

# CITY OF LENOIR BICYCLE PLAN

MARCH 2018 | FINAL



PREPARED FOR:



PREPARED BY:

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# ACKNOWLEDGEMENTS

Thank you to all of the citizens, stakeholders, bike enthusiasts, and City staff that contributed to the creation of the Lenoir Bicycle Plan. Thank you specifically to the members of the steering committee, listed below.

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# EXECUTIVE SUMMARY

Promoting and encouraging multimodal travel has become a major priority for the City of Lenoir and for communities across the region, the state, and the country. The City of Lenoir Comprehensive Plan recommended the creation of a Bicycle, Pedestrian, and Greenway Plan, and in 2012 the City completed a Comprehensive Pedestrian Plan that included sidewalks, greenway, and crossing locations. Recognizing that bicycling - both as a form of transportation and as a recreational activity - can benefit the community's mobility, safety, health, economy, environment, and livability, the City of Lenoir applied for a grant through North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation's (NCDOT-DBPT) Planning Grant Initiative. The planning grant, along with a 30% match from the City funded the creation of this Bicycle Plan.

The development of the Lenoir Bicycle Plan was spearheaded by a project team consisting of planners, engineers, and City staff. A 17-person steering committee met four times over the course of the plan's development, setting and refining the plan's direction to reflect the needs and desires of the community. Public input was a critical piece of the planning process, and public engagement strategies included two open houses, an online survey, and a public hearing. Ultimately, the overarching and aspirational vision of the Lenoir Bicycle Plan is that:

RIDING BICYCLES IN THE CITY OF LENOIR WILL BE A SAFE AND CONVENIENT WAY FOR RESIDENTS AND VISITORS TO TRAVEL FOR TRANSPORTATION AND RECREATION. THE CITY'S BICYCLE NETWORK WILL BE ACCESSIBLE, CONNECTED, AND ATTRACTIVE FOR PEOPLE OF ALL AGES, ABILITIES, AND BACKGROUNDS.

The Lenoir Bicycle Plan consists of five major elements, followed by an Appendix. The Bicycle Plan begins with an introduction of Lenoir and the impetus behind the creation of the plan, followed by a detailed look at the demographic, operational, and administrative characteristics of Lenoir. The Public Input chapter presents a synthesis of the input contributed by those who participated in the plan's public engagement activities. The Recommendations chapter details the facility, policy, and program recommendations to accomplish the Bicycle Plan's vision, and the Implementation chapter provides a framework that describes a timeline of strategies and highlights the parties who will be responsible for implementing those strategies. Summaries of each chapter are shown on the next page.

## INTRODUCTION

The Introduction chapter of the Lenoir Bicycle Plan presents the timeline of the planning process, starting with NCDOT-DBPT awarding the planning grant to the City of Lenoir and ending with adoption of the plan by Lenoir City Council. This chapter also introduces the Bicycle Plan's vision statement and six supporting goals, and describes how the vision of a more bicycle friendly Lenoir would benefit residents, business owners, and visitors alike.

## EXISTING CONDITIONS

The Existing Conditions chapter defines the starting point for the Bicycle Plan. The chapter begins with an explanation of the Bicycle Plan's philosophy, encapsulated by what has traditionally been called the "Five Es," now joined by a sixth E: equity. Several maps depict where undeserved populations live in Lenoir, followed by a discussion of how Lenoir residents get to work and the identification of non-work destinations. The chapter then transitions to an exploration of Lenoir's transportation network in both driving and bicycling contexts. The chapter concludes with a recognition of existing policies and programs impacting bicycling in Lenoir today and an inventory of previous planning efforts that set the stage for the Lenoir Bicycle Plan.

- » Lenoir has a strong greenway system providing connection to the Northeast quadrant of the City, but no on-street bicycle facilities.
- » Most attractive destinations in Lenoir are located along US 321 and US 64/NC 18, which bisect in the center of the City.
- » There have been many recent wins for bikeability in the City of Lenoir with an additional segment of greenway and the removal of rail for the Overmountain Victory National Historic Trail all happening during the short duration of this planning process.

## PUBLIC INPUT

The Public Input chapter describes the Bicycle Plan's public engagement process and highlights some key findings. The plan's public engagement included four meetings with the steering committee, an online survey which included a questionnaire and map exercise, two open house meetings that emphasized issues identification and project prioritization, and a public hearing.

- » There was strong support for the continued expansion of the Lenoir Greenway system.
- » Participants in the public engagement sessions placed a strong emphasis on enhancing access to Downtown Lenoir. Members of the Bicycle Planning Committee expressed that the provision of bicycle facilities in Downtown Lenoir would strike a balance of practicality due to low travel speeds and ample destinations, with making the presence of bicycling apparent to the most number of residents in Lenoir.

## RECOMMENDATIONS

The Recommendations chapter comprises three sections: an overview of the bicycle facility planning process, project profiles for the top five priority projects, and a compilation of program and policy recommendations. The project profiles include information about each project's purpose as well as implementation considerations, planning-level cost estimates, typical cross-sections, and conceptual images. The program and policy recommendations consist of encouragement, educational, and administrative improvements to enhance the City's bicycle friendliness.

The top 3 facility recommendations include the addition of a buffered bike lane along Harper Avenue in Downtown, the extension of the Lenoir Greenway parallel to US 64, and shared lane markings along Pennton Avenue connecting Downtown to the existing Lenoir Greenway. The map to the right displays the top 5 priority projects and renderings of each.

## IMPLEMENTATION

The Implementation chapter defines actionable steps for the City of Lenoir and its partners in the short-, mid-, and long-term to accomplish the Bicycle Plan's vision. This action plan is supported by an organizational framework that indicates how the City's partners will be involved; information regarding local, state, federal, and private funding sources; suggestions for ways to measure the performance of the Bicycle Plan or its individual facility recommendations; and a listing of guidance documents for the planning and design of bicycle facilities.

1. HARPER AVENUE BIKE LANE



2. GOOGLE CONNECTOR SIDEPATH



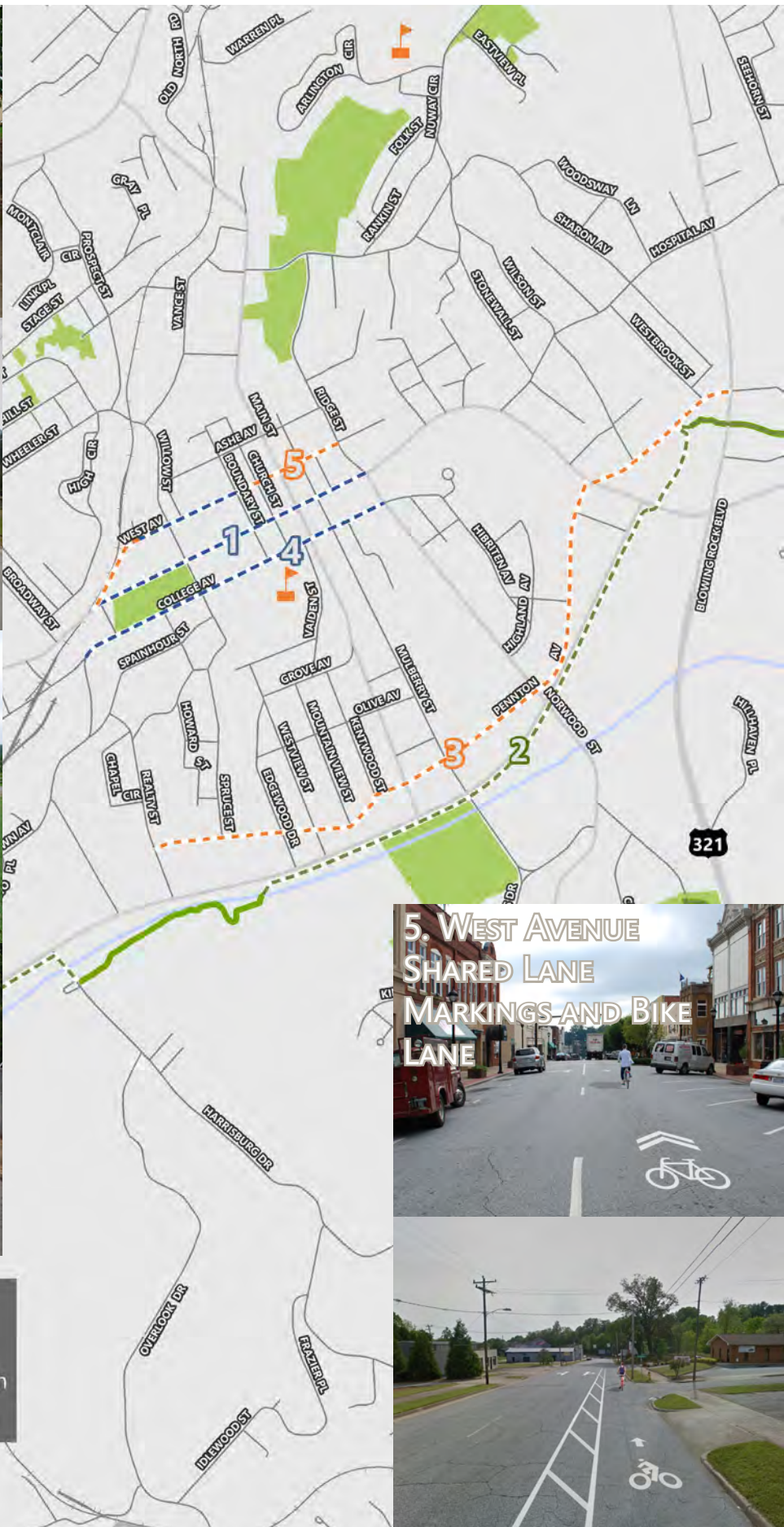
3. PENNTON AVENUE SHARED LANE MARKINGS







4. COLLEGE AVENUE BIKE LANES



5. WEST AVENUE SHARED LANE MARKINGS AND BIKE LANE



-  Proposed Bike Lane
-  Proposed Shared Lane
-  Proposed Shared Use Path
-  Existing Shared Use Path



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# INTRODUCTION

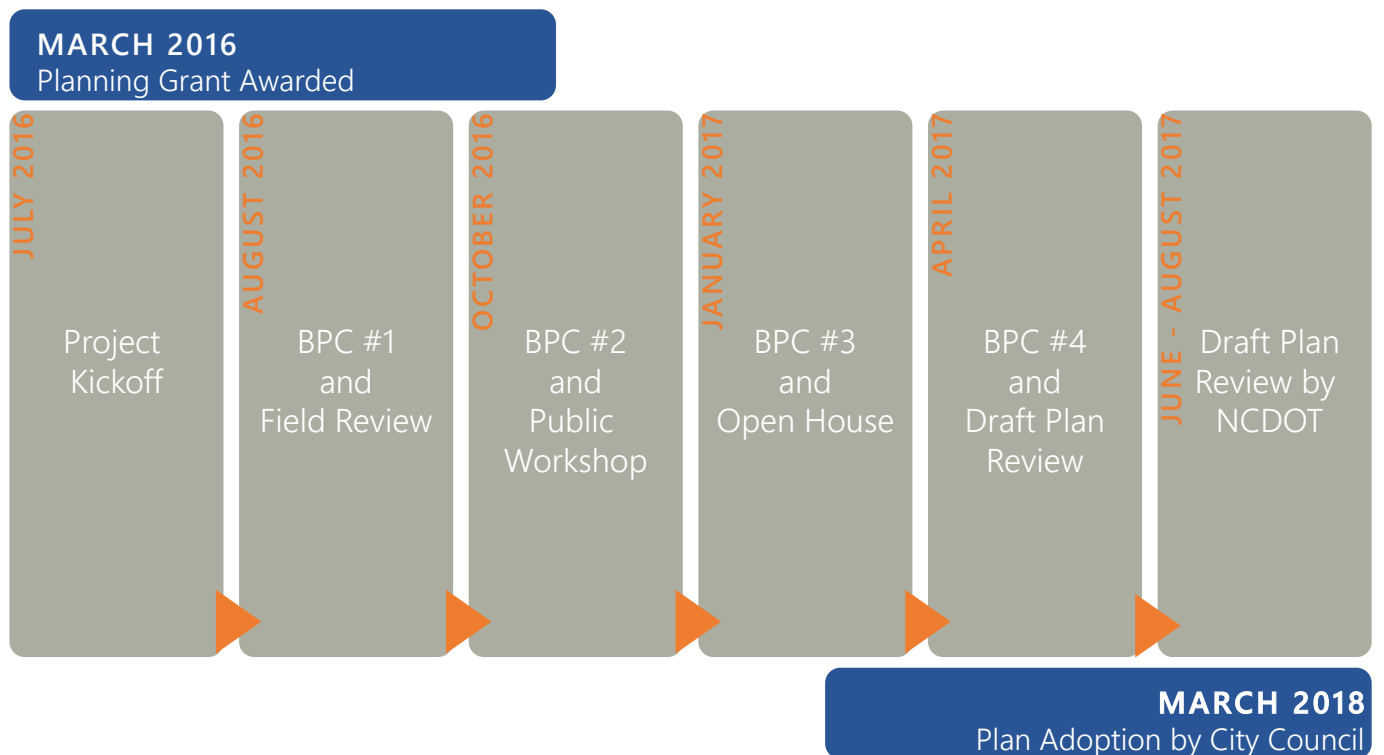
## BACKGROUND

The Lenoir Bicycle Plan sets the stage for improving bicycling conditions in the City of Lenoir. Encouraging and promoting transportation and recreation by bicycling through constructing bicycle facilities, implementing local policies, and creating educational programs can play a part in creating a transportation system that is balanced, integrated, and connected.

The development of the Lenoir Bicycle Plan was funded by a grant awarded by the North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation (NCDOT-DBPT) through its Planning Grant Initiative and a local match provided by the City of Lenoir. Through the Planning Grant Initiative, NCDOT-DBPT encourages the development of bicycle and pedestrian plans at the municipal level by offering planning grants, totaling approximately \$5 million across 180 municipalities since 2004 through 2017.

## PROJECT TIMELINE

The development of the Lenoir Bicycle Plan included several opportunities for public input, a field review, and 4 meetings with the plan's steering committee. Made up of government staff, local advocates, educators, and health representatives, the steering committee guided the planning process to produce facility, program, and policy recommendations for the Lenoir Bicycle Plan.



## VISION AND GOALS

The Lenoir Bicycle Planning Committee and the project team created a vision statement that succinctly communicates the desired future for bicycling in Lenoir.

RIDING BICYCLES IN THE CITY OF LENOIR WILL BE A SAFE AND CONVENIENT WAY FOR RESIDENTS AND VISITORS TO TRAVEL FOR TRANSPORTATION AND RECREATION. THE CITY'S BICYCLE NETWORK WILL BE ACCESSIBLE, CONNECTED, AND ATTRACTIVE FOR PEOPLE OF ALL AGES, ABILITIES, AND BACKGROUNDS.

The vision statement served as a guide for the development of the Bicycle Plan's recommendations and was supported by goals encapsulated by what has traditionally been called the "Five Es," now joined by a sixth E: equity. These goals are defined below.




- » **ENGINEERING**: create safe and convenient places to ride and park bicycles
- » **EDUCATION**: give people of all ages and abilities the skills and confidence to ride
- » **ENCOURAGEMENT**: create a strong bike culture that welcomes and celebrates bicycling
- » **ENFORCEMENT**: ensure safe roads for all users
- » **EVALUATION & PLANNING**: plan for bicycling as a safe and viable transportation option
- » **EQUITY**: seek fairness in mobility and accessibility to meet the needs of all bicyclists


## BENEFITS OF BICYCLING

Bicycling for transportation and recreation can benefit the City of Lenoir's mobility, safety, health, economy, environment, and livability. Five of the six benefits stem from the five pillars found in WalkBikeNC, North Carolina's Bicycle and Pedestrian Plan. The sixth benefit, livability, is often incidental and happens naturally as efforts are made to enhance mobility, safety, health, economy, and environment. These benefits are described in the following table.

More information about WalkBikeNC can be found at <https://www.ncdot.gov/bikeped/walkbikenc>.

TABLE 1: BENEFITS OF BICYCLING

CATEGORY	DEFINITION	POTENTIAL BENEFITS
 <b>MOBILITY</b>	Mobility is the equitable availability of transportation options for everyone.	Currently only 0.4% of Lenoir's population bikes to work. <sup>1</sup> Bicycling can be an attractive travel mode for short trips that would otherwise be made by driving. Bicycling can also be an option for individuals without access to motor vehicles, which in Lenoir comprises 8% of the population.
 <b>SAFETY</b>	Safe travel conditions result from effective design, enforcement, and education.	The presence of bike infrastructure and people on bicycles naturally calms traffic, and fully separated facilities provide safe travel ways. Currently, the minimal presence of infrastructure underscores the safety concerns voiced by many members of the public during the public engagement process for this plan. Chapter 2 describes in more detail the safety concerns in Lenoir.
 <b>HEALTH</b>	Health includes the mental state and physical condition of individuals and collective communities.	Almost a third of people who ride bicycles do so for exercise and fitness. <sup>2</sup> Bicycling is a low-impact form of exercise that can reduce stress and diseases such as high blood pressure and obesity. While data isn't available for the City of Lenoir, the CDC reported in 2013 that 32.7% of the adult population in Caldwell County was considered obese.

CATEGORY	DEFINITION	BENEFITS
 <p data-bbox="331 499 454 527">ECONOMY</p>	<p data-bbox="505 373 850 495">Job growth, increased sales revenue, and land development support strong economies.</p>	<p data-bbox="867 197 1507 449">Improving bikeability can be a benefit to homeowners and business owners, as bicycle investments can increase property values and retail sales, increase tourism, and lead to the creation of new jobs.<sup>3</sup> Bicycle tourism is already popular in western North Carolina. Improving Lenoir specifically as a destination for bicyclists will likely increase the sales revenue of local businesses.</p> <p data-bbox="867 485 1484 674">Bicycle tourism in the Outer Banks benefited from a nine to one return on investment in trails and paved shoulders. Lenoir’s strong grant-winning record coupled with stakeholders such as Caldwell County Pathways and the North Carolina Main Street Center could bring similar results to the City of Lenoir.</p>
 <p data-bbox="305 1016 480 1043">ENVIRONMENT</p>	<p data-bbox="505 890 824 1012">Environmental stewardship holds the community accountable in protecting natural resources.</p>	<p data-bbox="867 684 1500 936">More people on bikes can result in lower levels of motor vehicle emissions, cleaner air, and stronger preservation of streams and open spaces. As Lenoir implements the programs, policies, and infrastructure projects recommended by this plan, it is anticipated that a portion of trips that would have been made by car, releasing harmful emissions, will instead be made by bike.</p> <p data-bbox="867 972 1516 1224">The City of Lenoir and Caldwell County have been taking measures to actively reduce ozone levels since 2002 when they signed the Early Action Compact (EAC) with other members of the Unifour region (Caldwell, Catawba, Alexander, and Burke counties). The EAC supports several emissions reduction strategies including plans to encourage bicycle and pedestrian mode share.</p>
 <p data-bbox="331 1535 454 1562">LIVABILITY</p>	<p data-bbox="505 1423 850 1524">Quality of life, sense of place, and community vibrancy for residents and visitors.</p>	<p data-bbox="867 1234 1516 1486">Infrastructure features that increase comfort for bicyclists can enhance the character of communities by reducing motor vehicle speeds and improving safety. In places where residents are regularly seen outside walking or bicycling, visitors feel a sense of community and safety there. Comfortable bicycling conditions also improve the desirability of living in Lenoir, which can increase property values for residents.</p> <p data-bbox="867 1522 1516 1711">Livability also extends beyond creating a sense of place and enhancing community character. Livability is fully rendered when actions are taken to support the other benefits of bicycling. Safe, equitable, healthy, and environmentally cognizant transportations decisions work hand-in-hand to support community livability.</p>



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# EXISTING CONDITIONS

The development of the Lenoir Bicycle Plan started with the establishment of an understanding of Lenoir's current demographic, societal, administrative, geographic, physical, and operational context. Who lives in Lenoir, how they currently travel, how they would like to travel, and the factors that influence their travel choices are all important considerations for the recommendations of the Bicycle Plan.

The City of Lenoir, approximately 20 square miles in size and home to 18,000 people<sup>4</sup>, is located in western North Carolina amidst the foothills of the Blue Ridge Mountains. Lenoir is situated at the convergence of US 321 and US 64 approximately 30 miles south of Boone, 40 miles west of Statesville and 75 miles north of Charlotte, NC. The City of Lenoir's downtown is a Main Street America™ Accredited program and as the city strives for downtown revitalization and active living, the importance of safe and comfortable bicycle infrastructure is echoed.

## EQUITY

While transportation professionals have historically placed an emphasis on the 5 Es to advance bicycling, another element has recently emerged as a priority – equity.

Equity in transportation is fairness in how decision-makers meet the mobility, accessibility, and connectivity needs of the community they serve<sup>5</sup>. Equity should not be confused with equality, which implies that all parts of a community should be allocated the same amount of resources. Instead, transportation officials should distribute resources in a way that considers the unique needs of underserved populations and seeks parity and mobility for all community members. Traditionally underserved populations include low income families, minorities, low vehicle ownership households, and the elderly. These groups are described in the figure below and maps on the following pages.

## THE 5 ES OF IMPROVING BICYCLE-FRIENDLINESS

**Engineering** directs the safe and effective design and construction of bicycle infrastructure.

**Education** helps both motorists and bicyclists understand how to safely navigate the streets together.

**Encouragement** promotes bicycling as a viable form of transportation and provides incentives for choosing to bicycle.

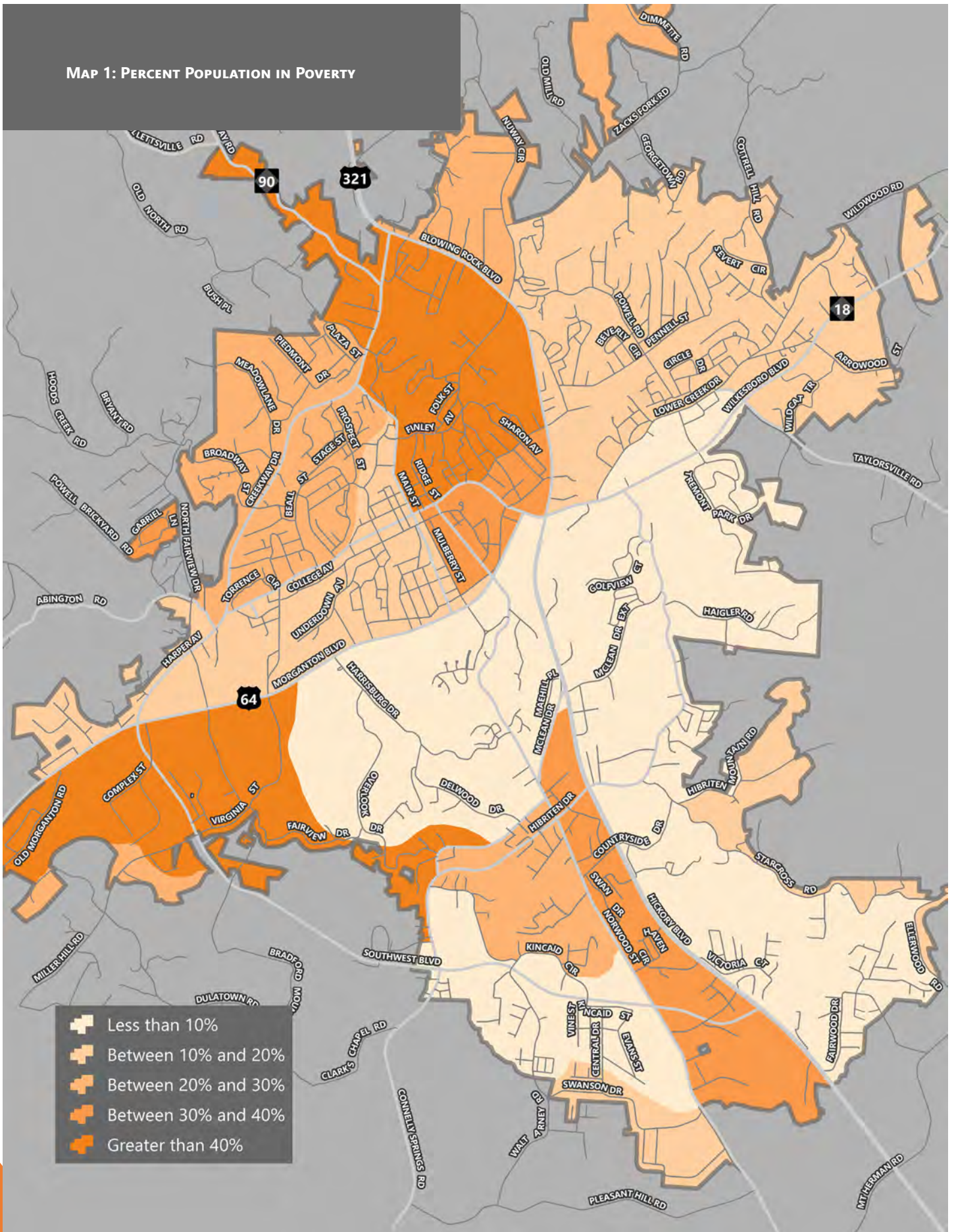
**Enforcement** ensures that all road users comply with local and state rules and regulations.

