THE TOWN OF MOORESVILLE

Pedal Moore(sville) Bicycle Plan

August 2022

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Contents

EXECUTIVE SUMMARY

THE TOWN OF MOORESVILLE

Pedal Moore(sville) Bicycle Plan

Executive Summary

Plan Contents

Chapter 1, Introduction, provides an overview of the project background; outlines the vision, goals, and objectives for this plan; and considers the benefits of active transportation.

Vision & Goals

Over the next 10 years, Mooresville will elevate safety for bicyclists by creating a highly connected, convenient, fun, and low-stress bicycling network.

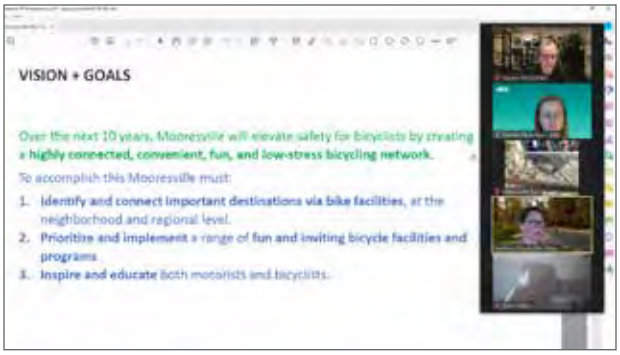
To accomplish this Mooresville must:

Goal 1. IDENTIFY AND CONNECT important destinations via bike facilities, at the neighborhood and regional level.

Goal 2. PRIORITIZE AND IMPLEMENT a range of fun and inviting bicycle facilities and programs.

Goal 3. INSPIRE AND EDUCATE both motorists and bicyclists.

Chapter 2, Current Conditions, considers the broader context of this plan, including demographic and development trends, the transportation system, and the current state of the active transportation network, including bicycle, greenway, and trail facilities in the town. Maps depicting the existing bike facilities in town, as well as funded bike facility projects that are scheduled to be built in the next 1-3 years, are provided.



Screenshot of a Steering Committee meeting and discussion of the Vision & Goals for this plan.

Chapter 3, Recommended Bicycle System, identifies a network of bicycle facility recommendations that will serve the entire Town of Mooresville. Maps of the recommended network display the long-term vision for a complete network, as well as crossing improvement recommendations, and priority projects for near-term implementation. Maps for these categories of bike facility projects are shown on the following pages.

Chapter 4, Recommended Programs + Policies, summarizes the education, encouragement, engagement, and enforcement activities that will support a more bicycle-friendly community. The chapter also presents recommendations for updated local policies and regulatory ordinances to guide the planning design, and construction of bicycle facilities.

Chapter 5, Implementation Plan, provides an overview of implementation recommendations and describes the organizational framework needed. It also describes the roles of stakeholder agencies, organizations, and partners for implementing the key programs, policies, and infrastructure projects. Potential funding sources and design guidance resources are also outlined in this chapter.

The Appendices, provide details on the priority project cost estimates, policy and regulatory review process, and recommended bike facility details guidance for Mooresville's Strategic Corridors.

Bicyclists attending the public outreach event at Food Lion on Brawley School Road

FIGURE ES.1 *Proposed Bicycle Facilities*

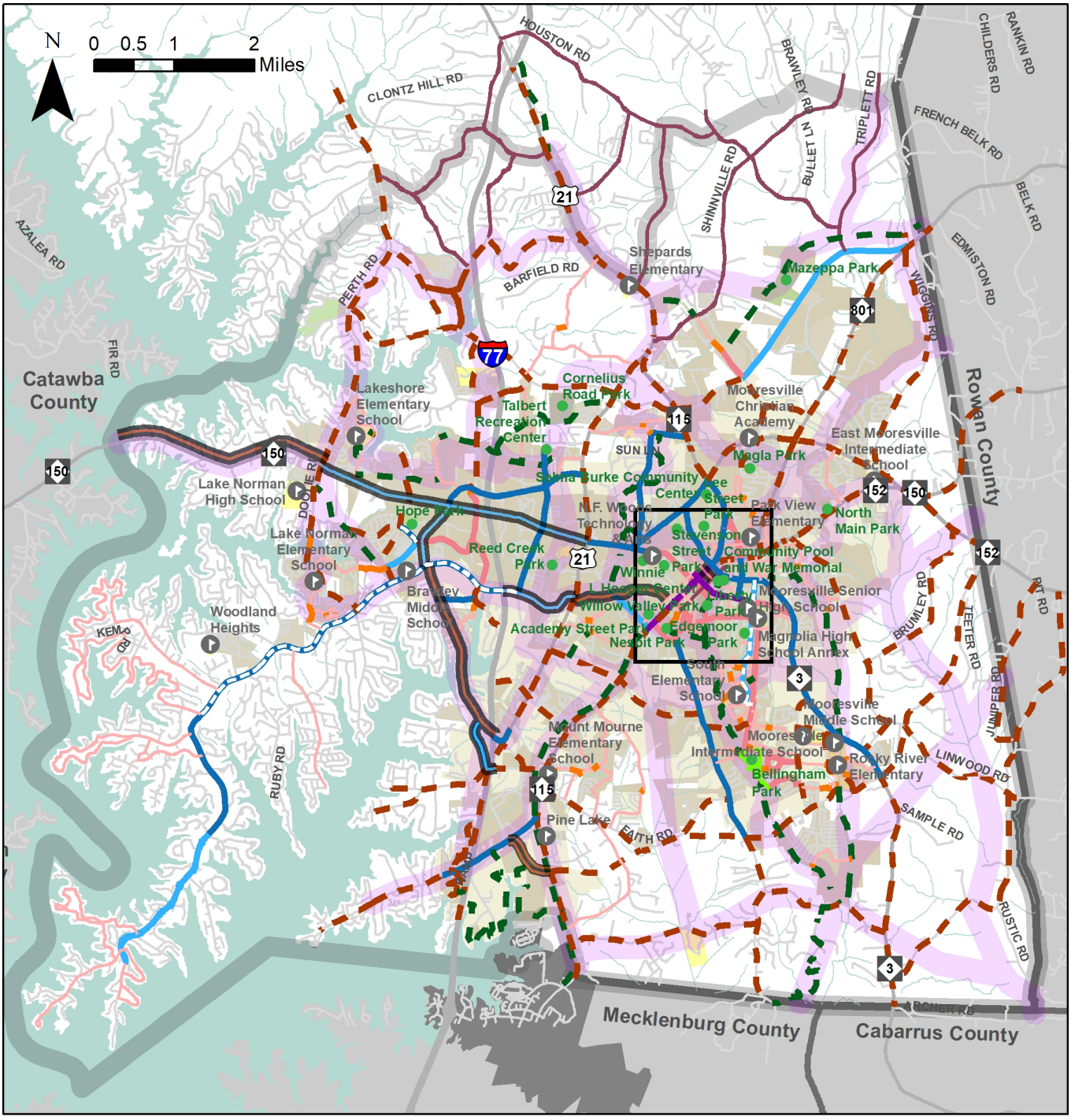


FIGURE ES.2 *Proposed Bicycle Facilities- Downtown Inset*

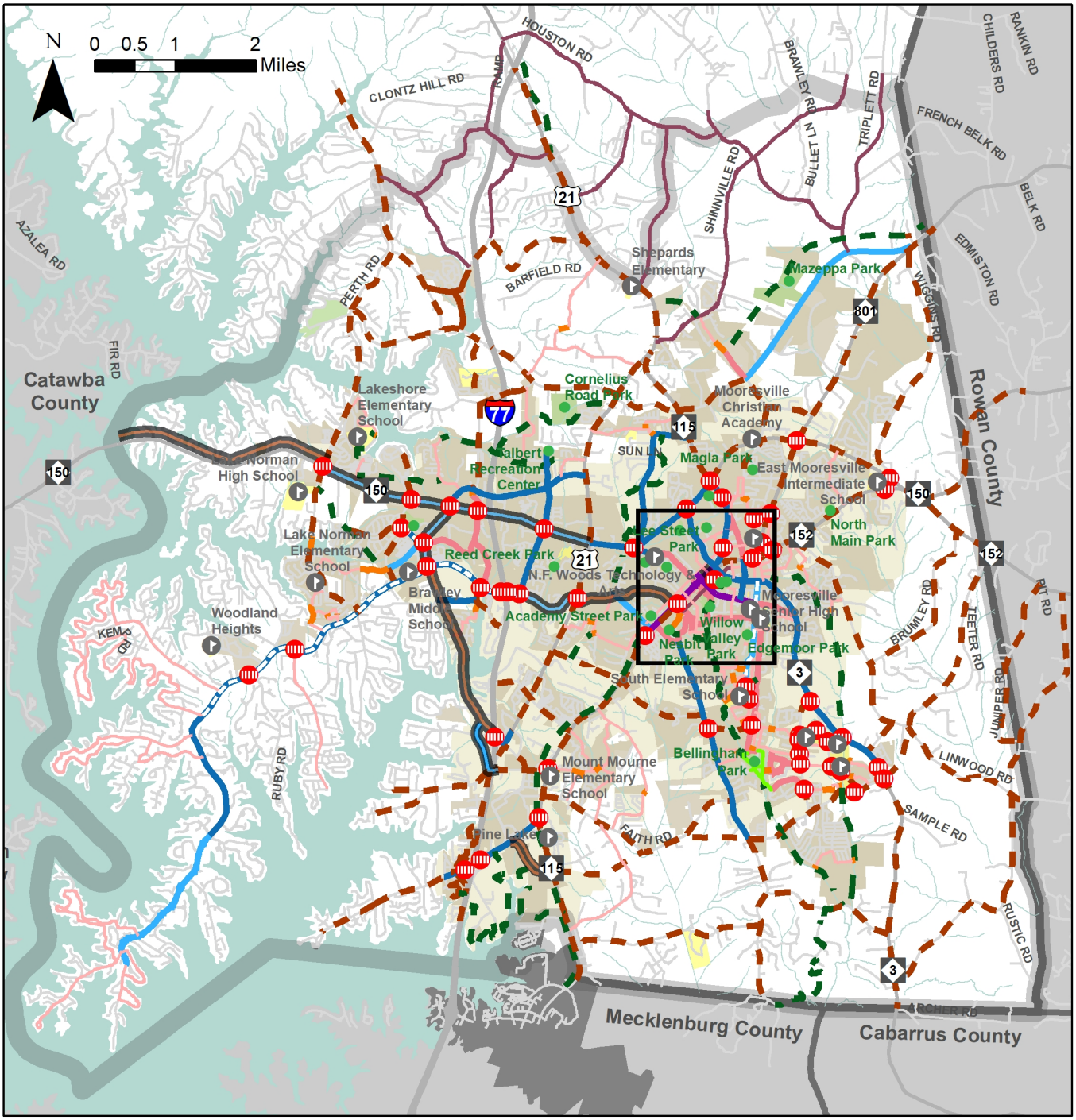
Proposed Bike Facilities
- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Streets w/Traffic Calming+Wayfinding
- Separated Bike Facility (TBD- sidepath or SBLs)
- Bike Lanes/Paved Shoulders
- Shared Lane Markings

Funded Bike Facility Projects
- Multi-Use Path/Greenway
- Standard Bike Lanes
- Shared Lane Markings

Existing Bike Facilities
- Bike Lanes (white dash)
- Greenway

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE ES.3 *Proposed Crossing Improvements*



Proposed Bike Facilities
- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
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- Bike-Ped Connector
- Quiet Streets w/Traffic Calming+Wayfinding
- Separated Bike Facility (TBD- sidepath or SBLs)
- Bike Lanes/Paved Shoulders
- Shared Lane Markings

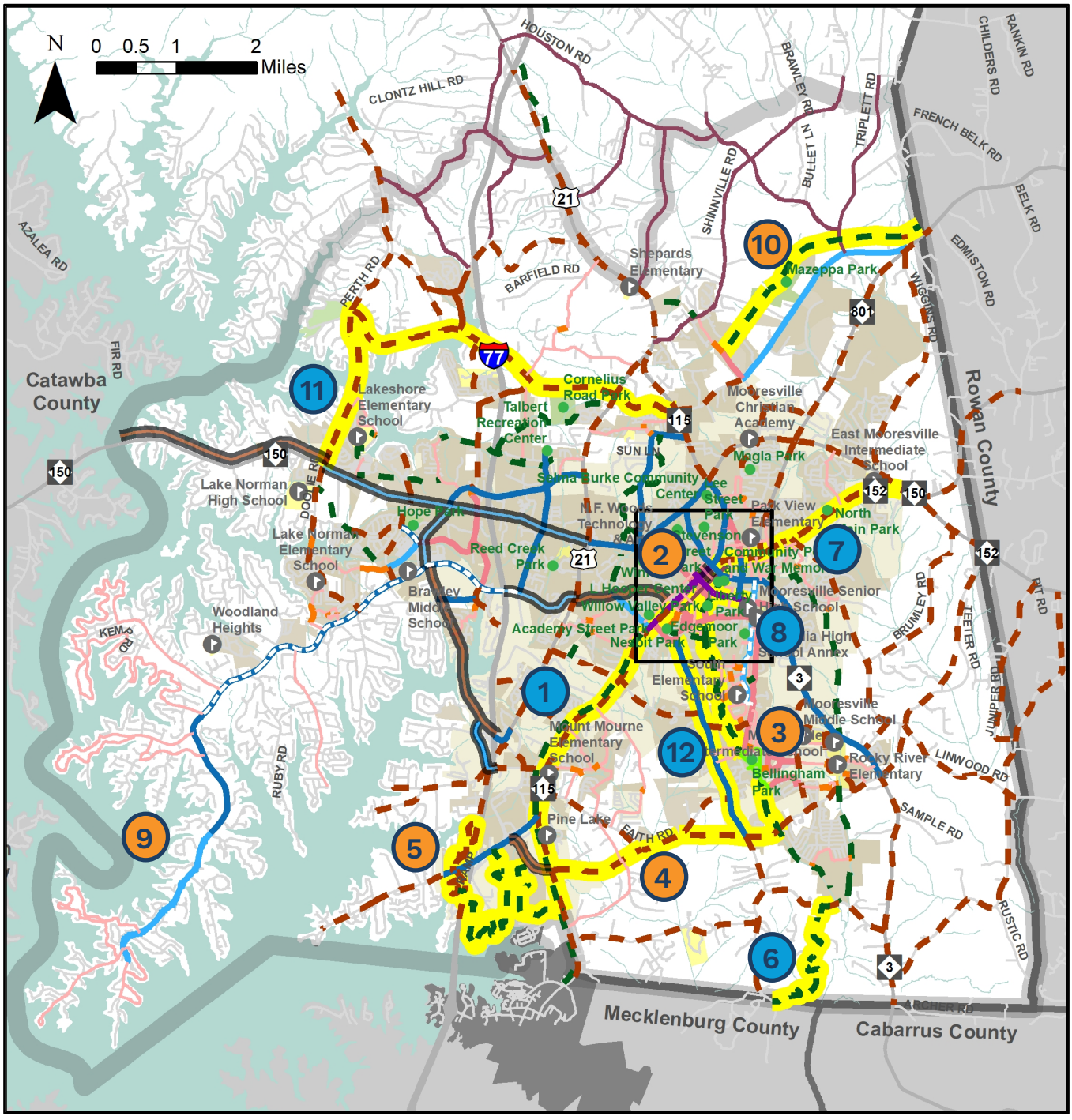
Funded Bike Facility Projects
- Multi-Use Path/Greenway
- Standard Bike Lanes
- Shared Lane Markings

Existing Bike Facilities
- Bike Lanes (white dash)
- Greenway

Crossing Identified
- Crossing Improvement

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE ES.4 *Priority Projects*



Proposed Bike Facilities

- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Streets w/Traffic Calming+Wayfinding
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- Bike Lanes/Paved Shoulders
- Shared Lane Markings

Funded Bike Facility Projects

- Multi-Use Path/Greenway
- Standard Bike Lanes
- Shared Lane Markings

Existing Bike Facilities

- Bike Lanes (white dash)
- Greenway

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

PRIORITY PROJECTS

The Mooresville Lake Loop

1. Sidepath along **NC 115** from College Street to the Mecklenburg County line
2. Separated bike facility through downtown from Norman Drive to Institute Street
3. **Dye Creek Greenway**, from Liberty Park/ N. Church Street to Bellingham Park
4. Sidepaths on both sides of the street along the future **East-west Connector** from Langtree Road to NC 3/Coddle Creek Highway
5. **Langtree area trails**: Gateway Peninsula Trail; Langtree Trail (and separated bike lanes on Langtree Road); and the Normy Overlook Trail
6. **Rocky River Greenway**, from Johnson Dairy Road to the Mecklenburg County line
7. Sidepath along **N. Main Street**, from Iredell Avenue to NC 150/Oakridge Farm Highway
8. Separated bike lanes on **Center Avenue**, from Church Street to Magnolia Street
9. Bike Route Wayfinding for the Brawley School Road area
10. **Greenway connection to Mazeppa Park**, from NC 115/Statesville Highway to the Rowan County line
11. Sidepath along **Perth Road**, from Cornelius road to NC 150/River Highway
12. Paved shoulders along **Shearer Road**, from Brawley Avenue to Rocky River Road (this is a near-term recommendation; the long-term recommendation is for separated bike lanes when the road is widened)

Priority Project #8 calls for a restriping of Center Avenue to create separated bike lanes connecting downtown Mooresville to Mooresville High School

INTRODUCTION

1

Pedal Moore(sville) provides a vision and action plan for the Town of Mooresville to create a complete and connected network of bicycle facilities. Through improved on-street bikeways and paved shared use paths, the resulting network seeks to support residents and visitors of all ages and abilities. This plan serves as an update to the previously-adopted Comprehensive Bicycle Plan (2008). It focuses on supporting safer travel in and around Mooresville while maintaining and expanding connections with neighboring jurisdictions.

Population and employment growth in Mooresville demands more mobility options for travel in town and within our region. An improved bicycle network consisting of shared-use paths, greenway trails, on-street bikeways, and enhanced bicycle amenities will provide Mooresville expanded transposition choices to meet the needs of people of all ages and abilities.

Plan Contents

Chapter 1, Introduction, outlines the vision for this plan and considers the benefits of active transportation.

Chapter 2, Current Conditions, considers the broader context of this plan, including demographic and development trends, the transportation system, and the current state of the active transportation network, including bicycle, pedestrian, and trail facilities in the town.

Chapter 3, Recommended Bicycle System, identifies a network of bicycle facility recommendations that will serve the entire Town of Mooresville. Maps of the recommended network display the long-term vision for a complete network, as well as near-term opportunities for development of facilities through new construction, retrofits, and regularly scheduled road maintenance.

Chapter 4, Recommended Programs + Policies, summarizes the education, encouragement, and enforcement activities that will support a more bicycle-friendly community. The chapter also presents recommendations for updated local policies and regulatory ordinances to guide the planning design, and construction of bicycle facilities.

Chapter 5, Implementation Plan, provides an overview of implementation recommendations and describes the organizational framework needed. It also describes the roles of stakeholder agencies, organizations, and partners for implementing the key programs, policies, and infrastructure projects.

Bicyclists riding on NC 115 south of Downtown Mooresville

Project Background

The *Pedal Moore(sville) Bicycle Plan* aims to create a complete, interconnected, system of shared use paths, greenway trails, on-street bikeways, and intersection improvements to support residents as they recreate and travel in and around the town.

Local and regional planning documents, specifically those aimed at improving biking, informed development of the *Pedal Moore(sville) Bicycle Plan*. Recommendations put forth in this plan incorporate previous planning efforts, while acknowledging changing conditions in the town influencing the growth of active transportation networks.

Local plans reviewed include the *Safe Routes to School* report (2022), the Comprehensive Plan, *OneMooresville*, (2019), the *Mooresville Bicycle Plan* (2008), the *Comprehensive Pedestrian Plan* (2006), the *Lake Norman Regional Bike Plan* (2006), the *Carolina Thread Trail Master Plan for Iredell County Communities* (2011), the *Safe Routes to School Action Plan* (2011), the *Mooresville Comprehensive Transportation Plan* (CTP) (2012), the *Downtown Master Plan* (2009), and multiple Small Area Plans and corridor studies from 2005 to the present.

The *Pedal Moore(sville) Bicycle Plan* builds on the goals and priorities outlined in Chapter 4 of *OneMooresville*, which serves as an updated Comprehensive Transportation Plan (CTP) for the Town and is referred to as a Transportation Master Plan (TMP). The goals and priorities identified in Chapter 4 of *OneMooresville* include:

- Connection: fostering internal connectivity while creating and maintaining regional connections that are important for Mooresville's success.
- Choice: Increasing transportation choices to allow viable alternatives to using a personal vehicle because key destinations are connected by a safe and efficient network of roads, sidewalks, bicycle facilities, shared-use paths, or transit.
- Future Development: connecting existing and future concentrations of development with a transportation network that allows easier movement of people and goods without sacrificing context of place.

The *OneMooresville* plan will guide the long-term physical development of the town, while the *Pedal Moore(sville) Bicycle Plan* will guide the town's implementation of recommendations that support the town's vision for improved bicycle and multi-modal connectivity.

The Bicycle Map from Chapter 4 of the *OneMooresville* Comprehensive Plan of 2019.

Vision, Goals, & Objectives

Vision Statement

Over the next 10 years, Mooresville will elevate safety for bicyclists by creating a highly connected, convenient, fun, and low-stress bicycling network. To accomplish this Mooresville must:

Goals & Objectives

GOAL 1. IDENTIFY AND CONNECT IMPORTANT DESTINATIONS VIA BIKE FACILITIES, AT THE NEIGHBORHOOD AND REGIONAL LEVEL.

- Identify relevant bicycle network, on-road and off-road facility types, cross-sections, and plans now in place
- Specify amenities that make biking pleasurable and practical, such as landscaping, traffic calming, public restrooms and showers, lockers, bicycle racks, and recreational opportunities
- Identify recreational bike facilities, such as bike parks, pump tracks, etc., that can serve as spaces for recreation, education, and programming to promote bicycling as a fun, safe, and healthy activity
- Identify necessary construction projects and connect destinations
- Identify quality bicycle safety and driver awareness programs
- Identify grants and other funding opportunities
- Connect with partners to help achieve goals
- Connect with bike-friendly local businesses
- Identify existing relevant policies and ordinances, and recommend best practices for improving policy language regarding bike facilities and amenities
- Identify innovative ways to communicate safe biking routes in the community, e.g., smartphone app

GOAL 2. PRIORITIZE AND IMPLEMENT A RANGE OF FUN AND INVITING BICYCLE FACILITIES AND PROGRAMS.

- Prioritize and implement bicycle safety and driver awareness programs
- Prioritize safety and accessibility for bicyclists of all types, with a special consideration for children, low-income residents, and the elderly
- Prioritize construction of new projects that build off existing facilities and programs, with a focus on closing critical system gaps
- Pursue grants to implement prioritized projects and programs
- Implement recommended policy changes to support the construction of bike facilities
- Implement network recommendations at local, regional, and state levels
- Create a Bicycle Advisory Committee and/or Vision Zero Task Force to offer recommendations and implement the plan

GOAL 3. INSPIRE AND EDUCATE BOTH MOTORISTS AND BICYCLISTS.

- Inspire and educate both motorists and bicyclists to create an atmosphere where motorists are familiar with bicyclists and bicyclists are comfortable with motorists, e.g., bicycle safety clinics and friendly driver programs
- Educate and promote awareness of the wide-ranging benefits of bicycling throughout the community, including environmental, physical, and mental health benefits
- Create and share across a variety of media platforms campaigns that shows the Town fully supports and encourages bicycling as a viable means of transportation
- Continue to fund educational campaigns and materials related to bicycling through programs like Safe Routes to School (SRTS) and Watch for Me NC

Bicyclists riding on Magnolia Street North of South Elementary School

Benefits of Bicycling & Active Transportation

Investment in bicycle infrastructure—including bikeways, multi-use paths, and trails—supports residents, employees, and visitors as they travel in and around Mooresville. Bicycle infrastructure can also support a more active lifestyle by supporting safe active transportation in the form of biking AND walking since shared-use paths and trails allows for pedestrian travel as well. Bicycle infrastructure also connects people to recreation, employment, or educational opportunities; and for many, it serves as a primary way to travel.

The benefits of bicycle and active transportation are well-documented and broad-reaching, including environmental, economic, and health benefits. Key benefits include:

Safety

Addressing network gaps, improving existing infrastructure, and supporting continued education and enforcement can reduce potential conflicts among people walking, bicycling, and driving. Well-designed roadways and bicycle and active transportation facilities can improve safety for all roadway users through increased predictability and increased separation from motor vehicles.

Health and Equity

A connected bicycle and active transportation network can provide safer and more comfortable ways to travel for all ages and abilities. Low-stress networks can expand access to schools, jobs, homes, and parks—connecting residents to economic, education, and recreational opportunities. Bicycle and active transportation supports those who cannot drive or choose not to drive.

Further, bicycling and active transportation supports mental and physical well-being through reduced stress, reduced anxiety, and numerous health benefits associated with higher levels of activity. For example, students who walk or bike to school are more likely to show up ready to learn.

Environmental

Increased bicycling activity for transportation can reduce vehicle miles traveled and reduce vehicle emissions, resulting in improved air quality. This not only helps improve the quality of life for those vulnerable to asthma and other respiratory conditions, but it also helps reduce the town's contribution to climate change.

Quality of Life

Bicycle infrastructure provides residents with more choices for how they can get around safely. Not only does improved infrastructure increase the comfort of a route for those bicycling, it can also encourage more people to use active modes of travel for short trips. Residents can more easily connect with educational, economic, and recreational opportunities, supporting an improved quality of life for residents who may otherwise be stuck in traffic.

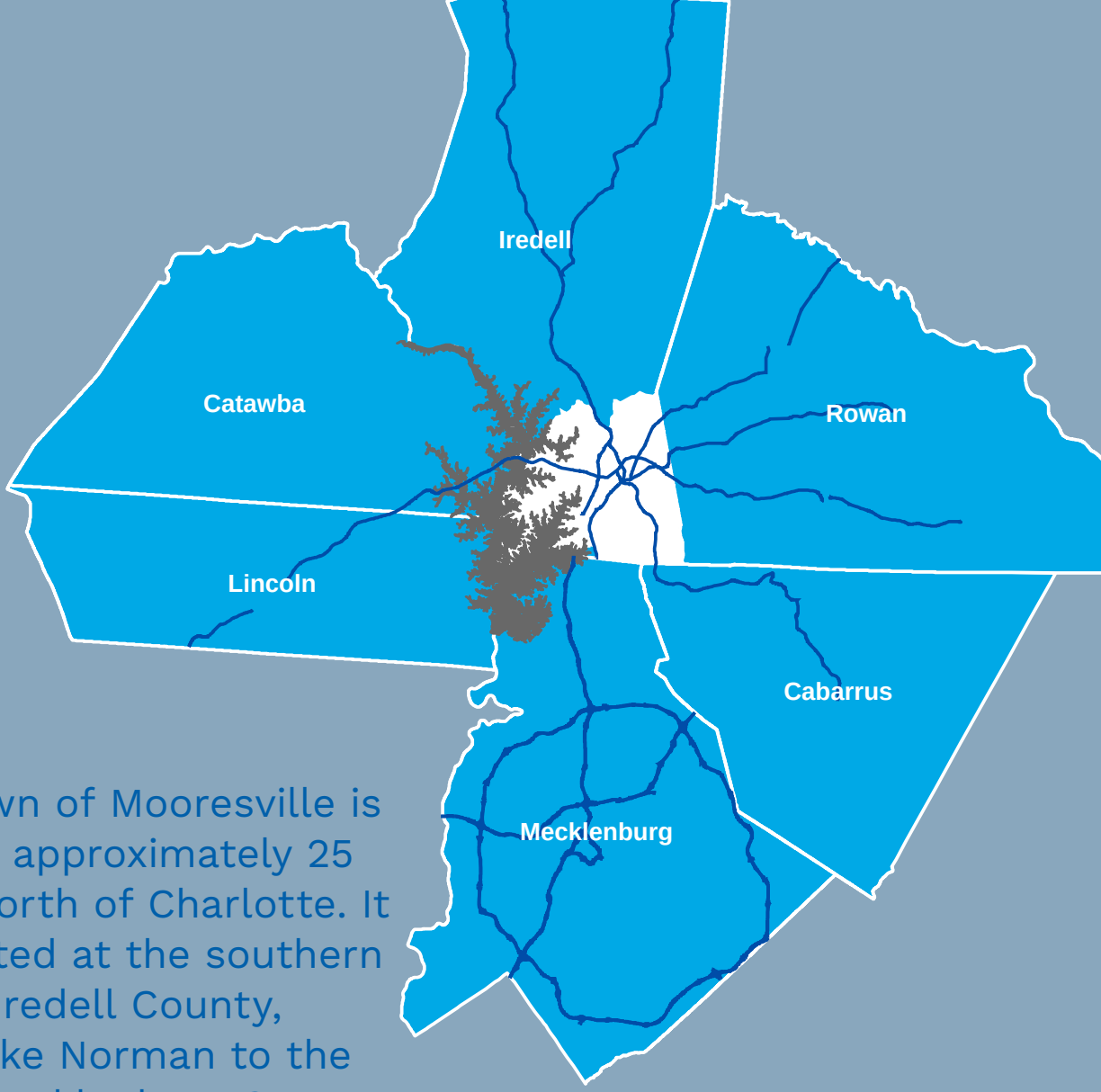
Other Benefits

In addition to the benefits outlined above, investment in bicycle infrastructure can reduce the demand for driving, which then provides savings in the form of reduced maintenance needs for roadways, reduced collisions, and reduced collision-related costs.

Bicyclists attending the public outreach event at Food Lion on Brawley School Road

CURRENT CONDITIONS

2



The Town of Mooresville is located approximately 25 miles north of Charlotte. It is situated at the southern end of Iredell County, with Lake Norman to the west, Mecklenburg County to the south and Rowan County to the east. With the highest growth rate in the Charlotte region, Mooresville is focused on improving the quality of life of residents by providing more transportation choices and fostering regional connectivity by expanding its bikeways and multi-use path network.

Community Context

Mooresville residents represent a diverse and growing population. Since 2010, the population of Mooresville has grown by 53%. The 2020 Census reports that there were an estimated 50,193 people living within Mooresville town limits.[2] More than 14% of households speak a language other than English, and Black/African Americans represent 11% and Hispanic/Latino persons represent 9% of Mooresville residents.

The population is also well-educated, with over 40% of residents over 25 years of age having a Bachelor's degree or higher, compared to 31% for the state of North Carolina. Further, the area median income is approximately 20% higher than that of State of North Carolina.[2] The town also has a lower poverty rate than the state, with approximately 10% of households living at or below the federal poverty level, compared to 14% statewide.

According to the 2019 comprehensive plan, *OneMooresville*, Mooresville is growing faster on average than the Charlotte Metropolitan Statistical Area (MSA), and by 2040 the town's population could be nearly 100,000 people—representing a 140% increase over 40 years.

With a growing number of people living and/or working in Mooresville, there will be a greater demand on the roadway network, including increased congestion. Expansion of travel options, including improved walking and biking network and connections to transit, can provide options to driving and expand choice for how Mooresville residents and visitors travel.

In addition to traveling to reach employment opportunities, Mooresville residents are also traveling to reach basic services or educational opportunities. Approximately 29% of the population is under the age of 18, while 12% are age 65 or older.[2] This represents a significant proportion of the total population, and residents in these age brackets are often the most vulnerable road users. Opportunities to provide safe routes to access schools, services, and other key destinations for these demographic groups should be a priority. (A Safe Routes to School study was conducted concurrently with this bike plan and includes school-specific recommendations.)

1 2020 Decennial Census
2 2019 ACS 5-year estimate

FIGURE 2.1 *Historic Trends and Projected Population in Planning Area*

Transportation Overview

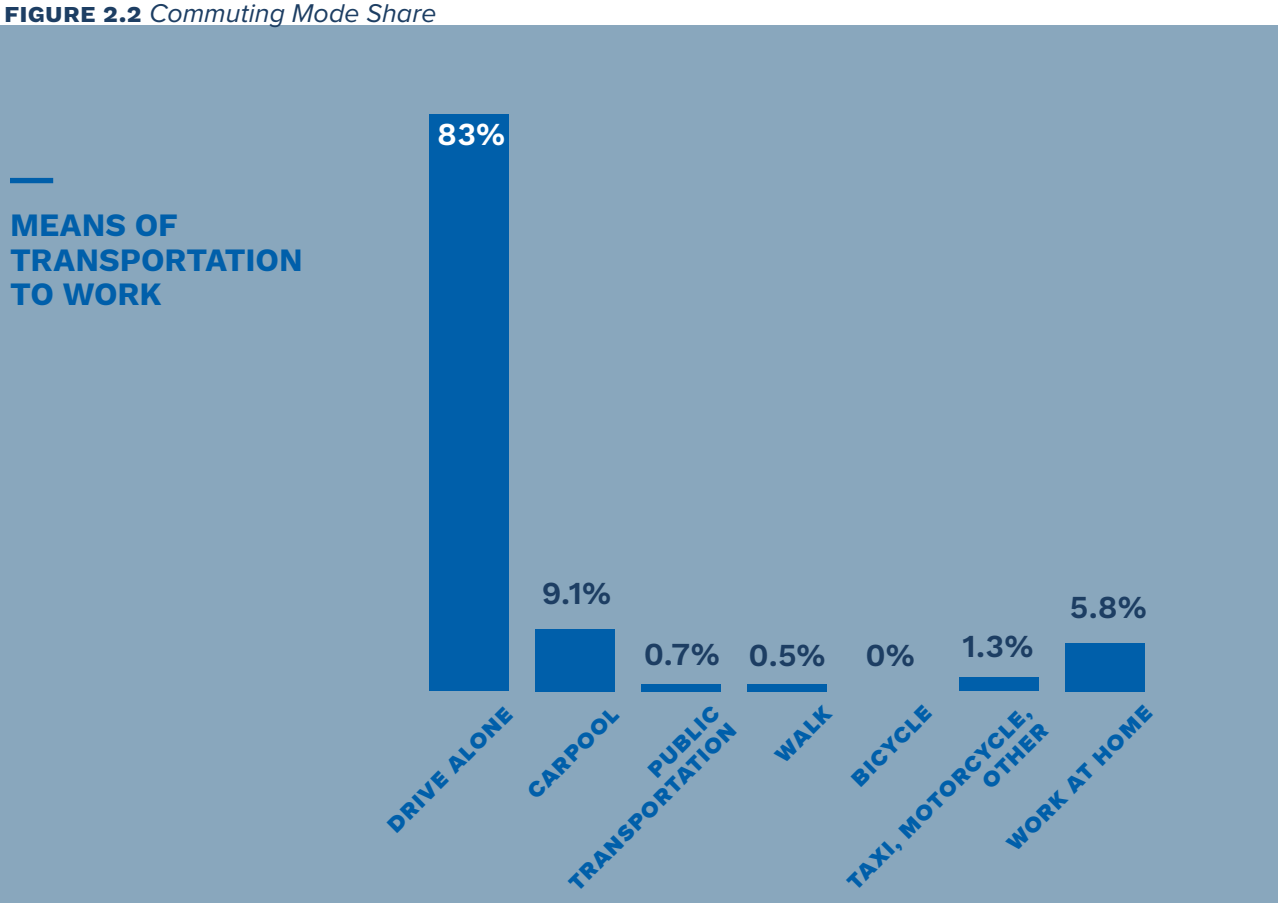
The transportation system in Mooresville consists mainly of its roadway and sidewalk network, with a limited number of bicycle facilities. Public transportation is available in the form of fixed and on-demand bus services provided by Iredell County Area Transportation System. The limited availability of transportation choices is reflected in the travel mode patterns in Mooresville, where 83% of workers commute to work by driving alone, and zero commute by bicycle.

The roadway network in Mooresville includes several major highways that are regionally significant. Interstate 77, US Highway 21, NC Highway 115, and NC Highway 3 are major north-south routes, while NC Highway 150, 152 are the main east-west corridors. US 21 and NC Highways 3, 115, and 152 are two-lane highways, and NC 150 is a five-lane roadway. These highways do not have any bicycle facilities, and are significant barriers to safe bicycle travel. Interstate 77 is a particularly difficult barrier to bicycle travel, since there are a limited number of roads that cross over it, and only one of them has bike facilities—standard bike lanes on Brawley School Road; however, these bike lanes do not provide any separation between bicyclists and the heavy motor vehicle traffic, and are not comfortable for bicyclists of all ages and abilities.

Bicycle Network

In addition to the bicycle lanes on Brawley School Road, which extend from Talbert Road to South Fork Road, there are also standard bike lanes on

FIGURE 2.2 *Commuting Mode Share*



Source: 2019 ACS 5-year estimate

Magnolia Street, Wilson Avenue, and Plantation Ridge Drive. There are shared lane markings on Center Avenue and Magnolia Street and multi-use paths in the Atwater Landing neighborhood and at Bellingham Park. The maps on pages 13 and 14 show these existing facilities, along with the planned bike facilities that are already funded and scheduled for construction shown on pages 15 and 16.

Mooresville does not currently have other bikeway types, such as buffered bike lanes, bike boulevards, or separated bike lanes (also known as cycle tracks); these facility types are discussed in greater detail beginning on page 39. The existing bike facilities generally support travel along Brawley School Road and Magnolia Street, but these corridors are isolated and disconnected from each other and any other bicycle facilities.

Many of the bicyclists who have participated in the public outreach efforts as part of this project have been recreational bicyclists who primarily ride on the roads despite the lack of dedicated bicycle infrastructure (see Figure 2.7 on page 17 for details on popular biking corridors). Many of the roads they report riding on in Mooresville are two-lane roads without any paved shoulder (NC Highway 115, Shearers Road, Linwood Road, Wiggins Road, and Mazeppa Road). Bicyclists who travel on Brawley School Road, which has bike lanes, have reported debris in the bike lanes as a problem and hindrance to safe biking.

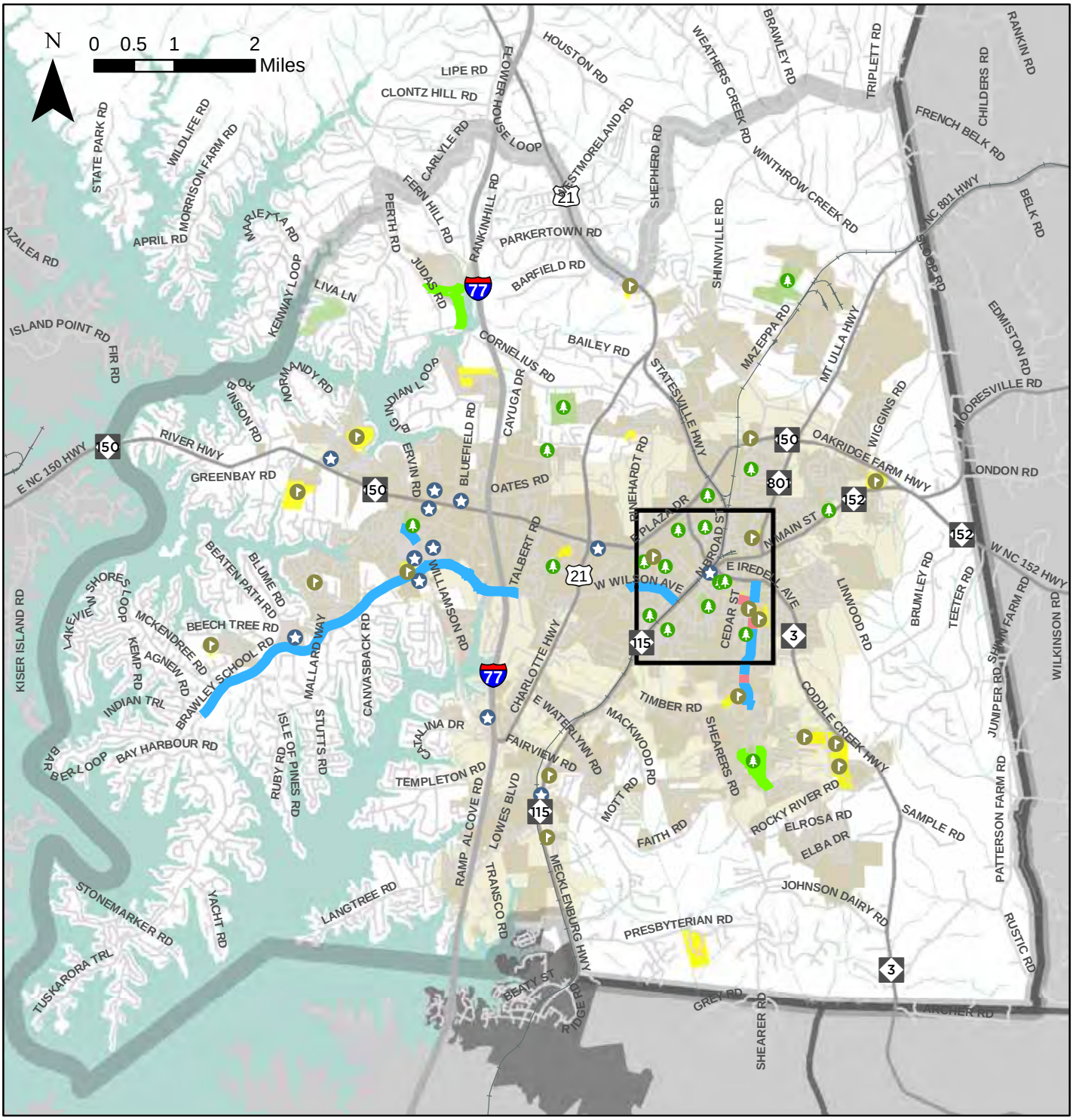
Planned improvements scheduled for the next couple of years will upgrade NC 150 to include a sidepath from the western county line to Perth Road, and standard bike lanes from Perth Road to US Highway 21; a sidepath and standard bicycle lanes on Williamson Road; a sidepath on West Wilson Avenue; and standard bike lanes on Brawley School Road from US Highway 21 to I-77. New roadway projects will also add bicycle lanes along the Fairview Road extension and Alcove Road from Templeton Road to Williamson Road, and sidepaths along the new roadway segment for the East-West Connector, between Langtree Road and NC Highway 115.

The few bikeways that exist in Mooresville are limited and disconnected; they do not provide a network that can facilitate safe bicycle travel to desirable destinations in town. Planning and project development should be concentrated on connecting existing infrastructure to activity and employment centers.

TABLE 2.1 *Existing Bikeways*

FACILITY TYPE	LENGTH
Paved Multi-Use Paths	2.2 miles
Bike Lanes	7.0 miles
Shared Lane Markings	0.4 miles
TOTAL	9.6 miles

FIGURE 2.3 *Existing Bike Facilities*



Existing Bike Facilities
- Bike Lanes
- Multi-Use Path/Greenway
- Shared Lane Markings

Key Destinations
- Schools
- Parks
- Shopping Center

- School Property
- Parks Property
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE 2.4 *Existing Bike Facilities- Downtown Inset*

Existing Bike Facilities
- Bike Lanes
- Shared Lane Markings

Key Destinations
- Schools
- Parks
- Shopping Center

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE 2.5 *Existing Bike Facilities + Funded Projects*

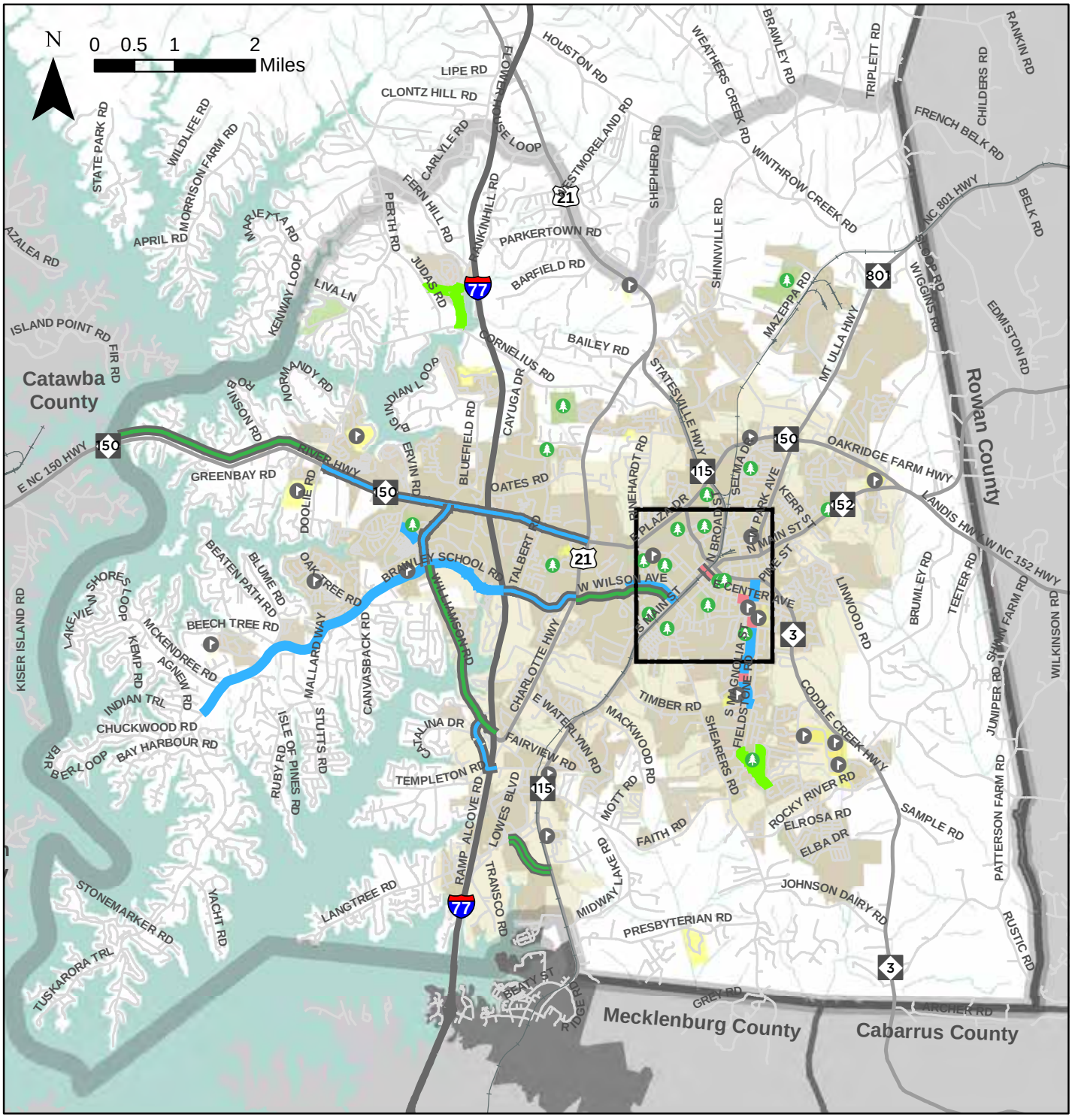
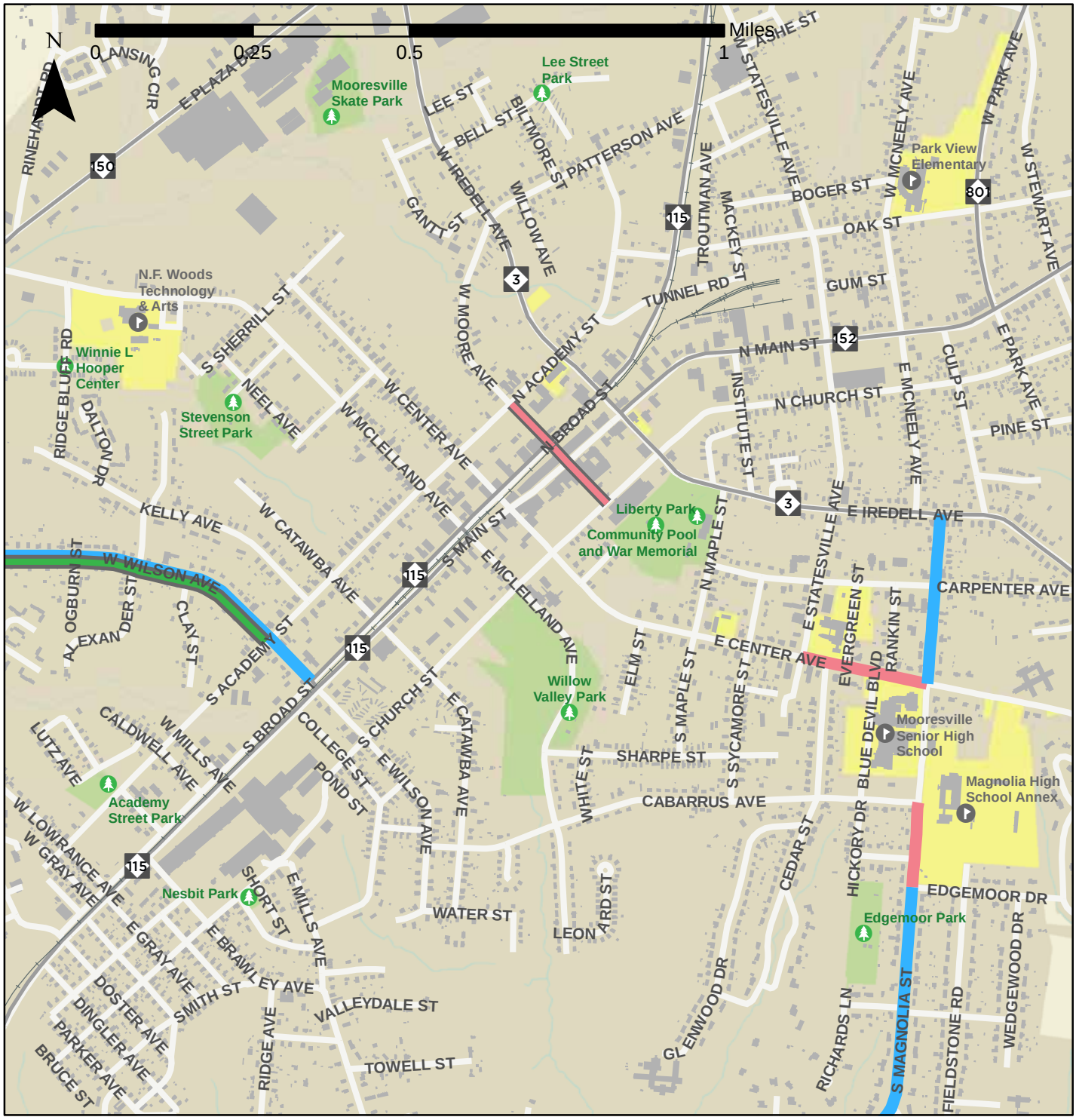


FIGURE 2.6 *Existing Bike Facilities + Funded Projects- Downtown Inset*

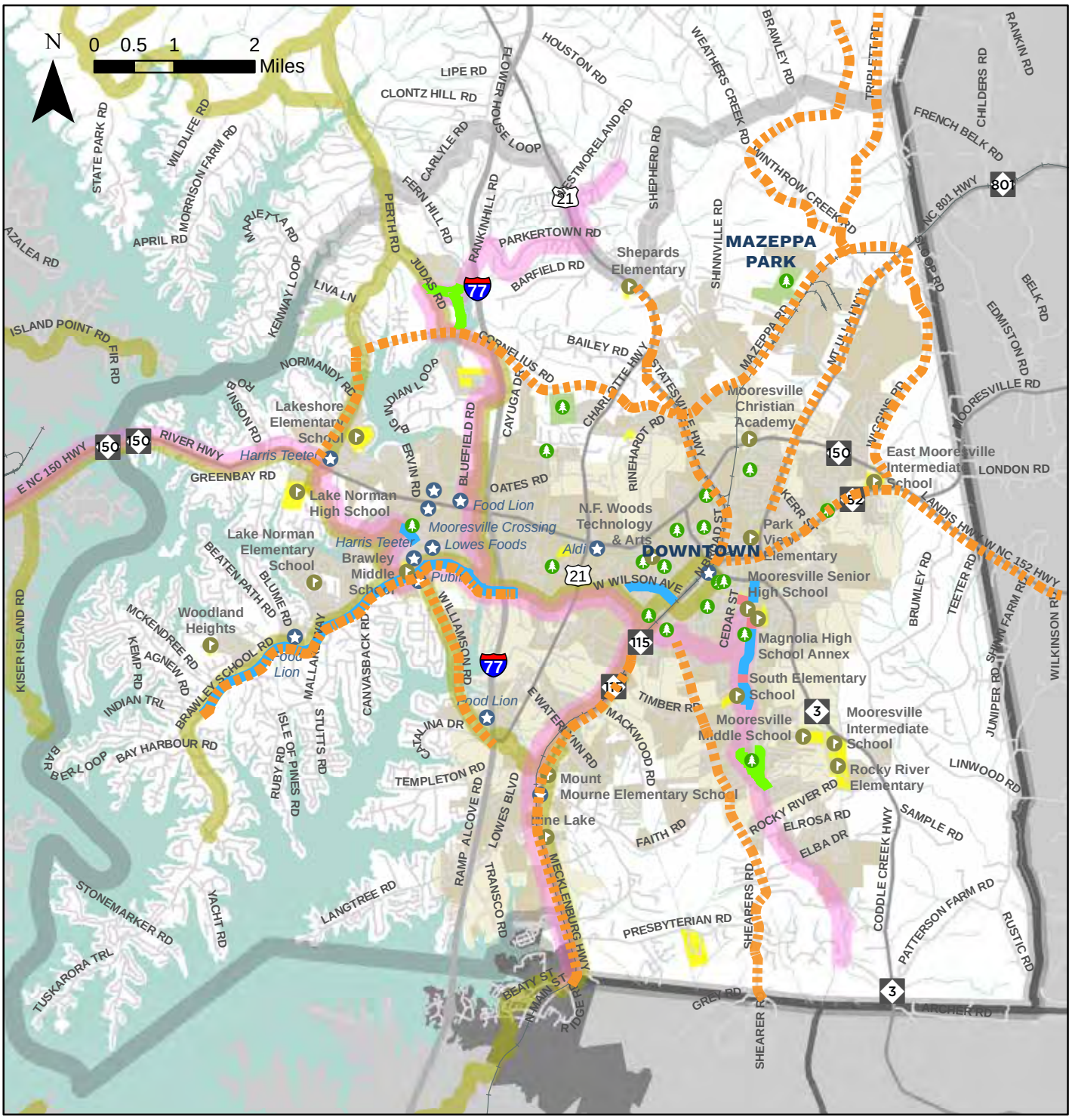


Existing Bike Facilities
- Bike Lanes
- Shared Lane Markings

Funded Future Bike Facilities
- Sidepath
- Shared Lane Markings

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE 2.7 *Key Destinations and Popular Biking Corridors*



Existing Bike Facilities
- Bike Lanes
- Multi-Use Path/Greenway
- Shared Lane Markings

Regional Bike & Trail Routes
- Carolina Thread Trail
- Lake Norman Bike Route

Key Destinations
- Schools
- Parks
- Shopping Center
- Popular Biking Corridors

- School Property
- Parks Property
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

TABLE 2.2 *Inventory of Select Roadways*

Roadway	Predominant Pavement Width (LF)	Number of Lanes	AADT*	Speed Limit (MPH)	Presence of Curb + Gutter	Presence of Sidewalks	Presence of Bike Facility
Alcove Road	*20*	*2*	*3,800*	*45*	*no*	*no*	*no*
Bluefield Road	*22*	*2*	*8,600*	*45*	*no*	*no*	*no*
Brawley School Road	*54*	*4*	*31,000*	*45*	*yes*	*yes*	*bike lanes*
Center Avenue	*36*	*2*	*unavailable*	*35*	*yes*	*yes*	*SLM***
Cornelius Road	*20*	*2*	*8,200-12,500*	*45*	*no*	*no*	*no*
Fairview Road	*36*	*2-3*	*8,000*	*35*	*partial*	*partial*	*no*
Faith Road	*20*	*2*	*7,100*	*45*	*no*	*no*	*no*
Fieldstone Road	*28*	*2*	*unavailable*	*25*	*yes*	*yes*	*no*
Johnson Dairy Road	*20*	*2*	*4,500*	*45*	*no*	*no*	*no*
Kistler Farm Road	*20*	*2*	*4,300-5,800*	*45*	*no*	*no*	*no*
Langtree Road	*85*	*5*	*11,000*	*45*	*varies*	*no*	*paved shoulders*
Linwood Road	*20*	*2*	*2,100-3,900*	*35*	*no*	*no*	*no*
Magnolia Street	*32*	*2*	*unavailable*	*35*	*yes*	*partial*	*bike lanes*
N Main Street	*22-36*	*2-3*	*9,500-12,000*	*35*	*no*	*partial*	*no*
Mazeppa Road	*22*	*2*	*3,800*	*45*	*no*	*no*	*no*
Mount Ullu Highway	*20*	*2*	*8,300*	*45*	*no*	*no*	*no*
NC 3/Coddle Creek Highway	*20*	*2*	*11,000-11,500*	*45*	*no*	*no*	*no*
NC 115/Mecklenburg Highway	*24*	*2*	*unavailable*	*55*	*no*	*no*	*no*
NC 115/Statesville Highway	*20*	*2*	*12,500*	*45*	*no*	*no*	*no*
NC 150/ Oakridge Farm Highway	*24*	*2*	*15,500*	*45*	*no*	*no*	*no*
NC 150/E Plaza Drive	*60*	*5*	*21,000-40,000*	*45*	*yes*	*partial*	*no*
NC 150/River Highway	*24-70*	*2-5*	*21,500-36,000*	*45*	*no*	*partial*	*no*
Oates Road	*20*	*2*	*4,000*	*35*	*no*	*partial*	*no*
Park Avenue	*20*	*2*	*4,500-5,200*	*35-45*	*no*	*no*	*no*
Perth Road	*22*	*2*	*11,000*	*45*	*no*	*partial*	*no*
Presbyterian Road	*20*	*2*	*3,700*	*45*	*no*	*no*	*no*
Rocky River Road	*20*	*2*	*3,300-5,200*	*45*	*partial*	*partial*	*no*
Talbert Road	*20-80*	*2-5*	*18,000*	*45*	*partial*	*partial*	*no*

Source: NCDOT Roadway Data (2014-2018) and Google Earth Imagery Data from 10/1/2021.

