31 and 32** show the proposed network in relation to these demographic metrics at the block group level based on American Community Survey (ACS) five-year estimates (2015 to 2019). Where feasible, projects were selected to better serve areas with high percentages of these populations.

FIGURE 31: PROPOSED BIKE NETWORK IN RELATION TO NON-WHITE POPULATIONS

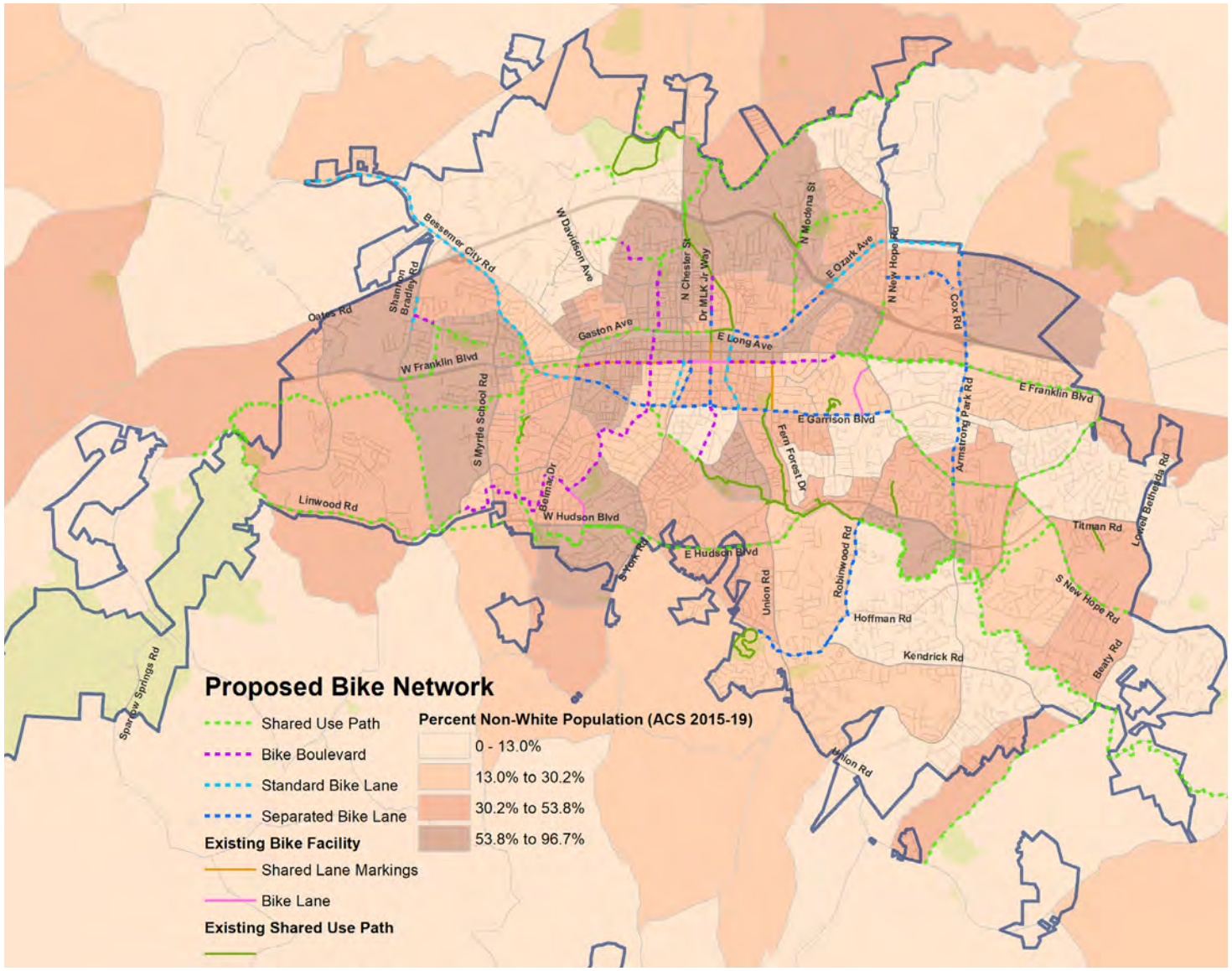
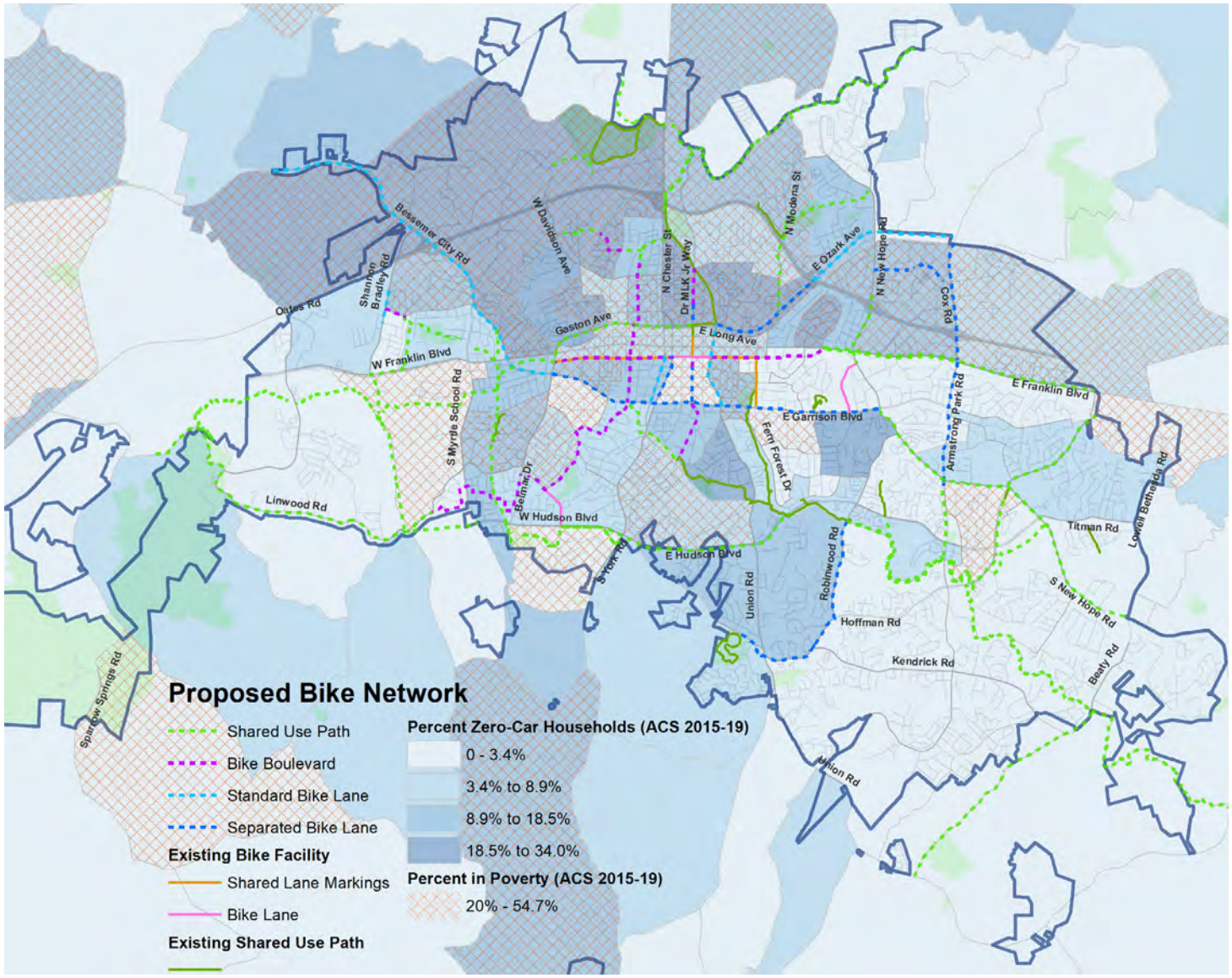


FIGURE 32: PROPOSED BIKE NETWORK IN RELATION TO ZERO-CAR HOUSEHOLDS AND AREAS WITH HIGH LEVELS OF POVERTY



Bicycle Facility Types

The proposed network targets bicycle users who are 'interested but concerned'—those who are excited at the prospect of bicycling but feel unsafe using the existing facilities. For each corridor within the proposed bicycle network, the project team recommended a facility type based on factors like roadway speed, volume, width, and right-of-way constraints. The speed and traffic volume thresholds used to determine bicycle facility type are illustrated in **Figure 33**. These thresholds are generally accepted as industry standard to determine what qualifies as a low-stress bicycle facility type and correspond with FHWA's thresholds. **Figure 34** presents the proposed bicycle network by recommended facility type. **Table 1** shows the total miles of the proposed bicycle network by bicycle facility type. Detailed design guidelines for each bicycle facility type are provided in Design Guidelines and Resources on page 87.

FIGURE 33: TRAFFIC VOLUME AND SPEED THRESHOLDS TO DETERMINE LOW-STRESS FACILITY TYPE

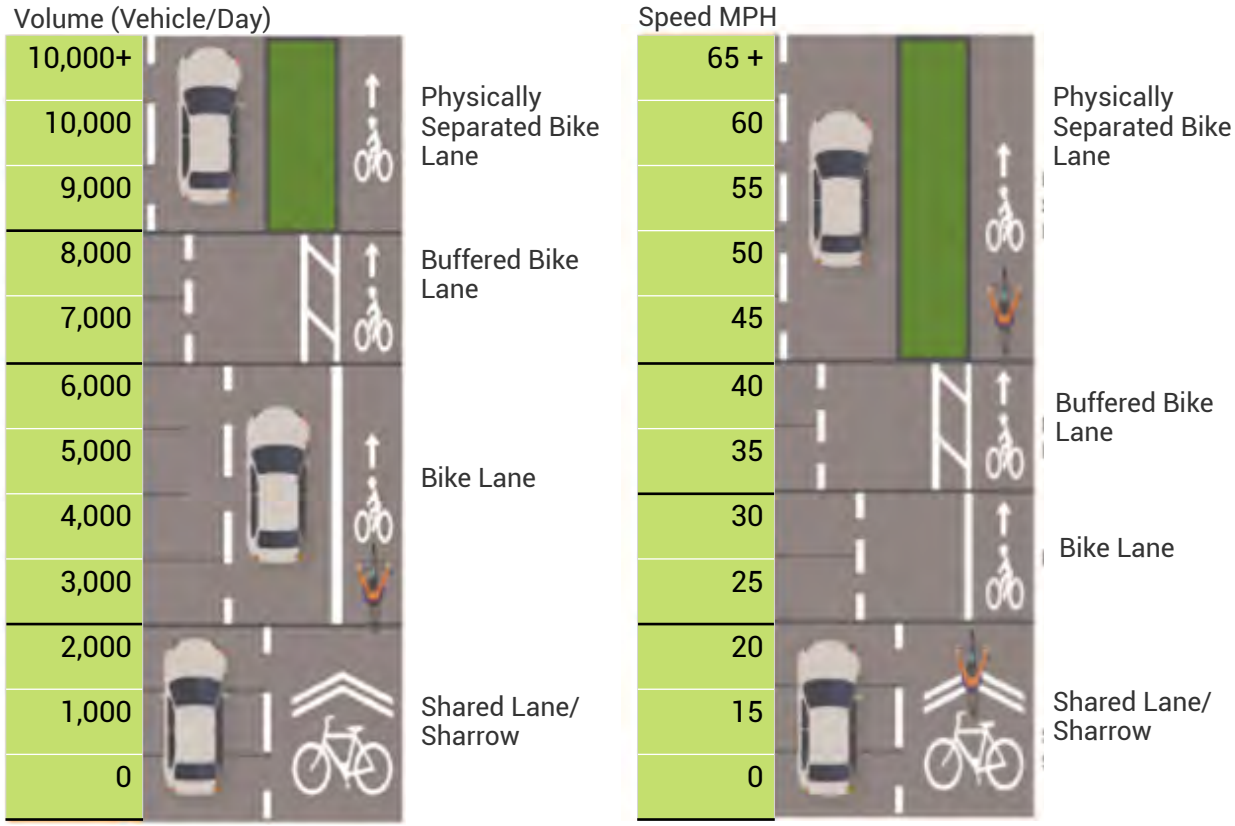


TABLE 1: TOTAL LENGTH OF PROPOSED BICYCLE NETWORK BY FACILITY TYPE

PROPOSED BICYCLE FACILITY TYPE	TOTAL LENGTH (MILES)
Neighborhood Bike Routes	9.25
Conventional Bike Lanes	7.58
Separated/Buffered Bike Lanes	11.56
Shared Use Paths	58.11
Total Proposed Bicycle Network	86.5

NEIGHBORHOOD BIKE ROUTES

Sometimes called greenways or bicycle boulevards, neighborhood bike routes are shared lane roadways ideal for low-speed, low-volume local streets. These corridors are generally low-stress and comfortable for most types of riders. As exemplified in the two photos, neighborhood bike routes use shared lane markings—commonly called sharrows—and signage to make drivers aware of cyclists, and they typically use wayfinding signs to help cyclists navigate the area. Traffic calming features such as mini-traffic circles, speed humps, and curb bumpouts can also be used on neighborhood bike routes to slow vehicular traffic and create a comfortable cycling environment. **Table 2** lists all the proposed neighborhood bike routes.

(Source: Bernstyle.com)

Top: Existing Sharrows on 2nd Avenue in Gastonia, NC. Bottom: Neighborhood Greenway Signage

TABLE 2: PROPOSED NEIGHBORHOOD BIKE ROUTES

Project ID	Facility Name	From	To	Length (mi)	Facility Type
1	Dr MLK Jr Way	Walnut Ave	Highland Rail Trail	0.37	Bike Boulevard
2	E Second Ave, Cumberland Ave, and S Belvedere Ave	S Broad St	E Franklin Blvd	1.19	Bike Boulevard
3	S Marietta St	Osceola St	E Garrison Blvd	0.63	Bike Boulevard
4	S Marietta St	Third Ave	Second Ave	0.11	Bike Boulevard
5	W Second Ave	Linwood Rd	S York St	1.24	Bike Boulevard
6	N Ransom St and W Sycamore Ave	Beaverbrook Dr	N Weldon St	0.36	Bike Boulevard
7	Trenton St and Pryor St	W Garrison Blvd	Erwin Park	1.56	Bike Boulevard
8	Lakewood Dr, Penn Cir, Providence Dr, Miller St, Hillcrest Ave, Athenian Dr	Linwood Rd	W Garrison Blvd	3.54	Bike Boulevard
9	Crescent Ln and Newcastle Rd	Shannon Bradley Rd	T Jeffers Greenway (proposed)	0.25	Bike Boulevard

CONVENTIONAL BIKE LANES

Conventional bike lanes use striping and signage to designate space for cyclists alongside vehicle traffic. Though they vary in width, conventional bike lanes should not be less than 5-feet wide, because wider lanes are more comfortable for cyclists. Reallocating and striping shoulder space can provide on-street bicycle lanes, particularly on streets with low to moderate vehicular volumes (less than 7,000 vehicles per day) and speeds (under 35 mph). Streets with higher volumes and speeds should have buffered or protected bicycle facilities. **Table 3** lists all the proposed conventional/standard bike lanes.

Bike lane on Second Avenue, Gastonia, NC

TABLE 3: PROPOSED CONVENTIONAL/STANDARD BIKE LANES

Project ID	Facility Name	From	To	Length (mi)	Facility Type
10	W Garrison Blvd and Bessemer City Rd	Linwood Rd	City limits (east of Costner School Rd)	4.18	Standard Bike Lane
11	E Ozark Ave	I-85	City limits (west of Cox Rd)	1.65	Standard Bike Lane
12	Union Rd and Broad St	E Garrison Blvd	E Long Ave	0.89	Standard Bike Lane
13	Shannon Bradley Rd	Spring Valley Dr	Knollwood Dr	0.35	Standard Bike Lane
14	S Chester St	W Garrison Blvd	Second Ave	0.51	Standard Bike Lane

SEPARATED/BUFFERED BIKE LANES

Separated/buffered bike lanes, are one- or two-way facilities that physically separate cyclists from vehicular traffic. Striped buffers distinguish these facilities from conventional bike lanes, and the addition of curbs, flexposts, or planters can further separate those cycling from those driving. Separated/buffered bike lanes are recommended for high-speed and high-volume streets. Utility, stormwater drainage, and driveway location reviews help assess the feasibility of separated bike lanes along a corridor. Typically, separated and buffered bike lanes require similar widths. Buffered bike lanes can be an interim treatment using restriping and later transformed into separated bike lanes by adding vertical separation. **Table 4** lists all the proposed separated/buffered bike lanes.

Uptown CycleLink protected bike lane in Charlotte, NC

TABLE 4: PROPOSED SEPARATES/BUFFERED BIKE LANES

Project ID	Facility Name	From	To	Length (mi)	Facility Type
15	S York St	W Garrison Blvd	Second Ave	0.52	Separated/Buffered Bike Lane
16	Armstrong Park Rd and Cox Rd	E Perry St	City limits (south of E Ozark Ave)	2.57	Separated/Buffered Bike Lane
17	Court Dr	N New Hope Rd	Employee Dr	0.75	Separated/Buffered Bike Lane
18	E Long Ave and E Ozark Ave	N Broad St	I-85	1.25	Separated/Buffered Bike Lane
19	Dr MLK Jr Way	E Long Ave	Walnut Ave	0.22	Separated/Buffered Bike Lane
20	S Marietta St	E Garrison Blvd	Third Ave	0.36	Separated/Buffered Bike Lane
21	Garrison Blvd	Linwood Rd	S New Hope Rd	3.49	Separated/Buffered Bike Lane
22	Neal Hawkins Rd and Robinwood Rd	Valleywood Dr	E Hudson Blvd	2.40	Separated/Buffered Bike Lane

SHARED USE PATHS

Shared use paths provide dedicated space for non-motorized modes. These paths are typically paved and accommodate travel in both directions. They may have center striping to separate traffic. Shared use paths include greenways that are not associated with the road network as well as facilities adjacent to the street. When they are adjacent to the street, shared use paths can serve as an extra-wide multimodal sidewalk and be used when the street cannot accommodate bicycle facilities Landscape buffers, trees, shrubs, and other elements further separate the path from the street in these circumstances. Because shared use path users encounter vehicles at driveways, intersections, and crossings, signage and striping can improve safety for drivers, cyclists, pedestrians, and anyone else using the path. **Table 5** lists all the proposed shared use paths.