**Evaluation** and planning quantifies the benefits of bicycling investments to guide future decision making.

TABLE 2: POPULATION & HOUSEHOLDS

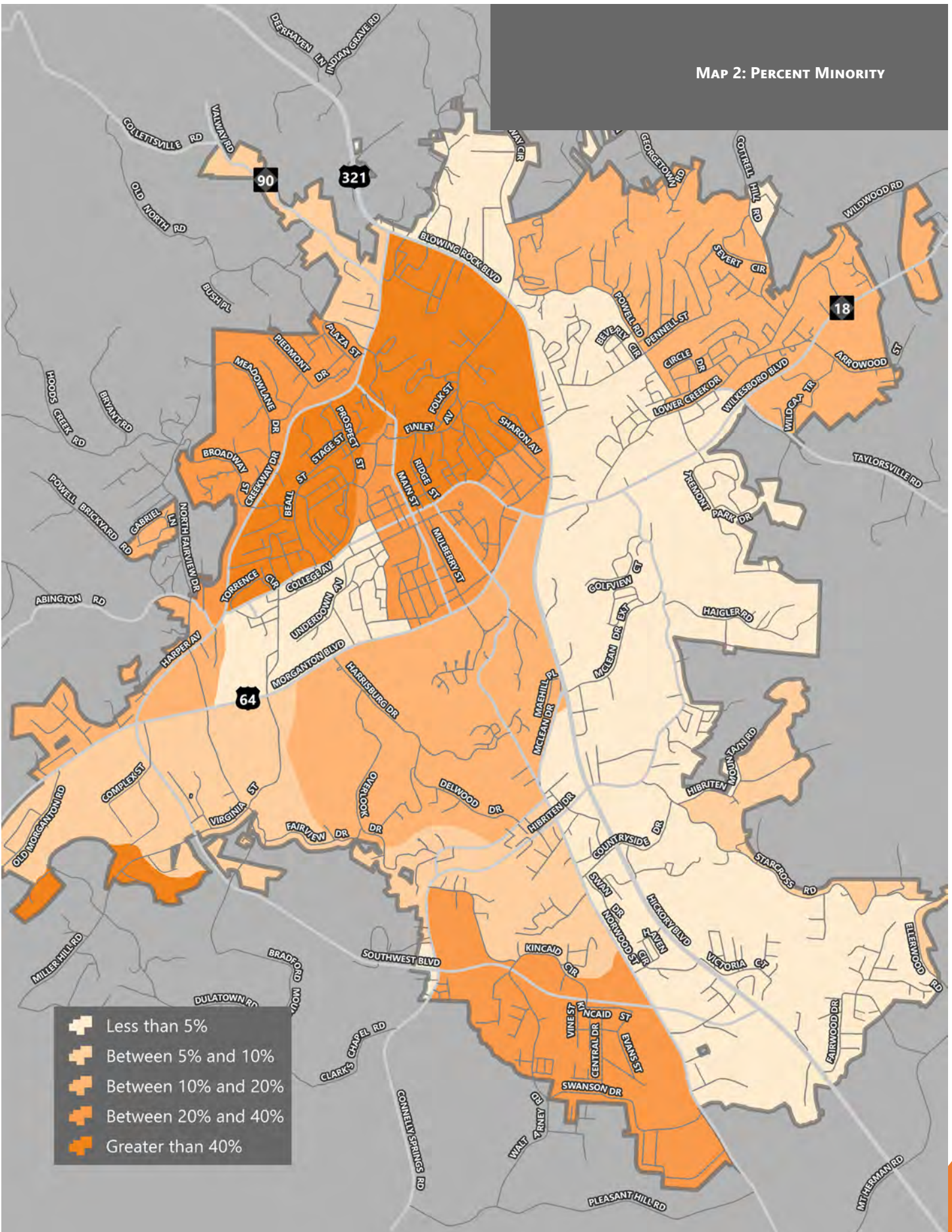
POPULATION & HOUSEHOLDS	CITY OF LENOIR	CALDWELL COUNTY	NORTH CAROLINA
<b>POPULATION</b>	<b>18,061</b>	<b>82,104</b>	<b>9,750,405</b>
Percent in Poverty	15.2 %	20.5 %	17.6 %
Percent Minority	23.1 %	11.5 %	30.4 %
Percent Over 64	19.4 %	16.7 %	13.8 %
<b>HOUSEHOLDS</b>	<b>5,920</b>	<b>45,534</b>	<b>3,742,514</b>
Percent without Motor Vehicles	7.8 %	5.1 %	6.5 %

MAP 1: PERCENT POPULATION IN POVERTY



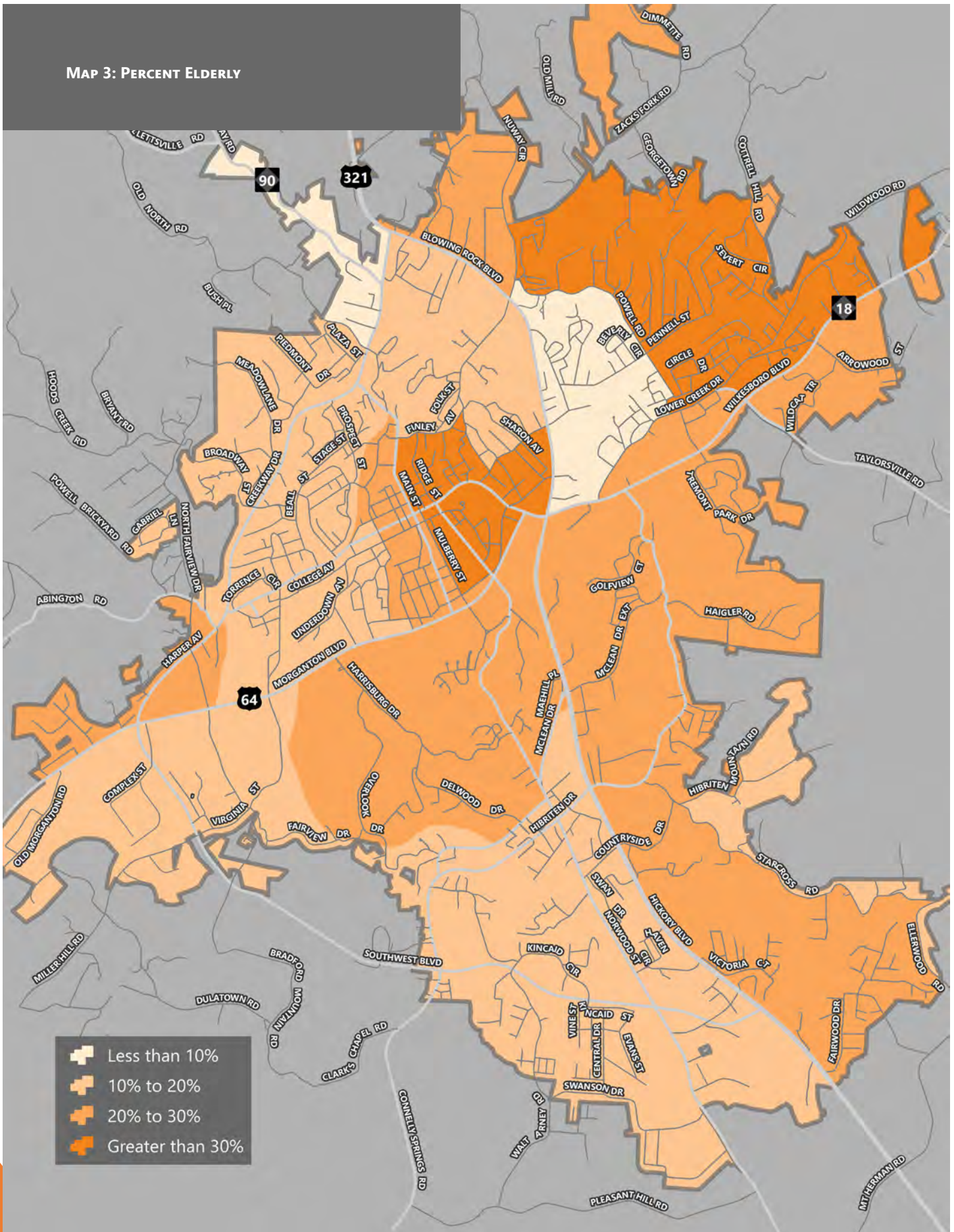
- Less than 10%
- Between 10% and 20%
- Between 20% and 30%
- Between 30% and 40%
- Greater than 40%





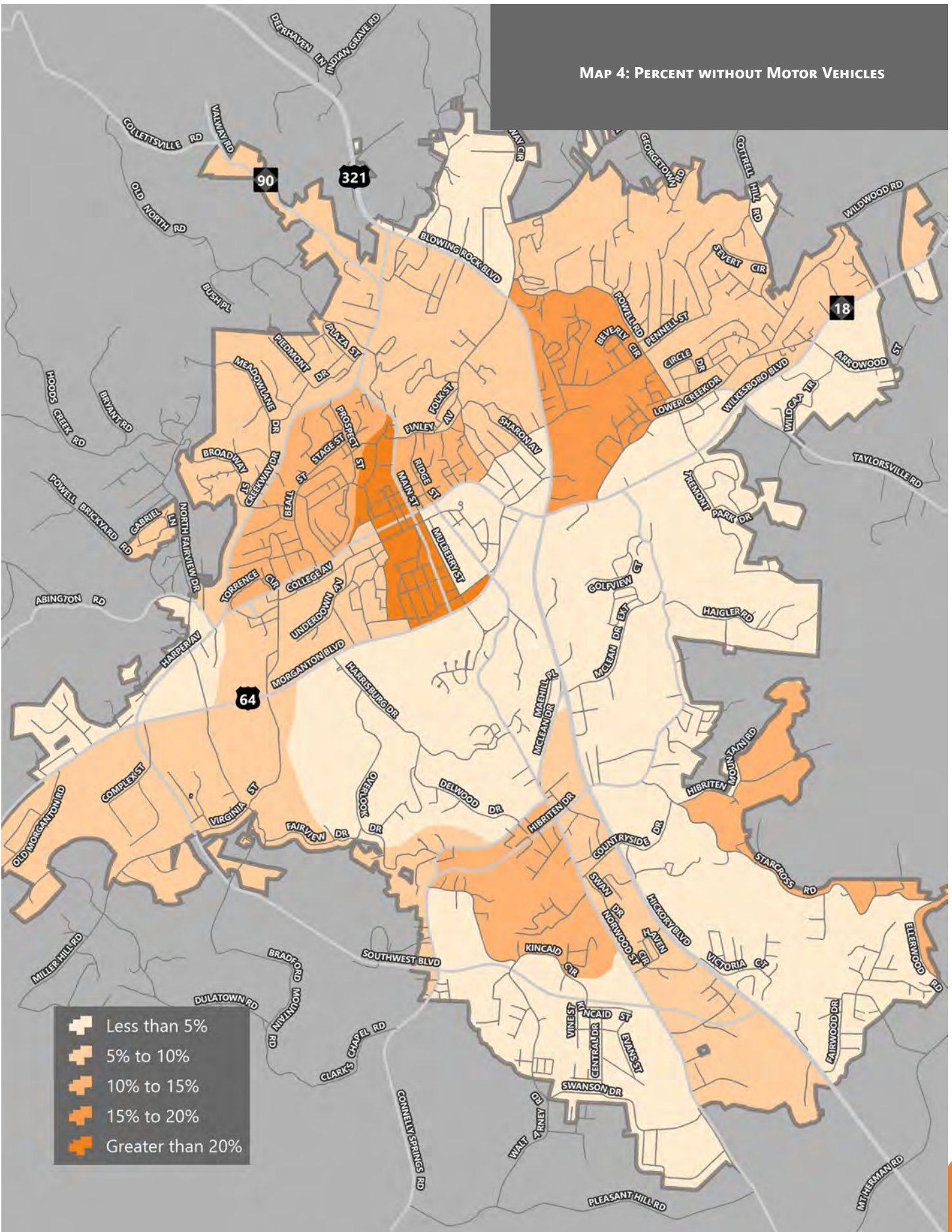


MAP 3: PERCENT ELDERLY





MAP 4: PERCENT WITHOUT MOTOR VEHICLES

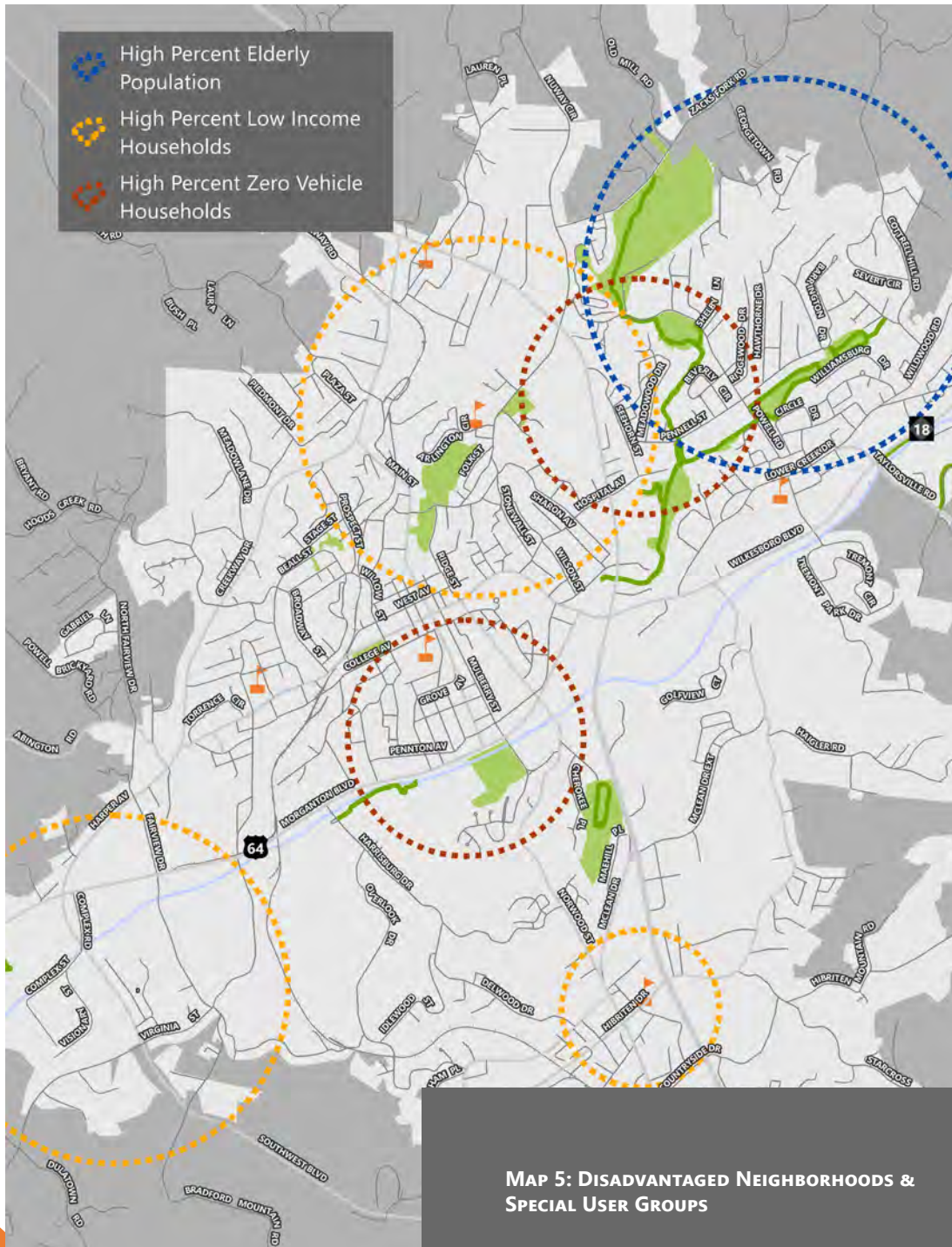




## DISADVANTAGED NEIGHBORHOODS AND SPECIAL USER GROUPS

As in every city, Lenoir is home to areas that are at an economic disadvantage and populations that may benefit from enhanced bicycle infrastructure out of necessity. Based on census data, there are large areas in northwest and west Lenoir, between US 321 and Greenhaven Drive and south of US 64, where greater than 40% of households are living below the federal poverty line. This is important to note as members of these communities may be more reliant on commuting by biking or walking.

In addition to disadvantaged neighborhoods, nearly 20% of Lenoir's population is over the age of 65. Seniors often times face limited mobility options as they age and become unable to drive or uncomfortable with driving. It is important for the City of Lenoir to consider this large portion of the population as plans are made for both bicycle and pedestrian infrastructure, and particularly with greenway expansion. The map below highlights the disadvantaged neighborhoods and special user groups described here.

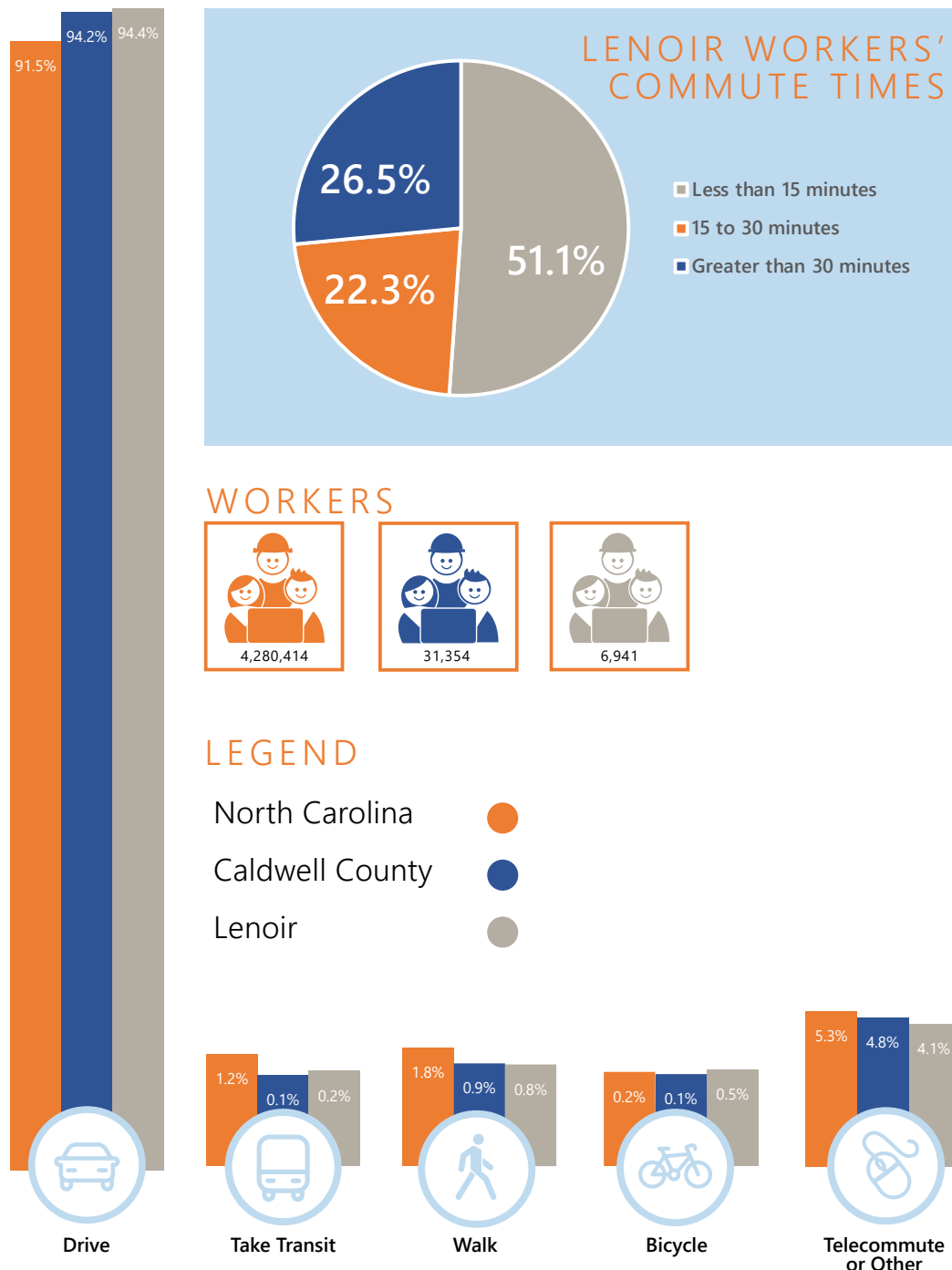


## COMMUTING

Four out of ten people who bicycle primarily do so for transportation (personal errands, visiting friends, and commuting), while the remainder bicycle primarily for recreation and exercise<sup>6</sup>. Commuting to work or school is a major consideration for transportation planners, as commute trips generally occur when streets are the most congested. While commute data captured by the American Community Survey is fairly limited and does not effectively reflect commuters who utilize different modes throughout the week, throughout the day, or even within the same trip, the information still provides insight into commuters' primary mode of transportation.

In the City of Lenoir, most bicyclists are riding for recreation along the current greenway system or mountain bike trails. In the online survey taken as part of the outreach process, 80% of respondents reported that they primarily rode their bicycle for recreation purposes.

FIGURE 2: COMMUTE PATTERNS



## DESTINATIONS

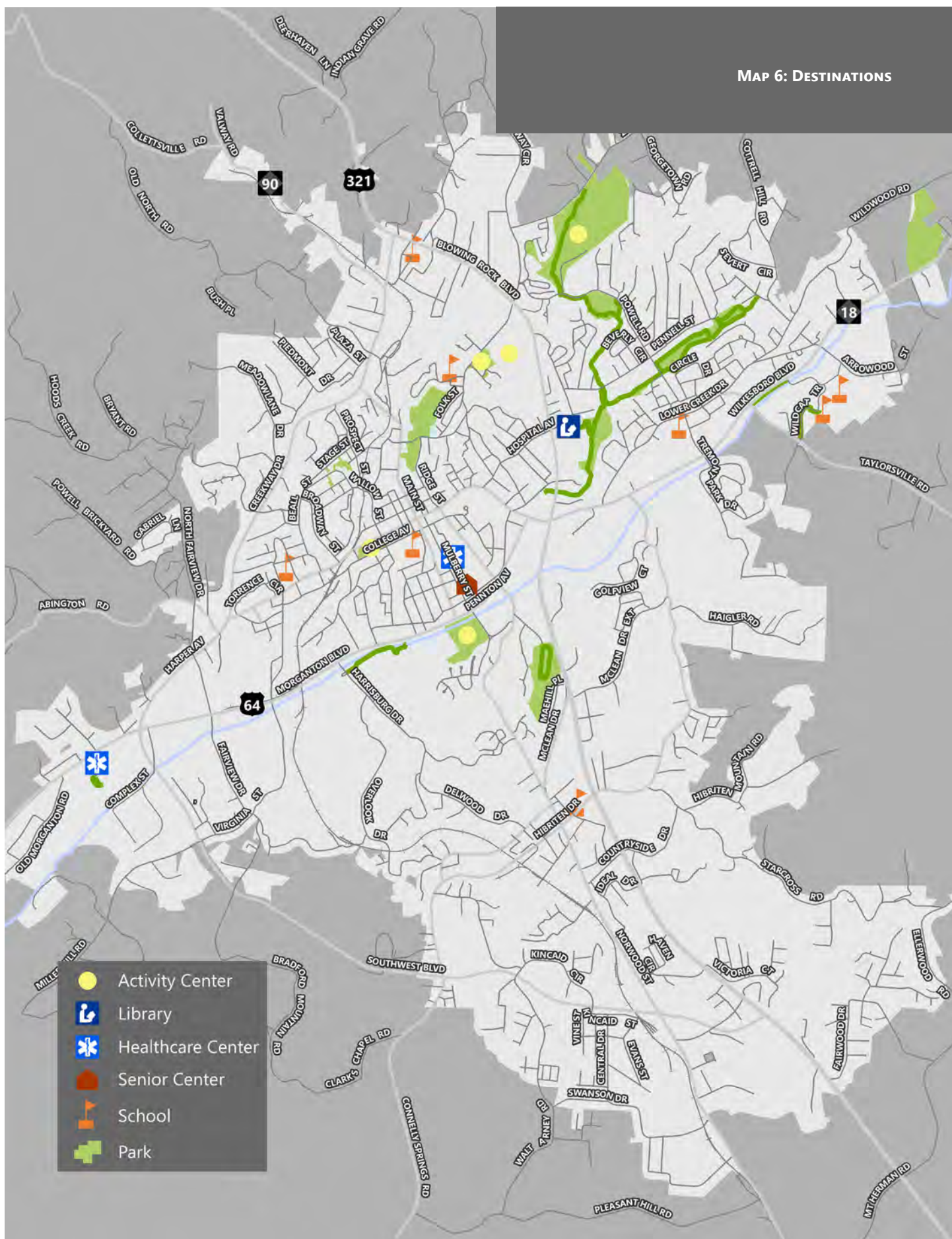
Developing a community-wide plan for improving bikeability requires the consideration of accessibility and connectivity to key destinations, including major employers, parks, greenways, and other retail centers such as downtown and grocery stores.

FIGURE 3: KEY DESTINATIONS





MAP 6: DESTINATIONS





## STREET NETWORK

Lenoir's street system is characterized by two arterials (US 64 and NC 18) meeting perpendicularly to the southeast of downtown and a series of local roads. Traveling along the major arterials or crossing them can subject bicyclists to high levels of stress, since the major arterials have no dedicated bicycle facilities and are generally high volume and high speed. One pair of one-way streets cross Lenoir's downtown: West Avenue which permits only westbound travel and Harper Avenue which permits only eastbound travel.

One of the primary reasons individuals choose not to bicycle is because they feel that it's unsafe. A major barrier to bicycling along Lenoir's streets is the fear of collisions with motorists, which is heightened along roadways with fast-moving motor vehicle traffic, high volumes of motor vehicle traffic, or large percentages of truck traffic. Other physical barriers to bicycling include one-way streets, variable topography, poor pavement conditions, and gaps in the street network.

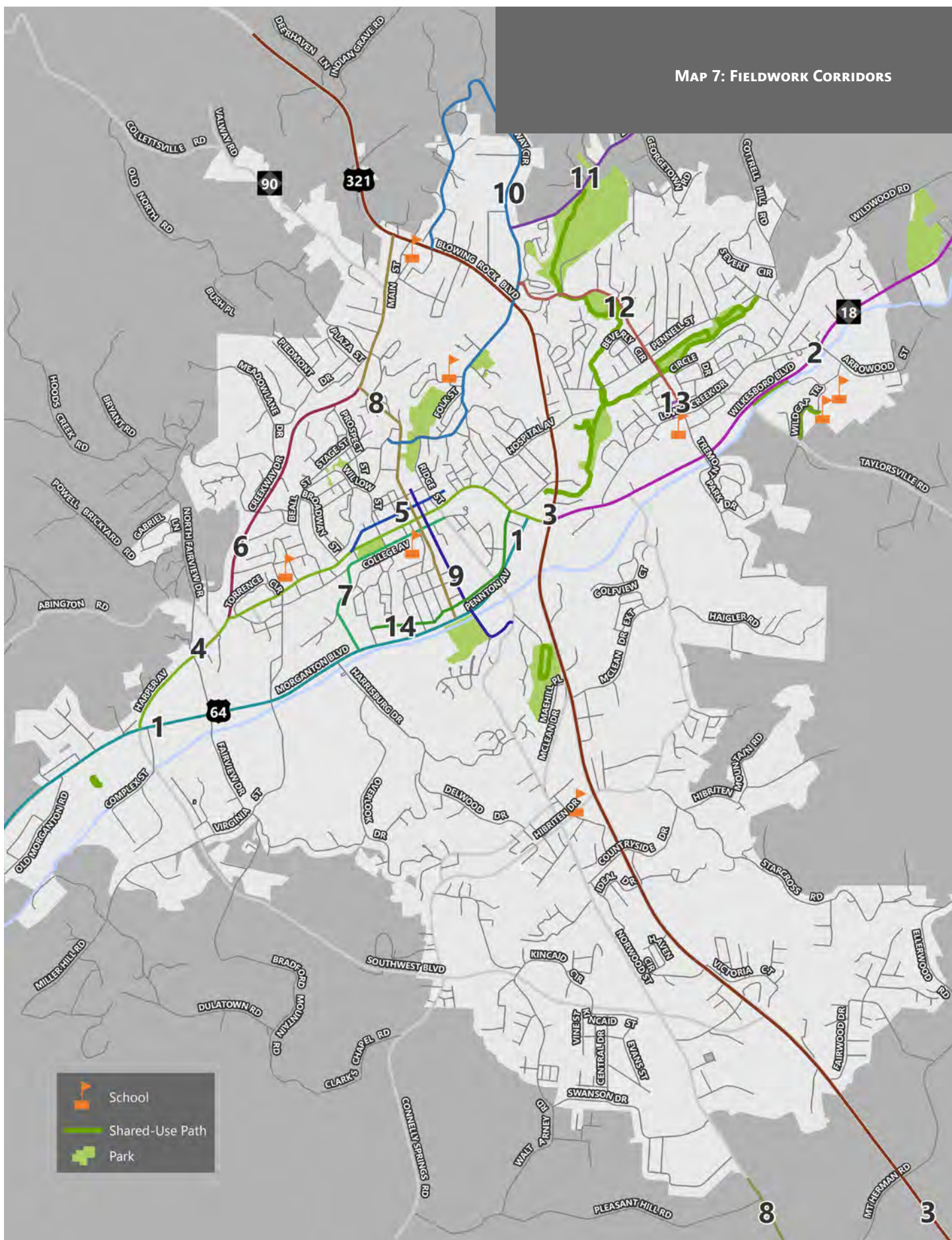
At the onset of the planning process, the project team worked with City staff to identify priority corridors for field inventory. The 14 corridors in the table below correspond by Map ID with the corridors labeled on the map to the right. The following pages provide more detail about each corridor.

**TABLE 3: FIELDWORK CORRIDORS**

MAP ID	STREET NAME
1	US 64 (Morganton Boulevard)
2	NC 18 (Wilkesboro Blvd)
3	US 321 (Hickory Boulevard/Blowing Rock Boulevard)
4	Harper Avenue
5	West Avenue
6	Creekway Drive/Harper Avenue
7	Jennings Street, Underdown Avenue, College Avenue
8	Main Street
9	Mulberry Street
10	Finley Avenue, Greenhaven Drive, Nuway Circle
11	Zacks Fork Road
12	Powell Road (North of Glenview Street)
13	Pennel Street
14	Pennton Avenue

Data sources for the attributes found in the tables on pages 16 and 18 are as follows:

Lanes	Project team field inventory
Median Type	Project team field inventory
Shoulder Treatment	Project team field inventory
Speed Limit	Project team field inventory
Rights-of-way (ROW)	Measured using City of Lenoir property lines
AADT	2014 Annual Average Daily Traffic (AADT) volumes provided by NCDOT's Traffic Survey Group
Maintained By	NCDOT State Maintained Roads, Last modified August 15, 2017 ( <a href="https://ncdot.maps.arcgis.com/home/item.html?id=157dbc4ef33f4db4aa1ecc1a3182a375">https://ncdot.maps.arcgis.com/home/item.html?id=157dbc4ef33f4db4aa1ecc1a3182a375</a> )



## US 64 (MORGANTON BOULEVARD)

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
1	4	Two-way left-turn	Curb & gutter	45-50 MPH	150 ft	14,000 to 22,000 vpd	NCDOT

## NC 18 (WILKESBORO BOULEVARD)

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
2	4	Two-way left-turn	Paved	45 MPH	90-150 ft	7,100 to 8,400 vpd	NCDOT

## US 321 (HICKORY BOULEVARD/BLOWING ROCK BOULEVARD)

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
3	4	Two-way left-turn (N of US 64) Divided (S of US 64)	Curb & gutter (N of US 64) Paved (S of US 64)	45-55 MPH	100-260 ft	16,000 to 37,000 vpd	NCDOT

## HARPER AVENUE

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
4	2	Two-way left-turn (E of Norwood St) No median (W of Norwood St)	Mixed curb & gutter/paved	<b>Downtown:</b> 20 MPH <b>Outside of Downtown:</b> 25-35 MPH	40-100 ft	Not available	City of Lenoir

Notes: Harper Avenue has on-street parking in Downtown Lenoir

## WEST AVENUE

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
5	4	No median	Curb & gutter	20 MPH	40-90 ft	Not available	City of Lenoir

Notes: West Avenue has on-street parking in Downtown Lenoir

## CREEKWAY DRIVE/HARPER AVENUE

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
6	4	Two-way left-turn	Curb & gutter	45 MPH	80-115 ft	8,900 to 14,000 vpd	NCDOT

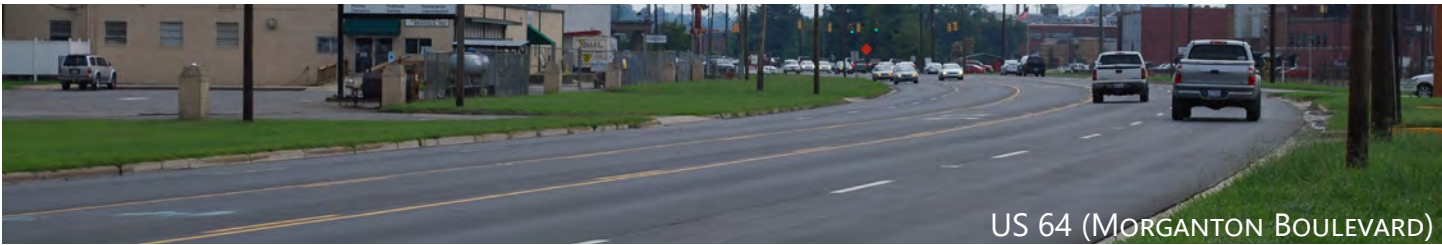
## JENNINGS STREET/UNDERDOWN AVENUE/COLLEGE AVENUE

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
7	2	No median	Mixed curb & gutter/paved	20 MPH	40-60 ft	1,000 to 2,400 vpd	City of Lenoir

Notes:

College Avenue through Downtown Lenoir has on-street parking  
In many locations, resurfacing has caused the curb elevation to be level with the road elevation.