**AADT = Annual average daily traffic*

***Center Avenue has shared lane markings; it previously had bike lanes before being repaved around 2018.*

Roadway	Predominant Pavement Width (LF)	Number of Lanes	AADT*	Speed Limit (MPH)	Presence of Curb + Gutter	Presence of Sidewalks	Presence of Bike Facility
Timber Road	*20*	*2*	*4,500*	*45*	*no*	*no*	*no*
US Highway 21/ Charlotte Highway	*24-75*	*2-6*	*17,000-21,500*	*45*	*partial*	*no*	*no*
Waterlynn Road	*22-35*	*2-3*	*7,800*	*35*	*partial*	*partial*	*no*
Williamson Road	*22*	*2*	*19,000-25,500*	*35*	*no*	*no*	*no*
Wilson Avenue	*24-35*	*2-3*	*11,000-16,000*	*35*	*partial*	*partial*	*bike lanes, partial*

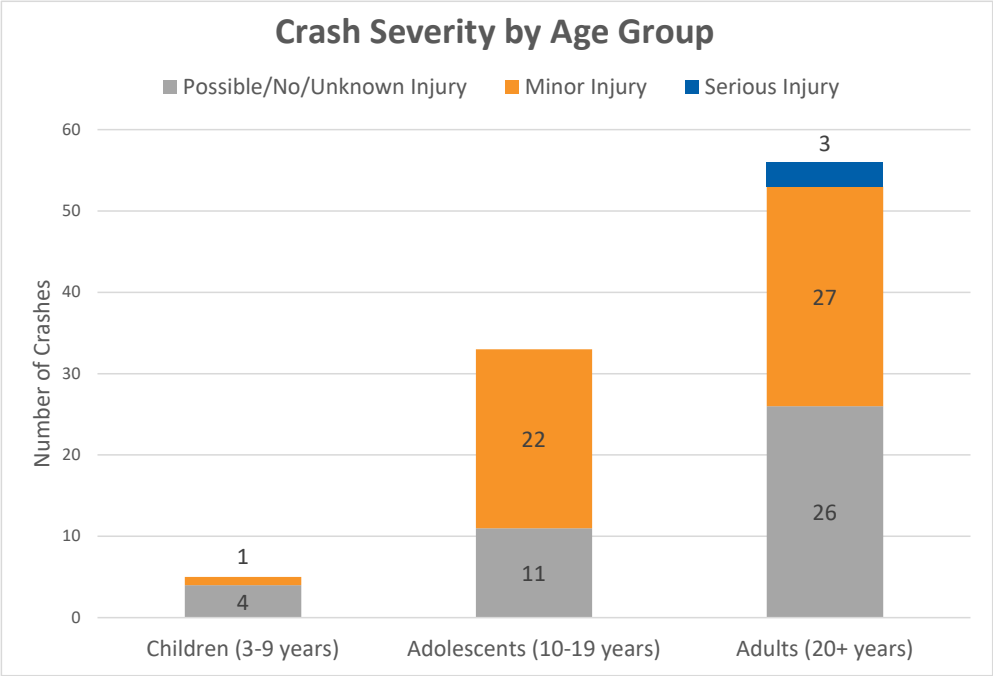
Source: NCDOT Roadway Data (2014-2018) and Google Earth Imagery Data from 10/1/2021.

**AADT = Annual average daily traffic*

Crash Analysis

Analysis of bicyclist-involved crashes revealed 94 crashes in Mooresville and the surrounding extra-territorial jurisdiction (ETJ), between 2007 and 2019. Below is a summary of this analysis. Refer to page 21 and 22 for maps that depict the locations of these crashes.

94 Bicyclist-Involved Crashes



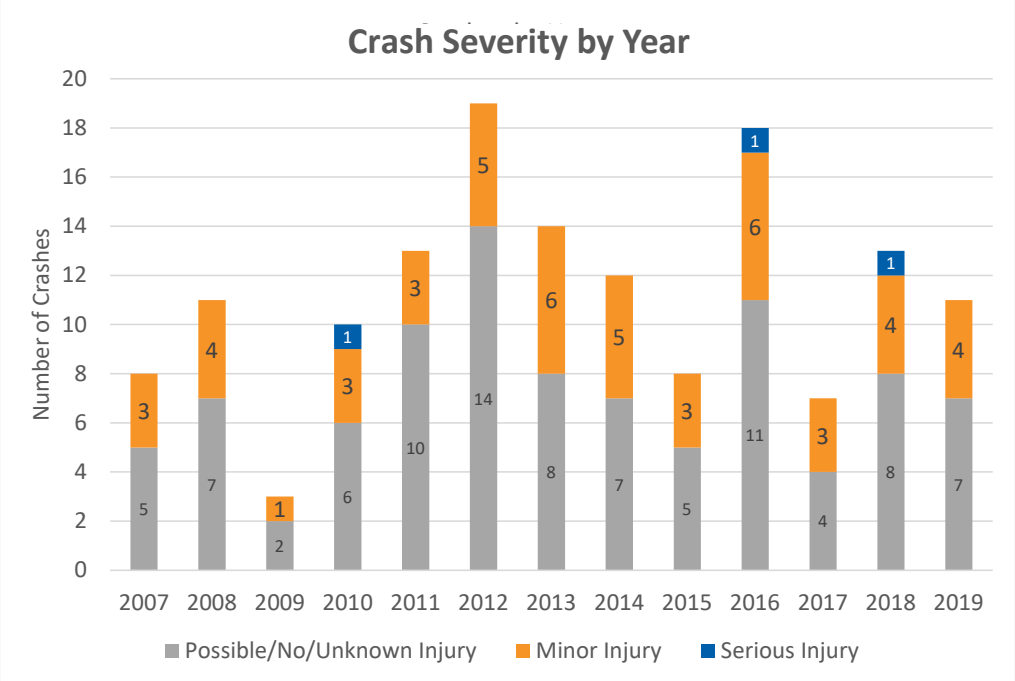
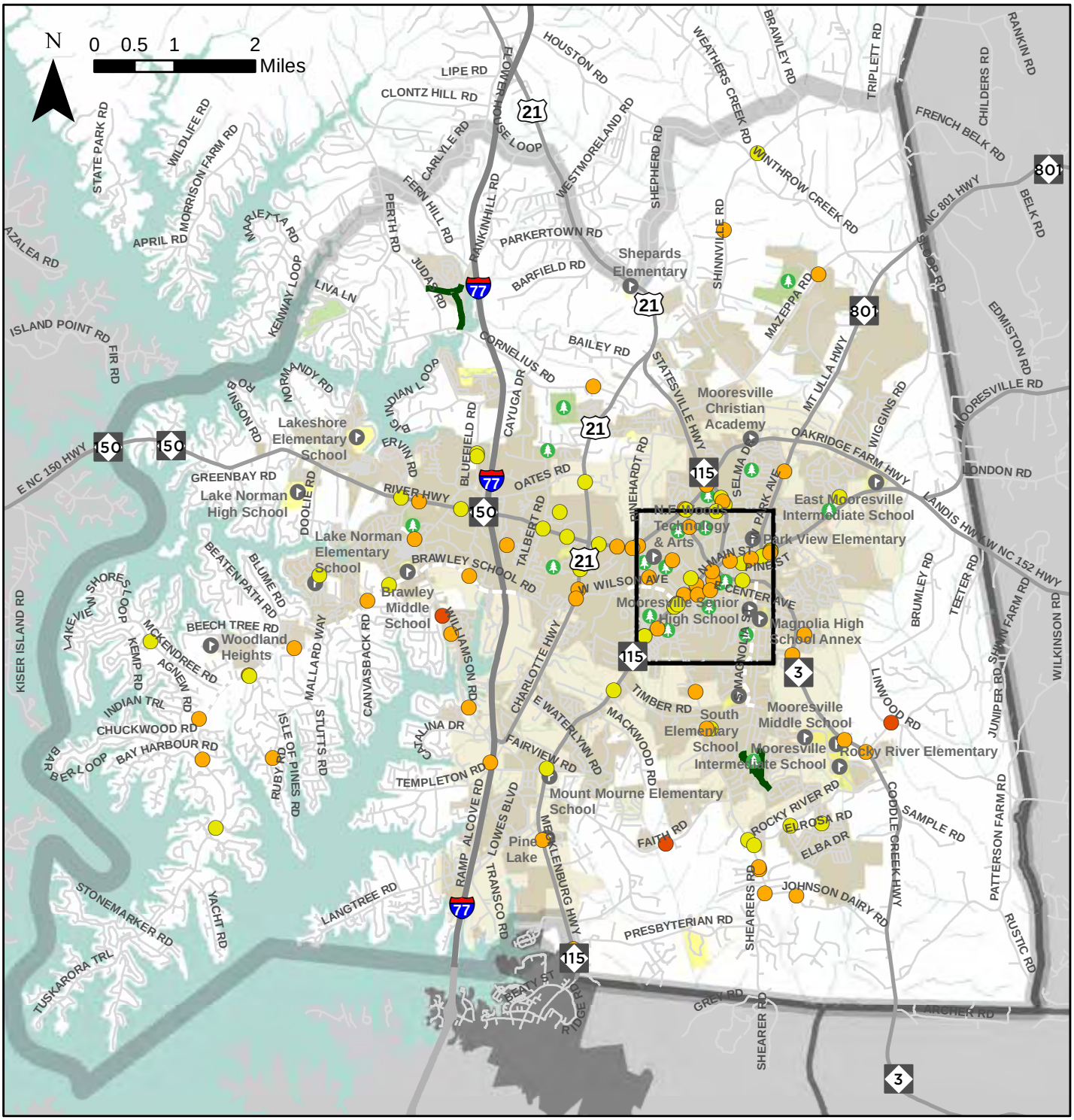


FIGURE 2.8 *Crash Analysis*



Bike Crashes (2007-2019)

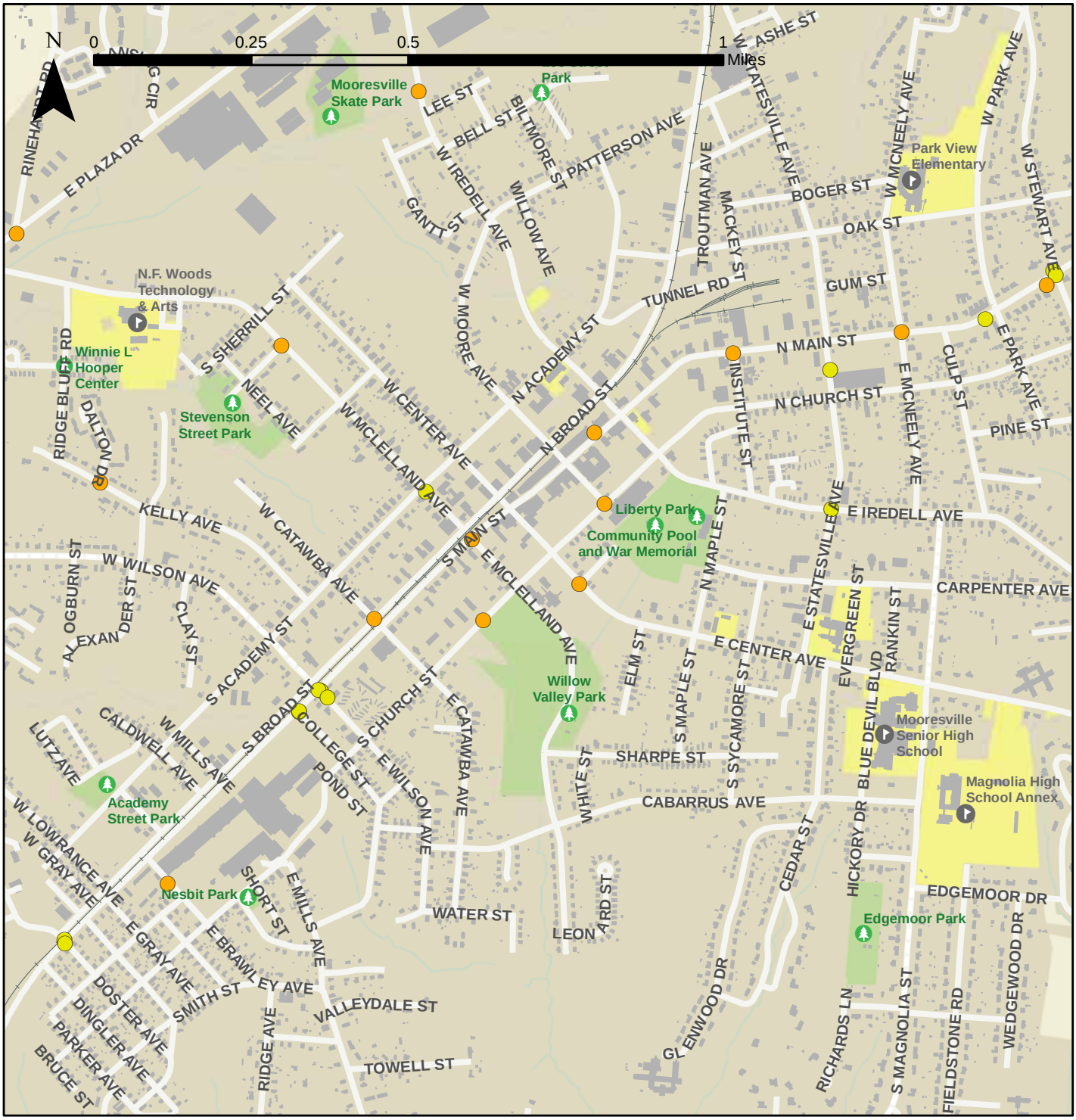
- Possible/No/Unknown Injury
- Minor Injury
- Serious Injury

Existing Bike Facilities

- Bike Lanes (white dash)
- Greenway

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE 2.9 *Crash Analysis- Downtown Inset*



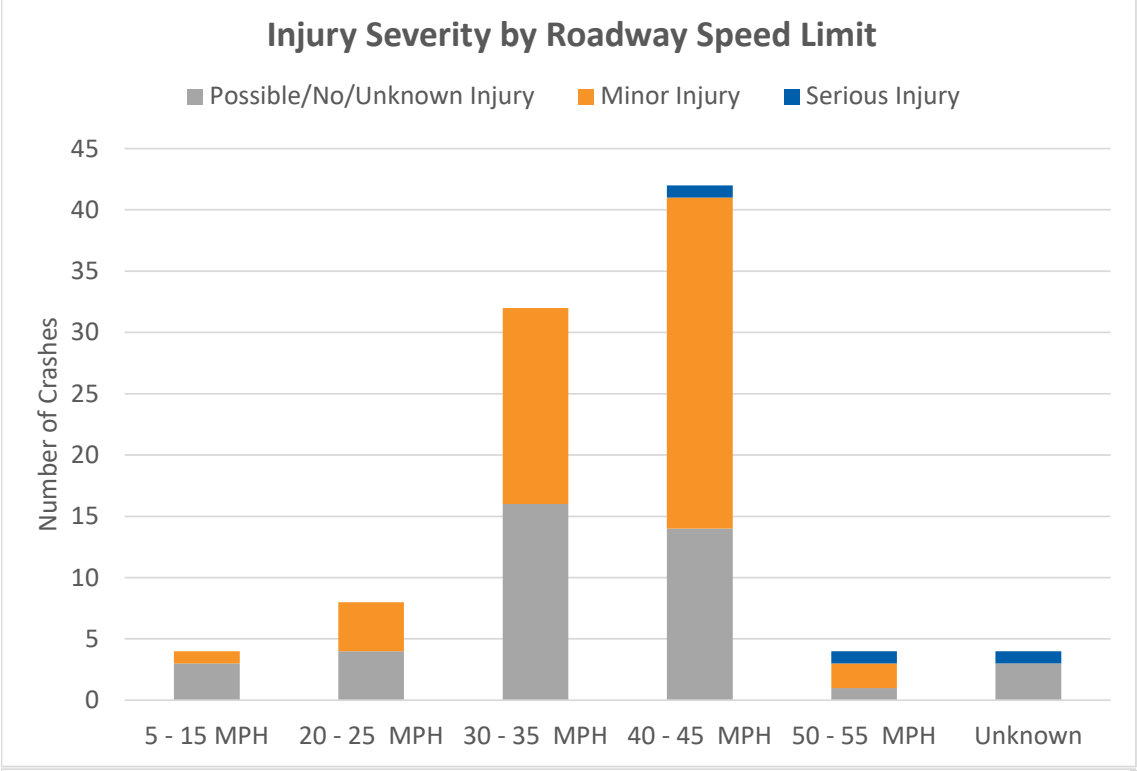
Bike Crashes (2007-2019)

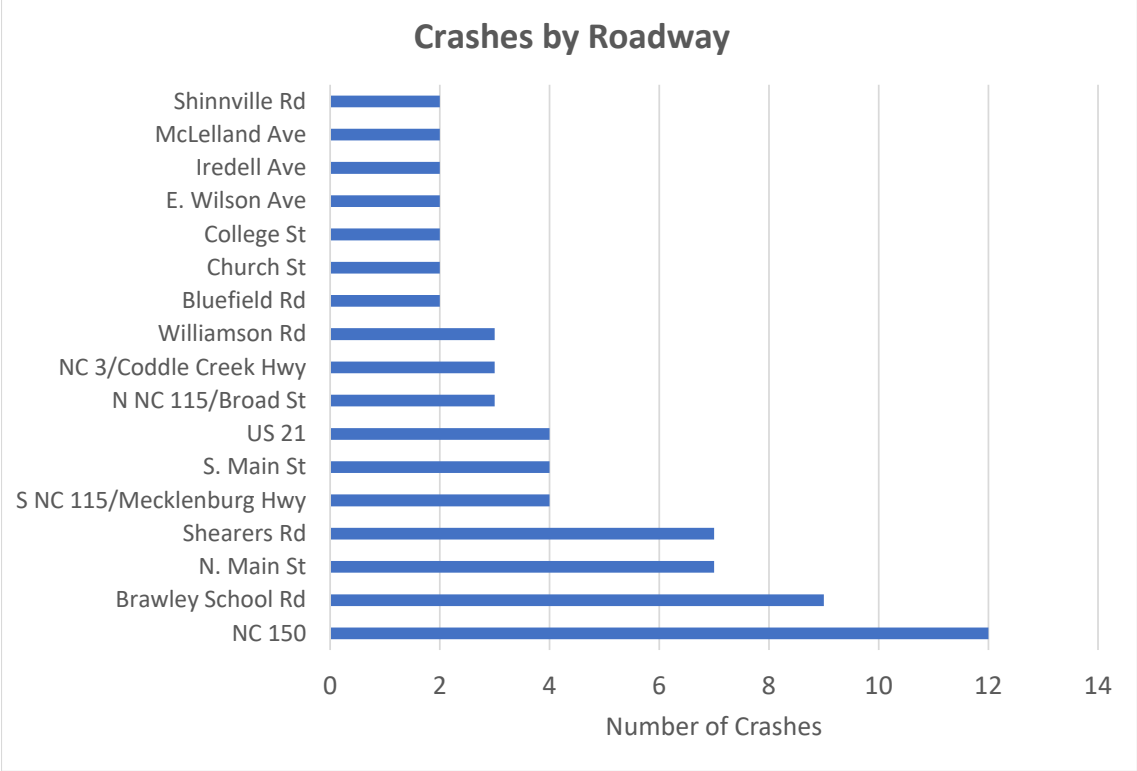
- Possible/No/Unknown Injury
- Minor Injury
- Serious Injury

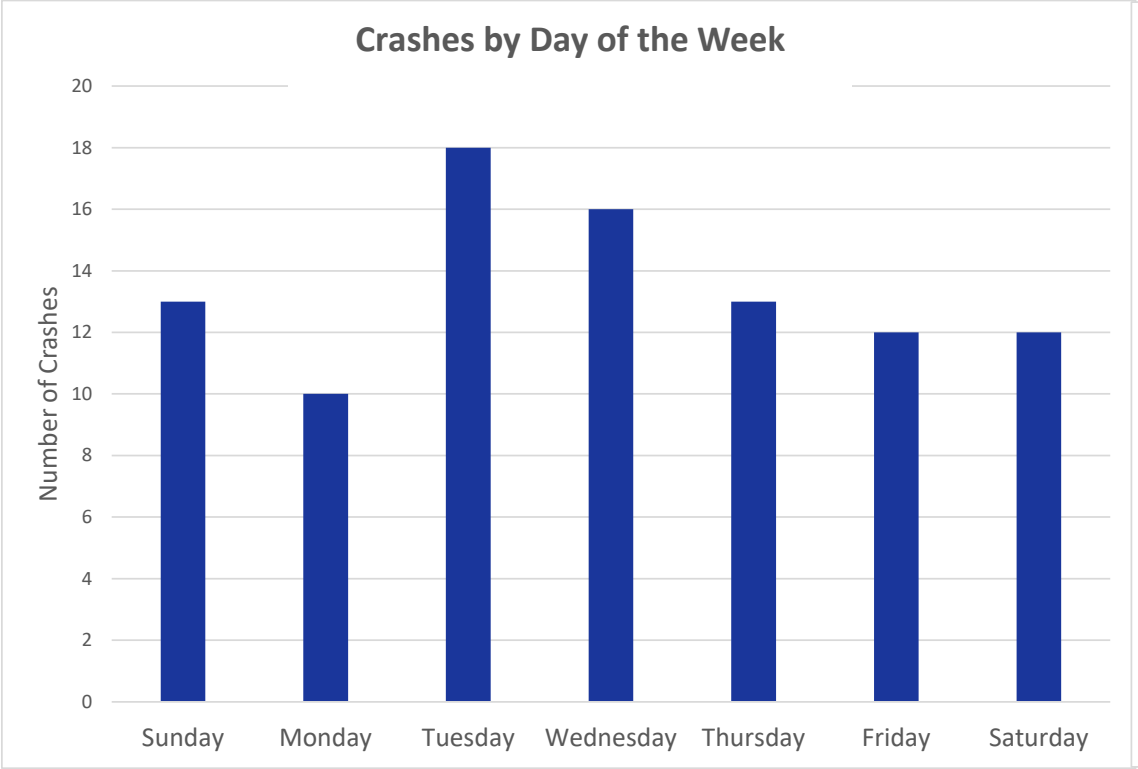
Existing Bike Facilities

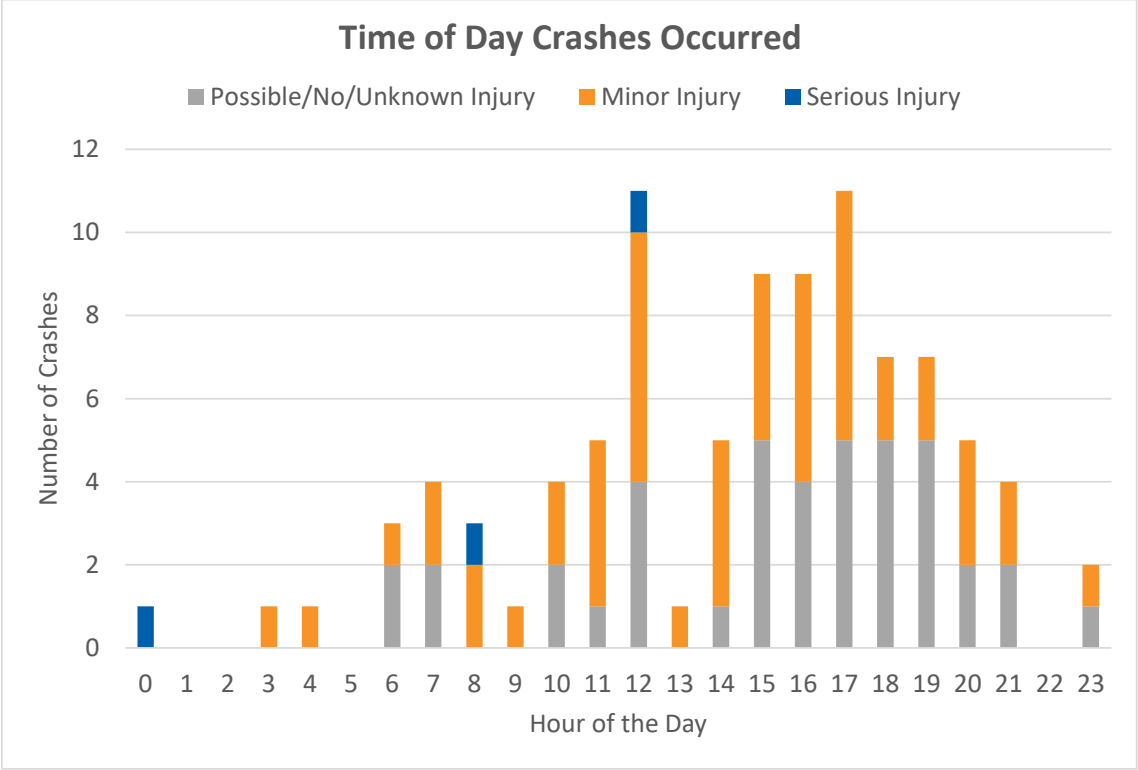
- Bike Lanes (white dash)
- Greenway

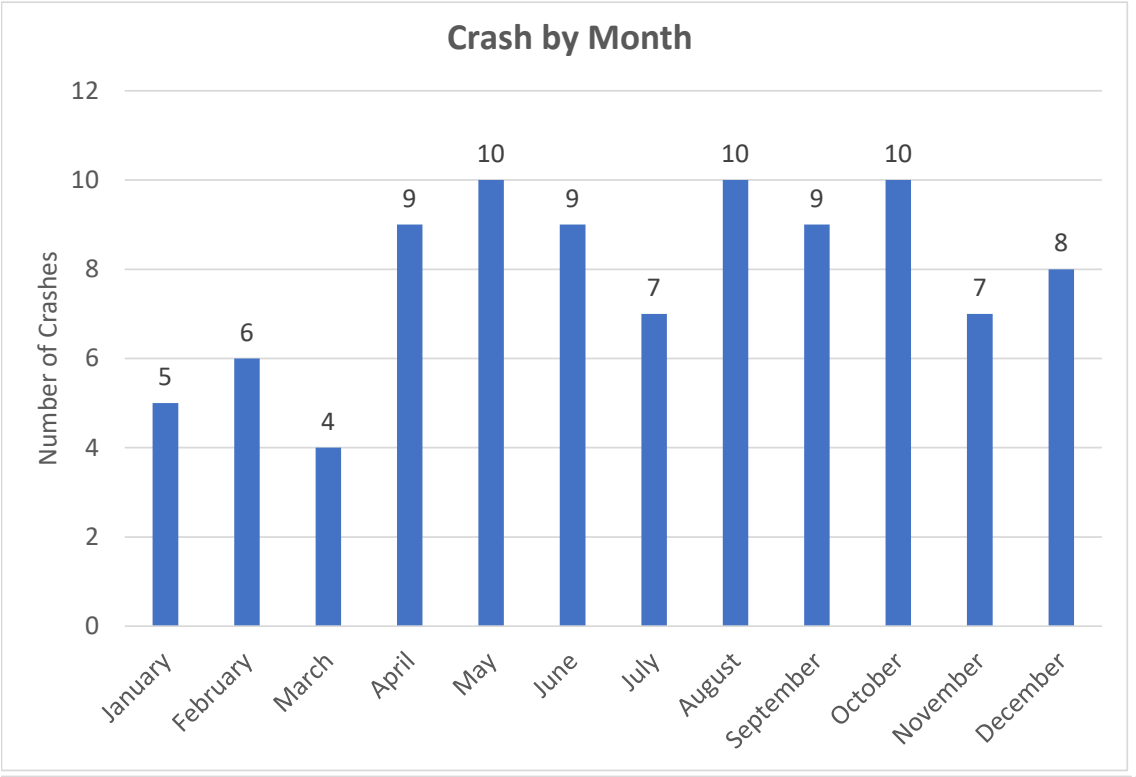
- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

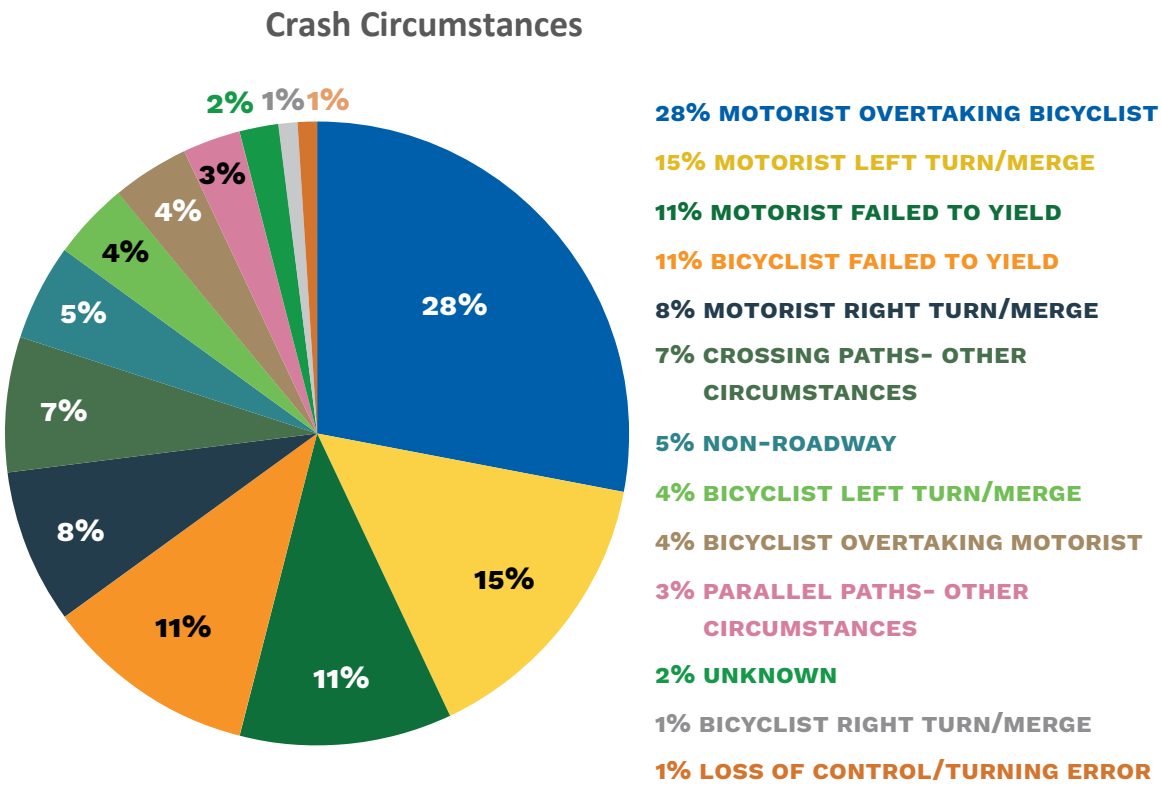

Injury Severity by Roadway Speed Limit
Possible/No/Unknown Injury
Minor Injury
Serious Injury
Number of Crashes
45
40
35
30
25
20
15
10
5
0
5 - 15 MPH
20 - 25 MPH
30 - 35 MPH
40 - 45 MPH
50 - 55 MPH
Unknown


Crashes by Roadway
Shinnville Rd
McLelland Ave
Iredell Ave
E. Wilson Ave
College St
Church St
Bluefield Rd
Williamson Rd
NC 3/Coddle Creek Hwy
N NC 115/Broad St
US 21
S. Main St
S NC 115/Mecklenburg Hwy
Shearers Rd
N. Main St
Brawley School Rd
NC 150
0
2
4
6
8
10
12
14
Number of Crashes

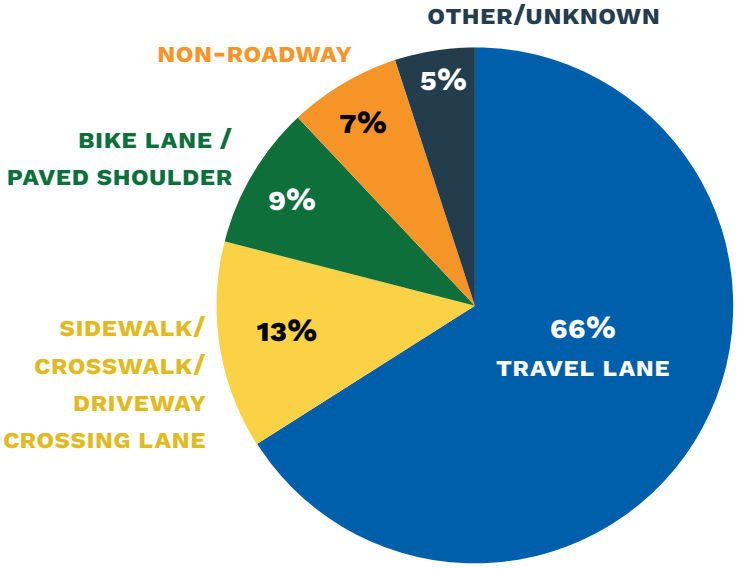

Crashes by Day of the Week
Number of Crashes
20
18
16
14
12
10
8
6
4
2
0
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

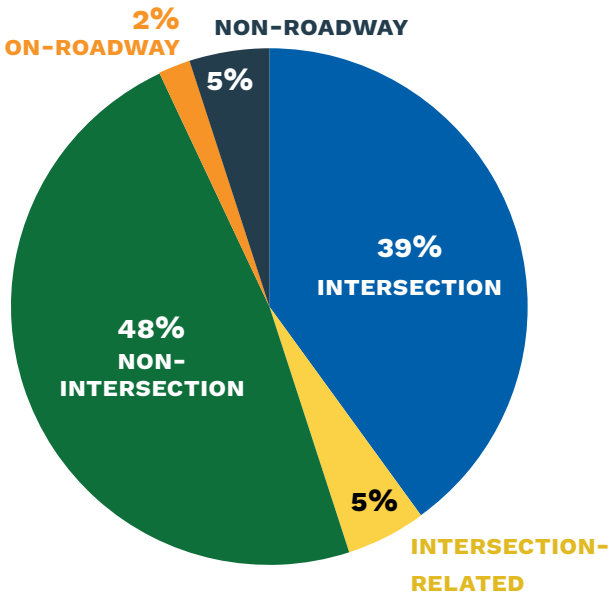

Time of Day Crashes Occurred
Possible/No/Unknown Injury
Minor Injury
Serious Injury
Number of Crashes
12
10
8
6
4
2
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Hour of the Day


Crash by Month
Number of Crashes
12
10
8
6
4
2
0
5
6
4
9
10
9
7
10
9
10
7
8
January
February
March
April
May
June
July
August
September
October
November
December

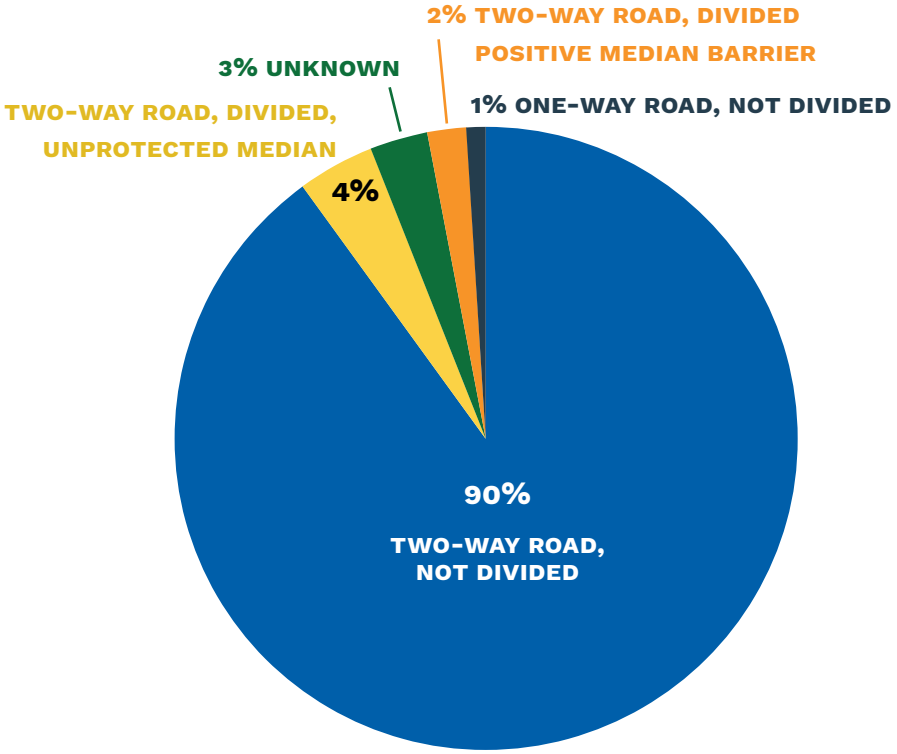

Crash Circumstances
28%
15%
11%
11%
8%
7%
5%
4%
4%
3%
2%
1%
1%
28% MOTORIST OVERTAKING BICYCLIST
15% MOTORIST LEFT TURN/MERGE
11% MOTORIST FAILED TO YIELD
11% BICYCLIST FAILED TO YIELD
8% MOTORIST RIGHT TURN/MERGE
7% CROSSING PATHS- OTHER CIRCUMSTANCES
5% NON-ROADWAY
4% BICYCLIST LEFT TURN/MERGE
4% BICYCLIST OVERTAKING MOTORIST
3% PARALLEL PATHS- OTHER CIRCUMSTANCES
2% UNKNOWN
1% BICYCLIST RIGHT TURN/MERGE
1% LOSS OF CONTROL/TURNING ERROR

Crashes by Bicyclist Location





Crashes by Roadway Type



Existing Plan Review

One Mooresville Plan (2019)

Chapter 4 of Mooresville's Comprehensive Plan, One Mooresville, serves as an updated Comprehensive Transportation Plan (CTP), and is referred to as a Transportation Master Plan (TMP). This TMP outlines plans for a transportation system that is more connected and offers more choices to personal vehicular travel. The plan identifies three main components to creating a multimodal network: strategic corridors, transportation networks, and a street design priority matrix. Detailed design recommendations are provided for 11 strategic corridors, including multimodal components, which will be a helpful starting point for drafting recommendations for this bicycle master plan update. The section on transportation networks provides a map of network connections by transportation mode. The bicycle network map will also be a good starting point for the bike plan recommendations.

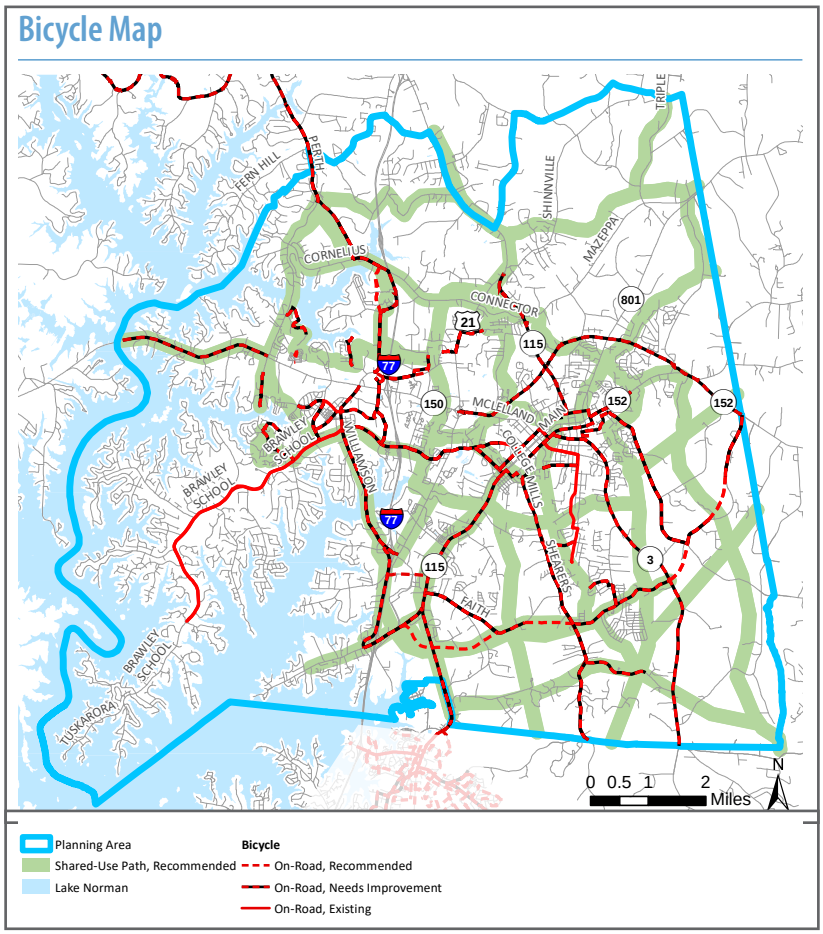


FIGURE 2.10 *Bicycle Map from the One Mooresville Plan*

Alcove Road Small Area Plan (SAP) (2015)

Alcove Road, situated between I-77 and Lake Norman, extends from Williamson Road to Langtree Road in the south. Chapter Three details the transportation improvements along this corridor. These improvements include increasing street connectivity and providing opportunities for both utility and recreational transportation options such as bicycle facilities and sidewalks. Specifically, the plan promotes The Fairview Flyover project, which would provide a grade-separated connection across I-77 between Fairview road and Alcove Road. The proposed cross section for Alcove Road includes a multi-use path on the west side of Alcove Road, not recommending on-street bicycle facilities due to safety concerns.

Safe Routes to School Action Plan (2011)

The Safe Routes to School Action Plan, adopted in 2011, has a vision "To develop a comprehensive pedestrian, bicycle, and greenway network that connects seamlessly to sidewalks in local neighborhoods allowing children to travel safely to and from school." Since the adoption of the previous Safe Routes to School Action Plan, improvements have been made to crossings and sidewalks near the schools. The plan at hand expands on and reiterates these recommendations and accomplishments. This current plan also updates the SRTS curriculum, reflecting an elimination of Enforcement as one of the core tenets of the program, replacing this with Equity and Engagement.

Cornelius Road SAP (2011)

The Cornelius Road study area covers Cornelius Road from Lake Norman to the West and US 21 to the East, straddling Iredell County and Town of Mooresville jurisdictions. It provides specific guidance, expanding on the guidance within the Comprehensive Land Use and Comprehensive Transportation Plans and has an outlook to 2028. The Plan recommends preserving land around I-77 for a future interchange, and that Cornelius Road be redeveloped into a 4-lane divided road with sidewalks and bike lanes. It recommends that additional bridges over I-77 are established.

Carolina Thread Trail (CTT) Master Plan for Iredell County Communities (2011)

The Carolina Thread Trail (CTT) is a developing trail network that will eventually reach 15 counties in the Charlotte region, and over 2 million people. Communities have begun building trails that will link parks, green spaces and attractions throughout the region. Not all local trails and greenways will become part of the Carolina Thread Trail. Analogous to highway systems, the Thread will develop as a "green interstate" focused on linking local trails and regionally significant attractions.

The main sections of the CTT in and around Mooresville include Segment V, Segment W, Segment X, and Segment Y, as shown on the map below. Additional connection opportunities in Mooresville identified in the plan include Segments Z, AA, BB, CC, DD, and EE.

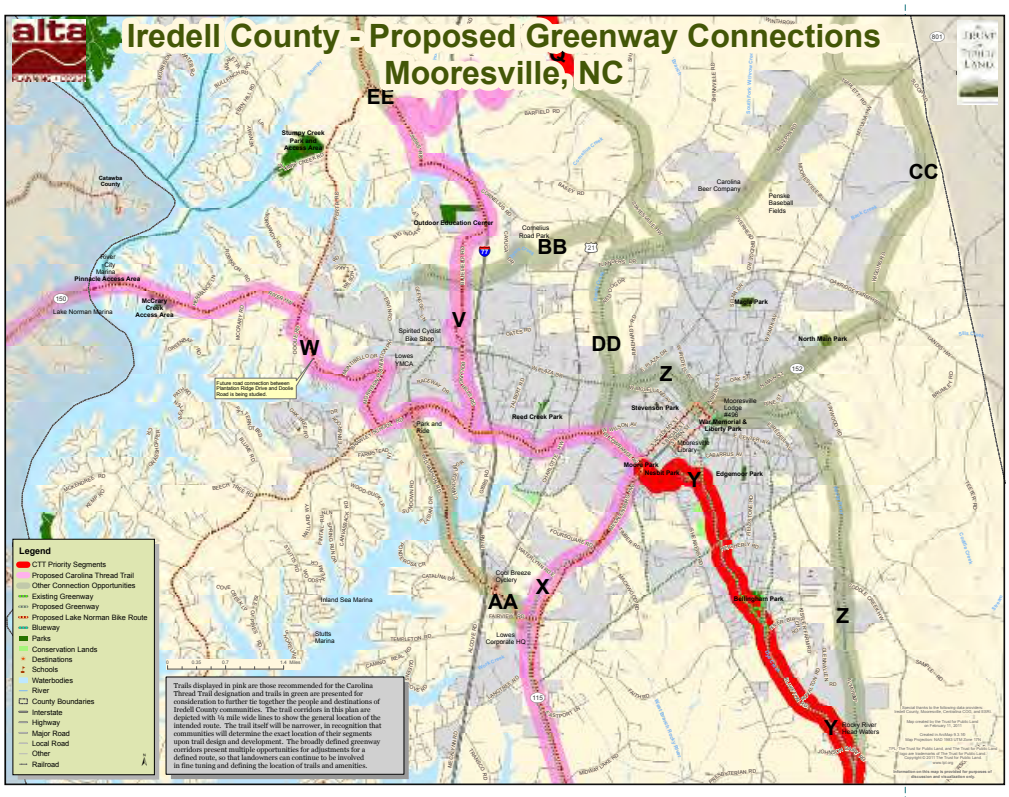


FIGURE 2.11 *Carolina Thread Trail Proposed Greenway Connections*

Brawley School Road SAP (2010)

The Brawley School Road small area plan, approved in 2009 and amended in 2010, provides specific policy guidance at a finer grain level than that in the Comprehensive Land Use Plan. This area is on the western edge of Mooresville, west of US-21 and straddles I-77.

Along with providing specific land use guidance to promote denser development for better walk and bikeability in this area, the plan details updated cross sections for Rolling Hills Parkway, Brawley School Road, and Talbert Road. All three of these corridor-specific recommendations include improvements and installation of sidewalks and bike lanes.

US 21 Corridor SAP (2010)

US 21 is situated between Downtown Mooresville and I-77. The US-21 Small area study extends to Lake Norman on the West. The plan places substantial weight on the existing and proposed land uses along the corridor, with emphasis on increasing density along the corridor, in turn enhancing the walk and bikeability of the corridor. There are four cross sections for US-21 detailed in the study, each of which include a 10' Multi-use path on one side of the road, and no on-street bicycle facilities. The plan details that intersections with Brawley School road and Wilson Avenue should accommodate safe and comfortable crossings of the multi-use paths. Recommendation 2.5-4 is to "Provide interconnected pedestrian and bicycle facilities through the corridor," with specific strategies including requiring new development to develop greenways and trails in accordance with the Greenway master plan.

Downtown Master Plan (2009)

The Mooresville Downtown Master Plan creates a shared vision for the activity types and land uses in and around downtown Mooresville. Because of the geographic focus of the plan, the Mooresville Downtown Master Plan most specifically applies to Park View School, located in what it considers the north main street area. It primarily makes recommendations for land use and development character, indicating that the residential development has potential to increase in this area. Overall connectivity within the town, the downtown master plan recommends more consistent sidewalks and bicycle lanes. Part 6 details ways to increase mobility options.

NC 3 Corridor Study (2009)

NC-3 spans three jurisdictions. In Mooresville, as Coddle Creek Highway, it runs to the east of Mooresville Middle School.

Cross section recommendations: North of Rocky River Road, NC 3 is to remain a 2-lane boulevard with bike lanes and sidewalks, south of Rocky River Road to Iredell county line a four-lane road with multi-use path, no on-street bike facility.

Mooresville Bicycle Plan (2008)

The previous bike plan describes Mooresville as having a vibrant recreational cycling community, but very few utilitarian bicyclists given the limited amount of bicycle facilities. The plan identifies three bicycle districts to focus planning efforts: Downtown Mooresville, Lake Norman, and Mount Mourne. These 3-mile districts represent areas of opportunities for bicycle facility improvement that form the foundation of this previous bike plan's recommendations. Design guidance is provided on the following bike facility types: multi-use paths, sidepaths, cycle tracks (separated bike lanes), off-road dirt trails, bike lanes, paved shoulders, wide outside lanes, sharrows, shared bicycle/parking lanes, bicycle routes, and bicycle boulevards. Design guidance is also provided for intersection treatments; road diets and other traffic calming treatments; and bicycle parking, signage, lighting, and landscaping treatments. A robust set of program recommendations is also provided, which have formed the foundation for updated program recommendations in this current bike plan.

Lake Norman Regional Bike Plan (2006)

The Lake Norman Regional Bike Plan establishes the vision for the Lake Norman Bike Route (LNBR), a regional bicycle circuit encompassing Lake Norman in the southern piedmont area of North Carolina. In addition to providing a continuous loop around Lake Norman, the LNBR also consists of a network of bicycling excursion routes throughout the lake area. The purpose of the plan is to develop a bicycle route and supporting text with sufficient

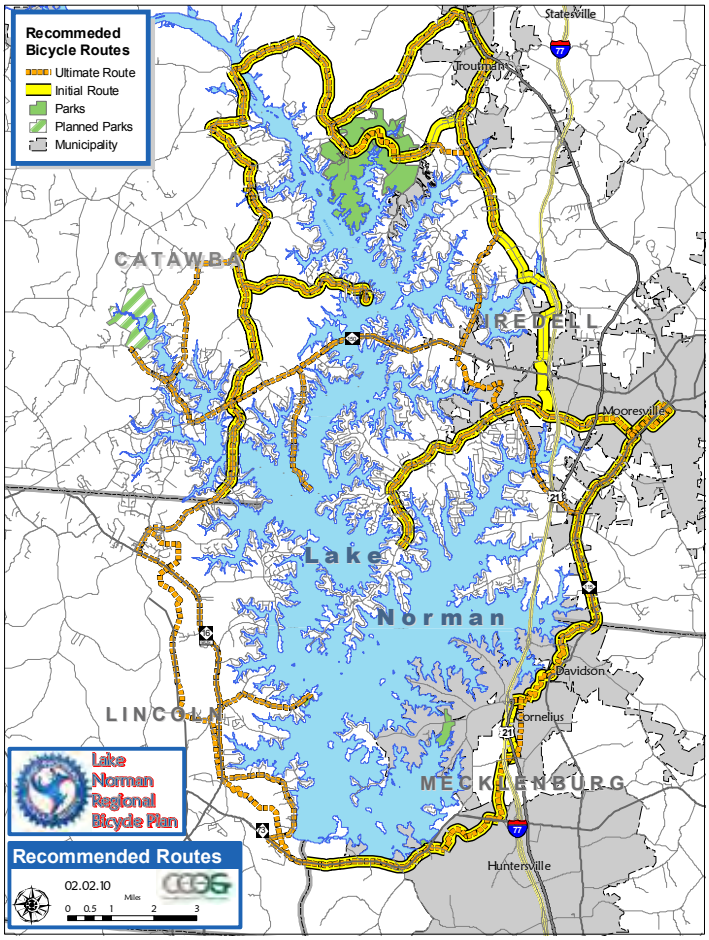


FIGURE 2.12 *Lake Norman Bike Route*

information for use by state, regional, and local agencies to aid in implementation of the route. The bike route would sign and improve nearly 125 miles of roads along the lake to better connect cyclists in the five-town and four-county area.