Avon and Catawba Creeks Greenway in Gaston County, NC

(Source: Carolina Thread Trail)

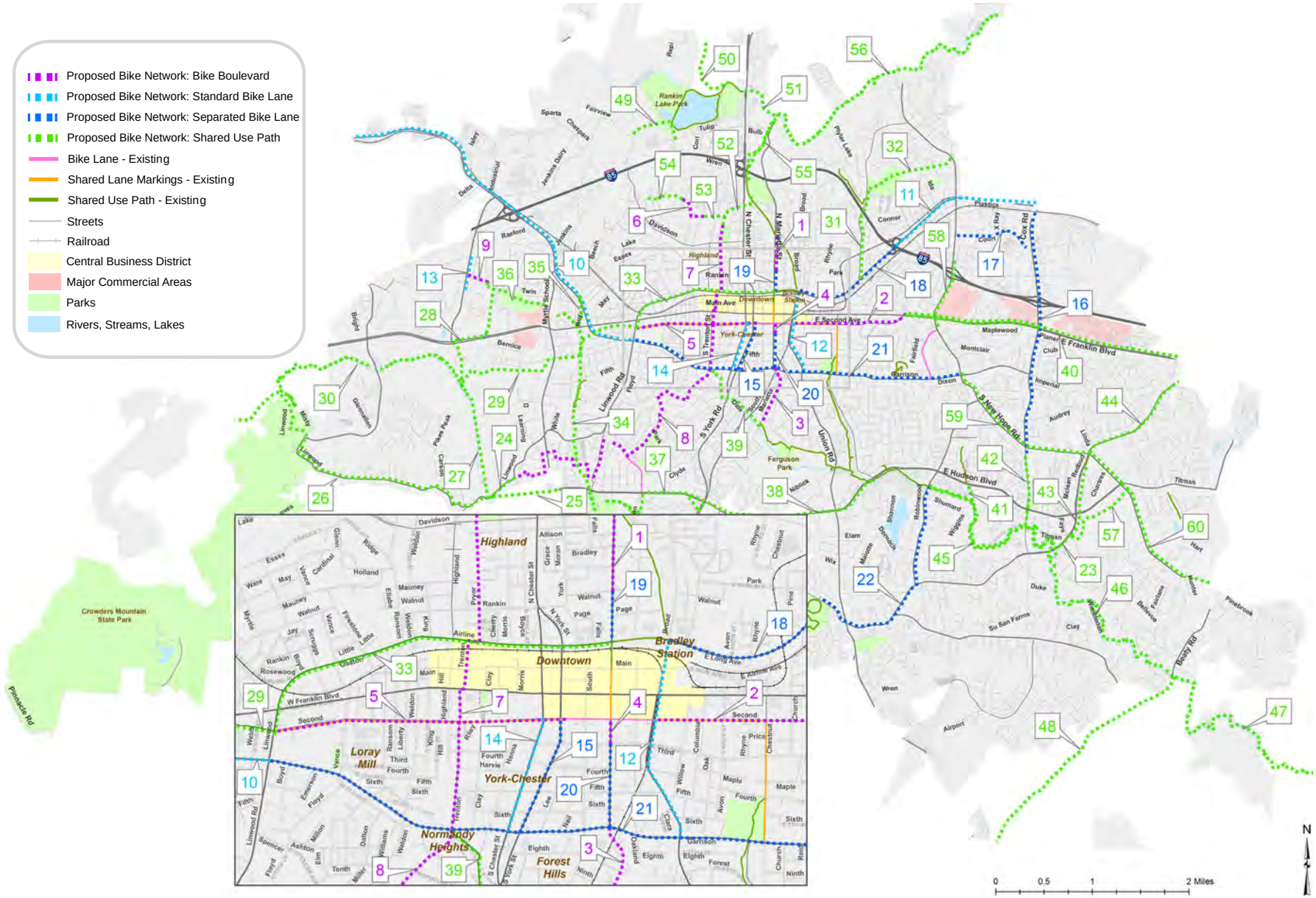
TABLE 5: PROPOSED SHARED USE PATHSRID CUTEREM QUIDERI PONFICI VILNEQUITIUM TA, UT INC MOR QUOD PERFIT, CONLOSTIM NONLOCUL

Project ID	Facility Name	From	To	Length (mi)	Facility Type
23	Hoffman Rd	Carolina Thread Trail	Leonard Dr	0.21	Shared Use Path
24	Linwood Rd	Crowders Creek	Lakewood Dr	0.34	Shared Use Path
25	Linwood Rd (with proposed extension to Hudson Blvd)	Carson Rd	Davis Park Rd	1.43	Shared Use Path
26	Linwood Rd	Lincoln Academy Rd	Carson Rd	2.96	Shared Use Path
27	SUP along Crowders Creek	Linwood Rd	Carolina Thread Trail (proposed)	1.11	Shared Use Path
28	Crowders Creek Development SUP	Carolina Thread Trail (proposed)	T Jeffers Center Greenway (proposed)	1.35	Shared Use Path
29	Carolina Thread Trail (west section 1)	Crowders Creek	Linwood Rd	2.42	Shared Use Path

Project ID	Facility Name	From	To	Length (mi)	Facility Type
30	Carolina Thread Trail (west section 2; east of Crowders Mountain)	Crowders Mountain State Park eastern limits	Crowders Creek	2.66	Shared Use Path
31	Modena St	E Long Ave	N Jean Rd	0.97	Shared Use Path
32	Bradley Center SUP Connector (N Jean Rd extension)	Moderna St	New Hope Rd	0.97	Shared Use Path
33	Gaston Ave, W Airline Ave, W Long Ave	Second Ave	N Marietta St	1.64	Shared Use Path
34	Blackwood Creek Greenway	Phillips Center	Gastonia Fire Station 1	2.45	Shared Use Path
35	Blackwood Creek Greenway Branch	Blackwood Creek Greenway (proposed) and Roy St	Bessemer City Rd	0.35	Shared Use Path
36	T Jeffers Center Greenway	Vancouver Ln	Hartman St	0.71	Shared Use Path
37	Phillips Center Greenway	Echo Ln	S York Rd	2.05	Shared Use Path
38	Hudson Blvd	Lyon St	Catawba Creek Greenway	2.56	Shared Use Path
39	Catawba Creek Greenway - NW Extension	S Marietta St	Linwood Rd	0.88	Shared Use Path
40	E Franklin Blvd	S Belvedere Ave	Old Redbud Dr	4.36	Shared Use Path
41	Shoal Creek Extension	Shoal Creek SUP	Carolina Thread Trail (proposed)	0.18	Shared Use Path
42	Gaston Day School Rd	Catawba Creek	E Perry St	0.70	Shared Use Path
43	Hoffman Rd and Redbud Dr	Catawba Creek	Existing Redbud Dr SUP	0.94	Shared Use Path
44	Redbud Dr	S New Hope Rd	City limits (northeast of Old Redbud Dr)	1.23	Shared Use Path
45	Carolina Thread Trail (east section 1)	Robinwood Rd	Hoffman Rd	4.74	Shared Use Path
46	Carolina Thread Trail (east section 2)	Hoffman Rd	Beaty Rd	2.50	Shared Use Path
47	Carolina Thread Trail (east section 3)	Beaty Rd	East of city limits	2.93	Shared Use Path
48	Beaty Rd	Union Rd	Catawba Creek	2.58	Shared Use Path

Project ID	Facility Name	From	To	Length (mi)	Facility Type
49	Green Meadow Dr and Weetabix Pkwy (to Rankin Lake Park)	Fairview Dr	Tulip Dr	0.63	Shared Use Path
50	Rankin Lake Park Northern Extension	Rankin Lake Park	Technology Pkwy	0.76	Shared Use Path
51	Rankin Lake Park Eastern Extension (Long Creek)	Rankin Lake Park	Dr MLK Jr Way	0.47	Shared Use Path
52	Highland Neighborhood Trail Connection	N Pryor St	Norfolk Southern Railroad Trail	0.49	Shared Use Path
53	SUP Connection west of Erwin Park	Sycamore Ave	Highland Neighborhood Trail Connection (proposed)	0.21	Shared Use Path
54	Hargrove Ave SUP Connection	Trexlar Ave	N Ransom St	0.43	Shared Use Path
55	Carolina Thread Trail (north section 1; Highland Branch Greenway)	Rankin Lake Park	Old Dallas Rd	1.56	Shared Use Path
56	Carolina Thread Trail (north section 2; SUP along Long Creek/Flyer Park)	Old Dallas Rd	City limits	3.34	Shared Use Path
57	Creek/South Fork Development SUP	Hoffman Rd (along Leonard Dr)	New Hope Rd	0.89	Shared Use Path
58	N New Hope Rd and S New Hope Rd	Remount Rd	Burtonwood Dr	0.77	Shared Use Path
59	S New Hope Rd	Garrison Blvd	Titman Rd	2.15	Shared Use Path
60	S New Hope Rd	Titman Rd	Lowell Bethesda Rd	1.47	Shared Use Path

FIGURE 34: PROPOSED BIKE NETWORK BY FACILITY TYPE



Project Prioritization

Project prioritization helps to identify which projects best advance the vision and goals of the plan and enables the City to allocate resources needed for project implementation.

METHODOLOGY

Proposed projects were evaluated and scored based on the plan's six goals: safety, comfort, connectivity, accessibility, coordination, and equity. Those goal scores were then added together to reach an overall project priority score.

Multiple metrics evaluated how each project advanced a particular goal. The higher a project scored on these metrics, the higher the score the project received for the corresponding goal.

A ranking system displays how a project scores on each goal as shown below:

○	Indicates a project has scored poorly on metrics for that goal
◐	Indicates a project meets approximately half of the metrics for that goal
●	Indicates a project scored highly on all metrics for that goal

Prioritization should also consider how each proposed bicycle facility relates to existing planned non-bicycle projects from either NCDOT, GCLMPO, or the City of Gastonia. These roadway improvement projects provide an opportunity to include bicycle improvements concurrently. For example, the best time to add a bike lane is when that road is already scheduled for resurfacing. Prioritizing projects on roads with already planned improvements will greatly ease implementation, reduce project costs, and allow all roadway improvements to be made at once without tearing up work from previous projects.

Plan Goal Metrics

Safety

- Project location is where a bike and/or pedestrian crash occurred
- Project is on/near (within 50 feet) a road the public has identified as a safety concern

Comfort

- Project is on/near (within 50 feet) a high-stress road
- Project is on/near (within 50 feet) a road the public has identified as a desired bike route or in need of bike improvements

Connectivity

- Project connects to the existing low-stress road network
- Project connects to an existing bike facility or shared use path
- Project is near (within 1/8 mile) existing and/or proposed transit stops
- Project is near (within 50 feet) existing sidewalks

Accessibility

- Project is near (within 1/8 mile) a key destination*
- Project serves a high population density community
- Project serves an area with high employment density

Coordination

- Project is located within an existing Ward Area Plan
- Project intersects with or is along a GCLMPO non-highway project
- Project intersects with or is along a GCLMPO highway project
- Project intersects with or is along a NCDOT project
- Project is on a City road with planned improvements (e.g. resurfacing)

Equity

- Project serves a predominately low-income community
- Project serves an area with high concentration of zero vehicle households
- Project serves traditionally underserved communities

**Key Destinations were identified during the Existing Conditions analysis. They include trails and greenways, parks, museums, civic and community centers, major commercial areas, and recreational facilities.*

PRIORITIZATION TABLE

Proposed projects were evaluated to see how each project aligns with the plan goals. Based on how each project aligns with the plan goals, an overall priority level, high, medium, or low was assigned. **Table 6** through **Table 8** summarize the high, medium, and low priority projects, respectively and provide an overview of how each project achieves the plan goals.

TABLE 6: HIGH PRIORITY PROJECTS

Project ID	Street Name	Safety	Comfort	Connectivity	Accessibility	Coordination	Equity
7	Trenton St and Pryor St	◐	●	●	●	◐	●
8	Lakewood Dr, Penn Cir, Providence Dr…Miller St, Hillcrest Ave, Athenian Dr	◐	●	●	◐	◐	●
10	W Garrison Blvd and Bessemer City Rd	●	●	●	◐	●	●
12	Union Rd and Broad St	◐	◐	●		◐	●
16	Armstrong Park Rd and Cox Rd	◐	◐	●	●	◐	●
21	Garrison Blvd	◐	●	●	●	◐	●
22	Neal Hawkins Rd and Robinwood Rd	●	●	●	◐	●	◑
28	Crowders Creek Development SUP	◐	●	◐	◐	◐	●
29	Carolina Thread Trail (west section 1)	◐	◐	◐	◐	◐	●
31	Modena St SUP	◐	●	●	◐	○	●
33	Gaston Ave, W Airline Ave, W Long Ave SUP Connector	◐	●	●	●	◐	●
34	Blackwood Creek Greenway	◐	◐	◐	◐	◐	●
37	Phillips Center Greenway	●	◐	◐	◐	◐	◑
38	Hudson Blvd SUP	●	◐	◐	◐	◐	●

Project ID	Street Name	Safety	Comfort	Connectivity	Accessibility	Coordination	Equity
39	Catawba Creek Greenway - NW Extension	◐	◐	◐	◐	◐	●
40	E Franklin Blvd SUP	◐	●	●	◐	●	●
44	Redbud Dr SUP	◐	●	◐	◐	◐	◐
45	Carolina Thread Trail (east section 1)	○	◐	◐	◐	◐	●
52	Highland Neighborhood Trail Connection SUP	◐	◐	◐	◐	○	●
54	Hargrove Ave SUP Connection	◐	○	◐	◐	◐	●
55	Carolina Thread Trail (north section 1; Highland Branch Greenway)	◐	○	◐	◐	●	●
58	N New Hope Rd and S New Hope Rd SUP	◐	◐	◐	◐	◐	●
59	S New Hope Rd SUP	◐	●	●	◐	◐	●

○ Indicates a project has scored poorly on metrics for that goal

◐ Indicates a project meets approximately half of the metrics for that goal

● Indicates a project scored highly on all metrics for that goal

TABLE 7: MEDIUM PRIORITY PROJECTS

Project ID	Street Name	Safety	Comfort	Connectivity	Accessibility	Coordination	Equity
2	E Second Ave, Cumberland Ave, and S Belvedere Ave	◐	●	●	◐	◐	●
3	S Marietta St	◐	●	●	◐	○	●
4	S Marietta St	◐	●	◐	●	○	●
5	W Second Ave	◐	◐	●	●	◐	●
6	N Ransom St and W Sycamore Ave	◐	◐	●	◐	◐	●
15	S York St	◐	◐	●	◐	○	◐
17	Court Dr	◐	◐	◐	◐	●	◐
18	E Long Ave and E Ozark Ave	◐	◐	●	◐	◐	●
20	S Marietta St	◐	◐	●	◐	○	●
25	Linwood Rd SUP(with proposed extension to Hudson Blvd)	◐	◐	◐	◐	◐	◐
32	Bradley Center SUP Connector (N Jean Rd extension)	○	◐	◐	◐	○	◐
35	Blackwood Creek Greenway Branch	◐	◐	◐	◐	◐	●
36	T Jeffers Center Greenway	◐	○	●	◐	◐	◐
42	Gaston Day School Rd SUP	●	◐	◐	◐	○	◐
43	Hoffman Rd and Redbud Dr SUP	◐	◐	◐	◐	○	◐
53	Erwin Park SUP Connection	◐	◐	◐	◐	○	◐
57	Creek/South Fork Development SUP	◐	◐	◐	◐	◐	◐
60	S New Hope Rd SUP	◐	◐	◐	◐	◐	◐

TABLE 8: LOW PRIORITY PROJECTS

Project ID	Street Name	Safety	Comfort	Connectivity	Accessibility	Coordination	Equity
1	Dr MLK Jr Way	◐	◐	◐	◐	○	●
9	Crescent Ln and Newcastle Rd	○	◐	●	◐	◐	●
11	E Ozark Ave	◐	●	●	◐	◐	◐
13	Shannon Bradley Rd	○	○	◐	◐	○	●
14	S Chester St	◐	◐	●	◐	○	◐
19	Dr MLK Jr Way	◐	◐	◐	◐	○	●
23	Hoffman Rd SUP	○	◐	○	◐	◐	◐
24	Linwood Rd SUP	○	●	○	○	◐	◐
26	Linwood Rd SUP	○	◐	◐	○	○	◐
27	SUP along Crowders Creek	○	●	○	○	○	◐
30	Carolina Thread Trail (west section 2; east of Crowders Mountain)	○	○	○	○	○	◐
41	Shoal Creek Extension SUP	◐	○	◐	◐	○	◐
46	Carolina Thread Trail (east section 2)	○	◐	◐	◐	○	◐
47	Carolina Thread Trail (east section 3)	○	◐	○	○	○	○
48	Beaty Rd SUP	◐	◐	◐	○	◐	○
49	Green Meadow Dr and Weetabix Pkwy SUP (to Rankin Lake Park)	○	◐	◐	○	◐	◐
50	Rankin Lake Park Northern Extension SUP	○	○	◐	○	◐	●