US 64 (MORGANTON BOULEVARD)



NC 18 (WILKESBORO BOULEVARD)



US 321 (HICKORY BOULEVARD/BLOWING ROCK BOULEVARD)



HARPER AVENUE



WEST AVENUE



CREEKWAY DRIVE/HARPER AVENUE



COLLEGE AVENUE



## MAIN STREET

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
8	2/4	Two-way left-turn (N of Creekway Dr) No median (S of Creekway Dr)	Curb & gutter (except where shoulders are paved between Conley Pl & Creekway Dr)	<b>N of Downtown:</b> 35 MPH <b>Downtown:</b> 20 MPH <b>S of Downtown:</b> 25 MPH	40-80 ft	7,900 to 8,500 vpd (N of Creekway Dr) Not available (S of Creekway Dr)	NCDOT/ City of Lenoir

## Notes:

Main Street has on-street parking in Downtown Lenoir.

NCDOT maintenance: Creekway Drive to US 321; City maintenance: Creekway Drive to US 64

## MULBERRY STREET

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
9	2	No median	Curb & gutter	<b>Downtown:</b> 20 MPH <b>Outside of Downtown:</b> 25 MPH	50 ft	Not available	City of Lenoir

Notes: Mulberry Street has on-street parking in Downtown Lenoir.

## FINLEY AVENUE/GREENHAVEN DRIVE/NUWAY CIRCLE

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
10	2	No median	No shoulder	25-35 MPH	30-60 ft	480 to 4,500 vpd	NCDOT/ City of Lenoir

Note: NCDOT maintenance: Nuway Circle; City maintenance: Finley Avenue/Greenhaven Drive

## ZACKS FORK ROAD

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
11	2	No median	No shoulder	35 MPH	60 ft	920 to 1,900 vpd	NCDOT

## POWELL ROAD (NORTH OF GLENVIEW STREET)

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
12	2	No median	No shoulder (N of Pennel St) Curb & gutter (S of Pennel St)	25 MPH	30-60 ft	Not available (N of Pennel St) 3,200 to 3,800 vpd (S of Pennel St)	City of Lenoir

## PENNEL STREET

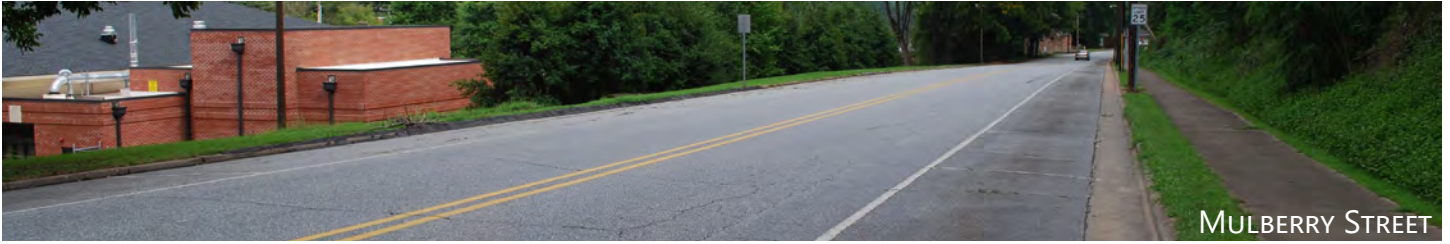
MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
13	2	No median	Curb & gutter	25 MPH	30-40 ft	2,600 vpd (W of Powell Rd)	City of Lenoir

## PENNTON AVENUE

MAP ID	LANES	MEDIAN TYPE	SHOULDER TREATMENT	POSTED SPEED LIMIT	ROW	AADT	MAINTAINED BY
14	2	No median	Curb & gutter (W of Mulberry St) Mixed curb & gutter/paved (E of Mulberry St)	25 MPH	40-50 ft	420 to 2,300 vpd	City of Lenoir



MAIN STREET



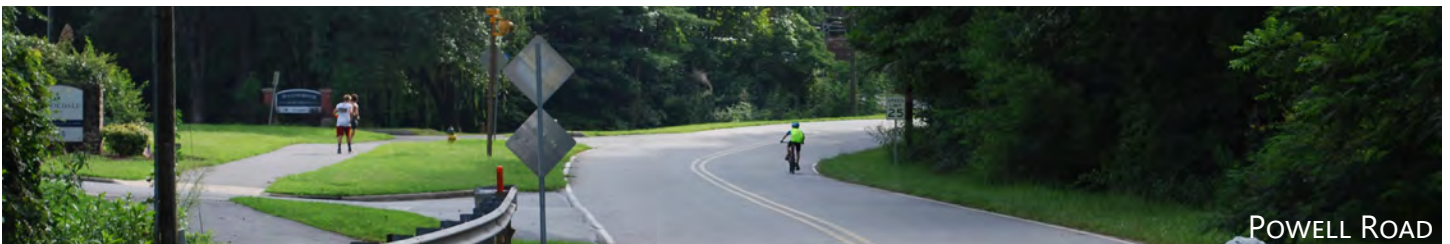
MULBERRY STREET



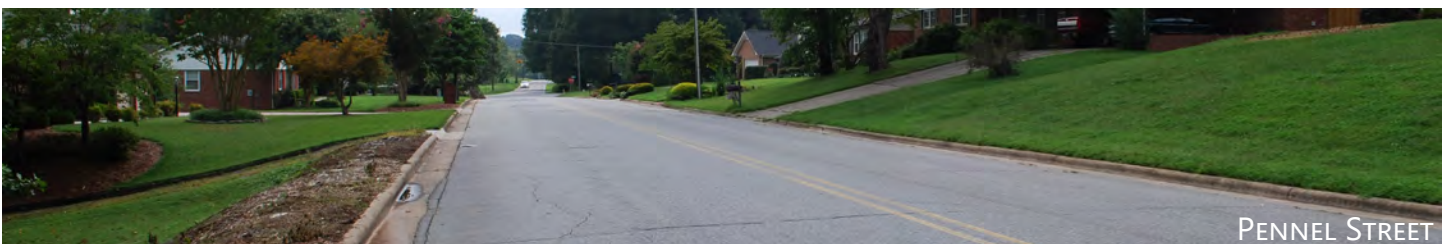
GREENHAVEN DRIVE



ZACKS FORK ROAD



POWELL ROAD



PENNEL STREET



PENNTON AVENUE

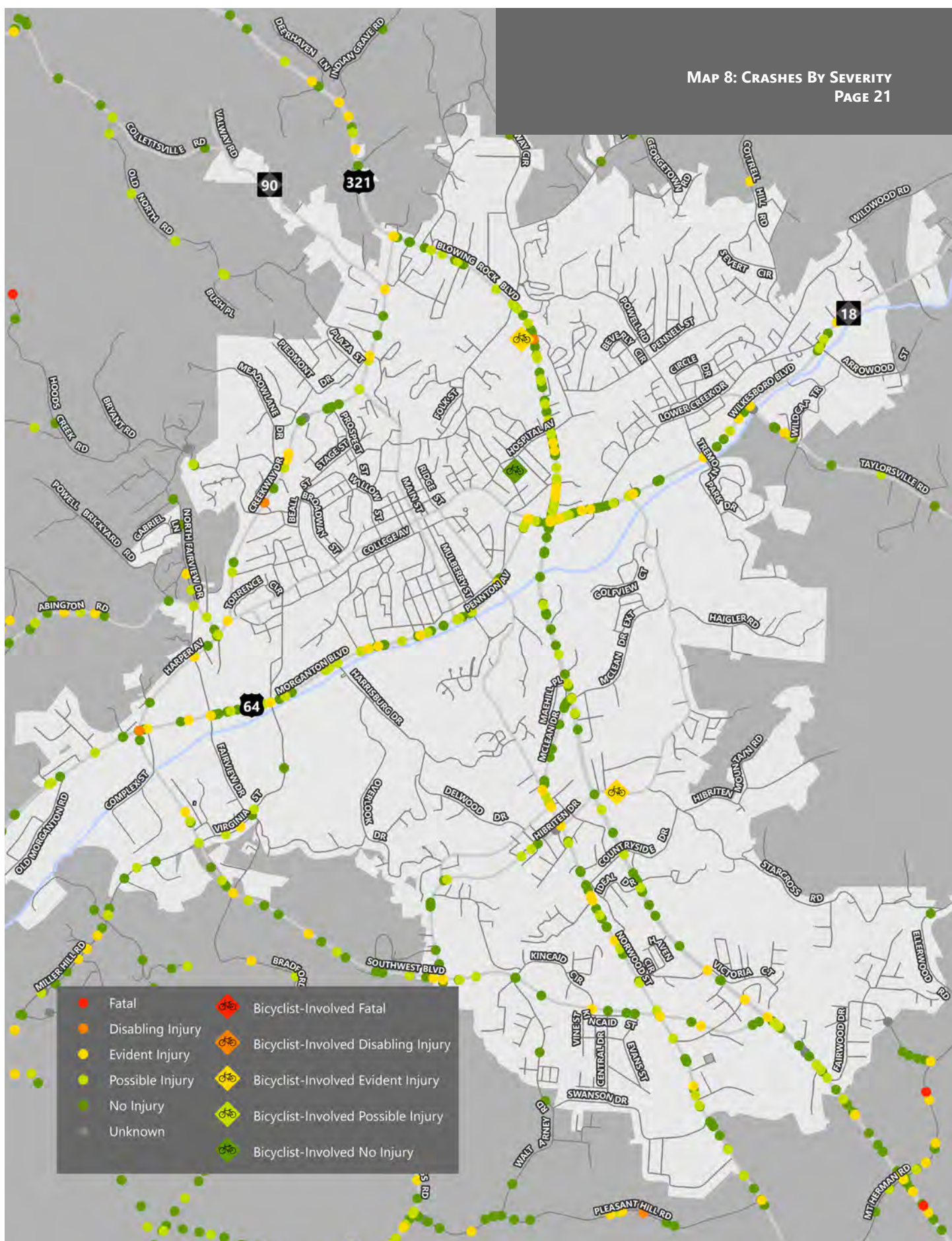
## CRASH STATISTICS

The North Carolina Department of Transportation documents and makes available crashes reported along state-maintained roadways. While this dataset doesn't include crashes that occur on local streets and does not reflect the frequency of close calls or near misses, it still provides insight in highlighting key corridors and intersections for improvement. Streets that are characterized by a high frequency of motor vehicle crashes, a high severity of motor vehicle crashes, or both are generally unsafe environments for bicycle travel.

Between January of 2013 and December of 2015, a total of 1,197 crashes occurred on state-maintained roadways in Lenoir. In this same time period, there was one collision involving a bicyclist on Hibriten Drive near Winhurst Street, and two other crashes occurring in public vehicular areas such as parking lots.



MAP 8: CRASHES BY SEVERITY  
PAGE 21





## BICYCLE INFRASTRUCTURE AND ROUTES

Dedicated bicycle facilities are separated from automobile traffic by physical barriers, such as striping, parking, bollards, or a grass berm. Shared facilities, such as shared lane markings, require bicyclists and motorists to share the travel way. There are currently no dedicated bicycle facilities in Lenoir.

Lenoir's shared facilities include the NC 2 Mountains-to-Sea designated bike route and the existing greenway system. The NC 2 Mountains-to-Sea route is approximately 700 miles and bisects the state from east to west. In Lenoir, the route follows Wilkesboro Boulevard (US 64/NC18) and Harper Avenue. Additionally, Lenoir is home to Zacks Fork Mountain Bike Trail, which consists of 2.8 miles of unpaved pathway.

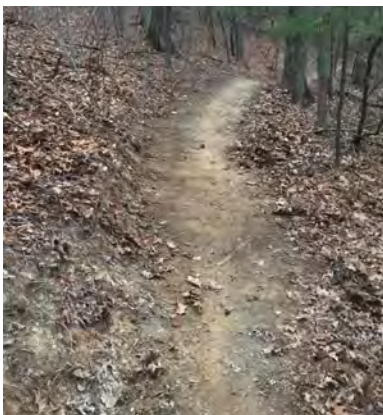
The existing Lenoir Greenway system comprises 9 different trail sections for a total of 7.2 miles of paved pathway. Currently, the greenway system starts at Westbrook Street, passes under US 321, and follows Zacks Fork Creek north to the Lenoir Rotary Soccer Complex. In addition to the north/south segments, the greenway system also includes 2 miles of trail between Sherlee Street and Zacks Fork Creek. In addition to the parks along the greenway, the greenway can be accessed via Sherlee Street, Powell Road, and the Lenoir Public Library.

Plans are in place to extend the greenway towards downtown along Lower Creek and US 64. The greenway expansion is part of the Google Connector priority project in Chapter 4 of this plan. Currently the City has secured approximately half of the funds for construction through PARTF, RTP, and Google grants. During the planning process, the nearly 1.5 mile segment between the old Lenoir Mall and Harrisburg Drive was constructed. The most difficult remaining section near Harper Avenue has significant environmental constraints and will be very costly.

Additionally, in March of 2017, work began to remove the railroad tracks in the heart of Lenoir. This is a significant step in advancing the completion of the National Park Service's Overmountain Victory National Historic Trail. While funds for construction haven't been obtained, the City anticipates public use of the former rail right-of-way prior to paving.



THE LENOIR GREENWAY



ZACKS FORK MOUNTAIN BIKE TRAIL



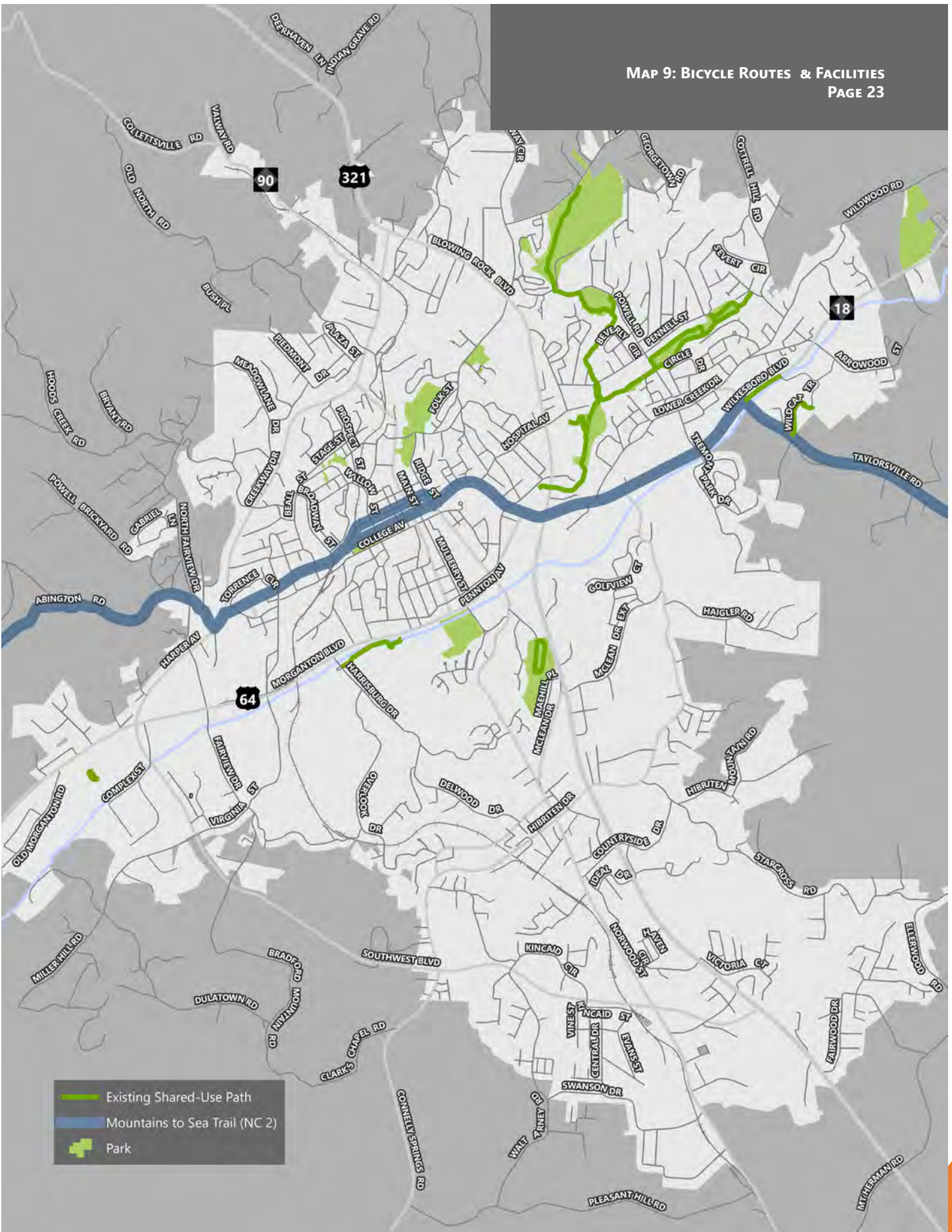
MAIN ST. BICYCLE RACK



NC 2 BIKE ROUTE



MAP 9: BICYCLE ROUTES & FACILITIES  
PAGE 23





## IDENTIFIED CHALLENGES & OPPORTUNITIES

Through collaboration with City staff, the Bicycle Planning Committee (BPC), and key stakeholders the project team worked to identify challenges hindering bicycling and opportunities that may increase bikeability in Lenoir. Identified challenges ranged from the lack of access management and skewed intersections to natural barriers such as floodways. Opportunities for enhancing the bikeability of Lenoir included connections to the existing greenway, potential partnerships with Quest 4 Life Wellness Center and the Caldwell County Health Department, and the future Overmountain Victory National Historic Trail. The map on page 21 displays these locations, while the sections below provide greater detail about a few specific challenges and opportunities.

### HARPER AVENUE AND PENNTON AVENUE

Pennton Avenue serves as the primary connection for bicyclists traveling from Downtown Lenoir to the Lenoir Greenway located a quarter mile northeast of the intersection. The intersection geometry is both offset and skewed, creating an unsafe crossing for bicyclists. In addition to the skew and offset of the intersection, there are several driveway openings within close proximity to the traffic signal, which increase conflict points. Due to the close proximity of local businesses, reconfiguring the intersection is unlikely. However, countermeasures with lower impacts could include driveway closings and consolidations, as well as using colored pavement to direct cyclists through the intersection. The application of colored pavement will also raise driver awareness of bicyclists in the intersection. An example of one countermeasure is shown below.

#### EXISTING INTERSECTION



#### EXAMPLE COUNTERMEASURES



### LENOIR GREENWAY TUNNEL - FLOODING

Due to its location near Zacks Fork Creek and within the floodway, the pedestrian tunnel underneath US 321 frequently floods. Flood waters and debris such as mud make the tunnel a slip hazard for bicyclists and pedestrians alike.

#### FLOODED GREENWAY TUNNEL BENEATH US 321



### OVERMOUNTAIN VICTORY NATIONAL HISTORIC TRAIL

The Overmountain Victory National Historic Trail (OVNHT) is a 330-mile trail stretching through North Carolina, South Carolina, Tennessee, and Virginia. The trail's route is commemorative of the patriot militia's march over the Appalachian Mountains for the Battle of Kings Mountain in 1780. The current plans for the OVNHT include approximately 2.5 miles in the City of Lenoir, with partial use of the abandoned rail line in Downtown Lenoir.



## POLICIES AND PROGRAMS

Existing local policies impact Lenoir's bicycle-friendliness. For example, Lenoir allows bicyclists to ride on sidewalks as long as the bicyclist yields to pedestrians<sup>7</sup>. This allows less skilled bicyclists, including children, to feel more comfortable bicycling along major arterials.

### REVIEW OF EXISTING PROGRAMS

The City of Lenoir is actively involved in several programs and initiatives that advance active lifestyles and a culture of bicycling.

TABLE 4: EXISTING PROGRAMS

PROGRAM	DESCRIPTION
School Resource Officers	The Lenoir police department has officers trained through the National Association of School Resource Officers and provide instruction courses to students on several topics including bicycle safety.
Caldwell County Pathways	Caldwell County Pathways is a non-profit organization that works to coordinate and promote non-motorized shared use pathways across all of Caldwell County. Caldwell County Pathways provides information about local trails, sponsors bike rides, and helped fund the feasibility study for the Overmountain Victory National Historic Trail.
Safe Kids Caldwell County	The Safe Kids is a coalition of local agencies and businesses. The coalitions primary goal is to reduce the number of children injured or killed due to preventable injuries, and as a part of this focus on bicycle and pedestrian safety.
Downtown Lenoir Main Street Program	The Downtown Lenoir Main Street program is a resource that helps guide and facilitate economic development and revitalization of downtown. The Downtown Lenoir Main Street Program includes the importance of active living in the vision statement and will be a key stakeholder in supporting the implementation of this plan. NCDOT also includes the potential expansion of the Main Street Program to include Complete Street design elements in the state bicycle and pedestrian plan.

### REVIEW OF LOCAL ORDINANCES

The City of Lenoir requires within its zoning and subdivision ordinances for private land developers to provide sidewalk facilities within subdivisions and provide the necessary easements for greenway extensions and connections<sup>8</sup>. However, no ordinance currently requires developers to consider or provide any form of bicycle facilities. In addition to the lack of provisions for bicycle facilities, street design standards reference the *1987 Lenoir-Hudson Thoroughfare Plan*. With the absence of ordinances relative to bicycle facilities, the City of Lenoir should consider the policies listed below. More information about each policy can be found in Chapter 4 of this report.

TABLE 5: POLICY UPDATES

POLICY	UPDATE TO BE CONSIDERED
Chapter 18 - Streets	Consider using NCDOT <i>Complete Streets Planning and Design Guidelines</i> in conjunction with the <i>1987 Lenoir-Hudson Thoroughfare Plan</i> .  Consider updating Sec. 18-21 to include reference to the recommendations within this plan under the requirement for additional width dedication by developments on existing streets.
Chapter 19 - Subdivisions	Include greenways and on-street bicycle facilities in Sections 19-16 and 19-41 in addition to the existing requirements for sidewalks.
Appendix A - Zoning	Update Article X - Off-street Parking and Loading Requirements to include the provision of bicycle parking.

## PREVIOUS PLANNING EFFORTS

The Lenoir Bicycle Plan acknowledges that its foundation is built upon past bicycle planning efforts in Lenoir and the region. The Bicycle Plan considers and builds upon the key findings and recommendations of previously adopted plans, summarized in the table below.

**TABLE 6: PREVIOUS PLANNING EFFORTS**

PLAN NAME	RELEVANT FINDINGS AND RECOMMENDATIONS
Lenoir Comprehensive Plan	<p>Recommends and encourages...</p> <ul style="list-style-type: none"> <li>the increased use of alternative modes of transportation, including walking, bicycling, buses, and railroads</li> <li>improving connectivity between recreation facilities and destination points such as schools and downtown</li> <li>the creation of a Pedestrian, Greenway, and Bicycle Plan</li> <li>the inclusion of a standard DOT bicycle lane on roads when improvements and construction occurs</li> <li>the construction of a bicycle lane on Harper Avenue as part of the NC 2 Mountains-to-Sea Bike Route</li> </ul>
Lenoir Comprehensive Pedestrian Plan	<p>Recommends...</p> <ul style="list-style-type: none"> <li>expansion of the Lenoir Greenway</li> <li>construction of the Lower Creek Greenway</li> <li>development of wayfinding signage</li> </ul>
North Main Street Small Area Plan	<p>Promotes development of...</p> <ul style="list-style-type: none"> <li>Rails-to-Trails Greenway within the existing C&amp;NW railroad ROW (planned as part of the OVNHT)</li> <li>Rails-to-Trails Greenway crossing at Old North Road and Main Street</li> </ul>
Overmountain Victory National Historic Trail Master Plan	<p>Includes...</p> <ul style="list-style-type: none"> <li>design guidelines for 6 possible trail types</li> <li>detailed alignment, crossings, trailhead location and design for 3 segments of the OVNHT from Lenoir to Morganton</li> </ul>
Western Piedmont Bicycle Plan	<p>Program and Policy Recommendations</p> <ul style="list-style-type: none"> <li>creation of the Greater Hickory MPO's Bicycle and Pedestrian Advisory Committee</li> <li>safe routes to school programs</li> <li>establishment of minimum standards for bike facilities and maintenance protocols</li> <li>roadway retrofitting per NCDOT's Complete Streets Guidelines</li> <li>law enforcement education about state laws pertaining to bicyclists</li> <li>involvement with Watch for Me NC &amp; Let's Go NC</li> <li>development of a regional bicycling website</li> </ul> <p>Facility Recommendations</p> <ul style="list-style-type: none"> <li>greenway along NC 18/ US 64 connecting Lenoir and Morganton</li> <li>development of Route Segments 10,11, &amp; 12 using a combination of paved shoulders, sharrows, bike lanes, and sharrows</li> </ul>
Greater Hickory MPO 2040 Long Range Transportation Plan	<p>Encourages and emphasizes...</p> <ul style="list-style-type: none"> <li>connected multimodal transportation</li> <li>linking bicycle and pedestrian facilities with public transportation</li> <li>promoting biking and walking as healthy alternatives</li> <li>the delineation of pedestrian and bicycle routes</li> </ul>
WalkBikeNC Statewide Pedestrian and Bicycle Plan	<p>Recommends...</p> <ul style="list-style-type: none"> <li>rerouting of NC 2 from Abington Road into Lenoir via NC 90</li> </ul>

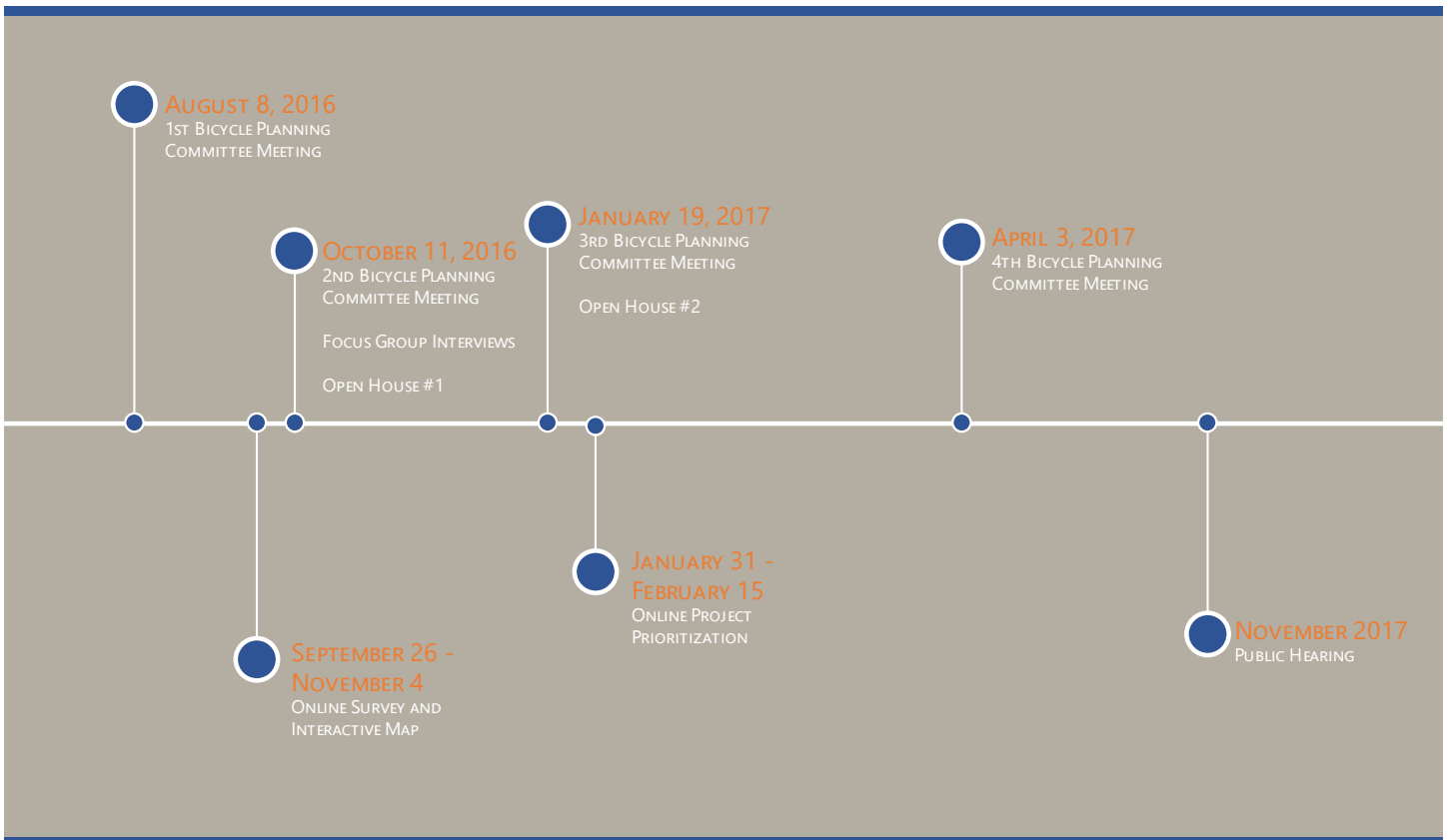


# PUBLIC INPUT

Engaging the public during the bicycle planning process creates the opportunity to capture and consider public opinion and awareness of the Bicycle Plan. Gaining an understanding of the public's values increases the likelihood that the end product will offer viable strategies that are responsive to the needs of the community.