Comprehensive Pedestrian Plan (2006)

Representing Mooresville's first study focused wholly on improving walking conditions, the Mooresville Comprehensive Pedestrian Plan was approved in 2006. The plan outlines the existing conditions of Mooresville's pedestrian environment and establishes prioritized recommendations based on the plan's goals. These goals include providing access to everyday destinations for all people, especially vulnerable populations such as children. A more robust network of sidewalks, greenways, and safe crossings ensures that walking can become a viable form of transportation in Mooresville.

Of specific relevance to this SRTS plan, the Comprehensive Pedestrian Plan identifies the lack of sidewalks around the Town's schools as a major gap in the pedestrian network.

Cascade Redevelopment Plan (2005)

The Cascade redevelopment plan applies to the area of Mooresville north of Statesville Road, east of the Norfolk Southern Rail Line, south of Oakridge Farm Highway, and west of Park Avenue. The redevelopment plan was published to outline the policies and plans for eliminating dilapidated housing, preserve the historic character, and develop parks and greenways. The plan does not provide any specific action steps for transportation changes or greenway implementation.

Mount Morne & South Iredell Master Plan

The Mount Mourne Small area plan covers the region west of NC 3, bounded by Lake Norman, with a primary focus on the activity centers along NC 115. While emphasizing Land Uses and development generators, Guiding Principle 2 is to Improve Transportation Access throughout Mount Mourne. This includes expanding the roadway network with new roads and additional connections, and recognizing that a roadway's design influences its character, and preserving roadway character is prioritized over increasing the speed of travel on roadways. Three roadway characters are identified in this plan: rural roadways, neighborhood residential roadways, and village center/transitional roadways. The latter two include concepts for sidewalks and "optional" bicycle facilities, and the rural roadway's cross section does not include bicycle or pedestrian facilities.

Policies & Programs Review

Education and Encouragement Programs

Bicycle focused programs provide education and encouragement for residents to use existing bicycle and trail networks. Programs complement quality infrastructure and are a vital component of a comprehensive approach to active transportation in Mooresville.

Programs may be offered by the Town, agency partners, or other organizations. There are limited existing programs in Mooresville today; however, there are significant opportunities to expand these options for residents. New program opportunities are explored in the Recommendations Chapter.

Safe Routes to School: Currently, the Town of Mooresville is conducting a Safe Routes to School (SRTS) study of five schools in the Mooresville Graded School District. The recommendations of this SRTS study reflect those of this study and report, and also include programmatic recommendations for each of the five schools.

Safe Streets Campaign: With the tagline “Mind Your P’s and Q’s! Keep Mooresville Streets Safe for School,” Mooresville's safety campaign was developed in 2020 to encourage all road users to travel with attention and caution as they navigate Mooresville’s streets, especially in areas with heavy school-related traffic.

Public Engagement Summary

Engagement activities provided opportunities for those who live, work, recreate, and learn in Mooresville to share about their experience traveling in town. While network data provides insight into active transportation opportunities, experiences from people who regularly navigate the town support a clearer picture of challenges and opportunities for active transportation.

The COVID-19 pandemic created many challenges throughout the engagement process, requiring significant shifts in the approach during the final phases of the planning process. The following section summarizes engagement activities, key themes, and ways that outreach adapted to the pandemic.

Project Steering Committee

The Project Steering Committee was comprised of key stakeholders from multiple town departments and local institutions—including Town Board of Commissioners and business owners—as well as representatives from several regional organizations.

The Committee met four times during the project—a kickoff meeting in January 2021, a meeting in March 2021 to develop a vision and goals for the project, a meeting in June 2021 to review the draft recommendations, and a meeting in February 2022 to review the draft report.

The Committee was instrumental in shaping a bold vision for biking in Mooresville over the coming decades, and then creating a plan to realize that vision.

Public Meetings

An initial public meeting for this project was held in March 2021 to gather input on the needs and opportunities for improved bicycling in Mooresville. This first public meeting was held as an online meeting via Zoom.com, given the restrictions to in-person meeting due to the COVID-19 pandemic. Two online meeting sessions were held, and approximately 30 people attended in total. In addition to the online meetings, an online whiteboard was made available to the public through Conceptboard.com, where they could review preliminary maps of the bike facilities in Mooresville, and offer their input on where improvements are needed.

A second series of public meetings were held in July 2021, where the public was given opportunities to review the preliminary infrastructure and programmatic recommendations. Meetings were held at Hope Park and at the Food Lion on Brawley School Road, where approximately 25 people attended, across the two locations/times. Input gathered at these meetings helped the project team gauge the public's preferences

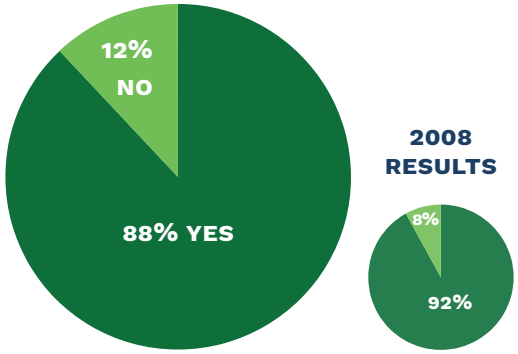
FIGURE 2.13 *Screenshot of participants from the first Public Meeting, conducted online via Zoom, in March 2021.*

for near-term priority projects, and to identify popular bike routes with recreational bicyclists. In addition to the in-person meetings, maps of the preliminary recommendations were made available through the same Conceptboard.com website that was used for the first public meeting in March. Links to this website were made available through the advertisements for the meeting so interested persons could access the materials online or attend the meetings in-person. Public comments were received via the in-person meetings and the online Conceptboard.com website.

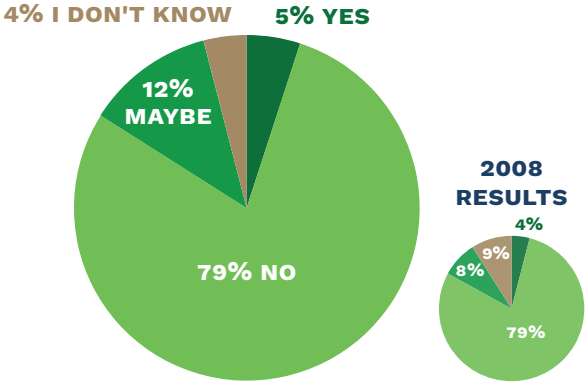
Public Survey

A public survey was made available through SurveyMonkey.com from March 2021 through October 2021 for the public to provide input on the current bicycling conditions in Mooresville, as well as the needs and opportunities to improve those conditions. The survey asked the same or similar questions as those asked in the survey that was conducted as part of the Mooresville Bicycle Plan of 2008, in order to evaluate longitudinal changes in the bicycling conditions and needs since the time of that study. Over 500 people participated in the updated survey, and the results are summarized at right and in the appendix. Comparisons between the 2021 data and 2008 data are provided, where available.

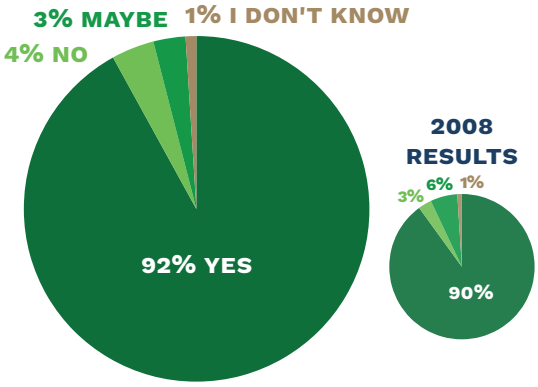
I RIDE A BICYCLE ON OCCASION (AT ANY LOCALE)



I BELIEVE THAT MOORESVILLE HAS ADEQUATE BICYCLE ACCOMMODATIONS



I BELIEVE THAT MOORESVILLE WILL BENEFIT FROM HAVING BETTER BICYCLE ACCOMMODATIONS



RECOMMENDED BICYCLE SYSTEM

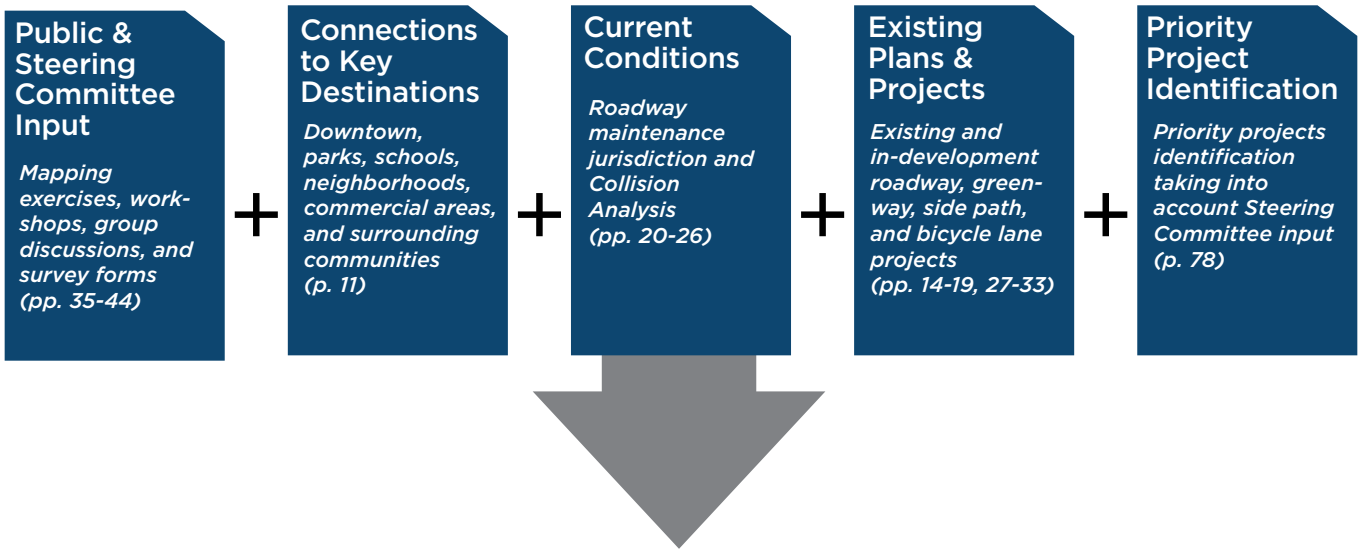
3

The Pedal Moore(sville) Bicycle Plan represents a vision for a bicycle network that expands choices for how people in Mooresville travel, improves safety for bicyclists and roadways users, and expands access to destinations for people of all ages and abilities. The following chapter identifies a network of bicycle facility recommendations that will serve the entire Town of Mooresville. Maps of the recommended network display the long-term vision for a complete network, as well as near-term opportunities for development of facilities through new construction, retrofits, and regularly scheduled road maintenance.

Bicycle Facility Recommendations

The following pages detail the network of bicycle facilities that are recommended in for Mooresville. The recommended facility type for any given roadway was selected based on a number of factors including: roadway characteristics (traffic volumes, speed limit, available right-of-way); review of previous plans and recommendations; review of planned projects; input from the public and steering committee on popular bicycling corridors; opportunity for separation of bicycle travel from vehicular traffic, and connectivity to destinations. In all cases, the facility type that is recommended was selected based on meeting the needs of bicyclists of all ages and abilities, and not just experienced bicyclists, in order to make bicycling safer and convenient for a broader audience, as this was a main concern of the Steering Committee. Where multi-use paths are recommend as the bicycle facility type along major streets, it is assumed that a path will be installed on both sides of the street in conjunction with any street improvement project.

BASIS OF RECOMMENDATIONS

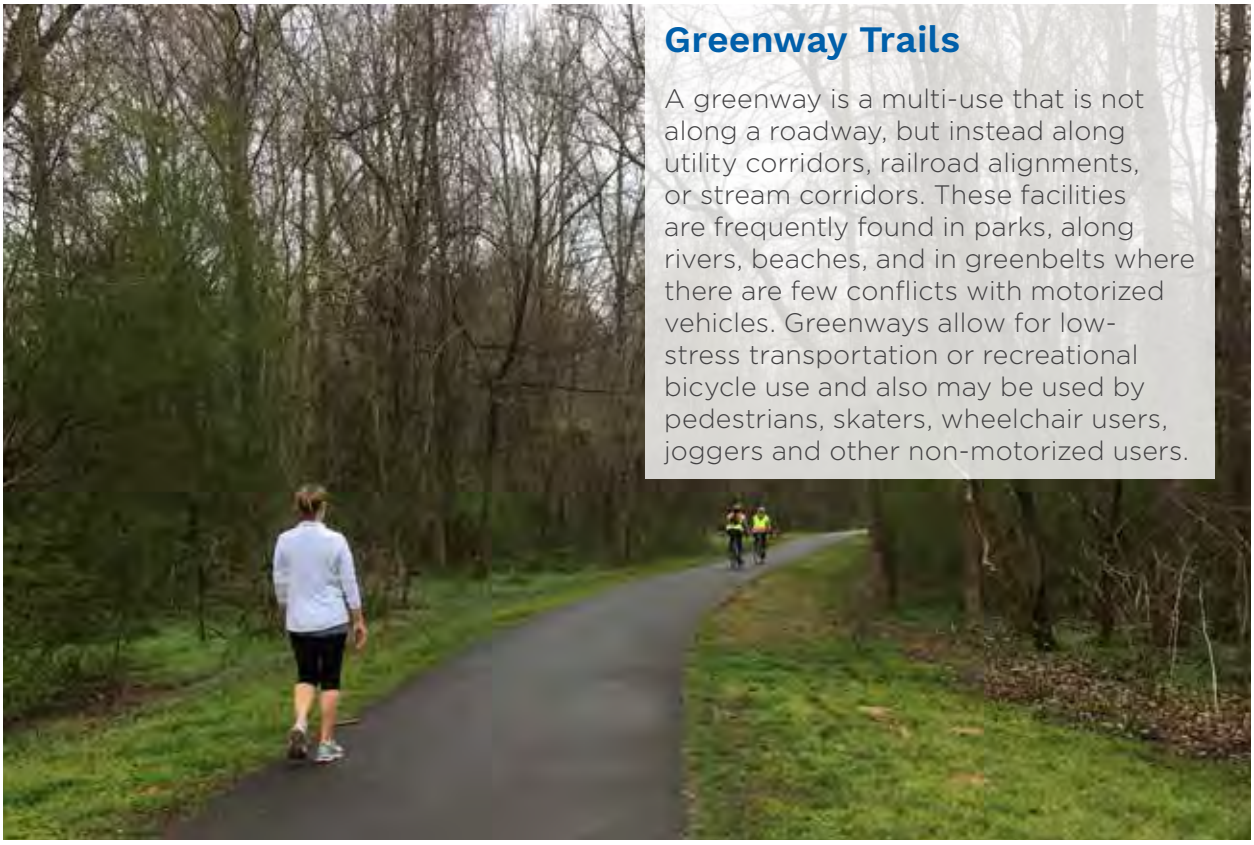


Bicycle Facility Recommendations
Crossing Improvement Recommendations
Priority Projects

Bicycle Facility Types

Multi-use paths

A multi-use path, also known as a sidepath, provides a travel area separate from motorized traffic along a roadway. Multi-use paths are desirable for bicyclists of all skill levels preferring separation from traffic. Multi-use paths may be implemented immediately adjacent and parallel to a roadway.



Greenway Trails

A greenway is a multi-use that is not along a roadway, but instead along utility corridors, railroad alignments, or stream corridors. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts where there are few conflicts with motorized vehicles. Greenways allow for low-stress transportation or recreational bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users.

Bike + ped connector

A bicycle + pedestrian connector (bike + ped connector) is a multi-use path that connects bicycle and/or pedestrian facilities across short distances.

Bike/ped connectors provide residential areas with direct pedestrian and bicycle access to parks, trails, greenspaces, and other recreational areas, connecting to and from the larger bicycle/pedestrian network. They can also connect dead-end streets, cul-de-sacs, and provide access to nearby destinations not provided by the street network.

Separated bike lanes

Separated Bike Lanes (SBLs), also known as "Protected Bike Lanes" are dedicated bikeways that use a vertical element, such as flexible posts, bollards, or planting strips, to provide separation from motor vehicle traffic. The vertical separation discourages drivers from parking or idling in the bikeway.

Two-way cycle track

A two-way cycle track is a type of separated bike lanes where both directions of bicycle travel are located on the same side of the roadway, with a vertical separation between bicyclists and motor vehicles.

Standard bike lanes

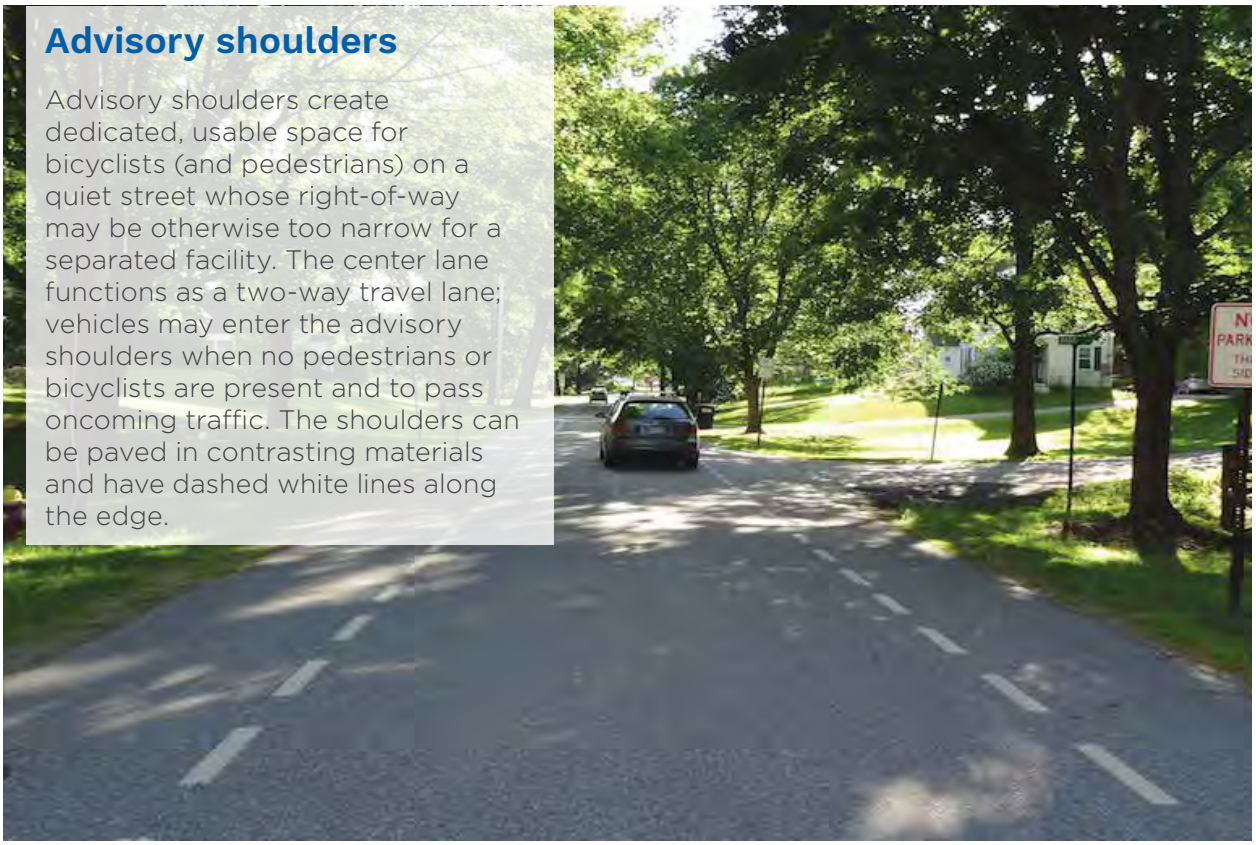
Standard bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. Bike lanes make bicycling a more visible and comfortable option for people who usually would drive or walk.

Paved shoulder

Paved shoulders on the edge of roadways can be enhanced to serve as a functional space for bicyclists to travel in the absence of other facilities with more separation.

Advisory shoulders

Advisory shoulders create dedicated, usable space for bicyclists (and pedestrians) on a quiet street whose right-of-way may be otherwise too narrow for a separated facility. The center lane functions as a two-way travel lane; vehicles may enter the advisory shoulders when no pedestrians or bicyclists are present and to pass oncoming traffic. The shoulders can be paved in contrasting materials and have dashed white lines along the edge.



Bike boulevard

A bicycle boulevard is a shared roadway along quiet streets where traffic calming elements—such as speed humps, chicanes, and traffic circles—as well as lower speed limits, wayfinding signage and pavement markings are used to offer priority for bicyclists operating within a roadway shared with motor vehicle traffic.

Shared lane markings

Shared lane markings (SLMs) are roadway markings that are used to designate a shared lane environment for bicycles and automobiles, and also indicate proper bicyclist positioning. Shared lanes are typically only comfortable for confident bicyclists.

Crossing improvements

Roadway crossings represent a key safety challenge for bicyclists and pedestrians, especially at non-signalized intersections, greenway crossings, or across streets lacking bicycle and pedestrian infrastructure. A combination of actuated signals and traffic controls can increase driver awareness of bike crossings. Crossing treatments are based on trail and roadway characteristics. Key roadway factors influencing the selected treatment include the posted speed limit, traffic volume, line of sight, street width, roadway and greenway geometry, and intersection configuration.

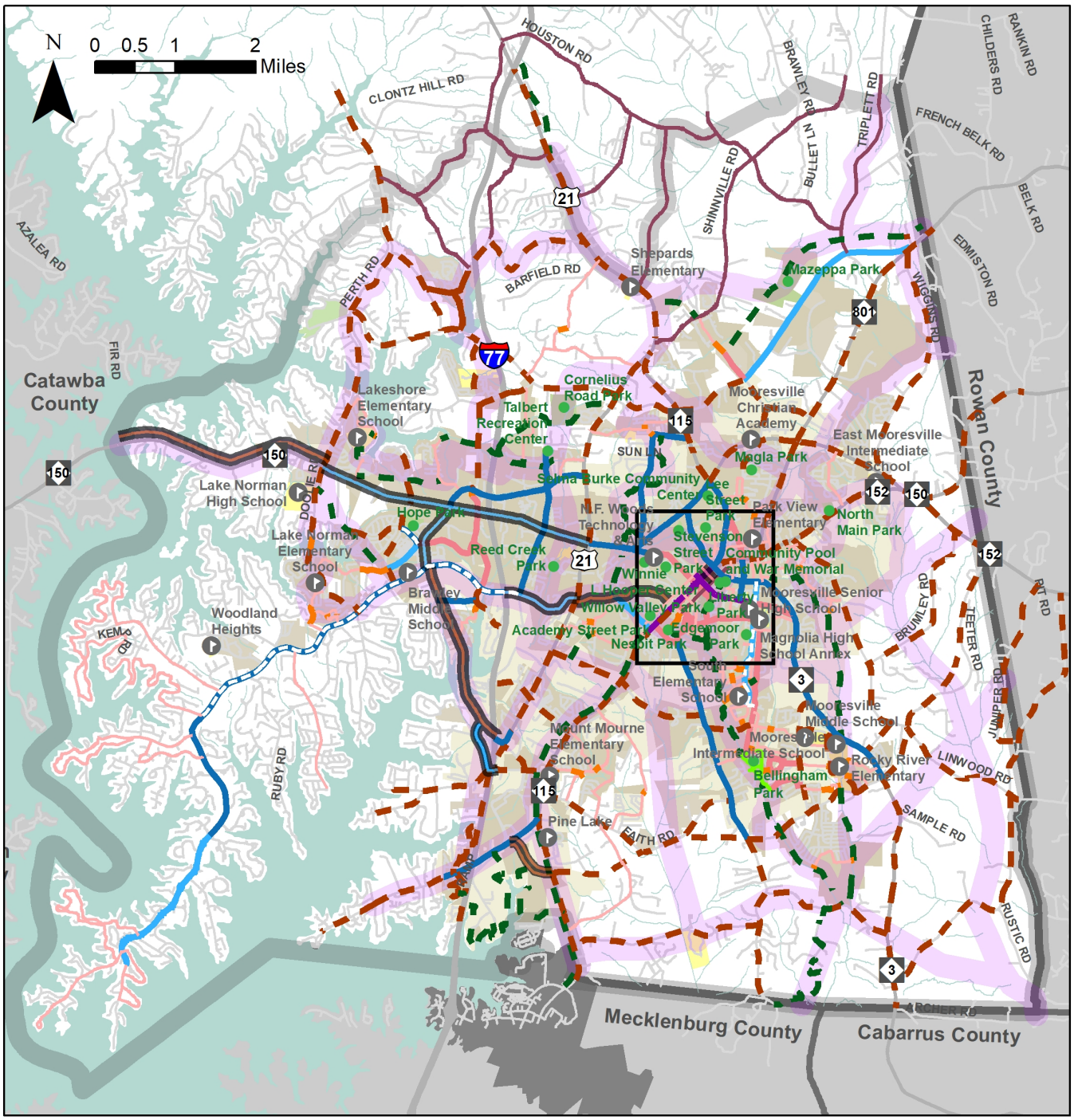
Recommended Bicycle Network

The recommended bicycle network is depicted in a series of maps on the following pages, and each project is detailed in Table 3.1 below, which is continued in Appendix B, starting on page 144.

TABLE 3.1 *Project List of Recommended Bicycle Facilities*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
1	Brawley School Rd	Polpis Dr	Hopkinton Dr	bike lanes	restripe with bike lanes	2.09
2	Brawley School Rd	I-77	South Fork Rd	separated bike lanes	widen roadway	4.66
3	Brawley School Rd	South Fork Rd	Polpis Dr	separated bike lanes	restripe 3-to-2 road diet	1.72
4	Stutts Rd	Brawley School Road	southern terminus	wayfinding	signage	1.86
5	McKendree/South Fork Loop	Brawley School @ McKendree	Brawley School @ South Fork	wayfinding	signage	10.13
6	Chuckwood/Bay Harbour Loop	Brawley School @ Chuckwood	Brawley School @ Bay Harbour	wayfinding	signage	4.54
7	Stonemarker/ Blarney Loop	Brawley School @ Stonemarker	Brawley School @ Blarney	wayfinding	signage	2.93
8	Tuskarora Tr	Brawley School Rd	southern terminus	wayfinding	signage	1.61
9	Gainswood Dr Loop	Brawley School @ Gainswood (north)	Brawley School @ Gainswood (south)	wayfinding	signage	0.93
10	Washam Rd Loop	Brawley School @ Washam (north)	Brawley School @ Washam (south)	wayfinding	signage	0.91
11	Fairview Flyover/ Alcove Rd	existing Fairview Rd	Williamson Rd	bike lanes	to be built with roadway construction	0.76
12	Templeton Rd	Alcove Rd	Irish Rd	sidepath	new construction	1.26
13	Camino Real Rd	Templeton Rd	western terminus	sidepath	new construction	0.75
14	Alcove Road	Fairview Flyover	Langtree Road	sidepath	new construction	1.39
15	Langtree Rd	Landings Drive	western terminus	sidepath	new construction	1.67
16	Langtree Rd	Landings Drive	NC 115/ Mecklenburg Hwy	separated bike lanes	widen roadway	1.40
17	Langtree Trail	northern terminus of Langtree Shore Dr	southern terminus of Landings Dr	sidepath	new construction	1.70
18	Gateway Peninsula Trail	Langtree Trail	Langtree Rd	sidepath	new construction	3.21

FIGURE 3.1 *Proposed Bicycle Facilities*



Proposed Bike Facilities
- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Streets w/Traffic Calming+Wayfinding
- Separated Bike Facility (TBD- sidepath or SBLs)
- Bike Lanes/Paved Shoulders
- Shared Lane Markings

Funded Bike Facility Projects
- Multi-Use Path/Greenway
- Standard Bike Lanes
- Shared Lane Markings

Existing Bike Facilities
- Bike Lanes (white dash)
- Greenway

One Mooresvile Overlay
- Shared Use Path Corridor

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE 3.2 *Proposed Bicycle Facilities- Downtown Inset*

Proposed Bike Facilities
- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Streets w/Traffic Calming+Wayfinding
- Separated Bike Facility (TBD- sidepath or SBLs)
- Bike Lanes/Paved Shoulders
- Shared Lane Markings

Funded Bike Facility Projects
- Multi-Use Path/Greenway
- Standard Bike Lanes
- Shared Lane Markings

Existing Bike Facilities
- Bike Lanes (white dash)
- Greenway

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

Funded projects

Several roadway projects are currently being designed and are already funded, some funded through the North Carolina State Transportation Improvement Plan (STIP), and some through the Town of Mooresville. These include the following projects, which are depicted in the maps with a black background:

- STIP Project Number R-2307B: Widening of NC 150; to include a multi-use path from the Catawba County line to Perth Road and standard bike lanes from Perth Road to US 21
- STIP Project Number R-5100 A & B: Widening of Williamson Road; to include a multi-use path from I-77 to Brawley School Road and standard bike lanes from Brawley School Road to NC 150
- STIP Project Number U5817: Construction of a new grade-separated crossing of I-77 as an extension of Fairview Road to Alcove Road; to include standard bike lanes from the existing Fairview Road to Williamson Road
- STIP Project Number R-3833C: Widening of Brawley School Road from I-77 to US 21; to include standard bike lanes
- Construction of a sidepath along Wilson Road from US 21 to Academy Street (Town funded)
- Construction of a section of the East-West Connector between Langtree Road and NC 115; to include multi-use paths on both sides (Town funded)
- Shared lane markings to be striped along Moore Avenue between Academy Street and Church Street (Town funded)

In addition to the *funded* projects listed above, the following are *unfunded* projects in the early planning stages:

- STIP Project Number U-6037: Widening of US 21 from Medical Park Road to NC 150; current plans include a 10' sidepath on the west side, from Medical Park Road to Brawley School Road, and standard bike lanes from Medical Park to NC 150. This plan recommends fully separated bicycle facilities with sidepaths on both sides. Separated bike lanes could also be considered
- STIP Project Number U-5960: Widening of NC 150 from NC 115 (Broad Street) to NC 801 (Park Avenue/Mt Ulla Highway); to include standard bike lanes. This plan recommends a fully separated bike facilities with sidepaths on both sides. Separated bike lanes could also be considered.
- STIP Project Number U-5816: Creation of I-77 overpass between Midnight Lane and Oates Road; to include the widening of both roads to three lanes and standard bike lanes from Bluefield Road to US 21. This plan recommends separated bike lanes.

Low-Stress Connectivity and Crossing Improvements

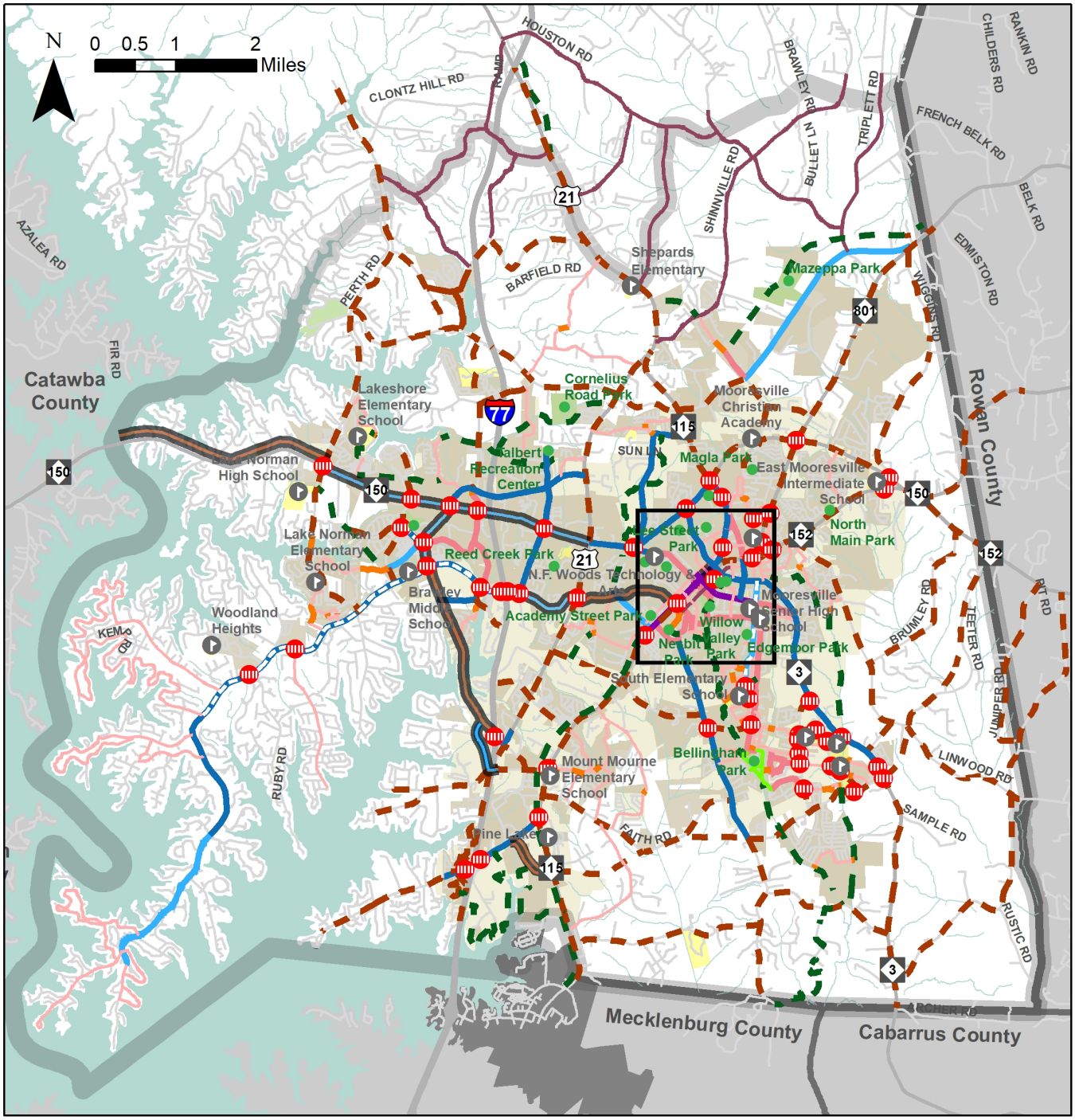
Low-stress routes can support families, students, and interested but concerned adults in exploring their city, traveling to work or school, or running daily errands by bike. These routes provide greater separation from motor vehicles, support safe crossings of major roadways, and have lower posted speeds. **However, low-stress roadways are only beneficial if they help people get where they need to go.**

If a trip occurs primarily along a low-stress road or paved path but requires someone to travel briefly along a high-speed, high-volume roadway or navigate a major roadway crossing without a signal, the trip is no longer low-stress. A low-stress network must help people get from trip start to trip end along low-stress roadways and crossings.

Improving crossings to connect neighborhoods across major roadways, completing the multi-use path network to address major barriers like rail and highways, and exploring opportunities for new street-end connections can help people reach the places they want to go along more comfortable and connected networks. The maps on the following pages show only the low-stress facilities that address the needs of bicyclists of all ages and abilities.

Recommendations for crossing improvements are shown in maps 3.3 and 3.4. The locations for the crossing improvements were identified through the safety analysis, the concurrent Safe Routes to School project, and through public input on difficult crossing locations. The identified crossing locations should be considered a starting point, and additional locations may be identified as the bicycle facilities that are recommended in this plan are built out. Planning and design for intersection and crossing improvements should accompany the planning and design of the bicycle facility projects.

FIGURE 3.3 *Proposed Crossing Improvements*



Proposed Bike Facilities
- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Streets w/Traffic Calming+Wayfinding
- Separated Bike Facility (TBD- sidepath or SBLs)
- Bike Lanes/Paved Shoulders
- Shared Lane Markings

Funded Bike Facility Projects
- Multi-Use Path/Greenway
- Standard Bike Lanes
- Shared Lane Markings

Existing Bike Facilities
- Bike Lanes (white dash)
- Greenway

Crossing Identified
- Crossing Improvement

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE 3.4 *Proposed Crossing Improvements- Downtown Inset*

Proposed Bike Facilities
- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Streets w/Traffic Calming+Wayfinding
- Separated Bike Facility (TBD- sidepath or SBLs)
- Bike Lanes/Paved Shoulders
- Shared Lane Markings

Funded Bike Facility Projects
- Multi-Use Path/Greenway
- Standard Bike Lanes
- Shared Lane Markings

Existing Bike Facilities
- Bike Lanes (white dash)
- Greenway

Crossing Identified
- Crossing Improvement

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

Priority Projects

Fourteen priority projects were identified by the Steering Committee and Town Staff for near-term implementation. These projects address deficiencies in the bicycle facilities along popular biking corridors and main roadways throughout Mooresville, and connect to key biking destinations.

The first five projects are grouped under the heading *The Mooresville Lake Loop*, which is a loop of multi-use paths connecting Downtown Mooresville to Langtree Road and Bellingham Park (see Figure 3.13 for details). Contained within the Mooresville Lake Loop is also a section of "The Seam," which is a regional trail alignment that is planned to connect Statesville, North Carolina to the South Carolina state line. The exact alignment of The Seam has yet to be determined but will approximately follow NC 115 through Mooresville.

The fourteen priority projects are outlined to the right. The **bolded projects** are outlined in further detail in project cutsheets, starting on page 60. The cutsheets provide preliminary concept-level design for six specific projects. These projects are examples of a variety of facility types and were selected from the priority projects listed above to be representative of the types of bicycle project recommendations in the Plan. They show realistic examples of what implementation of each type of project might look like. These examples help the general public make informed decisions when they are recommending projects for funding.

Each project cutsheet also includes a planning level cost estimate, with more detailed estimates provided in Appendix D. The estimates are based on preliminary assessment of feasibility, and not engineering design; they are for planning purposes only. Costs will likely change as more information becomes available in the design phase.

PRIORITY PROJECTS

The Mooresville Lake Loop

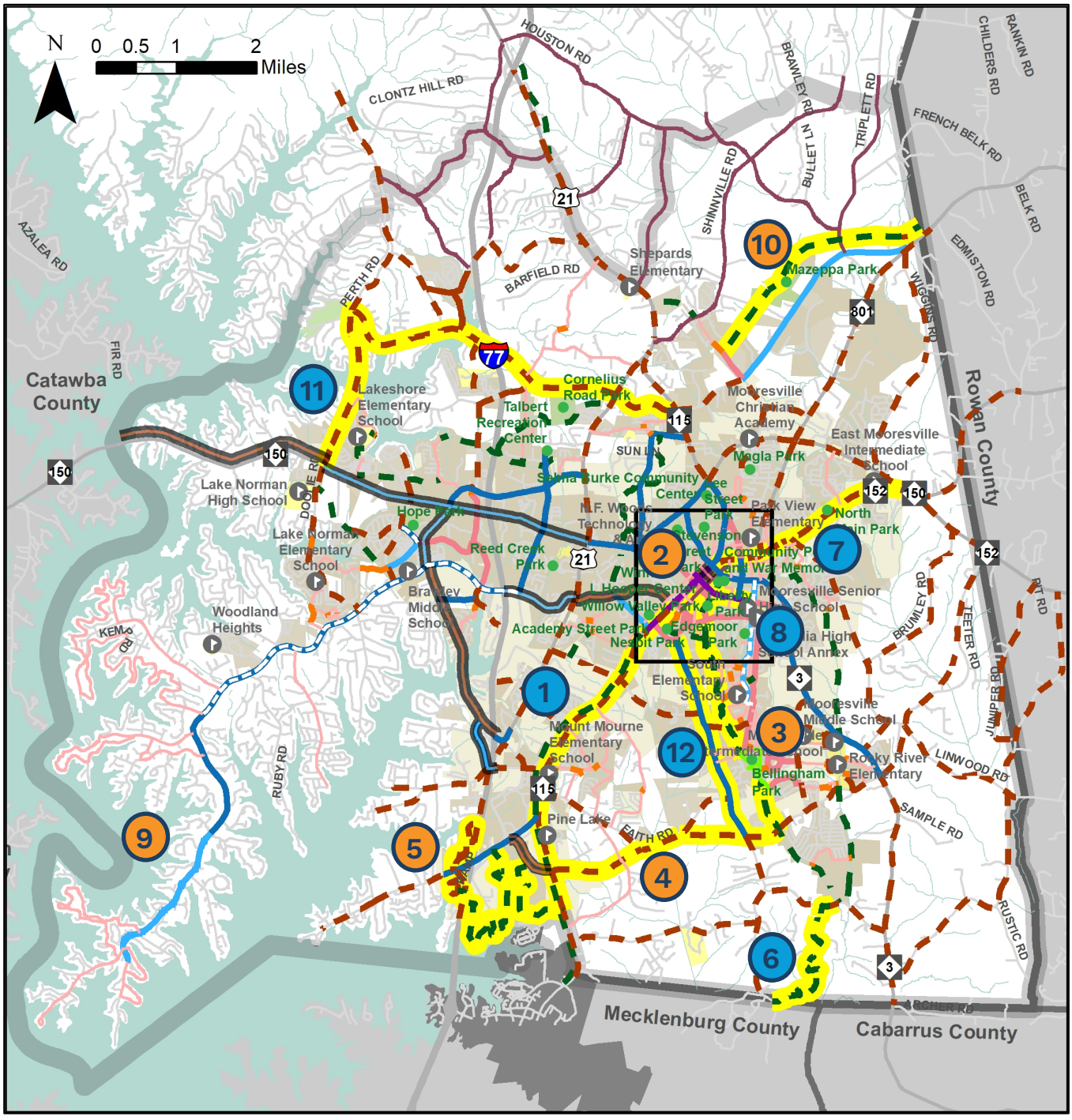
1. **Sidepath along NC 115 from College St to the Mecklenburg County line**
2. Separated bike facility through downtown from Norman Drive to Institute Street
3. Dye Creek Greenway, from Liberty Park/N. Church Street to Bellingham Park
4. Sidepaths on both sides of the street along the future East-west Connector from Langtree Road to Rocky River Road
5. Langtree area trails: Gateway Peninsula Trail; Langtree Trail (and separated bike lanes on Langtree Road); and the Normy Overlook Trail
6. **Rocky River Greenway, from Johnson Dairy Road to the Mecklenburg County line**
7. **Sidepath along N. Main Street, from Iredell Avenue to NC 150/Oakridge Farm Highway**
8. **Two-way Cycle Track on Center Avenue, from Church Street to Magnolia Street**
9. Bike Route Wayfinding for the Brawley School Road area
10. Greenway connection to Mazeppa Park, from NC 115/ Statesville Highway to the Rowan County line
11. **Sidepath along Perth Road, from Cornelius road to NC 150/River Highway**
12. **Paved shoulders along Shearer Road, from Brawley Avenue to Rocky River Road (this is a near-term recommendation;** the long-term recommendation is for buffered bike lanes and a multi-use path when the road is widened)

ESTIMATED CONSTRUCTION COSTS

Each project cutsheet shows a planning level cost estimate; a more in-depth estimate for each project is provided in Appendix D. Other key considerations for these costs are noted below:

- The estimates are based on preliminary assessment of feasibility, and not engineering design; they are for planning purposes only. Costs will likely change as more information becomes available in the design phase.
- Costs are based on 2022 unit prices.
- Each project estimate includes a built-in 20% construction contingency.
- Costs exclude right-of-way acquisition, engineering design, and construction engineering & inspection.
- Costs exclude special landscaping, lighting, and green infrastructure.

FIGURE 3.7 *Priority Projects*



Proposed Bike Facilities
- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Streets w/Traffic Calming+Wayfinding
- Separated Bike Facility (TBD- sidepath or SBLs)
- Bike Lanes/Paved Shoulders
- Shared Lane Markings

Funded Bike Facility Projects
- Multi-Use Path/Greenway
- Standard Bike Lanes
- Shared Lane Markings

Existing Bike Facilities
- Bike Lanes (white dash)
- Greenway

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE 3.8 *Priority Projects- Downtown Inset*

Proposed Bike Facilities

- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Streets w/Traffic Calming+Wayfinding
- Separated Bike Facility (TBD- sidepath or SBLs) houlders
- Shared Lane Markings

Funded Bike Facility Projects

- Multi-Use Path/Greenway
- Standard Bike Lanes
- Shared Lane Markings

Existing Bike Facilities

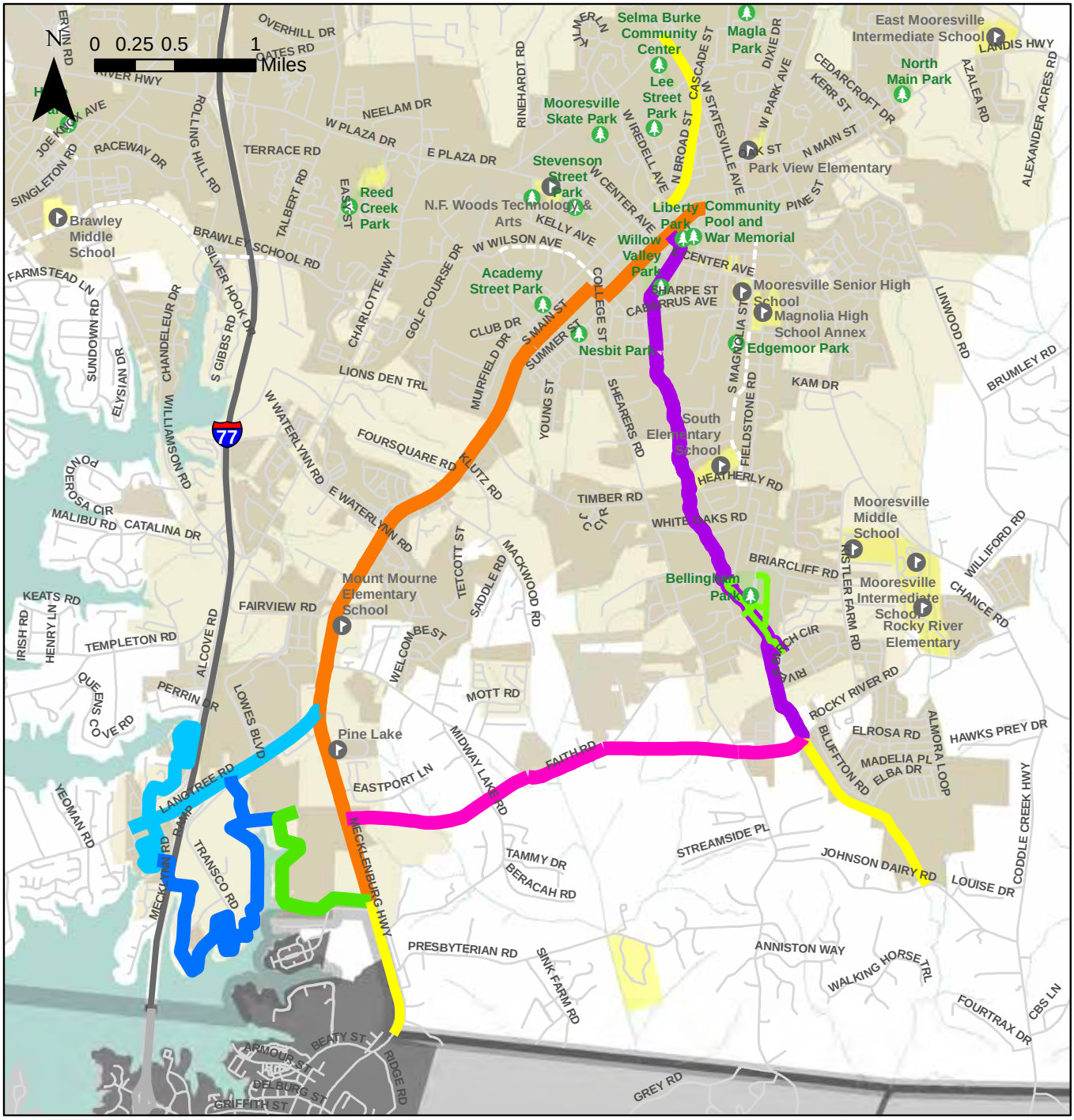
- Bike Lanes (white dash)
- Greenway

Bike Plan Priorities

- Priority Corridors

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE 3.9 *Priority Projects- Lake Loop detail by section*



The Lake Loop

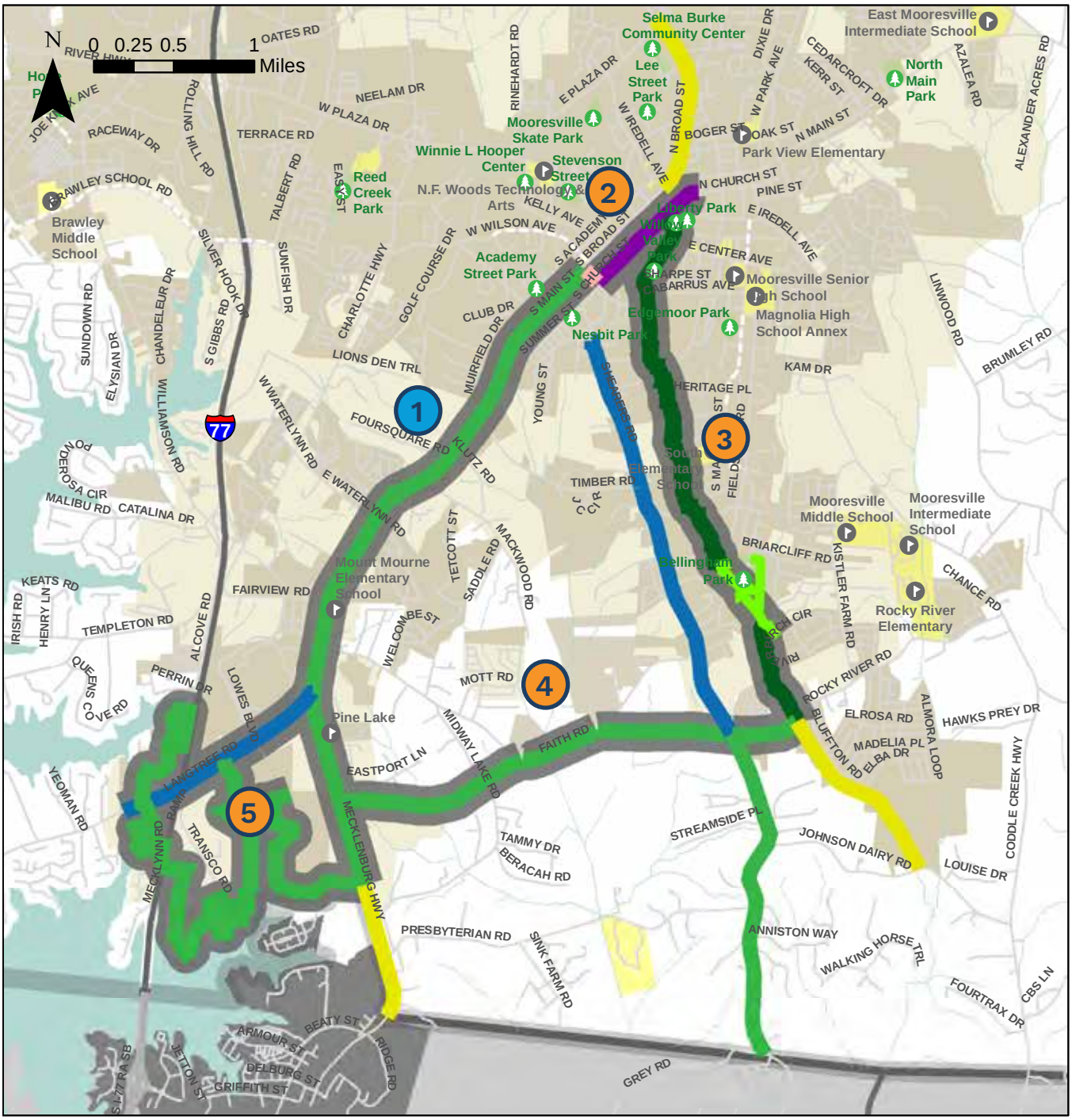
- Gateway Peninsula Trail
- Langtree Trail
- Normy Overlook Trail
- East West Connector
- The Seam
- Dye Creek Greenway
- Moore Ave Sharrows
- Regional Connections

Existing Bike Facilities + Routes

- Bike Lanes (white dash)
- Greenway

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE 3.10 *Priority Projects- Lake Loop detail by facility type*



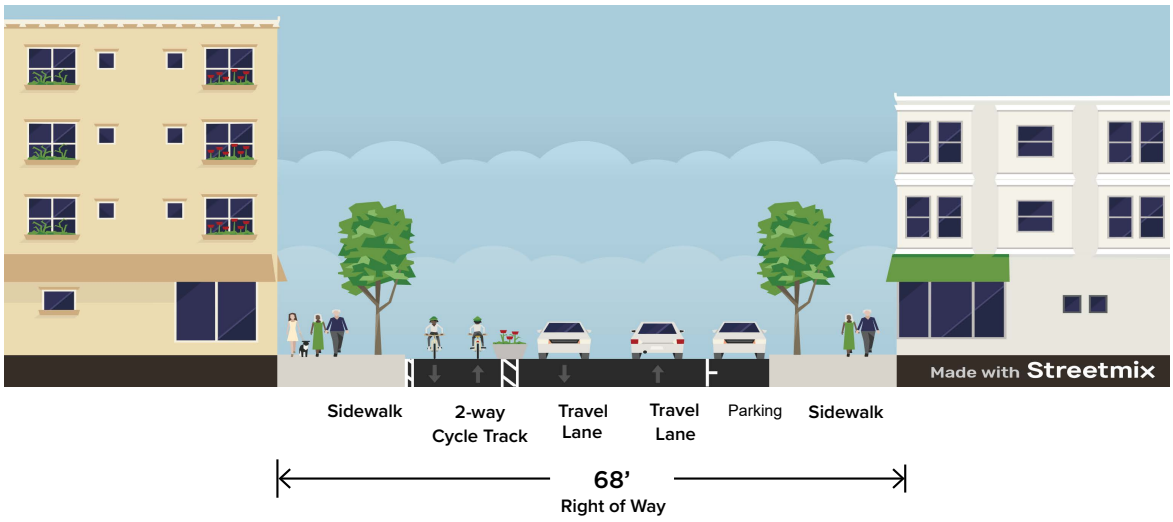
Lake Loop highlights:

The Mooresville Lake Loop includes five separate sections, with various facility types. Once completed, it will create a continuous loop of facilities between some of the major activity centers in town, Downtown Mooresville, Lake Norman, Lowes employment center, and the Dye Creek Greenway and Bellingham Park. The five sections of the loop include:

1. **Sidepath along NC 115 from College St to the Mecklenburg County line**
2. Separated bike facility through downtown from Norman Drive to Institute Street
3. Dye Creek Greenway, from Liberty Park/N. Church Street to Bellingham Park
4. Sidepaths on both sides of the street along the future East-west Connector from Langtree Road to Rocky River Road
5. Langtree area trails: Gateway Peninsula Trail; Langtree Trail (and separated bike lanes on Langtree Road); and the Normy Overlook Trail

Sections 1 and 2 of the Lake Loop will also coincide with the Seam trail, which is a vision for a multi-use path connection between Charlotte and Statesville. The Lake Loop and Seam will pass through the heart of Mooresville, following NC 115 and using other streets as necessary to pass through to the north side of Downtown

Potential Church St Cross-Sections with 68' ROW



Representative Project Cutsheet- Priority Project #1:

Mooresville Lake Loop: Sidepath along **NC 115**, from College Street to the Mecklenburg County line

NC 115 between Downtown Mooresville and Davidson is one of 11 Strategic Corridors identified in the Transportation Master Plan (TMP) that is part of the *OneMooresville Comprehensive Plan*. NC 115 is also a very popular biking route that has been a longstanding priority among bicyclists and the community for building dedicated bike facilities. This stretch of NC 115 is a 2-lane road with periodic left turn lanes, but it lacks even paved shoulders in many places, leaving bicyclists the only option to ride in the lane with motor vehicles. With an average annual daily traffic counts of approximately 15,500 vehicles, bicyclists get passed by many motor vehicles while on this road, making it an uncomfortable and unsafe road on which to travel by bike. This is borne out in the crash history, with seven bicyclist-involved crashes along this stretch of NC 115 between 2007 and 2019, and an additional fatal collision in 2020.