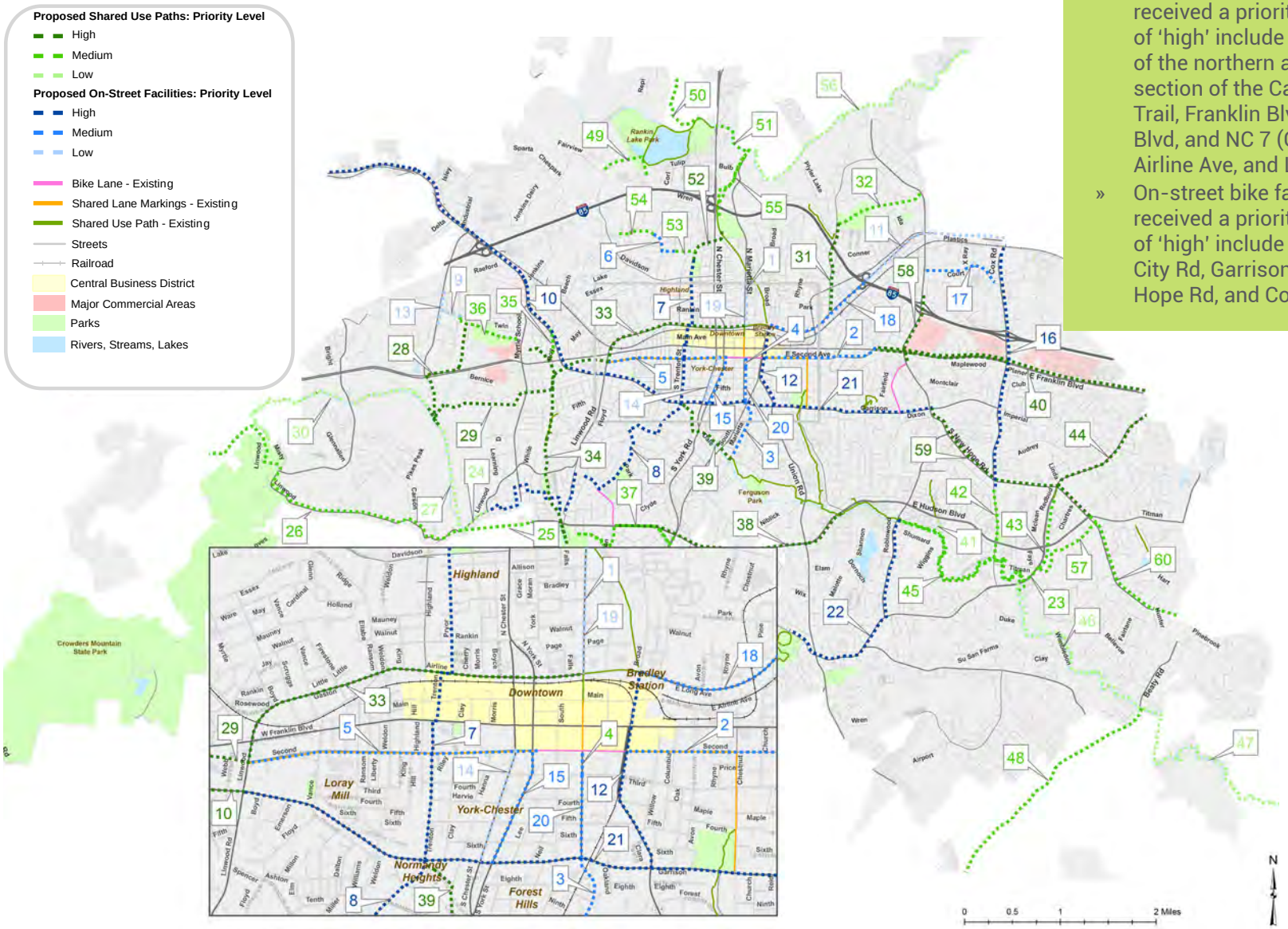
Project ID	Street Name	Safety	Comfort	Connectivity	Accessibility	Coordination	Equity
51	Rankin Lake Park Eastern Extension SUP (Long Creek)	○	◐	○	◐	○	●
56	Carolina Thread Trail (north section 2; SUP along Long Creek/Flyer Park)	○	○	◐	◐	○	◐

Based on the findings from the project prioritization analysis, a priority level was assigned to each proposed facility (separated into on-street facilities and shared use paths) as described below.

●	HIGH projects fall into the top third of overall scores
◐	MEDIUM projects fall into the middle third of overall scores
○	LOW projects fall into the bottom third of overall scores for on-street facilities maps the overall priority level for each proposed facility

Figure 35 provides a map of the proposed project by priority level, and Table 9 Table 8 summarizes each project by extents, facility type, and priority level.

FIGURE 35: PROPOSED BIKE NETWORK BY PRIORITY LEVEL



PRIORITY PROJECTS TAKEAWAYS

- Shared use paths that received a priority level score of 'high' include segments of the northern and western section of the Carolina Thread Trail, Franklin Blvd, Hudson Blvd, and NC 7 (Gaston Ave, Airline Ave, and Long Ave).
- On-street bike facilities that received a priority level score of 'high' include Bessemer City Rd, Garrison Blvd, New Hope Rd, and Cox Rd.

TABLE 9: PROJECT PRIORITIZATION SUMMARY

Project ID	Street Name	From	To	Length (miles)	Current Roadway Owner	Facility Type	Priority
1	Dr MLK Jr Way	Walnut Ave	Norfolk Southern Railroad Trail	0.37	NCDOT	Bike Boulevard	○
2	E Second Ave, Cumberland Ave, and S Belvedere Ave	S Broad St	E Franklin Blvd	1.19	City	Bike Boulevard	◐
3	S Marietta St	Osceola St	E Garrison Blvd	0.63	City	Bike Boulevard	◐
4	S Marietta St	Third Ave	Second Ave	0.11	City	Bike Boulevard	◐
5	W Second Ave	Linwood Rd	S York St	1.24	City	Bike Boulevard	◐
6	N Ransom St and W Sycamore Ave	Beaverbrook Dr	N Weldon St	0.36	City	Bike Boulevard	◐
7	Trenton St and Pryor St	W Garrison Blvd	Erwin Park	1.56	City	Bike Boulevard	●
8	Lakewood Dr, Penn Cir, Providence Dr., Miller St, Hillcrest Ave, Athenian Dr	Linwood Rd	W Garrison Blvd	3.54	City	Bike Boulevard	●
9	Crescent Ln and Newcastle Rd	Shannon Bradley Rd	T Jeffers Greenway (proposed)	0.25	City	Bike Boulevard	○
10	W Garrison Blvd and Bessemer City Rd	Linwood Rd	City limits (east of Costner School Rd)	4.18	NCDOT	Standard Bike Lane	●
11	E Ozark Ave	I-85	City limits (west of Cox Rd)	1.65	NCDOT	Standard Bike Lane	○
12	Union Rd and Broad St	E Garrison Blvd	E Long Ave	0.89	City (north of US 74)		●
13	NCDOT (south of US 74)	Standard Bike Lane	Bessemer City Rd	0.35	Shared Use Path		○
14	Shannon Bradley Rd	Spring Valley Dr	Knollwood Dr	0.35	NCDOT	Standard Bike Lane	○
15	S Chester St	W Garrison Blvd	Second Ave	0.51	NCDOT	Standard Bike Lane	◐

Project ID	Street Name	From	To	Length (miles)	Current Roadway Owner	Facility Type	Priority
16	S York St	W Garrison Blvd	Second Ave	0.52	NCDOT	Separated/ Buffered Bike Lane	●
17	Armstrong Park Rd and Cox Rd	E Perry St	City limits (south of E Ozark Ave)	2.57	NCDOT	Separated/ Buffered Bike Lane	◐
18	Court Dr	N New Hope Rd	Employee Dr	0.75	City	Separated/ Buffered Bike Lane	◐
19	E Long Ave and E Ozark Ave	N Broad St	I-85	1.25	NCDOT	Separated/ Buffered Bike Lane	○
20	Dr MLK Jr Way	E Long Ave	Walnut Ave	0.22	NCDOT	Separated/ Buffered Bike Lane	◐
21	Garrison Blvd	Linwood Rd	S New Hope Rd	3.49	NCDOT	Separated/ Buffered Bike Lane	●
22	Neal Hawkins Rd and Robinwood Rd	Valleywood Dr	E Hudson Blvd	2.40	NCDOT	Separated/ Buffered Bike Lane	●
23	Hoffman Rd SUP	Carolina Thread Trail	Leonard Dr	0.21	NCDOT	Shared Use Path	○
24	Linwood Rd SUP	Crowders Creek	Lakewood Dr	0.34	NCDOT	Shared Use Path	○
25	Linwood Rd SUP (with proposed extension to Hudson Blvd)	Carson Rd	Davis Park Rd	1.43	N/A	Shared Use Path	◐
26	Linwood Rd SUP	Lincoln Academy Rd	Carson Rd	2.96	N/A	Shared Use Path	○
27	SUP along Crowders Creek	Linwood Rd	Carolina Thread Trail (proposed)	1.11	N/A	Shared Use Path	○

Project ID	Street Name	From	To	Length (miles)	Current Roadway Owner	Facility Type	Priority
28	Crowders Creek Development SUP	Carolina Thread Trail (proposed)	T Jeffers Center Greenway (proposed)	1.35	NCDOT (US 74)	Shared Use Path	●
29	Carolina Thread Trail (west section 1)	Crowders Creek	Linwood Rd	2.42	N/A	Shared Use Path	●
30	Carolina Thread Trail (west section 2; east of Crowders Mountain)	Crowders Mountain State Park eastern limits	Crowders Creek	2.66	N/A	Shared Use Path	○
31	Modena St SUP	E Long Ave	N Jean Rd	0.97	City	Shared Use Path	●
32	Bradley Center SUP Connector (N Jean Rd Extension)	Modena St	New Hope Rd	0.97	City (N Jean Rd)	Shared Use Path	◐
33	Gaston Ave, W Airline Ave, W Long Ave SUP Connector	Second Ave	N Marietta St	1.64	NCDOT	Shared Use Path	●
34	Blackwood Creek Greenway	Phillips Center	Gastonia Fire Station 1	2.45	N/A	Shared Use Path	●
35	Blackwood Creek Greenway Branch	Blackwood Creek Greenway (proposed) and Roy St	Bessemer City Rd	0.35	N/A	Shared Use Path	◐
36	T Jeffers Center Greenway	Vancouver Ln	Hartman St	0.71	City (Whitener St)	Shared Use Path	◐
37	Phillips Center Greenway	Echo Ln	S York Rd	2.05	NCDOT (Hudson Blvd and S York Rd)	Shared Use Path	●
38	Hudson Blvd SUP	Lyon St	Catawba Creek Greenway	2.56	NCDOT	Shared Use Path	●
39	Catawba Creek Greenway - NW Extension	S Marietta St	Linwood Rd	0.88	N/A	Shared Use Path	●
40	E Franklin Blvd SUP	S Belvedere Ave	Old Redbud Dr	4.36	NCDOT	Shared Use Path	●

Project ID	Street Name	From	To	Length (miles)	Current Roadway Owner	Facility Type	Priority
41	Shoal Creek Extension SUP	Shoal Creek SUP	Carolina Thread Trail (proposed)	0.18	N/A	Shared Use Path	○
42	Gaston Day School Rd SUP	Catawba Creek	E Perry St	0.70	NCDOT	Shared Use Path	◑
43	Hoffman Rd and Redbud Dr SUP	Catawba Creek	Existing Redbud Dr SUP	0.75	NCDOT	Shared Use Path	◑
44	Redbud Dr SUP	S New Hope Rd	City limits (northeast of Old Redbud Dr)	1.23	NCDOT	Shared Use Path	●
45	Carolina Thread Trail (east section 1)	Robinwood Rd	Hoffman Rd	4.74	N/A	Shared Use Path	●
46	Carolina Thread Trail (east section 2)	Hoffman Rd	Beaty Rd	2.50	N/A	Shared Use Path	○
47	Carolina Thread Trail (east section 3)	Beaty Rd	East of city limits	2.93	N/A	Shared Use Path	○
48	Beaty Rd SUP	Union Rd	Catawba Creek	2.58	NCDOT	Shared Use Path	○
49	Green Meadow Dr and Weetabix Pkwy SUP (to Rankin Lake Park)	Fairview Dr	Tulip Dr	0.63	City (Weetabix Pkwy)	Shared Use Path	○
50	Rankin Lake Park Northern Extension SUP	Rankin Lake Park	Technology Pkwy	0.76	N/A	Shared Use Path	○
51	Rankin Lake Park Eastern Extension SUP (Long Creek)	Rankin Lake Park	Dr MLK Jr Way	0.47	N/A	Shared Use Path	○
52	Highland Neighborhood Trail Connection	N Pryor St	Norfolk Southern Railroad Trail	0.49	City (New Way Dr)	Shared Use Path	●
53	Erwin Park SUP Connection	Sycamore Ave	Highland Neighborhood Trail Connection (proposed)	0.21	N/A	Shared Use Path	◑
54	Hargrove Ave SUP Connection	Trexlar Ave	N Ransom St	0.43	City (Hargrove Ave)	Shared Use Path	●

Project ID	Street Name	From	To	Length (miles)	Current Roadway Owner	Facility Type	Priority
55	Carolina Thread Trail (north section 1; Highland Branch Greenway)	Rankin Lake Park	Old Dallas Rd	1.45	N/A	Shared Use Path	●
56	Carolina Thread Trail (north section 2; SUP along Long Creek/Flyer Park)	Old Dallas Rd	City limits	3.34	N/A	Shared Use Path	○
57	Creek/South Fork Development SUP	Hoffman Rd (along Leonard Dr)	New Hope Rd	0.89	N/A	Shared Use Path	◐
58	N New Hope Rd and S New Hope Rd SUP	Remount Rd	Burtonwood Dr	0.77	NCDOT	Shared Use Path	●
59	S New Hope Rd SUP	Garrison Blvd	Titman Rd	2.15	NCDOT	Shared Use Path	●
60	S New Hope Rd SUP	Titman Rd	Lowell Bethesda Rd	1.47	NCDOT	Shared Use Path	◐

● Indicates a project with a **high** priority level

◐ Indicates a project with a **medium** priority level

○ Indicates a project with a **low** priority level

Demonstration Project: Garrison Boulevard

PROJECT BACKGROUND

A major east-west route bisecting Gastonia, Garrison Boulevard has a mixture of character zones with different land uses, including a high number of community destinations and publicly-owned facilities. With the City's goal for future redevelopment around the York Chester Historic District and initiatives to make the corridor a major public gateway, Garrison Boulevard serves as a key opportunity where Gastonia could prioritize bicycle improvements to create a safe, separated bicycle facility that would appeal to users of all ages and abilities.

As shown in **Figure 36**, Garrison Boulevard from Linwood Road to New Hope Road (project ID number 21 of the proposed bike network) currently consists of four travel lanes with a center turn lane. This corridor received a high priority level score for an on-road bicycle facility as part of this plan's proposed bicycle network prioritization. A road diet along Garrison Boulevard would reduce the number of vehicle travel lanes and provide space for separated bicycle facilities that better serve bicyclists along one of Gastonia's key east-west routes. **The proposed designs shown in this section are conceptual in nature and would require more detailed traffic and engineering analysis to determine feasibility.**

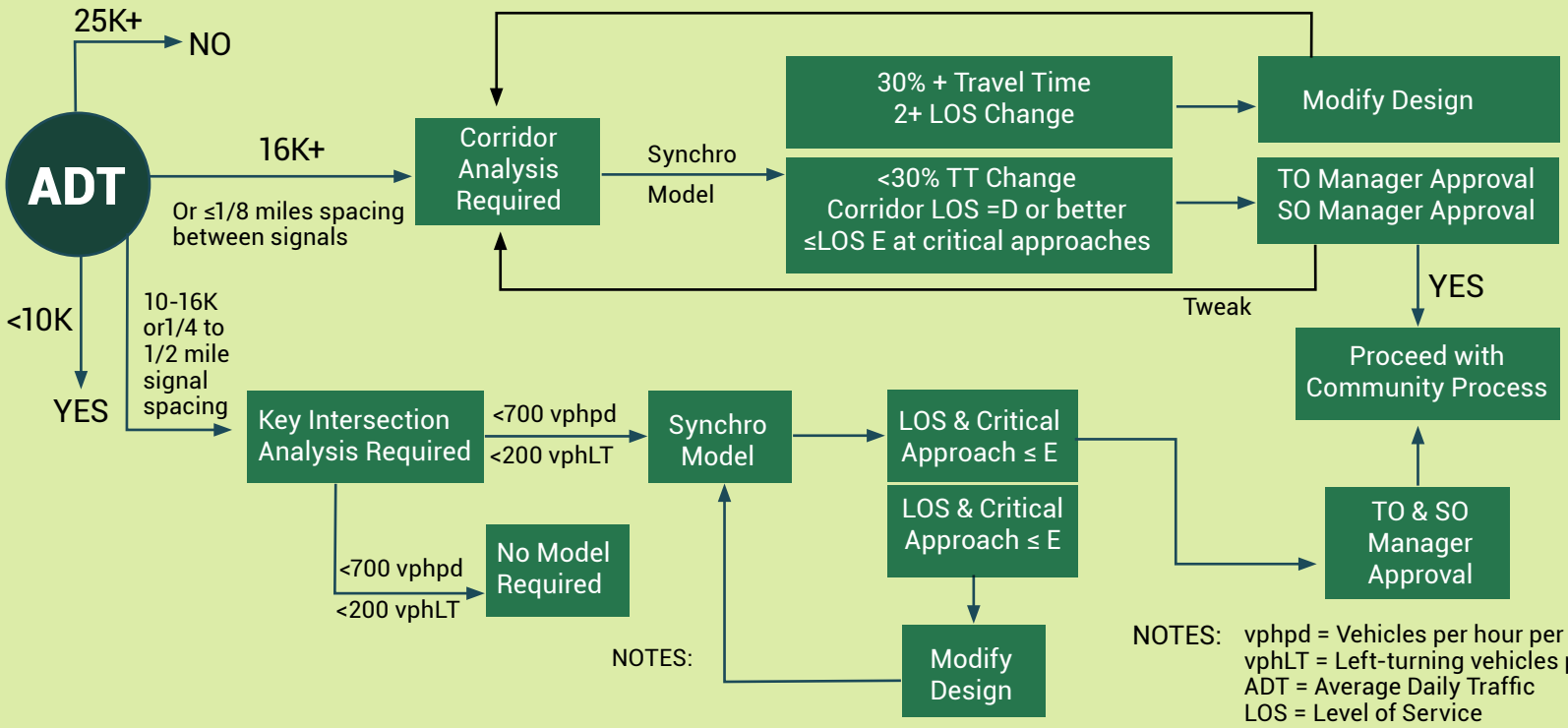
FIGURE 36: TYPICAL CONDITIONS ON GARRISON BOULEVARD

What is a road diet?

A road diet consists of reducing the number of travel lanes along a road to improve safety and accessibility for users. Typical road diet conversions include converting one or more travel lanes into center turn lanes (for instance, four travel lanes converted to two travel lanes with a median turn lane). Five-lane to three-lane road diets have also been implemented successfully, including on East Boulevard in Charlotte, NC. Road diets can accommodate non-motorized users, including bicyclists, by implementing dedicated bike lanes. They also increase pedestrian safety at intersections with shortened crossing distances.