Lenoir citizens helped the project team identify key destinations and priority corridors for facility recommendations. The public also provided feedback regarding the desirability of proposed program and policy recommendations. The public engagement process for the Lenoir Bicycle Plan included several opportunities for the public to learn about the plan and provide their input.

**FIGURE 5: PUBLIC INPUT TIMELINE**



## STEERING COMMITTEE

Convening four times during the creation of the Bicycle Plan, the Plan's bicycle planning committee included representation from the following entities and groups:

- City Council
- Public Works Department
- Police Department
- Caldwell Memorial Hospital
- Caldwell County Schools
- Caldwell Community College
- Caldwell County Pathways
- Luna Cycle
- Lenoir Planning Board
- Lenoir Business Advisory Board
- North Carolina Department of Transportation
- Caldwell County Parks and Recreation



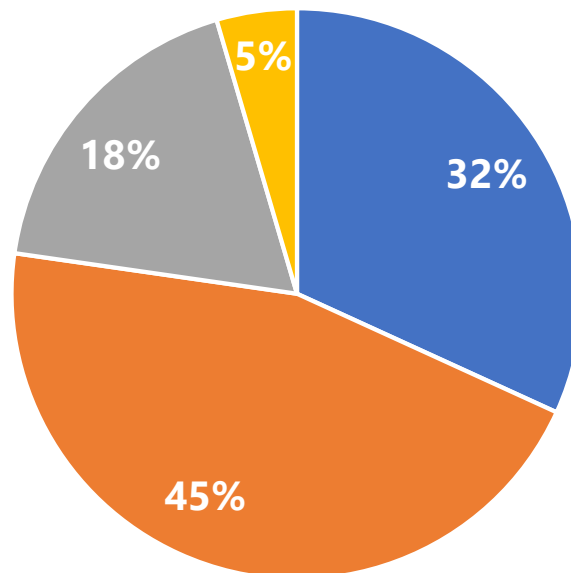
## ONLINE SURVEY

The project team created an interactive online survey to gather additional input from members of the Lenoir community. This exercise expanded the reach of the public engagement process to include people who were unable to attend the public meetings.

The survey consisted of a brief questionnaire and a map where participants could mark recommended bicycle facilities, as well as identify current bicycling obstacles. Participants were also asked to mark where they live, work, recreate, and/or go to school. Routes identified for bicycle facilities by survey participants included Pennton Avenue, Harper Avenue, and West Avenue. There was also a recommendation for a multi-use path along Hibriten Drive. The most commonly expressed obstacle was motor vehicle speeds, specifically along Harper Avenue as it nears the intersections of US 64 and US 321.

The graphs on the following pages display the outcomes of the questionnaire portion of the survey.

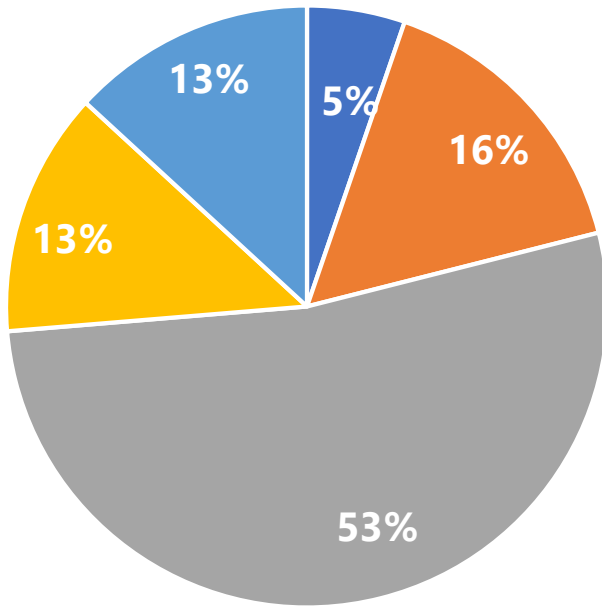
### HOW WOULD YOU DESCRIBE YOURSELF AS A CYCLIST?



- Strong and fearless: I prefer to ride in the roadway and I'm comfortable riding on high-speed roads.
- Enthusied and confident: I can handle myself in the roadway but prefer routes that include bikeways and greenways.
- Interested but concerned: I would like to ride my bike more, but I'm concerned about safety and comfort.
- No way, no how: There's nothing anyone can do or say that will get me on a bike.

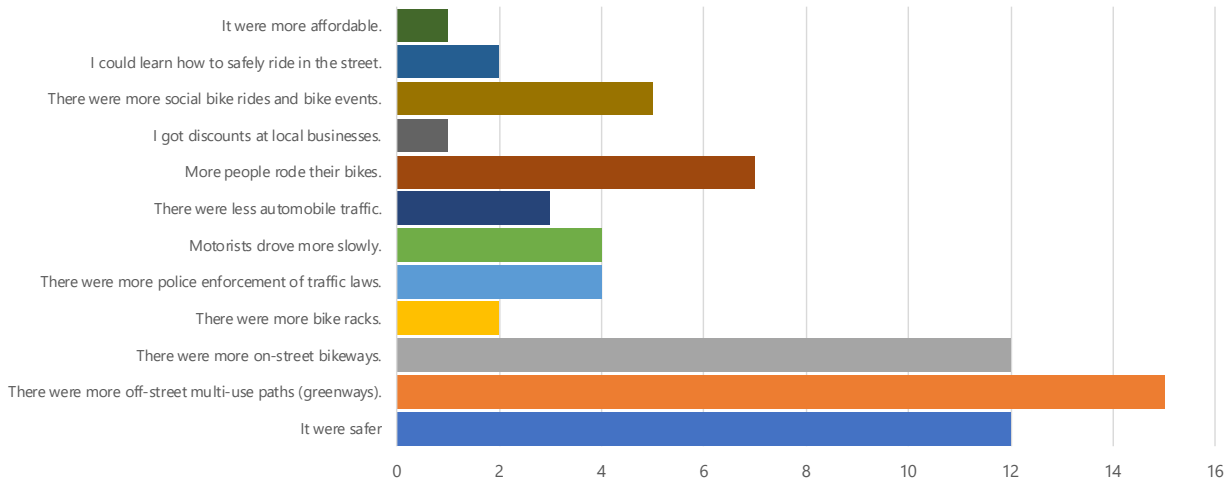


WHAT ARE YOUR PRIMARY REASONS FOR RIDING A BIKE IN LENOIR?



- I don't ride a bike
  - For recreation and exercise
  - To get to work or school
- To run errands or visit family and friends
  - To get to restaurants or shops

I MIGHT RIDE MY BIKE MORE IF...



Detailed results from the online survey and general comments are included in the Appendix.

## FOCUS GROUP INTERVIEWS

During the Bicycle Planning Workday on October 11th, the project team met with four focus groups: the Lenoir Business Advisory Board (LBAB), Caldwell County Schools, Caldwell Memorial Hospital, and Caldwell County Health Department. Each focus group provided insight on popular destinations, existing issues, priority streets, and existing programs and policies. A common theme during each interview revolved around the lack of bicycle education and programs or initiatives to encourage bicycle ridership.

## PUBLIC MEETINGS

The project team held public meetings in October 2016 and January 2017. Information about the plan was presented to the public at these meetings and attendees participated in a variety of activities to provide their input. The October open house captured existing perceptions and desired bicycling conditions in Lenoir, while the January open house provided an opportunity for the public to review and rank the plan's recommendations.

The public played a key role in highlighting existing deficiencies in the street network for bicycling and prioritizing corridors for short-term improvements. Connectivity to key destinations was also a major consideration for infrastructure recommendations.

At the January open houses, the public ranked the twelve priority projects that had been identified by the project team. These rankings (along with steering committee feedback and a data-driven scoring process) sorted the priority projects into short-term and mid-term tiers. The public also reviewed and ranked recommendations pertaining to bicycle education and encouragement. The same ranking exercises were formatted as an online survey to provide opportunity for additional feedback. The public's feedback influenced the Lenoir Bicycle Plan's next steps, described in the Implementation section.







# RECOMMENDATIONS

## INTRODUCTION

Generally speaking, there are four categories of bicyclists: 1. people who are comfortable riding on high-speed roadways (the “strong and fearless”), 2. people who are comfortable sharing travel lanes with motorists but would prefer dedicated facilities (the “enthused and confident”), 3. people who would like to ride but are worried about their safety (the “interested but concerned”), and 4. people who wouldn’t even consider riding a bicycle (“no way, no how”).

In a study published by the Portland State University, over half of survey respondents reported being in the interested but concerned category of bicyclists. This group represents people who would ride their bikes if it were safer, more convenient, and more comfortable to do so.<sup>9</sup> The Lenoir Bicycle Plan seeks to serve the interested but concerned majority.

## BICYCLE FACILITY PLAN

Lenoir’s recommended bicycle facility plan consists of individual projects along key streets and corridors. These projects support the City’s goal to improve its infrastructure for bicyclists of all ages and abilities. The next steps for the City of Lenoir, in partnership with the Greater Hickory Metropolitan Planning Organization (GHMPO) and the North Carolina Department of Transportation (NCDOT), are to prioritize, design, fund, construct, and evaluate these projects in the future. The Lenoir Bicycle Plan initiates the prioritization process by identifying six projects that can be implemented in the next five to ten years.

## FACILITY PLANNING PROCESS

The creation of the recommended bicycle facility plan began with the drafting of the Lenoir Bicycle Plan’s vision statement:

RIDING BICYCLES IN THE CITY OF LENOIR WILL BE A SAFE AND CONVENIENT WAY FOR RESIDENTS AND VISITORS TO TRAVEL FOR TRANSPORTATION AND RECREATION. THE CITY’S BICYCLE NETWORK WILL BE ACCESSIBLE, CONNECTED, AND ATTRACTIVE FOR PEOPLE OF ALL AGES, ABILITIES, AND BACKGROUNDS.

The key words in the vision statement relating to facility planning are safe, convenient, accessible, connected, and all ages, abilities, and background. The vision statement serves as a reminder to the project team, the Bicycle Planning Committee (BPC), and the public of what the Lenoir Bicycle Plan is seeking to accomplish regarding infrastructure improvements from a big picture perspective.

Following consensus on the vision statement, the project team initiated an iterative process to create the recommended bicycle facility plan. This process, graphically displayed in the maps on the following pages, began with inventorying existing facilities, i.e. the NC 2 Mountains-to-Sea designated bike route and the Lenoir Greenway, and facility recommendations from previously adopted plans, including the Lenoir Comprehensive Plan and the GHMPO 2040 Long Range Transportation Plan.

The BPC and the public then identified destinations that people are already bicycling to along with destinations that people would like to bicycle to, including schools, parks, neighborhoods, employers, and downtown Lenoir. The Lenoir Greenway serves as both a bikeway and a destination. This exercise yielded a mostly blank “connect the dots” map – the dots represent the destinations, and the lines represent the existing and planned bicycle facilities. The BPC and the public were responsible for the preliminary connecting of the dots, making decisions about which routes have the greatest potential for improvement considering the context of safety, comfort, connectivity, and equity. This step included superficial considerations of the operational and geometric characteristics of Lenoir’s streets and opportunities to construct off-street facilities such as shared use paths.

The project team then reviewed the preliminary bicycle facility map to fill in network gaps, augment the network with additional recommendations, and make determinations about what facility type would characterize each recommendation. The graphic below details the bicycle facility toolkit at the disposal of the project team.

## BALANCING BIKE LANE VISION PROJECTS WITH THE DEMAND FOR ON-STREET PARKING

On-street bicycle lanes are generally implemented in one of two ways: as part of new roadways or striped within the existing pavement width. The latter strategy can be coordinated with existing street resurfacing programs to reduce implementation costs. However, restriping a street to include bike lanes where bike lanes did not previously exist can sometimes result in the loss of travel lanes or on-street parking lanes.

On the surface, business owners may have the most to lose when on-street parking is considered for reallocation for the creation of bike lanes. Every on-street parking space is valuable because it is an opportunity for a customer to park their vehicle. Not being able to find convenient parking may turn customers away from patronizing the business.

However, several case studies investigating the economic impact of converting on-street parking into bike lanes show net gains in sales revenue or no change at all.<sup>10</sup> While bicyclists can’t carry as much as motorists and thus, don’t spend as much money during each shopping trip, bicyclists tend to make more trips and spend more money overall.

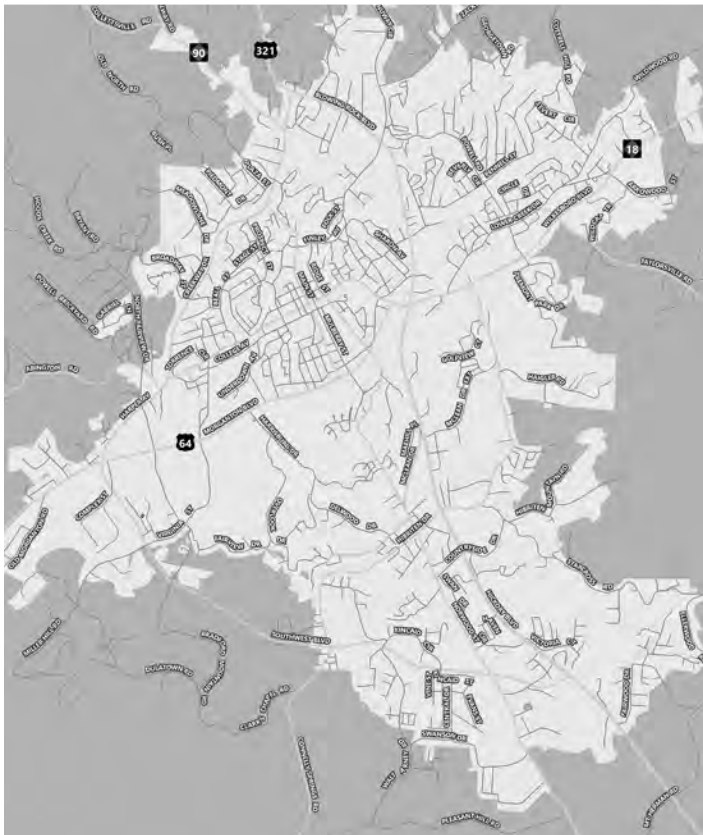
The City of Lenoir recognizes the value of on-street parking and should make every effort to communicate and collaborate with those who may be impacted by the potential modification of on-street parking due to recommended bike lanes. Where existing on-street parking and proposed bike lanes vie for the same cross-sectional space, the City of Lenoir and its partners should develop a committee of key stakeholders and City staff to consider preferred outcomes. The committee will weigh the community-wide impacts and benefits of restriping to include bicycle facilities and will investigate mitigation measures where appropriate.

FIGURE 5: BICYCLE FACILITY TOOLKIT

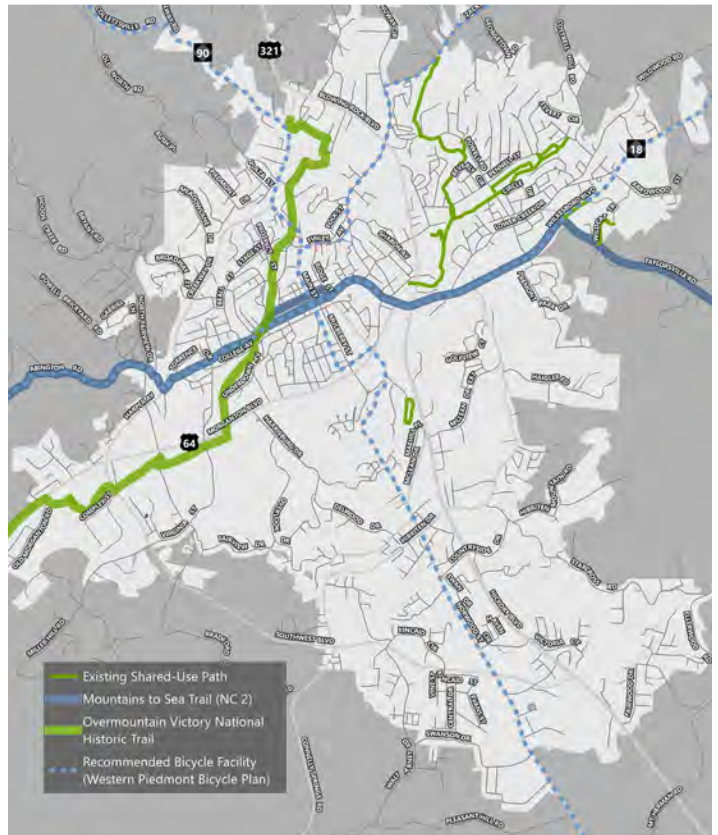




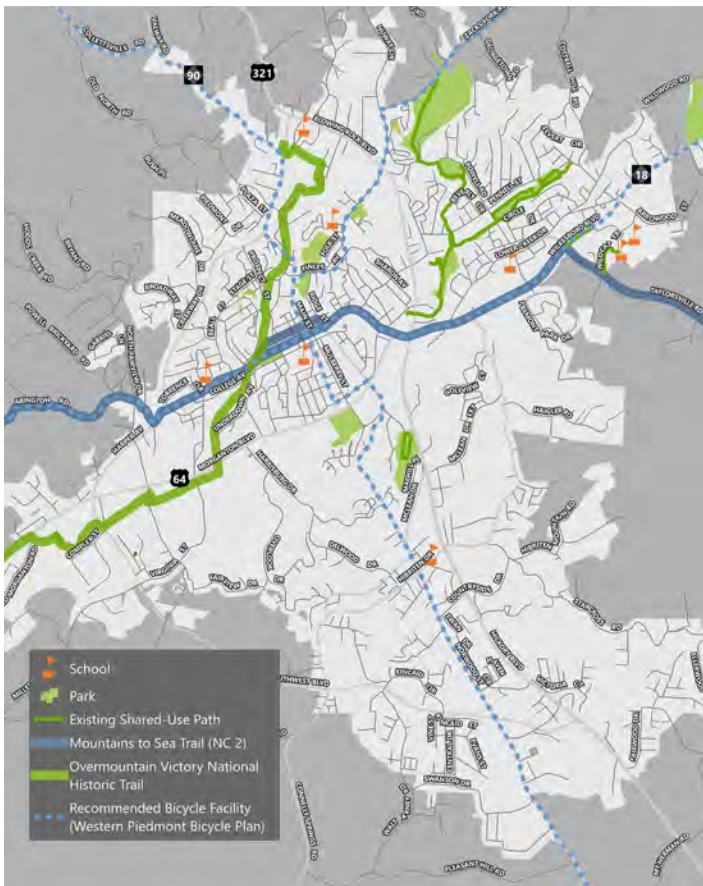
MAP 10: LENOIR



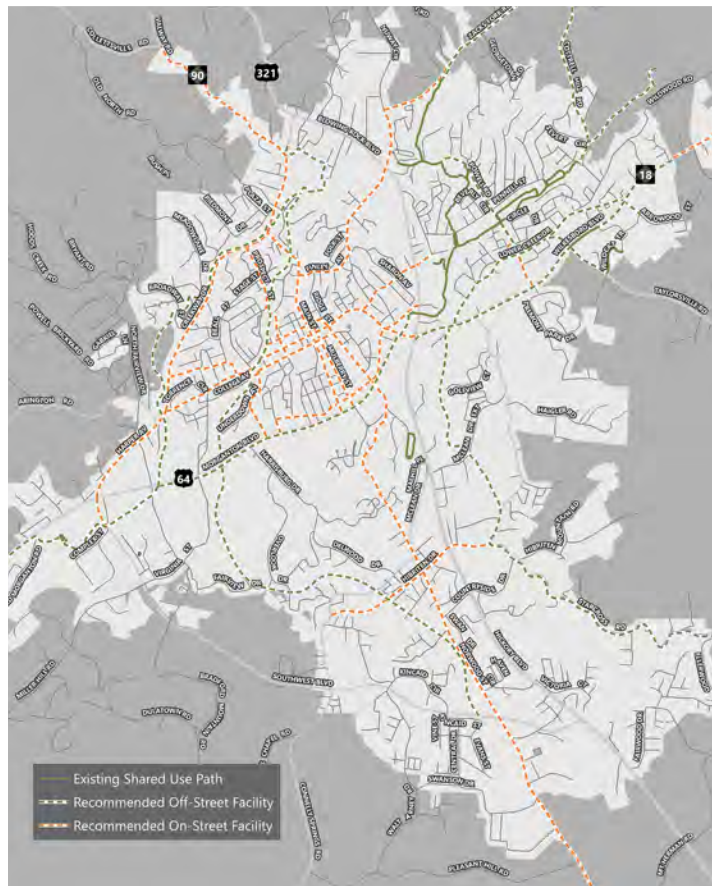
MAP 11: INVENTORY OF EXISTING & PLANNED FACILITIES



MAP 12: CRITICAL DESTINATIONS



MAP 13: STREETS RECOMMENDED FOR IMPROVEMENT





MAP 14: RECOMMENDED BICYCLE FACILITY PLAN  
PAGE 37

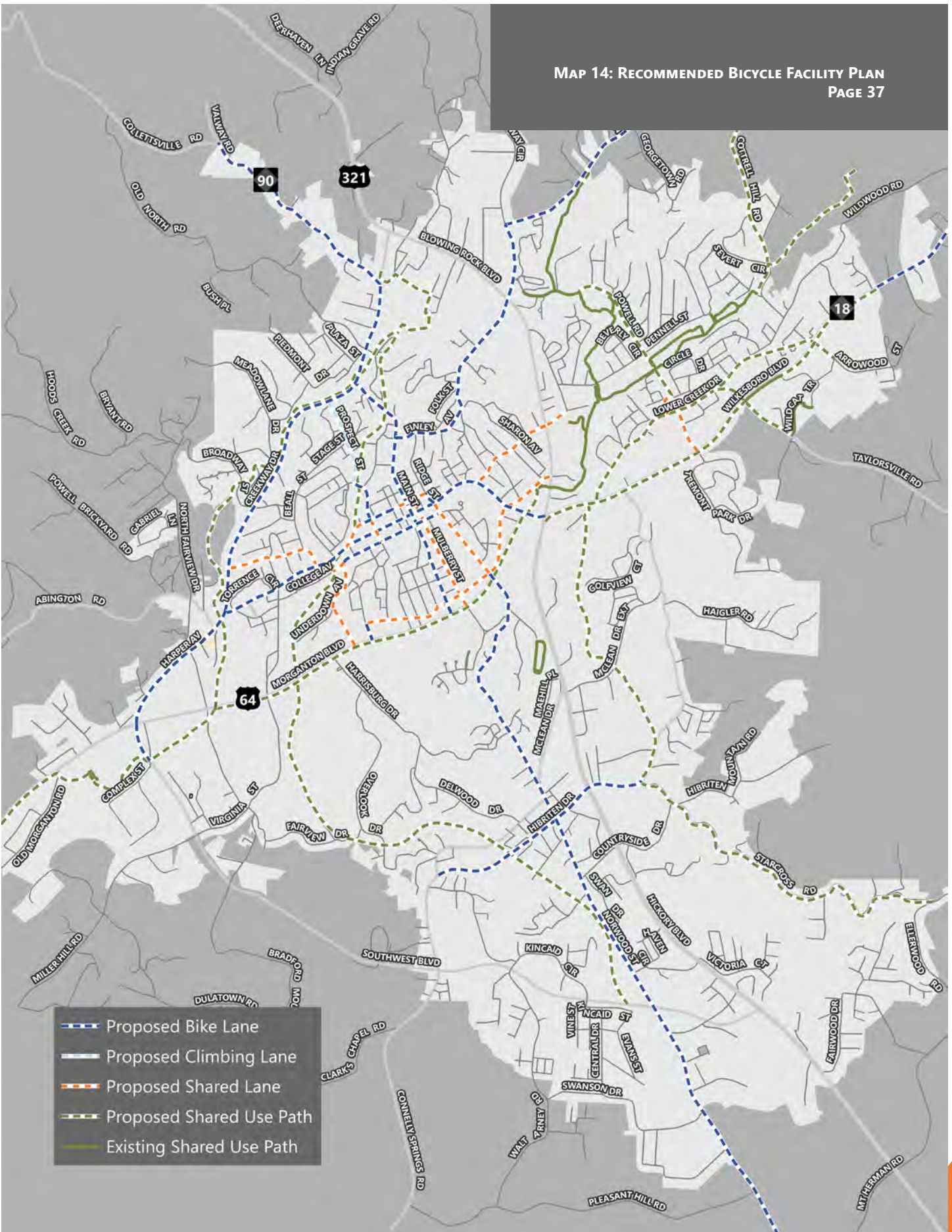


TABLE 7: ALL FACILITY RECOMMENDATIONS

* STREET NAME	FROM	TO	FACILITY TYPE
* Airport Extension	Sherlee Street	Lower Creek Airport	Shared Use Path
* Cottrell Hill Road Extension	Severt Circle	Black Trail Terminus	Shared Use Path
* Google Connector 1	Harper Avenue	Library Trail Terminus	Shared Use Path
* Google Connector 2	Harper Avenue	Fairview Drive	Shared Use Path
* Huntington Extension	Ellerwood Road	US 64	Shared Use Path
* Lower Creek Extension	US 321	Tomlinson Court	Shared Use Path
* Main Street	Morganton Boulevard	Valway Road	Bike Lane
* Overmountain Victory National Historic Trail			Shared Use Path
* Rails-to-Trails	US 64	Southwest Boulevard	Shared Use Path
* Spainhour Creek Extension	Morganton Boulevard	RR Tracks North of Advent Circle	Shared Use Path
* Valway Road	Main Street	Collettsville Road	Bike Lane
* Zacks Fork Road	Nuway Circle	Cottrell Hill Road	Bike Lane
Arrowood Street	NC 18	Panther Trail	Side Path
College Avenue	Norwood Street	Underdown Avenue	Bike Lane
College Avenue	Underdown Avenue	Light Street	Shared Lane
Creekway Drive	Main Street	Harper Avenue	Bike Lane
Greenhaven Drive	Zacks Fork Road	Main Street	Bike Lane
Harper Avenue	Morganton Boulevard	US 321	Bike Lane
Hibriten Drive	Hickory Boulevard	Connelly Springs Road	Bike Lane
Hospital Avenue	Seehorn Street	Harper Avenue	Shared Lane
Jennings Street	Underdown Avenue	Morganton Boulevard	Shared Lane
Lower Creek Drive	US 64	NC 18	Side Path
Mulberry Street	Morganton Boulevard	Ashe Avenue	Shared Lane
Norwood Street	Harper Avenue	Pennton Avenue	Shared Lane
Norwood Street	Pennton Avenue	Mt Herman Road	Bike Lane
Pennton Avenue	Block Rock Boulevard	Harper Avenue	Shared Lane
Pennton Avenue	Harper Avenue	Realty Street	Shared Lane
Poplar Street	Creekway Drive	Beall Street	Shared Lane
Powell Road	Lower Creek Drive	Glenview Street	Shared Lane
Powell Road	Glenview Street	Wellington Court	Side Path
Powell Road	Nuway Circle	Camelot Court	Side Path
Prospect Street	Creekway Drive	Willow Street	Climbing Lane
Realty Street	Morganton Boulevard	Pennton Avenue	Bike Lane
Ridge Street	Harper Avenue	West Avenue	Bike Lane
Southwest Boulevard	Morganton Boulevard	Complex Street	Bike Lane
Taylorville Road	Lower Creek Drive	US 64	Side Path
Tremont Park Drive	Lower Creek Drive	Wilkesboro Boulevard	Shared Lane
Underdown Avenue	College Avenue	Jennings Street	Shared Lane
West Avenue	Harper Avenue	Ridge Street	Bike Lane
Wilkesboro Boulevard (NC 18)	City Limits	Wildwood Road	Bike Lane
Willow Street	Prospect Street	West Avenue	Bike Lane
Willow Street	West Avenue	College Avenue	Shared Lane

\* Recommendation from previous planning efforts



## REASONABLE IMPLEMENTABILITY AND FUTURE CONDITIONS

For recommendations such as the bike lanes along Main Street detailed by the Western Piedmont Bike Plan, it is important to note that resurfacing of the facility may occur before development that would drive the upgrade to a curb and gutter section. In this instance, the project team recommends that a paved shoulder be included with the resurfacing as an interim facility. Additionally, any bike lanes that are recommended as part of a reallocation of paved way or road diet will need further study. While the current and future travel projections display some roads significantly under capacity, at the time of implementation new traffic forecasts should be performed to verify the conditions. In the event that traffic volumes will require full lane utilization, the project team recommends the inclusion of a shared use path in lieu of the on-street facilities.