In order to create a safer bicycling environment, a sidepath is recommended on the east side of the roadway. The east side is recommended to both serve the residential and school properties on that side of the street and to avoid conflicts with the railroad right-of-way on the west side of the road. This project could be completed in phases, with Downtown to Faith Road as the first phase, and Faith Road to the county line as the second.

- Representative Project Limits

Proposed Bike Facilities

- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Street w/Traffic Calming+Wayfinding

Roadway Characteristics (Existing):

- Average Annual Daily Traffic (AADT) = 15,500
- Speed Limit = 55 mph
- Curb + Gutter presence: none
- Pavement Width: 24-28 ft
- Number of Lanes: 2
- Presence of Shoulders varies between 0-2 feet.

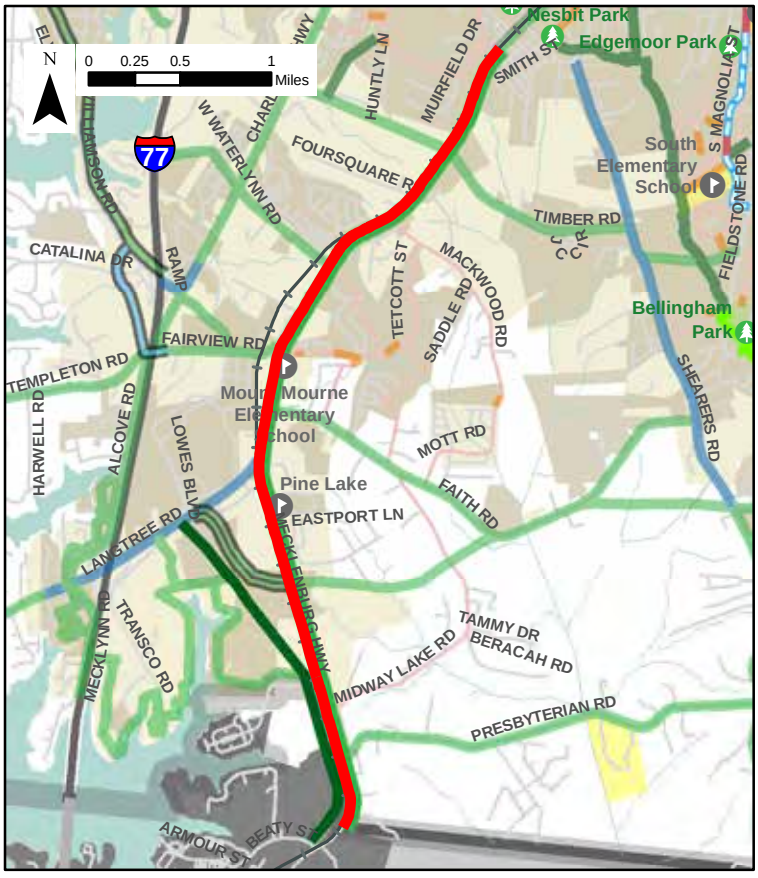
Proposed Facility Type:

- 12-ft Sidepath
- Wayfinding Signage

Project Length & Estimated Cost:

- Length: 4.83 miles
- Construction Cost: $9.14 million*

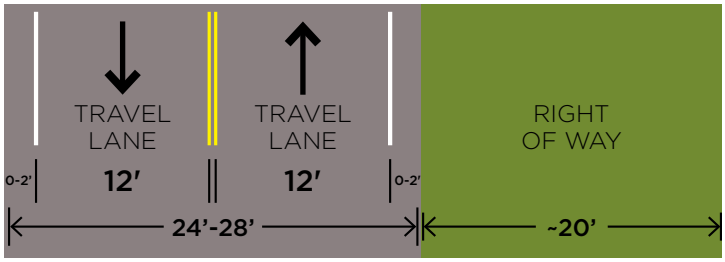
*Detailed cost estimates are provided in the Appendix, reflecting 2022 prices. Costs do not include right-of-way acquisition, if necessary.



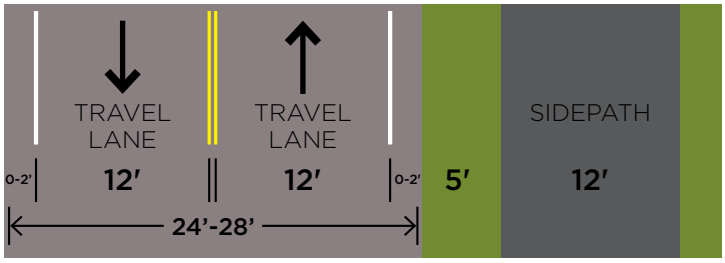
NC Highway 115 (Existing):

- **This plan's recommed for a multi-use path on east side of NC 115 is in addition to greenway alignment on the west side of the rail-road tracks between the Mecklenburg County line and Langtree Road. These two alignments are approved as recommendation from in the previous bike plan, which was adopted in 2008.**
- **The multi-use path on the east side is an opportunity for capital investment to connect existing landuses (e.g., schools, housing, apartments), while the west side alignment will serve future devleopments as they are built.**

Existing Cross-Section



Proposed Cross-Section: Sidepath



Existing Conditions

Proposed Treatment

Representative Project Cutsheet- Priority Project #6:

Dye Creek/Rocky River Greenway, from Johnson Dairy Road to the Mecklenburg County line

This section of proposed greenway will connect to the Dye Creek Greenway to the north, and will continue to the south in Mecklenburg County along the Rocky River to connect to the greenways and trails at Fisher Farm Park and Abersham Park. A section of the Dye Creek Greenway still needs to be funded and built to make the greenway sections connect (north of Johnson Dairy Road to Bellingham Park).

One of the considerations for the corridor will be where it crosses major roadways, specifically Johnson Dairy Road. A rectangular rapid flashing beacon (RRFB) signal is recommended to enhance visibility of bicyclists (and pedestrians) for motorists. Johnson Dairy Road has approximately 4,500 vehicles per day.

Another consideration is the alignment and right-of-way acquisition, which will require further analysis and engineering. The alignment shown in the map at right crosses eight parcels, with at least six different owners.

This project was submitted to the Charlotte Regional Transportation Planning Organization (CRTPO) for funding in 2021 and will be resubmitted in 2022.

Corridor Characteristics (Existing):

- Average Annual Daily Traffic (AADT) of Johnson Dairy Road = 4,500
- Speed Limit = 55 mph
- Curb + Gutter presence: none
- Presence of Shoulders varies between 0-2 feet.

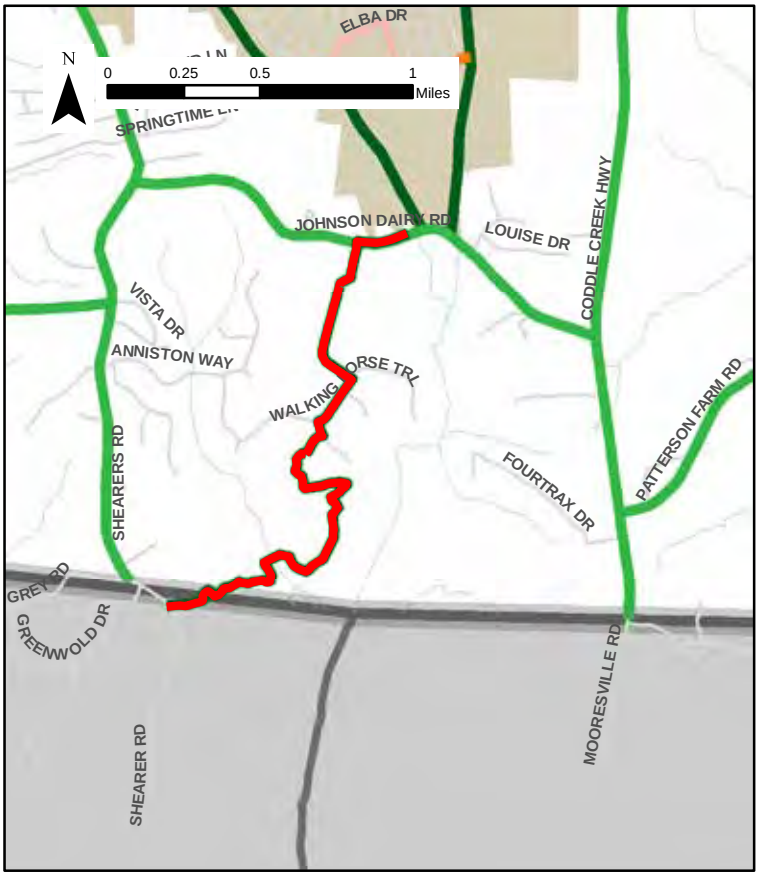
Proposed Facility Type:

- 12-ft Sidepath
- Wayfinding Signage

Project Length & Estimated Cost:

- Length: 1.40 miles
- Construction Cost: $1.01 million*

*Detailed cost estimates are provided in the Appendix, reflecting 2022 prices. Costs do not include right-of-way acquisition, if necessary.

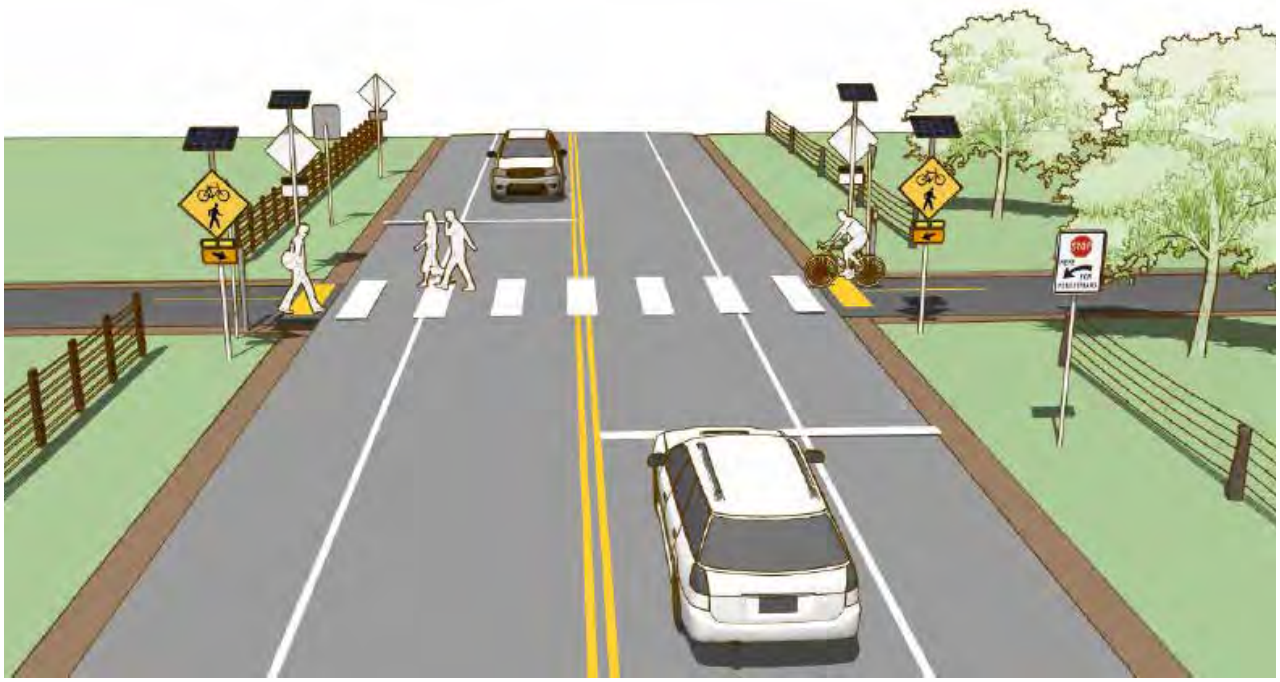


Representative Project Limits

Proposed Facility Type

Multi-Use Path

Greenway



RRFB

Representative Project Cutsheet- Priority Project #7:

Sidepath along **N. Main Street**, from Iredell Avenue to NC 150/ Oakridge Farm Highway

North Main Street is an important corridor connecting Downtown Mooresville to East Mooresville Intermediate School and North Main Park. The sidepath that is recommended for this roadway will help connect residents, families, and students to these key destinations via biking and walking. It will also provide a connection to the rural roads that are popular routes for recreational bicyclists.

Like NC 115, described on page 60, N. Main Street is two-lane road with no shoulders in most places. Intermittent turn lanes provide space in some places for motor vehicles to pass bicyclists, but with 12,000 daily vehicles, there is a high risk for conflict, and the eight bicyclist-involved collisions between 2007 and 2020 bear witness to that risk. Providing a separated facility will make bicycling safer and more comfortable for a wide range of bicyclists.

In the section east of Linwood Avenue, there is no sidewalk and ample right-of-way to accommodate a 12-foot sidepath, but closer to downtown, between Iredell Avenue and Linwood Avenue, there is sidewalk present. This sidewalk could be widened to 10-12-feet as right-of-way allows. This project could be completed in phases as follows: Wiggins to Bradberry, Bradberry to Linwood, and Linwood to Iredell Avenue.

- Representative Project Limits

Proposed Bike Facilities

- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Street w/Traffic Calming+Wayfinding
- Bike Lanes/Paved Shoulders
- Shared Lane Markings

Roadway Characteristics (Existing):

- Average Annual Daily Traffic (AADT) = 12,000
- Speed Limit = 35 mph
- Curb + Gutter presence: none
- Pavement Width: 22-36 ft
- Number of Lanes: 2-3
- Presence of Shoulders varies between 0-2 feet.

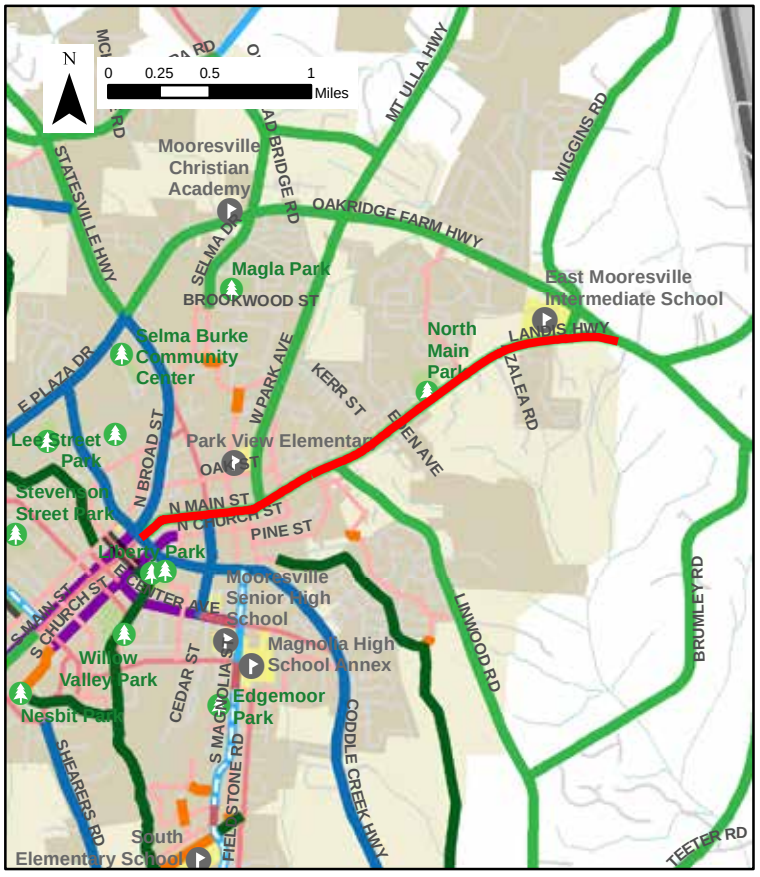
Proposed Facility Type:

- 12-ft Sidepath

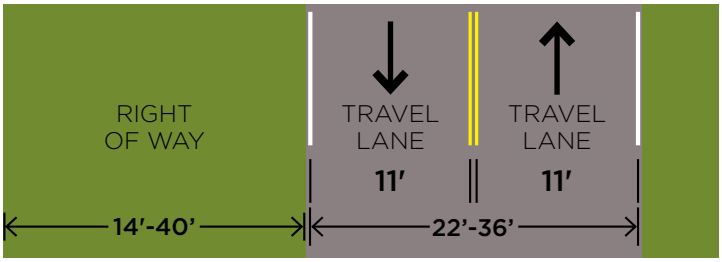
Project Length & Estimated Cost:

- Length: 2.63 miles
- Construction Cost: $6.29 million*

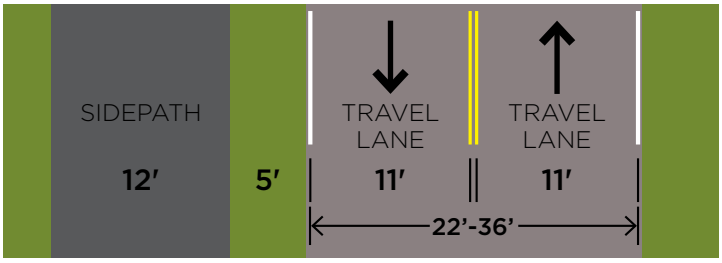
*Detailed cost estimates are provided in the Appendix, reflecting 2022 prices. Costs do not include right-of-way acquisition, if necessary.



Existing Cross-Section

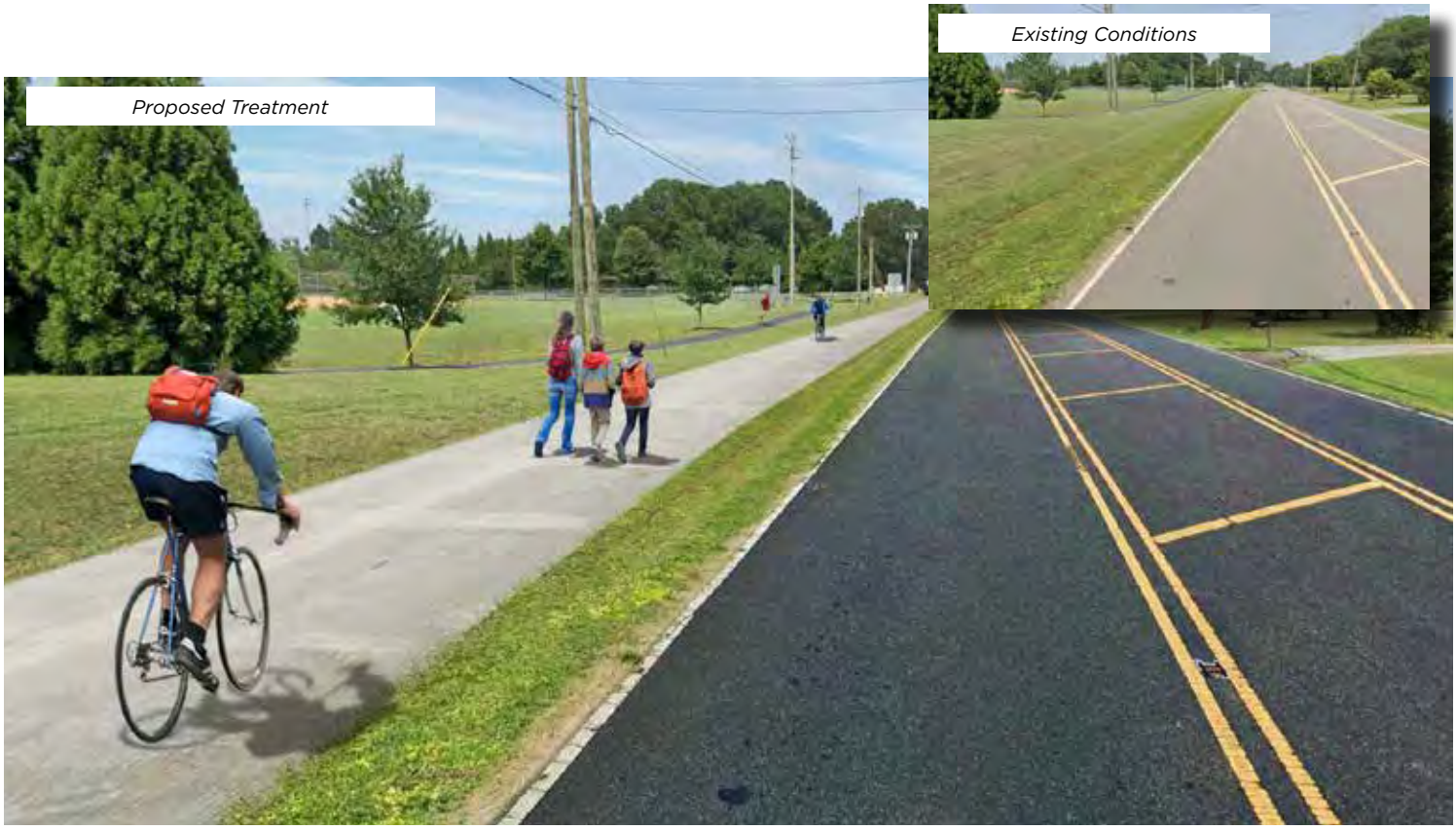


Proposed Cross-Section: Sidepath



Existing Conditions

Proposed Treatment



Representative Project Cutsheet- Priority Project #8

Separated Bike Lanes on **Center Avenue**, from Church Street to Magnolia Street

Central Avenue is a primary corridor connecting Downtown Mooresville to Mooresville High School and various businesses along Central Avenue. Central Avenue is a relatively wide road, with on-street parking in places, and it has had bicycle facilities in the form of shared lane markings (SLMs) and standard bicycle lanes in the past; however, these facilities have not been maintained through multiple rounds of resurfacing and restriping of the roadway. In addition, the SLMs were not ideally positioned within the travel lanes to properly indicate where bicyclists should safely ride.

Given the width of the paved surface, and the fact that many of the businesses along Central Avenue have surface parking lots that can accommodate the demand for parking, this plan recommends that Central Avenue be restriped to narrow the travel lanes, and use the space gained from that and the space previously designated as on-street parking, to create a 2-way separated cycle track. This fully separated bike facility will provide safer and more comfortable space for bicyclists to reach the many destinations along this corridor. In particular, students will be able to safely bicycle to Mooresville High School. The cycle track will also connect to the SLMs and bike lanes on Magnolia Street, creating connectivity to the schools and parks to the south.

- Representative Project Limits

Proposed Bike Facilities

- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Quiet Street w/Traffic Calming+Wayfinding
- Shared Lane Markings

Roadway Characteristics (Existing):

- Average Annual Daily Traffic (AADT) = 15,500
- Speed Limit = 55 mph
- Curb + Gutter presence: none
- Presence of Shoulders varies between 0-2 feet.

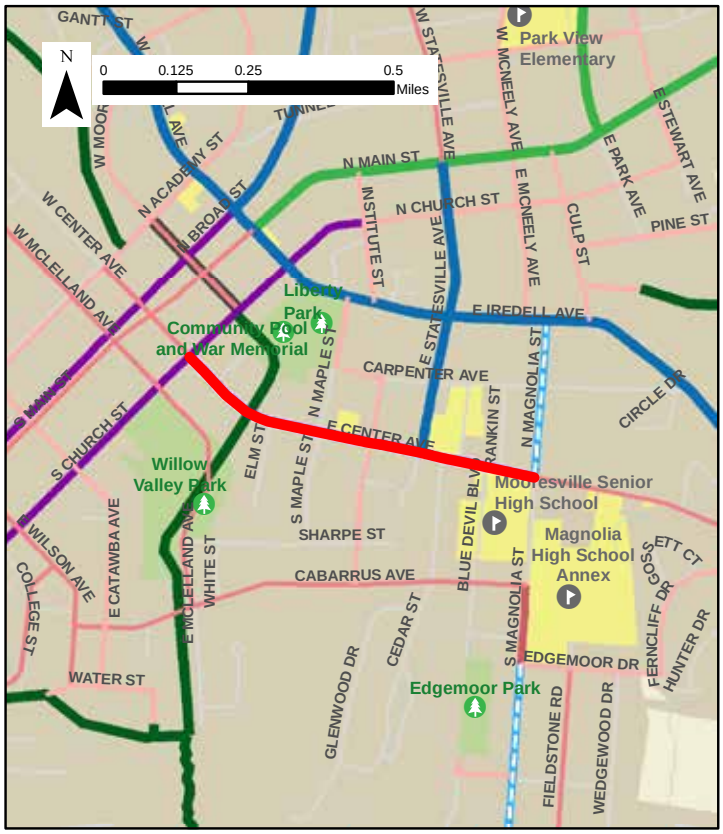
Proposed Facility Type:

- Cycle Track
- Wayfinding Signage

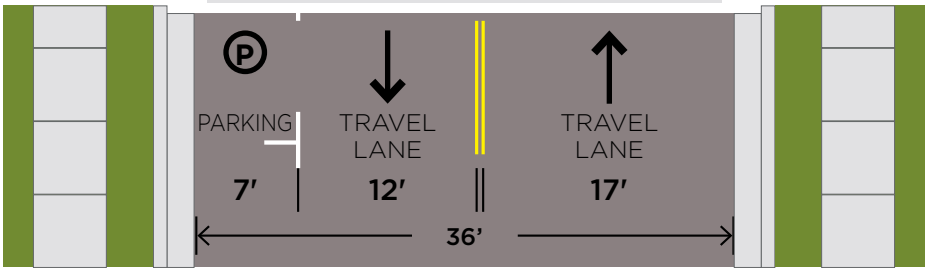
Project Length & Estimated Cost:

- Length: 0.65 miles
- Construction Cost: $403,000*

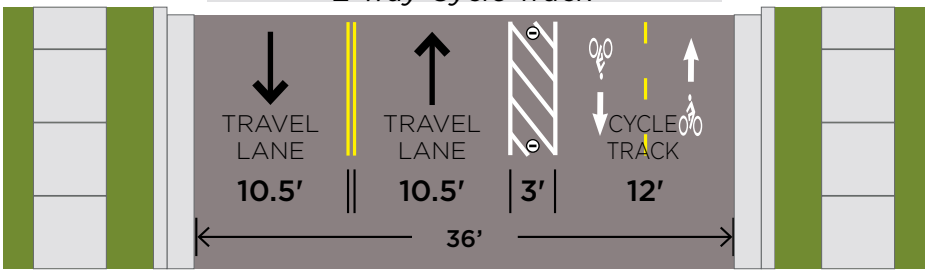
*Detailed cost estimates are provided in the Appendix, reflecting 2022 prices. Costs do not include right-of-way acquisition or planter boxes;



Existing Cross-Section



Proposed Cross-Section: 2-way Cycle Track



Existing Conditions

Proposed Treatment

Representative Project Cutsheet- Priority Project #11:

Sidepath along **Perth Road**, from Cornelius Road to NC 150/River Highway

Perth Road is another one of the 11 Strategic Corridors identified in Mooresville's Transportation Master Plan. It is also a popular corridor with bicyclists and serves as an important connector between a number of residential neighborhoods and key destinations, including Lakeshore Elementary School, Lakeshore Middle School, and Lake Norman High School.

With so many nearby schools and the potential for students to walk and bike to school, a bike facility that is fully separated from motor vehicles is recommended. A sidepath along the roadway provides such separation, and will be a facility that encourages and invites bicyclists of all ages and abilities.

A sidepath on one side of the street can provide connectivity along the corridor in the near-term, but sidepaths on both sides should be the long-term goal in order to provide access and connectivity to the many destinations on either side of the road, without the need for frequent crossing.

One major constraint to this project is the bridge over Lake Norman. The existing bridge is two lanes, with narrow shoulders approximately two feet wide. This project would require a new bridge to include bike and pedestrian facilities.

Representative Project Limits

Proposed Bike Facilities

- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Street w/Traffic Calming+Wayfinding

Funded Bike Facility Projects

- Multi-Use Path/Greenway
- Standard Bike Lanes

Roadway Characteristics (Existing):

- Average Annual Daily Traffic (AADT) = 15,500
- Speed Limit = 55 mph
- Curb + Gutter presence: none
- Presence of Shoulders varies between 0-2 feet.

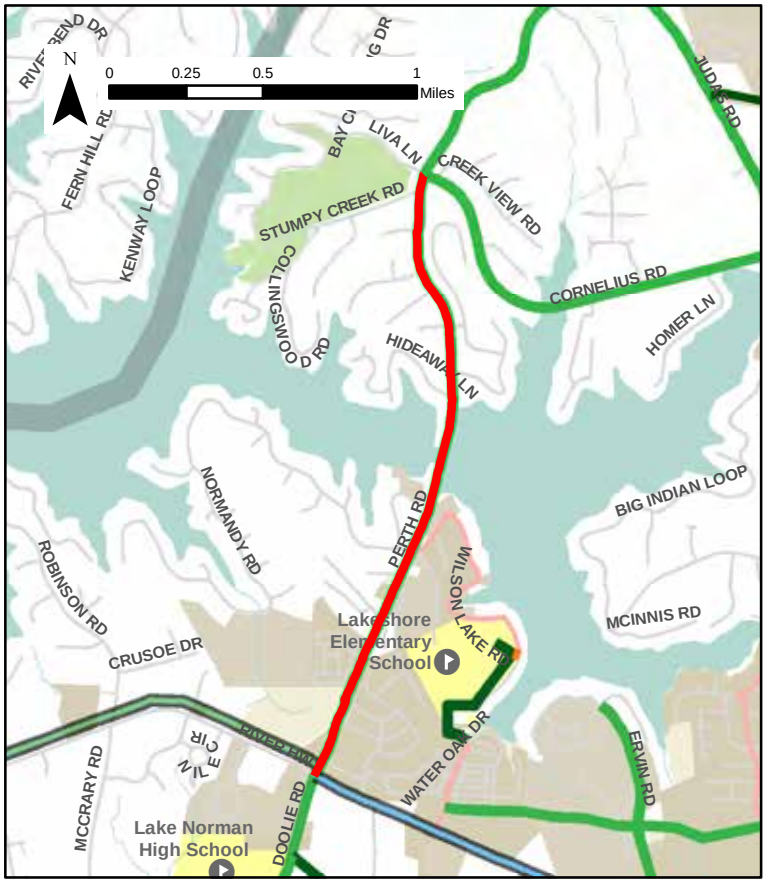
Proposed Facility Type:

- 12-ft Sidepath
- Wayfinding Signage

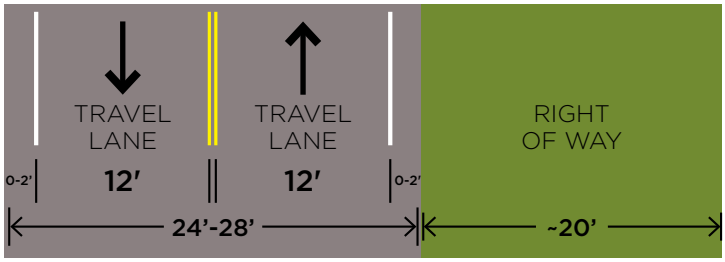
Project Length & Estimated Cost:

- Length: 2.08 miles
- Construction Cost: $4.84 million*

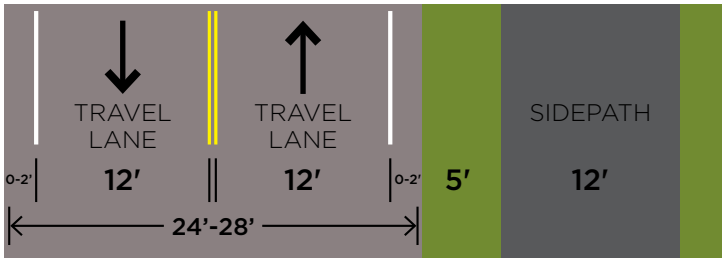
*Detailed cost estimates are provided in the Appendix, reflecting 2022 prices. Costs do not include right-of-way acquisition, if necessary.



Existing Cross-Section



Proposed Cross-Section: Sidepath



Existing Conditions

Proposed Treatment

Representative Project Cutsheet- Priority Project #12:

Paved Shoulders (near-term)/Separated Bike Lanes (long-term) along **Shearers Road,** from Brawley Avenue to Rocky River Road

Shearer Road is identified in Mooresville's Transportation Master Plan (TMP) as a Strategic Corridor. It is a popular biking route for recreational bicyclists, and it is a main arterial connecting southeast Mooresville to Downtown. Currently, the paved surface is only 20-feet wide in most places, with 10-foot travel lanes and no shoulder. With average traffic counts of 11,000 vehicles per day, the potential risk of conflicts between motor vehicles and bicycles is significant, as there is limited space for vehicles to safely pass bicyclists. Six bicyclist-involved collisions have occurred along Shearers Road since 2007.

The near-term recommendation is to pave shoulders when the roadway comes up for repaving. These shoulders will provide some space for the bicyclists that frequently travel along Shearers. Based on NCDOT's paving schedule, Shearers Road was scheduled to be repaved in 2021, but this has been pushed back to 2023, based on changes to the Highway Maintenance Improvement Program (HMIP).

The long-term recommendation is to provide separated bike lanes. The Comprehensive Plan, OneMooresville, calls for standard bike lanes, but given the traffic counts along the corridor, a more separated facility is warranted to create a safe facility for bicyclists of all ages and abilities.

- Representative Project Limits

Proposed Bike Facilities

- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Street w/Traffic Calming+Wayfinding
- Shared Lane Markings

Roadway Characteristics (Existing):

- Average Annual Daily Traffic (AADT) = 11,000
- Speed Limit = 45 mph
- Curb + Gutter presence: none
- Presence of Shoulders varies between 0-2 feet.

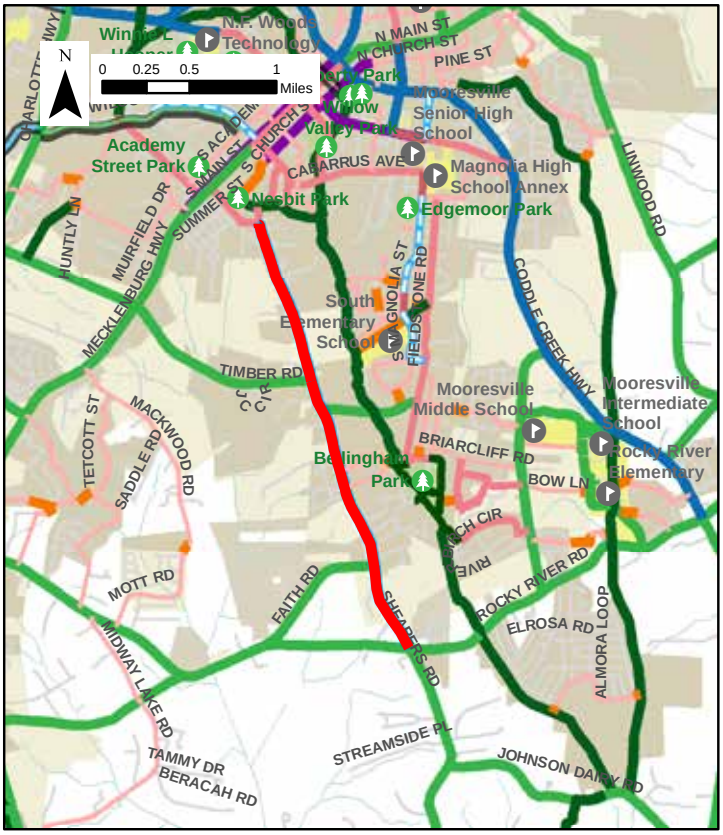
Proposed Facility Type:

- 4-ft Paved Shoulders (near-term)
- Separated Bike Lanes (long-term)

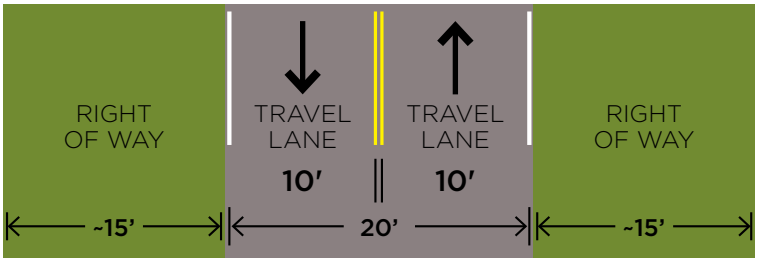
Project Length & Estimated Cost:

- Length: 2.61 miles
- Construction Cost: $1.86 million*

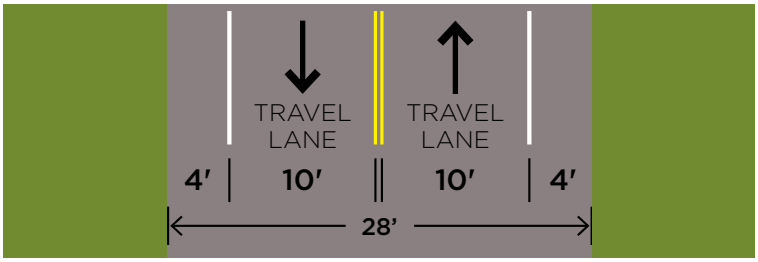
*Detailed cost estimates are provided in the Appendix, reflecting 2022 prices. Costs do not include right-of-way acquisition, if necessary.



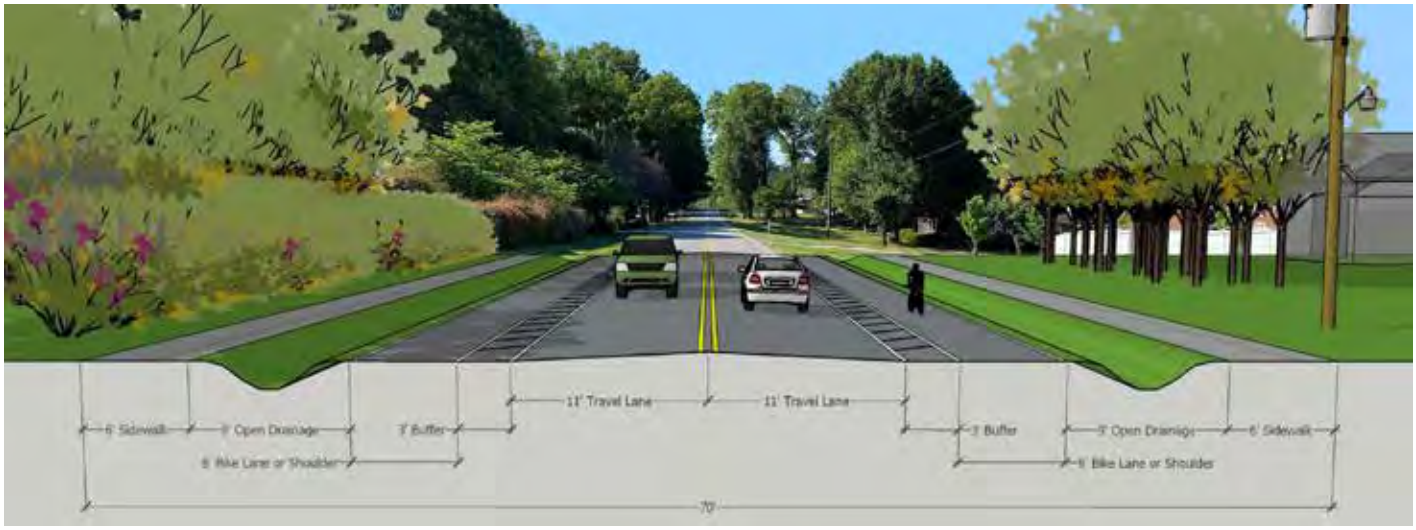
Existing Cross-Section



Proposed Cross-Section:
Near-Term- Paved Shoulders



Proposed Cross-Section:
Long-Term- Buffered Bike Lanes +
Multi-Use Path



RECOMMENDED PROGRAMS + POLICIES

Education and encouragement activities provide opportunities for those who live, work, recreate, and learn in Mooresville to share and broaden their experience bicycling in town. While the project recommendations provide the infrastructure by which to travel, the programs recommended in the following chapter support safe bicycling by helping to create a culture and awareness around safe biking.

Program Recommendations

The Safe Routes to School report that was completed for five Mooresville Schools in 2021 provides details on a number of school-related programs that Mooresville and its school systems can consider to encourage and improve the safety of walking and biking to school.

In addition to the programs recommended in the SRTS Plan, the Mooresville Comprehensive Bicycle Plan of 2008 offers an extensive list of program recommendations, many of which are still relevant and worthwhile to implement. The original plan is available on the Town of Mooresville's website, here: https://mooresvillenc.gov/DocumentCenter/View/4715/Mooresville-Comprehensive-Bicycle-Plan, and the list of programs can be found on page 115 of that report. These two previous reports can be looked to as resources for program ideas.

Based on a review of the programs outlined in these two previous efforts, and on input from the public and steering committee, the following programs have been distilled as key recommendations to educate and inspire Mooresville residents and to create an atmosphere that supports and encourages bicycling as a viable means of transportation and recreation.

Public feedback on program priorities from one of the public meetings in July 2021

Education Programs

BIKING SKILLS & SAFETY PROGRAMS

Bicycle skills and safety programs can be designed to meet the needs of many different members of the community.

Family bicycling programs help parents figure out how to safely transport children by bicycle and help children learn bicycling skills. Activities may include bicycle safety checks, a group ride or parade, “freedom from training wheels” clinics, and opportunities to try out different ways to transport children (e.g. trailers, cargo bicycles, kid seats, etc.).

Adult bicycle skills courses can help adults who have never received training on how to ride a bike safely or may want a refresher to learn how to more safely and comfortable navigate the city by bike. As bicycle infrastructure increases, this can help support a more vibrant bicycling culture in Mooresville.

The Town should explore options for partnership with bicycling courses offered through the League of American Bicyclists, Cycling Savvy, and Let's Go NC. Details on these programs is outlined at right:

- **Learn to Ride**
  - » Learn to Ride programs are events where families can learn to go from training wheels to pedaling in one morning! These events are best when held at a municipal/school track or similar facility that is flat with plenty of room for kids to get their bearings
  - » Learn to ride programs can be implemented with partner organizations in the community, such as bicycle non-profits and local bike shops.
  - » For more details, visit learntorideclt.com.
- **All Kids Bike Elementary Bicycle Education Program**
  - » The All Kids Bike Program is an all inclusive bicycle education program for kindergarten and first grade students that is taught through their physical education classes. All Kids Bike provides an eight-lesson curriculum (with teacher training and certification), a fleet of 24 Strider bicycles, 24 pedal conversion kits, 24 helmets, and a 5 year support plan.

Photo courtesy of learntorideclt.com

» The All Kids Bike Program costs $6,000 per school. With a goal of bringing the program to all four elementary schools in Mooresville, some community organization around fund raising and support will be an important strategy to pursue.

- **Smart Cycling Course by the League of American Bicyclists**
  - » Partner with League Certified Instructors (LCIs) to offer Smart Cycling courses through Parks and Recreation
  - » The Smart Cycling course curriculum provides a solid foundation to participants on the principles of safely and comfortably operating your bike around town. The War Memorial Recreation Center would be a great location for this course as downtown is a great place to practice cycling skills
  - » League of American Bicyclists: bikeleague.org/ridesmart

- **Savvy Cycling Course by the American Bicycling Education Association (ABEA)**
  - » The Savvy Cycling course curriculum provides a solid foundation to participants on the principles of safely and comfortably operating your bike around town. The War Memorial Recreation Center would be a great location for this course as downtown is a great place to practice cycling skills.
  - » Partner with ABEA certified instructors to offer Savvy Cycling courses through parks and recreation
  - » Cycling Savvy: cyclingsavvy.org/

- **Let's Go NC!**
  - » The Let's Go NC! curriculum is available through NCDOT and is designed for multiple grade levels.
  - » Specialized curricula for safe walking and safe bicycling are available. (The bicycling curriculum was implemented at Park View Elementary School in the spring of 2022).
  - » See NCDOT's website for more details: www.ncdot.gov/initiatives-policies/safety/lets-go-nc/Pages/default.aspx

A Smart Cycling course in progress.

SAFE ROUTES TO SCHOOL PROGRAMS

Mooresville is currently conducting a Safe Routes to School (SRTS) study and training program, through which five schools in Mooresville were audited for safety, walkability, and bikeability. The SRTS report outlines infrastructure improvements for the areas surrounding each of these five schools (which are reflected in this plan's recommendations), and it recommends specific programs for each of the schools. These programs include:

- Bicycle & Pedestrian Rodeos
- Bike Maintenance Workshops
- Carpool Encouragement
- Walk-at-School Program
- Park & Walk Programs
- Walking School Bus or Bike Train
- Parent Surveys
- Student Travel Mode Tallies
- Parent Safe Driving Reward Campaigns

Details on these SRTS programs can be found in the 2021 Mooresville SRTS Report.

In addition to the school-specific recommendations, the SRTS project included a program to train Mooresville schools how to teach bike safety and skills as part of the physical education curriculum (using the Let's Go NC! curriculum described in the previous section). This program was conducted at Park View Elementary School by the Bike Plan project team, and the Parks and Recreation Department will continue to expand the program at more schools in the future until bicycle safety and skills become a regular component of all Mooresville schools' curriculum. This will help build a constituency of safe bicyclists and a culture of safe biking in town.

TRAFFIC GARDEN INSTALLATION

Traffic Gardens are permanent child scale street networks painted on flat asphalt surfaces that are used to teach kids safe biking practices and safe use of streets in general. Traffic gardens make great additions to schools that have existing SRTS programs, or bicycle class through PE. Traffic gardens are also great resources for parks and recreation programming at recreation centers for kids' bicycle education and adult bicycle education.

Example of a traffic garden

SAFE STREETS EDUCATION PROGRAM

Safety education campaigns target motorists and those walking, biking, and taking transit to create a shared sense of responsibility among all roadway users, rather than singling out one user group. In Mooresville, safety campaigns can be coordinated with the Police Department, NCDOT, local advocacy groups, and the Charlotte Regional Transportation Planning Organization (CRTPO). Examples may include education campaigns on the 3-foot law for passing bicyclists, or bicyclists' right to use the whole travel lane.

A comprehensive safety campaign should include education, encouragement, and enforcement components and can be implemented in conjunction with statewide safety efforts and include Safe Routes to School programming.

Watch for Me NC is a program offered through NCDOT that provides communities with resources to create a safety campaign that reminds people that all roadway users share the responsibility of making sure the roadways are safe for all users. Information on this program is available at watchformenc.org/

MOUNTAIN BIKING COURSES

Partner with certified instructors to offer intro to mountain biking courses through the town Parks and Rec department and continue to allow skills instructors to host courses to town facilities.

Mazeppa Park is a great venue for town residents (both kids and adults) to learn mountain biking skills. Consider having women's only classes to encourage women to participate in a welcoming environment.

Children attending a mountain bike workshop.

Encouragement Programs

OPEN STREET EVENTS/CICLOVIAS

Car-free, open street events have many names-Sunday Parkways, Ciclovias, Summer Streets, and Sunday Streets-and involve periodic street "openings" that create a temporary park that is open to the public for walking, bicycling, dancing, and other physical activity. The purpose of the event is to encourage physical activity by providing a fun, welcoming environment for activity. Car-free street events have been very successful internationally and are rapidly becoming popular in the US.

Local businesses open doors and set up tables along sidewalks to support the event and generate foot and bike traffic for their businesses. The events can be centered in Mooresville's historic downtown or across neighborhoods. They should be located on roadways that feature key destinations but also reach into a variety of neighborhoods, including under-served communities.

Mooresville should work with partner organizations to build off of national open street best practices. There are many potential models. The event may take place on roads that are successful and vibrant thoroughfares or roads with significant safety issues but that provide vital connections. A street with planned bikeway improvements can provide an opportunity to demonstrate proposed improvements during the event. The Town of Mooresville may host the event or other stakeholders may also sponsor and organize the events with support from the town. Consider starting with one event a year, and eventually expanding to multiple events during the spring, summer, and fall. Examples of small towns with successful events include Salisbury, NC, and Carrboro, NC.

See http://openstreetsproject.org/ for more information.

Examples of Open Street events in Durham, NC (left), and Boone, NC (above).

POP-UP BICYCLE PARK

Pop-up bike park installations can be a quick and low-budget approach to creating fun and safe space for recreational biking. The parks can provide space to learn and develop safe biking skills and gain experience on new terrain.

Pop-up parks also offer a short-term approach to gauging residents' interest in a more permanent bike park facility. The opportunity to install a pop-up bicycle park exists at any number of local parks in Mooresville, including Mazeppa Park, Cornelius Park, and Magnolia Park.

More permanent bike parks might include pump tracks, which are great for building bike handling skills at any age and any level of experience. For details on the benefits of pump tracks and how to build one, visit the following websites resources:

- Benefits of a pump track: https://bit.ly/3fV9VEs
- How to build a pump track: https://bit.ly/3r0YuS5

BICYCLE PARKING AND BICYCLE VALET AT TOWN EVENTS

Downtown Mooresville hosts many popular community events throughout the year and providing a secure location for folks to park their bicycles while attending events is a great way to encourage more people to bike to the events rather than drive. Bicycle Parking areas should be conveniently located at an event/festival entrance. Bicycle Valet setups are fun and inviting and have valet monitor who checks bike in and out of a secure parking area. Valet areas can be run by community organizations, bike shops, or events themselves

Events to consider providing and promoting bicycle parking areas include:

- Rock the Park concerts at Liberty Park
- Festival of Food Trucks
- Spinners baseball games
- Any other large events that are in a bikeable area of town

A pop-up bicycle park in Charlotte, NC.

BICYCLE PARKING IN ACTIVITY CENTERS & PARKS

Mooresville is home to many commercial activity centers that attract patrons to shopping, restaurants, and entertainment. These activity centers have been developed over time and have varying levels of usable bicycle parking based on the bicycle parking ordinances in the town's zoning code at the time of installation. The town should investigate bicycle parking availability in key activity centers, and at parks as well, and consider investing in the installation of bicycle racks in the public right of way or other areas in activity centers. The Town should consider strategic partners, for example Mooresville Public Arts Committee, to assist with bicycle parking installations.

Spotlight on Bicycle Parking needs in Downtown Mooresville Activity Center

Downtown Mooresville is home to a great mix of restaurants and shops and currently has almost no bicycle parking. Downtown is connected to many neighborhood by bikeable streets, and the Town should encourage people to ride their bikes to downtown as motor vehicle parking is limited and in high demand.

With limited sidewalk width in Downtown, bike parking corrals are a great option to add bicycle parking without cluttering constrained sidewalks. Retrofitting one parking space with bicycle parking will provide eight bicycle parking spaces, increasing the overall parking stock in Downtown.

Bicycle corrals can be placed in on-street parking spaces at intersections or crosswalks to create additional sight distance. Large vehicles cannot park in the bicycle corrals and obscure the pedestrians.

For more details on bicycle parking, see the bicycle parking policy section on page 89.

In locations with higher demand, bike corrals can create more parking options for bicycles. If implemented on street, as shown below, they also can provide traffic calming and enhance the pedestrian environment.

BICYCLE BENEFITS PROGRAM IN DOWNTOWN

The Town should consider joining the national Bicycle Benefits program or create a Downtown Mooresville specific bicycle benefits program.

The idea behind bicycle benefits programs is that patrons who ride their bikes to business (and have the bicycle benefits sticker on their helmets) receive a discount or a fun incentive form the business. This could be 10% off your order, a free desert, a free drink, etc.

Bicycle benefits encourage less driving and more biking to activity centers.

A map of Bicycle Benefit locations in Charlotte, NC.

EARN A BIKE PROGRAM

Earn a bike programs, such as those offered through the Trips for Kids Recyclery in Charlotte, are great ways for lower income youth to have access to a bicycle and learn bicycle mechanic and safe riding skills. Earn a bike program offered through community non-profits are great companions to community development and affordable housing initiatives.

BIKE SHARE SYSTEM IN DOWNTOWN

Bike share programs contribute to healthier, more economically vibrant, more sustainable, and better-connected local communities by expanding access to bicycles and providing a convenient way to get around town that integrates into the existing transportation system.

The Town should investigate opportunities to implement a publicly accessible bike share system in Downtown Mooresville that residents and visitors can use to access destinations and employment in and around Downtown. Bike share systems are typically owned by a government agency that then subcontracts the operations to a for-profit company or non-profit organization, but they can also be set up where a for-profit or non-profit entity is both owner and operator. Each arrangement has different advantages and disadvantages.

B-Cycles in Charlotte, NC is an example of a successful bike share system the region.

Key Encouragement Programs

NATIONAL BIKE MONTH IN MOORESVILLE

May is National Bike Month through the League of American Bicyclists. National Bike Month provides a great platform for communities to have a focused calendar of bicycling education and encouragement events to get more folks out on their bikes. Some communities also chose to have a concentration of bicycle programming in the Fall to compliment the Spring National Bike Month activities.