Vehicle volumes are typically used to determine the feasibility of a road diet along a corridor. For example, the Seattle Department of Transportation uses these road diet feasibility guidelines to evaluate converting a four- or five-lane road into three lanes:

MODELING FLOW CHART FOR ROAD DIETS (FROM 4 OR 5 LANES TO 3 LANES)



CHARLOTTE EAST BOULEVARD, BEFORE

CHARLOTTE EAST BOULEVARD, AFTER

PROPOSED IMPROVEMENTS

Along the Garrison Boulevard corridor, it is proposed that vehicular lanes be reduced from 5 lanes to either 3 or 4 lanes and that separated bike lanes be added on both sides of the street. New or expanded sidewalks are recommended in areas with high current or future pedestrian activity. Intersection improvements are proposed to increase safety for all users, including bicyclists and pedestrians.

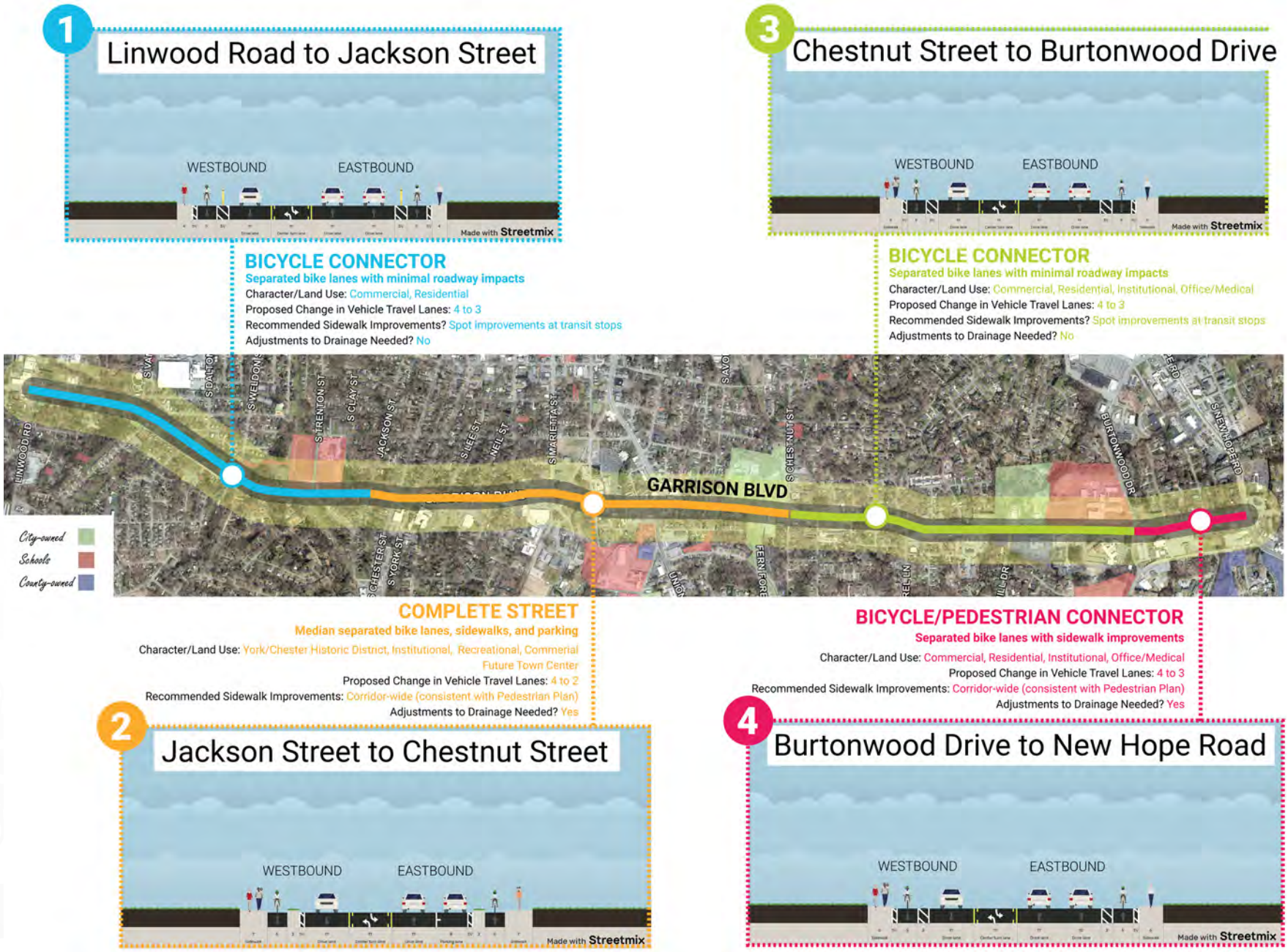
Typical Sections

The proposed improvements to Garrison Boulevard between Linwood Road and New Hope Road are divided into four distinct character zones:

1. **Linwood Road to Jackson Street** is an area of existing commercial and residential development with the opportunity to function as a bicycle connector through the implementation of separated bike lanes with minimal roadway impacts.
2. **Jackson Street to Chestnut Street** is the location of the York Chester Historic District and an area of planned future redevelopment, with institutional, recreational, and commercial land uses; this segment is also an opportunity to implement a complete street with median separated bike lanes and improved pedestrian facilities.
3. **Chestnut Street to Burtonwood Drive** is an existing commercial, residential, institutional, and office/medical land use area with the opportunity to become a bicycle connector.
4. **Burtonwood Drive to New Hope Road** is an existing commercial, residential, institutional, and office/medical land use area with the opportunity to become both a bicycle and pedestrian connector if separated bike lanes and sidewalk improvements are implemented.

Figure 37 shows the proposed improvements along each Garrison Boulevard's four sections.

FIGURE 37:PROPOSED IMPROVEMENTS ALONG GARRISON BOULEVARD



Proposed Treatments

Along Garrison Boulevard, flex posts for the Bicycle and Pedestrian Connector sections (1, 3, and 4) would provide separation between bicycle and vehicle traffic and result in greater facility comfort and safety. Raised or planted medians would provide separation for the Complete Streets section (2), which would correspond with planned future redevelopment through this area. Green painted lanes with conflict markings at intersections and driveways are recommended for all facilities along the corridor.

Photos numbered 1-3 in **Figures 38** illustrate how San Francisco, California; Austin, Texas; and Portland, Oregon have used flex posts, raised medians, and planted medians to separate bike lanes. The image from San Francisco also showcases the use of green paint to delineate bicycle lanes.

For some segments of the Complete Streets section (2), parking-separated bike lanes—adding on-street parking between the travel lane and bike lane—would provide additional parking within the York Chester Historic District and future redevelopment area, as exemplified in photo number 4. For the blocks with parking-separated bike lanes, removing on-street parking around the intersection—to create clear corners—would prevent parking adjacent to crosswalks and improve the visibility of pedestrians and bicyclists who may be obscured by parked vehicles.

Several design treatments can be used at intersections along Garrison Boulevard to improve safety and comfort for all roadway users. All crosswalks within the proposed improvement extents along Garrison Boulevard are recommended to be high visibility crosswalks to further improve the visibility of pedestrians crossing the street. At major intersections along the corridor, protected intersection treatments would increase visibility of bicyclists to drivers and improve safety for bicyclists. Examples of these design treatments are shown in photos number 5 -6 and illustrated further in the intersection concepts section. All intersection treatments should be designed to accommodate truck traffic along the corridor.

FIGURE 38: GARRISON BOULEVARD TOOLKIT OF TREATMENTS

A green painted bike lane with flex post separations and conflict markings

(Source: FHWA)

Raised median separated bike lane

(Source: FHWA)

Planted median separated bike lane

(Source: FHWA)

Parking-separated bike lane

(Source: FHWA Separated Bike Lane Planning and Design Guide, 2015)

Intersection clear corners.

Source: (NYCDOT, Enhanced Crossings)

A protected intersection

(Source: Washington Area Bicyclist Association)

Intersection Concepts

Figures 39 and 40 show proposed concept-level improvements at the intersections of Garrison Boulevard with US 321 (Chester Street and York Street) and Burtonwood Drive. These improvements include protected intersection treatments and dedicated bike crossings with high-visibility green conflict markings.

FIGURE 39: PROPOSED INTERSECTION CONCEPT AT GARRISON BOULEVARD AND US 321 (CHESTER STREET & YORK STREET)

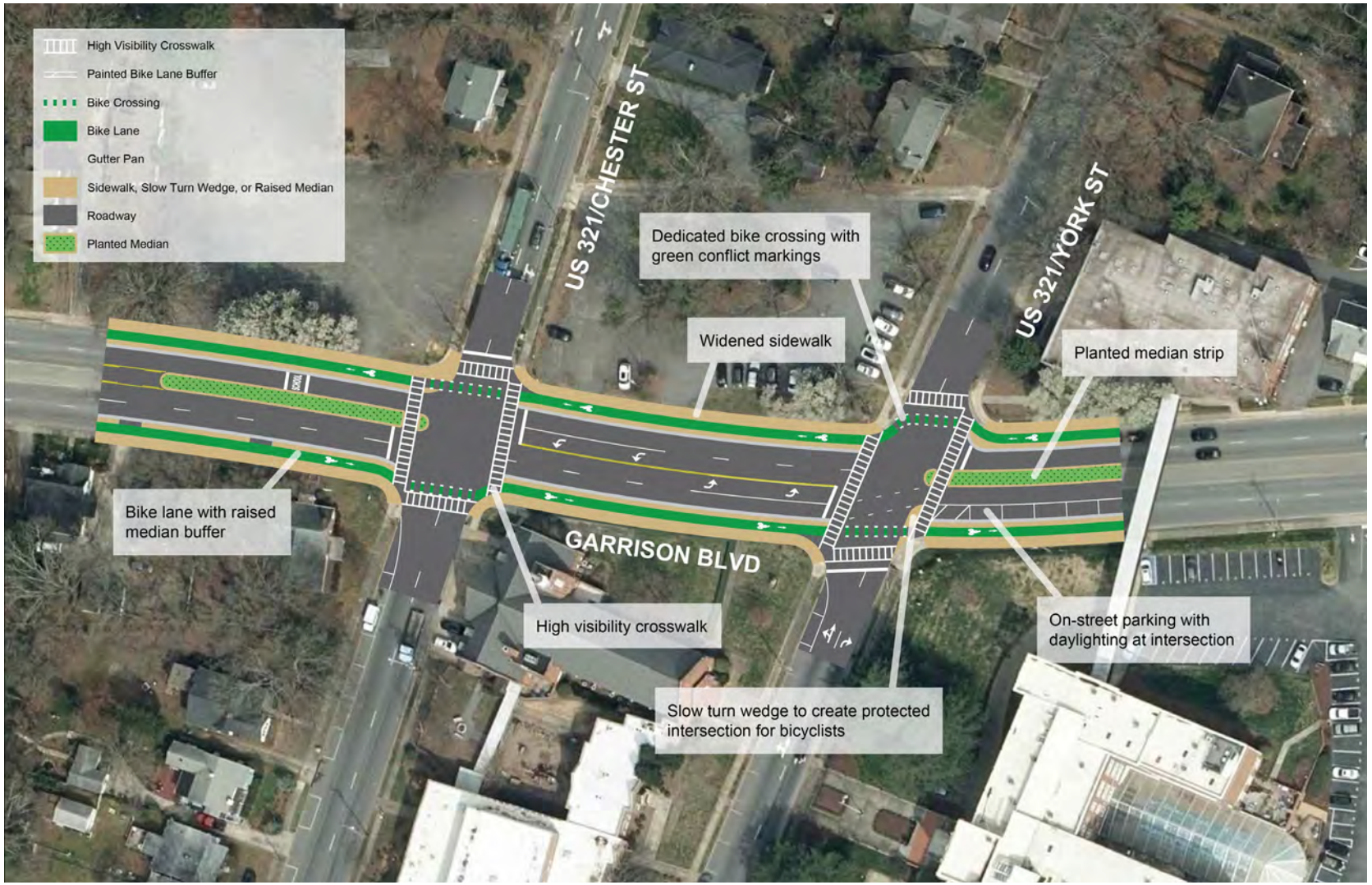
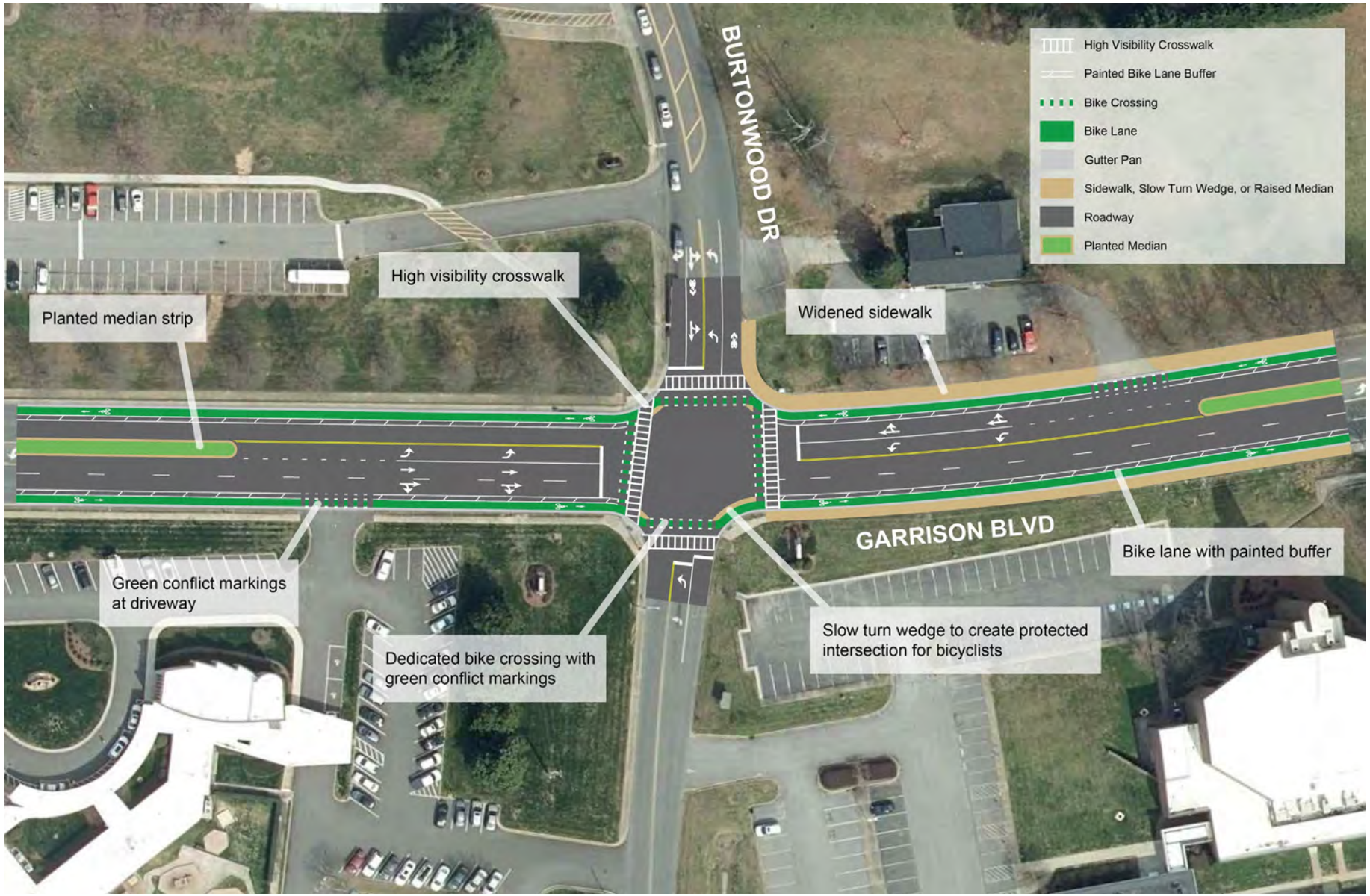


FIGURE 40: PROPOSED INTERSECTION CONCEPT AT GARRISON BOULEVARD AND BURTONWOOD DRIVE



Cost Estimates

Table 10 outlines planning-level cost estimates for the proposed improvements for each typical section. These estimates were developed using NCDOT's Bicycle & Pedestrian Cost Estimation Tool and provide a high-level estimation of projects costs; more detailed engineering estimates of probable costs should be developed if the project progresses.

TABLE 10: GARRISON BOULEVARD PROPOSED BIKE FACILITY COST ESTIMATES

Section Number	From	To	Length (mi)	Estimated Cost	Goal Achievement
1	Linwood Rd	Jackson St	0.99	$3.78M	●
2	Jackson St	Chestnut St	1.19	$5.66M	●
3	Chestnut St	Burtonwood Dr	0.73	$3.64M	●
4	Burtonwood Dr	New Hope Rd	0.31	$1.33M	●
TOTALS			**3.22**	**$14.41M**	

IMPLEMENTATION CONSIDERATIONS

This plan's proposed improvements along Garrison Boulevard are conceptual and require further evaluation to assess whether a road diet is feasible. Detailed data collection is needed to understand current directional travel flows and travel demands and to determine whether the number of lanes can be reduced. Impacts to the vehicular network—such as the ability of the corridor to serve as an overflow facility due to closures along I-85 and changes to turning movements and general roadway operations—should also be studied in greater detail.

Because Garrison Boulevard is currently owned and maintained by NCDOT, it should be noted that implementing the proposed improvements would require the approval of and collaboration with NCDOT Division 12 or require the City to take over ownership and maintenance of the corridor and its infrastructure. Short-term implementation of the recommended concepts is possible with paint and posts; however, longer-term improvements with raised curbs and more permanent infrastructure could be combined with future redevelopment.

PROGRAM AND POLICY RECOMMENDATIONS

While this plan's recommended bicycle network provides the foundation for increasing bicycle use and creating safer streets, the City must program effectively to make the best use of bicycle infrastructure. Bicycle-related programs help educate people about bicycling in their community and encourage them to do so. It's important to also implement supportive policies that welcome bicycling and are consistently enforced as well as conduct ongoing evaluations for the current infrastructure's effectiveness and the need for new or updated projects. Policies and programs can complement engineering improvements such as bike lanes, routes, and greenways by giving Gastonia residents the tools they need to ride their bicycles safely and confidently.