## PRIORITY PROJECTS

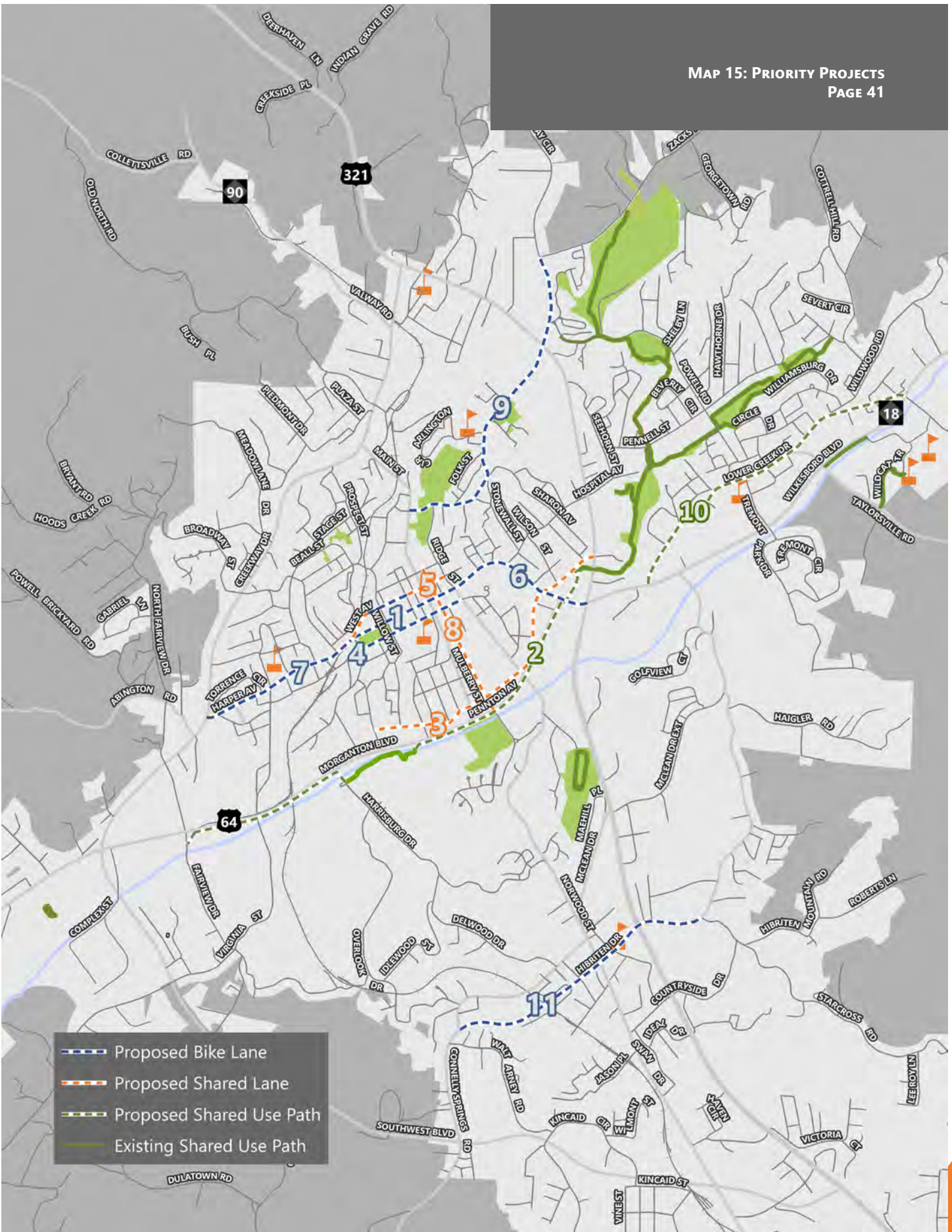
To guide the development of the implementation plan described in the next chapter, the project team solicited feedback from the BPC and the public to identify twelve priority projects. Of the entire list of recommended bikeway projects, these twelve are the most likely to garner public support and be constructed in the next 10 years.

The priority projects and their planning-level cost estimates are shown in the table below and in the map on the next page. The cost estimates do not include utility relocation, acquisition of right-of-way, or sidewalk construction or reconstruction. More information about roadway maintenance and potential constraints can be found in the Appendix.

**TABLE 8: PRIORITY PROJECTS**

MAP ID	STREET	START	END	TYPE	IMPLEMENTATION	LENGTH (MI)	COST ESTIMATE
1	Harper Avenue	Norwood Street	West Avenue	Buffered Bike Lane	Restriping	0.58	\$152,000
2a	Google Connector Phase 1	Fairview Drive	Harper Avenue	Shared Use Path	New Construction	2.36	\$2.32 million
3	Pennton Avenue	Blowing Rock Road (US 321)	Realty Street	Shared Lane Markings & Speed Cushions	Marking	1.58	\$118,000
4	College Avenue	Norwood Street	Underdown Avenue	Bike Lanes	Restriping and Widening	0.64	\$1.07 million
2b	Google Connector Phase 2	Harper Avenue	Library Trail	Shared Use Path & Pedestrian Tunnel	New Construction	0.21	\$1.04 million
5	West Avenue	Ridge Street	Harper Avenue	Bike Lanes and Shared Lane Markings	Restriping and Marking	0.59	\$193,000
6	Harper Avenue	Norwood Street	Blowing Rock Road (US 321)	Bike Lanes	Road Widening	0.76	\$1.77 million
7	Harper Avenue	West Avenue	Creekway Drive	Bike Lanes	Road Widening	0.83	\$2.05 million
8	Mulberry Street	Wilkesboro Boulevard (US 64)	Ashe Avenue	Shared Lane Markings	Marking	0.81	\$22,000
9	Greenhaven Drive	Zacks Fork Road	Main Street	Bike Lanes	Road Widening	1.69	\$4.25 million
10	Lower Creek Drive	Wilkesboro Boulevard (US 64)	Wilkesboro Boulevard (NC 18)	Shared Use Path	New Construction	1.69	\$1.79 million
11	Hibriten Drive	Connelly Springs Road	Starcross Road	Bike Lanes	Restriping & Road Diet (5 to 3 lanes)	1.40	\$442,000

MAP 15: PRIORITY PROJECTS  
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The primary objective of defining a list of priority projects is to score and rank the projects. The top six priority projects will be included in the City's short-term implementation plan. The remaining six projects will make up the mid-term implementation plan. Four major categories of input informed the scoring process which are listed below with their respective weights:

- Bicycle Planning Committee input (20%)
- Public input (20%)
- Bicycle safety (20%)
- Quantitative data (40%)
  - Nearby activity centers (6.67%)
  - Nearby employment centers (6.67%)
  - Population served (6.67%)
  - Low income population served (6.67%)
  - Minority population served (6.67%)
  - Percent households with no access to motor vehicles (6.67%)

More detailed results of the priority project scoring and ranking are provided in the Appendix. The following pages include a map of the top six priority projects and project profiles comprising descriptions, concept illustrations, and typical cross-sections.

**TABLE 9: TOP 6 PRIORITY PROJECTS**

Map ID	STREET	START	END	TYPE	IMPLEMENTATION	LENGTH (MI)	COST ESTIMATE
1	Harper Avenue	Norwood Street	West Avenue	Buffered Bike Lane	Restriping	0.58	\$152,400
2a	Google Connector Phase 1	Fairview Drive	Harper Avenue	Shared Use Path	New Construction	2.36	\$2.32 million
2b	Google Connector Phase 2	Harper Avenue	Library Trail	Shared Use Path & Pedestrian Tunnel	New Construction	0.21	\$1.04 million
3	Pennton Avenue	Blowing Rock Road (US 321)	Realty Street	Shared Lane Markings & Speed Cushions	Marking	1.58	\$118,000
4	College Avenue	Norwood Street	Underdown Avenue	Bike Lanes	Restriping and Widening	0.64	\$1.07 million
5	West Avenue	Ridge Street	Harper Avenue	Bike Lanes and Shared Lane Markings	Restriping and Marking	0.59	\$192,500

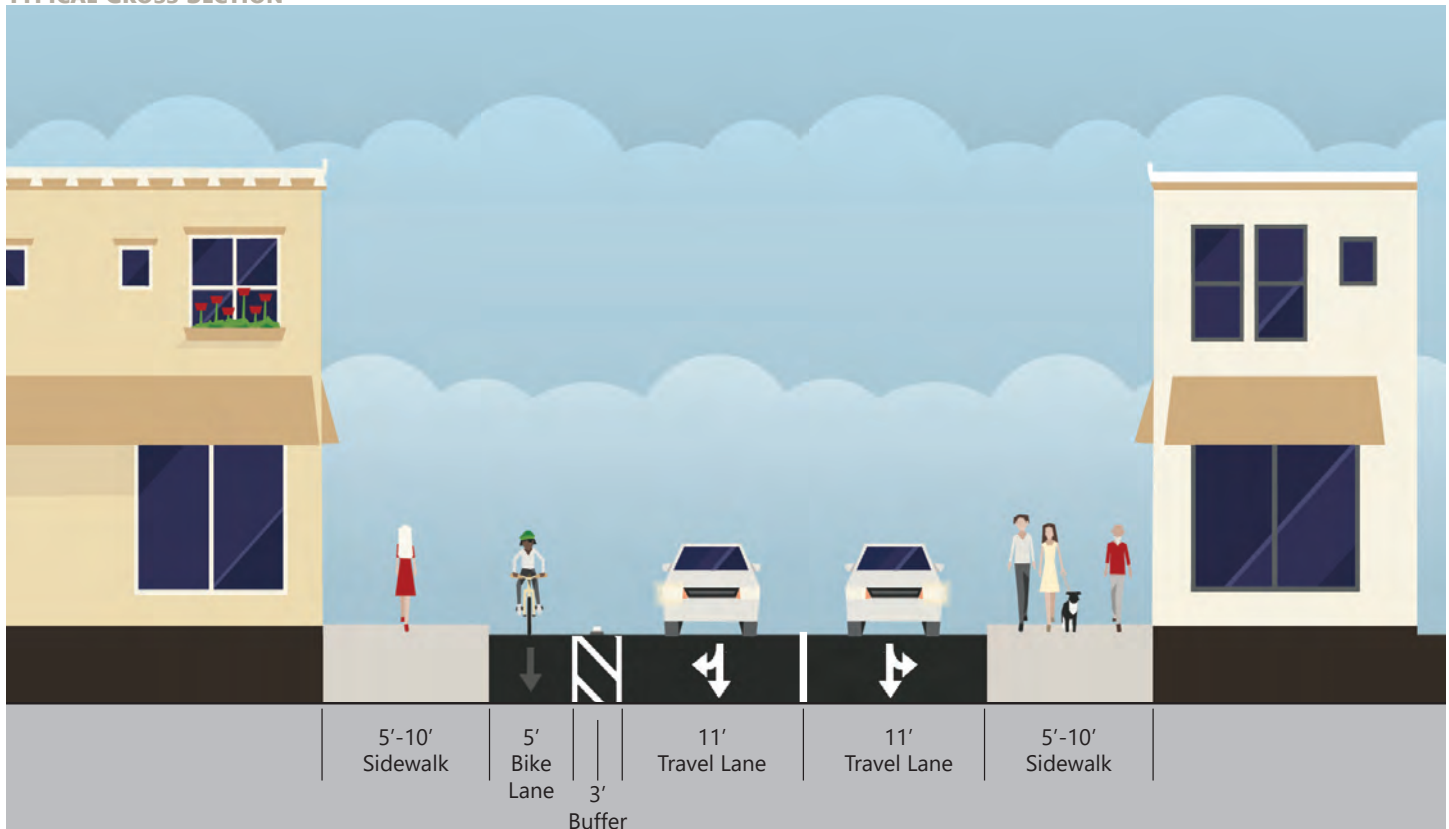
MAP 16: TOP 6 PRIORITY PROJECTS  
PAGE 43



## PRIORITY PROJECT #1: HARPER AVENUE

<b>EXTENTS</b>	Norwood Street to West Avenue
<b>BACKGROUND</b>	This segment of Harper Avenue is a one-way street and is the primary eastbound route through the center of Downtown Lenoir. It parallels West Avenue, which is the primary westbound route through Downtown. Many destinations in Downtown, including restaurants, shops, and other businesses, are immediately accessible along this segment of Harper Avenue. It provides direct connections to other main travel routes through the City, such as US 64 and US 321, and serves as a connection to the Lenoir Greenway which can be accessed further east along Harper Avenue.
<b>PROJECT DESCRIPTION</b>	A bicycle lane in the same direction as the vehicle travel lanes along Harper Avenue would connect bicyclists to the heart of Downtown Lenoir and provide continuity for bicyclists traveling along this main important eastbound route. Wide travel lanes and existing on-street parking between West Avenue and Church Street will allow for restriping to provide a 5' bicycle lane with a 3' buffer between the bicycle lane and travel lanes. Between Church Street and Norwood Street, removing one of the three existing travel lanes by restriping will allow for the same 5' bicycle lane with 3' buffer along the remainder of this segment.
<b>PROJECT CONSTRAINTS</b>	One constraint to this project is the necessary removal of ten on-street parking spaces. The ten on-street spaces are located on the south side of Harper Avenue between Willow Street and the Forbes Printing driveway. There are three business fronts along this side of Harper Avenue adjacent to the on-street parking, which all have access to off-street parking lots with a combined total of approximately 100 spaces. A parking occupancy study will need to be conducted to ensure that the available off-street spaces are enough to accommodate the local businesses that will be losing on-street parking.
<b>LENGTH</b>	0.58 miles
<b>COST ESTIMATE</b>	\$152,000 Project cost estimates do not include utility relocation, acquisition of right-of-way, or sidewalk construction or reconstruction.

### TYPICAL CROSS SECTION







HARPER AVENUE — EXISTING



HARPER AVENUE — CONCEPTUAL

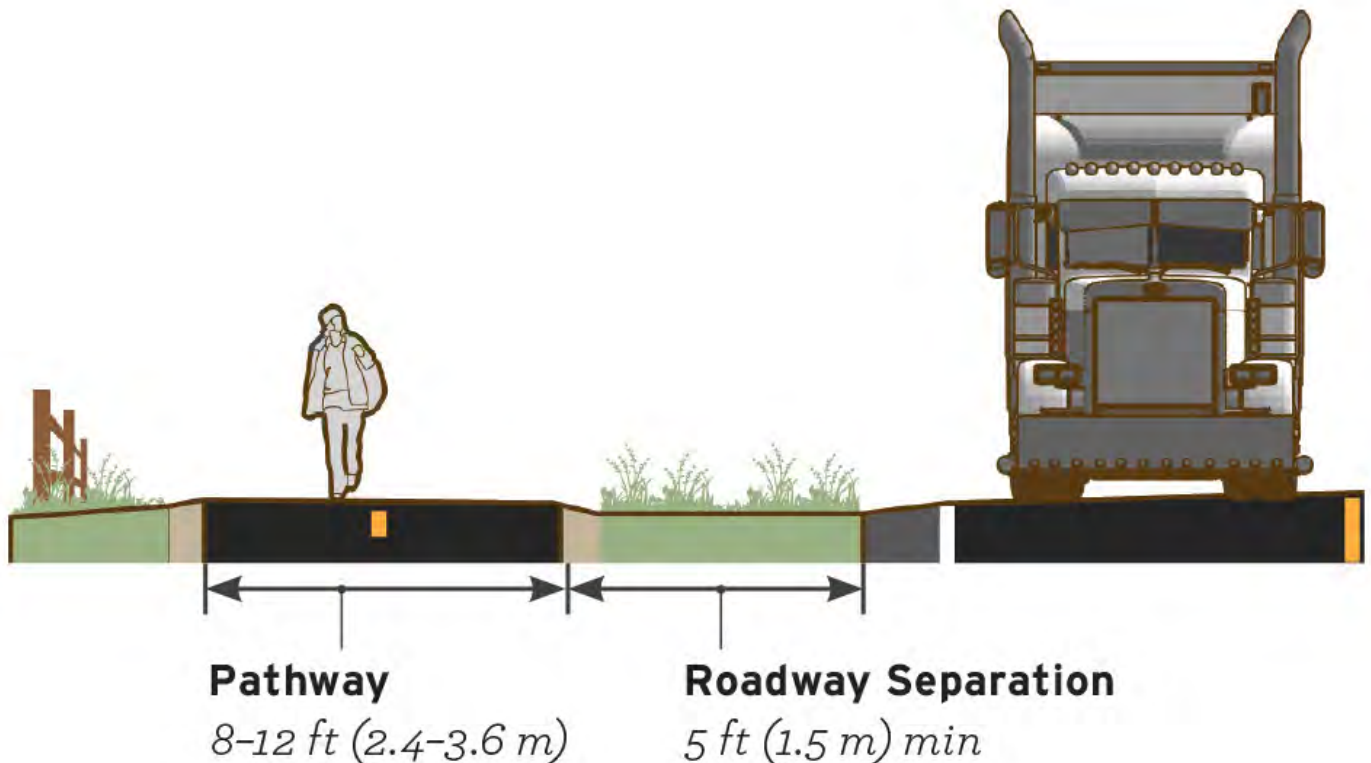


## PRIORITY PROJECT #2: GOOGLE CONNECTOR

<b>EXTENTS</b>	Fairview Drive to Library Trail
<b>BACKGROUND</b>	This shared-use path has been identified as a potential way to provide bicycling connections to important employers in Lenoir and to bypass US 64, a barrier for bicyclists looking to travel south of the City. It has also been identified in the Lenoir Comprehensive Pedestrian Plan and Western Piedmont Bicycle Plan as a way to augment the existing Lenoir Greenway system and to provide connections to existing and other planned trails such as the Overmountain Victory National Historic Trail.
<b>PROJECT DESCRIPTION</b>	This project will be accomplished by constructing a new shared use path for commuters and recreationalists parallel to US 64. This alternative to US 64 will attract bicyclists not comfortable riding on high-speed roadways. Due to environmental conflicts, it will likely need to be completed in two phases. The Phase 1 portion of this shared use path will improve access to major employers and other destinations along US 64 and the Phase 2 portion will provide direct access to the existing Lenoir Greenway.
<b>PROJECT CONSTRAINTS</b>	While the use of the Google Connector greenway will be beneficial in providing flood control and a stream side buffer, there is environmental concern with the measures necessary to pass under Harper Avenue. The required greenway underpass will likely require extensive permitting with NCDOT, FEMA, and the Army Corps of Engineers in order to use the existing box culvert. Modification of the existing culvert will also significantly increase the project construction cost.
<b>LENGTH</b>	<i>Phase 1:</i> 2.36 miles <i>Phase 2:</i> 0.21 miles
<b>COST ESTIMATE</b>	<i>Phase 1:</i> \$2.32 million <i>Phase 2:</i> \$1.04 million Project cost estimates do not include utility relocation, acquisition of right-of-way, or sidewalk construction or reconstruction.

### TYPICAL CROSS SECTION

SOURCE: SMALL TOWN AND RURAL MULTIMODAL NETWORKS, FHWA





GOOGLE CONNECTOR—EXISTING



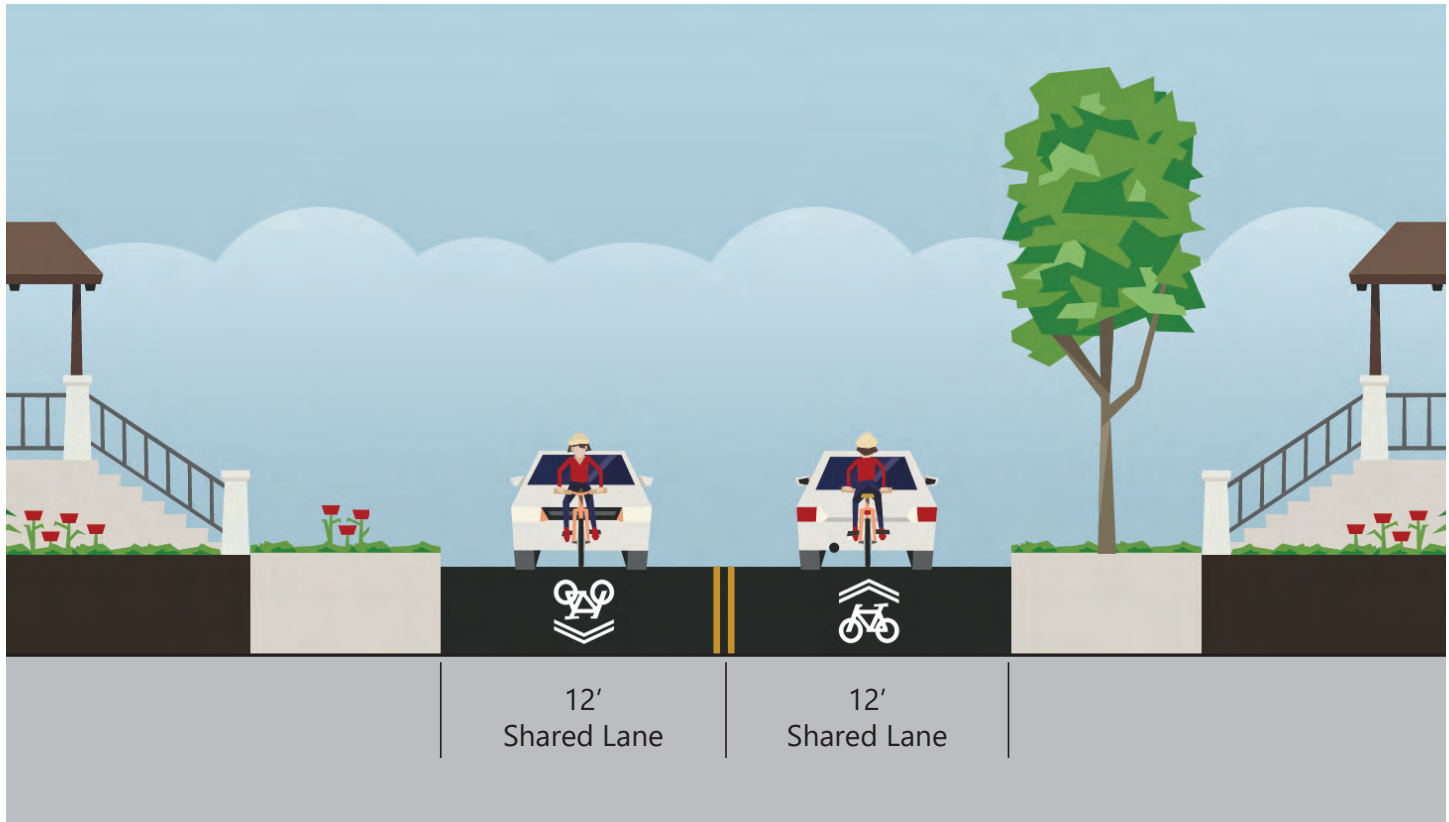
GOOGLE CONNECTOR — CONCEPTUAL



## PRIORITY PROJECT #3: PENNTON AVENUE

<b>EXTENTS</b>	US 321 to Realty Street
<b>BACKGROUND</b>	Pennton Avenue is currently a collector street for the many residences located between Downtown Lenoir and US 64. It provides direct access to US 321 and connects to other main routes that provide access to US 64 and Downtown Lenoir. It currently provides a comfortable alternative to US 64 and US 321 for bicyclists wishing to access the many businesses and employment centers located along those routes. It also offers convenient access to the Lenoir Greenway underpass which allows bicyclists to safely cross US 321.
<b>PROJECT DESCRIPTION</b>	This project includes installing shared lane markings and speed cushions along Pennton Avenue to improve motorist awareness of bicycles and to reinforce it as an attractive alternative to US 64 and US 321 for bicyclists. The accessibility to the Lenoir Greenway will make this facility a useful route for the residential areas south and west of Downtown Lenoir.
<b>PROJECT CONSTRAINTS</b>	Implementation of shared lane markings and speed cushions along Pennton Avenue has no obvious constraints. However, it will be important after construction to monitor and enforce motor vehicle travel speeds to ensure bicyclist safety.
<b>LENGTH</b>	1.58 miles
<b>COST ESTIMATE</b>	\$118,000 Project cost estimates do not include utility relocation, acquisition of right-of-way, or sidewalk construction or reconstruction.

TYPICAL CROSS SECTION







PENNTON AVENUE — EXISTING



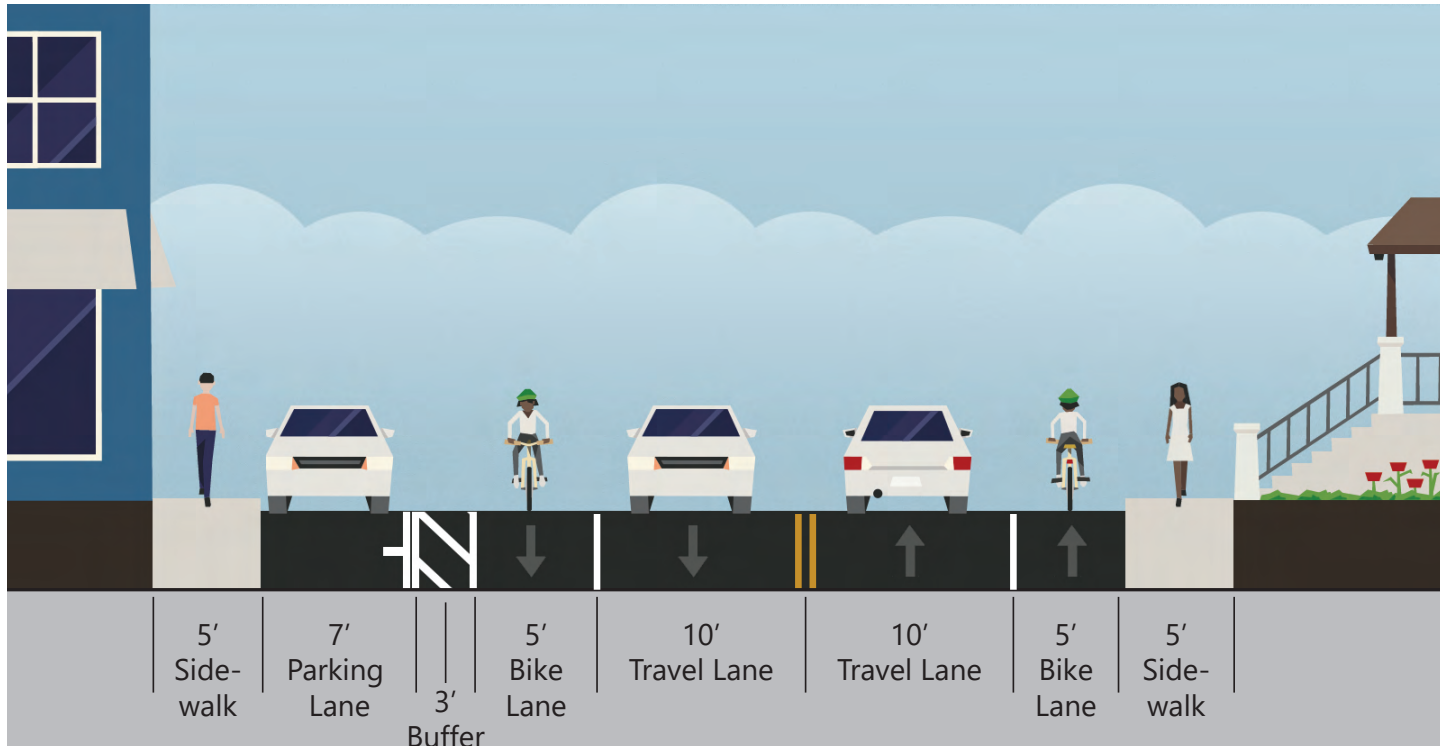
PENNTON AVENUE — CONCEPTUAL



## PRIORITY PROJECT #4: COLLEGE AVENUE

<b>EXTENTS</b>	Norwood Street to Underdown Avenue
<b>BACKGROUND</b>	This section of College Avenue runs along the southern edge of Downtown Lenoir and parallels the main routes through Downtown of Harper Avenue and West Avenue. Since it parallels these main routes through Downtown, it could serve as a comfortable alternative for those traveling through the City. Notable destinations along this road include Davenport Elementary School and multiple places of worship, and the Caldwell Memorial Hospital is located nearby to the south along Mulberry Street. It could also serve as a collector for the many residences located to the south wishing to access Downtown Lenoir.
<b>PROJECT DESCRIPTION</b>	The project would take advantage of wide pavement and space currently allocated to on-street parking found throughout most of the segment. Restriping and removing on-street parking on one side of the road will allow for 5' bicycle lanes in each direction. Additionally, a 3' buffer for the bicycle lane alongside the remaining on-street parking will be installed to mitigate the likelihood of collisions with opening car doors. Between Willow Street and Boundary Street, where the existing cross section is narrower, roadway widening would allow for continuity of the bicycle facilities throughout the entire segment.
<b>PROJECT CONSTRAINTS</b>	The primary project constraint to installing bike lanes along College Avenue will be the removal of on-street parking along the north side of College Avenue. Additionally, the 750-ft section between Willow Street and Boundary Street will require roadway widening which will include moving curb, sidewalk, and utilities, substantially increasing project cost.
<b>LENGTH</b>	0.64 miles
<b>COST ESTIMATE</b>	\$1.07 million Project cost estimates do not include utility relocation, acquisition of right-of-way, or sidewalk construction or reconstruction.