National bike month provides an opportunity to bring some of the education and encouragement programming recommended in this chapter together under one umbrella to magnify the reach in our community.

Education and Encouragement partnership organizations for National Bike Month activities

- SAFE LKN
- Tarheel Trailblazers
- Local bike shops
- All Kids Bike

An example of bike park facilities at Cedar Glades Park in Hot Springs, Arkansas.

BIKE PARK AND BICYCLE RECREATION DEVELOPMENT

Providing high quality bicycle recreation facilities is a key element of a Bicycle Friendly Community. Facilities such as mountain biking trails, pump tracks, bike parks, and bike playgrounds give families and sporting enthusiasts great ways to enjoy riding their bikes for recreation. These facilities are especially impactful in neighborhood parks where residents can ride to the park.

The Town of Mooresville and partners have done a great job developing the Mazeppa Park mountain bike trail system, and there are opportunities to add more bicycle recreation amenities to the parks system. Some of these opportunities include:

- Expanding the trails and bicycle offerings at Mazeppa Park to add more mileage and trails that serve intermediate and advanced riders
- Exploring the addition of a paved pump track at Mazeppa Park. The parking and other infrastructure at Mazeppa Park make it a great candidate for a paved pump track which could be a regional-scale bicycling attraction.
- Exploring opportunities to add bicycle recreation at other parks with good biking access, such as Bellingham Park, which is a great candidate for a beginner pump track and trails.

To complement an expansion of bike park facilities, Mooresville can consider supporting or starting a local bicycle race series at Mazeppa park. A local race series brings the community together and brings in riders from the region to enjoy riding in Mooresville.

WAYFINDING SIGNAGE

Wayfinding signage enhances resident and visitor orientation by directing pedestrians, bicyclists, and motorists to popular destinations around town.

Bicycle wayfinding, specifically, confirms orientation and directs bicyclists to local and regional destinations. Bicycle wayfinding is typically placed along shared use pathways and on-street bicycle facilities. These types of signs are designed so that bicyclists can easily read signs while moving, quickly comprehend the information, and adjust direction of travel in advance of turns.

Mooresville should consider developing a customized bicycle wayfinding program that complements its existing wayfinding signage for motorists. A bicycle wayfinding program can include directional signage, on-road markings, and kiosks with town maps that provide effective orientation and direction to key destinations.

Above: Example wayfinding signage from Cornelius, NC. A customized wayfinding signage design could be developed for Mooresville to include Mooresville logos; destinations; walking and bicycling-oriented travel times; and sponsorship branding.

TOWNWIDE BIKE MAP/DIGITAL MAP

One effective way of encouraging people to ride a bicycle is through the use of maps and guides to show where you can bike, and to guide people to enjoyable routes and destinations. Maps can also be coupled with bicycle safety education, such as informational graphics that demonstrate bicycle hand signals and how to share the road and the trail safely.

Bike maps can be made available online and printed as needed to be actively distributed to residents and visitors. A Mooresville Town Bike Map could be created following completion of this plan to help residents identify biking routes along existing bike facilities and quiet neighborhood streets.

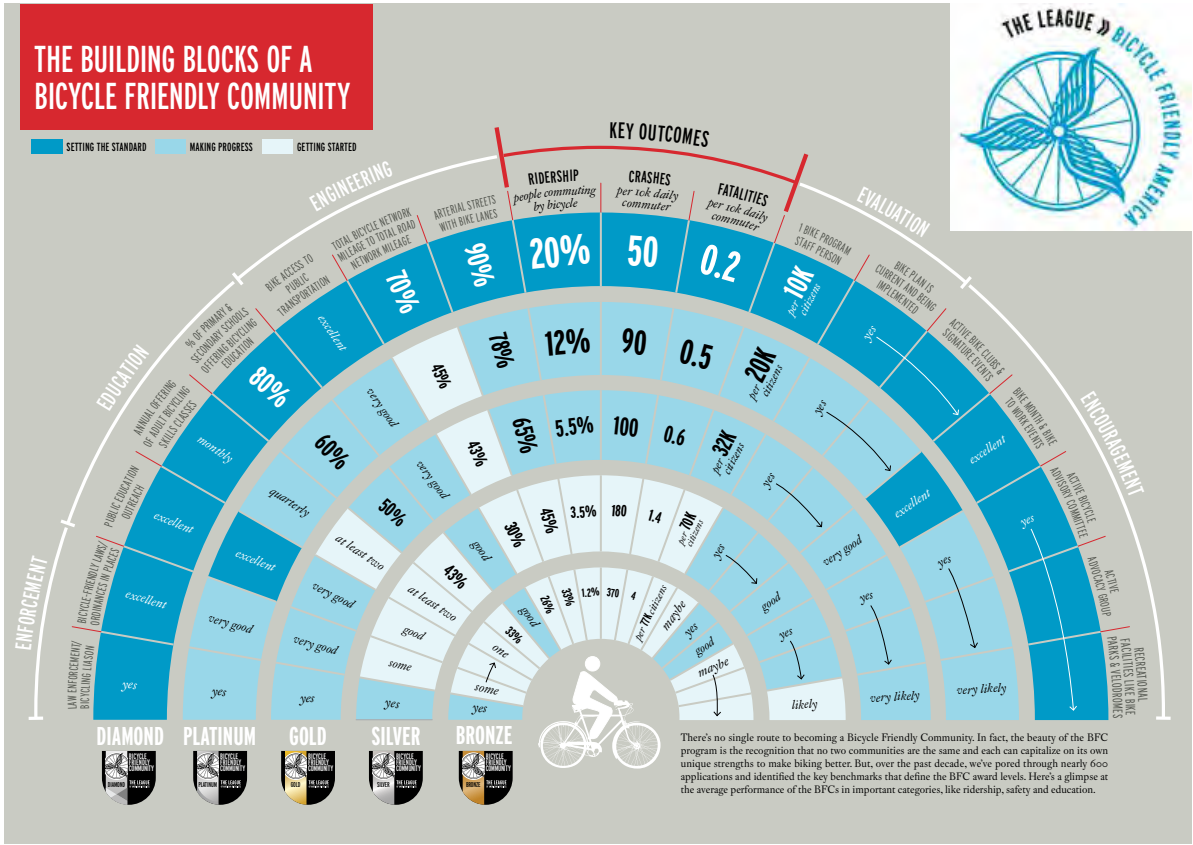
BIKE-FRIENDLY COMMUNITY DESIGNATION

The Bicycle Friendly Community (BFC) program (administered by the League of American Bicyclists) is a national recognition program developed to encourage towns and cities across the U.S. to create more bikeable environments. Even just by applying for the BFC program, the Town of Mooresville would receive valuable feedback from the League of American Bicyclists on how to improve conditions for bicycling as compared to peer communities in NC and nationwide. Visit bikeleague.org/content/communities for more information.

BICYCLE ADVISORY COMMITTEE

The Town should establish a permanent bicycle advisory committee, appointed by Board of Commissioners. The responsibilities of the committee could include: providing input and expertise to Town plans as they are developed; participating in ongoing evaluation of and updates to the Pedal Moore(sville) Bicycle Plan; leading specific programs to promote bicycling in Mooresville; and providing resident oversight on the implementation of this plan's recommendations.

BFC Infographic. Download the full version here: http://bikeleague.org/sites/default/files/BFC%20infographic.pdf



Engagement & Evaluation Programs

INITIATE POLICE TRAININGS ON CURRENT BIKE LAWS

As Mooresville develops new laws to improve the safety of vulnerable roadway users, partnering with the Mooresville Police Department to improve the police department's curriculum on bicyclist safety laws will be important. When police officers are knowledgeable about bicycle laws and safety, they are more able and willing to enforce the laws that keep bicyclists safe.

A curriculum on existing laws around sharing the road can be oriented towards enforcement of bicyclists and drivers. This may include updating course material to include laws around new forms of micromobility, such as e-bikes.

The Mooresville Police Department can work with local bike advocates to review any existing training materials and to develop course material. They can create a brief presentation that can be incorporated in a training, with a presentation that lasts no more than 20 minutes. Pamphlets on applicable laws (with the enforcement codes listed) can be made so police officers can quickly reference and pass out when enforcing bicycle safety laws. The Town should consider including additional information on reporting bicycle crashes that is based on best practices.

An example of a law enforcement training and education program on bicycle (and pedestrian) safety is available through the BikeCleveland advocacy group's website here:

- www.bikecleveland.org/enforcement/

VISION ZERO

Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. First implemented in Sweden in the 1990s, Vision Zero has proved successful across Europe — and now it is gaining momentum in major American cities.

A Vision Zero Plan is a specific plan intended to reduce conflicts between cars and other roadways users—drivers, cyclists, pedestrians, and others. By reducing conflicts between cars and other roadway users, Vision Zero prioritizes safety as it encourages all modes of transportation, with the primary goal of reducing bicycle and pedestrian conflicts.

A Vision Zero planning process is used to identify and address the causes of roadway-related injury and deaths through a data-driven process. Vision Zero focuses on human behavior; it emphasizes design solutions that account for human error and awareness to improve human behavior. More information on Vision Zero can be found at: ncvisionzero.org/.

COMPREHENSIVE DATA COLLECTION PROGRAM

Data regarding all bicycle facilities and biking activity should be collected regularly. Three primary areas for data collection that should be explored and expanded include:

- **Safety:** To better understand crash patterns and who is affected, opportunities to record additional information on crash types and parties should be explored. The training program for police enforcement that is recommended on the previous page will help improve the collection of bicyclist-involved collisions and improve the Town's ability to identify safety issues related to bicycling and other forms of active transportation.
- **User Counts:** Implement an annual counts program to track use of existing facilities and identify areas for future facility implementation. Counts programs can rely on permanent automatic counters, temporary counters, or manual counts completed in coordination with local volunteers. Counts should be collected annually, utilizing consistent locations and methodology. The National Bicycle and Pedestrian Documentation project provides information on how to get started.
- **Infrastructure Inventory:** Project implementation and maintenance is best supported when location and quality of assets is known. To better track implementation progress and identify locations for new crosswalks, maintenance needs, or other project opportunities, the city should develop a comprehensive database that documents existing infrastructure, such as: signal locations; crosswalk locations and quality; sidewalk and bikeway location, quality, and width; pedestrian-scale lighting location; traffic calming locations; and similar. The data plan should include considerations for regular updates to the data set and protocols for integrating new projects.

A bike count program can evaluate the impact of new facilities on ridership

Policy Recommendations

Development Ordinances & Policy Review

One of the most cost-effective bicycle plan implementation strategies for the Town of Mooresville is to establish land development regulations and street design policies that promote bikeable new development and capital projects. As part of a comprehensive approach to developing recommendations for a more bikeable community, Mooresville's development ordinances, standards and policies were reviewed to identify general issues and opportunities impacting the bicycling environment. Regulatory standards and policies were analyzed through the lens of the project visions and goals, and to be consistent with the vision for this plan:

> "Mooresville will elevate safety for bicyclists by creating a highly connected, convenient, fun, and low-stress bicycling network."

Model regulatory and policy language from around North Carolina and the U.S. was identified for elements including land use/ transportation integration, connectivity, Complete Streets, and bicycle parking, enabling the Town to maximize on-road bicycle and multi-use trail improvements in conjunction with new development, redevelopment, and corridor improvement projects.

Based on the policy and ordinance review, the following priority policy recommendations are identified:

Priority Policy and Regulatory Recommendations:

1. Update Land Development and Engineering Design Standards to reflect bicycle facility types recommended in this plan.
2. Update Engineering Standards to incorporate more detailed short- and long-term bike parking standards.

By updating the design standards for bicycle facilities and bicycle parking, the Town of Mooresville will be more prepared to have these facilities built as roadways are repaved and widened, and as new developments are built. These approaches to infrastructure improvements will complement other specific capital projects, and education, enforcement, and evaluation recommendations provided elsewhere in this planning document. The full policy and regulatory review is in the Appendix.

BICYCLE FACILITY DESIGN

The Town should review and update all relevant policy and design guidance regarding bikeway design, materials, and supporting amenities to be consistent with regional guidance. The Town should clearly define opportunities for relevant departments to coordinate on design, implementation, and maintenance of the network so that it can best serve the needs of all users.

The Comprehensive Plan, *OneMooresville*, outlines cross-sections for its Strategic Corridors, which include Perth Road, Cornelius Road/Connector Road, NC 115 (Central), Mazeppa Road, NC-150/NC-152, Teeter Road, NC-3/Coddle Creek Highway, Shearers Road, the future East-West Connector, NC 115 (South), and Langtree Road. Updated cross-sections for these roadways are provided in the Appendix of this plan to reflect the bike facility types recommended in this plan for those Strategic Corridors.

Design Guidance Resources for the development of bicycle facilities by roadway type are also provided in Chapter 5, Implementation.

BIKE PARKING

Bicycle parking is an important component of the bicycle network. Secure end-of-trip accommodations encourage people to travel by bicycle. The following policies seek to enhance current efforts to provide functional, secure and convenient bicycle parking.

Bike Corrals

Develop appropriate policies and standards to allow and promote the implementation of bike corrals. Bike corrals offer more short-term bicycle parking (that would normally be placed on the sidewalk) in a consolidated space on the street, occupying a traditional motor vehicle parking space. Bike corrals are commonly installed at locations that attract bicyclists and where parking bicycles at traditional short-term racks may crowd or clutter available sidewalk space.

Before installing bike corrals, a maintenance plan should be developed defining responsibilities, schedule, and methods for improving their longevity, maintaining their utility, and how corrals will fit into snow removal and street sweeping programs.

The bike corral parking area can be delineated or protected using poured concrete curbs, bollards, or planter boxes. Regardless of delineation type, corrals should be designed with the user in mind, maintaining ingress and egress and the same aisle and spacing standards desired for the short-term bicycle parking.

The benefits of bike corrals are not limited to the users themselves. Corrals can also provide, on average, a ratio of 8 to 12 customers to one

parking space, thus fostering more commercial opportunities for nearby businesses.

Long-Term Bike Parking

Consider developing requirements for long-term bicycle parking where land uses might encourage high demand for more secure, weather-proof bicycle parking. These could include places like schools, universities, or places that offer end of trip facilities such as changing rooms and lockers.

These facilities may include:

- *Lockers*. Fully enclosed and secure bicycle parking space accessible only to the owner or operator of the bicycle.
- *Restricted Access Parking*. A location that provides short-term-style bicycle racks within a locked room or locked enclosure accessible only to the owners of bicycles parked within.
- *Personal Storage*. Storage within view of the bicycle owner either in his or her office or another secure location within the building.

Request-A-Rack

Implementing a Request-A-Rack program will allow and encourage requests for bike racks that meet the standards set forth in this section. The Town should maintain a supply of standard bicycle racks that can be installed upon request by business and property owners, managers and other bicycle parking requesters to provide increased bicycle parking in Mooresville and mitigate bicycles locked to posts, signs, and trees. The rack request form can be hosted on the town's website. Each request should be sent to the appropriate staff as well.

Additional Policy Recommendations

In addition to the policy updates identified in development ordinance review, the following policy areas are recommendations to address the vision and goals of this plan.

MAINTENANCE

Routine maintenance can prolong the life of surface materials, increase the utility of the system, and encourage greater use of the network. This includes maintaining bike lanes, protected facilities, and shared use paths by keeping them clear of debris, surfaces free from obstructions, and crossings well-marked. For shared use paths and trails, maintaining access points, trail surface, and crossings are important components to a well-functioning and effective system that supports trips of all types.

It is recommended that the Town develop a routine maintenance schedule and track maintenance over time. These activities should include all components of the bicycle, shared use path, and trail networks.

In addition to routine maintenance, the Town should track more significant maintenance needs and integrate these improvements into annual budgeting. This information should be tracked in a manner consistent with the system inventory recommended as part of this plan.

DEVELOP A DEDICATED BICYCLE FUNDING STREAM

Communities that are successful in expanding their bicycling network leverage funds from a variety of sources and consistently make investments in capital and maintenance projects. A dedicated funding source is one mechanism to ensure sustainability and consistent expansion of bikeways.

Local governments can create a dedicated funding source by setting aside portions of general transportation revenue, public school bonds, county health department funding, parking fees, and traffic violation revenue for upgrades to biking facilities.

Mooresville should consider partnering with other area governmental agencies, such as the CRTPO and Iredell County to identify potential funding mechanisms. As an example, the City of Columbia, SC, implements bikeways through Richland County, which created a 1% sales tax for transportation, one-third of which goes to funding greenways and trails.

COMPLETE STREETS + VISION ZERO

Adopting Complete Streets and Vision Zero Policies can support a more balanced transportation system with a commitment to improving safety of all roadway users. Existing streets and any future street reconstruction projects should be reviewed for their compatibility with the goals and objectives of the Complete Streets policy. Education and encouragement programs should integrate Vision Zero principles.

ELECTRIC BIKES & SHARED USE PATH/ GREENWAY USE

The shared use path and greenway system will support both recreational and transportation trips in Mooresville. To anticipate the increasing number of personal e-bikes and e-scooters, the Town should develop clear policy regarding the use of shared use paths by these modes. This guidance should be consistent with county, regional, and state guidance. Information regarding this policy should be made available through educational and encouragement materials, including at trailheads and other key access points. This information can provide guidance to users about trail etiquette and help reduce potential conflicts along the pathway.

COMPREHENSIVE GREENWAY PLANNING

The Town of Mooresville should conduct a comprehensive greenway study to take a more holistic and focused look at greenway alignment planning and planning-level cost estimates. Greenway recommendations have been included in both this bike plan and the comprehensive plan, *OneMooresville*, but a comprehensive greenway plan can take the recommendations from both these plans and refine them to be in a better position to pursue funding.

IMPLEMENTATION PLAN

5

This chapter defines a structure for managing the implementation of this Plan. Implementing its recommendations will require leadership and dedication to bicycle facility development on the part of a variety of agencies.

Equally critical, will be meeting the need for a recurring source of revenue. Even small amounts of local funding are essential for matching and leveraging outside sources. Most importantly, the Town need not accomplish the recommendations of this plan by acting alone; success will be realized through collaboration with regional and state agencies, the private sector, and non-profit organizations.

Implementation Framework

KEY PARTNERS & ROLES IN IMPLEMENTATION

Mooresville Board of Commissioners

Recognize the value of bikeways and greenways by adopting this plan, thereby supporting quality of life in Mooresville.

NCDOT-IMD

Guidance on bicycle policy & project funding; Support in coordinating with local division & district offices

Mooresville Interdepartmental Partners and/or VZTF

- Lead on funding, as part of CIP and public-private partnerships
- Coordinate implementation of this Plan's Action Steps
- Coordinate with CRTPO to leverage local funding on specific projects
- Coordinate with NCDOT Division for pedestrian and bicycle facilities as incidental projects during roadway reconstruction and resurfacing
- Continue to enforce development regulations to support bicycle facility and greenway development
- Coordinate with NCDOT, CRTPO and other project partners through the bikeway and greenway development process

Private Sector

Potential partners in developing bicycle facilities and potential program sponsorship

NCDOT Division 12

- Become familiar with the recommendations in this plan
- Communicate with CRTPO on potential projects that could incorporate bicycle facilities, especially where recommendations cross or align with NCDOT maintained ROW
- Coordinate with CRTPO on the STI process for bicycle projects

Local Residents, Business Owners, and Civic Organizations

- Help build public support for bicycle projects and programs
- Reach out to elected officials and other decision-makers to express support for greenways + bikeways

CRTPO

Coordinate with Mooresville on leveraging funding opportunities through the LAPP and STI processes; Incorporate this Plan's projects into long-range transportation plans

Consultants

Assist Mooresville by providing guidance on project development, and by providing design and construction services

Regional Partners

Continued coordination and partnerships with:

- Iredell County Planning and Parks & Recreation
- Mooresville Graded and Iredell-Statesville School Districts
- Neighboring cities and counties
- The Carolina Thread Trail and the Catawba Lands Conservancy
- Private Developers

Acronym Legend:
VZTF: Vision Zero Task Force
NCDOT: North Carolina Department of Transportation
IMD: Integrated Mobility Division
CRTPO: Charlotte Regional Transportation Planning Organization
STI: Strategic Transportation Investments

Action Steps

Table 5.1 Implementation Action Steps

#	TASK	LEAD	SUPPORT	DETAILS	PHASE
	ADMINISTRATIVE ACTION STEPS				
1	Adopt Pedal Moore(sville) Bicycle Plan.	Town Board of Commissioners	Town Staff, Project Consultants, Steering Committee	Through adoption, the Plan becomes an official planning document of the Town. Adoption does not commit the town to dedication of funding, but rather shows intention to support plan implementation over time. It also signals to outside funding groups that Mooresville has undergone a successful, supported planning process, which is key to securing outside funding.	2022
2	Designate staff to lead implementation of Pedal Moore(sville), including a "Bike Plan [& Pedestrian] Coordinator".	Town Board of Commissioners & Town Manager	Multiple departmental directors	The Town Manager and Town directors of Planning & Community Development; Parks & Recreation; Public Works; and Engineering should each identify their respective departmental staff leads for implementing this bicycle plan. A staff organizational chart for plan implementation should be shared among departments, so there is a known point person for each. A single point person among the designated staff should be designated as the "Ped + Bike Plan Coordinator".	2022
3	Designate a Vision Zero Task Force (VZTF) for plan implementation.	Town Board of Commissioners	Town Manager and designated staff from step above	The Town of Mooresville should form a Vision Zero Task Force (VZTF) out of the plan's steering committee to assist in the implementation of this plan. The VZTF should have representation from active commuting and recreational cyclists and pedestrians, and should champion the recommendations of this plan. The formation of this group would be a significant step in becoming designated as a Bicycle Friendly Community. The committee would provide a communications link between the residents of the community and local government. They should also continue to meet periodically, and be tasked with assisting Town staff in community outreach, marketing, and educational activities recommended by this plan. See Chapter 4 on program recommendations for more details.	2022
4	Communicate this plan's priority projects to potential implementation partners.	[future] Bike & Ped Plan Coordinator	VZTF & NCDOT-Integrated Mobility Division (IMD)	The purpose of this step is to network with potential project partners, and to build support for implementing the top projects. Possible groups to receive a presentation/coordination meeting include: CRTPO, NCDOT Division 12, Iredell County Parks & Recreation, neighboring jurisdictions.	2022
5	Update Pedal Moore(sville) Bike Plan	Town Board of Commissioners & [future] Bike & Ped Plan Coordinator	VZTF	This plan should be updated by 2027 (about five years from adoption). If many projects and programs have been completed by then, a new set of priorities should be established. If not, a new implementation strategy should be established, potentially reassigning project priorities.	2027

Table 5.1 Implementation Action Steps, continued

#	TASK	LEAD	SUPPORT	DETAILS	PHASE
	INFRASTRUCTURE, POLICY, AND FUNDING ACTION STEPS (CONTINUED)				
6	Ensure that Pedal Moore(sville) Bike Plan recommendations are implemented as part of new development.	[future] Bike & Ped Plan Coordinator	Designated staff from Planning & Community Development Services, Public Works, Engineering departments	Other town documents and maps should be updated with recommendations from Pedal Moore(sville), to ensure bicycle facilities are implemented with new development. Consider updates to the development standards to better support bicycling and bicycle parking standards (refer to the recommendations in the Policy Review).	2022
7	Ensure that projects are incorporated in NCDOT's prioritization process and in the future planning of the NCDOT Planning Branch	[future] Bike & Ped Plan Coordinator	CRTPO, NCDOT Division 12, and NCDOT Planning Branch	The Town of Mooresville, CRTPO, and NCDOT Division 12 should coordinate to fund recommendations from this plan over time. Use the plan cut-sheets and recommendation maps to communicate project details and to submit projects for funding. The Town will need to be prepared to match at least 20% of their submitted project totals. Projects that have secured public right-of-way and design completed (or at least underway) will be more competitive.	2022 onward
8	Seek multiple funding sources and facility development options.	[future] Bike & Ped Plan Coordinator	VZTF (for potential grant writing assistance, funding research, letters of support, etc.)	It will be necessary to consider many different sources of funding that together will support plan implementation. Funding sources can be used for a variety of activities, including: programs, planning, design, implementation, and maintenance. The following section in this chapter outlines the most likely sources of funding from the federal, state, and local government levels as well as from the private and non-profit sectors.	2022 onward
9	Develop a long-term funding strategy.	[future] Ped + Bike Plan Coordinator & departmental leads	Town Board of Commissioners	To allow continued development of the project recommendations, capital funds for bicycle facility construction should be set aside every year. Funding for an ongoing maintenance program should also be included in the Town's operating budget. Consider incorporating Pedal Moore(sville) recommendations into a multi-year bond package for the Town of Mooresville, along with other initiatives, such as with projects related to parks, recreation, and transportation improvements.	2022 onward
10	Convene a staff Street Retrofit Committee quarterly	Engineering/ P&CD	Planning and Community Development, Public works, street maintenance, others as needed	Evaluate and implement low hanging fruit multi-modal street improvements with street resurfacing, signage and markings changes, and minor concrete work.	2022

Table 5.1 Implementation Action Steps, continued

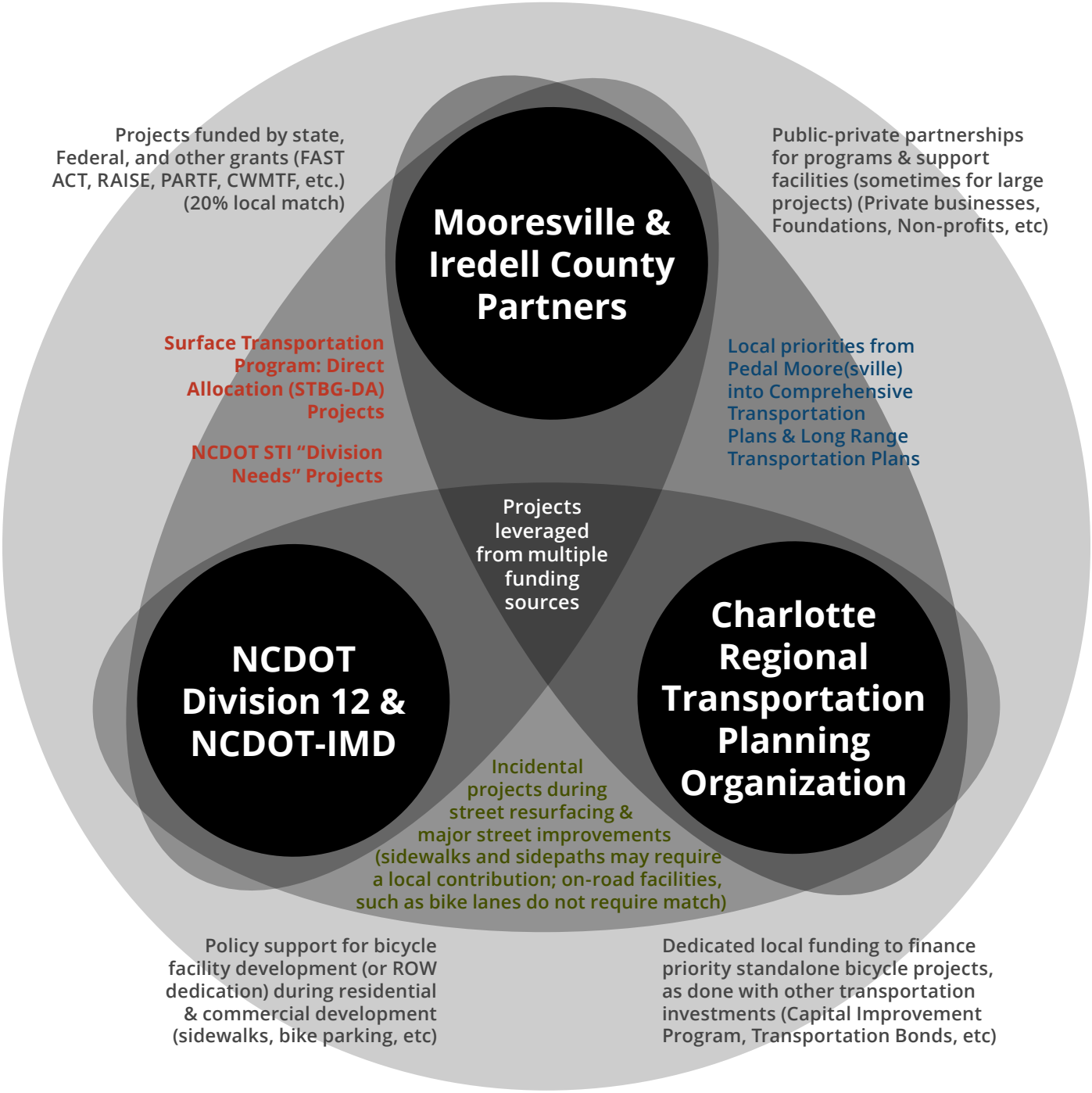
#	TASK	LEAD	SUPPORT	DETAILS	PHASE
	INFRASTRUCTURE, POLICY, AND FUNDING ACTION STEPS (CONTINUED)				
11	Begin Priority Projects	[future] Bike & Ped Plan Coordinator	Town Board of Commissioners, departmental leads, private contractors	Dedicate funding, seek proposals, and hire a contractor for a site survey, construction documents, and permitting. Confirm that the project can be designed completely within existing public right-of-way, and secure easements if needed. When design is complete, select a phase of the project to be constructed first, based on costs and funding available at that stage. Send the project out to bid, select a contractor, and begin work. See typical project development cycle later in this chapter.	2022 onward
12	Invest in staff training opportunities related to pedestrian and bicycle infrastructure.	Town Board of Commissioners	[future] Bike & Ped Plan Coordinator & departmental leads	Consider trainings from the National Association of City Transportation Officials (NACTO) on the Urban Bikeway Design Guide. These trainings can be customized for Mooresville staff, helping to ensure that as new facilities are designed and constructed, they are up to world-class standards for safety and functionality. If Mooresville hosts the workshop, they could strategically invite NCDOT division staff, CRTPO staff, and others who would be partners in implementation. Cost sharing for the training could come from participation of staff from neighboring municipalities. More info: https://nacto.org/training-and-workshops/	Training would be most beneficial before design phase of major projects
13	Maintain bicycle facilities.	Designated staff from Public Works and Parks & Recreation	VZTF & General Public (for reporting maintenance needs); NCDOT	Mooresville should define a maintenance plan, budget, and schedule for existing and future bicycle facilities, pavement markings, and greenways, working with NCDOT where necessary.	2022 onward
14	Expand bicycle recreation opportunities in our parks	Parks and Recreation	Planning, Mooresville Visitors Bureau Community Partners	Implement additions to the Mazeppa Park Mountain Bike Trail, investigate a paved pump track at Mazeppa, and beginner pump track at Bellingham Park	2023
15	Coordinate with NCDOT Division 12 on their 3-year road resurfacing schedule (and any short term changes to it) to accomplish projects that require pavement markings.	[future] Bike & Ped Plan Coordinator & Designated staff from Public Works & Engineering	NCDOT Division 12	Resurfacing is a very important opportunity for implementing bike facilities, especially ones that are primarily pavement markings. It is essential for implementation that the Town stay in close touch with NCDOT Division 12 Operations and Maintenance staff to stay on top of the resurfacing schedule and keep closely abreast of any updates or changes to the schedule. Checking in with the Division at least once every quarter is not too often. Additionally, a VZTF representative could be assigned to reviewing the three-year resurfacing/restriping schedule from Division 12 on a regular basis to ensure there are no missed opportunities.	2022 onward

Table 5.1 Implementation Action Steps, continued

#	TASK	LEAD	SUPPORT	DETAILS	PHASE
PROGRAM ACTION STEPS					
16	Develop a National Bike Month Program	Parks and Recreation	Planning and Community Development, Community Partners	Use guidance from the League of American Bicyclists to develop a National Bike Month calendar of events in the community.	2023
17	Continue efforts to provide safe routes to school	Town of Mooresville	Mooresville Graded and Iredell-Statesville School Districts; NCDOT IMD	This effort will complement the objectives and priorities of Pedal Moore(sville). Additionally, NCDOT is looking to ways to continue some Safe Routes to School (SRTS) funding; coordinate with NCDOT-IMD regarding any future opportunities for SRTS funding.	2022 onward
18	Launch new programs.	[future] Bike & Ped Plan Coordinator & VZTF	NCDOT IMD, Mooresville Police Dept., Mooresville Graded and Iredell-Statesville School & Iredell County Health Department, public health advocates	These groups should coordinate to launch new programs, as described in Chapter 4, such as launching a safety campaign, developing a map or mobile app with bike routes, hosting an "open streets" event, and pursuing some form of greenways signage and wayfinding program. Pedal Moore(sville) Steering Committee members could also be called upon for program involvement.	Most feasible to begin programs after a VZTF is formed
19	Distribute bicycle safety information.	VZTF	NCDOT IMD, Police Department	NCDOT has print material with safety tips for motorists, bicyclists and pedestrians available for download at https://www.watchformenc.org/program-materials/. Other methods of distribution could include web sites, social media, and 'on-the-ground' in park kiosks. The Watch for Me NC program is another resource for this task (with more information at https://www.watchformenc.org/).	2022
20	Implement Learn to Ride programming	Parks and Recreation	Police	Provide a Learn to Ride program through Mooresville Parks and Recreation that is open to the public which allows families to come and have their children (or parents!) learn to ride in a safe environment that day.	2023
21	Add mountain biking skills courses to Parks Programming	Parks and Recreation		Partner with mtb skills instructors to offer mountain biking course at Mazeppa Park.	2023
22	Plan for Bicycle Parking in Downtown	Planning and Community Development, Downtown Association	Public Works, Parks and Recreation Engineering	Identify locations in the downtown core where bicycle parking can be implemented in the public right of way and install it. Identify private business partners where bicycle parking can be added.	2023
23	Conduct a comprehensive greenway study	Planning and Community Development,	Public Works, Parks and Recreation Engineering	Refine greenway alignment recommendations and develop planning-level cost estimates in order to identify and pursue funding opportunities.	2023

Funding Opportunities

Typical Project Funding Partners and Methods



FACILITY DEVELOPMENT METHODS

NCDOT STRATEGIC TRANSPORTATION INVESTMENTS (STI)

The NCDOT's State Transportation Improvement Program is based on the Strategic Transportation Investments Bill, signed into law in 2013. The Strategic Transportation Investments (STI) Initiative introduces the Strategic Mobility Formula, a new way to fund and prioritize transportation projects. See the appendix for more information.

RESIDENTIAL AND COMMERCIAL DEVELOPMENT

The construction of bicycle facilities, trails, greenways, and safe crosswalks should be required during development. Construction of facilities that corresponds with site construction is more cost-effective than retrofitting. In commercial development, emphasis should also be focused on safe bicyclist access into, within, and through large parking lots. This ensures the future growth of the bicycle networks and the development of safe communities.

ROADWAY CONSTRUCTION

Bicyclists should be accommodated any time a new road is constructed or an existing road is reconstructed. In the longer-term, all new roads with moderate to heavy motor vehicle traffic should have bicycle facilities and safe intersections. Also, case law surrounding the Americans with Disabilities Act (ADA) has found that roadway resurfacing constitutes an alteration, which requires the addition of curb ramps at intersections where they do not yet exist.

REPAVING

Repaving projects provide a clean slate for revising pavement markings. When a road is repaved, the roadway should be restriped to provide space for bike lanes and shoulders, where feasible. In addition, if the spaces on the sides of non-curb and gutter streets have relatively level grades and few obstructions, the total pavement width can be widened to include paved shoulders, though this will likely require a local contribution. NCDOT provides three-year plans that include resurfacing schedules. Please see the following website: https://connect.ncdot.gov/resources/Asset-Management/HMIP-Plans/Pages/HMIP.aspx.

BRIDGE CONSTRUCTION OR REPLACEMENT

Provisions should always be made to include bicycling facilities (and pedestrian facilities) as a part of vehicular bridges. See NCDOT's "List of Bridges and Current Status": https://www.ncdot.gov/initiatives-policies/Transportation/bridges/Pages/default.aspx. Even though bridge construction and replacement does not occur regularly, it is important to consider these policies for long-term bicycle planning.

CITY EASEMENTS

Mooresville should continue to revise existing utility easements to accommodate public access greenway trail facilities. Adopting policy language to allow for public access for trail users, as a matter of right, on all new sewer and utility easements would greatly enhance the development of greenways. Sewer easements are very commonly used for this purpose, offering cleared and graded corridors that easily accommodate trails. This approach avoids the difficulties associated with acquiring land, and it better utilizes the Town's resources.

Typical Project Development Process

These are the steps typically involved in bicycle facility development, when the project is being built independent of other major development or roadway projects. Certain funding sources may have additional requirements, and some steps may occur simultaneously or in a different order.

The Infrastructure Investment and Jobs Act (IIJA)

(also known as the Bipartisan Infrastructure Bill)

The following is a preliminary summary of how IIJA may affect funding sources related to bicycle, pedestrian, and trail infrastructure based on what is known at the time this plan was written (late 2021).

FORMULA FUNDS (STATE DOTS ADMINISTER TO LOCALS)

TRANSPORTATION ALTERNATIVES PROGRAM (TAP)

TAP funding will increase from $850 million to $1.44 billion per year. This is the largest dedicated source of funds for walking and biking projects in the US and it just got 70% bigger. The North Carolina Department of Transportation (NCDOT) administers this funding for rural areas of the state that do not have a metropolitan planning organization.

Charlotte Regional Transportation Planning Organization (CRTPO) administers Transportation Alternatives Program funding on a competitive basis to local jurisdiction in the Iredell County, Mecklenburg County, and western Union County area.

CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM (CMAQ)

CMAQ funding will increase by 10% to $13.2B. This program funds interchange improvements, local transit operations, and bike and pedestrian infrastructure to help meet the National Ambient Air Quality Standard in non-attainment areas. Each project is evaluated to quantify its air quality improvement benefits. Funds cannot be used to add capacity for single-occupancy vehicles. NCDOT distributes funding to non-attainment areas by population and weighted by air quality severity.

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

States where more than 15% of all fatalities involve cyclists or pedestrians (Vulnerable Road Users or VRU), will be required to spend 15% of their Highway Safety Improvement Program (HSIP) funding on bicycle/pedestrian projects. Projects are evaluated, prioritized, and selected at the NCDOT district level based on three years of crash data (targeted funds) or systemic approved projects as outlined in the HSIP guidance.

Every state and MPO will be required to use at least 2.5% of its apportioned funding to develop planning documents that can include but are not limited to, Complete Streets standards, a Complete Streets prioritization plan, multimodal corridor studies, or active transportation plans (among other uses).

FOR MORE INFORMATION on these programs, check with CRTPO staff.

DISCRETIONARY GRANTS (US DOT ADMINISTERS TO LOCALS)

REBUILDING AMERICAN INFRASTRUCTURE WITH SUSTAINABILITY AND EQUITY (RAISE)

In the first RAISE grant cycle, nearly one in five funded grant applications involved trail development. In addition, the selection committee awarded another 21% of funding to projects focused on making roads safer for vulnerable road users like cyclists and pedestrians. The Lake Loop and other greenway projects might compete well for the RAISE program with a focus on connecting people to local and regional destinations.

Under the Infrastructure Investment and Jobs Act (IIJA), the RAISE grant program will have $7.5 billion available over the next five years. Competitive applications to this program have the following in common:

1. The project can demonstrate broad community support and is a recognized local or regional priority.
2. The project explicitly considers how it will address climate change and racial equity.
3. The project documents direct and significantly favorable local or regional impact relative to the scoring criteria:
    - Safety
    - Environmental Sustainability
    - Quality of Life
    - Economic Competitiveness
    - State of Good Repair
    - Innovation
    - Partnership
4. The project has a high benefit to cost ratio.
5. The project demonstrates readiness by providing a detailed scope of work and budget, a realistic project delivery schedule, an understanding of the environmental risks, permit requirements, and mitigation measures, and is within the public right-of-way.
6. A United States Senator or Congress member actively champions the project.

For more information on RAISE program guidelines and upcoming Notice of Funding Opportunities, see:

www.transportation.gov/RAISEgrants

HEALTHY STREETS PROGRAM

This new program is a $500 million federal grant program to fund projects that address urban heat island effect, to include porous pavement changes and improvements to the tree canopy, especially along pedestrian walkways and public transit stops.

ACTIVE TRANSPORTATION INFRASTRUCTURE INVESTMENT PROGRAM

This is another new program through which local, regional, state, and tribal governments can apply to the program to receive funding for active transportation projects and planning grants that build upon a local/regional/state network or network spine. The projects and planning efforts have to account for safety and facilitate more people walking and biking.

SAFE STREETS AND ROADS FOR ALL

With $6 billion, this new federal grant program will fund Vision Zero plans, infrastructure, and programs.

US DOT is developing grant program guidelines and will publish Notices of Funding Opportunities (NOFO) as they become available for each of the programs above.

When considering possible funding sources for bicycle and pedestrian projects, it is important to remember that not all construction activities or programs will be accomplished with a single funding source. It will be necessary to consider several sources of funding that together will support full project completion. Funding sources can be used for a variety of activities, including: programs, planning, design, implementation, and maintenance. This section outlines the most likely sources of funding from the federal, state, and local government levels as well as from the private and non-profit sectors.

Note that this reflects the funding available at the time of writing. Funding amounts, cycles, and the programs themselves may change over time.

Federal Funding Sources

AMERICAN RESCUE PLAN ACT (ARPA)

Funding Agency: Various Federal agencies including USDA; Consumer Product Safety Fund; Elementary and Secondary School Emergency Relief Fund; EPA; CDC; FEMA; PPP; Veterans Health Administration

Match: 0%

Description: The Coronavirus State and Local Fiscal Recovery Funds provide substantial flexibility for each government to meet local needs—including support for households, small businesses, impacted industries, essential workers, and the communities hardest hit by the crisis. These funds can also be used to make necessary investments in water, sewer, and broadband infrastructure.

Source: https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/state-and-local-fiscal-recovery-funds

GREAT AMERICA OUTDOORS ACT (GAOA)

Funding Agency: National Park Service; US Fish and Wildlife Service; Bureau of Land Management; Bureau of Indian Education; US Forest Service

Match: 0%

Description: This legislation will use revenues from energy development to provide needed maintenance for critical facilities and infrastructure in our national parks, forests, wildlife refuges, recreation areas, and American Indian schools. It will also use royalties from offshore oil and natural gas to permanently fund the Land and Water Conservation Fund to invest in conservation and recreation opportunities across the country.

Source: https://www.nps.gov/subjects/legal/great-american-outdoors-act.htm

INFRASTRUCTURE INVESTMENT AND JOBS ACT (PENDING CONGRESS)

Funding Agency: Various government agencies

Match: 0%

Description: The fund will rebuild the nation's deteriorating roads and bridges and fund new climate resilience and broadband initiatives such as modernizing the nation's power grid, repairing and replacing aging public works proj-

ects, moving communities vulnerable to climate change, reconnect communities divided by highway construction, improve access to running water in tribal and Alaska Native communities, restore lakes across the country, provide funding for Amtrak, provide more funding for programs intended to provide safe commutes for pedestrians, reduce collisions between vehicles and wildlife, clean up drinking water by removing lead-contaminated pipes, and reserve at least $25 million per year for "small and disadvantaged communities."

Source: https://www.congress.gov/bill/117th-congress/house-bill/3684

BUILDING RESILIENT INFRASTRUCTURE AND COMMUNITIES

Funding Agency: Federal Emergency Management Agency (FEMA)

Match: Contextually dependent

Description: Building Resilient Infrastructure and Communities (BRIC) will support states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards.

The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.

Source: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

ENVIRONMENTAL PROTECTION AGENCY FLOOD MITIGATION ASSISTANCE PROGRAM (FMA)

Funding Agency: Federal Emergency Management Agency (FEMA)

Match: 0%

Description: FMA is a competitive grant program that provides funding to states, local communities, federally recognized tribes, and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. FEMA requires state, local, tribal, and territorial governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation assistance projects.

Source: https://www.ncdps.gov/our-organization/emergency-management/disaster-recovery/hazard-mitigation/non-disaster-grants

UNITED STATES DEPARTMENT OF AGRICULTURE HEALTHY FORESTS RESERVE PROGRAM (HFRP)

Funding Agency: USDA Natural Resources Conservation Service

Match: 0%

Description: HFRP helps landowners restore, enhance and protect forestland resources on private lands through easements and financial assistance. HRFP aids the recovery of endangered and threatened species under the Endangered Species Act, improves plant and animal biodiversity and enhances

carbon sequestration. Land enrolled in HFRP easements must be privately owned or owned by Indian tribes and restore, enhance or measurably increase the recovery of threatened or endangered species, improve biological diversity, or increase carbon storage.

Source: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/forests/

UNITED STATE DEPARTMENT OF AGRICULTURAL CONSERVATION EASEMENT PROGRAM (ACEP)

Funding Agency: USDA Natural Resources Conservation Service

Match: 17%

Description: ACEP helps landowners, land trusts, and other entities protect, restore, and enhance wetlands, grasslands, and working farms and ranches through conservation easements. Land protected by agricultural land easements protect the long-term viability of the nation's food supply by preventing conversion of productive working lands to non-agricultural uses, and provides additional public benefits, including environmental quality, historic preservation, wildlife habitat and protection of open space.

Source: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/nc/programs/easements/acep/?cid=stelprdb1249510

REBUILDING AMERICAN INFRASTRUCTURE WITH SUSTAINABILITY AND EQUITY (RAISE)

Funding Agency: U.S Department of Transportation (USDOT)

Match: 20%

Description: RAISE provides an opportunity for DOTs to invest in road, rail, transit and port projects that promise to achieve national objectives. RAISE grants are for capital investments in surface transportation infrastructure and are to be awarded on a competitive basis for projects that will have a significant local or regional impact.

Source: https://www.transportation.gov/RAISEgrants

INFRASTRUCTURE FOR REBUILDING AMERICA

Funding Agency: U.S Department of Transportation (USDOT)

Match: 20%

Description: These grants advance the priorities of rebuilding America's infrastructure and creating jobs by funding highway and rail projects of regional and national economic significance. NFRA grants are selected based on several criteria: how they would improve local economies, create jobs, and meet all statutory requirements, and how they would address climate change, environmental justice, and racial equity.

Source: https://www.transportation.gov/buildamerica/financing/infra-grants/infrastructure-rebuilding-america

COMMUNITY DEVELOPMENT BLOCK GRANTS (CDBG)

Funding Agency: US Department of Housing and Urban Development

Match: 0%

Description: CDBG provides annual grants on a formula basis to states, cities, and counties to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low- and moderate-income persons.

Source: https://www.hudexchange.info/programs/cdbg/

FEDERAL LANDS ACCESS PROGRAM (FLAP)

Funding Agency: U.S. Federal Highway Administration (FHWA)

Match: 20%

Description: FLAP was established to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands. FLAP supplements State and local resources for public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators.

Source: https://highways.dot.gov/federal-lands/programs-access

TRANSPORTATION ALTERNATIVES SET-ASIDE (TA)

Funding Agency: U.S. Federal Highway Administration (FHWA)

Match: 20%

Description: TA provides funding for projects and activities defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation, trails that serve a transportation purpose, and safe routes to school projects.

Source: https://www.fhwa.dot.gov/fastact/factsheets/transportationalternativesfs.cfm

SURFACE TRANSPORTATION BLOCK GRANT (STBG)

Funding Agency: U.S. Federal Highway Administration (FHWA)

Match: 5%

Description: STBG provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.

Source: https://www.fhwa.dot.gov/specialfunding/stp/

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

Funding Agency: U.S. Federal Highway Administration (FHWA)

Match: 0%

Description: The HSIP is a core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance.

Source: https://safety.fhwa.dot.gov/hsip/

NATIONAL HIGHWAY PERFORMANCE PROGRAM (NHPP)

Funding Agency: U.S. Federal Highway Administration (FHWA)

Match: 20%

Description: The NHPP provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS.

Source: https://www.fhwa.dot.gov/fastact/factsheets/nhppfs.cfm

SAFE ROUTES TO SCHOOL (SRTS) PROGRAM

Funding Agency: U.S Department of Transportation (USDOT)

Match: 0%

SRTS enables and encourages children to walk and bike to school. The program helps make walking and bicycling to school a safe and more appealing method of transportation for children. SRTS facilitates the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools. Most of the types of eligible SRTS projects include sidewalks or shared use paths. However, intersection improvements (i.e. signalization, marking/upgrading crosswalks, etc.), on-street bicycle facilities (bike lanes, wide paved shoulders, etc.) or off-street shared use paths are also eligible for SRTS funds.

Source: https://www.transportation.gov/mission/health/Safe-Routes-to-School-Programs

FEDERAL LAND AND WATER CONSERVATION FUND

Funding Agency: State and Local Assistance Programs Division (SLAD)

Match: 50%

Description: The Land and Water Conservation Fund (LWCF) has historically been a primary funding source of the U.S. Department of the Interior for outdoor

recreation development and land acquisition by local governments and state agencies. Over its first 49 years (1965 - 2014), LWCF has provided more than $16.7 billion to acquire new Federal recreation lands as grants to State and local governments.

Over 40,000 grants to states and localities have been approved under the LWCF grants program for acquisition, development and planning of outdoor recreation opportunities in the United States. Grants have supported purchase and protection of 3 million acres of recreation lands and over 29,000 projects to develop basic recreation facilities in every State and territory of the nation.

As of August 2020, the LWCF is now permanently funded by the federal government for $900 million every year. This is hundreds of millions more per year than the fund typically receives.

Source: https://www.nps.gov/subjects/lwcf/stateside.htm

ENVIRONMENTAL CONTAMINATION CLEANUP FUNDING SOURCES

Funding Agency: U.S. Environmental Protection Agency (EPA)

EPA's Brownfields Program provides direct funding for brownfields assessment, cleanup, revolving loans, and environmental job training. EPA's Brownfields Program collaborates with other EPA programs, other federal partners, and state agencies to identify and leverage more resources for brownfields activities. The EPA provides assessment grants to recipients to characterize, assess, and conduct community involvement related to brownfields sites. They also provide Area-wide planning grants (AWP) which provides communities with funds to research, plan, and develop implementation strategies for areas affected by one or more brownfields.

Source: https://www.epa.gov/brownfields

COOPERATIVE ENDANGERED SPECIES CONSERVATION FUND GRANTS

Funding Agency: U.S. Fish and Wildlife Service (USFWS)

Match: 25%

Description: Section 6 of the ESA authorizes the Service to provide federal financial assistance through the Cooperative Endangered Species Conservation Fund (CESCF) to states and territories (states) to support the development and implementation of conservation programs for the benefit of resident listed, candidate, and at-risk species on non-federal lands. This financial assistance, provided in the form of competitive grants and made available through four CESCF grant programs, contributes approximately $51.8 million toward species and habitat conservation annually.

Source: https://www.fws.gov/endangered/grants/

State Funding Sources

There are multiple sources for state funding of bicycle and pedestrian transportation projects. However, beginning July 1, 2015, state transportation funds cannot be used to match federally-funded transportation projects, according to a law passed by the North Carolina Legislature.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) STRATEGIC TRANSPORTATION INVESTMENTS (STI)

Passed in 2013, the Strategic Transportation Investments law (STI) allows NCDOT to use its funding more efficiently and effectively to enhance the state's infrastructure, while supporting economic growth, job creation and a higher quality of life. This process encourages thinking from a statewide and regional perspective while also providing flexibility to address local needs.

STI also establishes the Strategic Mobility Formula, a new way of allocating available revenues based on data-driven scoring and local input. It was used for the first time to develop NCDOT's current construction schedule, the 2016-2025 State Transportation Improvement Program (STIP).

The STIP, which identifies the transportation projects that will receive funding during a 10-year period, is a state and federal requirement. Federal law requires it to be updated at least every four years. NCDOT, however, updates it every two years. Work is currently underway to update the STIP for 2023-2032.

The new Strategic Mobility Formula funds projects in three categories: Division Needs, Regional Impact, and Statewide Mobility. All independent bicycle and pedestrian projects are placed in the "Division Needs" category, and are currently ranked based on 50% data (safety, access, demand, connectivity, and cost effectiveness) and 50% local input, with a breakdown as follows:

Safety 15%

- Definition: Projects or improvements where bicycle or pedestrian accommodations are non-existent or inadequate for safety of users
- How it's measured: Crash history, posted speed limits, and estimated safety benefit
- Calculation:
  - » Bicycle/pedestrian crashes along the corridor within last five years: 40% weight
  - » Posted speed limits, with higher points for higher limits: 40% weight
  - » Project safety benefit, measured by each specific improvement: 20% weight

Access 10%

- Definition: Destinations that draw or generate high volumes of bikes/pedestrians
- How it's measured: Type of and distance to destination

Demand 10%

- Definition: Projects serving large resident or employee user groups
- How its measured: # of households and employees per square mile within 1 ½ mile bicycle or ½ mile pedestrian facility + factor for unoccupied housing units (second homes)

Connectivity 10%

- Definition: Measure impact of project on reliability and quality of network

STI Revenue Distribution (Source: www.ncdot.gov/strategictransportationinvestments)

- How it's measured: Creates score per each Strategic Transportation Investments based on degree of bike/ped separation from roadway and connectivity to similar or better project type

Cost Effectiveness 5%

- Definition: Ratio of calculated user benefit divided by NCDOT project cost
- How it's measured: Safety + Demand + Access + Connectivity)/Estimated Project Cost to NCDOT

Local Input 50%

- Definition: Input from MPO/RPOs and NCDOT Divisions, which comes in the form points assigned to projects.
- How it is measured: Base points + points for population size. A given project is more likely to get funded if it is assigned base points from both the MPO/RPO and the Division, making the need for communicating the importance of projects to these groups critical. Further, projects that have a local match will score higher.

ADDITIONAL BICYCLE PROJECT REQUIREMENTS:

- Federal funding typically requires a 20% non-federal match
- **State law prohibits state match for bicycle and pedestrian projects (except for Powell Bill). Since state law prohibits state monies from being the match for bicycle and pedestrian projects, the Town will need to supply the 20% match from other sources, such as the Town's own funds, matching grants, etc.**
- Limited number of project submittals per MPO/RPO/Division
- Minimum project cost requirement is $100,000
- Bike/Ped projects typically include: bicycle lanes, side path/greenway, paved shoulders, sidewalks, pedestrian signals, SRTS infrastructure projects, and other streetscape/multi-site improvements (such as median refuge, signage, etc.)