Program and policy recommendations in the Gastonia Bicycle Plan are based on a review and assessment of land use and development regulations in the City's existing Code of Ordinances and Unified Development Ordinance (UDO), conversations with City staff, thorough review of existing relevant planning documents, the vision and goals of this plan, as well as the public engagement process. While many elements of the City's policies support bicycle-friendly development and bicyclists in the community, this plan identifies areas where the City could strengthen bicycle parking standards and general references to bicyclist conduct. Detailed program and policy recommendations are provided in appendix A.

Key recommendations include:

- Amending the City's Code of Ordinances and UDO with proposed new language that encourages bicycling on Gastonia's streets, requires bicycle parking facilities in certain areas, is consistent with North Carolina state law, and is realistic to enforce.
- Updating the city's infrastructure reimbursement agreement standards to include bike lanes and multiuse shared use paths as desired municipal infrastructure, thereby setting an expectation for developers to include these facilities in site plan design.
- Adopting a City Complete Streets Policy to guide street design whenever new roadways are created or existing streets are reconstructed or upgraded, making the best use of City and NCDOT rights-of-way.

- Continuing to highlight the success of repurposing roadway infrastructure within the existing right-of-way and narrowing vehicular travel lanes to accommodate bicycle lanes. Temporary retrofits are also encouraged to test facility design ideas and enlist volunteers.
- Encouraging the installation of bicycle supportive infrastructure, including establishing a formalized application or procedure through the City to request bicycle racks, allowing bicycles on Gastonia buses, and prioritizing bike racks at transit stops and Bradley Station.
- Developing a Gastonia-specific bicycling map that provides information about bicycle parking, bicycle lane and greenway locations, parks, bus routes, and bicycle routes based on roadway classifications. The map could also include rules of the road for cyclists and drivers.
- Developing and adopting a City Traffic Calming Policy.
- Implementing creative safety awareness campaigns and programming.
- Scheduling regular bicycle patrols for Gastonia's Police Department in the Central District to more effectively utilize its bicycle fleet.
- Establishing a transportation-focused City commission to liaise with agencies and provide resident-supported ideas to elected leaders.
- Continuing to partner with GCLMPO and Safe Routes to School, to encourage more bicycle riding from a young age and to help establish Gastonia as a city where bicycling is common and welcomed.

Successful implementation of recommended policies and programs will require interdepartmental, interagency, and stakeholder coordination. Working together with Gaston County, NCDOT, the GCLMPO, and other community partners is an effective way to leverage adequate funding and support for program efforts.

IMPLEMENTATION

This section provides information on how the plan can be implemented over time, including measuring success with performance measures, project phasing, potential partners and funding sources, and design guidelines and resources that can be used to design projects.

Performance Measures

Implementing the proposed projects listed in this plan will require a large investment of resources. Therefore, to ensure the City is achieving this plan's goals, it is important to identify key performance measures that can evaluate each project and be used to measure how successfully the plan is being implemented. Because no one performance measure can capture all the goals the proposed bicycle facilities are trying to achieve, multiple performance measures provide the best evaluation. Each performance measure included as part of this plan relates to one or more of the plan goals. **Table 11** lists the performance measures and their related goals. **Table 12** describes each performance measure and how it will be measured. The performance measures included in this plan are inspired by FHWA's Guidebook for Developing Pedestrian & Bicycle Performance Measures.

These performance measures should be evaluated at regular intervals over the course of the plan, including at the start of the plan to document the baseline condition, and after individual projects are implemented. Each time a measure is updated, it should be compared with the baseline condition.

TABLE 11: PERFORMANCE MEASURES BY GOAL

PERFORMANCE MEASURE	GOALS					
	Safety	Comfort	Connectivity	Accessibility	Coordination	Equity
Crashes	✓	N/A	N/A	N/A	N/A	✓
Facility Maintenance	✓	✓	✓	✓	✓	✓
Bicycle Level of Service	✓	✓	N/A	✓	✓	✓
Miles of Pedestrian/ Bicycle Facilities	✓	✓	✓	✓	✓	✓
Mode Split	N/A	✓	N/A	✓	N/A	✓
Network Completeness	✓	✓	✓	✓	✓	✓
Population Served by Bicycle Infrastructure	✓	N/A	✓	✓	N/A	✓
Transportation-Disadvantaged Population Served	N/A	N/A	✓	✓	N/A	✓
User Perceptions	✓	✓	N/A	✓	✓	N/A

TABLE 12: DETAILED DESCRIPTION OF PERFORMANCE MEASURES

Performance Measure	Definition	How to Measure	Data	How Often to Measure
Crashes	Total number of crashes (all crashes and bicycle crashes), or crash rate (crashes per number of users) over a specific time period. Crashes are separated by mode and severity.	Define geographical area and time period of interest. Pull crash reports from local and/or state database for the area of interest.	Local and/ or state crash report database	Annually
Facility Maintenance	A qualitative assessment of the physical condition of bicycle facilities	Develop and maintain inventory of the conditions of bicycle facilities. Characteristics to note include: sidewalk presence and condition, pavement condition, lane marking condition, and curb ramp condition	City inventory	Annually
Bicycle Level of Service	How people biking perceive the quality of service (e.g., delay, travel time, comfort, etc.)	Use Highway Capacity Manual 2010 Multimodal Level of Service (MMLOS) methodology	Multimodal volumes and speed data	Annually
Miles of Pedestrian/ Bicycle Facilities	Total distance of bicycle facilities in a given area	Sum length of bicycle facilities	Bicycle facility inventory data	After implementing a new bicycle facility
Mode Split	The share of people who travel by each mode	Refer to existing surveys such as the American Community Survey which collects mode choice for trip to work. Additional travel surveys may be conducted to gather mode split for different trip types.	U.S. Census (American Community Survey) Other local/ regional travel surveys Multimodal traffic counts Transit ridership	Annually
Network Completeness	The share of the whole transportation network usable for people who bike	Set a threshold for what qualifies a road segment as usable for people who bike. Calculate the percentage of roadway miles that are usable for people who bike	Roadway and bicycle facility inventory data	Annually

Project ID	Street Name	Safety	Comfort	Connectivity
Population Served by Bicycle Infrastructure	The population in proximity to bicycle infrastructure	Determine the percent of population within a quarter-mile network distance to a bicycle facility	Bicycle and roadway network U.S. Census population data	Annually
Transportation Disadvantaged Population Served	The share of low-income, zero vehicle, and minority households with access to bicycle facilities	Determine the percent of disadvantaged population within a quarter-mile network distance to a bicycle facility	Bicycle and roadway network U.S. Census (American Community Survey) population data	Annually
User Perceptions	How safe a user feels while biking on a bicycle facility	Conduct Bicycle Level of Traffic Stress analysis	Vehicle speeds an volumes Roadway and bicycle facility characteristics	Before and after facility implementation

Project Phasing

Due to the large number of projects in the recommended bicycle network and the many steps required to move a project from planning through construction, implementation of this plan will likely take place over the next 15-20 years. Projects have been divided into the following phasing categories:

Short Term (0–5 years): City and NCDOT projects that are funded and have horizon years before 2025 or that have minimal roadway impacts (e.g., signing and pavement marking only)

Medium Term (6–14 years): City and NCDOT projects that are funded and have horizon years of 2035 or that have moderate roadway impacts (e.g., road diets/restriping to accommodate bicycle facilities) and SUPs that are already in planning/design stages

Long Term (15+ years): City and NCDOT projects that are not funded and have horizon years of 2050 or that have significant roadway impacts (road widenings) and SUPs that are not yet in the planning stages

Figure 41 and **Table 13** present a map and list of the proposed bicycle facilities with their anticipated project phasing timelines.

FIGURE 44: PROPOSED BIKE NETWORK BY PHASING TIMELINE

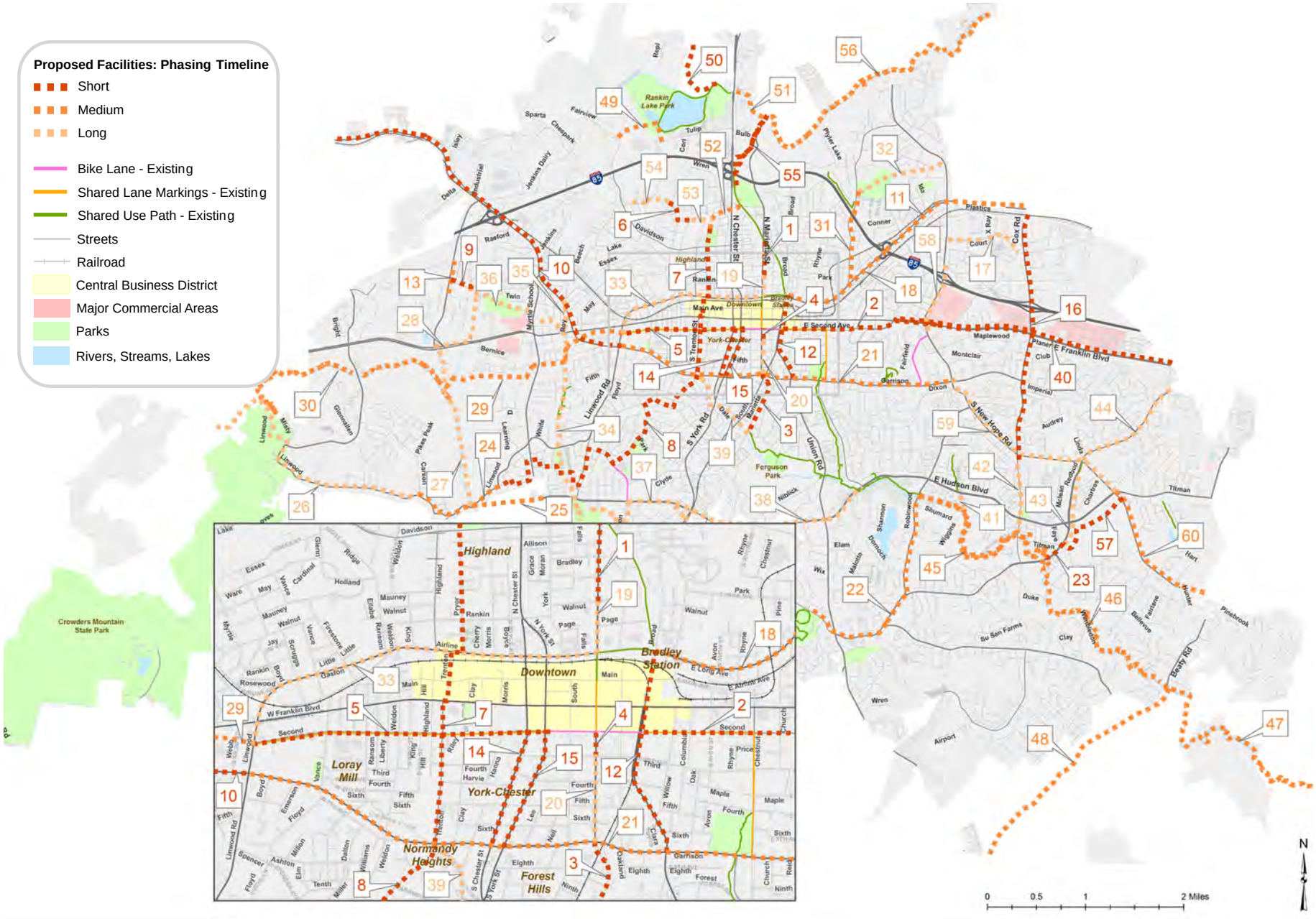


TABLE 13: LIST OF PROJECTS WITH PHASING TIMELINE

Project ID	Street Name	Lengths (miles)	Facility Type	Priority	Timeline
1	Dr MLK Jr Way	0.37	Bike Boulevard	Low	Short
2	E Second Ave, Cumberland Ave, and S Belvedere Ave	1.19	Bike Boulevard	Medium	Short
3	S Marietta St	0.63	Bike Boulevard	Medium	Short
4	S Marietta St	0.11	Bike Boulevard	Medium	Short
5	W Second Ave	1.24	Bike Boulevard	Medium	Short
6	N Ransom St and W Sycamore Ave	0.36	Bike Boulevard	Medium	Short
7	Trenton St and Pryor St	1.56	Bike Boulevard	High	Short
8	Lakewood Dr, Penn Cir, Providence Dr.. Miller St, Hillcrest Ave, Athenian Dr	3.54	Bike Boulevard	High	Short
9	Crescent Ln and Newcastle Rd	0.25	Bike Boulevard	Low	Short
10	W Garrison Blvd and Bessemer City Rd	4.18	Standard Bike Lane	High	Short
11	E Ozark Ave	1.65	Standard Bike Lane	Low	Medium
12	Union Rd and Broad St	0.89	Standard Bike Lane	High	Short
13	Shannon Bradley Rd	0.35	Standard Bike Lane	Low	Medium
14	S Chester St	0.51	Standard Bike Lane	Low	Short
15	S York St	0.52	Separated/Buffered Bike Lane	Medium	Short
16	Armstrong Park Rd and Cox Rd	2.57	Separated/Buffered Bike Lane	High	Short
17	Court Dr	0.75	Separated/Buffered Bike Lane	Medium	Long
18	E Long Ave and E Ozark Ave	1.25	Separated/Buffered Bike Lane	Medium	Medium
19	Dr MLK Jr Way	0.22	Separated/Buffered Bike Lane	Low	Long
20	S Marietta St	0.36	Separated/Buffered Bike Lane	Medium	Long
21	Garrison Blvd	3.49	Separated/Buffered Bike Lane	High	Medium

Project ID	Street Name	Lengths (miles)	Facility Type	Priority	Timeline
22	Neal Hawkins Rd and Robinwood Rd	2.40	Separated/Buffered Bike Lane	High	Medium
23	Hoffman Rd SUP	0.21	Shared Use Path	Low	
24	Linwood Rd SUP	0.34	Shared Use Path	Low	Medium
25	Linwood Rd SUP (with proposed extension to Hudson Blvd)	1.43	Shared Use Path	Medium	Medium
26	Linwood Rd SUP	2.96	Shared Use Path	Low	Long
27	SUP along Crowders Creek	1.11	Shared Use Path	Low	Long
28	Crowders Creek Development SUP	1.35	Shared Use Path	High	Long
29	Carolina Thread Trail (west section 1)	2.42	Shared Use Path	High	Medium
30	Carolina Thread Trail (west section 2; east of Crowders Mountain)	2.66	Shared Use Path	Low	Medium
31	Modena St SUP	0.97	Shared Use Path	High	Medium
32	Bradley Center SUP Connector (N Jean Rd extension)	0.97	Shared Use Path	Medium	Long
33	Gaston Ave, W Airline Ave, W Long Ave SUP Connector	1.64	Shared Use Path	High	Long
34	Blackwood Creek Greenway	2.45	Shared Use Path	High	Long
35	Blackwood Creek Greenway Branch	0.35	Shared Use Path	Medium	Long
36	T Jeffers Center Greenway	0.71	Shared Use Path	Medium	Long
37	Phillips Center Greenway	2.05	Shared Use Path	High	Long
38	Hudson Blvd SUP	2.56	Shared Use Path	High	Long
39	Catawba Creek Greenway - NW Extension	0.88	Shared Use Path	High	Long
40	E Franklin Blvd SUP	4.36	Shared Use Path	High	Short
41	Shoal Creek Extension SUP	0.18	Shared Use Path	Low	Long

Project ID	Street Name	Lengths (miles)	Facility Type	Priority	Timeline
42	Gaston Day School Rd SUP	0.70	Shared Use Path	Medium	Long
43	Hoffman Rd and Redbud Dr SUP	0.75	Shared Use Path	Medium	Long
44	Redbud Dr SUP	1.23	Shared Use Path	High	Long
45	Carolina Thread Trail (east section 1)	4.74	Shared Use Path	High	Medium
46	Carolina Thread Trail (east section 2)	2.50	Shared Use Path	Low	Medium
47	Carolina Thread Trail (east section 3)	2.93	Shared Use Path	Low	Medium
48	Beaty Rd SUP	2.58	Shared Use Path	Low	Medium
49	Green Meadow Dr and Weetabix Pkwy SUP (to Rankin Lake Park)	0.63	Shared Use Path	Low	Medium
50	Rankin Lake Park Northern Extension SUP	0.76	Shared Use Path	Low	Short
51	Rankin Lake Park Eastern Extension SUP (Long Creek)	0.47	Shared Use Path	Low	Medium
52	Highland Neighborhood Trail Connection SUP	0.49	Shared Use Path	High	Medium
53	Erwin Park SUP Connection	0.21	Shared Use Path	Medium	Long
54	Hargrove Ave SUP Connection	0.43	Shared Use Path	High	Long
55	Carolina Thread Trail (north section 1; Highland Branch Greenway)	1.45	Shared Use Path	High	Short
56	Carolina Thread Trail (north section 2; SUP along Long Creek/Flyer Park)	3.34	Shared Use Path	Low	Medium
57	Creek/South Fork Development SUP	0.89	Shared Use Path	Medium	Short
58	N New Hope Rd and S New Hope Rd SUP	0.77	Shared Use Path	High	Long
59	S New Hope Rd SUP	2.15	Shared Use Path	High	Long
60	S New Hope Rd SUP	1.47	Shared Use Path	Medium	Medium

Key Partners and Potential Funding Sources

Leveraging projects, support, and funding sources from key partners will be critical to successfully implement this plan. These implementation actions could include:

- Reviewing planned/funded projects on the MTIP to identify where other agencies will be making improvements.
- Coordinating with City agencies on bicycle initiatives.
- Facilitating conversations with developers to include bicycle connections in their developments.
- Working with stakeholders to build local support for a project.

IMPLEMENTATION PARTNERS

NCDOT and GLCMPO are key partners who are planning and funding transportation projects in Gastonia. Many of these projects already include bicycle infrastructure that will help construct Gastonia's bicycle network. With enough lead time, other projects can be adjusted to include the plan's proposed facilities. For example, the planned I-85 widening project will reconstruct all I-85 overpasses in Gastonia. The City and MPO are currently working with NCDOT to identify which of these crossings should be reconstructed with bicycle facilities as part of the widening project. By using this bicycle plan as the basis for these discussions, several high-cost bicycle connections can be funded and constructed by NCDOT.