TYPICAL CROSS SECTION







COLLEGE AVENUE — EXISTING

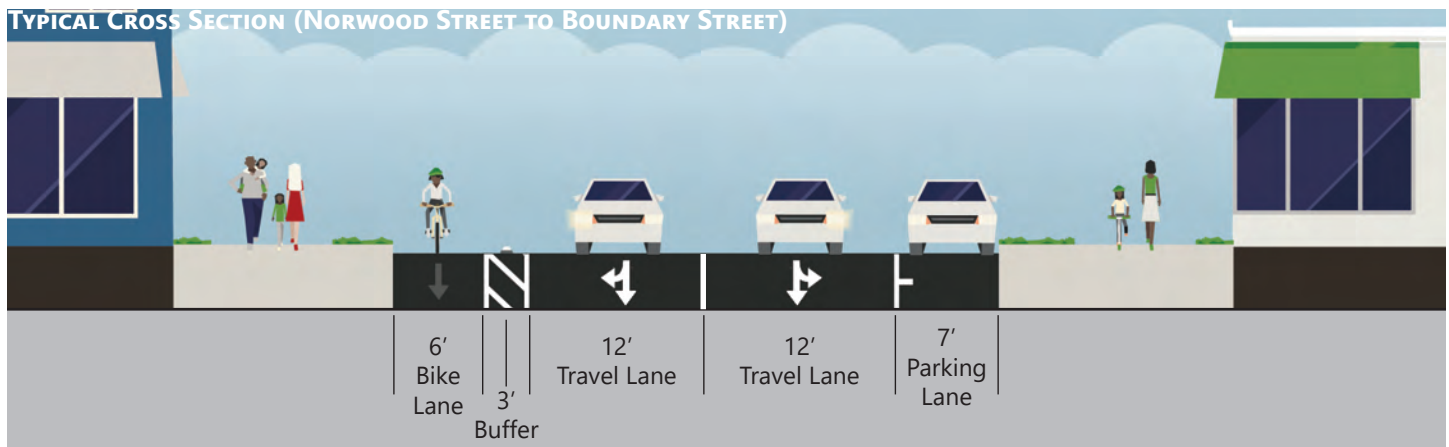
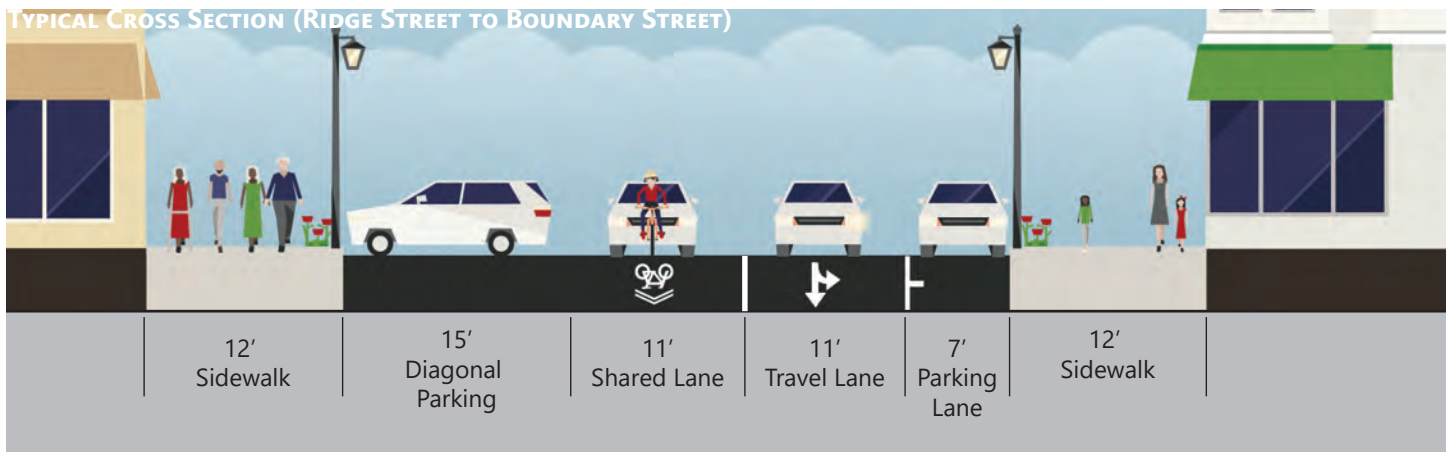


COLLEGE AVENUE — CONCEPTUAL



## PRIORITY PROJECT #5: WEST AVENUE

<b>EXTENTS</b>	Ridge Street to Harper Avenue
<b>BACKGROUND</b>	West Avenue is a one-way street and is the primary westbound route through the center of Downtown Lenoir. It parallels Harper Avenue, which is the primary eastbound route through Downtown. Many destinations in Downtown are immediately accessible along West Avenue including City Hall, the Lenoir Police Department, and multiple restaurants and other businesses. It provides direct connections to Harper Avenue and thereby many other key travel routes in Lenoir.
<b>PROJECT DESCRIPTION</b>	This project will provide shared lane markings between Ridge Street and Boundary Street and between Depot Street and Harper Avenue. This will increase motorist awareness of bicyclists and help establish Downtown Lenoir as a more accessible place for bicyclists. This project will also provide a 5' bicycle lane with a 3' buffer between Boundary Street and Depot Street by restriping and removing the existing exclusive right-turn lane in this section. This bicycle lane would provide separation from vehicles as travelers leave the Downtown environment. As a whole, this project would connect bicyclists to the heart of Downtown Lenoir and many of the other important travel routes around the City.
<b>PROJECT CONSTRAINTS</b>	The removal of on-street parking along the north side of West Avenue near Willow Street may be a barrier to adding a bike lane. Additionally, further study and turning movement counts of the intersection of West Avenue and Willow Street will need to be conducted prior to removing the exclusive right turn lane. If the right turn lane cannot be removed due to traffic volumes, consideration can be given to widening the existing sidewalk to accommodate both pedestrians and bicyclists. Another opportunity to provide a separated facility exists south of Depot Place as the railroad tracks intended to be used for the Overmountain Victory National Historic Trail (OVNHT) run parallel to West Avenue. This alternative is more costly and the timeline of the OVNHT is currently unknown.
<b>LENGTH</b>	0.59 miles
<b>COST ESTIMATE</b>	\$193,000 Project cost estimates do not include utility relocation, acquisition of right-of-way, or sidewalk construction or reconstruction.







WEST AVENUE — EXISTING



WEST AVENUE — CONCEPTUAL



## PROGRAMS & POLICIES

Beyond the facility recommendations included in the previous section, the City of Lenoir and other local groups can undertake programmatic efforts to improve bicycling conditions. These efforts can include creating programs or putting on events to promote and encourage bicycling; education motorists, pedestrians, and bicyclists about how to safely and legally navigate the City together; and creating policies that ensure bicycling is treated as a valid mode of transportation. The project team in coordination with the City of Lenoir staff created a series of program and policy best practices. The pages follow detail each of these recommendations.

**TABLE 10: PROGRAM & POLICY RECOMMENDATIONS**

RECOMMENDATION	DESCRIPTION
Create a Bicycle/Pedestrian Advisory Commission.	A Bicycle/Pedestrian Advisory Commission consists of volunteers who provide guidance and leadership concerning bicycle and pedestrian issues to City staff. The Bicycle/Pedestrian Advisory Commission would meet regularly to discuss strategies to improve bicycling and walking conditions in Lenoir. This group could be housed within the Lenoir Parks and Recreation Department, it could be an extension of the Bicycle Planning Committee that met as part of this project, or it could be a new commission initiated by the City Council.
Incorporate bicycling safety into driver education and training courses.	Including bicycling safety in the curriculum of driver education and traffic school courses will increase motorist awareness about laws pertaining to bicyclists and teach motorists how to safely share the roadway with bicyclists. The City of Lenoir should leverage partnerships with City police who are already members of the National Association of School Resource Officers (NASRO). School resource officers can provide instruction on both bicycle safety and laws.
Adopt a local Complete Streets policy.	Complete Streets policies establish a process which requires planning and designing for all roadway users, including pedestrians, bicyclists, transit users, and motorists. A local Complete Streets policy would supplement NCDOT's Complete Streets policy and would be specifically applicable to City-owned streets. Additionally, the City can adopt the NCDOT Complete Streets Guidelines by reference in the UDO. More information about Complete Streets, example projects, and design guidelines can be found at <a href="http://www.completestreetsnc.org">http://www.completestreetsnc.org</a> .
Require new developments to include bicycle facilities and parking.	Lenoir's zoning and subdivision ordinances currently include sidewalk requirements for new developments. Adding bicycle facility and parking requirements would leverage the opportunity of new development to expand the City's bicycle network.
Establish a local Safe Routes to School program.	Safe Routes to School programs promote safe walking and bicycling to and from schools to improve the health and well-being of school children. North Carolina's statewide Safe Routes to School program created a project called Active Routes to School, which provides resources and guidance through Regional Coordinators. Lenoir is part of Active Routes to School Region 2, and more information can be found by contacting the regional coordinator Mary Smith at <a href="mailto:ActiveKidswnc@gmail.com">ActiveKidswnc@gmail.com</a> or 828-669-1997.

RECOMMENDATION	DESCRIPTION
Become a League of American Bicyclists Bicycle Friendly Community.	The League of American Bicyclists awards varying levels of the Bicycle Friendly Community designation to applying communities. Bicycle Friendly Communities have demonstrated progress in making bicycling a safe and convenient means of transportation and recreation. The City should consider applying for the designation after completing a few of the priority projects and implementing some of the programs described in this section.
Regularly update local street design standards to reflect national best practices.	Local street design standards dictate how roadways can be built according to the local Complete Streets policy. Road design guidelines often control the inclusion and design of bicycle infrastructure.
Identify and prioritize locations for bicycle rack installation.	Properly installed and conveniently-located bicycle racks encourage bicyclists to park their bicycles in secure and convenient locations. Adequate bicycle parking also reduces the likelihood of damage that may result from locking bicycles to trees, sign posts, or other objects. The City should consider installing additional bicycle racks at activity centers such as parks, public buildings, schools, retail locations, and greenway trailheads. Examples of these locations are displayed on map XX. For more information about bicycle parking, refer to the <i>Essentials of Bike Parking</i> at <a href="http://www.apbp.org/Bike_Parking">http://www.apbp.org/Bike_Parking</a> .
Require bicycle education in schools.	Introducing bicycle education into school curriculum provides students with the knowledge and skills to ride a bicycle safely, while also establishing bicycling as a social norm. Early education can instill bicycling confidence in youth before they learn how to operate motor vehicles. This can be introduced using Lenoir's school resource officers or Caldwell County Health Departments Safe Kids coalition.
Deploy bicycle patrols.	Bicycle patrols provide officers with more opportunities for positive interaction with the public, while also normalizing bicycling as a form of transportation. Bicycle officers can employ reverse ticketing campaigns where they provide information or safety equipment to bicyclists instead of ticketing. The City should increase the presence of bicycle officers in downtown during special events and festivals, as well as along the Lenoir Greenway and in City parks.
Plan and execute Open Streets events.	Open Streets events temporarily close streets to motor vehicular traffic allowing the street to be used for a variety of pedestrian, bicyclist, and recreation activities. These events build community while celebrating the use of non-motorized transportations. The City could consider an open streets event as a low-cost method of promoting biking and walking. Viable streets for closure in the City of Lenoir are West Avenue and Main Street in Downtown Lenoir.
Create events to promote National Bike Month and Bike to Work Day.	National Bike Month takes place in May and can include planned events such as group rides, educational classes, and local bike challenges. National Bike to Work Day occurs in the same month and encourages commuters to ride bicycles to work, which can be incentivized by employers and other City events. The City can work with major employers and other organizations to create "pit stops" throughout the City that offer refreshments, prizes, and educational information. The City can also help organize convoys or ride buddies for those interested but concerned riders who may not want to ride alone.



RECOMMENDATION	DESCRIPTION
Become a Watch for Me NC partner community.	Watch for Me NC, a collaborative effort between NCDOT and local communities, endeavors to reduce the number of bicyclists and pedestrians injured in crashes with vehicles through public education and police enforcement. Partner communities receive additional support and training from NCDOT. The campaign helps increase public awareness of traffic laws and bicycle and pedestrian safety. The City can participate by visiting WatchForMeNC.org and downloading materials such as flyers and pamphlets now. The City should also consider applying when NCDOT holds the annual Call for Participants.
Host a Bike Rodeo.	Bike rodeos provide a great opportunity for children to learn about and practice bicycle safety. Bike rodeos offer the opportunity to teach children about the correct way to ride a bicycle, the appropriate hand signals for alerting a driver of their next action, as well as provide the opportunity to ensure a proper helmet fit.
Adopt a traffic calming policy.	Traffic calming policies enable jurisdictions to retrofit streets with physical and visual features that reduce travel speeds and, in turn, make streets safer and more comfortable environments for bicyclists. Currently the City of Lenoir does not have an adopted traffic calming policy. Many outreach participants expressed concern with current vehicle travel speeds, which can be remedied through the effective use of a traffic calming policy. You can read more about traffic calming and its benefits to bicycle facilities at <a href="https://nacto.org/publication/urban-bikeway-design-guide/bicycle-boulevards/speed-management/">https://nacto.org/publication/urban-bikeway-design-guide/bicycle-boulevards/speed-management/</a> .
Distribute bike lights, helmets, and bells.	Bike lights, helmets, and bells are important features of safe bicycling. Distribution of safety equipment will promote responsible bicycling behavior and create safer conditions for both bicyclists and motorists sharing the roadways. Distribution of bike lights, helmets, and bells can occur through both the Watch For Me NC campaign, as well as the Caldwell County Safe Kids coalition.
Create a local Bicycle Benefits program.	Bicycle Benefits is a program designed to reward individuals and businesses alike for their commitment to creating a more livable and sustainable community. Bicyclists benefit by receiving discounts from participating businesses, and businesses benefit from increased customer traffic.
Conduct regular bicycle counts.	Regular bicycle counts can guide planning and funding decisions. Counts can also be used to quantify the benefits of investments in bicycle infrastructure.

# IMPLEMENTATION

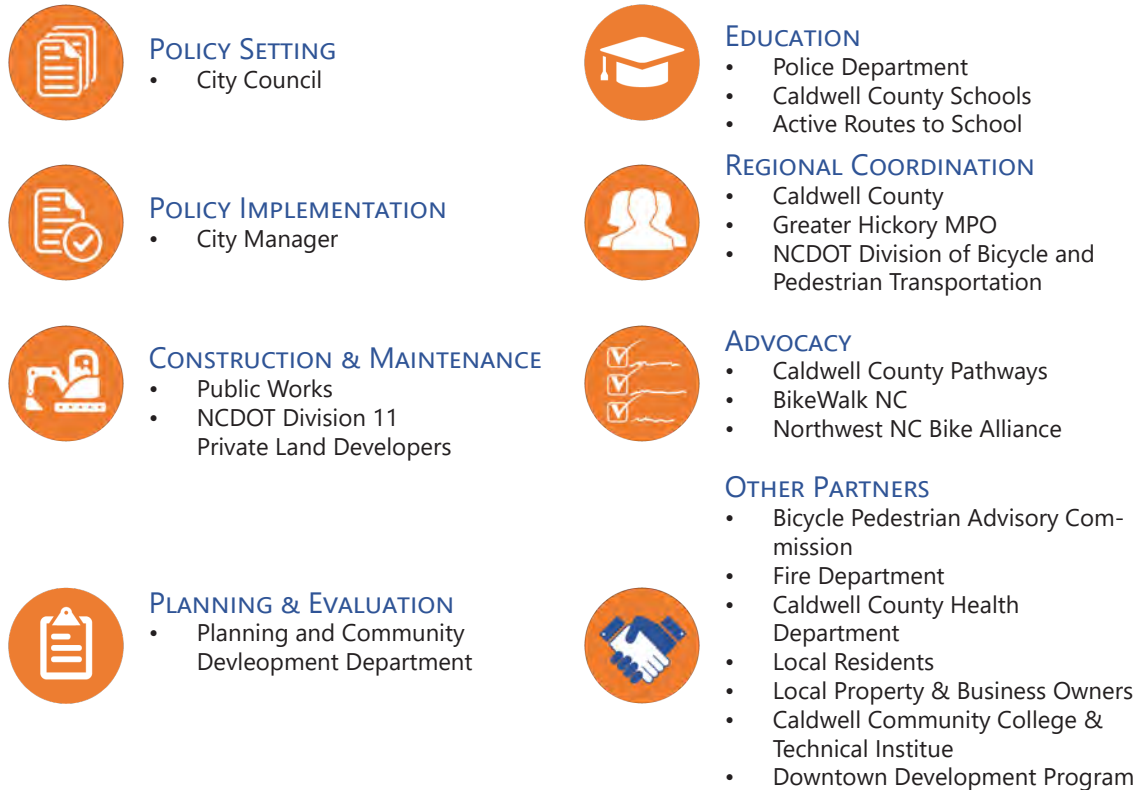
## INTRODUCTION

The implementation plan provided a framework of actionable steps for achieving the vision of the Lenoir Bicycle Plan. The implementation plan is categorized by short-term, mid-term, and long-term strategies and indicates who will be responsible for championing them. This chapter also offers guidance for securing funding, establishing design standards, and evaluating performance measures.

## ORGANIZATIONAL FRAMEWORK

The organizational framework represents the roles and responsibilities of local, regional, and statewide organizations in implementing the recommendations of the Lenoir Bicycle Plan. From setting policy to constructing facilities, from coordinating with governmental agencies to partnering with bicycle advocacy groups, the City of Lenoir will need external support and resources to achieve a more bicycle friendly city.

FIGURE 6: ORGANIZATIONAL FRAMEWORK





## IMPLEMENTATION PLAN

TABLE 11: IMPLEMENTATION PLAN

ACTION & DESCRIPTION	LEAD ORGANIZATION	PARTNERS
<b>SHORT TERM</b>		
<p><b>PRESENT THE BICYCLE PLAN FOR CITY COUNCIL ADOPTION.</b> Following NCDOT-DBPT approval, the project team will present the Bicycle Plan to the City Council for their adoption. Adoption of the Bicycle Plan will communicate to all City departments and partner agencies that the City of Lenoir supports the recommendations of the Plan. Having an adopted Bicycle Plan clarifies expectations for bike facilities on the streets in Lenoir and aids in securing funding.</p>	Project Team	Planning Department
<p><b>CREATE A BICYCLE ADVISORY COMMISSION.</b> Bicycle Advisory Commissions consist of members of the community who volunteer their time to be formal citizen liaisons to City staff. Meeting once a month with City staff, Bicycle Advisory Commissions create committees, task forces, and programs to address bicycling issues and serve as a review board for local projects and initiatives.</p>	City Council	Planning Department
<p><b>PUBLICIZE, PROMOTE, AND PRESENT THE BICYCLE PLAN.</b> The Bicycle Plan should be made available online and publicized using the City's website and social media outlets. Additionally, the Bicycle Plan and its recommendations should be presented to partner agencies including the Greater Hickory MPO and NCDOT Division 11.</p>	Planning Department	GHMPO NCDOT
<p><b>SCHEDULE QUARTERLY COORDINATION MEETINGS BETWEEN THE PLANNING, PUBLIC WORKS, AND PARKS AND RECREATIONS DEPARTMENT</b> Ongoing coordination between City departments will streamline the construction of facility recommendations and implementation of programs and policies. Quarterly meetings will provide the opportunity for City staff to calibrate their respective efforts.</p>	Planning Department	Public Works Parks & Recreation
<p><b>CREATE AND ADOPT A LOCAL COMPLETE STREETS POLICY.</b> Complete Streets policies require that all street projects provide safe accommodations for all modes, including bicycling, walking, taking transit, and driving. To supplement NCDOT's Complete Streets policy which only covers state-maintained roadways, the City of Lenoir should consider creating and adopting a local Complete Streets policy, or formally adopting the NCDOT Complete Streets Design Guide.</p>	City Council	Planning Department Public Works
<p><b>UPDATE ZONING AND SUBDIVISION ORDINANCES TO REQUIRE PROVISIONS FOR BICYCLISTS.</b> The current ordinances require that new developments include sidewalks but make no mention of bicycle facilities or bicycle parking. Language should be added to the zoning and subdivision ordinances specifying the type, location, and amount of bicycle infrastructure for new developments.</p>	Planning Department	Private Developers
<p><b>ENSURE COORDINATION WITH NCDOT DIVISION 11 AND THE 3-YEAR RESURFACING PROGRAM.</b> By staying in continual coordination with NCDOT Division 11, the City of Lenoir can make efforts to include recommendations of this plan for consideration when an NCDOT maintained roadway is about to be repaved or begin the design process for improvements.</p>	Planning Department Public Works	NCDOT Division 11

ACTION & DESCRIPTION	LEAD ORGANIZATION	PARTNERS
<b>SHORT TERM</b>		
<p><b>BECOME A WATCH FOR ME NC PARTNER COMMUNITY.</b>            Watch for Me NC is a statewide bicycle and pedestrian safety campaign. Partner communities are provided with materials including bumper stickers, promotional posters, and informational brochures. The City of Lenoir can take advantage of existing resources to improve bicycle safety by applying to become a Watch for Me NC partner community.</p> <p><a href="http://watchformenc.org/">http://watchformenc.org/</a></p>	Planning Department	Police Department Bicycle Advisory Commission
<p><b>INCLUDE CURRICULUM ABOUT BICYCLING LAW AND SAFETY IN DRIVER EDUCATION COURSES.</b>            There are several driver education providers serving western North Carolina that could enhance their curriculum by educating both new and experienced motorists on how to safely navigate the streets with bicyclists. This effort will require the creation of curriculum and reaching out to driver education providers.</p> <p><a href="https://www.bikelaw.com/wp-content/uploads/2014/11/BIKELAW_RG_NC_Web.pdf">https://www.bikelaw.com/wp-content/uploads/2014/11/BIKELAW_RG_NC_Web.pdf</a></p>	Bicycle Advisory Commission	BikeWalk NC
<p><b>FORM LOCAL SAFE ROUTES TO SCHOOLS PROGRAMS.</b>            Safe Routes to School seeks to make bicycling and walking to school safer for school children. The statewide program supports local SRTS programs by providing resources such as “An event planning guide for Walk to School Day and Bike to School Day”<sup>11</sup> and partner with the North Carolina Division of Public Health to create a project called “Active Routes to School”. The ARTS program is facilitated by regional coordinators who work with their communities to create SRTS events and programs. You can find the Active Routes to School Region 2 regional coordinators contact information on page 54.</p>	Caldwell County Public Schools	Active Routes to School Region 2
<p><b>INCLUDE BICYCLING SAFETY CURRICULUM IN SCHOOLS.</b>            Introducing bicycle education into school curriculum provides schoolchildren with the knowledge and skills to ride a bicycle safely, while also establishing bicycling as a social norm. Early education can instill bicycling confidence in youth before they learn how to operate motor vehicles.</p> <p><a href="https://connect.ncdot.gov/projects/BikePed/Pages/LetsGoNC.aspx">https://connect.ncdot.gov/projects/BikePed/Pages/LetsGoNC.aspx</a></p>	Caldwell County Public Schools	Active Routes to School Region 2
<p><b>PLAN AND INSTALL A BIKE FACILITY PILOT PROJECT.</b>            Bike facility pilot projects are temporary installations of bike lanes or traffic-calming measures to demonstrate their efficacy in improving comfort, mobility, and safety. Pilot projects can be implemented quickly because of their temporary nature, and may be installed in isolation or as part of a larger community event. Successful pilot projects are often converted to permanent facilities.</p>	Planning Department	Public Works Bicycle Advisory Commission
<p><b>DESIGN AND INSTALL TWO OF THE TWELVE PRIORITY PROJECTS.</b>            Based on feasibility of construction, available funding, and public support, the City of Lenoir should identify two of the twelve priority projects to progress into design and installation. Successfully implementing two of the priority projects in the short term will validate the Bicycle Plan and its recommendations.</p>	Planning Department	Public Works Bicycle Advisory Commission

ACTION & DESCRIPTION	LEAD ORGANIZATION	PARTNERS
<b>MID-TERM</b>		
<p><b>IDENTIFY PROJECTS TO SUBMIT TO GHMPO FOR PRIORITIZATION FOR FUNDING.</b> The Greater Hickory MPO submits projects to NCDOT for prioritization for funding representing the MPO's transportation priorities for the region. The City of Lenoir should coordinate with GHMPO to identify which of the Bicycle Plan's facility recommendations have the greatest likelihood of success in securing funding.</p>	Planning Department	GHMPO
<p><b>CREATE A BIKE RACK INSTALLATION PRIORITIZATION PROGRAM.</b> The identification of potential locations for bike rack installation should be formalized to consider potential demand, space availability, and maintenance. In partnership with property and business owners, City staff should inventory and evaluate these locations to determine where bike racks should be installed first. Read more about bike rack installation on page 55.</p>	Public Works	Downtown Development Program Business Owners
<p><b>COMPLETE ADDITIONAL PRIORITY PROJECTS.</b> Beyond installation of two priority projects in the short-term, the City of Lenoir should aim to complete three or more additional priority projects in the mid-term. The top five projects detailed in the Recommendations chapter should be given heavy consideration, since they perform well both quantitatively and qualitatively.</p>	Planning Department	Public Works Bicycle Advisory Commission
<p><b>APPLY TO BECOME A BICYCLE FRIENDLY COMMUNITY.</b> The League of American Bicyclists awards the designation of Bicycle Friendly Community to municipalities that have demonstrated success in making their communities more bicycle friendly. Following the completion of the short-term and mid-term actions of the implementation plan, the City of Lenoir should be in a prime position to apply for and be awarded a Bicycle Friendly Community designation.</p>	Planning Department	Downtown Development Program Bicycle Advisory Commission
<b>LONG-TERM</b>		
<p><b>COORDINATE LAND ACQUISITION FOR OFF-STREET SHARED USE PATHS.</b> As the City of Lenoir continues expansion of the greenway network and promotion of the Overmountain Victory National Historic Trail, consideration should be given to long-term land acquisition.</p>	Planning Department	Caldwell County Property Owners
<p><b>UPDATE BICYCLE PLAN.</b> Successful implementation of the Bicycle Plan will necessitate an update in five to ten years. The Bicycle Plan's recommendations will need to be revisited, revised, and augmented to keep pace with Lenoir's progress toward a more bicycle friendly community. Municipalities with bicycle plans that are older than five years are eligible to apply for NCDOT Division of Bicycle and Pedestrian planning grants.</p>	Planning Department	Bicycle Advisory Commission



## FUNDING SOURCES

Implementation requires taking advantage of federal, state, local, and private funding opportunities. As a municipality in a metropolitan planning organization area in North Carolina, the City of Lenoir can use federal and state funding that has been allocated to NCDOT Division 11 or to Greater Hickory Metropolitan Planning Organization. The City's capital improvement program and private entities are other sources that can be used to implement the recommendations of the Bicycle Plan. These funding sources are summarized in the sections below.