These rankings largely determine which projects will be included in NCDOT's State Transportation Improvement Program (STIP). The STIP is a federally mandated transportation planning document that details transportation planning improvements prioritized by the stakeholders for inclusion in NCDOT's Work Program over the next 10 years. "More than 900 non-highway construction projects were prioritized for years 2015-2020, totaling an estimated $9 billion. NCDOT will only have an estimated $1.5 billion to spend during this time period." The STIP is updated every 2 years. The STIP contains funding information for various transportation divisions of NCDOT, including,

highways, rail, bicycle and pedestrian, public transportation and aviation.

For more information on STIP: www.ncdot.gov/initiatives-policies/Transportation/stip/Pages/default.aspx

To access the STIP: connect.ncdot.gov/projects/planning/Pages/State-Transportation-Improvement-Program.aspx

For more about the STI process: www.ncdot.gov/initiatives-policies/Transportation/stip/Pages/strategic-transportation-investments.aspx

INCIDENTAL PROJECTS

Bicycle accommodations, such as bike lanes, wide paved shoulders, , intersection improvements, bicycle safe bridge design, etc., are frequently included as "incidental" features of larger highway/roadway projects. This is increasingly common with the adoption of NCDOT's "Complete Streets" Policy.

In addition, bicycle safe drainage grates and handicapped accessible sidewalk ramps are now a standard feature of all NCDOT highway construction. Most pedestrian safety accommodations built by NCDOT are included as part of scheduled highway improvement projects funded with a combination of federal and state roadway construction funds, and usually with a local match. On-road bicycle accommodations, if warranted, typically do not require a local match.

"Incidental Projects" are often constructed as part of a larger transportation project, when they are justified by local plans that show these improvements as part of a larger, multi-modal transportation system. Having a local bicycle or pedestrian plan is important, because it allows NCDOT to identify where bike and pedestrian improvements are needed, and can be included as part of highway or street improvement project. It also helps local government identify what their priorities are and how they might be able to pay for these projects. Under "Complete Streets" local governments may be responsible for a portion of the costs for bicycle and pedestrian projects.

DUKE ENERGY WATER RESOURCES FUND

Duke Energy is investing $10 million in a fund for projects that benefit waterways in the Carolinas. The fund supports science-based, research-supported projects and programs that provide direct benefit to at least one of the following focus areas:

- Improve water quality, quantity and conservation;
- Enhance fish and wildlife habitats;
- Expand public use and access to waterways; and
- Increase citizens' awareness about their roles in protecting these resources.

Mooresville could consider this resource for its proposed creekside greenways. For more information: www.nccommunityfoundation.org/apply/grants/corporate-grantmaking-programs/duke-energy-water-resources-fund

CLEAN WATER MANAGEMENT TRUST FUND

The Clean Water Management Trust Fund is available to any state agency, local government, or non-profit whose primary purpose is

the conservation, preservation, and restoration of North Carolina's environmental and natural resources. Grant assistance is provided to conservation projects that:

- enhance or restore degraded waters;
- protect unpolluted waters, and/or
- contribute toward a network of riparian buffers and greenways for environmental, educational, and recreational benefits;
- provide buffers around military bases to protect the military mission;
- acquire land that represents the ecological diversity of North Carolina; and
- acquire land that contributes to the development of a balanced State program of historic properties.

The application deadline is typically in February. For more information: nclwf.nc.gov/grants

SPOT SAFETY PROGRAM

The Spot Safety Program is a state funded public safety investment and improvement program that provides highly effective low cost safety improvements for intersections, and sections of North Carolina's 79,000 miles of state maintained roads in all 100 counties of North Carolina. The Spot Safety Program is used to develop smaller improvement projects to address safety, potential safety, and operational issues. The program is funded with state funds and currently receives approximately $9 million per state fiscal year. Other monetary sources (such as Small Construction or Contingency funds) can assist in funding Spot Safety projects, however, the maximum allowable contribution of Spot Safety funds per project is $250,000.

The Spot Safety Program targets hazardous locations for expedited low cost safety improvements such as traffic signals, turn lanes, improved shoulders, intersection upgrades, positive guidance enhancements (rumble strips, improved channelization, raised pavement markers, long life highly visible pavement markings), improved warning and regulatory signing, roadside safety improvements, school safety improvements, and safety appurtenances (like guardrail and crash attenuators).

A Safety Oversight Committee (SOC) reviews and recommends Spot Safety projects to the Board of Transportation (BOT) for approval and funding. Criteria used by the SOC to select projects for recommendation to the BOT include, but are not limited to, the frequency of correctable crashes, severity of crashes, delay, congestion, number of signal warrants met, effect on pedestrians and schools, division and region priorities, and public interest. For more information: connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx

POWELL BILL FUNDS

Annually, State street-aid allocations (Powell Bill Funds) are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways. Beginning July 1, 2015 under the Strategic Transportation Investments initiative,

Powell Bill funds may no longer be used to provide a match for federal transportation funds such as Transportation Alternatives. Certified Statement, street listing, add/delete sheet and certified map from all municipalities are due between July 1st and July 21st of each year. Additional documentation is due shortly after. More information: connect.ncdot.gov/municipalities/State-Street-Aid/Pages/default.aspx

HIGHWAY HAZARD ELIMINATION PROGRAM

The Hazard Elimination Program is used to develop larger improvement projects to address safety and potential safety issues. The program is funded with 90 percent federal funds and 10 percent state funds. The cost of Hazard Elimination Program projects typically ranges between $400,000 and $1 million. A Safety Oversight Committee (SOC) reviews and recommends Hazard Elimination projects to the Board of Transportation (BOT) for approval and funding. These projects are prioritized for funding according to a safety benefit to cost (B/C) ratio, with the safety benefit being based on crash reduction. Once approved and funded by the BOT, these projects become part of the department's State Transportation Improvement Program (STIP). For more information: connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx

GOVERNOR'S HIGHWAY SAFETY PROGRAM

The Governor's Highway Safety Program (GHSP) funds safety improvement projects on state highways throughout North Carolina. All funding is performance-based. Substantial progress in reducing crashes, injuries, and fatalities is required as a condition of continued funding. This funding source is considered to be "seed money" to get programs started. The grantee is expected to provide a portion of the project costs and is expected to continue the program after GHSP funding ends. State Highway Applicants must use the web-based grant system to submit applications. For more information: www.ncdot.gov/initiatives-policies/safety/ghsp/Pages/default.aspx

THE NORTH CAROLINA DIVISION OF PARKS AND RECREATION – RECREATIONAL TRAILS AND ADOPT-A-TRAIL GRANTS

The North Carolina Division of Parks and Recreation and the State Trails Program offer funds to help citizens, organizations and agencies plan, develop and manage all types of trails ranging from greenways and trails for hiking, biking, and horseback riding to river trails and off-highway vehicle trails. "The Adopt-a-Trail Grant Program (AAT) awards $108,000 annually to government agencies, nonprofit organizations and private trail groups for trail projects. The Recreational Trails Program (RTP) is a $1.3 million grant program funded by Congress with money from the federal gas taxes paid on fuel used by off-highway vehicles. Grant applicants must be able to contribute 20% of the project cost or in-kind contributions. Both grant applications are typically due in January or February. For more information: trails.nc.gov/trail-grants

NC PARKS AND RECREATION TRUST FUND (PARTF)

The Parks and Recreation Trust Fund (PARTF) provide dollar-for-dollar matching grants to local governments for parks and recreational projects to serve the general public. Counties, incorporated municipalities, and public authorities, as defined by G.S. 159-7, are eligible applicants. A local government can request a maximum of $500,000 with each application. An applicant must match the grant dollar-for-dollar, 50 percent of the total cost of the project, and may contribute more than 50 percent. The appraised value of land to be donated to the applicant can be used as part of the match. The value of in-kind services, such as volunteer work, cannot be used as part of the match. Grant applications are typically due in February. For more information: www.ncparks.gov/more-about-us/parks-recreation-trust-fund/parks-and-recreation-trust-fund

COMMUNITY DEVELOPMENT BLOCK GRANT FUNDS

Community Development Block Grant (CDBG) funds are available to local municipal or county governments that qualify for projects to enhance the viability of communities by providing decent housing and suitable living environments and by expanding economic opportunities, principally for persons of low and moderate income. State CDBG funds are provided by the U.S. Department of Housing and Urban Development (HUD) to the state of North Carolina. All North Carolina small cities are eligible to apply for funds except for 23 entitlement cities that receive funds directly from the U.S. Department of Housing and Urban Development (HUD) (Mooresville does not receive direct funds, so it is eligible to apply). Each year, CDBG provides funding to local governments for hundreds of critically-needed community improvement projects throughout the state. More information: www.nccommerce.com/grants-incentives

CLEAN WATER MANAGEMENT TRUST FUND (CWMTF)

This fund was established in 1996 and has become one of the largest sources of money in North Carolina for land and water protection, eligible for application by a state agency, local government, or non-profit. At the end of each year, a minimum of $30 million is placed in the CWMTF. The revenue of this fund is allocated as grants to local governments, state agencies, and conservation non-profits to help finance projects that specifically address water pollution problems. Funds may be used for planning and land acquisition to establish a network of riparian buffers and greenways for environmental, educational, and recreational benefits. Deadlines are typically in February. For more information: nclwf.nc.gov/#appmain.htm

SAFE ROUTES TO SCHOOL (SRTS)

SRTS is managed by NCDOT, but is federally funded; See Federal Funding Sources above for more information.

URBAN AND COMMUNITY FORESTRY GRANT

The North Carolina Division of Forest Resources Urban and Community Forestry grant can provide funding for a variety of projects that will help toward planning and establishing street trees as well as trees for urban open space. The goal is to improve public understanding of the benefits of preserving existing tree cover in communities and assist local governments with projects which will lead to a more effective and efficient management of urban and community forests. Grant requests should range between $1,000 and $15,000 and must be matched equally with non-federal funds. Grant funds may be awarded to any unit of local or state government, public educational institutions, approved non-profit 501(c)(3) organizations, and other tax-exempt organizations. First time municipal applicant and municipalities seeking Tree City USA status are given priority for funding. Grant applications are due by March 31 at 5:00 pm and recipients are notified by mid-July each year.

For more about Tree City USA status, including application instructions, visit: www.ncforestservice.gov/Urban/urban_grant_program.htm

Local Government Funding Sources

Municipalities often plan for the funding of pedestrian and bicycle facilities or improvements through development of Capital Improvement Program (CIP) or occasionally, through their annual Operating Budgets. In Raleigh, for example, the greenways system has been developed over many years through a dedicated source of annual funding that has ranged from $100,000 to $500,000, administered through the Recreation and Parks Department. CIPs should include all types of capital improvements (water, sewer, buildings, streets, etc.) versus programs for single purposes. This allows municipal decision-makers to balance all capital needs. Typical capital funding mechanisms include the capital reserve fund, capital protection ordinances, municipal service district, tax increment financing, taxes, fees, and bonds. Each category is described below. A variety of possible funding options available to North Carolina jurisdictions for implementing pedestrian and bicycle projects are also described below. However, many will require specific local action as a means of establishing a program, if not already in place.

CAPITAL RESERVE FUND

Municipalities have statutory authority to create capital reserve funds for any capital purpose, including pedestrian facilities. The reserve fund must be created through ordinance or resolution that states the purpose of the fund, the duration of the fund, the approximate amount of the fund, and the source of revenue for the fund. Sources of revenue can include general fund allocations, fund balance allocations, grants, and donations for the specified use.

CAPITAL PROJECT ORDINANCES

Municipalities can pass Capital Project Ordinances that are project specific. The ordinance identifies and makes appropriations for the project.

LOCAL IMPROVEMENT DISTRICT (LID)

Local Improvement Districts (LIDs) are most often used by cities to construct localized projects such as streets, sidewalks, or bikeways. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as traffic trip generation.

MUNICIPAL SERVICE DISTRICT

Municipalities have statutory authority to establish municipal service districts, to levy a property tax in the district additional to the town-wide property tax, and to use the proceeds to provide services in the district. Downtown revitalization projects are one of the eligible uses of service districts, and can include projects such as street, sidewalk, or bikeway improvements within the downtown taxing district.

TAX INCREMENT FINANCING

Project Development Financing bonds, also known as Tax Increment Financing (TIF) is a relatively new tool in North Carolina, allowing localities to use future gains in taxes to finance the current improvements that will create those gains. When a public project (e.g., sidewalk improvements) is constructed, surrounding property values generally increase and encourage surrounding development or redevelopment. The increased tax revenues are then dedicated to finance the debt created by the original public improvement project. Streets, streetscapes, and sidewalk improvements are specifically authorized for TIF funding in North Carolina. Tax Increment Financing typically occurs within designated development financing districts that meet certain economic criteria that are approved by a local governing body. TIF funds are generally spent inside the boundaries of the TIF district, but they can also be spent outside the district if necessary to encourage development within it. Although larger cities use this type of financing more often, Woodfin, NC is an example of another small town that has used this type of financing.

OTHER LOCAL FUNDING OPTIONS

- Bonds/Loans
- Taxes
- Impact fees
- Exactions
- Installment purchase financing
- In-lieu fees
- Partnerships

Private and Non-Profit Funding Sources

Many communities have solicited funding assistance from private foundations and other conservation-minded benefactors. Below are several examples of private funding opportunities available.

LAND FOR TOMORROW CAMPAIGN

Land for Tomorrow is a diverse partnership of businesses, conservationists, farmers, environmental groups, health professionals, and community groups committed to securing support from the public and General Assembly for protecting land, water, and historic places. The campaign was successful in 2013 in asking the North Carolina General Assembly to continue to support conservation efforts in the state. The state budget bill includes about $50 million in funds for key conservation efforts in North Carolina. Land for Tomorrow works to enable North Carolina to reach a goal of ensuring that working farms and forests, sanctuaries for wildlife, land bordering streams, parks, and greenways, land that helps strengthen communities and promotes job growth, and historic downtowns and neighborhoods will be there to enhance the quality of life for generations to come. For more information: www.land4tomorrow.org/

THE ROBERT WOOD JOHNSON FOUNDATION

The Robert Wood Johnson Foundation was established as a national philanthropy in 1972 and today it is the largest U.S. foundation devoted to improving the health and health care of all Americans.

Grant making is concentrated in four areas:

- To ensure that all Americans have access to basic health care at a reasonable cost
- To improve care and support for people with chronic health conditions
- To promote healthy communities and lifestyles
- To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs

Projects considered for funding typically are innovative and aim to create meaningful, transformative change. Project examples include: service demonstrations; gathering and monitoring of health-related statistics; public education; training and fellowship programs; policy analysis; health services research; technical assistance; communications activities; and evaluations. For more specific information about what types of projects are funded and how to apply, visit: www.rwjf.org/en/how-we-work/grants-and-grant-programs.html

NORTH CAROLINA COMMUNITY FOUNDATION

The North Carolina Community Foundation, established in 1988, is a statewide foundation seeking gifts from individuals, corporations, and other foundations to build endowments and ensure financial security for non-profit organizations and institutions throughout the state. Based in Raleigh, the foundation also manages a number of community affiliates throughout North Carolina, that make grants in the areas of human services, education, health, arts, religion, civic affairs, and the conservation and preservation of historical, cultural, and environmental resources. The foundation also manages various scholarship programs statewide. For more information: https://www.nccommunityfoundation.org/

RITE AID FOUNDATION GRANTS

The Rite Aid Foundation is a foundation that supports projects that promote health and wellness in the communities that Rite Aid serves. Award amounts vary and grants are awarded on a one year basis to communities in which Rite Aid operates. The Rite Aid Foundation focuses on three core areas for charitable giving: children's health and well-being; special community health and wellness needs; and Ride Aid's own community of associates during times of special need. Online resource: foundation.riteaid.com/

Z. SMITH REYNOLDS FOUNDATION

This Winston-Salem-based Foundation has been assisting the environmental projects of local governments and non-profits in North Carolina for many years. The Foundation focuses its grant making on five focus areas: Community Economic Development; Environment; Public Education; Social Justice and Equity; and Strengthening Democracy. Deadline to apply is typically in August. For more information: www.zsr.org/grants-programs

BANK OF AMERICA CHARITABLE FOUNDATION, INC.

The Bank of America Charitable Foundation is one of the largest in the nation. There are numerous different initiatives and grant programs, yet the ones most relevant to increased recreational opportunities and trails are the Revitalizing Neighborhoods and Environment Programs. Starting in 2013, a new 10-year, $50 billion goal to be a catalyst for climate change was launched. This initiative aims to spark the "innovation economy and advance a transition to a low-carbon future." For more information: about.bankofamerica.com/en/making-an-impact/find-resources

DUKE ENERGY FOUNDATION

Funded by Duke Energy shareholders, this non-profit organization makes charitable grants to selected non-profits or governmental subdivisions. Each annual grant must have:

- An internal Duke Energy business "sponsor"
- A clear business reason for making the contribution

The grant program has several investment priorities: Education; Environment; Economic and Workforce Development; and Community Impact and Cultural Enrichment. Related to this project, the Foundation would support programs that support conservation, training, and research around environmental and energy efficiency initiatives. For more information: www.duke-energy.com/community/duke-energy-foundation

NATIONAL TRAILS FUND

American Hiking Society created the National Trails Fund in 1998, the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. 73 million people enjoy foot trails annually, yet many of our favorite trails need major repairs due to a $200 million backlog of badly needed maintenance. National Trails Fund grants help give local organizations the resources they need to secure access, volunteers, tools and materials to protect America's

cherished public trails. To date, American Hiking has granted more than $588,000 to 192 different trail projects across the U.S. for land acquisition, constituency building campaigns, and traditional trail work projects. Awards range from $500 to $10,000 per project.

Projects the American Hiking Society will consider include:

- Securing trail lands, including acquisition of trails and trail corridors, and the costs associated with acquiring conservation easements.
- Building and maintaining trails which will result in visible and substantial ease of access, improved hiker safety, and/or avoidance of environmental damage.
- Constituency building surrounding specific trail projects - including volunteer recruitment and support.

For more information: https://americanhiking.org/National-Trails-Fund/

THE CONSERVATION ALLIANCE

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

The Conservation Alliance Funding Criteria are as follows:

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

For more information: http://www.conservation-alliance.com/grants

NATIONAL FISH AND WILDLIFE FOUNDATION (NFWF)

The National Fish and Wildlife Foundation (NFWF) is a private, non-profit, tax exempt organization chartered by Congress in 1984. The National Fish and Wildlife Foundation sustains, restores, and enhances the Nation's fish, wildlife, plants, and habitats. Through leadership conservation investments with public and private partners, the Foundation is dedicated to achieving maximum conservation impact by developing and applying best practices and innovative methods for measurable outcomes.

The Foundation provides grants through more than 70 diverse conservation grant programs. A few of the most relevant programs for bicycle and pedestrian projects include Acres for America, Conservation Partners Program, and Environmental Solutions for Communities. Funding priorities include bird, fish, marine/

coastal, and wildlife and habitat conservation. Other projects that are considered include controlling invasive species, enhancing delivery of ecosystem services in agricultural systems, minimizing the impact on wildlife of emerging energy sources, and developing future conservation leaders and professionals.

For more information: http://www.nfwf.org/whatwedo/grants/Pages/home.aspx

THE TRUST FOR PUBLIC LAND

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the TPL is the only national non-profit working exclusively to protect land for human enjoyment and well-being. TPL helps acquire land and transfer it to public agencies, land trusts, or other groups that have intentions to conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities.

For more information: http://www.tpl.org

BLUE CROSS BLUE SHIELD OF NORTH CAROLINA FOUNDATION (BCBS)

Blue Cross Blue Shield (BCBS) focuses on programs that use an outcome approach to improve the health and well-being of residents. Healthy Places grant concentrates on increased physical activity and active play through support of improved build environment such as sidewalks, and safe places to bike. Eligible grant applicants must be located in North Carolina, be able to provide recent tax forms and, depending on the size of the non-profit, provide an audit. For more information: http://www.bcbsncfoundation.org/

ALLIANCE FOR BIKING & WALKING: ADVOCACY ADVANCE GRANTS

Bicycle and pedestrian advocacy organizations play the most important role in improving and increasing biking and walking in local communities. Rapid Response Grants enable state and local bicycle and pedestrian advocacy organizations to develop, transform, and provide innovative strategies in their communities. Since 2011, Rapid Response grant recipients have won $100 million in public funding for biking and walking. The Advocacy Advance Partnership with the League of American Bicyclists also provides necessary technical assistance, coaching, and training to supplement the grants. For more information, visit www.peoplepoweredmovement.org

LOCAL TRAIL SPONSORS

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

CORPORATE DONATIONS

Corporate donations are often received in the form of liquid investments (i.e. cash, stock, bonds) and in the form of land. Municipalities typically create funds to facilitate and simplify

a transaction from a corporation's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented.

PRIVATE INDIVIDUAL DONATIONS

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

FUNDRAISING/CAMPAIGN DRIVES

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

VOLUNTEER WORK

It is expected that many citizens will be excited about the development of a greenway corridor. Individual volunteers from the community can be brought together with groups of volunteers form church groups, civic groups, scout troops and environmental groups to work on greenway development on special community workdays. Volunteers can also be used for fund-raising, maintenance, and programming needs.

INNOVATIVE FUNDING OPTIONS

Crowdsourcing "is the process of obtaining needed services, ideas, or content by soliciting contributions from a large group of people, and especially from an online community, rather than from traditional employees or suppliers." An example crowdsourcing tool used locally with some success is "ioby", which offers the ability to organize different forms of capital—cash, social networks, in-kind donations, volunteers, advocacy: https://www.ioby.org/about

Bicycle/Trail Partnership Case Studies in the Carolinas

Mooresville may be able to partner with the private sector for funding or sponsorship for some aspects of this plan. Some examples of trail partnerships across the Carolinas are provided below.

WILMINGTON/NEW HANOVER COUNTY & BLUE CROSS BLUE SHIELD (BCBS)

BCBSNC and their GO NC! program donated funds to complete the final phase of the 15-mile Gary Shell CrossCity Trail from Wade Park to the drawbridge at Wrightsville Beach. In addition to completing the trail, other enhancements include mile markers along the 15-mile trail and five bicycle fix-it stations along the trail. This partnership came about during development of the WMPO's Wilmington/New Hanover County Comprehensive Greenway Plan in 2012. http://www.bcbsnc.com/content/campaigns/gonc/index.htm

SPARTANBURG, SC & THE MARY BLACK FOUNDATION

The Mary Black Foundation Rail Trail was a collaboration between the Mary Black Foundation, Palmetto Conservation Foundation, City of Spartanburg, Partners for Active Living, SPATS, and local citizens. It extends from downtown Spartanburg at Henry Street, between Union and Pine Streets, and continues 2 miles to Country Club Road. Since its inception there has been buzz about redeveloping the Rail Trail corridor. The commuter and recreational trail brings together all walks of life, and connects neighborhoods, businesses, restaurants, a school, a bike shop, the YMCA, a grocery store, and a skate park. As the Hub City Connector segment of the Palmetto Trail through Spartanburg County, the Rail Trail is an outdoor transportation spine for Spartanburg from which other projects are expected to spin off. One great example is the first phase of B-cycle bicycle-sharing program located at the Henry Street trailhead. Project contact: Lisa Bollinger, Spartanburg Area Transportation Study, Spartanburg, SC.

SWAMP RABBIT TRAIL AND GREENVILLE HEALTH SYSTEM, GREENVILLE, SC

The Greenville Health System Swamp Rabbit Trail is a shared-use-path that runs along the Reedy River through Greenville County, connecting parks, schools, and local businesses. The GHS Swamp Rabbit has become very popular among residents and visitors for recreational and transportation purposes. The Greenville Heath System has become a private sponsor because of the health benefits offered by the trail as well as the branding opportunity achieved by having its name and logo on the trail's signs. The GHS Swamp Rabbit Trail continues to increase in size and popularity, with communities in neighboring counties making plans to extend the trail into their towns. Project contact: Ty Houck, Greenville County Parks, Recreation and Tourism, Taylors, SC.

Design Guidance Resources

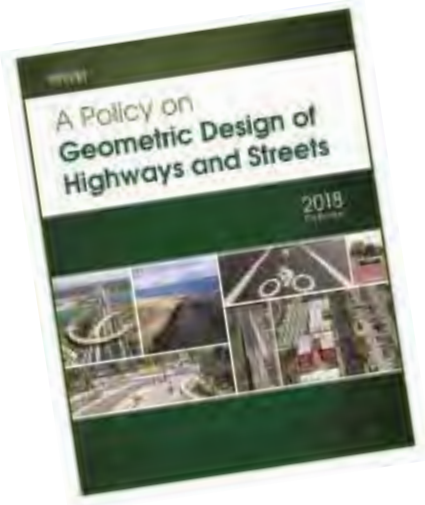
This Design Guidance section presents a toolbox of current design guidance and standards to implement bicycle improvements. It has been developed to complement the Town's Bicycle Plan and reflects other nationally recognized efforts to promote bicycle safety and comfort. The information assembled here is not, however, a substitute for a more thorough evaluation by a professional engineer prior to implementation of facility improvements with considerations to physical, right of way, and other constraints.

National Guidance

NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS' (NACTO) URBAN STREET DESIGN GUIDE

https://nacto.org/publication/urban-street-design-guide/

The National Association of City Transportation Officials' **(NACTO)** *Urban Street Design Guide* **(2013)** is a collection of nationally recognized street design standards, and offers guidance on the current state of the practice designs. This guide provides best practice for streets to serve as not only efficient travel corridors but public spaces, and it includes a toolkit of street design elements with key dimensions and applications.



AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS' (AASHTO) A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS

A Policy on Geometric Design of Highways and Streets **(2018)** provides national guidance on the design of highways and streets. The 7th edition of the "The Green Book" offers an updated framework for geometric design that is more flexible, multimodal, and performance based than in previous editions.

FEDERAL HIGHWAY ADMINISTRATION'S (FHWA) SEPARATED BIKE LANE PLANNING AND DESIGN GUIDE

The *Separated Bike Lane Planning and Design Guide* **(2015)** is the latest national guidance on the planning and design of separated bike lane facilities released by the Federal Highway Administration (FHWA). The resource documents best practices as demonstrated around the U.S., and offers ideas on future areas of research, evaluation and design flexibility.

NACTO URBAN BIKEWAY DESIGN GUIDE

https://nacto.org/publication/urban-bikeway-design-guide/

The NACTO *Urban Bikeway Design Guide* is a publication of nationally recognized bicycle way design, and offers guidance on current state-of-the-practice designs. This guide is based on current practices in the best cycling cities in the world. The intent of the guide is to offer substantive guidance for cities seeking to improve bicycle transportation in places where competing demands for the use of the right of way present unique challenges. All of the NACTO *Urban Bikeway Design Guide* treatments are in use internationally and in many cities around the US.

FHWA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

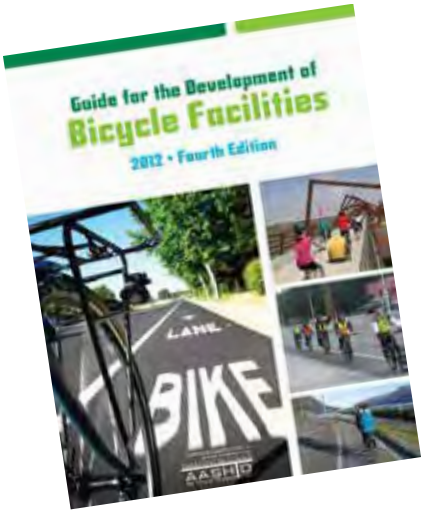
https://mutcd.fhwa.dot.gov/

The *MUTCD* defines the standards used by road managers nationwide to install and maintain traffic control devices on public streets, highways, bikeways, and private roads open to public traffic. The *MUTCD* is the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings.

To further clarify the *MUTCD* standards, the FHWA created a table of contemporary bicycle facilities that lists various bicycle related signs, markings, signals, and other treatments and

identifies their official status (e.g., can be implemented, currently experimental).

Bicycle way treatments not explicitly covered by the *MUTCD* are often subject to experiments, interpretations and official rulings by the FHWA. The *MUTCD* Official Rulings is a resource that allows website visitors to obtain information about these supplementary materials. Copies of various documents (such as incoming request letters, response letters from the FHWA, progress reports, and final reports) are available on this website.



AASHTO GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES

The AASHTO *Guide for the Development of Bicycle Facilities*, updated in June 2012, provides guidance on dimensions, use, and layout of specific bicycle facilities. The standards and guidelines presented by AASHTO provide basic design information, such as minimum shared use pathway widths, bicycle lane dimensions, geometric design, detailed striping requirements and recommended signage and pavement markings.

US DEPARTMENT OF TRANSPORTATION (USDOT) SMALL TOWN AND RURAL MULTIMODAL NETWORKS GUIDE

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/

The *Small Town and Rural Multimodal Networks Guide* translates existing street design guidance and facility types for bicycle and pedestrian safety and comfort for the smaller scale places not addressed in guides such as the NACTO *Street Design Guide* and ITE *Walkable Urban Thoroughfares* report. The guide provides clear examples of how to interpret and apply design flexibility to improve bicycling and walking conditions. This guide pertains in particular to the Municipality of Anchorage as it is comprised of a small urbanized area and large rural area.

The stated goals of the guide include “to provide a bridge between existing guidance

on bicycle and pedestrian design and rural practice, encouraging innovation in the development of safe and appealing networks for bicycling and walking in small towns and rural areas, and to provide examples of peer communities and project implementation that is appropriate for rural communities."

State Guidance

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT):

- WalkBikeNC: The Statewide Pedestrian and Bicycle Plan: https://www.ncdot.gov/bikeped/walkbikenc/default.aspx
- North Carolina Terminology for Active Transportation: https://connect.ncdot.gov/projects/BikePed/Documents/NC%20Terminology%20for%20Active%20Travel.pdf
- NCDOT Complete Streets, including the Complete Streets Planning and Design Guidelines: https://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf
- NC Local Programs Handbook: https://connect.ncdot.gov/municipalities/Funding/Pages/LPM%20Handbook.aspx
- Traditional Neighborhood Development Guidelines: https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Traditional%20Neighborhood%20Development%20Manual.pdf

GREENWAY CONSTRUCTION STANDARDS:

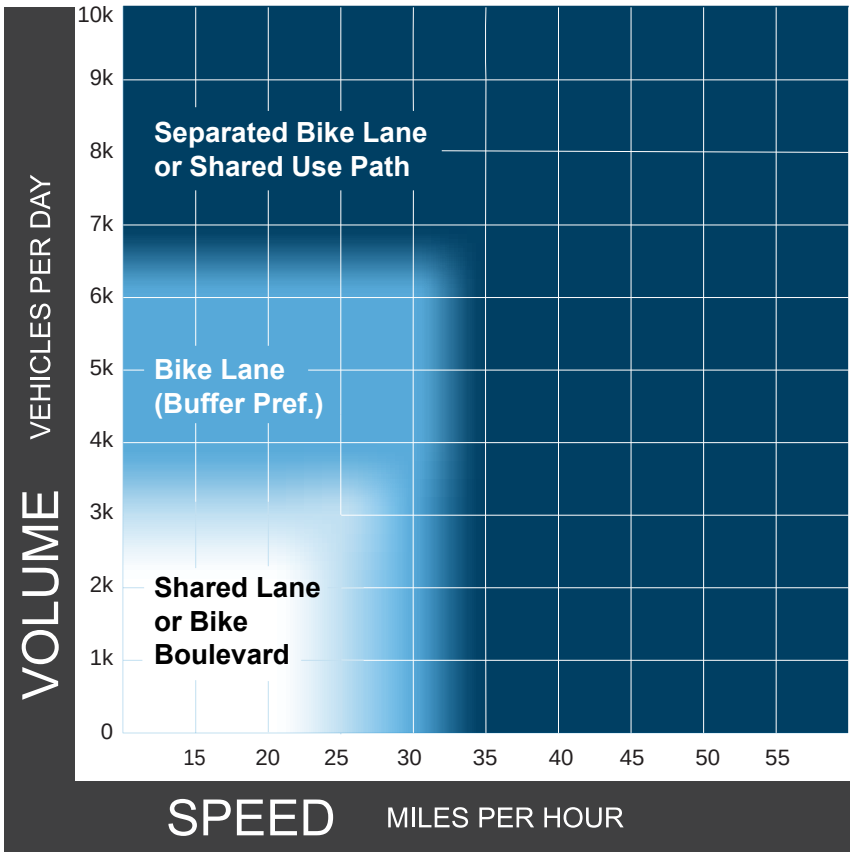
- Greenway Standards Summary Memo: https://connect.ncdot.gov/projects/BikePed/Documents/Greenway%20Standards%20Summary%20Memo.pdf
- Design Issues Summary: https://connect.ncdot.gov/projects/BikePed/Documents/Design%20Issues%20Summary.pdf
- Greenway Design Guidelines Value Engineering Report: https://connect.ncdot.gov/projects/BikePed/Documents/Greenway%20Design%20Guidelines%20Value%20Engineering%20Report.pdf
- Summary of NCDOT Responses to Greenway Design Standards Value Engineering Study: https://connect.ncdot.gov/projects/BikePed/Documents/Summary%20of%20Recommendations.pdf
- Minimum Pavement Design Recommendations for Greenways: https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Minimum%20Pavement%20Design%20Recommendations%20for%20Greenways.pdf

Facility Selection: Bikeways

Selecting the best bicycle way facility type for a given roadway can be challenging given the range of factors that influence a bicycle user's comfort and safety. There is a significant impact on cycling comfort when the speed differential between bicycle and motor vehicle traffic is high and traffic volumes are high. The tool below will assist with appropriate selection of facility based on average daily traffic and posted speed.

Other factors beyond volume which affect facility selection include traffic speed, traffic mix of automobiles and heavy vehicles, the presence of on-street parking, intersection density, surrounding land use, and roadway sight distance. These factors are not included in the facility selection chart below, but should always be considered in the facility selection and design process.

Preferred Bikeway Type for Urban, Urban Core, Suburban and Rural Town Contexts



Notes

1 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.

2 Advisory bike lanes may be an option where traffic volume is <3K ADT.

3 See page 32 for a discussion of alternatives if the preferred bikeway type is not feasible.

Source: Facility selection tool from FHWA Bikeway Selection Guide, where additional guidance is available on shoulder bikeways.

Design Needs of Bicyclists

The facility designer must have an understanding of how bicyclists operate and how their bicycle influences that operation. Bicyclists, by nature, are much more affected by poor facility design, construction and maintenance practices than motor vehicle drivers. By understanding the unique characteristics and needs of bicyclists, a facility designer can provide quality facilities and minimize user risk.

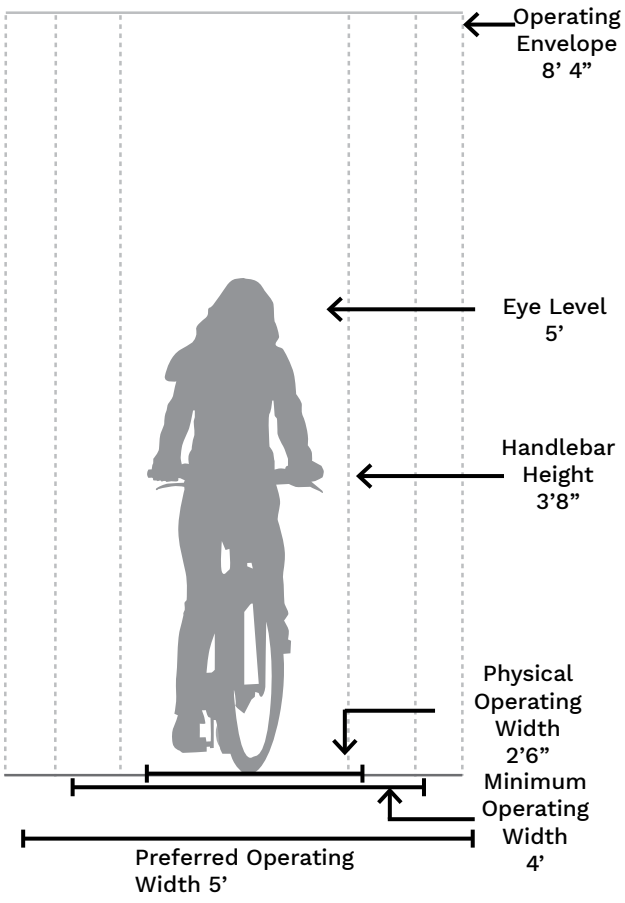
Bicycle as a Design Vehicle

Similar to motor vehicles, bicyclists and their bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The design of a bikeway should consider reasonably expected bicycle types on the facility and utilize the appropriate dimensions.

The Bicycle Rider figure illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility. This is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable.

In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories.

BICYCLE RIDER - TYPICAL DIMENSIONS



BICYCLE AS DESIGN VEHICLE – DESIGN SPEED EXPECTATIONS

BICYCLE TYPE	FEATURE	TYPICAL SPEED
Upright Adult Bicyclist	Paved level surfacing	8-12 mph*
	Crossing Intersections	10 mph
	Downhill	+ 20 mph
	Uphill	5 -12 mph
Recumbent Bicyclist	Paved level surfacing	18 mph

** Typical speed for causal riders per AASHTO 2013.*

APPENDIX

A

Appendix A: Public Survey Summary

Appendix B: Numbered Project Maps + Tables

Appendix C: Bicycle Policy + Regulatory Review

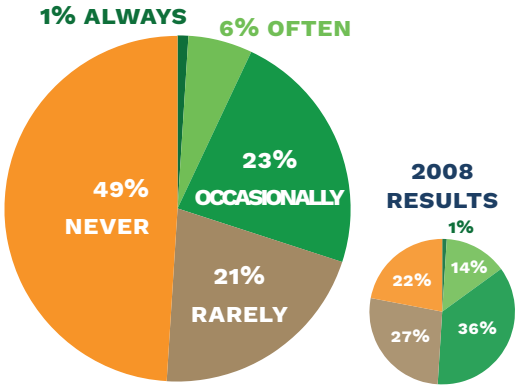
Appendix D: Updated Cross-Sections for Strategic Corridors

Appendix E: Detailed Cost Estimates for Priority Projects

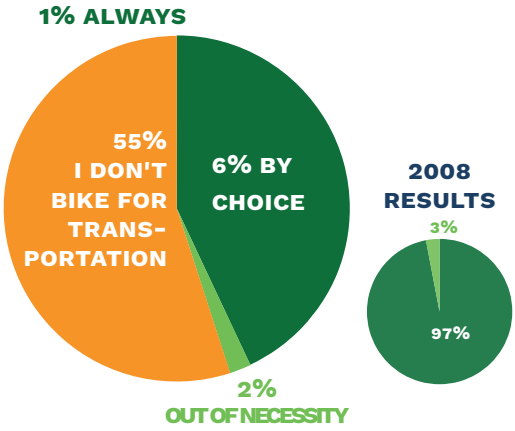
Appendix A: Public Survey Summary

Public Survey, continued

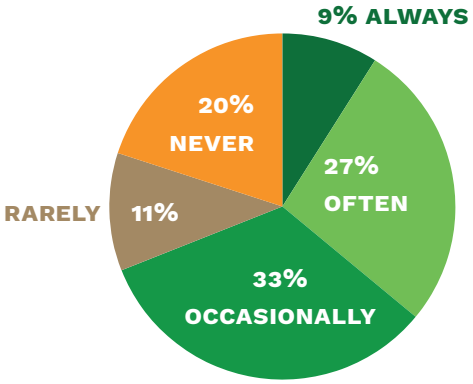
I BICYCLE FOR TRANSPORTATION (NOT RECREATION) AROUND MY COMMUNITY



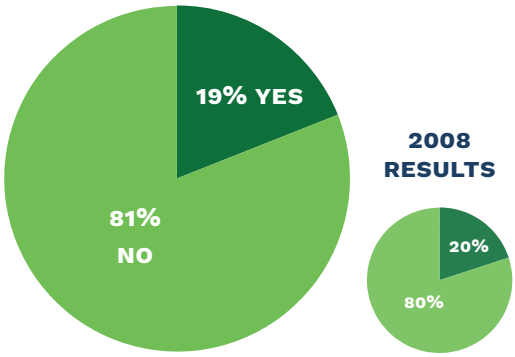
I BIKE FOR TRANSPORTATION



I WOULD LIKE TO BICYCLE FOR TRANSPORTATION

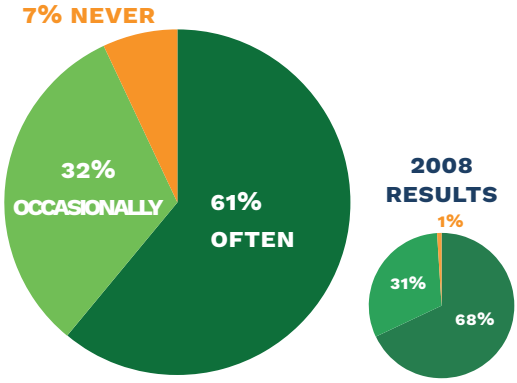


I HAVE USED A BICYCLE TO GET TO WORK IN/FROM MOORESVILLE

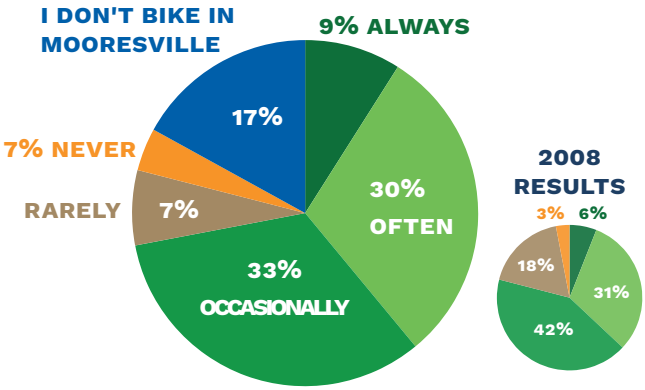


Public Survey, continued

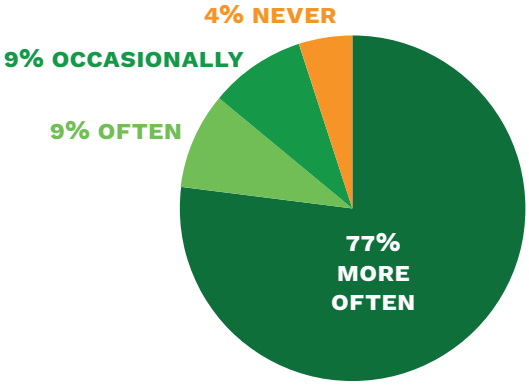
I BIKE FOR PLEASURE OR RECREATION



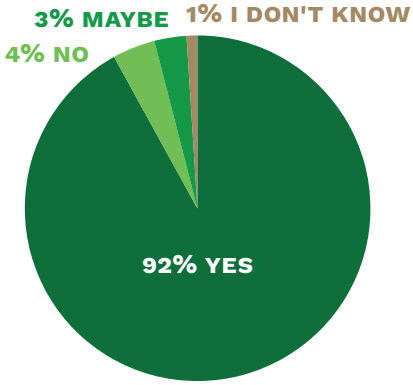
WHEN BIKING IN MOORESVILLE, DO MOTORISTS TREAT YOU WITH CARELESSNESS OR AGGRESSION?



I WOULD LIKE TO BIKE FOR PLEASURE OR RECREATION

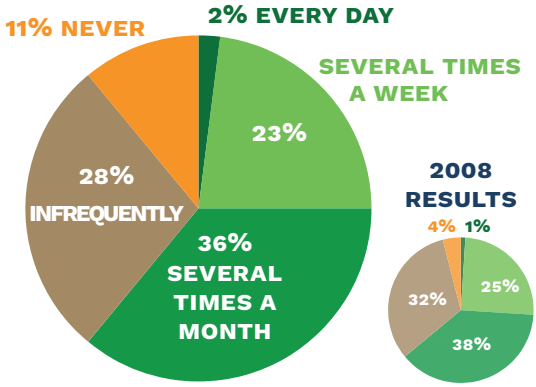


I BELIEVE THAT MOORESVILLE WILL BENEFIT FROM HAVING BETTER BICYCLE ACCOMMODATIONS

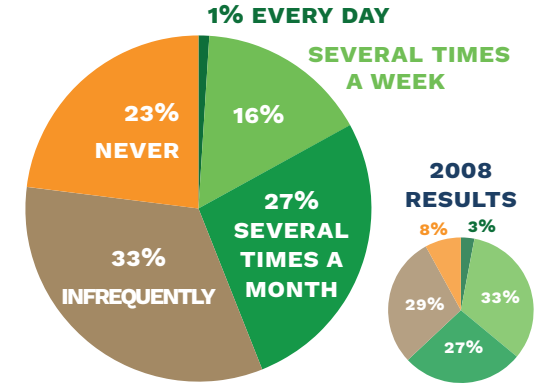


Public Survey, continued

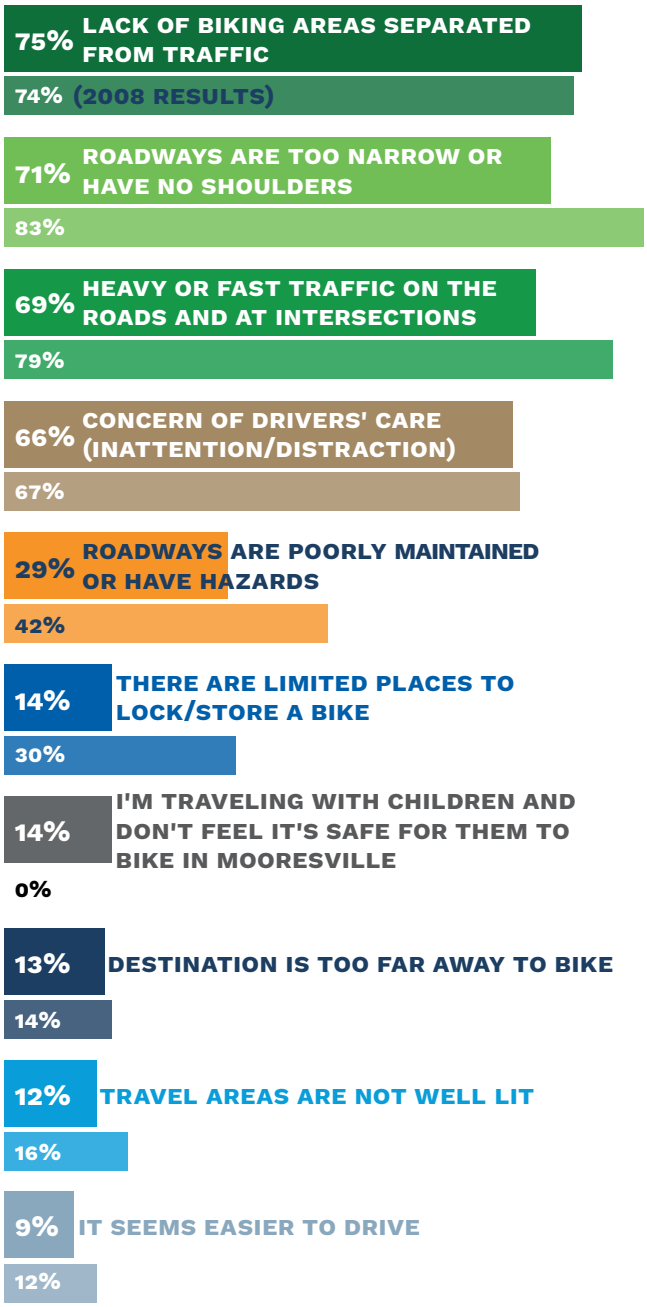
HOW OFTEN DO YOU RIDE YOUR BICYCLE WITHIN THE MOORESVILLE (SOUTH IREDELL) AREA?



HOW OFTEN DO YOU RIDE YOUR BICYCLE OUTSIDE OF THE MOORESVILLE (SOUTH IREDELL) AREA?

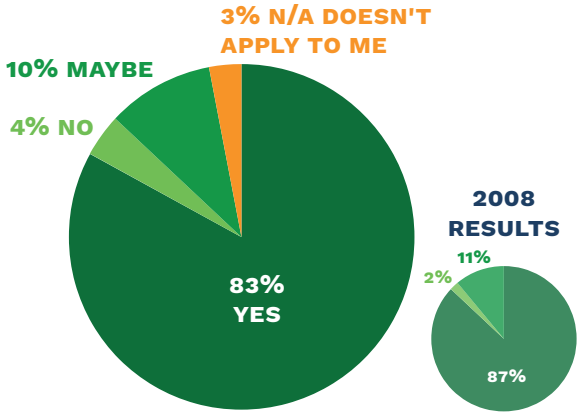


THE FOLLOWING OBSTACLES HAVE MOST DISCOURAGED ME FROM BIKING IN MOORESVILLE

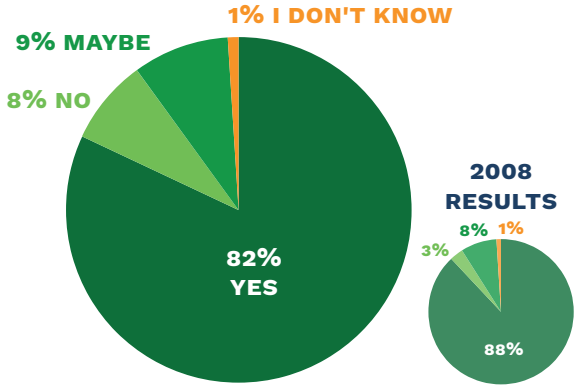


Public Survey, continued

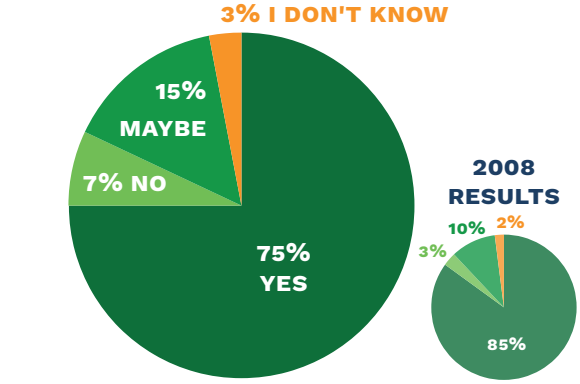
WOULD YOU BICYCLE MORE IF MANY OF THE OBSTACLES IN THE PREVIOUS QUESTION WERE OVERCOME?



WOULD YOU SUPPORT PUBLIC FUNDING FOR BICYCLE FACILITIES, SUCH AS BIKE LANES AND GREENWAYS?

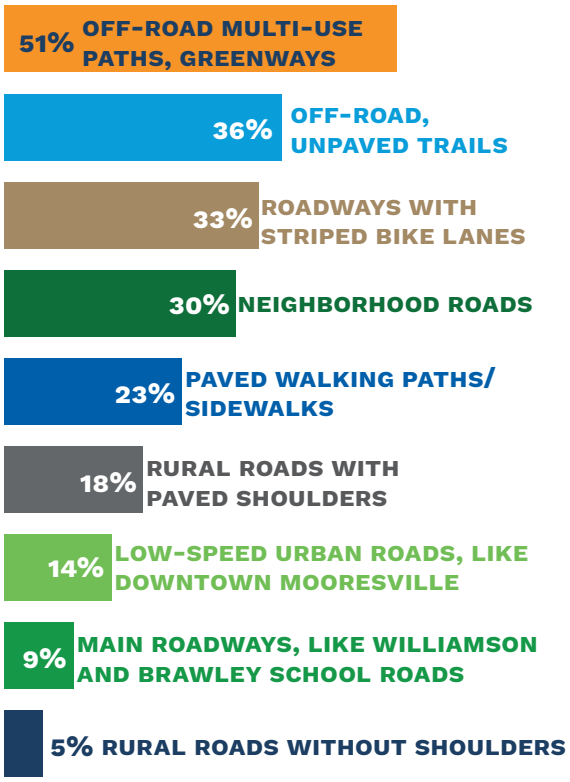


WOULD YOU SUPPORT DEVELOPMENT POLICIES THAT ENCOURAGE BICYCLING, SUCH AS MANDATORY BIKE FACILITIES ALONG NEW ROADS AND GREENWAYS?