A key funding and implementation partner for Gastonia's network of proposed greenways and shared use paths, the Carolina Thread Trail supports the planning and implementation of Thread Trail system greenways through:

- **Community Support**—helping municipalities plan for and prioritize segments of the Thread Trail.
- **Funding**—providing grant funds to communities for planning, design, land acquisition and construction of trail segments.
- **Expertise**—establishing best practices, mapping trails, and training volunteers for trail building.

Partnerships with local developers will also be critical. Several ongoing and planned development projects in the City will provide opportunities to align proposed shared use paths with development plans; a key opportunity includes the Crowders Creek connection to Crowders Mountain State Park.

Other important agency partners include Gastonia Transit, Gaston County Planning Department, and Gastonia City Departments such as Public Works, Parks & Recreation, the Gastonia Police Department, and schools.

POTENTIAL FUNDING SOURCES FOR BICYCLE IMPROVEMENTS

Implementing the plan will also require a variety of funding sources, including federal, state, local, and non-profit/private funds. The following pages summarizes source types available for bicycle improvements.

FEDERAL FUNDING

Program	Description
TRANSPORTATION ALTERNATIVES (TA)	Funding source under the FAST Act Funds may be used for a variety of pedestrian, bicycle, and streetscape projects including sidewalks, bikeways, side paths, and rail-trails. TA funds may also be used for selected education and encouragement programming such as Safe Routes to School.
SURFACE TRANSPORTATION PROGRAM (STP)	Provides states with flexible funds which may be used for a variety of highway, road, bridge, and transit projects. Eligible projects include trails, sidewalks, crosswalks, pedestrian signals, and ADA upgrades to sidewalks. Unlike most highway projects, STP-funded pedestrian facilities may be located on local and collector roads which are not part of the Federal-aid Highway System.
CONGESTION MITIGATION/ AIR QUALITY PROGRAM (CMAQ)	Funds projects and programs in air quality non-attainment and maintenance areas for ozone, carbon monoxide, and particulate matter which reduce transportation related emissions. Can be used to build bicycle and pedestrian facilities that reduce travel by automobile. Purely recreational facilities generally are not eligible.
SAFE ROUTES TO SCHOOL (SRTS) PROGRAM	Eligible SRTS projects include sidewalks, intersection improvements (signalization, marking/upgrading crosswalks, etc.), on-street bicycle facilities (bike lanes, wide paved shoulders, etc.) or off street shared use paths.
RAISE DISCRETIONARY GRANT PROGRAM	Previously known as BUILD and TIGER grants. Project sponsors at state and local levels can obtain funding for multimodal projects that are more difficult to support through traditional DOT programs. Funding can be awarded to projects that connect communities and people to jobs, services, and education as well as to projects that anchor economic revitalization and job growth in communities.

STATE FUNDING

Program	Description
NCDOT STRATEGIC TRANSPORTATION INVESTMENTS (STI)	20% of total project cost is currently required as non-federal match by local governments. State law prohibits state match for bicycle and pedestrian projects, except for Powell Bill. Includes adopted bicycle plans, greenway plans, pedestrian plans, Safe Routes to School action plans, comprehensive transportation plans (CTPs), and long-range transportation plans
NCDOT HIGH IMPACT/LOW COST FUNDS	Low-cost projects with high impacts to the transportation system including intersection improvement projects, minor widening projects, and operational improvement projects. $1.5 million max per project unless otherwise approved by the Secretary of Transportation.
DUKE ENERGY WATER RESOURCES FUND	Could be used for creekside greenways (e.g., Crowders Creek).
POWER BILL FUNDS	Can be used for planning, construction, and bikeway or sidewalk maintenance.
EAT SMART, MOVE MORE NORTH CAROLINA COMMUNITY GRANTS	Provides funding to local communities to support efforts to develop community-based interventions that encourage, promote, and facilitate physical activity.
ADOPT-A-TRAIL GRANTS	Awards $108,000 annually to government agencies, nonprofit organizations, and private trail groups for trail projects.
COMMUNITY DEVELOPMENT BLOCK GRANT FUNDS	For projects that enhance the viability of communities by providing housing and suitable living environments and by expanding economic opportunities, principally for people with low and moderate incomes.
NCDOT'S COMPLETE STREETS POLICY	Policy requires incorporating multimodal facilities in NCDOT roadway projects.

LOCAL FUNDING

Program	Description
TAX INCREMENTAL FINANCING (TIF)	Leverages future tax gains to finance current improvements that will create those gains. Dedicates increased tax revenues to finance the debt created by the project.
PARTNERSHIPS	Local communities in the region may be able to partner with the private sector to fund or sponsors some aspects of a project. Examples » Wilmington/New Hanover County & Blue Cross Blue Shield (Gary Shell Cross City Trail) » Swamp Rabbit Trail & Greeneville Health System
DEVELOPER CONTRIBUTIONS	Negotiate bicycle and pedestrian facility construction in conjunction with an adjacent development project
MUNICIPAL SERVICE DISTRICT	Designates a district with a property tax in addition to the town-wide property tax. Within the MSD, revitalization projects are one of the eligible uses and can include street, sidewalk, or bikeway improvements within the downtown taxing district.

PRIVATE/NON-PROFIT FUNDING

Program	Description
THE ROBERT WOOD JOHNSON FOUNDATION	Largest US foundation devoted to improving the health and healthcare of all Americans.
	Grant making is concentrated in four areas: (1) To ensure that all Americans have access to basic health care at a reasonable cost, (2) To improve care and support for people with chronic health conditions, (3) To promote healthy communities and lifestyles, and (4) To reduce the personal, social, and economic harm caused by abuse of tobacco, alcohol, and illicit drugs.
RITE AID FOUNDATION GRANTS	Supports projects that promote health and wellness in the communities Rite Aid serves.
CAROLINA THREAD TRAIL	The Thread Trail grants funds to communities for planning, design, land acquisition, and construction of trail segments.
NATIONAL TRAILS FUND	Eligible projects include: (1) Securing trail lands, including acquisition of trails and trail corridors, and the costs associated with acquiring conservation easements; (2) Building and maintaining trails which will result in visible and substantial ease of access, improved hiker safety, and/or avoidance of environmental damage; and (3) Constituency building surrounding specific trail projects, including volunteer recruitment and support.
BLUE CROSS BLUE SHIELD OF NORTH CAROLINA FOUNDATION (BCBS)—HEALTHY PLACE GRANT	Program focuses on outcome approach to improve the health and well-being of residents.
	Eligible projects for grants concentrate on increased physical activity and active play through support of built environment improvements like sidewalks and safe places to bike.

Design Guidelines + Resources

There are several design guidelines and best practices resources that can be used for planning and designing bicycle facilities. Below is a summary list of current resources.

- FHWA Bikeway Selection Guide
- FHWA Separated Bike Lane Planning and Design Guide
- FHWA Small Town and Rural Multimodal Networks
- FHWA Manual on Uniform Traffic Control Devices (MUTCD), Chapter 9 Traffic Control for Bicycle Facilities
- AASHTO Guide for the Development of Bicycle Facilities
- NACTO Urban Bikeway Design Guide
- Portland State University—Fundamentals of Bicycle Boulevard Planning & Design
- MassDOT Separated Bike Lane Planning & Design Guide

The Bicycle Facility Toolkit (table 11) on the following pages summarizes relevant design guidance for bicycle facilities based on current guidance from key resources like the MUTCD, NACTO Urban Bikeway Design Guide, and AASHTO Guide for Development of Bicycle Facilities. The toolkit provides information on cost, typical application and roadways, as well as required, recommended, and preferred design features for each facility type.

The Bicycle Facility Toolkit identifies which bicycle facilities are appropriate for different Levels of Traffic Stress (LTS). LTS offer a high-level perspective of how bicyclists may experience a roadway based on its traffic volumes, speeds, and separation from vehicles. As shown in **Figure 42**, most of the US population falls into the less-experienced and risk-averse bicyclist group—often called the "interested but concerned" group. To be comfortable, these riders need facilities/streets that are LTS 1 or 2 for the entirety of their trip. A well-designed bicycle network must meet the needs of these riders.

Generally, the "interested but concerned" user prefers:

- Physically separated facilities like protected bike lanes and trails.
- Wide and preferably buffered bike lanes adjacent to the curb (not a parking lane) on streets with medium to low streets and low volumes.
- Bike boulevard treatments on low-stress neighborhood streets.

FIGURE 45: FOUR TYPES OF BICYCLISTS BASED ON EXPERIENCE AND RISK LEVELS

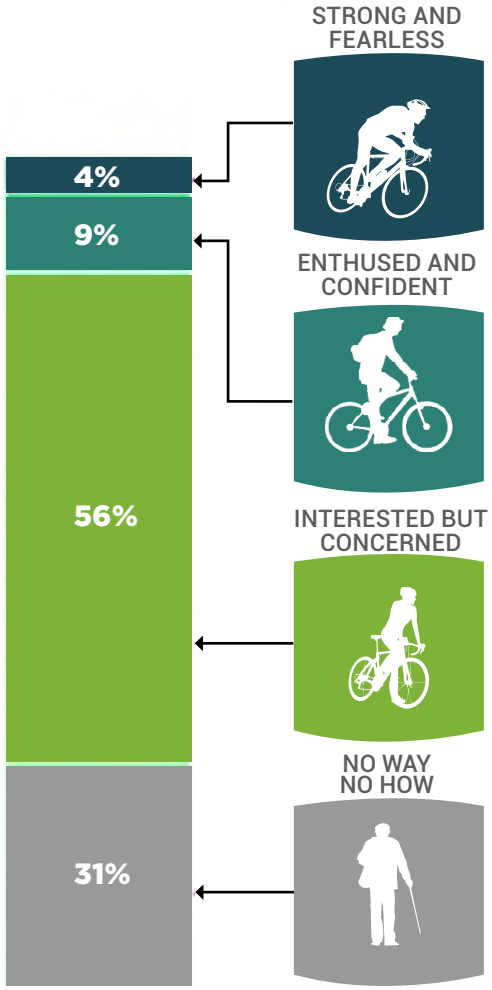
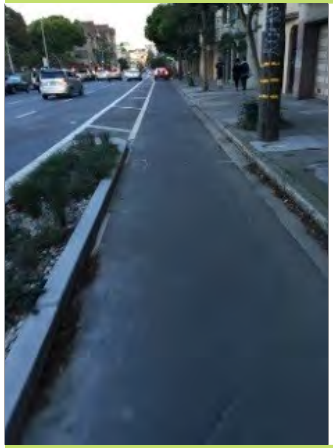


TABLE 14: BICYCLE FACILITY TOOLKIT SUMMARY MATRIX

TYPE	COST	TYPICAL APPLICATION	REQUIRED	RECOMMENDED	PREFERRED
BICYCLE FACILITIES					
BICYCLE BOULEVARDS					
	$	• Low traffic volumes (≤3,000 AADT) • Posted travel speed ≤ 25 mph • Avoid major streets • Appropriate LTS: 1, 2 (Apply full suite of traffic calming)	• Use wayfinding signs (starting on pg.240) • Indicate how bicyclists can stay on path if boulevard turns onto another road https://nacto.org/publication/nbikewaydesignguide/bicycleboulevards/	• Pavement marking should be standard size (112 x 40 in) • If narrow roads, place signs closer (See link for more)	• Curb heights lower than 6 in. can be used on diverters and medians for emergency vehicles (See link for more)
BIKE LANES					
	$	• Streets with traffic volumes ≥ 3000 AADT • Streets with travel speeds ≥ 25 mph and 35 mph or less • Most appropriate on arterials and collectors • Appropriate LTS: 1, 2	• Desired width is 6 ft with a minimum of 4 ft along street edge • If next to a parking lane, want parking/bike/buffer width total to be 14.5 ft with a minimum of 12 ft • Words, symbols to define lane periodically throughout (as per MUTCD Figure 9C3) • 68 in solid line to mark the difference between motor travel and bike NACTO, 7.	• Make wider than minimum widths wherever possible. • If next to a parking lane, solid white line of 4 in between parking and bike lanes to avoid encroachment. • If there's space, separation between parking and bike lane – maybe by buffer. • If turning vehicles must merge into bike lanes, increase dashed line length from 50–200 feet. NACTO, 9.	• Color the lanes to enhance space. • Install Bike lane signs before the beginning of a marked bike lane to designate preferential bike use. • Place Bike lanes adjacent to curbs and make it a “No Parking” zone (see MUTCD R83) NACTO, 11.

BUFFERED BIKE LANES					
	**$$**	• Motor traffic volume ≥ 10,000 AADT • Travel Speed ≥ 25 mph • High volume or higher speed warrant greater separation • Appropriate LTS: 1, 2, 3	• Mark the bike lane with words or symbol/arrow • Buffer marked with 2 solid white lines with diagonal hatching if 3 ft or wider NACTO, 21	• Next to parking, 5' minimum width • If high speed, buffer and bike lane should be 7' • Buffers at least 2' wide • intersection, transition to through bike lane NACTO, 22.	• Wide (68") solid line to mark the line closest to adjacent traffic • Separation between bike lane striping and parking • Color the beginning of each block NACTO, 23.
ONE-WAY SEPARATED/BUFFRED BIKE LANES					
	**$$$**	• Multi-lane traffic • Traffic volume ≥ 10,000 AADT • Travel speeds ≥ 40 mph) • Streets with few intersections and driveway access points • Appropriate LTS: 2, 3,	• Use a cycle track, as outlined by MUTCD • Place the symbol or arrow at the beginning and periodically throughout the track. NACTO, 62.	• Desired width is 5 foot but use 7 ft for high bicycle volume • Build at least a 3 foot buffer. • When using a pavement marker buffer, the combined parking and buffer width should be 11 ft. NACTO, 64.	• Cycle tracks can be placed closer to travel lane as intersections approach to put bicyclists in clear view of drivers. • Color pavement to define bike space. NACTO, 68.
TWO-WAY SEPARATED/BUFFRED BIKE LANES					
	**$$**	• Multi-lane traffic • Traffic volume ≥ 10,000 AADT • Travel speeds ≥ 40 mph) • Streets with few intersections and driveway access points • Contraflow bike travel is desirable • Appropriate LTS: 2, 3, 4	• Word, symbol or marking to indicate bike lane periodically throughout length • "Do Not Enter" with "Except Bike" (as per MUTCD R51) • Traffic controls along the street oriented towards contraflow See page 95 of NACTO Urban Bikeway Design Guide	• Minimum, want 12' • 3' buffer if next to parking lane • Dashed yellow line to separate the directions of flow • Two stage turn boxes to assist in making turns from the cycle track See pg. 97 of NACTO	• On minor intersections, can shift track more closely to travel lane • Can configure the track to be raised for better visibility See pg. 99 of NACTO

SHARED USE PATH					
	**$$$$**	• Existing roadway has high traffic speed and volumes in a constrained right-of-way • Appropriate LTS: 3, 4	• Separation between path and road	• Want 14 in width, 8 ft minimum • Use a design speed of 18 mph (See AASHTO Guide for Development of Bicycle Facilities, 2012)	• 10 ft vertical clearance, with 8 ft minimum • Meet ADA requirements very often
INTERSECTION TREATMENTS					
THROUGH BIKE LANES					
	**$**	• See page 172 on NACTO Urban Bikeway Design Guide, case study on St. Petersburg, FL (Evaluation of a Green Bike Lane Weaving Area	• Dashed white lines 6 in wide, 2 ft long • Right-turn only lanes should be as short as possible. • Color/add signage to enforce bike right-of-way. NACTO, 173.	• Use a bike box instead to designated through turn lane • Place bike warning signs or "share the road" signs in advance of transition. NACTO, 175.	• Use a bike box instead to designated through turn lane (See pg. • Bike warning signs or "share the road" signs in advance of transition NACTO, 175.
MEDIAN REFUGE ISLAND					
	**$$**	• Should be 10 ft or wider, absolute minimum is 6 ft. • See section 3I.02 MUTCD for pavement markings • Outline median in retroreflective white or yellow. NACTO, 157.	• Length should be greater than 6 ft. • Height of island should be curb level (6 in) • Wide enough for two way • Use angled cut-through so bicyclists can face oncoming traffic. NACTO, 159.	• Can provide landscaping if it doesn't compromise visibility. • Install lighting for night. • Can carry the median refuge across entire street to act as diverter. NACTO, 160.	• Same as Recommended

BIKE BOX					
	**$$**	• Signalized intersection with high volumes of motorists or bicyclists • Frequent motorist right turns or bicycle left turns	• Use 10–16-ft deep transverse lines to create the box. • Use a stop line to show where motorists must wait. • Center a pavement marking of a bike rider with a helmet between crosswalk and stop line. NACTO, 110.	• Place a "Stop here on red" sign at the stop line for cars. • Color the pavement green to encourage compliance. • Define potential areas of conflict across the intersection with green paint. NACTO, 112.	• Stop lines can be placed up to 7 ft in advance of bike box. • Bike box can extend across multiple travel lanes. • Can combine with exclusive bike signal phase for high volumes of bicyclists. NACTO, 115.
CROSSINGS SHARED USE PATH					
	**$$$**	• Conventional bike lanes • Bicycle signal • Intersections with bicycle-only movements	• Use 10–16-ft dConventional bike lanes • Bicycle signal • Clear standards are not defined, consider MUTCD general guidance	• Place Conventional bike lanes • Bicycle signal • Signal head should be clearly visible to oncoming bicycles. • Bicycle phase should provide adequate clearance time and actuation/detection (if not pretimed).	Same as Recommended
TWO STAGE QUEUE BOX					
	**$$$**	• Areas with high left turning volume • Works best for green lights, in contrast with bike box at red lights.	• A designated area to hold queuing bicyclists • Include a bicycle stencil and turn arrow to indicate proper bicycle positioning. • Place bike box in protected area. NACTO, 146.	• Color the pavement green to further define the space. • Using markings throughout the intersection. NACTO, 147.	• Position the queue box laterally in cross street parking, instead of in front of the travel lane. • Can use bike signals in conjunction with two-stage queue box. NACTO, 148.