### FIXING AMERICA'S SURFACE TRANSPORTATION

The most recent surface transportation legislation, Fixing America's Surface Transportation or FAST Act, was passed in December 2015. It restructured several of the funding programs that were active in the previous legislation, Moving Ahead for Progress in the 21st Century or MAP-21. For the programs described below, the City of Lenoir would apply to the Greater Hickory Metropolitan Planning Organization for funding and provide a 20% local match.

#### SURFACE TRANSPORTATION BLOCK GRANT PROGRAM

MAP-21's Surface Transportation Program-Direct Attributable (STPDA) was changed to the Surface Transportation Block Grant Program<sup>12</sup> (STBG) in the FAST Act. Municipalities within metropolitan planning organization (MPO) study areas, e.g., the Greater Hickory Metropolitan Planning Organization area, can submit projects for STBG funding through the MPO. Eligible projects include roadways, transit (operations excluded), bike facilities, pedestrian facilities, truck parking areas, and intelligent transportation systems (ITS) improvements.

#### TRANSPORTATION ALTERNATIVES

What was once the Transportation Alternatives Program (TAP) is now a set-aside under STBG called Transportation Alternatives<sup>13</sup> (TA). Eligible projects include pedestrian and bicycle facilities, recreational trails, and Safe Routes to School projects. Municipalities can apply for Transportation Alternatives funding in the same way they would apply for STBG funding.

#### METROPOLITAN PLANNING

The FAST Act maintains MAP-21's metropolitan planning funding program.<sup>14</sup> Jurisdictions that are members of an MPO can apply for this funding for planning studies. Localities must provide a 20% local match and can only use the funding on planning studies.

### NCDOT STRATEGIC MOBILITY FORMULA

NCDOT receives and allocates federal funding using their Strategic Mobility Formula, established by the Strategic Transportation Investments<sup>15</sup> law passed in 2013. The Strategic Mobility Formula is a data-driven and performance-based process of prioritizing projects for federal and state funding, and it updates NCDOT's 10-Year State Transportation Improvement Program (STIP) every two years. Projects in the first five years of the STIP have been committed for funding and construction, while projects in the last five years of the STIP are reevaluated every two years using the Strategic Mobility Formula. In the Strategic Mobility Formula, transportation projects are grouped into three separate funding categories: division needs, regional impact, and statewide mobility. All bicycle projects are considered division needs and are only eligible for funding that has been allocated for division needs projects.

The City of Lenoir can coordinate with GHMPO to submit bicycle facility projects for prioritization for funding. Projects identified in this Bicycle Plan would be eligible for Strategic Mobility Formula funding.

<https://www.ncdot.gov/strategictransportationinvestments/>

### POWELL BILL FUNDS

North Carolina's State street-aid program,<sup>16</sup> also known as the Powell Bill program, provides funding allocations for eligible municipalities based on population and mileage of locally-maintained roadways. The primary function of the Powell Bill program is to assist municipalities in funding resurfacing local streets, but the funds may also be used for planning, constructing, and maintaining bikeways, greenways, and sidewalks. The City of Lenoir received \$564,246 in Powell Bill funds in 2016.

## CAPITAL PROJECT FUND

Currently the City of Lenoir has two projects housed under the Capital Project Fund including the Fairview Street Bridge and the Lenoir Greenway. In Fiscal Year 2016, the City had no new revenue for the greenway project, and expended \$61,860 for construction. Since project authorization, the City has spent approximately \$1.25 million on construction of the greenway system.

## TRANSPORTATION BONDS

Transportation bonds generate revenue from a tax increase on property values. In North Carolina, bond referendums must be approved by the local council and then included on the ballot to be voted on by residents. Transportation bonds can include roadway, bicycle facility, and sidewalk projects.

## PRIVATE DEVELOPMENTS

Updating the City's zoning and subdivision ordinances to require private developers to include bicycle infrastructure in their site plans will help the City build out the Bicycle Plan's facility recommendations. Bicycle infrastructure requirements can include on-street and off-street facilities as well as bicycle parking.

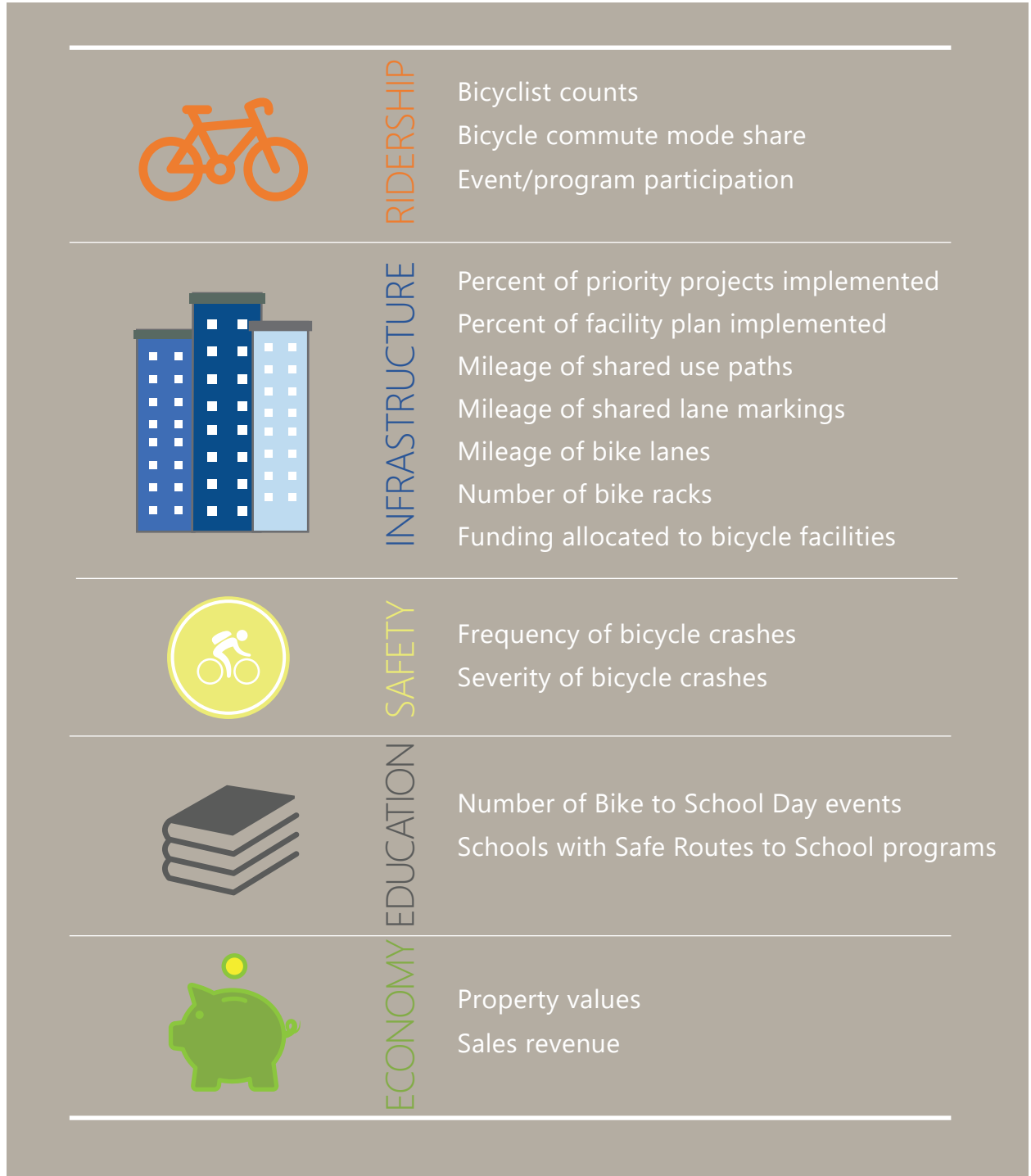
## NON-PROFIT ORGANIZATIONS

Non-profit organizations, such as the Blue Ridge Bicycle Club and PeopleForBikes, are potential sources of funding for bicycle facilities. PeopleForBikes awards grants through their Community Grant Program.<sup>17</sup> Grant amounts can be up to \$10,000 per project, can't be more than 50% of the project cost, and can be awarded to local governments or non-profit organizations.

## PERFORMANCE MEASURES

Beyond completing the action steps in the implementation plan, the City of Lenoir should consider evaluating its progress in achieving the vision of the Bicycle Plan. Some of the ways to track this progress are listed below:

FIGURE 7: SUGGESTED PERFORMANCE MEASURES





## DESIGN GUIDELINES

Several guidance documents exist for the planning and design of bicycle facilities. Updated versions of the Manual on Uniform Traffic Control Devices (MUTCD) and Guide for the Development of Bicycle Facilities are expected to be published in 2018. The guidance documents that the City of Lenoir should reference when implementing the facility recommendations of the Plan are summarized below. Information in addition to what is summarized below can be found at: <https://connect.ncdot.gov/projects/BikePed/Pages/Guidance.aspx>

**TABLE 12: BICYCLE FACILITY DESIGN GUIDANCE REFERENCES**

RESOURCE	AUTHOR	DATE	DESCRIPTION
Manual on Uniform Traffic Control Devices <sup>18</sup>	FHWA	May 2012	Part 9 of the MUTCD provides guidance for bicyclist traffic control devices, including signs, traffic signals, and pavement markings, on roadways and shared use paths. The document discusses the recommended application, placement, size, colors, and proper maintenance of these devices as they relate to bicyclist traffic. The MUTCD is used by public and private planners and engineers, law enforcement personnel, traffic control device designers and manufacturers, and many professional and safety organizations.
NCDOT Complete Streets Planning and Design Guidelines <sup>24</sup>	NCDOT	July 2012	The guidelines describe how Complete Streets are to be planned and designed for projects funded by NCDOT and/or on state-maintained roadways. Facility planning and design for bicycle, pedestrian, and transit infrastructure should respond to the land use context and operational characteristics of the corridor. The document includes illustrative street cross-sections of different types of Complete Streets designs.
Guide for the Development of Bicycle Facilities, 4 <sup>th</sup> Edition <sup>19</sup>	AASHTO	February 2013	Originally published in 1999, AASHTO's current Guide for the Development of Bicycle Facilities encourages context-sensitive design and multimodal travel by providing ranges of design values where flexibility is permissible. It also provides suggested minimum dimensions for the design of safe bicycle facilities. The 2018 update will likely include design guidelines for separated bike lanes.
Urban Bikeway Design Guide, Second Edition <sup>20</sup>	NACTO	March 2014	The Urban Bikeway Design Guide delineates required, recommended, and optional guidelines for bike lanes, cycle tracks, intersection treatments, bicycle signals, bikeway signing and marking, and bicycle boulevards. These guidelines are based on literature reviews, implementations in top bicycling cities worldwide, and collaboration with a panel of bike planning professionals in NACTO member cities.

RESOURCE	AUTHOR	DATE	DESCRIPTION
Separated Bike Lane Planning and Design Guide <sup>21</sup>	FHWA	May 2015	The Separated Bike Lane Planning and Design Guide is a collection of best practices for the design and implementation of separated bike lanes. It provides a list of key factors when considering the installation of a separated bike lane and a menu of forms of separation from motorists, such as vertical delineators or parking stops. The design guide also explains funding, maintenance, and outreach strategies in the context of case studies in cities like New York, Seattle, and Austin. It also provides recommendations regarding interaction between bike lanes and other modal elements, like transit stops, loading zones, and accessible parking.
Achieving Multimodal Networks <sup>22</sup>	FHWA	August 2016	Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts discusses strategies to achieve connected multimodal networks with minimal conflicts. The study uses case studies to give designers a greater practical awareness of where flexibility exists in national design standards, and how existing infrastructure can be retrofitted to better accommodate bicyclists and pedestrians.
Small Town and Rural Multimodal Networks <sup>23</sup>	FHWA	December 2016	The Small Town and Rural Multimodal Networks report is a resource and idea book intended to help small towns and rural communities support safe, accessible, comfortable, and active travel for people of all ages and abilities. It provides a bridge between existing guidance on bicycle and pedestrian design and rural practice, encourage innovation in the development of safe and appealing networks for bicycling and walking in small towns and rural areas, and show examples of peer communities and project implementation that is appropriate for rural communities.

## CALL TO ACTION

Promoting and encouraging multimodal travel has become a major priority for the City of Lenoir and for communities across the region, the state, and the country. The Lenoir Bicycle Plan is the first step in creating a vibrant community where bicycling can thrive, and in turn benefit the community's mobility, safety, health, economy, environment, and livability. This Plan, when supported by City administration, City staff, local businesses, and residents can serve as a great advocacy tool in achieving a location where riding bicycles is a safe and convenient way for residents and visitors to travel for transportation and recreation regardless of age, ability, or background.

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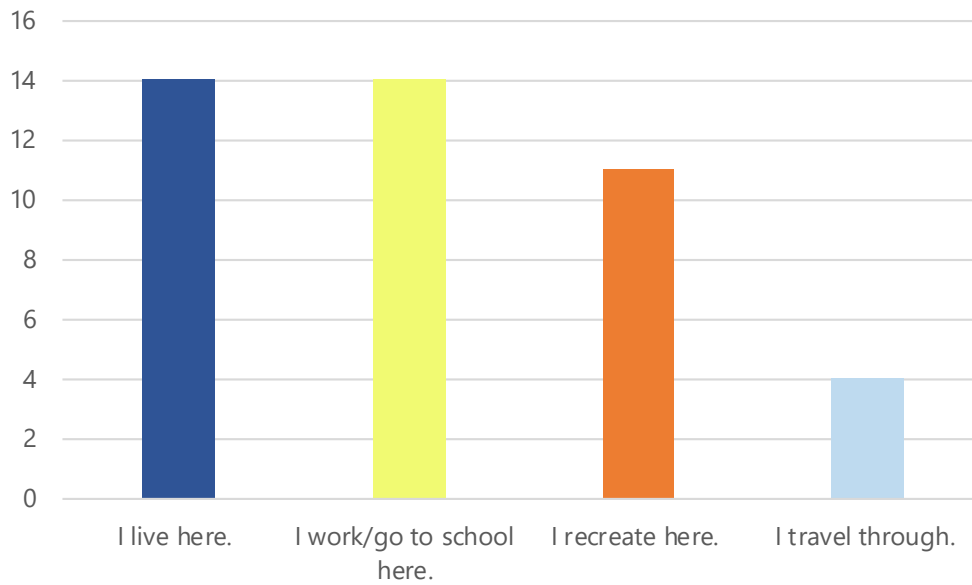
# APPENDIX

## ENDNOTES

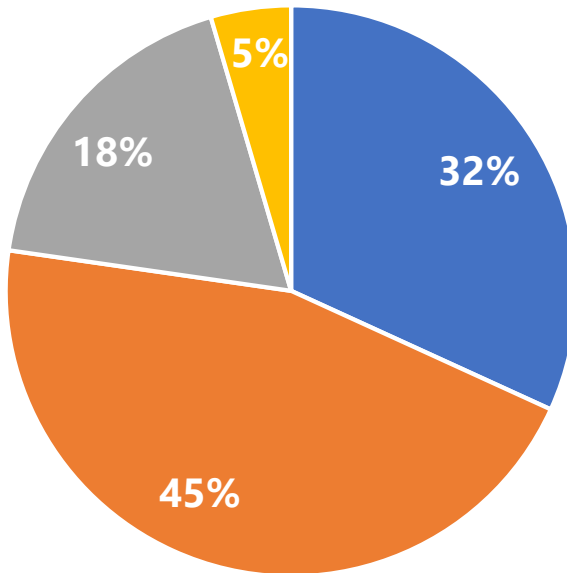
1. 2014 American Community Survey 5-Year Estimates, US Census Bureau
2. 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behavior, NHTSA, 2012
3. Bikenomics: How Cycling Can Save The Economy, Elly Blue, 2013
4. 2014 American Community Survey 5-Year Estimates, US Census Bureau
5. Pursuing Equity in Pedestrian and Bicycle Planning, Pedestrian and Bicycle Information Center, 2016
6. 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behavior, NHTSA, 2012
7. Lenoir, North Carolina Code of Ordinance Section 11-127, 11-128, 11-129
8. Lenoir, North Carolina Code of Ordinances Section 19-16
9. "Four Types of Cyclists? Testing a Typology to Better Understand Bicycling Behavior and Potential," [http://web.pdx.edu/~jdill/Types\\_of\\_Cyclists\\_PSUWorkingPaper.pdf](http://web.pdx.edu/~jdill/Types_of_Cyclists_PSUWorkingPaper.pdf)
10. "The Complete Business Case for Converting Street Parking to Bike Lanes," <http://www.citylab.com/cityfixer/2015/03/the-complete-business-case-for-converting-street-parking-into-bike-lanes/387595/>
11. Promoting walking and bicycling to school: An event planning guide for Walk to School Day and Bike to School Day, Safe Routes to School North Carolina
12. "Fixing America's Surface Transportation Act or 'FAST Act': Surface Transportation Block Grant Program," USDOT FHWA, 2016, <https://www.fhwa.dot.gov/fastact/factsheets/stbgfs.cfm>
13. "Fixing America's Surface Transportation Act or 'FAST Act': Transportation Alternatives," USDOT FHWA, 2016, <https://www.fhwa.dot.gov/fastact/factsheets/transportationalternativesfs.cfm>
14. "Fixing America's Surface Transportation Act or 'FAST Act': Metropolitan Planning," USDOT FHWA, 2016, <https://www.fhwa.dot.gov/fastact/factsheets/metropolitanplanningfs.cfm>
15. "Strategic Transportation Investments," NCDOT, <https://www.ncdot.gov/strategictransportationinvestments/>
16. "State Street-Aid (Powell Bill) Program," Connect NCDOT, <https://connect.ncdot.gov/municipalities/State-Street-Aid/Pages/default.aspx>
17. "Community Grants," PeopleForBikes, <http://www.peopleforbikes.org/pages/community-grants>
18. Manual on Uniform Traffic Control Devices: 2009 Edition with Revision Numbers 1 and 2 incorporated, dated May 2012 (PDF), USDOT FHWA, 2015
19. Guide for the Development of Bicycle Facilities, 4th Edition, 2012
20. Urban Bikeway Design Guide, National Association of City Transportation Officials
21. Separated Bike Lane Planning and Design Guide, USDOT FHWA, 2015
22. Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts, USDOT FHWA, 2016
23. Small Town and Rural Multimodal Networks, USDOT FHWA, 2016
24. NCDOT Complete Streets Planning and Design Guidelines, 2012

## ONLINE SURVEY RESULTS

WHAT IS YOUR RELATIONSHIP TO LENOIR? [CHECK ALL THAT APPLY]



HOW WOULD YOU DESCRIBE YOURSELF AS A BICYCLIST?

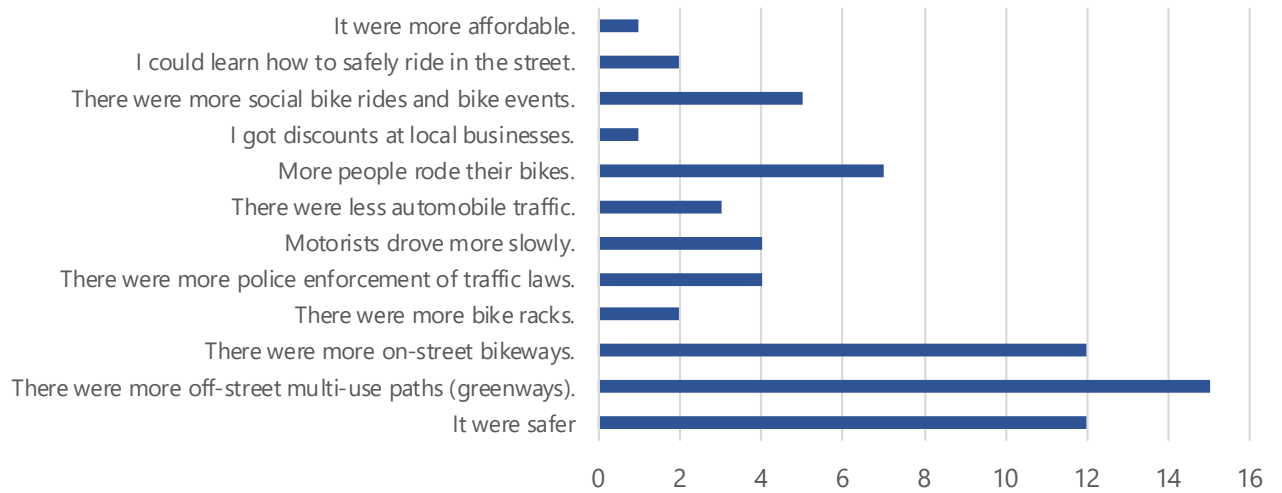


- Strong and fearless: I prefer to ride in the roadway and I'm comfortable riding on high-speed roads.
- Enthusied and confident: I can handle myself in the roadway but prefer routes that include bikeways and greenways.
- Interested but concerned: I would like to ride my bike more, but I'm concerned about safety and comfort.
- No way, no how: There's nothing anyone can do or say that will get me on a bike.

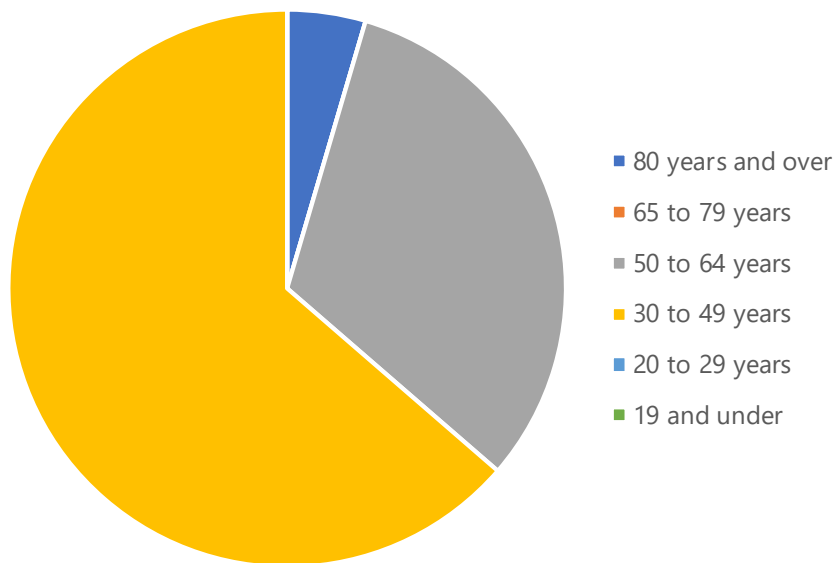
## ONLINE SURVEY RESULTS

### I MIGHT RIDE MY BIKE MORE IF...

#### I might ride my bike more if...



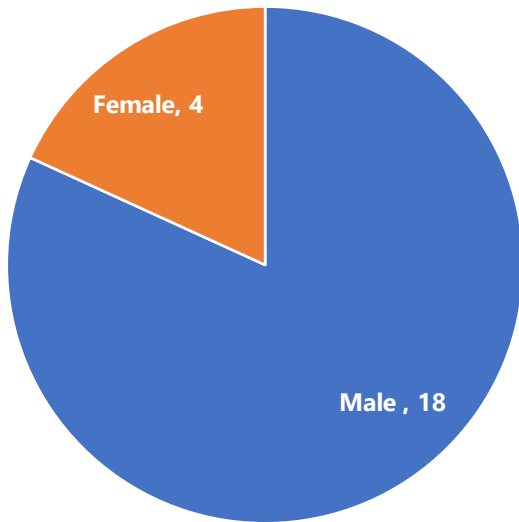
### WHAT IS YOUR AGE GROUP?





## ONLINE SURVEY RESULTS

### WHAT IS YOUR GENDER?



### WHAT ELSE WOULD ENCOURAGE YOU TO BIKE MORE?

- Education of motorists that would inform them of the rights bicyclists have on the roadway.
- If we had some sort of Police "Station" (sub-station) on the Greenway for Officers to take a break.
- Police riding the bike route on a regular basis

### HOW WOULD YOU GENERALLY DESCRIBE BICYCLING IN LENOIR?

- Good
- It great!
- Safer than people think and the main issue is one of enforcement of existing speed limits and traffic laws. Better education of law enforcement and motorists as to the bicycle laws in NC would be beneficial to those of us already riding, while better cycling infrastructure would help encourage casual and reluctant cyclists.
- Lenoir has generally developed around the automobile. Cars travel at high rates of speed and have very little respect for bikes. Sometimes I think car drivers try to see how close they can get to a biker. I only feel safe riding on the greenway and some non-thru streets that connect to it.
- People enjoy it on the greenway
- Trail riding only
- Uncommon. Unsafe due to drivers not understanding how to use a bike.  
Harder from a terrain perspective.  
The greenways are awesome.
- There is a lot of greenway and mountain bike trails, and also lots of rural road bike routes. Overall I think we are in a great area to ride.
- At this time not very safe, because we need more bike paths and bike lanes (zero now).
- I like the Greenway and the Zacks Fork Rd. Trail. Need more places to ride.
- Needs improvement
- Road bike enthusiasts go early in the morning and have to pick extremely rural areas.  
Off road riders have limited areas to ride unless they haul the bikes into the country
- Currently, limited greenway access/miles of greenway. I am looking forward to connecting greenways to add distance/destinations.
- Fairly safe
- Very, very nice... If not well-known..

## PROJECT PRIORITIZATION RESULTS

PUBLIC FEEDBACK	
PROJECT	RANK
College Avenue - Bike Lanes	6
Google Connector 1 - Shared Use Path	1
Google Connector 2 - Shared Use Path	3
Greenhaven Drive - Bike Lanes	9
Harper Avenue - Bike Lane <i>West Avenue to Norwood Street</i>	2
Harper Avenue - Bike Lane <i>Norwood Street to US 321</i>	4
Harper Avenue - Bike Lane <i>Creekway Drive to West Avenue</i>	5
Hibriten Drive - Bike Lane	10
Lower Creek Drive - Sidepath	7
Mulberry Street - Shared Lane	11
Pennton Avenue - Shared Lane	8
West Avenue - Bike Lane	12

BICYCLE PLANNING COMMITTEE FEEDBACK	
PROJECT	RANK
College Avenue - Bike Lanes	8
Google Connector 1 - Shared Use Path	4
Google Connector 2 - Shared Use Path	6
Greenhaven Drive - Bike Lanes	10
Harper Avenue - Bike Lane <i>West Avenue to Norwood Street</i>	1
Harper Avenue - Bike Lane <i>Norwood Street to US 321</i>	3
Harper Avenue - Bike Lane <i>Creekway Drive to West Avenue</i>	7
Hibriten Drive - Bike Lane	12
Lower Creek Drive - Sidepath	5
Mulberry Street - Shared Lane	9
Pennton Avenue - Shared Lane	2
West Avenue - Bike Lane	10

## PROGRAM AND POLICY PRIORITIZATION RESULTS

PUBLIC FEEDBACK	
PROGRAM OR POLICY	RANK
Adopt a local Complete Streets policy.	2
Regularly update local street design standards to reflect national best practices.	1
Create a Bicycle Pedestrian Program and hire a Program Coordination.	16
Create a Bicycle Pedestrian Advisory Commission.	9
Regularly update the City's traffic calming policy.	10
Require new developments to include bicycle facilities and parking.	3
Identify and prioritize locations for bicycle rack installation.	8
Incorporate bicycling safety into driver education and training courses.	5
Require bicycle education in school.	7
Deploy bicycle patrols.	18
Become a Watch for Me NC partner community.	17
Establish a local Safe Routes to School program.	6
Conduct police training on bicycle safety.	14
Plan and execute an Open Streets event.	11
Create events to promote National Bike Month and Bike to Work Day.	15
Conduct regular bicycle counts.	19
Become a League of American Bicyclists Bicycle Friendly Community.	4
Create a local Bicycle Benefits program.	13
Distribute bike lights, helmets, and bells.	11



## PROJECT PRIORITIZATION RESULTS

BICYCLE PLANNING COMMITTEE	
PROGRAM OR POLICY	RANK
Adopt a local Complete Streets policy.	7
Regularly update local street design standards to reflect national best practices.	11
Create a Bicycle Pedestrian Program and hire a Program Coordination.	18
Create a Bicycle Pedestrian Advisory Commission.	4
Regularly update the City's traffic calming policy.	13
Require new developments to include bicycle facilities and parking.	4
Identify and prioritize locations for bicycle rack installation.	3
Incorporate bicycling safety into driver education and training courses.	6
Require bicycle education in school.	8
Deploy bicycle patrols.	14
Become a Watch for Me NC partner community.	9
Establish a local Safe Routes to School program.	1
Conduct police training on bicycle safety.	10
Plan and execute an Open Streets event.	16
Create events to promote National Bike Month and Bike to Work Day.	15
Conduct regular bicycle counts.	19
Become a League of American Bicyclists Bicycle Friendly Community.	17
Create a local Bicycle Benefits program.	12
Distribute bike lights, helmets, and bells.	2

## PRIORITY PROJECTS AND AGENCY RESPONSIBLE FOR MAINTENANCE

STREET	START	END	TYPE	IMPLEMENTATION	Maintained By	LENGTH (MI)	COST ESTIMATE
Harper Avenue	Norwood Street	West Avenue	Buffered Bike Lane	Restriping	City of Lenoir	0.58	\$152,000
Google Connector Phase 1	Fairview Drive	Harper Avenue	Shared Use Path	New Construction	Off-street/ US 64 - NCDOT	2.36	\$2.32 million
Pennton Avenue	Blowing Rock Road (US 321)	Realty Street	Shared Lane Markings & Speed Cushions	Marking	City of Lenoir	1.58	\$118,000
College Avenue	Norwood Street	Underdown Avenue	Bike Lanes	Restriping and Widening	City of Lenoir	0.64	\$1.07 million
Google Connector Phase 2	Harper Avenue	Library Trail	Shared Use Path & Pedestrian Tunnel	New Construction	Off-street/ US 64 - NCDOT	0.21	\$1.04 million
West Avenue	Ridge Street	Harper Avenue	Bike Lanes and Shared Lane Markings	Restriping and Marking	City of Lenoir	0.59	\$193,000
Harper Avenue	Norwood Street	Blowing Rock Road (US 321)	Bike Lanes	Road Widening	City of Lenoir	0.76	\$1.77 million
Harper Avenue	West Avenue	Creekway Drive	Bike Lanes	Road Widening	NCDOT	0.83	\$2.05 million
Mulberry Street	Wilkesboro Boulevard (US 64)	Ashe Avenue	Shared Lane Markings	Marking	City of Lenoir	0.81	\$22,000
Greenhaven Drive	Zacks Fork Road	Main Street	Bike Lanes	Road Widening	City of Lenoir	1.69	\$4.25 million
Lower Creek Drive	Wilkesboro Boulevard (US 64)	Wilkesboro Boulevard (NC 18)	Shared Use Path	New Construction	City of Lenoir	1.69	\$1.79 million
Hibriten Drive	Connelly Springs Road	Starcross Road	Bike Lanes	Restriping & Road Diet (5 to 3 lanes)	NCDOT	1.40	\$442,000

## WESTERN PIEDMONT BICYCLE PLAN - CUT SHEETS

### Route Segment 10

Project Extent: From Harper Avenue (Lenoir) to Burke County Line

Project Total Length: 13.87 Miles

#### Current Conditions

Route Segment 10 is made of up of sections of Northwood Street, Northwood Street (US 321A), Main Street (US 321A) in Hudson, US 321A, North Main Street (US 321A) in Granite Falls, Main Street (US 321A) in Granite Falls, Duke Street, Caldwell Street, and Burke Street in Caldwell County. Northwood Street is a 35 mph, 2-lane minor arterial with an AADT count of 4,130 vpd and truck AADT count average of 225. Northwood Street (US 321A) is a 2-lane and 4-lane minor arterial, a posted speed limit of 45 mph with an AADT count average of 7,000 vpd and truck AADT count average of 177. Main Street (US 321A) in Hudson, US 321A, North Main Street (US 321A), and Main Street (US 321A) in Granite Falls are 35 and 45 mph, 2-lane minor with an AADT count average of 7,640 vpd and truck AADT count average of 253. Duke Street, Caldwell Street and Burke Street are 35 mph, 2-lane minor arterials with an AADT count average of 5,850 vpd.