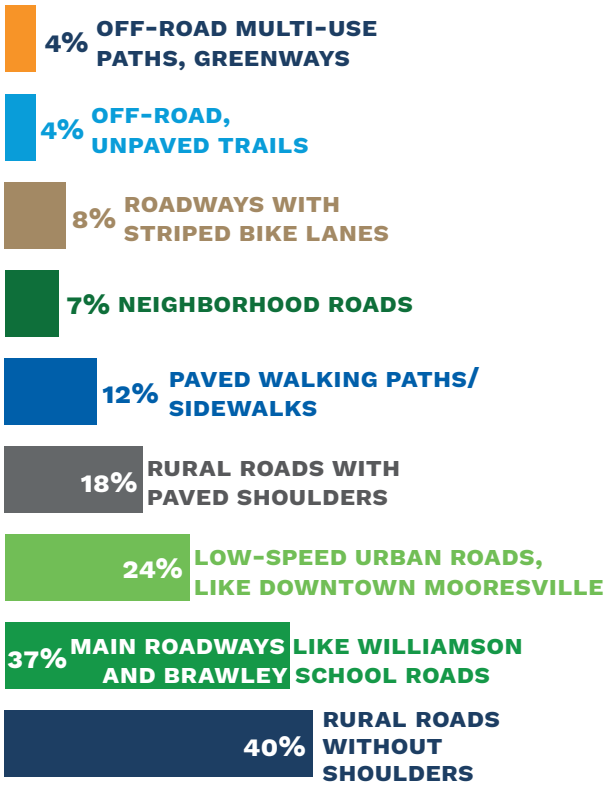


Public Survey, continued

THE PERCENTAGE OF RESPONDENTS WHO HIGHLY ENJOY BIKING IN THE FOLLOWING CONDITIONS:

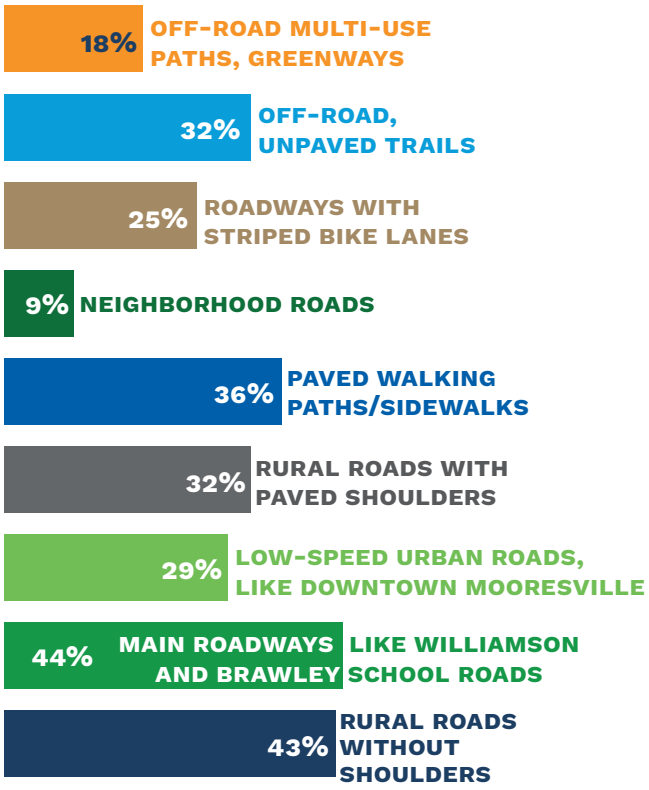


THE PERCENTAGE OF RESPONDENTS WHO DO NOT ENJOY BIKING IN THE FOLLOWING CONDITIONS:



Public Survey, continued

THE PERCENTAGE OF RESPONDENTS WHO DO NOT USE THE FOLLOWING CONDITIONS:



THE MOST COMMON ROADS THAT RESPONDENTS BIKE ON IN MOORESVILLE ARE:

#1 Brawley School Road (43%)

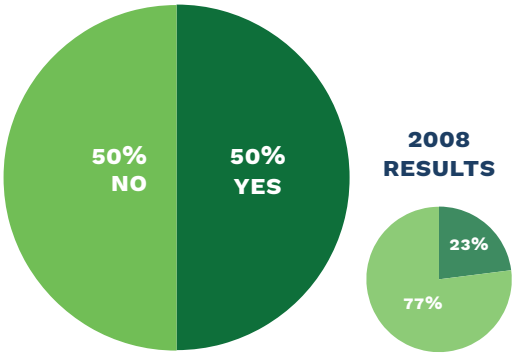
#2 Shearers Road (28%)

#3 Main Street (27%)

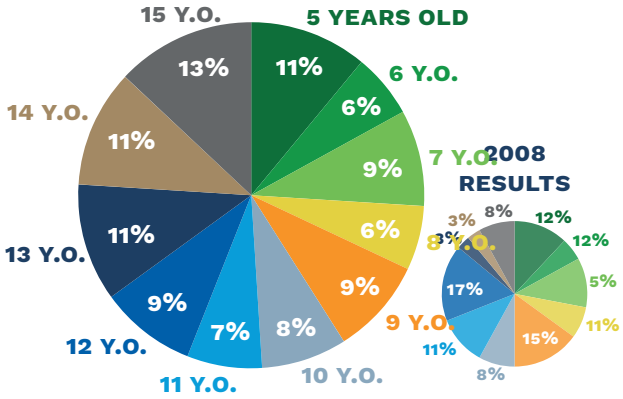
#4 NC 115/Mecklenburg Highway (23%)

Public Survey, continued

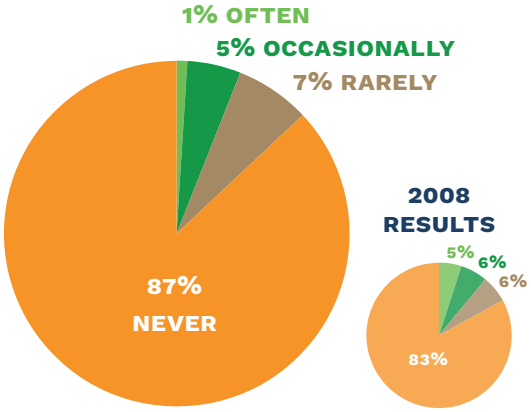
DO YOU HAVE ANY CHILDREN FROM THE AGES OF 5-15 YEARS OLD IN MOORESVILLE?



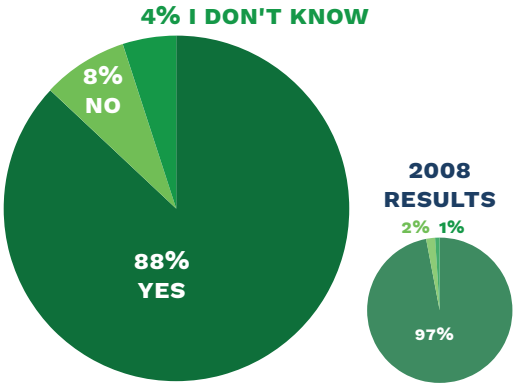
WHAT IS YOUR CHILD'S AGE?



MY CHILD(REN) RIDE A BICYCLE TO/ FROM SCHOOL

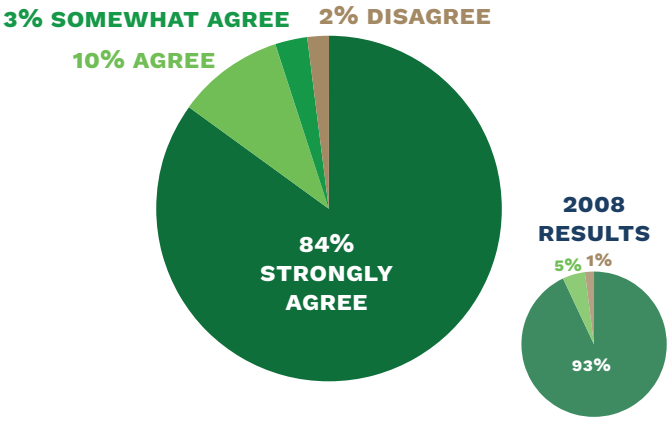


WOULD YOU LIKE FOR YOUR CHILD(REN) TO BE ABLE TO BIKE MORE OFTEN?



Public Survey, continued

I AM CONCERNED ABOUT THE SAFETY OF CHILDREN BIKING TO SCHOOL DUE TO TRAFFIC AND/OR LACK OF BIKE FACILITIES/PATHS

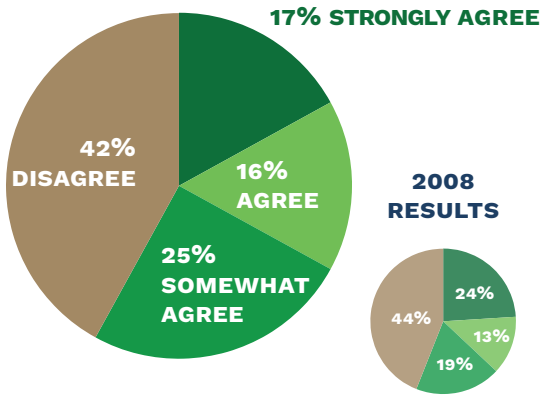


37% of parents would be more comfortable with their child biking to school if traffic speeds were lower in your neighborhood.

45% still would NOT be comfortable.

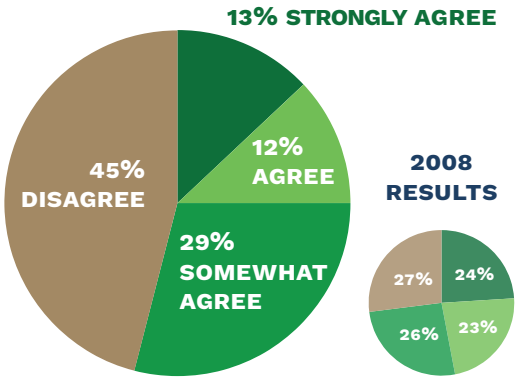
77% of parents would be more comfortable with their child biking to school if paved pathways were available.

I AM CONCERNED ABOUT CHILDREN BIKING TO SCHOOL BECAUSE THE DISTANCE IS TOO FAR FOR MY CHILD

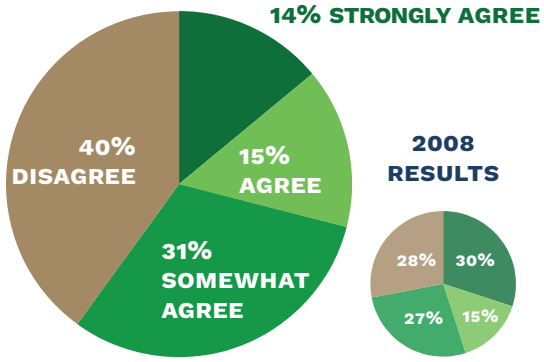


74% of parents would be more comfortable with their child biking to school if the school was closer to or in the neighborhood.

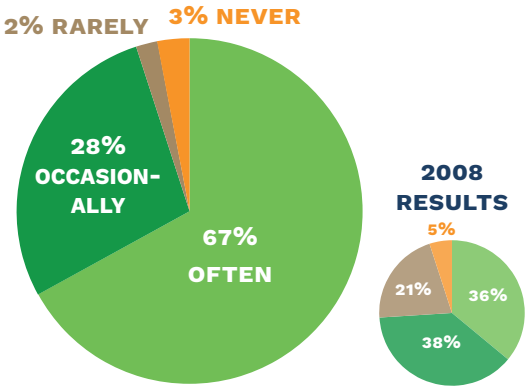
I AM CONCERNED ABOUT THE SAFETY OF CHILDREN BIKING TO SCHOOL DUE TO CRIME



I AM CONCERNED ABOUT CHILDREN BIKING TO SCHOOL BECAUSE BAD WEATHER AND HEAVY LOADS MAKE BIKING IMPRACTICAL



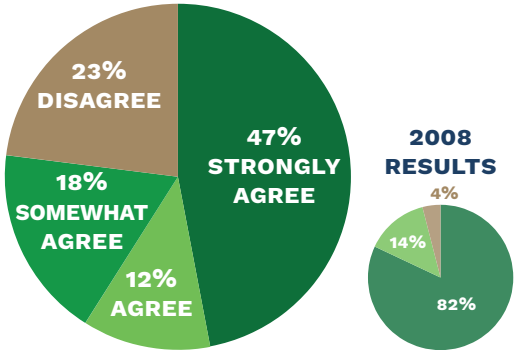
MY CHILD(REN) RIDE A BICYCLE AROUND OUR NEIGHBORHOOD/COMMUNITY



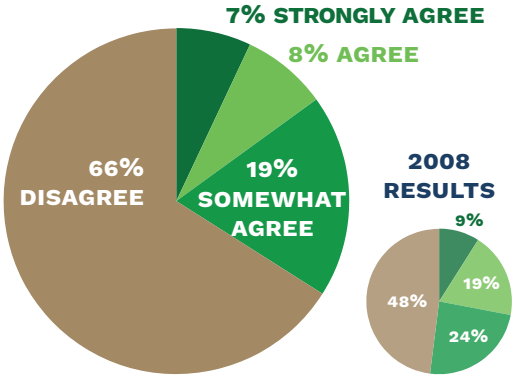
59% of parents would be more comfortable with their child biking more often in their neighborhood if traffic speeds were lower in your neighborhood.

88% of parents would be more comfortable with their child biking more often in their neighborhood if paved pathways were available.

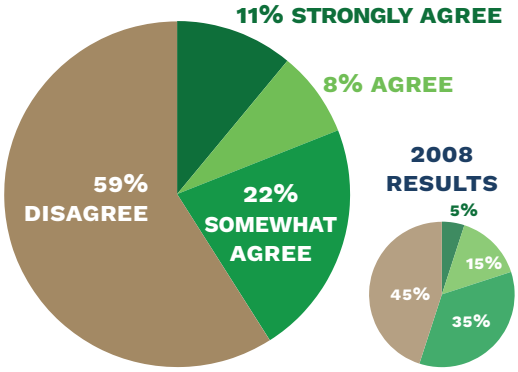
I AM CONCERNED ABOUT THE SAFETY OF CHILDREN BIKING IN YOUR NEIGHBORHOOD DUE TO TRAFFIC AND/OR LACK OF BIKE FACILITIES/PATHS



I AM CONCERNED ABOUT THE SAFETY OF CHILDREN BIKING IN YOUR NEIGHBORHOOD DUE TO CRIME



I AM CONCERNED ABOUT CHILDREN BIKING IN YOUR NEIGHBORHOOD BECAUSE THE DISTANCE IS TOO FAR FOR MY CHILD



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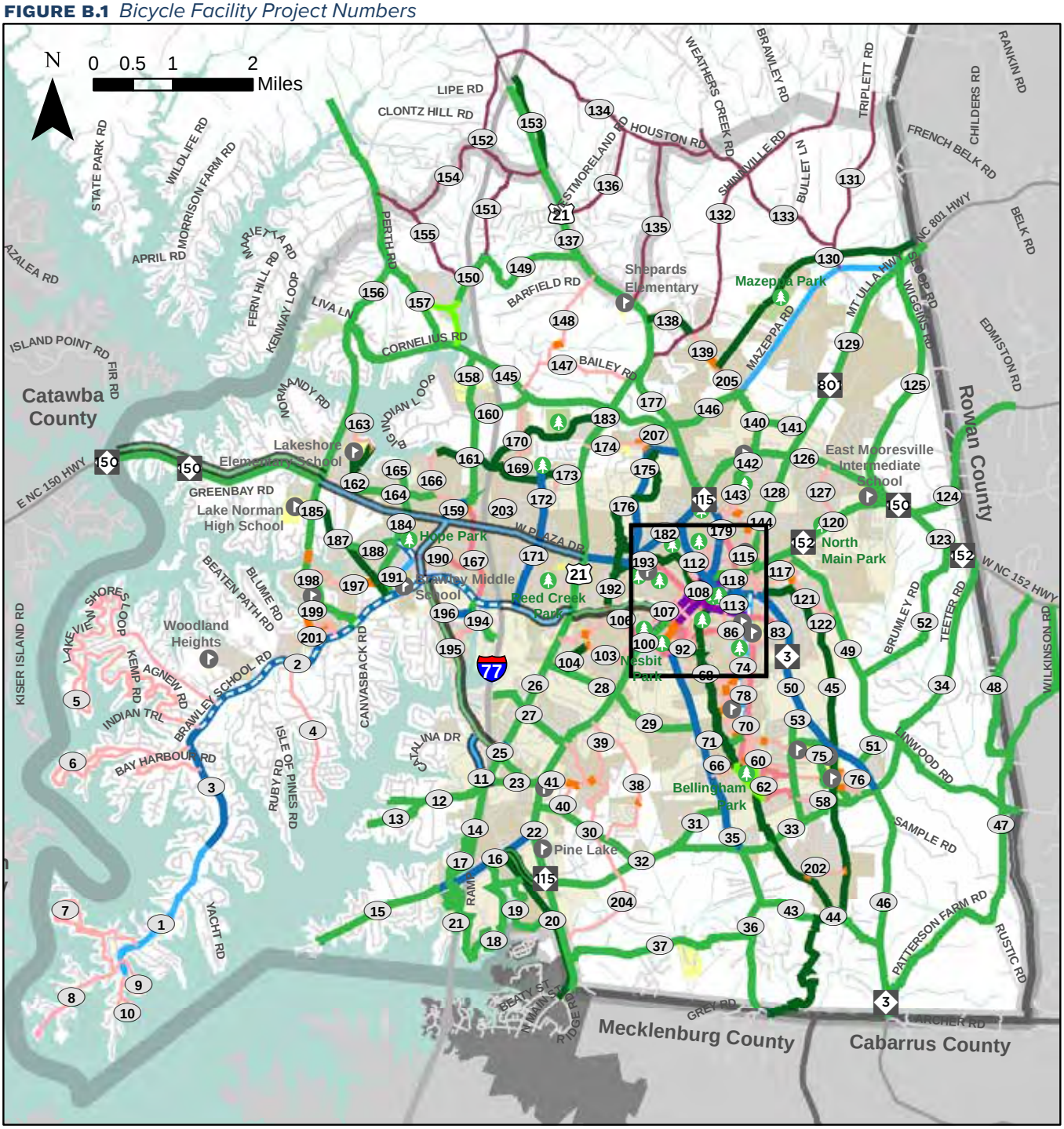
Appendix B: Numbered Project Maps + Tables

FIGURE B.1 *Bicycle Facility Project Numbers*



Proposed Bike Facilities

- Separated Bike Lanes (SBLs)
- 2-Way Cycle Track
- Multi-Use Path
- Greenway
- Bike-Ped Connector
- Quiet Streets w/Traffic Calming+Wayfinding
- Separated Bike Facility (TBD- sidepath or SBLs)
- Bike Lanes/Paved Shoulders
- Shared Lane Markings

Funded Bike Facility Projects

- Multi-Use Path/Greenway
- Standard Bike Lanes
- Shared Lane Markings

Existing Bike Facilities

- Bike Lanes (white dash)
- Greenway

- School Property
- Parks & Rec Facilities
- Mooresville City Limits
- Extra Territorial Jurisdiction
- Bike Plan Planning Area

FIGURE B.2 *Bicycle Facility Project Numbers- Downtown Inset*

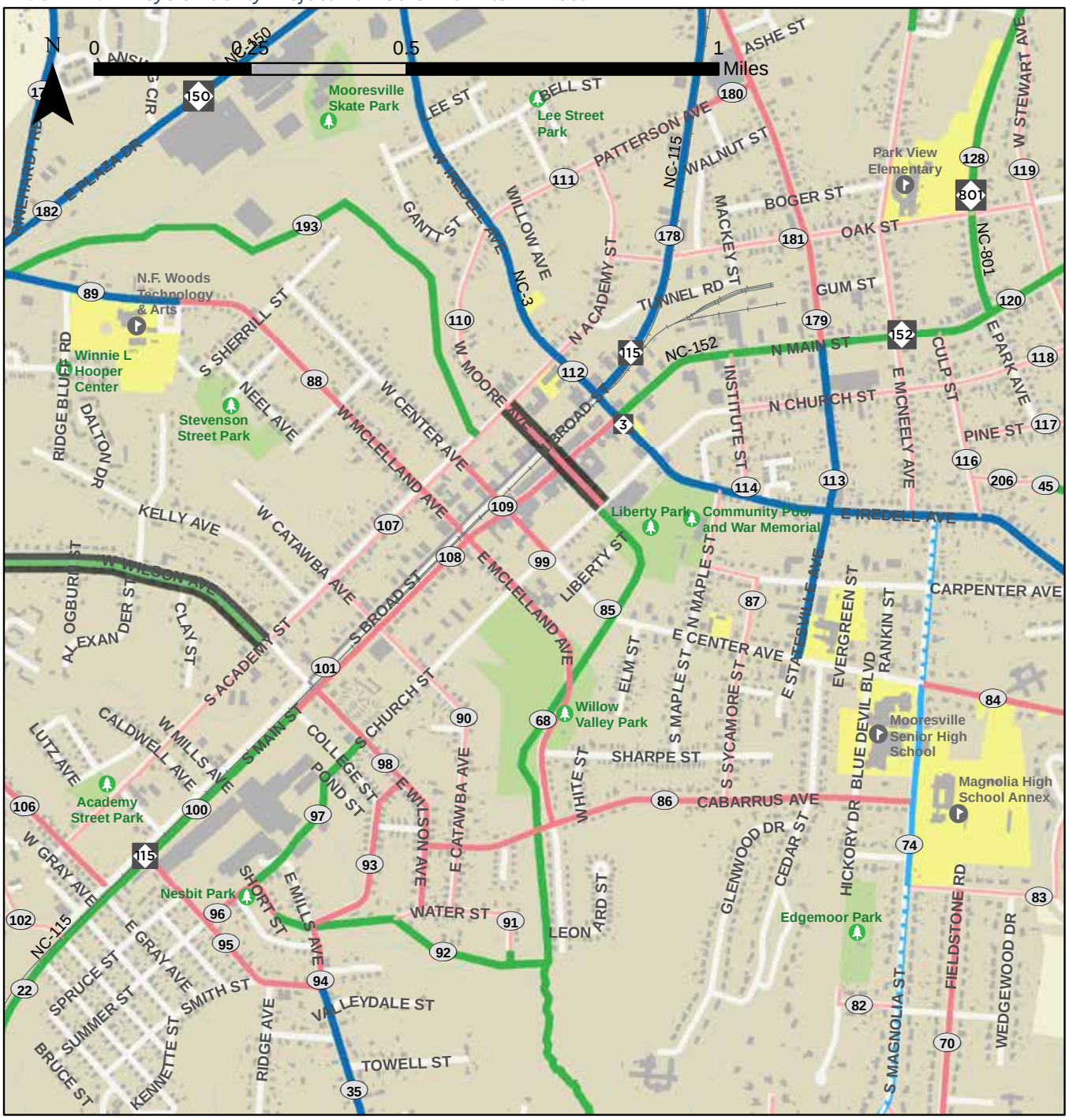


TABLE B.1 *Project List of Recommended Bicycle Facilities (continued from Table 3.1 on page 45)*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
19	Normy Overlook	Gateway Peninsula Trail	NC 115/ Mecklenburg Hwy	sidepath	new construction	1.34
20	Southwest Mooresville Greenway	Mecklenburg County line	Langtree Rd	greenway	new construction	2.11
21	Mecklynn Rd	Langtree Rd	southern terminus	sidepath	new construction	0.67
22	NC 115/Mecklenburg Hwy	Iredell County Line	Norman Drive	sidepath	new construction	4.83
23	Fairview Rd	US 21/Charlotte Highway	NC 115/ Mecklenburg Hwy	sidepath	new construction	1.02
24	Centre Church Rd/ Medical Park Rd	Fairview Rd (north)	Fairview Rd (@ Lowes Blvd)	sidepath	new construction	0.42
25	US 21/Charlotte Hwy	I-77	Medical Park Rd	separated bike lanes	widen roadway	0.31
26	US 21/Charlotte Highway	Medical Park Road	NC 150/Plaza Drive	sidepaths	new construction	2.55
27	Waterlynn Rd	NC 115/ Mecklenburg Hwy	Langtree Charter driveway (western)	sidepath	new construction	1.16
28	Timber Rd extension	US 21/Charlotte Hwy	NC 115/ Mecklenburg Hwy	sidepath	to be built with roadway construction	0.93
29	Timber Rd	NC 115/ Mecklenburg Hwy	Shearers Rd	sidepath	new construction	1.18
30	Faith Rd	NC 115/ Mecklenburg Hwy	E-W Connector	sidepath	new construction	1.46
31	Faith Rd	East-West Connector	Shearers Rd	sidepath	new construction	0.84
32	East-West Connector	NC 115/ Mecklenburg Hwy	Shearers Rd	sidepaths	to be built with roadway construction	2.55
33	Rocky River Rd/East-West Connector	Shearers Rd	NC-3/Coddle Creek Hwy	sidepaths	to be built with roadway construction	1.93
34	East-West Connector/Teeter Rd	NC-3/Coddle Creek Hwy	NC-152/Landis Hwy	sidepaths	to be built with roadway construction	3.27
35	Shearers Rd	Brawley Ave	Rocky River Rd	separated bike lanes	widen roadway	2.61
36	Shearers Rd	Rocky River Rd	Greystone Road	paved shoulders + sidepath	widen roadway; new construction	2.10
37	Presbyterian Rd	NC 115/ Mecklenburg Hwy	Shearers Rd	paved shoulders + sidepath	widen roadway; new construction	2.44

TABLE B.1 *Project List of Recommended Bicycle Facilities, continued*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
38	Mott Rd; Mackwood Rd; Mackwood Rd-Mott Rd connector	NC 115/ Mecklenburg Hwy	Faith Rd	bike-ped connector with Bike Blvd/ Wayfinding/ Advisory Shoulders (BB/ WF/AS)	new construction; traffic calming, signage	2.05
39	Jennymarie Rd, Stibbs Cross Rd, Holsworthy Dr, Tetcott St; Holsworthy-Alexandria connector	Mackwood Rd	Faith Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	1.66
40	Waterlynn Rd; Alexandria Dr; Fremont Loop; Fremont-Alexandria connector	NC 115/ Mecklenburg Hwy	Faith Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	1.21
41	Steam Engine Dr; Locomotive Ln; Locomotive-Alexandria connector	NC 115/ Mecklenburg Hwy	Alexandria Dr	bike-ped connector, BB/ WF/AS	new construction; traffic calming, signage	0.46
42	Boxcar Ln connector	Boxcar Ln	Mt Morne Middle School	bike-ped connector	new construction	0.03
43	Johnson Dairy Rd	Shearers Road	NC-3/Coddle Creek Hwy	sidepath	new construction	1.73
44	Dye Creek Greenway	Bellingham Park	Grey Rd extension	greenway with BP connector	new construction	3.88
45	Rocky River Greenway	Culp Street	Johnson Dairy Road	greenway with BP connector	new construction	4.77
46	NC-3/Coddle Creek Hwy	Rocky River Rd	Mecklenburg County Line	paved shoulders + sidepath	new construction	3.01
47	Patterson Farm Rd/ Wilkinson Rd	NC-3/Coddle Creek Hwy	NC 152	sidepath	new construction	6.00
48	Juniper Rd/Shinn Farm Rd	Patterson Farm Rd/Wilkinson Rd	NC 152	sidepath	new construction	2.50
49	Linwood Rd	N. Main St	Rowan County line	sidepath (short-term paved shoulders)	widen roadway; new construction	4.83
50	NC-3/Coddle Creek Hwy	Center Ave	Rocky River Rd	separated bike lanes	widen roadway	2.48
51	Williford Rd	NC-3/Coddle Creek Hwy	Linwood Rd	sidepath	new construction	0.47
52	Brumley Rd	Linwood Rd	NC 152/Landis Hwy	sidepath	new construction	2.23
53	Kistler Farm Rd	NC-3/Coddle Creek Hwy	Rocky River Rd	sidepaths	new construction	1.46

TABLE B.1 *Project List of Recommended Bicycle Facilities, continued*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
54	Access road for Mooresville Middle, Mooresville Intermediate, and RR Elem Schools	Kistler Farm Rd	Rocky River Rd	sidepath	new construction	1.71
55	Jenkins Farm Ln; Jenkins Farm Ln connector	Kistler Farm Rd	Mooresville Middle School driveway	bike-ped connector, BB/WF/AS	new construction; traffic calming, signage	0.36
56	Bow Ln; Bow Ln connector	Kistler Farm Rd	Mooresville Middle School driveway	bike-ped connector, BB/WF/AS	new construction; traffic calming, signage	0.39
57	Naomi Rd; Naomi Rd-Rocky River Greenway connector	Rocky River Rd	Rocky River Greenway	bike-ped connector, BB/WF/AS	new construction; traffic calming, signage	0.20
58	Sawhorse Dr; Naomi Rd-Saw Horse Dr connector	Kistler Farm Rd	Naomi Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.38
59	White Oaks Rd; Ashlyn Creek Dr; White Oaks-Ashlyn Creek connector	Fieldstone Rd	Kistler Farm Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.63
60	Briarcliff Rd	Bellingham Dr	Kistler Farm Rd	bike boulevard	traffic calming, signage	0.53
61	Bellingham Dr	White Oaks Rd	Bellingham Park	bike boulevard	traffic calming, signage	0.30
62	Winterfield Dr; Timberlane Tr; Woodlark Dr	Briarcliff Rd	Kistler Farm Rd	shared lane markings	paint SLM symbols	0.94
63	River Birch Cir	Dye Creek Greenway	Kistler Farm Road	shared lane markings	paint SLM symbols	0.50
64	Bellingham Park-timberlane connector	Timberlane Ter	Dye Creek Greenway	bike-ped connector	new construction	0.11
65	Bellingham Park-Grace Meadow connector	Grace Meadow Dr	Bellingham Park	bike-ped connector	new construction	0.06
66	Woodrest Rd; Millswood Dr; Bellingham Park-Woodcrest-Millswood connector	Shearers Rd	Dye Creek Greenway	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.67
67	Grace Meadow Dr	Fieldstone Rd	southern terminus	Advisory Shoulders	restripe with advisory shoulders	0.46
68	Dye Creek Greenway	Church St	Bellingham Park	greenway	new construction	2.48
69	Bellingham Park driveway	Fieldstone Rd	Bellingham Dr	shared lane markings	paint SLM symbols	0.14
70	Fieldstone Rd	Edgemoor Dr	Bellingham Park	shared lane markings	paint SLM symbols	1.54
71	White Oaks Rd	Shearers Rd	Fieldstone Rd	sidepath	new construction	0.55
72	Magnolia-White Oaks connector	Magnolia St	White Oaks Rd	bike-ped connector	new construction	0.11

TABLE B.1 *Project List of Recommended Bicycle Facilities, continued*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
73	Magnolia St/ Heatherly Rd	Magnolia St	Heatherly Rd	Advisory Shoulders	restripe with advisory shoulders	0.64
74	Magnolia Street	Iredell Avenue	Heatherly Road	bike lanes	restripe with bike lanes; may require widening in some sections	1.58
75	Access road for Mooresville Middle, Mooresville Intermediate, and RR Elem Schools	Kistler Farm Rd	Rocky River Elementary School	traffic calming	raised crossings	0.96
76	Wrangler Dr; Chance Rd; Northstone Rd; Wrangler Dr connector	Rocky River Elementary School driveway	NC 3/Coddle Creek Hwy	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.58
77	Championship Dr; Championship Dr connector	Rocky River Elementary School driveway	Rocky River Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.35
78	South Elem School Greenway	Dye Creek Greenway	Fieldstone Rd	greenway with BP connector	new construction	0.50
79	Briarwood Dr connector with BB/WF/AS on Briarwood Dr	Magnolia St	South Elementary School Greenway	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.31
80	Colony-Magnolia connector	Colony Dr	Magnolia St	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.99
81	Colony Hill-Forest Ln connector with BB/WF/ AS on Forest Ln, Woodberry Dr, + Rocky Creek Rd	Magnolia St	South Elem. School Greenway	Advisory Shoulders	restripe with advisory shoulders	0.57
82	Richards Ln/ Ridgecrest Dr	Edgemoor Park	Magnolia St	Advisory Shoulders	restripe with advisory shoulders	0.12
83	Edgemoor Dr/ Ferncliff Dr	Magnolia St	NC 3/Coddle Creek Hwy	bike boulevard	traffic calming, signage	0.68
84	Center Ave	Magnolia St	NC 3/Coddle Creek Hwy	shared lane markings	paint SLM symbols	0.50
85	Center Street	Church Street	Sycamore Street	separated bike lanes	restripe and add vertical separation	0.65
86	Cabarrus Ave	Wilson Ave	Magnolia Street	shared lane markings	paint SLM symbols	0.79
87	Maple St/Carpenter Ave/Sycamore St	Iredell Ave	Cabarrus Ave	bike boulevard	traffic calming, signage	0.57
88	McLelland Ave	Dunbar St	Cabarrus Ave	shared lane markings	paint SLM symbols	1.15
89	McLelland Ave	NC 150/Plaza Dr	Dunbar St	separated bike lanes	restripe and add vertical separation	0.34

TABLE B.1 *Project List of Recommended Bicycle Facilities, continued*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
90	Catawba Ave	Academy St	Water St	advisory shoulders/bike boulevard	restriping/traffic calming, signage	0.62
91	Water St	Nesbit Park Greenway connector	eastern terminus of Water St	advisory shoulders/bike boulevard	restriping/traffic calming, signage	0.25
92	Nesbit Park Greenway spur	Short Street	Dye Creek Greenway	greenway	new construction	0.48
93	Freeman Dr/College St	Wilson Ave	Mills Avenue	shared lane markings	paint SLM symbols	0.30
94	Mills Ave	Nesbit Park Greenway connector	Shearers Rd	shared lane markings	paint SLM symbols	0.10
95	Brawley Ave	Main St	Mills Ave	shared lane markings	paint SLM symbols	0.37
96	Summer St/Short St	Brawley Ave	eastern terminus of Short St	shared lane markings	paint SLM symbols	0.16
97	Church St	Wilson Ave	Short St	bike-ped connector	new construction	0.30
98	Wilson Ave	Main St	Water St	shared lane markings	paint SLM symbols	0.42
99	Church St	Iredell Ave	Wilson Ave	one-way street w/ SBL	restripe and add vertical separation	0.65
100	Main St	Doster Ave	College St	sidepath/cycle track	restripe and add vertical separation	0.52
101	Broad St	Iredell Ave	Norman Dr	one-way street w/ SBL	restripe and add vertical separation	1.23
102	Norman Dr	Lowrance Ave	Main St	bike boulevard	traffic calming, signage	0.31
103	Lockerbie Ln-Golf Course Dr connector with BB/WF/AS on Lockerbie Ln + Muirfield Dr	Golf Course Dr	Norman Dr	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.76
104	Golf Course Greenway connection	Golf Course Dr	Timber Rd extension	greenway	new construction	0.42
105	Longford Wy-Golf Course Dr connector with BB/WF/AS on Golf Course Dr + Abberly Green/ Longford/Claire/ Galway	US 21/Charlotte Hwy	Wilson Ave	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	1.08
106	Lowrance Ave	Wilson Ave	Main St	shared lane markings	paint SLM symbols	0.67
107	Academy St	Lowrance Ave	Patterson Ave	advisory shoulders/bike boulevard	restriping/traffic calming, signage	1.46
108	Main St	Iredell Ave	College St	shared lane markings	paint SLM symbols	0.70

TABLE B.1 *Project List of Recommended Bicycle Facilities, continued*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
109	Center Street	Academy St	Church St	shared lane markings	paint SLM symbols	0.21
110	Moore Ave	Iredell Ave	Academy St	advisory shoulders/bike boulevard	restriping/traffic calming, signage	0.33
111	Patterson Ave	Iredell Ave	Broad St	advisory shoulders/bike boulevard	restriping/traffic calming, signage	0.37
112	Iredell Ave	NC 150/Plaza Dr	Center Ave	separated bike lanes	widen roadway	2.06
113	Statesville Ave	Main St	Center Ave	separated bike lanes	restripe and add vertical separation	0.52
114	Institute St	Main St	Iredell Ave	bike boulevard	traffic calming, signage	0.23
115	Rebecca Jane Dr-McNeely Ave connector with BB/WF/AS on McNeely Ave	Rebecca Jane Dr	Iredell Ave	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.90
116	Culp St	Main St	Iredell Ae	bike boulevard	traffic calming, signage	0.30
117	Pine St	Main St	Culp St	Advisory Shoulders	restripe with advisory shoulders	0.63
118	Church St	Iredell Ave	Stewart Ave	bike lanes	restripe with bike lanes	0.71
119	Stewart Ave	Park Ave	Church St	advisory shoulders/bike boulevard	restriping/traffic calming, signage	0.54
120	N Main St	Iredell Ave	NC 150/Oakride Farm Hwy	sidepath	new construction	2.63
121	Brantley St-Golden Valley Dr connector with BB/WF/AS on Briarhill, Hillcrest, Brantley, Golden Valley, + Middle Grove	Pine St	Linwood Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	1.25
122	Washburn Range Dr-Rocky River Gwy connector with BB/WF/AS on Washburn Range Dr	Middle Grove Dr	Rocky River Greenway	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.18
123	NC 152/Landis Hwy	NC 150/ Oakridge Farm Hwy	Teeter Rd	sidepath	new construction	1.02
124	NC 150/Oakridge Farm Hwy	NC 152/Landis Hwy	Rowan County line	sidepath	new construction	2.16
125	Wiggins Rd	Mazeppa Park Greenway	NC 152/Landis Hwy	sidepath (short-term paved shoulders)	new construction	3.50
126	NC 150/Oakridge Farm Hwy	NC 115/ Statesville Hwy	NC 152/Landis Hwy	sidepaths	new construction	3.01

TABLE B.1 *Project List of Recommended Bicycle Facilities, continued*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
127	Wellesley Ln/ Warfield Dr/ Glastonbury Dr	NC 150/ Oakridge Farm Hwy	N Main St	bike boulevard	traffic calming, signage	0.80
128	Park Ave	NC 150/ Oakridge Farm Hwy	N Main St	sidepath	new construction	1.50
129	Mt Ulla Hwy	Rowan County line	NC 150/Oakridge Farm Hwy	sidepath (short-term paved shoulders)	new construction	0.00
130	Mazeppa Park Greenway	Rowan County line	Thunder Rd	greenway	new construction	3.17
131	Triplett Rd	Study Area Boundary	Mazeppa Rd	separated bike facility (TBD)	new construction/ widen roadway	2.40
132	Shinnville Rd	Study Area Boundary	US 21/Charlotte Hwy	separated bike facility (TBD)	new construction/ widen roadway	4.58
133	Winthrow Creek Rd	Study Area Boundary	Triplett Rd	separated bike facility (TBD)	new construction/ widen roadway	2.42
134	Houston Rd	US 21/Charlotte Hwy	Weathers Creek Rd	separated bike facility (TBD)	new construction/ widen roadway	3.18
135	Shepherd Rd	Houston Rd	US 21/Charlotte Hwy	separated bike facility (TBD)	new construction/ widen roadway	2.18
136	Westmoreland Rd	Houston Rd	US 21/Charlotte Hwy	separated bike facility (TBD)	new construction/ widen roadway	1.46
137	US 21/NC 115/ Charlotte Hwy	NC 115/ Statesville Hwy	I-77	sidepaths	new construction	4.17
138	US 21-Shinnville Greenway connector	US 21/NC 115/ Charlotte Highway	Shinnville Rd	greenway	new construction	0.62
139	Pecan Hills Dr-Thunder Rd connector with BB/ WF/AS on Pean Hills Dr	Shinnville Rd	Thunder Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.56
140	Overhead Bridge Rd	Mazeppa Rd	NC 150/Oakridge Farm Hwy	sidepath	new construction	0.88
141	Oliphant Rd	Overhead Bridge Rd	Mt Ulla Hwy	sidepath	new construction	0.60
142	Selma Dr	NC 150/ Oakridge Farm Hwy	Brookwood St	sidepath	new construction	0.53
143	BB/WF/AS on Williams St, Selma Dr, Cascade St, + Brookwood St	Brookwood St	Statesville Ave, Broad St	bike boulevard	traffic calming, signage	1.03
144	Selma Dr-Rebecca Jane Dr connector with BB/WF/AS on Rebecca Jane Dr	Selma Dr/ Williams St	Park Ave	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.52
145	Cornelius/Connector Rd	Perth Rd	NC 115/Statesville Hwy	sidepaths	new construction	4.69

TABLE B.1 *Project List of Recommended Bicycle Facilities, continued*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
146	Mazeppa Rd	NC 115/ Statesville Hwy	Thunder Rd/ Overhead Bridge Rd	sidepaths	new construction	0.94
147	Olympia Dr/Bailey Rd	Cornelius Rd	US 21/Charlotte Hwy	bike boulevard	traffic calming, signage	1.63
148	Warlick Dr-M & M Farms Dr connector with BB/WF/AS on Warlick, M&M Farms, + Barfield	US 21/Charlotte Hwy	Bailey Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	1.39
149	Parkertown Rd	Rankin Hill Rd	US 21/Charlotte Hwy	sidepath	new construction	1.58
150	Rankin Hill Rd	existing sidepath	Parkertown Rd	sidepath	new construction	0.68
151	Rankin Hill Rd	Flower House Lp	Parkertown Rd	separated bike facility (TBD)	new construction/ widen roadway	1.18
152	Flower House Lp	US 21/NC 115/ Charlotte Hwy (north)	US 21/NC 115/ Charlotte Hwy (south)	separated bike facility (TBD)	new construction/ widen roadway	2.03
153	The Seam Greenway	I-77	Flower House Lp	greenway	new construction	1.27
154	Carlyle Rd	Fern Hill Rd	Flower House Lp	separated bike facility (TBD)	new construction/ widen roadway	1.35
155	Fern Hill Rd	Perth Rd	Rankin Hill Rd	separated bike facility (TBD)	new construction/ widen roadway	1.66
156	Perth Rd	Fern Hill Rd	NC 150/River Hwy	sidepath	new construction	5.29
157	Judas Rd	Perth Rd	Cornelius Rd	sidepath	new construction	1.21
158	Bluefield Road (realigned)	Cornelius Rd	Midnight Ln	sidepath	new construction	1.94
159	Bluefield Road	Midnight Ln	NC 150/River Hwy	separated bike lanes	restripe and add vertical separation	0.38
160	Exmore Rd Flyover	Cornelius Rd	Bluefield Rd	sidepath	new construction	0.73
161	Byers Creek Greenway	Maranta Rd	Camforth Dr	greenway	new construction	1.79
162	Lakeshore Elementary School Trail with BB/WF/ AS on Gresham Ln + Water Oak Dr	Lakeshore Elem School	NC 150/River Hwy	greenway with BB/WF/AS	new construction; traffic calming, signage	0.86
163	BB/WF/AS on Lakeshore School Rd/Wilson Lake Rd	Perth Road	Lakeshore Elem School	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.90
164	Water Oak Dr-Glencoe Ln connector	Water Oak Dr	Glencoe Ln	sidepath	new construction	1.06
165	Ervin Rd	Lynnbrook Rd	NC 150/River Hwy	sidepath	new construction	0.68
166	Maranta Rd/Glencoe Ln/Carriage Club Dr	Byers Creek Greenway	Bluefield Rd	bike boulevard	traffic calming, signage	0.90

TABLE B.1 *Project List of Recommended Bicycle Facilities, continued*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
167	Regency Center Dr/ Rolling Hill Rd	northern terminus of Regency Center Dr	Brawley School Rd	shared lane markings	paint SLM symbols	1.25
168	Regency Center Dr-Bluefield Rd connector	Regency Center Dr	Bluefield Rd	bike-ped connector	new construction	0.09
169	Cayuga Dr	Exmore Rd	Byers Creek Rd	bike boulevard	traffic calming, signage	1.02
170	Byers Creek-Cornelius Rd Park Greenway	Byers Creek Greenway	US 21/Charlotte Hwy	greenway	new construction	1.93
171	Talbert Road	Oates Rd	Brawley School Rd	separated bike lanes	widen roadway	1.40
172	Talbert Pointe Drive	northern terminus	Oates Rd	separated bike lanes	restripe and add vertical separation	0.44
173	Camforth Dr	Oates Rd	US 21/Charlotte Hwy	bike boulevard	traffic calming, signage	0.47
174	Fleishhacker Pl-Rinehardt Rd connector with BB/WF/AS on Flanders/Ellington/ Fleishhacker	US 21/Charlotte Hwy	Rinehardt Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.88
175	Rinehardt Rd	NC 115/ Statesville Hwy	NC 150/Plaza Dr	separated bike lanes	widen roadway	1.86
176	Reeds Creek Greenway	Rinehardt Rd	NC 150/Plaza Dr	greenway	new construction	3.46
177	NC 115/Statesville Hwy	US 21/Charlotte Hwy	NC 150/Plaza Dr	sidepaths	new construction	1.85
178	NC 115/Broad St	NC 150/Plaza Dr	Iredell Ave	separated bike lanes	widen roadway	1.15
179	Statesville Ave	NC 115/Broad St	N Main St	shared lane markings	paint SLM symbols	0.66
180	Patterson Ave	NC 115/Broad St	Statesville Ave	shared lane markings	paint SLM symbols	0.11
181	Oak St	Academy St	Stewart Ave	bike boulevard	traffic calming, signage	0.69
182	NC 150/Plaza Dr	US 21/Charlotte Hwy	NC 115/Broad St/ Statesville Hwy	separated bike lanes	widen roadway	1.84
183	US 21/Charlotte Highway	NC 150/Plaza Drive	NC 115/Statesville Highway	sidepaths	new construction	2.61
184	Morrison Plantation Pkwy	NC 150/Plaza Drive	Brawley School Rd	sidepath	new construction	1.15
185	Doolie Rd	NC 150/Plaza Drive	southern terminus/ proposed bridge	sidepath	new construction	0.88
186	Doolie Rd-Happy Oaks Rd Bridge	Doolie Rd	Happy Oaks Rd	bike-ped connector	new construction	0.16

TABLE B.1 *Project List of Recommended Bicycle Facilities, continued*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
187	Doolie Rd-Brawley School Rd Greenway connection	Doolie Road	Brawley School Rd	greenway	new construction	1.60
188	Plantation Ridge Dr	Doolie Rd Greenway	Morrison Plantation Pkwy	sidepath	new construction	0.68
189	Plantation Ridge Dr	Morrison Plantation Pkwy	Singleton Rd	separated bike lanes	widen roadway/ convert on-street parking to SBL	0.28
190	Raceway Dr/ Gasoline Alley Dr	Plantation Ridge Dr	Rolling Hills Road	shared lane markings	paint SLM symbols	0.87
191	Singleton Rd	Morrison Plantation Pkwy	Plantation Ridge Dr	bike lanes	restripe with bike lanes	0.50
192	Reeds Creek Greenway	NC 150/Plaza Drive	Lowrance Ave	greenway	new construction	0.59
193	Reeds Creek Greenway Spur	Reeds Creek Greenway	Academy St	greenway	new construction	1.29
194	Silver Hook Dr	Brawley School Rd	Gibbs Rd	sidepath	new construction	0.62
195	Silverhood Dr-Chandeleur Dr connector with BB/WF/AS on Harbor Cove Ln + Chandeleur Dr	Silverhook Dr	Williamson Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.67
196	Sundown Rd extension	Williamson Rd	Silver Hook Dr	separated bike lanes	to be built with roadway construction	0.49
197	Castles Gate Dr-Singleton Rd connector with BB/ WF/AS on Morrison Cove Rd + Castles Gate Dr	Oak Tree Rd	Singleton Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	1.07
198	Oak Tree Rd	northern terminus	Brawley School Rd	sidepath	new construction	1.13
199	Matlen Dr-Oak Village Pkwy connector, Whitehall Dr-Village Commerce Dr connection with BB/ WF/AS on Matlen Dr, Oak Village Pkwy, Whitehall Dr, + Village Commerce DR	Oak Tree Rd	Brawley School Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.85
200	Oak Village Pkwy-Clusters Cir connector with BB/ WF/AS on Clusters Cir	Oak Village Pkwy	Village Commerce Dr	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.20

TABLE B.1 *Project List of Recommended Bicycle Facilities, continued*

Project Number	Corridor	From	To	Proposed Facility Type	Implementation Method	Length (mi)
201	Oak Village Pkwy-Shadow Brooke Ln connector with BB/WF/AS on Shadow Brooke Ln	Oak Village Pkwy	Brawley School Rd	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.35
202	Elba Dr/Almora Lp	Bluffton Rd	Rocky River Greenway connector	wayfinding	signage	0.63
203	Midnight Lane-Oates Road	Bluefield Road	US 21	separated bike lanes	to be built with roadway construction	1.50
204	Midway Lake Rd	NC 115/ Mecklenburg Hwy	Faith Rd	bike boulevard	traffic calming, signage	1.89
205	Thunder Rd	northern terminus	Mazappa Rd	shared lane markings	paint SLM symbols	0.41
206	Dogwood Ln	Culp St	Rocky River Greenway	bike boulevard	traffic calming, signage	0.10
207	Brewster Ct-Flanders Dr connector with BB/WF/AS on Grayland Rd + Brewster Ct	NC 115/ Statesville Hwy	Flanders Dr	bike-ped connector with BB/WF/AS	new construction; traffic calming, signage	0.54

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FIGURE B.3 *Crossing Improvement Project Numbers*

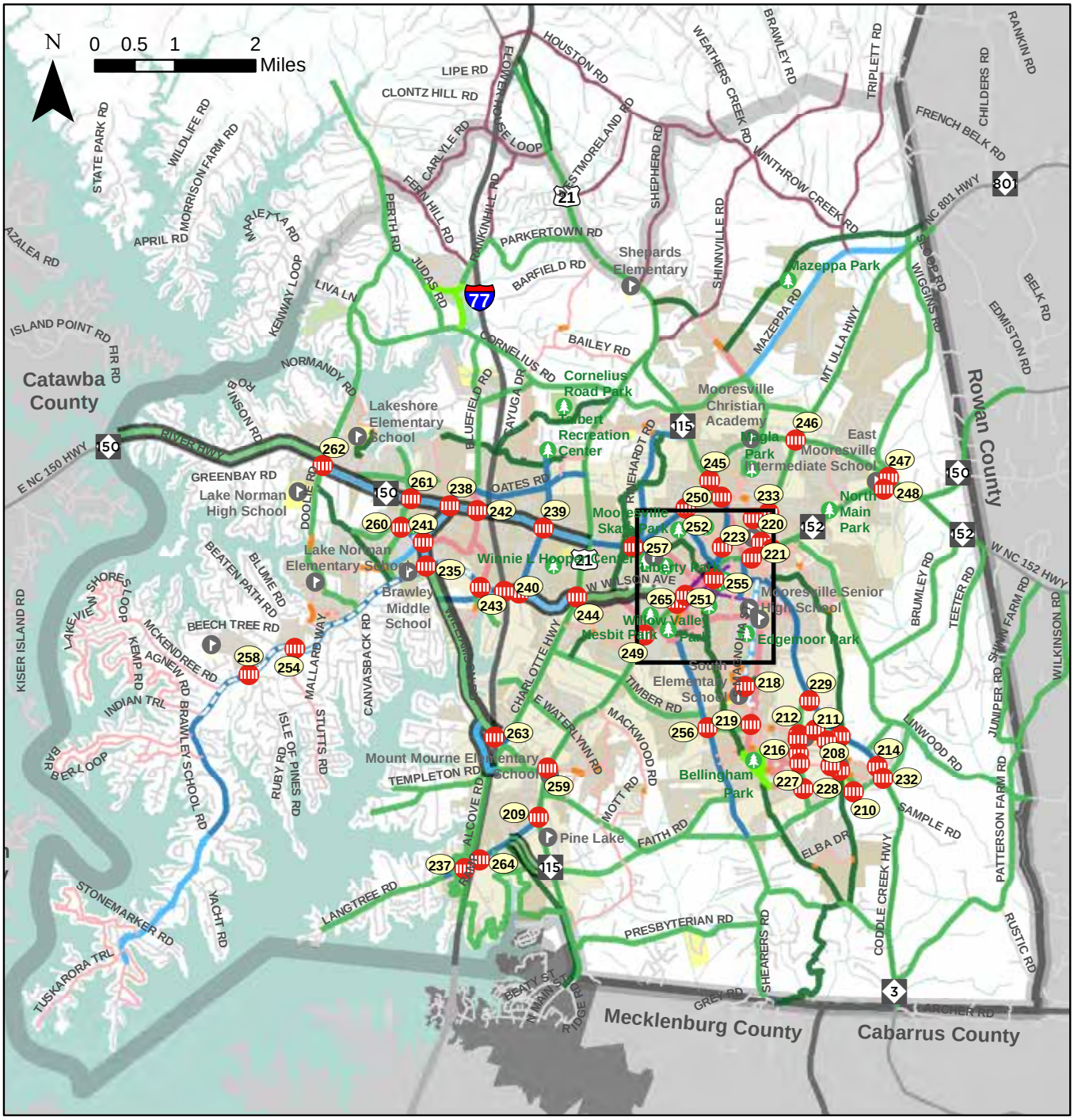


FIGURE B.4 *Crossing Improvement Project Numbers- Downtown Inset*

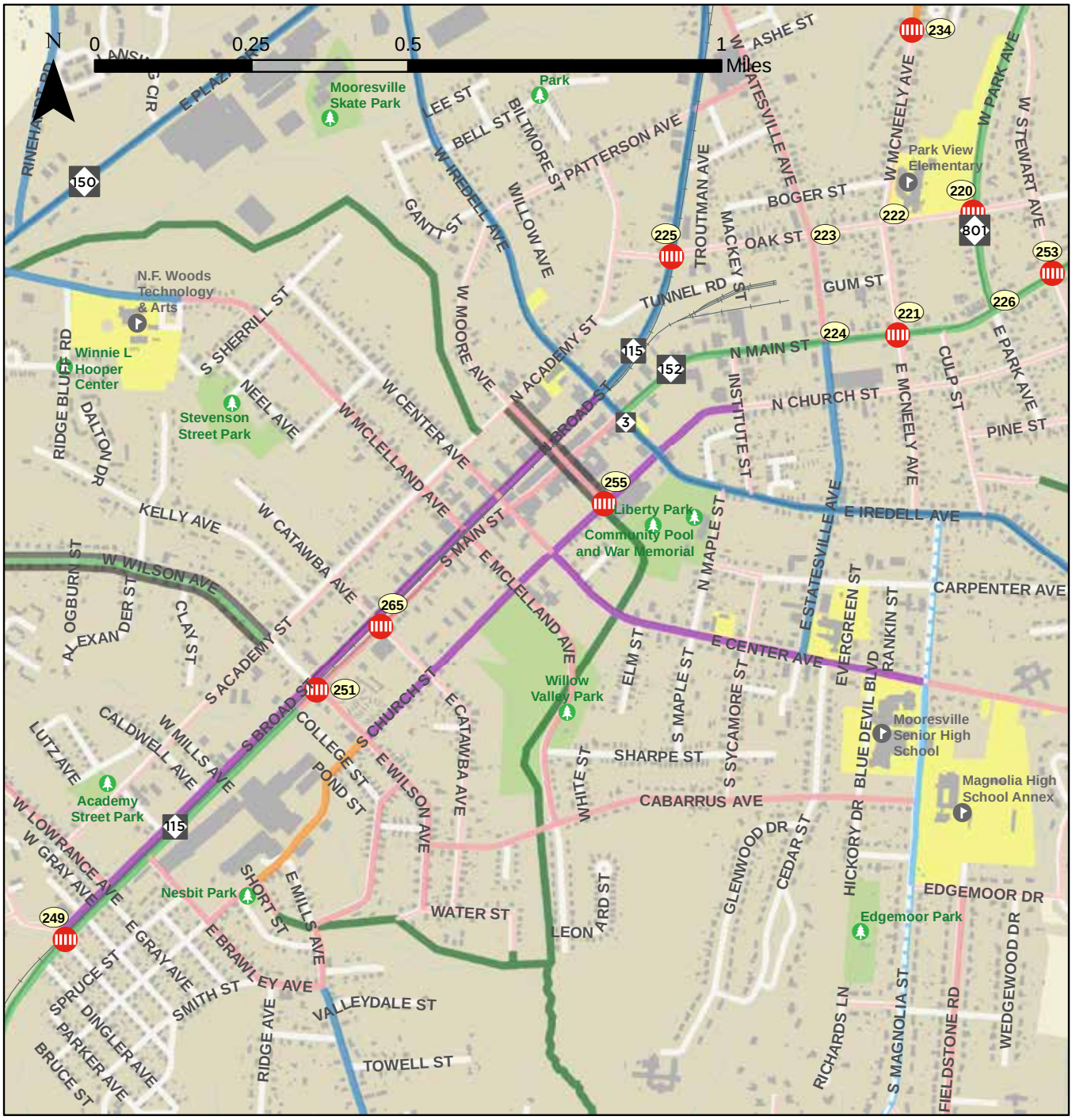


TABLE B.2 *Project List of Recommended Crossing Improvements*

Project Number	Corridor 1	Corridor 2	Proposed Facility Type
208	Rocky River Elementary School access road	Rocky River Elementary School carpool loop	Crossing Improvement
209	NC 115	Langtree Rd	Crossing Improvement
210	Rocky River Elem School access road/Vick Rd	Rocky River Road	Crossing Improvement
211	NC 3/Coddle Creek Hwy	Mooresville Intermediate School driveway	Crossing Improvement
212	Kistler Farm Rd	Mooresville Middle School driveway/Ashlyn Creek Dr	Crossing Improvement
213	Kistler Farm Rd	Mooresville Middle School driveway (south)	Crossing Improvement
214	NC 3/Coddle Creek Hwy	Northstone Rd	Crossing Improvement
215	Rocky River Elem School access road	Mooresville Middle School back parking lot	Crossing Improvement
216	Kistler Farm Rd	Briarcliff Rd	Crossing Improvement
217	Magnolia St	Hampton Pl	Crossing Improvement
218	Magnolia St	greenway connection	Crossing Improvement
219	Fieldstone Rd	White Oakes Rd	Crossing Improvement
220	Park Ave	Oak St	Crossing Improvement
221	N Main St	McNeely Ave	Crossing Improvement
222	Oak St	McNeely Ave	Crossing Improvement
223	Oak St	Statesville Ave	Crossing Improvement
224	N Main St	Statesville Ave	Crossing Improvement
225	Broad St	Oak St	Crossing Improvement
226	N Main St	Park Ave	Crossing Improvement
227	Kistler Farm Rd	Bow Ln	Crossing Improvement
228	Kistler Farm Rd	Sawhorse Dr	Crossing Improvement
229	Kistler Farm Rd	NC 3/Coddle Creek Hwy	Crossing Improvement
230	Rocky River Elem School access road	future Bow Ln connector	Crossing Improvement
231	Rocky River Elem School access road	Mooresville Intermediate north driveway	Crossing Improvement
232	Rocky River Rd	NC 3/Coddle Creek Hwy	Crossing Improvement
233	Park Ave	Wren Hill Dr	Crossing Improvement
234	McNeely Ave	Brunswick St/future Rebecca Jane Dr connector	Crossing Improvement
235	Brawley School Rd	Williamson Rd	Crossing Improvement
236	Brawley School Rd	Talbert Rd	Crossing Improvement

TABLE B.2 *Project List of Recommended Crossing Improvements, continued*

Project Number	Corridor 1	Corridor 2	Proposed Facility Type
237	Langtree Rd	I-77 southbound ramps	Crossing Improvement
238	NC 150/River Hwy	Williamson Rd/Bluefield Rd	Crossing Improvement
239	NC 150/Plaza Dr	Talbert Rd	Crossing Improvement
240	Brawley School Rd	I-77 ramps	Crossing Improvement
241	Williamson Rd	Raceway Dr	Crossing Improvement
242	NC 150/River Hwy	Rolling Hill Rd/Regency Center Dr	Crossing Improvement
243	Brawley School Rd	Rolling Hill Rd/Silverhook Dr	Crossing Improvement
244	Brawley School Rd/Wilson Ave	US 21/Charlotte Hwy	Crossing Improvement
245	NC 150/Plaza Dr/Oakridge Farm Hwy	NC 115/Broad St/Statesville Hwy	Crossing Improvement
246	NC 150/Oakridge Farm Hwy	NC 801/Park Ave/Mt Ulla Hwy	Crossing Improvement
247	NC 150/Oakridge Farm Hwy	Wiggins Rd	Crossing Improvement
248	NC 152/Landis Hwy	Wiggins Rd	Crossing Improvement
249	NC 115/Main St	Doster Ave	Crossing Improvement
250	NC 115/Broad St	Williams St	Crossing Improvement
251	NC 115/Main St	Wilson Ave	Crossing Improvement
252	NC 150/Plaza Dr	NC 3/Iredell Ave	Crossing Improvement
253	NC 152/N Main St	Stewart Ave	Crossing Improvement
254	Brawley School Rd	Stutts Rd	Crossing Improvement
255	Church St	Moore Ave	Crossing Improvement
256	Shearers Rd	White Oaks Rd	Crossing Improvement
257	NC 150/Plaza Dr	McLelland Ave	Crossing Improvement
258	Brawley School Rd	Isle of Pines Rd	Crossing Improvement
259	NC 115/Mecklenburg Hwy	Fairview Rd	Crossing Improvement
260	Plantation ridge Dr	Morrison Plantation Pkwy	Crossing Improvement
261	NC 150/River Hwy	Morrison Plantation Pkwy/ Ervin Rd	Crossing Improvement
262	NC 150/River Hwy	Perth Rd/Doolie Rd	Crossing Improvement
263	Williamson Rd	I-77	Crossing Improvement
264	Langtree Rd	I-77 northbound ramps	Crossing Improvement
265	Main St	Catawba Ave	Crossing Improvement

Appendix C:
Bicycle Policy + Regulatory Review

Mooresville's regulatory standards and policies were analyzed and compared to model regulatory and policy language from around North Carolina and the U.S. in order to identify areas to improve the regulatory language and enable the Town to maximize on-road bicycle and multi-use trail improvements in conjunction with new development, redevelopment, and corridor improvement projects. The complete policy review is summarized on the following pages. The priority policy changes and recommendations that were identified through this review are presented in Chapter 4.