SIGNED ROUTES/WAYFINDING					
	$	• Placed at designated bike routes or bicycle boulevards • Good for urban areas to improve visibility • Appropriate LTS: 1	• Follow MUTCD Section 9B.01 – Application and Placement of Signs (as per NACTO, 246).	• Design signs should be placed in advance of all turns at the near side of intersection. • Include direction and destinations, with nearest place on top. NACTO, 247.	• Periodically place bike route maps on/under signage. • Use a routing number system if there is a route map (see MUTCD Section 9B2.1 for more). NACTO, 250.

APPENDIX A

PROGRAM & POLICY RECOMMENDATIONS

Programs and Policies

1. Link All City Capital Projects to an Existing Plan Review

Opportunities exist to consider bicycling in preliminary plans for roadway improvements, park development, and other City infrastructure projects. By continually reviewing recommendations and priority corridors in this Plan, the City can advance the community's goal of supporting bicycling. Before finalizing plans for capital projects, City staff should review the Gastonia Bicycle Plan to identify possible opportunities that improve the project for bicyclists and advance implementation of the Plan.

Lead:	Planning
Support:	Development Services, Public Works
Timeframe:	Ongoing

2. Integrate Bicycling with Transit

Gastonia Transit riders would benefit from the ability to transport their bicycles on City buses. A survey could be developed and deployed to gauge rider need for bicycle racks on City buses. The City should consider purchasing buses that include a bicycle storage capability and also make sure that each bus stop is equipped with a place to park a bicycle, prioritizing stops with higher ridership rates and providing critical linkages in the transportation network.

Lead:	Public Works/Gastonia Transit
Support:	Safe Routes to School, Volunteer Groups, GCLMPO
Timeframe:	Medium-term, Ongoing

3. Partner with NCDOT and ITRE's Non-Motorized Traffic Monitoring Program (Bicycle Counts)

Since 2014, NCDOT and the Institute for Transportation Research and Education (ITRE) have partnered with local governments on a systematic approach to counting cyclists in North Carolina. This program installs equipment that uses electromagnetic bicycle detectors and infrared technology to count bicycle traffic. As more bicycle facilities are constructed in Gastonia, the City should work with NCDOT to install these devices to quantify its bicycle system use. The City should work with GCLMPO and NCDOT to install counting devices along the greenway system and areas identified for installation of bike lanes. This data can be helpful in justifying future investments, prioritizing corridors for additional infrastructure elements, and understanding preferred bicycling routes and behavior in Gastonia.

Lead:	Planning
Support:	Parks & Rec, NCDOT, ITRE, GCLMPO, Public Works
Timeframe:	Long-term, Ongoing

4. Continue Ongoing Communication with NCDOT & GCLMPO

It is important to communicate continually with these agencies to ensure that long-range transportation planners and traffic engineers understand the City of Gastonia's desire for bicycle facilities. Coordination with NCDOT and GCLMPO can yield inclusion of new bicycle infrastructure on planned roadway improvement projects, especially on key thoroughfares like Franklin Boulevard, Garrison Boulevard, Airline Avenue/Long Avenue, Union Road/ Broad Street, Linwood Road, New Hope Road, and Hudson Boulevard. The City should also continue to coordinate with these agencies to leverage opportunities for multimodal improvements when road resurfacing and bridge replacement occurs.

Lead:	Development Services
Support:	NCDOT Division 12, GCLMPO, Public Works, Planning
Timeframe:	Ongoing

5. Update the Comprehensive Transportation Plan (CTP)

Work with NCDOT and GCLMPO to update the GCLMPO CTP, which represents a community's consensus on the future transportation system (including the existing system and improvements) needed to support anticipated growth and development. The accompanying project descriptions should include additional detail regarding proposed bicycle facilities along these roads and where along each thoroughfare bike lanes or multiuse paths should exist. The GCLMPO CTP is the guide for Gastonia's subdivision street development and should reflect the goal of adding bicycle lanes incrementally through new subdivision platting, where feasible.

Lead:	Planning
Support:	NCDOT Division 12, GCLMPO, Development Services NCDOT Transportation Planning Division
Timeframe:	Ongoing

6. Create Bicycle-Oriented Wayfinding

As the City continues to develop its greenway system and begins to install new bike lanes, it should consider installing signage that provides wayfinding for active transportation users. A bicycle-oriented wayfinding sign system can help guide people along City streets, find parking and recommended bike routes, and connect them to the greenway system. The signs should incorporate the City's branding scheme, and sign locations and content should be determined through the development of a wayfinding master plan. These signs should ultimately be required on construction of all active transportation corridors, including greenways, shared use paths, and bicycle facilities.

Lead: Planning

Support: Public works

Timeframe: Long-term

7. Consider Tactical Urbanism

Tactical urbanism projects provide opportunities to test installation of low-cost, temporary treatments to the built environment for desired outcomes prior to investing in and undertaking capital improvements. A tactical urbanism approach could be used to promote traffic calming and low-stress bicycling routes in targeted areas. The City of Gastonia should identify key corridors, reflective of the goals of this plan, for short-term, low-cost bicycle demonstration projects. The City can work with volunteers to host design charettes to engage residents and enlist their support to help install treatments such as protected bike lanes, road "diets", on-street parking reconfiguration, etc. These temporary demonstrations can illustrate to NCDOT and other key stakeholders the feasibility and benefits of minor improvements. Depending on the success and outcomes of such projects, the temporary treatments could become permanent. The City could create a streamlined permitting process to allow community partners to collaborate on pilot projects.

Lead: Planning

Support: Safe Routes to School, Volunteer Groups, GCLMPO, Public Works

Timeframe: Medium-term, Ongoing

8. Adopt a City of Gastonia Complete Streets Policy

"Complete Streets" is a transportation philosophy and design approach that considers and incorporates multimodal transportation infrastructure when building new projects or making improvements to existing roadways. The goal of a complete streets approach is to provide a safe, efficient, and attractive environment for all transportation users regardless of age, ability, or mode. A complete streets approach is also context-sensitive, meaning design choices consider local needs and incorporate up-to-date standards appropriate for each project setting. Traffic volumes, types of adjoining land uses, and right-of-way widths are some of the factors that influence the facilities included in a street designed under the Complete Streets concept. Not every street will require dedicated bike lanes to make it multimodal, but it is important that streets are designed with all anticipated users from the earliest planning stages. This is often more cost-efficient by avoiding expensive modifications and retrofitting later. The City should create and adopt a Complete Streets Policy to serve as a guideline for street design whenever new streets are created or existing streets are reconstructed or upgraded. NCDOT's Complete Streets Policy can serve as a baseline guide for municipalities: https://connect.ncdot.gov/projects/BikePed/Pages/Complete-Streets.aspx

Lead: Planning

Support: Development Services, GCLMPO

Timeframe: Short- to Medium-term

9. Launch a City of Gastonia Traffic Safety Awareness Campaign

Developing an awareness campaign to highlight traffic safety, especially when cyclists mix with motor vehicles, can be an effective education tool. Banners, signs, flyers, and targeted advertising are simple ways to remind drivers that cyclists are part of a shared community, which can foster a more patient and understanding roadway environment. The campaign can convey messages about sharing the road, driving slowly, and general traffic safety reminders. Most public awareness campaigns are implemented once or twice a year, during peak travel seasons or along high-volume corridors. They can also be coupled with radar speed sign deployment. Humor can often make a campaign more memorable and successful.

Lead: Communications and Marketing/Planning

Support: Police, Safe Routes to School, Volunteer Groups

Timeframe: Medium-term, Ongoing

10. Develop an Online Gastonia Bicycle Map

Work with a professional mapping and/or graphic design firm to develop an online City of Gastonia Bicycle Map that clearly illustrates bike lanes, greenways, transit facilities, bike rack locations, City parks, and preferred routes based on local bicyclist feedback and street conditions. Use the data analysis from the Gastonia Bicycle Plan to inform the content of the map, with

low-stress streets identified, and clearly differentiate between bike lanes, wide sidewalks, natural surface trails, and paved paths. It is important for users to understand what a specific segment is supposed to look like and whether they are still on the right path, especially for individuals with mobility constraints. Such a resource will promote bicycle use that is safe, comfortable, and convenient. The map can be linked through the City's website and updated quickly with new infrastructure development and bicycle-friendly businesses, as well as a hazard reporting tool. Partner with Gaston County to update the County map as well.

Lead: Planning

Support: Development Services, Gaston County, GCLMPO, Parks & Rec

Timeframe: Medium to Long-term

11. Collaborate with NCDOT on Safety Programs

The "Watch for Me NC" programs are roadway safety programs run by NCDOT in partnership with local communities. Their aim is to reduce pedestrian and bicycle injuries and deaths through a comprehensive, targeted approach of safety and educational messages directed toward drivers, pedestrians, and bicyclists alongside enforcement efforts by area police to crack down on traffic safety law violations. Local programs are typically led by municipal, county, or regional government staff with the involvement of many others, including pedestrian and bicycle advocates, urban planners, and law enforcement agencies. Gastonia should work towards becoming a "Watch for Me NC" Partner Community. "Let's Go NC!" is a pedestrian and bicycle safety skills program for children, teaching elementary age children how to walk and bike safely, giving them the essential skills that they need to enjoy a healthy and active lifestyle. It provides an all-in-one package of lesson plans, materials, activities, and instructional videos that encourages children to learn about and practice fundamental skills that build safe habits. The City should make use of these resources and coordinate with NCDOT on distribution of materials. For information, visit http://watchformenc.org/ and https://connect.ncdot.gov/projects/BikePed/Pages/LetsGoNC.aspx

Lead: Planning

Support: NCDOT, Communications and Marketing, Gaston County, GCLMPO

Timeframe: Short- to Medium-term, Ongoing

12. Become a Designated "Bicycle Friendly Community"

The Bicycle Friendly Community program offered through the League of American Bicyclists provides a roadmap to improving conditions for bicycling and guidance to help make communities' vision for a better, bikeable community a reality. Designation as a Bicycle Friendly Community can help show that the City of Gastonia supports cycling and welcomes bicyclists as a desired user group. The application process is a useful tool to assess Gastonia's successes, and the results will point out deficiencies and areas for improvement. As the City develops its bicycle infrastructure, a Bicycle Friendly designation can offer recognition of those accomplishments, while helping acquire funding for future work.

Lead: Planning

Support: Communications and Marketing, Development Services

Timeframe: Medium- to Long-term

13. Form a City of Gastonia Multimodal Transportation Commission

Establish a City of Gastonia Multimodal Transportation Commission (MMTC), responsible for providing input to decision makers on projects, programs, and policies, and represent the City's shared and local interests to regional authorities. This advisory commission should make sure to receive and respond to citizen ideas and concerns, holding regular quarterly (or biannual) meetings to discuss all issues related to multimodal transportation, including major projects (e.g., bridges, street repaving, comprehensive plans). The MMTC can help spur innovation by providing a community forum to work through complicated issues such as on-street bike parking or stronger school-siting policies. This group can also organize events like bike-to-work days, bicycle races (which could be fun, themed rides and can raise funds for bicycle infrastructure improvements) and bicycle "rodeos" - a bicycle skills event which provides an opportunity for the participants to learn, practice, and demonstrate their bicycle handling skills in a fun, noncompetitive atmosphere. A police liaison for the MMTC is imperative, and can help answer questions about enforcement, safety data, and trends in the community.

Lead: Community Development

Support: Police, Communications and Marketing, Neighborhood Groups, Planning

Timeframe: Medium-term

14. Highlight Cultural and Historical Elements Along Gastonia's Greenways

Incorporating cultural features along greenways and at trailhead locations can provide opportunities for residents to learn about their community heritage and strengthen community bonds. Using local history and community identity through sequential art and stories conveyed through sculpture, signs, murals, site furniture, paving patterns, and other design elements can be integrated with programs - hosting cultural events such as storytelling, music, drama,

dance, and art classes – to really make the best use of the City's greenways as avenues for culture. Additionally, greenways are ideal for bicycle races and other community events. Particularly successful races or festivals can be scheduled as recurring events, which can help bring attention to the area and raise awareness about the trail system. Successful events can help show support for the continued investment in Gastonia's greenways and offer exciting new programming to the Parks and Recreation lineup.

Lead: Parks & Recreation

Support: Diversity, Equity and Inclusion, Planning, Communications and Marketing

Timeframe: Long-term

15. Prioritize School Safety

Focusing on school safety in the transportation context requires multiple stakeholder partnerships including Gaston County and the proposed Multimodal Transportation Commission. The City of Gastonia can continue to demonstrate support for Safe Routes to School programmatic and infrastructure efforts, such as bike-to-school events, school safety studies and traffic flow assessments, and common-sense safety amenities such as bicycle racks, high visibility crosswalks, and greenway connections to schools. Conducting vehicular movement and safety analyses for public schools in the city can highlight efficiency improvements for traffic flow and parking and should identify bicycle and pedestrian connections to the school and methods for improving overall safety. Impediments to access affects how students travel to school, so planning for connections to greenways and other safe routes should encourage more students (and teachers) to ride their bicycles to school and work. School safety studies can draw attention to problem areas, highlight success stories, and improve the overall health of young people in the community.

Lead: Gaston County Schools

Support: Parks & Rec, Planning, Safe Routes to School, GCLMPO, Trips for Kids Charlotte

Timeframe: Short- to Medium-term, Ongoing

16. Host "Bike Month" and Other Signature Events

National Bike Month takes place in May and can include planned events such as group rides, educational classes, and local bike challenges. National Bike-to-Work Day occurs in the same month and encourages commuters to ride bicycles to work, which can be incentivized by employers. Open Streets events temporarily close streets to motor vehicle traffic, allowing the street to be used for a variety of pedestrian, bicyclist, and recreational activities. These events build community while celebrating the use of non-motorized transportation. The section of West Main Avenue between York Street and Dr. MLK Jr. Way is an ideal location for an Open Streets event, with options for rerouting traffic and ample parking nearby for affected businesses and coinciding event space at the Rotary Centennial Pavilion and Center City Park.

Lead: Planning

Support: Gaston County, Communications and Marketing

Timeframe: Short-term, Ongoing

17. Utilize Police Bicycle Patrols

Establish two or more bicycle patrol officer schedules for Gastonia Police Department's Central District. Bicycle patrols result in more contacts with the public than vehicular patrols and maintain swift response times within a central business district area. They are conducive to developing positive rapport with the community and may help overcome negative perceptions that some people have about law enforcement. These patrols' main responsibilities could include patrolling special events, concerts, and parades as well as general patrol of the downtown area and adjacent parks and neighborhoods. Additionally, bicycles cost much less to purchase and maintain than traditional patrol cars. Patrol officers could promote goodwill and bicycle safety through having bicycle lights available to give to riders at night who do not have them and distributing helmets and bells to those who need them.

Lead: Police

Support: City Manager, Human Resources, Diversity, Equity and Inclusion

Timeframe: Medium- to Long-term

18. Target the Floodplain for Trail Easements

The City should conduct targeted outreach to landowners along the creeks and streams in Gastonia to ascertain interest in creating public trail easements on their land – if there is a proposed trail through or adjacent to their parcel(s). A trail easement would make a portion of their property available for public trail construction and use without having to subdivide the land or lose ownership of the parcel. Over time, the City or a land trust will be able to obtain enough land access (through easement and acquisition) to install new lengths of public trail. The City can work to support willing landowners by linking them to appraisal and survey services and assist them with navigating the County deed process. The City can draft standard easement language that sets terms governing how trails would be built, maintained, and used, with information about widths, bicycle use, landscaping, liability, and items like bike racks,

benches, and trash cans to promote consistency throughout the trail system. Easements run with the land, so even if the landowner sells the property, the trail will be permanently protected. As new sewer lines are extended along proposed greenway corridors, acquire public access easements for both sewer line use and future multi-use path use. This will ensure, however gradually, that there is dedicated space for future greenways.

Lead: Planning

Support: Community Services, Development Services, Diversity, Equity, and Inclusion

Timeframe: Long-term, Ongoing

19. Continue to Invest in Micro-mobility

Micro-mobility, an umbrella term for shared bike services and e-bikes, can provide a critical connection in the last mile of travel, particularly filling in the gaps between transit lines and riders' destinations, as well as offering a different way to explore and enjoy Gastonia. These services can also enhance Gastonia's image as a bike-friendly community. While the COVID-19 pandemic shuttered the Go Gaston bike share program, the City should continue to explore bicycle rentals through public-private partnerships and work to build off the previous program's successes. Through conducting a micro-mobility feasibility analysis, the City can determine the viability of a bike share program and, if viable, recommend what actions, organization, infrastructure, and equipment would be necessary to support a successful and equitable program in Gastonia.

Lead: Planning

Support: Gaston County, GCLMPO

Timeframe: Long-term

20. Identify and Prioritize Locations for Bicycle Rack Installation

Properly installed and conveniently located bicycle racks encourage people to park their bicycles in secure and convenient locations. Adequate bicycle parking also reduces the likelihood of damage that may result from locking bicycles to trees, signs posts, fences, or other objects. It also makes it easier for people to incorporate bicycling into daily activities. The City should map its existing bicycle parking infrastructure to make sure that all municipal buildings, public parks, County schools, and libraries are equipped with enough for daily use. The type and amount of parking depends on the location that is being served and the surrounding land use. Shopping districts and parks should have ample short-term parking, while employment centers and transit hubs should have more enhanced parking facilities that are well-lit and sheltered from rain to account for longer periods of use. Working with NCDOT and incorporating community feedback and analysis from the Gastonia Bicycle Plan, the City should identify priority locations for bicycle parking infrastructure along primary roadway corridors within the public right-of-way and install them on an ongoing basis. The City should also consider developing a matching funds program to place bike racks at existing businesses on a request basis.