#### Justification

Route Segment 10 connects Burke County to the City of Lenoir and the Towns of Hudson, Sawmills, Granite Falls, and Rhodhiss. Additionally the projects connects Caldwell and Burke Counties to the NC Bicycling Highway System (NC 2/Mountains-to-Sea), and to a Burke County high priority project that extends the Burke connection to the Town of Connelly Springs. This route segment also provides a connection to the Downtowns of Lenoir, Hudson, and Granite Falls.

#### Recommendations

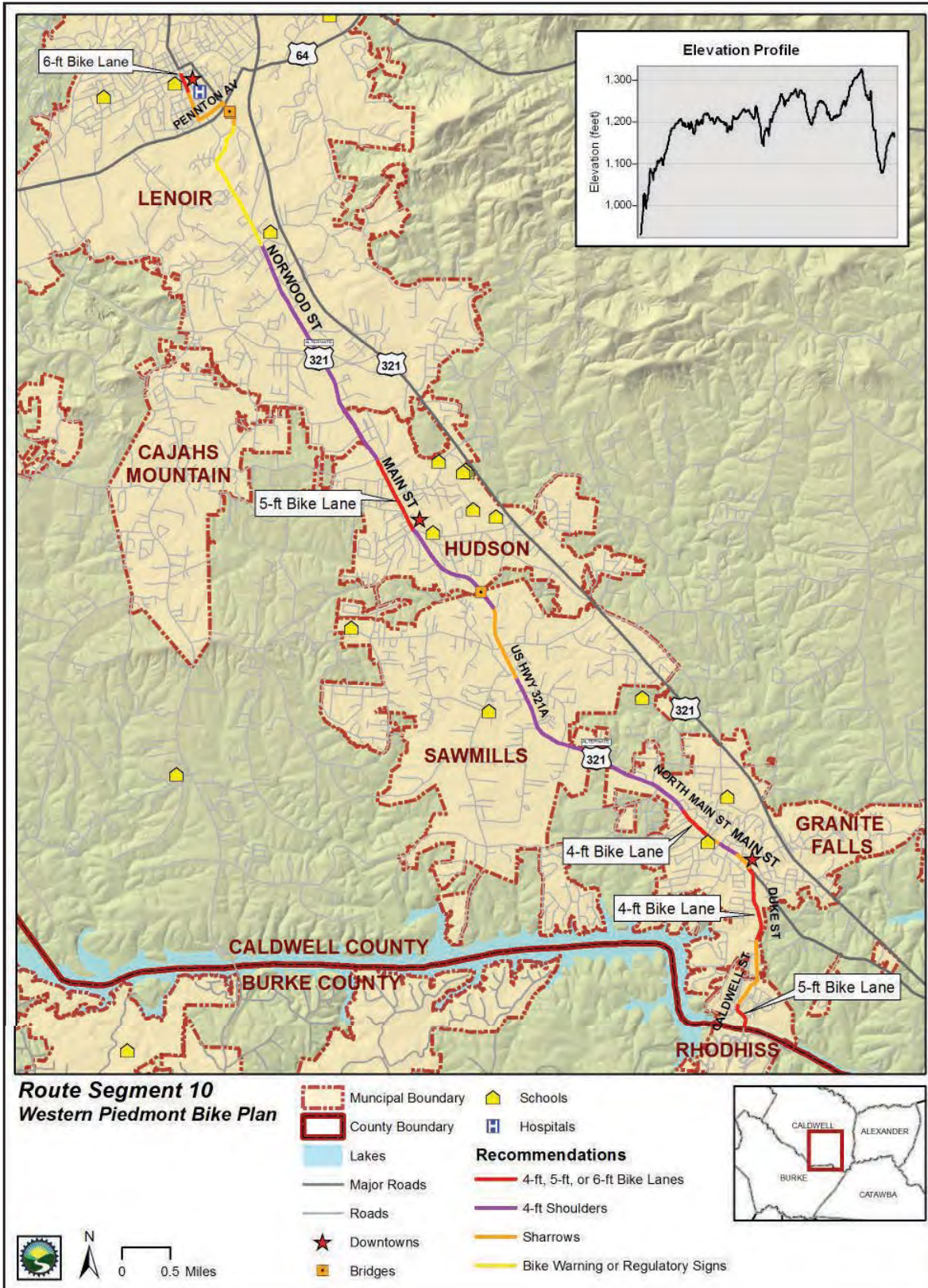
The recommendations for Route Segment 10 consist of 6.24 miles of 4-foot shoulders on Main Street, North Main Street, Norwood Street, and US 321A; and 2.46 miles of 4-foot bike lanes on Caldwell Street, Duke Street, Main Street, and North Main Street; and 2.98 miles of sharrows on Caldwell Street, Duke Street, Main Street, North Main Street, Norwood Street, Pennton Avenue, and US 321A; and 1.43 miles of bicycle warning or regulatory signs on Norwood Street



*Along Caldwell Street in the Town of Rhodhiss at Burke and Caldwell County line.*



**Figure 3-22**  
**Route Segment 10**



## Chapter 3 - Priority Segments

**Route Segment 10****Caldwell Street from Burke County Line to Burch Street**

- 2 Lanes/35 mph/36-ft wide; AADT = 5,300
- Curb and Gutter
- Bridge width adequate for bicycles
- Bridge approaches would need improvements
- Bridge would require bicycle-safe rails
- Consider striping 5-ft bike lanes

**Caldwell Street from Burch Street to Hickory Street**

- 2 Lanes/35 mph/20-ft wide; AADT = 6,400
- No opportunity for bicycle lanes
- Consider sharrows

**Duke Street from Hickory Street to Everett Drive**

- 2 Lanes/35 mph/18-ft wide; AADT = 6,400
- No opportunity for bicycle lanes
- Consider sharrows

**Duke Street from Everett Drive to US 321A**

- 2 Lanes/35 mph/32-ft wide; AADT = 6,400
- Curb and Gutter
- Consider striping 4-ft bike lanes

**South Main Street (US 321A) from Duke Street to Park Square**

- 2 Lanes/20 mph/70-ft wide; AADT = 8,500
- On Street Parking (Downtown Granite Falls)
- Consider sharrows

**North Main Street (US 321A) from Park Square to North Highland Avenue**

- 2 Lanes/35 mph/38-ft wide to 2 Lanes/35 mph/32-ft wide; AADT = 7,900
- Curb and Gutter

- Consider sharrows

**North Main Street (US 321A) from North Highland Avenue to North Summit Avenue**

- 2 Lanes/35 mph/32-ft wide; AADT = 7,900
- Poles on east side are close to roadway.
- Curb and gutter
- Consider striping 4-ft bike lanes

**North Main Street (US 321A) from North Summit Avenue to Jones Park Drive**

- 2 Lanes/35 mph/24-ft wide to 2 Lanes/35 mph/20-ft wide; AADT = 6,900
- No room for bicycle lanes
- If roadway is widened in the future, bicycle lanes should be provided
- Consider widening the shoulders to 4-ft

**US 321A from Jones Park Drive to Town of Sawmills Townhall**

- 2 Lanes/35 mph/20-ft wide to 2 Lanes/45 mph/20-ft wide; AADT = 6,800 to 7,200
- No room for bicycle lanes
- No shoulders
- If roadway is widened in the future, bicycle lanes should be provided
- Consider widening the shoulders to 4-ft

**US 321A from Sawmills Townhall to Holden Place**

- 2 Lanes/35 mph/34-ft wide; AADT = 5,100
- Sidewalk from Townhall to Mission Road
- No shoulders
- Consider sharrows

**North Main Street (US 321A) from Eastview Street to Cedar Valley Road**

- 2 Lanes/35 mph/20-ft wide to 2 Lanes/45 mph/20-ft wide; AADT = 4,900
- No shoulders
- If roadway is widened in the future,

bicycle lanes should be provided

- Consider widening the shoulders to 4-ft

**Main Street (US 321A) from Cedar Valley Road (Hudson) to Pleasant Hill Road (Hudson)**

- *3 Lanes/35 mph/34-ft wide; AADT = 8,800 to 12,000*
- Extra lane could be eliminated to provide bicycle lane
- Consider striping 5-ft bike lanes

**Main Street (US 321A) from Pleasant Hill Road to Swanson Road**

- *2 Lanes/45 mph/24-ft wide; AADT = 7,300*
- If roadway is widened in the future, bicycle lanes should be provided
- Consider widening the shoulders to 4-ft

**Norwood Street (US 321A) from Swanson Road to Hibriten Dr**

- *2 Lanes/45 mph/24-ft wide to 2 Lanes/35 mph/24-ft; AADT = 7,300*
- If roadway is widened in the future, bicycle lanes should be provided
- Consider widening the shoulders to 4-ft

**Norwood Street (US 321A) from Hibriten Drive to Lakewood Circle**

- *2 Lanes/35 mph/24-ft; AADT = 5,800*
- Roadway is too narrow for bicycle lanes
- Consider installing NCDOT approved bicycle warning (W11-1 and W16-1P) or regulatory signs (R4-11), sign information can be found in Appendix B

**Norwood Street (US 321A) from Lakewood Circle to Pennton Ave**

- *2 Lanes/35 mph/20-ft; AADT = 5,800*
- Roadway is too narrow for bicycle lanes
- Consider sharrows

**Pennton Avenue from Norwood Street to Main Street**

- *2 Lanes/35 mph/24-ft; AADT = 1,700*
- Sidewalk on North side of road from Norwood to Mulberry Street
- Curb and gutter from Mulberry to Main Street
- Consider sharrows

**Main Street from Pennton Avenue to Grove Avenue**

- *2 Lanes/25 mph/24-ft wide; AADT = N/A*
- Curb and Gutter, sidewalks
- Consider sharrows

**Main Street from Grove Avenue to College Avenue**

- *2 Lanes/25 mph/40-ft wide; AADT = N/A*
- Parallel parking is present on both sides. Parking is not being used. Lot parking is available
- Consider removing on street parking to add bike lanes
- Consider striping 6-ft bike lanes



## Route Segment 11

Project Extent: From Harper Avenue (Lenoir) to Burke County Line

Project Total Length: 15.02 Miles

### Current Conditions

Route Segment 11 is made up of sections of Main Street in Lenoir, Valway Road (NC 90), Collettsville Road (NC 90), and Adako Road in Burke County. Main Street is a 35 mph, 2-lane and 4-lane minor arterial with an AADT count average of 4,550 vpd and truck AADT count average of 256. Valway Road is a 35 mph, 2-lane minor arterial with an AADT count of 2,000 vpd and truck AADT count of 68. Collettsville Road (NC 90) is a 35 and 55, mph 2-lane major collector with an AADT count average of 945 vpd and truck AADT count average of 62. Adako Road is a 55 mph, 2-lane minor collector with an AADT count of 670 vpd.

### Justification

Route Segment 11 connects Burke County to the City of Lenoir, Downtown Lenoir, Caldwell/Burke County to the NC Bicycling Highway system (NC 2/Mountains-to-Sea), and to a Burke County high priority project that extends the Burke connection to NC 6/Piedmont Spur. Adako Road and Collettsville Road are currently part of the NC Bicycling Highway system (NC 2/Mountains-to-Sea).

### Recommendations

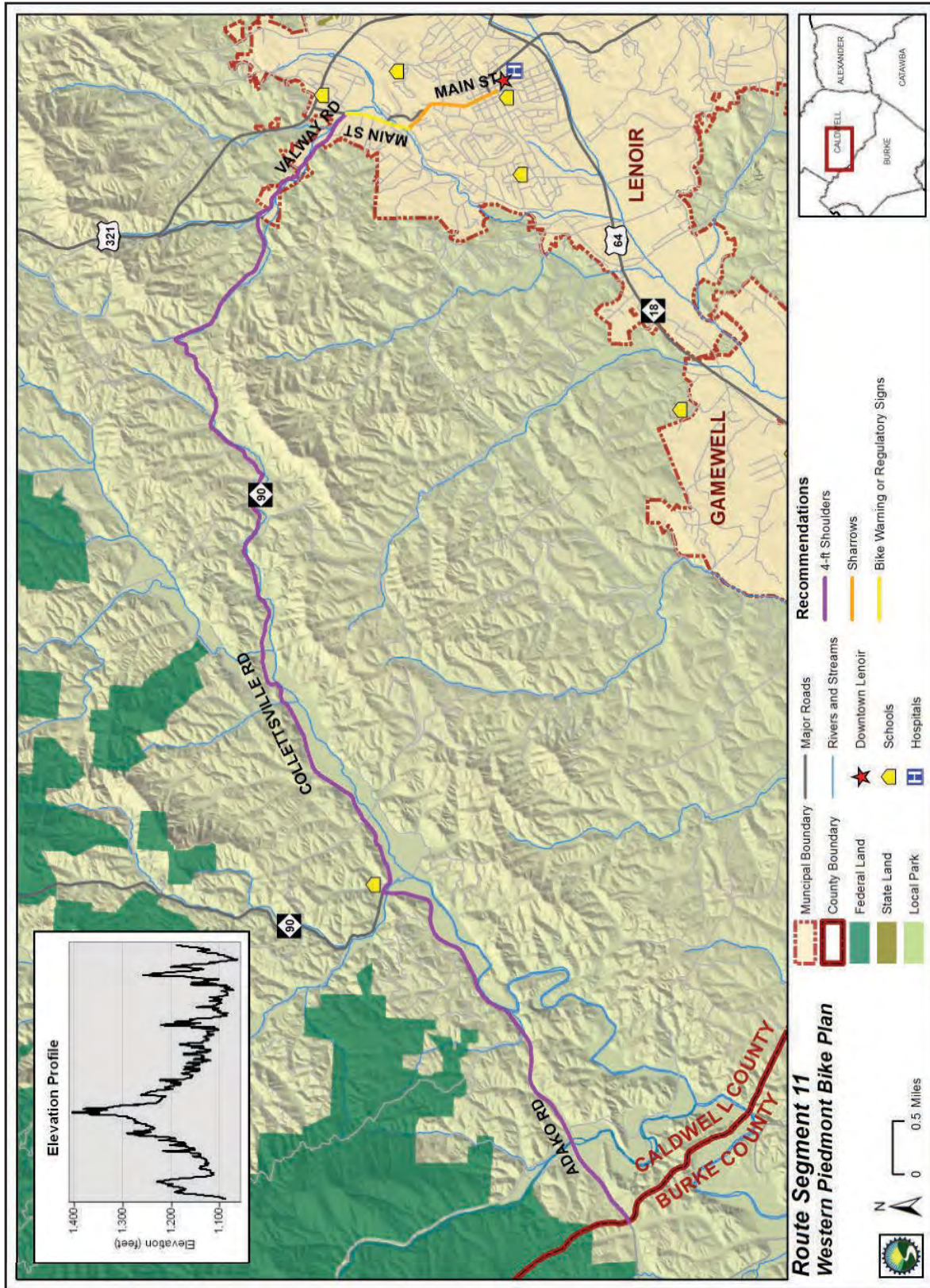
The recommendations for Route Segment 11 consist of 13.44 miles of 4-foot shoulders on Adako Road, Collettsville Road, and Valway Drive; 0.97 miles of sharrows on Main Street; and 0.61 miles of bicycle warning or regulatory signs on Main Street in Lenoir.



*Along On Collettsville Road between Adako Road and Abington Road*



Figure 3-23  
Route Segment 11



## Route Segment 11

### South Main Street from College Avenue to Harper Avenue

- 3 Lanes/25 mph/50-ft wide; AADT = N/A
- 2 Lanes southbound, one lane northbound
- Parallel parking is present on both sides.
- Consider sharrows

### Main Street from Harper Avenue to Ashe Avenue

- 3 Lanes/25 mph/44-ft wide; AADT = N/A
- 2 lanes southbound, one lane northbound
- Parallel parking is present on both sides with curb extensions
- Consider sharrows

### North Main Street from Ashe Avenue to American Legion Building

- 2 Lanes/20 mph/42-ft wide; AADT = 3,500
- Parallel parking is present on both sides.
- Consider sharrows

### North Main Street from American Legion Building to Creekway Drive

- *2 Lanes/20 mph/24-ft wide to 2 Lanes/35 mph/24-ft wide; AADT = 3,000 to 3,500*
- Curb and gutter, striped shoulders
- Consider sharrows

### North Main Street from Creekway Drive to Valway Road

- 4 Lanes/45 mph/60-ft wide; AADT = 8,900
- 5th Lane
- Curb and gutter
- Could use Old North Road as an alternate
- Consider Road Diet (3 Lanes with Bike Lanes)

- Consider installing NCDOT approved bicycle warning (W11-1 and W16-1P) or regulatory signs (R4-11), sign information can be found in Appendix B

### Valway Road from North Main Street to Colletsville Road

- *2 Lanes/35 mph/24-ft wide; AADT = 2,000*
- No paved shoulders
- Consider widening shoulders to 4-ft

### Colletsville Road from Valway Road to Adako Road

- *2 Lanes/55 mph/18-ft wide; AADT = 1,000*
- No paved shoulders
- Consider widening shoulders to 4-ft

### Adako Road from Colletsville Road to Burke County Line

- *2 Lanes/35 mph/20-ft wide; AADT = 670*
- No paved shoulders
- Consider widening shoulders to 4-ft





## Route Segment 12

Project Extent: From Wilkesboro Road (Lenoir) to Alexander County Line

Project Total Length: 9.84 Miles

### Current Conditions

Route Segment 12 is made up of a section of Taylorsville Road (US 64) in Caldwell County. Taylorsville Road is a 55 mph, 2-lane minor arterial with an AADT count average of 4,200 vehicles per day and truck AADT count of 400.

### Justification

Route Segment 12 connects the City of Lenoir to Alexander County and to an Alexander County high priority project that extends the Alexander connection to the town of Taylorsville. Caldwell-1D is currently part of the NC Bicycling Highway system (NC 2/Mountains-to-Sea).

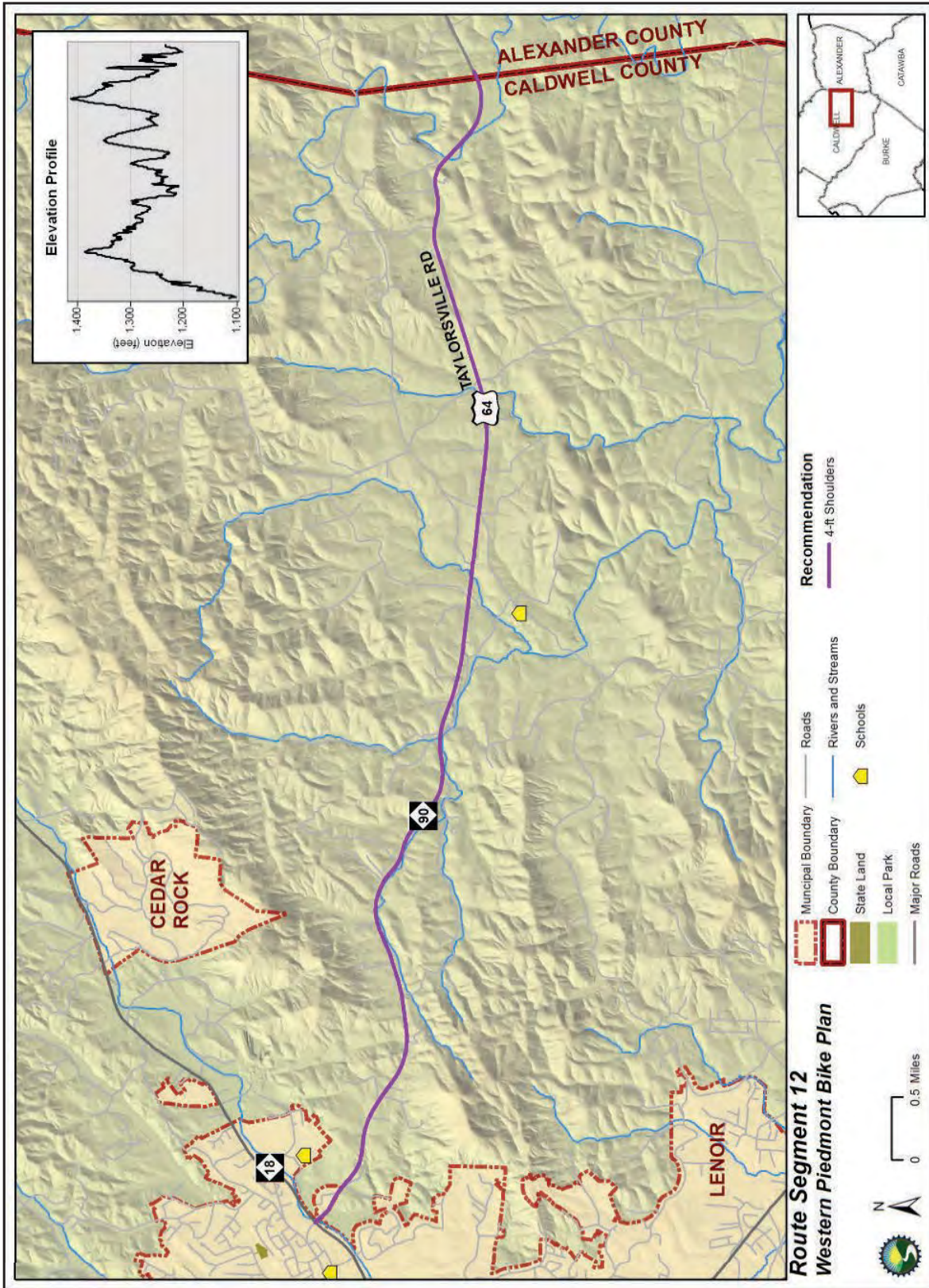
### Recommendations

The recommendation for Route Segment 12 consists of 9.84 miles of 4-foot shoulders on Taylorsville Road (US 64).



*Along Taylorsville Road near Caldwell and Alexander County line.*

Figure 3-24  
Route Segment 12





## Chapter 3 - Priority Segments

## Taylorsville Road (US 64) from Wilkesboro Boulevard to Alexander County Line


- *2 Lanes/55 mph/24-ft wide; AADT = 2,800 to 5,800*
- 35 mph in city limits.
- No shoulders
- Consider widening the shoulders to 4-ft

# City of Lenoir Bicycle Plan

## Project Prioritization



RANK*	ID	Project	Start	End	Type	Length (mi)	Activity Centers (within 0.5 mi)	Peopler per Mile	Jobs per Mile	Minority Population Served	Low Income Population Served	Zero Vehicle Households Served	Bicycle Safety	BPC Ranking	Public Ranking	Raw Score	Weighted Average
							6.67%	6.67%	6.67%	6.67%	6.67%	6.67%	20%	20%	20%		
3	A	College Avenue	Norwood Street	Underdown Avenue	Bike Lane	0.64	1	2	3	3	3	1	2	3	2	15	2.27
2	B	Google Connector 1	Fairview Drive	Harper Avenue	Shared Use Path	2.36	2	5	4	4	1	4	1	2	1	21	2.13
5	C	Google Connector 2	Harper Avenue	Library Trail	Shared Use Path	0.21	5	5	1	2	5	5	1	2	1	24	2.33
10	D	Greenhaven Drive	Zacks Fork Road	Main Street	Bike Lane	1.69	2	1	3	1	1	2	4	4	4	14	3.07
1	E	Harper Avenue (Norwood - West Ave)	Norwood Street	West Avenue	Bike Lane	0.58	1	2	2	3	3	1	3	1	1	15	1.80
7	F	Harper Avenue (Norwood - US 321)	Norwood Street	US 321	Bike Lane	0.76	4	4	1	2	2	4	5	1	2	22	2.73
8	G	Harper Avenue (West Ave - Creekway Dr)	West Avenue	Creekway Drive	Bike Lane	0.83	4	2	4	4	4	3	2	3	2	23	2.80
12	H	Hibriten Drive	Connelly Springs Road	Starcross Road	Bike Lane	1.4	3	4	5	5	4	3	5	5	4	29	4.00
11	I	Lower Creek Drive	Wilkesboro Blvd (US 64)	Wilkesboro Blvd (NC 18)	Side Path	1.69	5	3	5	5	5	5	1	2	3	29	3.07
9	J	Mulberry Street	US 64	Ashe Avenue	Shared Lane	0.81	3	1	1	1	1	2	3	4	5	12	3.00
3	K	Pennton Avenue	US 321	Realty Street	Shared Lane	1.58	2	3	2	2	2	2	3	1	3	16	2.27
6	L	West Avenue	Ridge Street	Harper Avenue	Bike Lane	0.59	1	1	2	1	2	1	2	4	5	10	2.73

Key	
1	Most Beneficial/Highest Rank  Least Beneficial/Lowest Rank
2	
3	
4	
5	

\*project rank is determined by weighted average

Metric	Source	Additional Information
Activity Centers	GIS/Mapping/BPC	Activity centers were classified as schools, parks, libraries, hospitals, community centers, and high density residential areas
People per mile	Census data on populatioin density from ACS 2014 5-Yr Estimates	
Jobs per mile	LEHD Origin-Destination Employment Statistics (LODES)	
Minority Population Served	Census data on minority population from ACS 2014 5-Yr Estimates	
Low Income Population Served	Census data on household poverty status from ACS 2014 5-Yr Estimates	
Zero-Vehicle Households Served	Census data on zero vehicle households from ACS 2014 5-Yr Estimates	
Bicycle Safety	AADT/Speed/Facility Type	Bicycle safety was assigned a subjective ranking based on traffic volumes, posted speed limit, and degree of separation of facility from travel way
BPC Ranking	BPC Meeting Feedback	
Public Ranking	Online Survey & Open House	