Topics/ Strategies	Policies/Recommendations
1. Complete Streets and Greenways	
1.1. Implement Complete Streets Policy A complete streets policy allows cities and towns to work towards creating a street network that encourages pedestrian and bicycle travel and provides safe and comfortable roadways for all users. Mooresville has an excellent complete street policy statement. The opportunity for Mooresville is to effectively integrate and coordinate the implementation details, guidance, and standards of its policy in practice.	**UDO, Adopted Plans, or Engineering/Design Standards** **EXCELLENT Complete Streets Statement.** From the Access and Connectivity Standards section (Section 5.1.1.): *The purpose of this section is to ensure that developments implement a coordinated multimodal transportation system that permits the safe and efficient movement of motor vehicles, emergency vehicles, transit vehicles, bicyclists, and pedestrians within the development and between the development and external transportation networks, neighboring developments, and local destination points such as places of employment, schools, parks, and shopping areas, that is consistent with the Town's adopted plans, including the Comprehensive Transportation Plan (CTP), the Metropolitan Transportation Plan (MTP), the Town Bicycle and Pedestrian Plan, and the Comprehensive Plan. In particular, the intent of this section is to build a multimodal transportation system that:* *1. Provides transportation options;* *2. Promotes walking and bicycling;* *3. Facilitates use of public transportation;* *4. Reduces emergency response time;* *5. Connects neighborhoods;* *6. Reduces vehicle miles of travel and travel times;* *7. Reduces greenhouse gas emissions;* *8. Improves air quality;* *9. Minimizes congestion and traffic conflicts; and* *10. Preserves the safety and capacity of the Town's transportation system.* From the Street Design Specifications subsection (Section 5.1.5.A.1.): *a. All developments subject to the requirements of this section shall be served by a system of sidewalks, paths, streets, accessways, and other facilities designed to provide for multiple travel modes (vehicular, transit, bicycle, and pedestrian), as appropriate to the developments size, character, and relationship to surrounding development and development patterns, and existing and planned community transportation systems.* *b. Vehicular, transit, bicycle, and pedestrian access and circulation systems shall be coordinated and integrated so as to provide transportation choices within and to and from the proposed development, as appropriate.* **General Recommendations** Consider adding as acceptable references for street design: - *NCDOT Complete Street Implementation Guide* - *NCDOT Complete Streets Policy Guidance memo* - *NCDOT Roadway Design Manual* - *NCDOT Complete Streets Planning and Design Guidelines* - *NCDOT Traditional Neighborhood Street Design Guidelines* - *FHWA Bikeway Selection Guide* - *FHWA Separated Bike Lane Guide* - *AASHTO Guide for the Design of Bicycle Facilities (latest edition; in the process of being updated at time of plan adoption.)* - *NACTO Urban Street Design Guide* - *NACTO Urban Bikeway Design Guide* - *Other State and national guidance, as relevant* In addition to the very thorough NCDOT's Complete Streets Policy documents and Complete Streets Planning and Design Guidelines*, Smart Growth America provides great resources for designing streets that cater to all users, including a best practices guide co-authored with APA. (*NCDOT's Planning & Design Guidelines were developed to provide planners, designers and decision makers with a framework for evaluating and incorporating various design elements into transportation projects and processes. For NCDOT's policy on implementation and funding of Complete Streets, see NCDOT's 2019 Complete Streets Policy Guidance memo and the NCDOT Complete Street Implementation Guide and NCDOT Roadway Design Manual.)

Topics/ Strategies	Policies/Recommendations
1. Complete Streets and Greenways, continued	
1.2 Develop Complete Street Design Guidelines for a variety of contexts and all street/ roadway user groups The subsections below include recommendations for bicycle-related elements of Complete Streets. Designated bikeways and trails and end-of trip facilities, such as bicycle parking are some most fundamental elements of Complete Streets for bicycle users. Access management, multi-modal level of service assessments, and traffic calming are also critical for developing complete street networks through the development review and capital project implementation process. The NCDOT *Complete Street Guidelines* and the design guidelines that accompany this plan also include detailed recommendations on complete street design elements.	**UDO, Adopted Plans, or Engineering/Design Standards** **Needs improvement.** The UDO could be improved to specify types of bikeways as outlined in this Bike Plan's recommendations. Currently, Article 5.1.6, Street, Sidewalk, and Greenway Standards only refer to bicycle facilities to be installed in accordance with the CTP and/or the Town's Bicycle Plan. So this plan's recommendations will form the basis of the UDO design standards. Needs to be improved to specify bicycle facility design standards in different roadway contexts in accordance with the recommendations of this plan and those of the TMP. Currently, greenways are the only type of bikeway included. **General Recommendations** Mooresville could adopt and endorse the NCDOT guidelines and other national guidelines, Including the NACTO *Urban Bikeway Design Guide*. The design guidelines would then need to be integrated into the Unified Development Ordinance and zoning standards for new development, as was done with the *Raleigh Street Design Manual* and the *Charlotte Urban Street Design Guidelines*.

Topics/ Strategies	Policies/Recommendations
1. Complete Streets and Greenways, continued	
1.3 Require bike accommodations by roadway type	**UDO, Adopted Plans, or Engineering/Design Standards**
	Needs improvement. The UDO does not specify bike accommodations by roadway type, but the Town's Transportation Master Plan (TMP), which can be found in Chapter 4 of *OneMooresville Comprehensive Plan*, does provide guidelines on the type of bike facility that is recommended based on the street type and surrounding land use and roadway context. The range of bike facility types should be specified based on the types of bikeways recommended in this plan and this plan's design guidance, as well as guidance provided in the TMP. Sample cross-sections are provided in Chapter 4, Recommended Programs + Policies. The engineering standards available through the Town's website and in the 2018 Land Development Standards do not include any bike facilities for any street type. Design standards are available for standard bicycle lanes, but not for any other bicycle facilities—separated bicycle lanes, buffered bike lanes, or other on-street bike facilities are not specified. The design standards for bicycle lanes specify minimum 4-ft bike lanes, with 5-ft preferred. State of the practice and national guidance recommends bike lanes of at least 5 ft and as wide as 6.5 ft to provide additional horizontal separation and comfort for cyclists. Per NCDOT Complete Street guidance, travel lane widths can be as little as 10 ft. (currently specified as 11 ft per Town standards). The Town's Engineering Standards also show 11-12 ft lanes on most street types. The range of bikeway types should be expanded and specified based on the types of bikeways recommended in this plan and the plan's design guidance, as well as the recommendations set forth in the TMP. **Design Standards:** **Need Improvement.** The Engineering Standard sections and the cross-sections in the TMP need to be updated to be consistent with those recommended in this plan.
	General Recommendations
	The design guidelines recommended as part of the Pedal Moore(sville) Bicycle Plan could be incorporated or included by reference in the Town's Engineering and Design Standards and Unified Development Ordinance. NACTO *Urban Bikeway Design Guide* provides additional design details for various on-street bikeway treatments and could be adopted by reference in the ordinance and/or the Engineering Standards. Many cities have taken this approach*: http://nacto.org/cities-for-cycling/design-guide/* See also the 2019 FHWA *Bikeway Selection Guide* and other current bikeway design guidance by AASHTO and NCDOT.

Topics/ Strategies	Policies/Recommendations
1. Complete Streets and Greenways, continued	
1.4 Require designated bikeways (bike lanes, separated bike lanes, shared-use paths, etc) during new development or redevelopment or capital projects.	**UDO, Adopted Plans, or Engineering/Design Standards** **Good.** The updated UDO requires a combination of bike facilities and low-speed local streets to be included for streets built with new development, and for right-of-way to be dedicated for bike facilities on existing streets when development occurs, but it does not specify the bicycle facility type or design standards of such bicycle facilities. *Section 5.1.6.C.1. Bicycle Facility Requirements* *a. All development that includes street construction shall include a combination of bicycle facilities and low-speed local streets, where applicable, that provide a safe, comfortable, and convenient route within the development and to bicycle facilities outside the development.* *b. Bicycle facilities shall be installed on new streets in accordance with the CTP and/or the Town's Bicycle Plan. Any collector or higher street not within such plan shall provide an on-street bicycle lane and appropriate buffer. Sharrows and bicycle lanes are strongly encouraged on all local streets.* *c. For development along existing streets for which bicycle facilities are identified in the CTP and/or the Town's Bicycle Plan, the developer For development along existing streets for which bicycle facilities are identified in the CTP and/or the Town's Bicycle Plan, the developer shall dedicate additional right-of-way as necessary to accommodate the bicycle facility.* *d. Where appropriate due to anticipated traffic volumes or conflicts with vehicular traffic, on-street bicycle facilities shall include features that enhance separation from motor vehicles such as physical buffering through means such as bollards, parked cars, or by being placed behind the roadway curb; or use of a separate shared sidepath or greenway trail, in accordance with the standards of the Town's Bicycle Plan.* The range of bike facility types should be specified based on the types of bikeways recommended in this plan and the plan's design guidance, as well as guidance provided in the Town's Transportation Master Plan (TMP, which can be found in Chapter 4 of *OneMooresville Comprehensive Plan*). **Design Standards:** **Need Improvement.** The Land Development Standard section on bicycle facilities need to be updated to be consistent with the bike facility types recommended in this plan. **General Recommendations** Generally, as traffic volumes exceed 3,000 vehicles per day and traffic speeds exceed 25mph, facilities to separate bicycle and motor vehicle traffic are recommended. See Chapter 4 of the NCDOT *Complete Streets Planning and Design Guidelines* for examples of facility types by roadway context. Also, see: • Chapter 6 of Wake Forest, NC UDO for recommendations for bikeways and greenways, esp. sections 6.8.2, 6.9, 6.10. • Chapter 7 of the Wilson, NC UDO regarding greenways.

Topics/ Strategies	Policies/Recommendations
1. Complete Streets and Greenways, continued	
1.5. Require dedication, reservation or development of greenways	**UDO, Adopted Plans, or Engineering/Design Standards**
	Access and Connectivity Standards: **Good.** Greenways are not addressed in detail, but are included in the types of bicycle facility requirements in Section C Bicycle Facilities, and in Section F Shared Use Path, in Article 5.1.6 Street, Sidewalk, and Greenway Standards. *C.1.e. Greenways and bicycle-pedestrian bridges shall be constructed to the standards of this UDO and the Town's Bicycle Plan.* *F. SHARED USE PATH* *All development shall dedicate land for shared use paths, including greenways and sidepaths, identified in CTP and/or the Town's Bicycle Plan. If a residential development consists of more than 50 units or a mixed-use or non-residential project contains more than 25,000 square feet, the shared use paths shall be constructed by the developer according to the standards of this UDO.* **Subdivision Standards:** **Good.** Greenways are addressed briefly in Section 6.2.4, Easements: *C. GREENWAY, BICYCLE FACILITY, AND PEDESTRIAN FACILITY EASEMENTS* *1. Easements for public greenway, bicycle facilities, and/or pedestrian facilities shall be dedicated to the Town.* *2. Easements shall be a minimum of 20 feet in width.* **Conservation Subdivisions:** **Good**. Greenways are also addressed briefly in Section 6.2.4, Conservation and Development Plan: *D. STEP 4: CONSERVATION AND DEVELOPMENT PLAN* *The applicant shall prepare a Conservation and Development Plan that includes the site analysis map, information gathered during the site inspection, and an exhibit showing the conservation and development areas. The Plan shall be submitted to the Planning Director and shall include the specific items identified in the Administrative Manual.:* *c. A preliminary site improvements plan showing proposed site development, including, but not limited to:* *i. Areas proposed for conservation;* *ii. Conceptual locations for proposed roads, greenways, and trails;* **Design Standards:** **Good, but could be improved.** Greenway design specifications are included. At a minimum, greenway design standards call for 10-ft paved surfaces. Additional width (12 ft) could be specified for sections of greenway where there is higher demand.
	General Recommendations
	Consider expanding requirements for greenway reservation, dedication, or provision in new developments where a property connects to an existing or proposed greenway. See requirements in Wake Forest, NC UDO Chapter 6, Section 6.8.2 Greenways: *"When required by Wake Forest Open Space & Greenways Plan or the Wake Forest Transportation Plan, greenways and multi-use paths **shall be provided** according to the provisions [that follow in the section cited above]."* Where greenway construction cannot politically or legally be required, consider offering additional incentives in the form of reduced fees, cost sharing, density bonuses, or reduction in other open space requirements when adopted greenways are constructed through private development. For additional examples of incentives, see also: https://www.law.ufl.edu/_pdf/academics/centers-clinics/clinics/conservation/resources/incentive_strategies.pdf

Topics/ Strategies	Policies/Recommendations
1. Complete Streets and Greenways, continued	
1.6. Require new bike lanes, greenways, etc., to connect to existing facilities	**UDO, Adopted Plans, or Engineering/Design Standards** **Needs improvement.** From Section 5.1.5. Subsection B Vehicular Connectivity: *v. A right of way shall be provided in a single-family detached, duplex, or attached residential subdivision for pedestrian and bicycle access between a cul-de-sac head or street turnaround and the closest street or pedestrian path (see Figure 5-4: below), if the cul-de-sac:* *(1) Is in close proximity to a significant pedestrian generator or destination such as a school, park, trail, greenway, employment center, mixed-use development, retail center, transit stop, or similar feature, or creates an unreasonable impediment to pedestrian circulation (defined generally as walking distance between uses on the cul-de-sac and uses on the closest street that is at least four times the actual physical distance between these two uses); and* *(2) Can be reasonably connected to an existing or proposed sidewalk, trail greenway, or other type of pedestrian connection or can provide for future connectivity to a vacant property.* Subsection C addresses Pedestrian Connectivity, and Subsection D addresses Transit Connectivity, but there is no Bicycle Connectivity section. **General Recommendations** Connectivity of facilities is critical for walking and biking conditions. New development should be required to connect to or extend existing facilities bicycle and pedestrian facilities. See: • Chapter 6 of Wake Forest, NC UDO for recommendations for bikeways and greenways, esp. sections 6.5.3, 6.8.2, 6.9, 6.10. • Chapter 7 of the Wilson, NC UDO regarding greenways.
1.7. Consider bicycle concerns and Level of Service (LOS) in Traffic Impact Analyses and other engineering studies	**UDO, Adopted Plans, or Engineering/Design Standards** **Needs improvement** No specific guidelines for bicycle LOS analysis or mitigation are included in the UDO. **General Recommendations** Mooresville should consider adopting multi-modal of service standards where active transportation and transit use are expected to be high. Consideration of bicycle and pedestrian levels of service assure adequate facilities for bicyclists and pedestrians in new development and capital improvements. This also helps promote walking and bicycling as a legitimate means of transportation. The NCDOT *Complete Streets Planning and Design Guidelines* provides factors of "Quality of Service " and LOS for bicycle, pedestrian, and transit modes (See Chapter 3, page 39 and Chapter 5). The City of Raleigh's Street Design Manual uses multimodal level of service approach in determining road improvements and traffic mitigation. Charlotte, NC uses Pedestrian LOS and Bicycle LOS Methodologies for intersection improvements in their *Urban Street Design Guidelines*.

Topics/ Strategies	Policies/Recommendations
1. Complete Streets and Greenways, continued	
1.8. Adopt traffic calming programs, policies, and standards Traffic calming on local streets increases safety and comfort for all roadway users, including cyclists. It also increases neighborhood livability.	**UDO, Adopted Plans, or Engineering/Design Standards** **Good, but could be improved.** From the Access and Connectivity Standards section: *e. Traffic-Calming Measures* *Within a residential development, any linear segment of a non-boulevard street that is more than 800 feet long, shall, to the maximum extent practicable, include features to interrupt direct vehicle flow, including, but not limited to, any of the following:* *i. Curb extensions to reduce the vehicular travel lanes;* *ii. Mini-roundabouts at intersections;* *iii. Curvilinear street design that interrupts a monotonous, straight road;* *iv. Traffic-diverting physical devices such as neckdowns, chicanes, and diverter islands;* *v. Roadway striping to reduce the vehicular travel lane width; and/or* *vi. Speed tables, raised intersections, or elevated pedestrian street crossings.* Design speeds could be specified to ensure that traffic calming measures achieve the desired effect of vehicle speeds being reduced to below a certain threshold, e.g., 25 mph. **Design Standards:** **Needs improvement** Not addressed **General Recommendations** FHWA has developed a comprehensive Traffic Calming ePrimer. See also the NACTO *Urban Bikeway Design Guide* section on Bicycle Boulevards, which includes traffic calming measures. The Town of Huntersville has an excellent example of neighborhood traffic calming policy that is a great model for other communities. Such traffic calming measures, if adopted by Mooresville, could be used to enhance bike boulevard treatments in the community.

Topics/ Strategies	Policies/Recommendations
2. Bicycle-oriented Urban Design Elements	
2.1. Adopt bicycle parking require-ments	**UDO, Adopted Plans, or Engineering/Design Standards** **Good, but could be improved.** Section 5.2.8, Bicycle Parking Standards includes a table that specifies the minimum bicycle parking required based on the type of building and zoning district. The location and design standards are also provided for bicycle racks and for vertical bicycle parking racks. The design standards do not specify the type of bike racks that should be used. This plan suggests that inverted U-racks be used and that **wave racks not be allowed** as they do not provide adequate security, capacity, or balance for bicycles. Also, the standards do not differentiate between short-term and long-term bicycle parking in terms of the amount of bicycle parking to be provided. **Design Standards:** **Needs improvement.** The Land Development Standards should be updated to reflect the guidance provided in the UDO. Consider performance standards for bike parking. **General Recommendations** Different standards of bicycle parking are needed for short-term visitors and customers and for longer term users like employees, residents, and students. See City of Wilson UDO, Chapter 9: Parking & Driveways, Section 9.4 and 9.6. The City of Charlotte has excellent standards for long-term and short-term bicycle parking it its Zoning Ordinance. Bicycle Parking Model Ordinance, Change Lab Solutions.

Topics/ Strategies	Policies/Recommendations
3. Connectivity Requirements	
3.1. Revise block size requirements From the NCDOT Complete Streets Planning and Design Guidelines, p 59: *"[A]* ***Good [street] network provides more direct (shorter) routes for bicyclists and pedestrians to gain access to the thoroughfares and to the land uses along them (or allows them to avoid the thoroughfare altogether).*** *Likewise, good connections can also allow short-range, local [motor] vehicular traffic more direct routes and access, resulting in less traffic and congestion on the thoroughfares. This can, in turn, help make the thoroughfare itself function as a better, more complete street. For all of these reasons,* ***a complete local street network should generally provide for multiple points of access, short block lengths, and as many connections as possible."***	**UDO, Adopted Plans, or Engineering/Design Standards** **Good, but needs improvement.** From Section 5.1.5, Access and Connectivity Standards: *2. Arrangement of Block and Streets* *Except as exempted in this section, to support the Town's goal for an integrated multimodal transportation network that provides high levels of access to destinations by driving, walking, bicycling, and taking transit, a development's block and street network shall comply with the following standards:* *a. General Block Standards* *i. The lengths, widths, and shapes of blocks in a development shall be determined by considering the size of building sites necessary for the needs of the anticipated use; the requirements of the zoning district in which the development is located, the needs of vehicular, bicycle, and pedestrian circulation; the control and safety of street traffic; the limitations and opportunities of topography; convenient access to water areas; and compliance with this UDO."* *Permitted maximum block length range from 550 to 1,000 feet, depending on development type;* **no minimum block size is specified** *for any development type.* **Design Standards:** Not Addressed **General Recommendations** Development density should determine the length of a block, with shorter blocks being more appropriate in areas of higher density. **Maximum block length in any situation should rarely exceed 800-1000 feet for good connectivity. In areas with highest development density (urbanized, mixed use centers and high density neighborhoods) block lengths can be as little as 200 feet.** In areas with blocks as long as 800 feet or greater, a pedestrian and/or bicycle path of 6-8 feet in width should be required, with an easement of 15-20 feet wide. See the example table on page 59 of the NCDOT *Complete Streets Planning and Design Guidelines* for a context-based approach to block size. Requiring connectivity or cross-access between adjacent developments is a great tool for reducing the amount of traffic on major roads while increasing connectivity for pedestrians, bicycles, service vehicles, and neighborhood access. For good model language, see City of Wilson, NC UDO, Section 6.4: Connectivity. Or City of Wake Forest, NC UDO, Section 6.5, Connectivity. Both codes above also **provide requirements for when bicycle/pedestrian connections between parcels, public open space, and between cul-de-sacs is required**.

Topics/ Strategies	Policies/Recommendations
3. Connectivity Requirements, continued	
3.2. Limit dead end streets or cul-de-sacs Dead end streets or Cul-de-sacs, while good at limiting motor vehicular traffic in an area, are a severe hindrance pedestrian and bicycle connectivity and over all neighborhood accessibility, including for emergency access and other services.	**UDO, Adopted Plans, or Engineering/Design Standards** **Good.** Section 5.1.5, Access and Connectivity Standards, Subsection 2.f, Cul-de-Sacs and Dead-End Streets provides specific guidance for when cul-de-sacs and dead-end streets are permitted, and also specifies connectivity index scores and pedestrian/bicycle connections at the end of cul-de-sacs. It specifies the following guidance: *v. A right of way shall be provided in a single-family detached, duplex, or attached residential subdivision for pedestrian and bicycle access between a cul-de-sac head or street turnaround and the closest street or pedestrian path (see Figure 5-4: below), if the cul-de-sac:* *(1) Is in close proximity to a significant pedestrian generator or destination such as a school, park, trail, greenway, employment center, mixed-use development, retail center, transit stop, or similar feature, or creates an unreasonable impediment to pedestrian circulation (defined generally as walking distance between uses on the cul-de-sac and uses on the closest street that is at least four times the actual physical distance between these two uses); and* *(2) Can be reasonably connected to an existing or proposed sidewalk, trail greenway, or other type of pedestrian connection or can provide for future connectivity to a vacant property* **Design Standards:** Not Addressed **General Recommendations** Mooresville's UDO provides specific connectivity standards based on land use context and other guidelines for when cul-de-sacs would be allowed, and also how cul-de-sacs are required to include pedestrian and bicycle connectivity features.

Topics/ Strategies	Policies/Recommendations
4. Resources	
The documents noted in the columns to the right were referenced for this policy and regulatory review. Other references for best practices are listed in the General Recommendations Column on the bottom right.	**UDO, Adopted Plans, or Engineering/Design Standards** Town of Mooresville's Unified Development Ordinance (still pending adoption as of the writing of this report, February 2022) *2018 Land Development Standards*, Town of Mooresville **General Recommendations** REFERENCED DOCUMENTS AND OTHER RESOURCES: 1. NCDOT Complete Streets Policy Memo and Implementation Guide (2019) and NCDOT Roadway Design Manual. 2. NCDOT *Complete Streets Planning and Design Guidelines* (July 2012 ; reference for planning and process only. This document is superseded by subsequent NCDOT Complete Streets policy guidance where noted): 3. NCDOT *Traditional Neighborhood Development (TND) Guidelines.* 4. City of Wilson, NC UDO. 5. Town of Wendell, NC UDO. 6. City of Wake Forest, NC UDO. 7. See Town of Davidson, NC Planning Ordinance. 8. Association of Pedestrian and Bicycle Professionals' *Bicycle Parking Guidelines*. (www.apbp.org) *9. Making Neighborhoods More Walkable and Bikeable*, ChangeLab Solutions. *10. Getting the Wheels Rolling: A Guide to Using Policy to Create Bicycle Friendly Communities*, ChangeLab Solutions And other documents noted in this column in the rows above.

Appendix D:
Updated Cross-Sections for Strategic Corridors

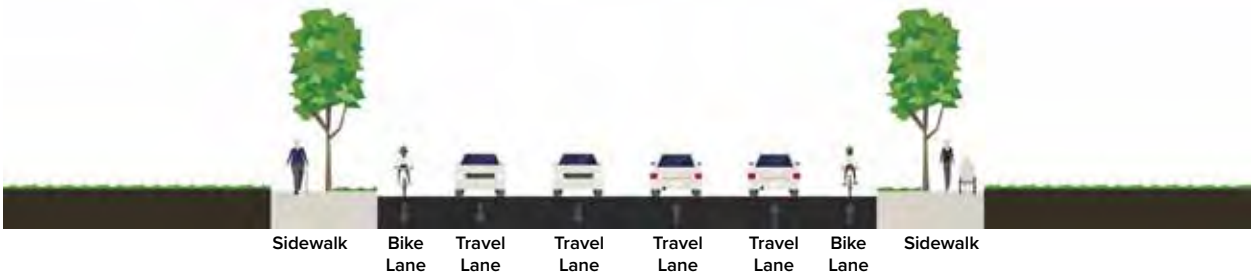
Mooresville's Comprehensive Plan, *OneMooresville*, identifies eleven Strategic Corridors that are the major transportation corridors that will support future growth and development. The plan provides guidance for how to anticipate the widening of these corridors to accommodate future motor vehicle traffic, as well as the needs of pedestrians and bicyclists. The recommended bicycle facilities for some of these Strategic Corridors have been modified during the course of this Bike Plan update and study. Updated cross-sections for the Strategic Corridors for which the bicycle facility recommendations have changed (**bolded** in the list at right) are described below.

The eleven Strategic Corridors are:

1. Perth Road
2. Cornelius Road/Connector Road
3. **NC 115 Central** (from US 21 to Patterson Avenue)
4. **Mazeppa Road**
5. **NC 150/NC 152**
6. **Teeter Road**
7. **NC-3/Coddle Creek Highway**
8. **Shearers Road**
9. East-West Corridor (future)
10. NC 115 South (from Brawley Avenue to the Mecklenburg County Line)
11. **Langtree Road**

NC 115 Central

CROSS-SECTION FROM *ONEMOORESVILLE* WITH STANDARD BIKE LANES

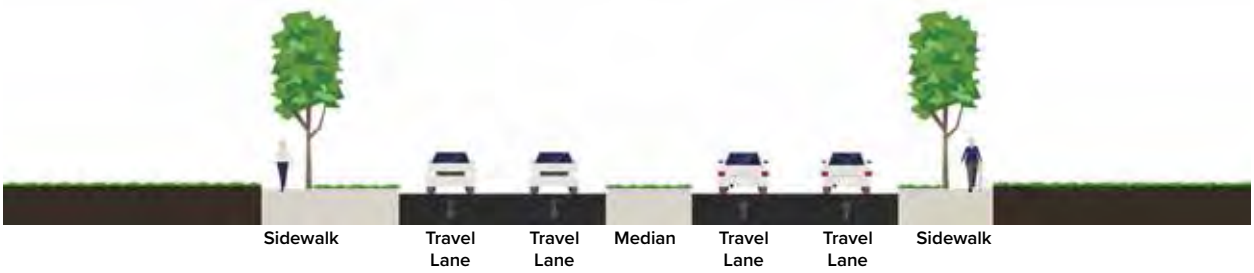


OneMooresville bike facility recommendation:
- standard bike lanes (and sidewalks)

Pedal Moore(sville) bike facility recommendation:
- multi-use paths on both sides instead of sidewalks

Mazeppa Road

CROSS-SECTION FROM *ONEMOORESVILLE* WITH NO BIKE FACILITIES

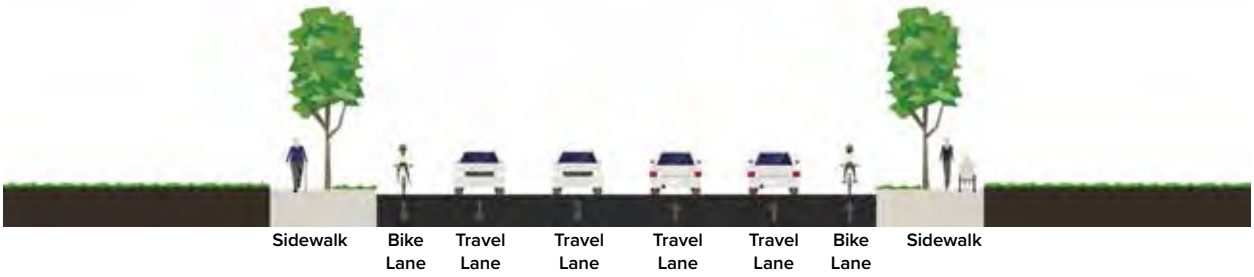


OneMooresville bike facility recommendation:
- none

Pedal Moore(sville) bike facility recommendation:
- paved shoulders/ standard bike lanes

NC 150/NC 152

CROSS-SECTION FROM *ONEMOORESVILLE* WITH STANDARD BIKE LANES

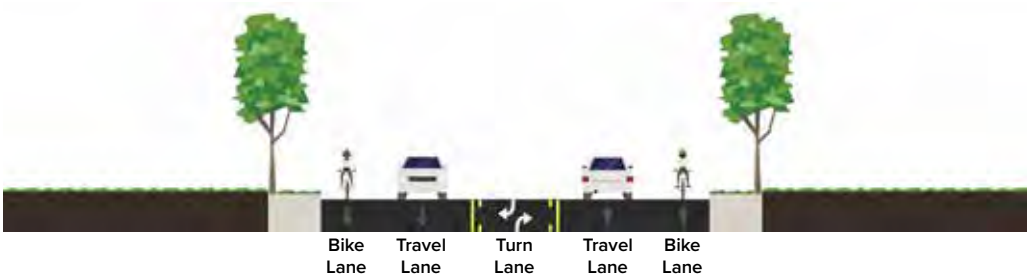


OneMooresville bike facility recommendation:
- standard bike lanes

Pedal Moore(sville) bike facility recommendation:
- separated bike lanes

Teeter Road

CROSS-SECTION FROM *ONEMOORESVILLE* WITH STANDARD BIKE LANES

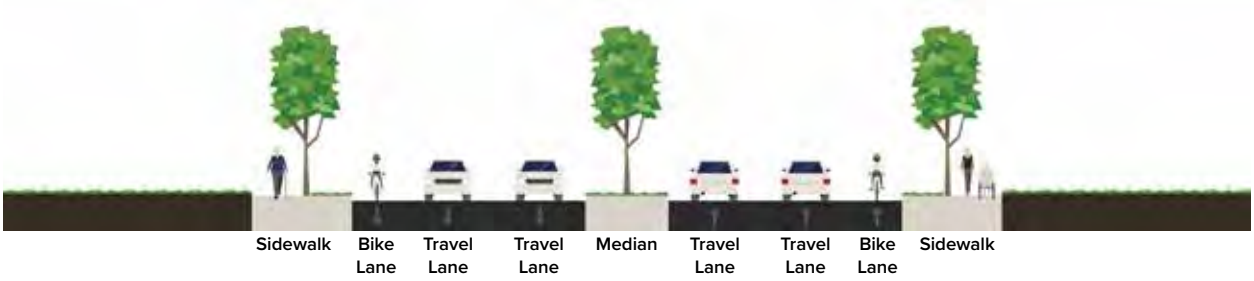


OneMooresville bike facility recommendation:
- standard bike lanes

Pedal Moore(sville) bike facility recommendation:
- multi-use paths on both sides

NC 3/Coddle Creek Highway

CROSS-SECTION FROM *ONEMOORESVILLE* WITH STANDARD BIKE LANES

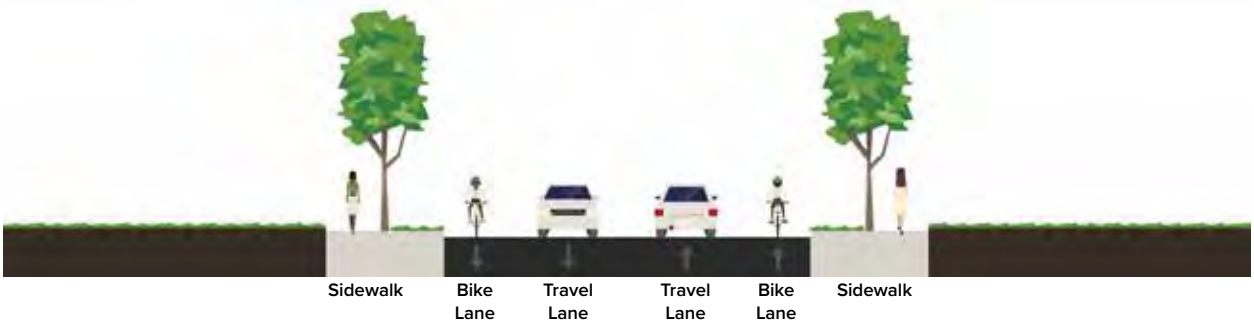


OneMooresville bike facility recommendation:
- standard bike lanes

Pedal Moore(sville) bike facility recommendation:
- separated bike lanes

Shearers Road

CROSS-SECTION FROM *ONEMOORESVILLE* WITH NO BIKE FACILITIES



OneMooresville bike facility recommendation:

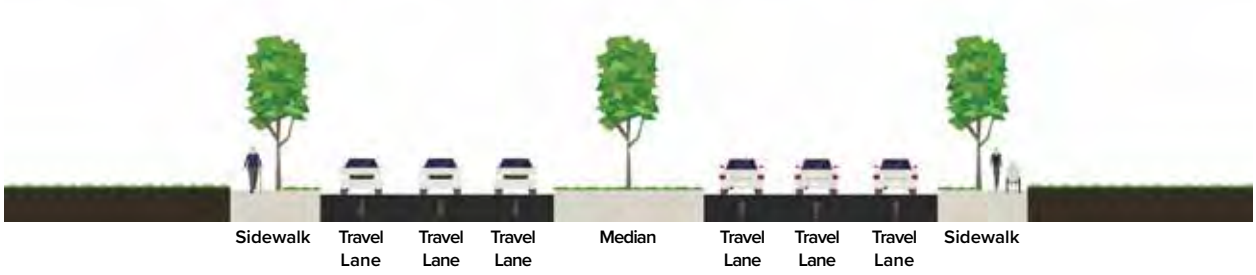
- standard bike lanes

Pedal Moore(sville) bike facility recommendation:

- separated bike lanes (north of future East-West connector
- shared-use paths (south of future East-West connector)

Langtree Road

CROSS-SECTION FROM *ONEMOORESVILLE* WITH STANDARD BIKE LANES



OneMooresville bike facility recommendation:

- none

Pedal Moore(sville) bike facility recommendation:

- separated bike lanes

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Appendix E:
Detailed Cost Estimates for Priority Projects

PLANNING COST ESTIMATE

DESCRIPTION AND LOCATION: 12-FEET WIDE SIDEPATH ON NC 115 FROM DOSTER AVE TO MECKLENBURG COUNTY LINE
PRIORITY PROJECT #1
MOORESVILLE

TIP: N/A COUNTY: IREDELL DIVISION: N/A

WBS NUMBER: N/A

ITEM NO.			ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
LINE. NO.	DESC. NO.	SECT. NO.					
			ROADWAY ITEMS				
0001	0000100000-N	800	MOBILIZATION	1	LS	$284,773.93	$284,773.93
	0000400000-N	801	CONSTRUCTION SURVEYING	1	LS	$47,462.32	$47,462.32
	0043000000-N	226	GRADING	1	LS	$619,073.77	$619,073.77
	0163000000-E	250	REMOVAL OF EXISTING CONCRETE PAVEMENT	919	SY	$225.00	$206,875.00
	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	7920	LF	$100.00	$792,000.00
	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	1056	TON	$120.00	$126,720.00
	1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	471	TON	$180.00	$84,857.14
	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	16	EA	$3,500.00	$55,440.00
	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE **	16	EA	$750.00	$11,880.00
	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	7920	LF	$35.00	$277,200.00
	2591000000-E	848	4" CONCRETE SIDEWALK	32303	SY	$60.00	$1,938,182.40
	2605000000-N	848	CONCRETE CURB RAMP	40	EA	$3,000.00	$120,000.00
	3420000000-E	SP	GENERIC GUARDRAIL ITEM (METAL SAFETY RAIL)	950	LF	$75.00	$71,250.00
	4399000000-N	1105	TEMPORARY TRAFFIC CONTROL	1	LS	$189,849.29	$189,849.29
	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	110	EA	$300.00	$33,073.92
	6000000000-E	1605	TEMPORARY SILT FENCE	7920	LF	$4.00	$31,680.00
		SP	GENERIC SIGNAL ITEM (MODIFY EXISTING SIGNAL)	5	LS	$30,000.00	$150,000.00
	8801000000-E	SP	MSE RETAINING WALL NO ****	1900	SF	$120.00	$228,000.00

		SUBTOTAL	$5,268,317.78
MINOR ITEMS		10%	$526,831.78
CONSTRUCTION SUBTOTAL			$5,795,149.56
INFLATION FACTOR	2 Years	5%	$594,002.83
CONSTRUCTION COST (2022)			$6,389,152.39
CONTINGENCIES		20%	$1,916,745.72
ESTIMATED CONTRACT COST (2022)			$8,305,898.10
E. & C.		10%	$830,589.81
CONSTRUCTION COST (2022)			$9,136,487.91
		SAY	**$9,137,000.00**

NOTE: E&C IS AN NCDOT ITEM AND WILL BE REQUIRED ONLY IF THE PROJECT IS FUNDED BY NCDOT
SIDEPATH TYPICAL SECTION CONSIST OF 5-FOOT PLANTING STRIP AND 12-FOOT WIDE PATH.
POTENTIAL UTILITY RELOCATION OR RIGHT-OF-WAY COSTS ARE NOT INCLUDED.

COMPUTED BY LZ
DATE 3/1/2022

PLANNING COST ESTIMATE

DESCRIPTION AND LOCATION: DYE CREEK / ROCKY RIVER GREENWAY FROM JOHNSON DAIRY ROAD TO MECKLENBURG CO LINE
PRIORITY PROJECT #6
MOORESVILLE

TIP: N/A COUNTY: IREDELL DIVISION: N/A

WBS NUMBER: N/A

ITEM NO.			ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
LINE. NO.	DESC. NO.	SECT. NO.					
			ROADWAY ITEMS				
0001	0000100000-N	800	MOBILIZATION	1	LS	$31,299.37	$31,299.37
	0000400000-N	801	CONSTRUCTION SURVEYING	1	LS	$5,216.56	$5,216.56
	0043000000-N	226	GRADING	1	LS	$68,042.12	$68,042.12
	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	200	LF	$100.00	$20,000.00
	1121000000-E	520	AGGREGATE BASE COURSE	1856	TON	$35.00	$64,967.47
	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	1109	TON	$120.00	$133,058.66
	1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	1109	TON	$180.00	$199,587.99
	2605000000-N	848	CONCRETE CURB RAMP	2	EA	$3,000.00	$6,000.00
	4399000000-N	1105	TEMPORARY TRAFFIC CONTROL	1	LS	$20,866.25	$20,866.25
		SP	GENERIC SIGNAL ITEM (MODIFY EXISTING SIGNAL)	1	LS	$30,000.00	$30,000.00

		SUBTOTAL	$579,038.42
MINOR ITEMS		10%	$57,903.84
CONSTRUCTION SUBTOTAL			$636,942.27
INFLATION FACTOR	2 Years	5%	$65,286.58
CONSTRUCTION COST (2022)			$702,228.85
CONTINGENCIES		20%	$210,668.65
ESTIMATED CONTRACT COST (2022)			$912,897.50
E. & C.		10%	$91,289.75
CONSTRUCTION COST (2022)			$1,004,187.25
		SAY	**$1,005,000.00**

NOTE: E&C IS AN NCDOT ITEM AND WILL BE REQUIRED ONLY IF THE PROJECT IS FUNDED BY NCDOT
SIDEPATH TYPICAL SECTION CONSIST OF 5-FOOT PLANTING STRIP AND 12-FOOT WIDE PATH.
POTENTIAL UTILITY RELOCATION OR RIGHT-OF-WAY COSTS ARE NOT INCLUDED.

COMPUTED BY LZ
DATE 3/1/2022

PLANNING COST ESTIMATE

DESCRIPTION AND LOCATION: SIDEPATH ALONG N. MAIN STREET FROM IREDELL AVE TO NC 150/OAKRIDGE FARM HIGHWAY
PRIORITY PROJECT #7
MOORESVILLE

TIP: N/A COUNTY: IREDELL DIVISION: N/A

WBS NUMBER: N/A

ITEM NO.			ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
LINE. NO.	DESC. NO.	SECT. NO.					
			ROADWAY ITEMS				
0001	0000100000-N	800	MOBILIZATION	1	LS	$195,996.12	$195,996.12
	0000400000-N	801	CONSTRUCTION SURVEYING	1	LS	$32,666.02	$32,666.02
	0043000000-N	226	GRADING	1	LS	$426,078.51	$426,078.51
	0163000000-E	250	REMOVAL OF EXISTING CONCRETE PAVEMENT	2933	SY	$225.00	$660,000.00
	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	5280	LF	$100.00	$528,000.00
	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	704	TON	$120.00	$84,480.00
	1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	314	TON	$180.00	$56,571.43
	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	11	EA	$3,500.00	$36,960.00
	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE **	11	EA	$750.00	$7,920.00
	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	5280	LF	$35.00	$184,800.00
	2591000000-E	848	4" CONCRETE SIDEWALK	17589	SY	$60.00	$1,055,366.40
	2605000000-N	848	CONCRETE CURB RAMP	40	EA	$3,000.00	$120,000.00
	4399000000-N	1105	TEMPORARY TRAFFIC CONTROL	1	LS	$130,664.08	$130,664.08
	6000000000-E	1605	TEMPORARY SILT FENCE	8606	LF	$4.00	$34,425.60
	8801000000-E	SP	MSE RETAINING WALL NO ****	600	SF	$120.00	$72,000.00

		SUBTOTAL	$3,625,928.16
MINOR ITEMS		10%	$362,592.82
CONSTRUCTION SUBTOTAL			$3,988,520.97
INFLATION FACTOR	2 Years	5%	$408,823.40
CONSTRUCTION COST (2022)			$4,397,344.37
CONTINGENCIES		20%	$1,319,203.31
ESTIMATED CONTRACT COST (2022)			$5,716,547.68
E. & C.		10%	$571,654.77
CONSTRUCTION COST (2022)			$6,288,202.45
		SAY	**$6,289,000.00**

NOTE: E&C IS AN NCDOT ITEM AND WILL BE REQUIRED ONLY IF THE PROJECT IS FUNDED BY NCDOT
SIDEPATH TYPICAL SECTION CONSIST OF 5-FOOT PLANTING STRIP AND 12-FOOT WIDE PATH.
POTENTIAL UTILITY RELOCATION OR RIGHT-OF-WAY COSTS ARE NOT INCLUDED.

COMPUTED BY LZ
DATE 3/1/2022

PLANNING COST ESTIMATE

DESCRIPTION AND LOCATION: SEPARATED BIKE LANES ON CENTER AVENUE FROM CHURCH STREET TO MAGNOLIA STREET
PRIORITY PROJECT #8
MOORESVILLE

TIP: N/A COUNTY: IREDELL DIVISION: N/A

WBS NUMBER: N/A

ITEM NO.			ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
LINE. NO.	DESC. NO.	SECT. NO.					
			ROADWAY ITEMS				
0001	0000100000-N	800	MOBILIZATION	1	LS	$12,440.45	$12,440.45
	0000400000-N	801	CONSTRUCTION SURVEYING	1	LS	$2,073.41	$2,073.41
	4399000000-N	1105	TEMPORARY TRAFFIC CONTROL	1	LS	$10,367.04	$10,367.04
	4520000000-N	1266	TUBULAR MARKERS (FIXED)	172	EA	$75.00	$12,870.00
	4686000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	17160	LF	$1.65	$28,314.00
	4702000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 120 MILS)	240	LF	$15.00	$3,600.00
	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	27	EA	$300.00	$8,236.80
	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	17160	LF	$2.00	$34,320.00
		SP	GENERIC SIGNAL ITEM (MODIFY EXISTING SIGNAL)	3	LS	$40,000.00	$120,000.00

		SUBTOTAL	$232,221.70
MINOR ITEMS		10%	$23,222.17
CONSTRUCTION SUBTOTAL			$255,443.87
INFLATION FACTOR	2 Years	5%	$26,183.00
CONSTRUCTION COST (2022)			$281,626.86
CONTINGENCIES		20%	$84,488.06
ESTIMATED CONTRACT COST (2022)			$366,114.92
E. & C.		10%	$36,611.49
CONSTRUCTION COST (2022)			$402,726.41
		SAY	**$403,000.00**

NOTE: E&C IS AN NCDOT ITEM AND WILL BE REQUIRED ONLY IF THE PROJECT IS FUNDED BY NCDOT
SIDEPATH TYPICAL SECTION CONSIST OF 5-FOOT PLANTING STRIP AND 12-FOOT WIDE PATH.
POTENTIAL UTILITY RELOCATION OR RIGHT-OF-WAY COSTS ARE NOT INCLUDED.

COMPUTED BY LZ
DATE 3/1/2022

PLANNING COST ESTIMATE

DESCRIPTION AND LOCATION: SIDEPATH ALONG PERTH ROAD FROM CORNELIUS ROAD TO NC 150 / RIVER HIGHWAY
PRIORITY PROJECT #1
MOORESVILLE

TIP: N/A COUNTY: IREDELL DIVISION: N/A

WBS NUMBER: N/A

ITEM NO.			ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
LINE. NO.	DESC. NO.	SECT. NO.					
			ROADWAY ITEMS				
0001	0000100000-N	800	MOBILIZATION	1	LS	$150,908.97	$150,908.97
	0000400000-N	801	CONSTRUCTION SURVEYING	1	LS	$25,151.50	$25,151.50
	0043000000-N	226	GRADING	1	LS	$328,062.98	$328,062.98
	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	4393	LF	$100.00	$439,296.00
	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	586	TON	$120.00	$70,287.36
	1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	261	TON	$180.00	$47,067.43
	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	9	EA	$3,500.00	$30,750.72
	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE **	9	EA	$750.00	$6,589.44
	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	4393	LF	$35.00	$153,753.60
	2591000000-E	848	4" CONCRETE SIDEWALK	13911	SY	$60.00	$834,662.40
	2605000000-N	848	CONCRETE CURB RAMP	20	EA	$3,000.00	$60,000.00
	3420000000-E	SP	GENERIC GUARDRAIL ITEM (METAL SAFETY RAIL)	1550	LF	$75.00	$116,250.00
	4399000000-N	1105	TEMPORARY TRAFFIC CONTROL	1	LS	$100,605.98	$100,605.98
	6000000000-E	1605	TEMPORARY SILT FENCE	10982	LF	$4.00	$43,929.60
	8801000000-E	SP	MSE RETAINING WALL NO ****	600	SF	$120.00	$72,000.00
	8897000000-N	SP	BOARDWALK/BRIDGE	250	LF	$1,250.00	$312,500.00

		SUBTOTAL	$2,791,815.98
MINOR ITEMS		10%	$279,181.60
CONSTRUCTION SUBTOTAL			$3,070,997.58
INFLATION FACTOR	2 Years	5%	$314,777.25
CONSTRUCTION COST (2022)			$3,385,774.83
CONTINGENCIES		20%	$1,015,732.45
ESTIMATED CONTRACT COST (2022)			$4,401,507.28
E. & C.		10%	$440,150.73
CONSTRUCTION COST (2022)			$4,841,658.01
		SAY	**$4,842,000.00**

NOTE: E&C IS AN NCDOT ITEM AND WILL BE REQUIRED ONLY IF THE PROJECT IS FUNDED BY NCDOT
SIDEPATH TYPICAL SECTION CONSIST OF 5-FOOT PLANTING STRIP AND 12-FOOT WIDE PATH.
POTENTIAL UTILITY RELOCATION OR RIGHT-OF-WAY COSTS ARE NOT INCLUDED.

COMPUTED BY LZ
DATE 3/1/2022

PLANNING COST ESTIMATE

DESCRIPTION AND LOCATION: PAVED SHOULDERS ALONG SHEARERS ROAD FROM BRAWLEY AVE TO ROCKY RIVER ROAD
PRIORITY PROJECT #1
MOORESVILLE

TIP: N/A COUNTY: IREDELL DIVISION: N/A

WBS NUMBER: N/A

ITEM NO.			ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
LINE. NO.	DESC. NO.	SECT. NO.					
			ROADWAY ITEMS				
0001	0000100000-N	800	MOBILIZATION	1	LS	$57,916.39	$57,916.39
	0000400000-N	801	CONSTRUCTION SURVEYING	1	LS	$9,652.73	$9,652.73
	0043000000-N	226	GRADING	1	LS	$125,905.20	$125,905.20
	1121000000-E	520	AGGREGATE BASE COURSE	5768	TON	$35.00	$201,863.20
	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	2729	TON	$120.00	$327,431.81
	1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	1378	TON	$180.00	$248,059.36
	4399000000-N	1105	TEMPORARY TRAFFIC CONTROL	1	LS	$38,610.93	$38,610.93
	4686000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	27562	LF	$1.65	$45,476.64
	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	55	EA	$300.00	$16,536.96

		SUBTOTAL	$1,071,453.21
MINOR ITEMS		10%	$107,145.32
CONSTRUCTION SUBTOTAL			$1,178,598.53
INFLATION FACTOR	2 Years	5%	$120,806.35
CONSTRUCTION COST (2022)			$1,299,404.88
CONTINGENCIES		20%	$389,821.47
ESTIMATED CONTRACT COST (2022)			$1,689,226.35
E. & C.		10%	$168,922.63
CONSTRUCTION COST (2022)			$1,858,148.98
		SAY	**$1,859,000.00**

NOTE: E&C IS AN NCDOT ITEM AND WILL BE REQUIRED ONLY IF THE PROJECT IS FUNDED BY NCDOT
SIDEPATH TYPICAL SECTION CONSIST OF 5-FOOT PLANTING STRIP AND 12-FOOT WIDE PATH.
POTENTIAL UTILITY RELOCATION OR RIGHT-OF-WAY COSTS ARE NOT INCLUDED.

COMPUTED BY LZ
DATE 3/1/2022