Lead: Public Works

Support: Planning, Parks and Rec, Gaston County, NCDOT

Timeframe: Short-term, Ongoing

POLICY & PROGRAM RECOMMENDATIONS (SUMMARY TABLE)

Recommendation	Description	Key Partners	Timeframe
Link all City capital projects to an existing plan review.	Before finalizing plans for capital projects, City staff should review the Gastonia Bicycle Plan to identify possible opportunities to improve projects for bicyclists and advance implementation of the plan.	**Planning** Development Services, Public Works	Ongoing
Integrate bicycling with transit.	The City should consider purchasing buses that include bicycle storage capability and also ensure each bus stop is equipped with bicycle parking, prioritizing stops with higher ridership rates and routes that provide critical links to the transportation network.	**Public Works/ Gastonia Transit** Safe Routes to School, Volunteer Groups, GCLMPO	Medium-Term, Ongoing
Partner with NCDOT and ITRE's Non-Motorized Traffic Monitoring Program (bicycle counts).	The City should work with GCLMPO and NCDOT to install counting devices along the greenway system and in areas identified for bike lane installation.	**Planning** Parks & Rec, NCDOT, ITRE, GCLMPO, Public Works	Long-Term, Ongoing
Continue ongoing communication with NCDOT & GCLMPO.	Coordination with NCDOT and GCLMPO can yield inclusion of new bicycle infrastructure on planned roadway improvement projects, especially on key thoroughfares. The City should also continue to coordinate with these agencies to leverage opportunities for multimodal improvements during road resurfacing and bridge replacement.	**Development Services** NCDOT, GCLMPO, Public Works, Planning	Ongoing
Update the Comprehensive Transportation Plan (CTP).	Work with NCDOT and GCLMPO to update the GCLMPO CTP, which represents a community's consensus on the future transportation system needed to support anticipated growth and can include bicycle facilities.	**Planning** NCDOT, GCLMPO, Development Services	Ongoing
Create bicycle-oriented wayfinding.	As the City continues to develop its greenway system and begins to install new bike lanes, it should consider installing signage that provides wayfinding for active transportation users.	**Planning** Public Works	Long-Term
Consider tactical urbanism.	The City of Gastonia should identify key corridors that reflect this plan's goals for short-term, low-cost bicycle demonstration projects. The City can work with volunteers to host design charettes to engage and enlist residents' support to help install treatments such as protected bike lanes, road diets, on-street parking reconfiguration, etc.	**Planning** Safe Routes to School, Volunteer Groups, GCLMPO, Public Works	Medium-Term, Ongoing
Adopt a City of Gastonia Complete Streets Policy.	The City should create and adopt a Complete Streets Policy to guide street design when new streets are created and existing streets are reconstructed or upgraded.	**Planning** Development Services, GCLMPO	Short- to Medium-Term

Recommendation	Description	Key Partners	Timeframe
Launch a City of Gastonia Traffic Safety Awareness Campaign.	Develop an awareness campaign to highlight traffic safety, especially in places where cyclists mix with motor vehicles. Banners, signs, flyers, and targeted advertising are simple ways to remind drivers that cyclists are part of a shared community, and these tools can help foster a more patient and understanding roadway environment. The campaign can convey messages about sharing the road, driving slowly, and other general traffic safety reminders.	**Communications and Marketing/ Planning** Police, Safe Routes to School, Volunteer Groups	Medium-Term, Ongoing
Develop an online Gastonia bicycle map.	Work with a professional mapping and/or graphic design firm to develop an online City of Gastonia Bicycle Map that clearly illustrates bike lanes, greenways, transit facilities, bike rack locations, City parks, and preferred routes based on local bicyclist feedback and street conditions.	**Planning** Development Services, Gaston County, GCLMPO, Parks & Rec	Medium- to Long-Term
Collaborate with NCDOT on safety programs.	Gastonia should work towards becoming a "Watch for Me NC" Partner Community and make use of "Let's Go NC!" resources and coordinate with NCDOT on distributing materials.	**Planning** NCDOT, Communications and Marketing, Gaston County, GCLMPO	Short- to Medium-Term, Ongoing
Become a designated "Bicycle Friendly Community".	As the City develops its bicycle infrastructure, a Bicycle Friendly designation helps recognize those accomplishments and help acquire funding for future work.	**Planning** Communications and Marketing, Development Services	Medium- to Long-Term
Form a City of Gastonia Multimodal Transportation Commission	Establish a City of Gastonia Multimodal Transportation Commission (MMTC), responsible for providing input to decision makers on projects, programs, and policies, and represent the City's shared and local interests to regional authorities. This advisory commission should receive and respond to citizen ideas and concerns, hold regular quarterly (or biannual) meetings to discuss all issues related to multimodal transportation, including major projects (e.g., bridges, street repaving, comprehensive plans).	**Community Development** Police, Communications and Marketing, Neighborhood Groups, Planning	Medium-Term
Highlight cultural and historical elements along Gastonia's greenways.	Incorporating cultural features along greenways and at trailhead locations can provide opportunities for residents to learn about their community heritage and strengthen community bonds. Integrating local history and community identity narratives with projects through sequential sculpture, signs, murals, site furniture, paving patterns, and other design elements can transform the City's greenways as avenues for culture.	**Parks and Rec** Diversity, Equity, and Inclusion, Planning, Communications and Marketing	Long-Term
Prioritize school safety.	The City of Gastonia can continue to demonstrate support for Safe Routes to School programmatic and infrastructure efforts, such as bike-to-school events, school safety studies and traffic flow assessments, as well as common-sense safety amenities like bicycle racks, high visibility crosswalks, and greenway connections to schools. School safety studies can draw attention to problem areas, highlight success stories, and improve the overall health of young people in the community.	**Gaston County Schools** Parks and Rec, Planning, Safe Routes to School, GCLMPO, Trips for Kids Charlotte, Gaston County Public Health	Short- to Medium-Term, Ongoing

Recommendation	Description	Key Partners	Timeframe
Host "Bike Month" and other signature events.	National Bike Month takes place in May and can include planned events such as group rides, educational classes, and local bike challenges. National Bike-to-Work Day occurs in the same month and encourages commuters to ride bicycles to work, which can be incentivized by employers. Open Streets events temporarily close streets to motor vehicle traffic, allowing the street to be used for a variety of pedestrian, bicyclist, and recreational activities.	**Planning** Gaston County, Communications and Marketing	Short-Term, Ongoing
Utilize police bicycle patrols.	Establish two or more bicycle patrol officer schedules for Gastonia Police Department's Central District. These patrols' responsibilities could include special events, concerts, and parades as well as general patrol of the downtown area and adjacent parks and neighborhoods. These officers might also promote safety by providing lights to people riding bikes at night.	**Police** City Manager, Human Resources, Diversity, Equity, and Inclusion	Medium- to Long-Term
Target the floodplain for trail easements.	The City should conduct outreach to landowners along the various creeks and streams in Gastonia to ascertain interest in creating public trail easements on their land. Over time, the City or a land trust will be able to piece together enough land access (through easement and acquisition) to install new lengths of public trail. The City can work to support willing landowners by linking them to appraisal and survey services and assist them with navigating the County deed process. The City can draft standard easement language that sets terms governing how trails would be built, maintained, and used, with information about widths, bicycle use, landscaping, liability, and items like bike racks, benches, and trash cans to promote consistency throughout the trail system.	**Planning** Community Services, Development Services, Diversity, Equity, and Inclusion	Long-Term, Ongoing
Continue to invest in micro-mobility.	The City should continue to explore shared-bicycle rentals through public-private partnerships and work to build off the previous program's successes. Through conducting a micro-mobility feasibility analysis, the City can determine the viability of a bike-share/e-scooter program and, if viable, recommend what actions, organization, infrastructure, and equipment would be necessary to support a successful and equitable program in Gastonia.	**Planning** Gaston County, GCLMPO	Long-Term
Identify and prioritize locations for bicycle rack installation.	The City should map its existing bicycle parking infrastructure to make sure that all municipal buildings, public parks, County schools, and libraries are equipped with enough racks for daily use. Working with NCDOT and incorporating community feedback and analysis from the Gastonia Bicycle Plan, the City should identify priority locations for bicycle parking infrastructure along primary roadway corridors within the public right of way and install them on an ongoing basis. The City should also consider developing a matching funds program to place bike racks at existing businesses on a by-request basis.	**Public Works** Planning, Parks and Rec, Gaston County, NCDOT	Short-Term, Ongoing

LOCAL ORDINANCES
GASTONIA CODE OF ORDINANCES

Section	Existing Text	Recommendation
Chapter 6, Article II, Division 3, Section 6-62 -Riding on roadways and bicycle paths (a)	"Every person operating a bicycle upon a roadway shall ride as near to the right side of the roadway as practicable, exercising due care when passing a standing vehicle or one proceeding in the same direction."	Amend to be consistent with state law (N.C.G.S. § 20-146(b)). Proposed new language: "Every person operating a bicycle upon a roadway shall ride in the right-hand lane then available for thru traffic, or as close as practicable to the right-hand curb or edge of the roadway, except when overtaking and passing another standing vehicle or vehicle proceeding in the same direction or when preparing for a left turn." Because the phrasing "as close as practicable" is somewhat nebulous, this requirement is up for interpretation. Cyclists usually ride on the right side of the lane but are entitled to the use of a full lane. We want language that encourages bicyclists to feel comfortable using the full lane and is consistent with state law.
Chapter 6, Article II, Division 3, Section 6-62 -Riding on roadways and bicycle paths (b)	"Persons riding bicycles upon a roadway shall not ride more than two abreast except on paths or parts of roadways set aside for the exclusive use of bicycles."	No change needed, as this allows for the common practice of riding two abreast.
Chapter 6, Article II, Division 3, Section 6-62 -Riding on roadways and bicycle paths (c)	"Wherever a usable path for bicycles has been provided adjacent to a roadway, bicycle riders shall use such path and shall not use the roadway."	Delete this requirement altogether as it is not consistent with state law and limits the rights of bicyclists. Per N.C.G.S. § 20-146, bicyclists are not required to ride on adjacent bicycle paths. Off-road paths should complement on-road bicycle facilities, not attempt to replace them. It should not be permissible to ban cyclists from riding in the road.
Chapter 6, Article II, Division 3, Section 6-62 - Riding on roadways and bicycle paths (d)	"No person may ride a bicycle on the premises of any municipal building including but not limited to the Garland Center, City Hall, the Rotary Pavilion, except in the parking lot adjacent to such buildings. No person may ride a bicycle on any sidewalk located in the central business district, hereby defined as being bounded on the north by Walnut Avenue, on the east by Broad Street, on the west by Chester Street, and on the south by Third Avenue."	No change needed; however, consider amending to change the boundaries for this regulation from Walnut Avenue to Long Avenue or Main Avenue, narrowing the area where bicycling on the sidewalk is prohibited to the very core of downtown. Limiting bicycles on sidewalks downtown makes sense, as the streets here are often safe enough to navigate by bicycle and there are more pedestrians on the sidewalks. The safety of pedestrians is critical, particularly in locations with substantial pedestrian activities like downtown, but the area where bicycling on the sidewalk is prohibited should be smaller. The sentence regarding sidewalk riding should be moved to Chapter 6, Article II, Division 3, Section 6-63 – Riding on sidewalks.

Recommendation	Description	Key Partners
Chapter 6, Article II, Division 3, Section 6-63 – Riding on sidewalks	(a) "No person 16 years or more of age may ride a bicycle upon any sidewalk in the city. (b) No person under 16 years of age riding a bicycle may go upon any sidewalk adjacent to the streets designated in appendix A, section 6A-12. (c) Whenever any person is riding a bicycle upon a sidewalk, such person shall yield the right-of-way to any pedestrian and shall give an audible signal before overtaking and passing such pedestrian."	Amend to be consistent with Chapter 6, Article II, Division 3, Section 6-62 – Riding on roadways and bicycle paths: "No person may ride a bicycle on any sidewalk in the central business district, hereby defined as being bounded on the north by Walnut Avenue, on the east by Broad Street, on the west by Chester Street, and on the south by Third Avenue." For consistency, delete current subsections (a) and (b)]. Prohibiting people from riding their bikes on sidewalks outside of downtown is putting bicyclists' safety at risk. If bicyclists feel unsafe riding in traffic and no designated facilities (bike lane, greenway) are provided for them, riding on the sidewalk is often a logical choice.However, if bicycles are permitted to use sidewalks in Gastonia, it should be clear that cyclists must always yield to pedestrians on sidewalks, so subsection (c) should remain.
Chapter 6, Article II, Section 6-65 – Required equipment on bicycles	(a) "Every bicycle used at night shall be equipped with the lighting required by G.S. 20-129(e). (b) No person may operate a bicycle unless it is equipped with a bell or other device capable of giving a signal audible for a distance of at least 100 feet, except that a bicycle shall not be equipped with, nor may any person use upon a bicycle, a siren or whistle. (c) No person may operate a bicycle unless it is equipped with a brake which will enable the operator to make the braked wheel skid on dry, level, clean pavement."	Amend to delete subsections (b) and (c), as they are hard to enforce and pose an undue burden on law enforcement. However, the Gastonia Police Department should maintain a supply of lights and bells for dispersal to bicyclists that are found not to have these devices.
Chapter 6, Article IV, Division 1, Section 6-135 – Parking of bicycles	"No person may park a bicycle upon a street other than upon the roadway against the curb or upon the sidewalk in a rack to support the bicycle or against a building or at the curb, in such manner as to afford the least obstruction to pedestrian and vehicular traffic."	No change needed. However, the language is somewhat confusing and could be amended to simply: "Every bicycle shall be parking in such a manner as to afford the least obstruction to pedestrian and vehicular traffic." If the language about parking bicycles on the street remains, consider amending to include a caveat for bicycle corrals, which are racks placed on the roadway in a reallocated on-street parking space.

Recommendation	Description	Key Partners
Chapter 6, Article VII, Division 2 - Bicycles	(a) "Subject to subsection (b), no person who resides within the city may ride, propel or operate a bicycle on any street, sidewalk, or bicycle path within the city unless (i) such bicycle has been registered in accordance with this division and (ii) a registration sticker or marker issued in accordance with this division is displayed in a conspicuous place on the form of such bicycle. (b) The provisions of subsection (a) shall not apply to the owner of a bicycle who operates a bicycle in or through the city for a period not exceeding 30 days. (c) There shall be no registration fee for the registration required by this section."	Delete this entire division in the City's Code of Ordinances. Bicycle registration usually results in a loss of revenue, as the cost of administering and enforcing these laws are typically greater than fees collected. If enforced widely, this would decrease cycling in Gastonia and limit the growth of bicycling in the area. The existing code is onerous to enforce, a barrier to entry for bicycle use, and does not promote Gastonia's goal of being a bicycle friendly community.
Chapter 7, Article VIII, Section 7-100 – Infrastructure reimbursement agreements (a)	"Pursuant to G.S. 160A-499, this section authorizes and sets forth the procedures and terms under which the city may approve reimbursement agreements with private developers and property owners for the design and construction of municipal infrastructure that is included on the city's capital improvement plan and serves the developer or property owner. For the purpose of this section, municipal infrastructure includes, but is not limited to, water mains, sanitary sewer lines, lift stations, stormwater lines, streets, curb and gutter, sidewalks, traffic control devices, and other associated facilities."	Add "bike lanes" and "multiuse paths" to the list of municipal infrastructure. Though these facilities are not excluded from the list, having them expressly listed sets an expectation for developers to include these facilities in site plan design.
Chapter 21, Section 21-2 - Definitions	"Greenway trail means a pathway designated by signage as a public trail for bicycles and pedestrians and not for motorized vehicular use by the general public. A greenway trail is not located within the right-of-way of a street."	Either add a separate definition for "multiuse path" or "sidepath" as a trail within the street right-of-way or amend the definition of "greenway" to say that it is not "typically" located within the right-of-way of a street.
Chapter 21, Section 21-7 – Permittee Communication with customers (a)	Permittees shall include substantially the following information for prospective customers on the permittee's mobile app and web site, and also displayed on the shared device for which the information is applicable: (4) City ordinance prohibits operating the device on sidewalks. (5) Operating electric assisted bicycles and motorized scooters is prohibited on greenway trails.	Consider amending subsection (4) to only prohibit electric scooter use on sidewalks within the Central Business District, enabling riders to use sidewalks elsewhere where traffic speeds are higher and pedestrian traffic is lower. Consider amending subsection (5) to permit both devices on greenways. If there are no bike lanes to ride on, the only viable place to ride is in a vehicular travel lane with automobile traffic. Until the City builds a substantial number of bike lanes along its streets, electric scooters and electric assisted bicycles should be permitted on greenways.

Recommendation	Description	Key Partners
Chapter 21, Section 21-10 – Reporting (a)	"Each permittee shall provide the city, or to such other persons that the city may specify, with data regarding customers and shared device trips, in the format and timeline specified by the director. The data shall include real-time availability data for all devices, archival trip data for all devices including the frequency and location of shared device trips during the permit period, including identification of the shared device by type. This data will be used to support safe, equitable, and effective management of the shared active transportation system throughout the city. The permittee shall communicate to prospective customers that this data will be collected and shared with the city."	No change needed. This data can be valuable to the City as quantifiable information regarding Gastonia's bike and scooter travel patterns. Having this information will help identify priority corridors for bike lanes and multiuse paths where the need is greatest.

UNIFIED DEVELOPMENT ORDINANCE (UDO)

Section	Existing Text	Recommendation
Chapter 7, Section 7.12 – Urban Mixed Use Design Standards	There is no parking requirement for uses in the Urban Mixed Use (UMU) District. This district is intended to provide an urban, walkable, dense type of development and should be bicycle-friendly.	Amend to include a requirement for bicycle parking facilities in the UMU district, with minimum requirements per use and bike rack design standards for placement siting and orientation.
Chapter 10, – Off-Street Parking and Loading	There is no requirement for bicycle parking in the UDO's Off-Street Parking and Loading chapter.	Consider adding bicycle parking requirements for larger developments, which can be a simple ratio of number of bike racks per number of vehicular parking spaces. Add a long-term bicycle parking minimum for high-density residential uses. Long-term parking means secure bike racks sheltered from the elements. Minimum parking standards should also be added for satellite parking lots in **Section 10.7 – Satellite Parking and Section 10.9 – Parking Deck Standards**.
Chapter 13, Section 13.31 – Sidewalks/ Green Strips	While dimensional standards are included for sidewalks in the City's Subdivision Ordinance, there are no standards for bike lanes or multiuse paths.	Amend Chapter 13 to add a requirement to adhere to proposed UDO bicycle lane and multiuse path standards for new subdivision streets (especially major and minor thoroughfares). Add dimensional standards for the width of bike lanes, multiuse paths, and buffers to **Chapter 9 – General Provisions.**
Chapter 13, Section 13.34 – Layout of blocks	"Block length shall be not less than four hundred (400) feet."	Delete the minimum block length from the Subdivision Ordinance. Smaller blocks are more conducive to walking and enable easier navigation by bicycle.