BIKE CRAMERTON

TOWN OF CRAMERTON BICYCLE PLAN

SEPTEMBER 2018

AECOM

TOWN OF CRAMERTON EST. 1915 NORTH CAROLINA

Division of Bicycle & Pedestrian Transportation
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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North Carolina Department of Transportation (NCDOT)
NCDOT Division of Bicycle and Pedestrian Transportation (DBPT)

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EXECUTIVE SUMMARY

TOWN OF CRAMERTON BICYCLE PLAN

Executive Summary

Brief History and Overview of the Community

The *Town of Cramerton Bicycle Plan* is the culmination of a planning process to improve bicycle safety, connectivity, and health and wellbeing through infrastructure projects and community policies and programs. This effort was led by the North Carolina Department of Transportation (NCDOT) Division of Bicycle and Pedestrian Transportation (DBPT), AECOM as the project consultant, and the locally appointed Steering Committee.

The South Fork of the Catawba River (AECOM, 2018)

The Town of Cramerton is located in the Piedmont Region of North Carolina, approximately 16 miles west of the City of Charlotte. The town was established in 1906 as Mayworth with the construction of a spinning mill along the South Fork of the Catawba River. Stuart Warren Cramer acquired the mill in 1910 and renamed the town Cramerton in 1922.

Cramer, a leader in the textile manufacturing industry, influenced the design of mills and their surrounding communities across the south, including Cramerton. Cramer designed the Mays Manufacturing Company mill in what would become Cramerton as a model mill village. This design included paved streets, concrete sidewalks, and new modern homes, with much of this infrastructure still standing today. Cramer and his textile mill most notably produced Cramerton Army Cloth, the "Army khaki," leading into World War II that became the standard issue uniform for the armed forces into the Vietnam War.

Currently, the Town has one protected bike lane. The Carolina Thread Trail includes three trails within Cramerton's town limits, which cyclists also use. Two signed bicycle routes also pass through town. Experienced cyclists use South New Hope Road, Cramer Mountain Road, Armstrong Ford Road, and Eagle Road for long distance riding while children, families, and casual riders use trails and neighborhood roads near Stuart W. Cramer High School and Belmont Elementary School.

Carolina Thread Trail at Riverside Park (AECOM, 2018)

Past Planning Efforts

In 2011, the Town of Cramerton adopted its *2011-2031 Land Use Plan*. The plan outlines strategies for future residential and commercial developments and how to mix them to create more efficient connections between

neighborhoods and businesses. The downtown business district serves as the center of social and economic life for the town, and potential future development should support connections to downtown.

With a strong dedication to improving bicycle and pedestrian safety and connectivity, the Town of Cramerton applied for a planning grant from the NCDOT DBPT to develop a bicycle plan.

Purpose and Process of This Plan

The *Town of Cramerton Bicycle Plan* (plan) was developed with the purpose to evaluate existing bicycle conditions in order to recommend strategic projects, policies, and programs to improve or expand safety, connectivity, and quality of life in the town. The NCDOT DBPT, a project consultant, and a Steering Committee worked collaboratively to develop this plan.

The Steering Committee (Committee) was formed by the town and is comprised of local officials, representatives from local organizations, and community members. Through the planning and development of this plan, the Committee approved goals and objectives that guided the recommendations for infrastructure projects, policies, and programs. Public meetings were also conducted for town residents to provide input on planning efforts.

Key Findings and Recommendations

According to input from three Steering Committee meetings, two public workshops, and a community survey, the plan confirmed that the community views bicycle facilities as very important to improving the safety and wellbeing of the community and that there is widespread support for implementing infrastructure projects as well as policies, ordinances, and programs. Members of the Steering Committee and public emphasized safe connections to parks and trails, downtown, and schools, along with adopting local ordinances that promote bicycling.

Infrastructure Projects

Spot improvements are infrastructure projects at specific locations to improve bicycle conditions, while linear facilities are projects along roadways or trails such as bicycle lanes, sidewalks, streetscape improvements, or multi-use paths or greenways.

Projects were organized based on bicycle routes that were identified by Steering Committee input. The projects were prioritized according to stakeholder and public input, constraints, safety, existing conditions, demand, connectivity, and equity. Both the Steering Committee and residents during the public meetings provided direct input that contributed to the overall development of projects

Riverside Greenway (AECOM, 2018)

and bicycle routes. The projects were grouped into three groups: high priority, medium priority, and low priority projects. Map ES-1 depicts the proposed projects.

Spot Improvements

Spot improvements are recommended at intersections and locations along roadways, parks, greenways, and trails to improve safety. Recommendations include wayfinding signage, bicycle parking, and railroad crossings. Locations of these intersection and crossing improvements include downtown Cramerton, along bicycling routes, parks, and Carolina Thread Trail sites. It is recommended that wayfinding signage be added along Eighth Avenue, along Eagle Road, at Goat Island Park, at the Centennial Center, and along the shared path in Riverside Park. It is also recommended that bicycle parking be added at Goat Island Park, C.B. Huss Recreation Complex, the Food Lion shopping plaza on Market Street, and at the Centennial Center on Eighth Avenue. Additional spot improvement recommendations are also included in this plan.

Eastwood Drive near Eagle Road in Cramerton (AECOM, 2018)

Linear Facilities

Bicycle linear facilities were also evaluated for Cramerton. Projects include shared lane markings and bicycle lanes. Linear facility recommendations emphasized connections between downtown Cramerton outward to locations like the Market Street shopping plazas and neighboring Belmont. Key corridors for linear facilities include the following: Eighth Avenue connecting downtown to Market Street and Eagle Road connecting to neighboring Belmont. Sharrows are recommended for the east and west side of Eighth Avenue.. Along Eagle Road, it is recommended that the road be widened with bike lanes.

Policies, Ordinances, and Programs

Critical to a successful bicycle plan are policies, ordinances, and programs to complement infrastructure projects. Not only is safety dependent upon such physical elements as dedicated bicycle facilities and spot improvements, it is also dependent upon education, reduced speed limits, enforcement of laws, and ordinances created to encourage bicycle-friendly development. This plan makes several programmatic recommendations to improve safety and encourage physical activity, including the implementation of a Watch for Me NC campaign and the implementation of a Safe Routes to School program, among others. Whereas infrastructure projects can be expensive to construct, programs are comparatively inexpensive to implement and can provide a tremendous benefit to the community. Recommended policies include adopting or modifying local ordinances to facilitate multi-modal transportation options that will make existing roadways safe and accessible to bicyclists, pedestrians, and vehicles. To lead these efforts promoting bicycling and pedestrianism, a Bicycle and Pedestrian Advisory Committee (BPAC) is encouraged.

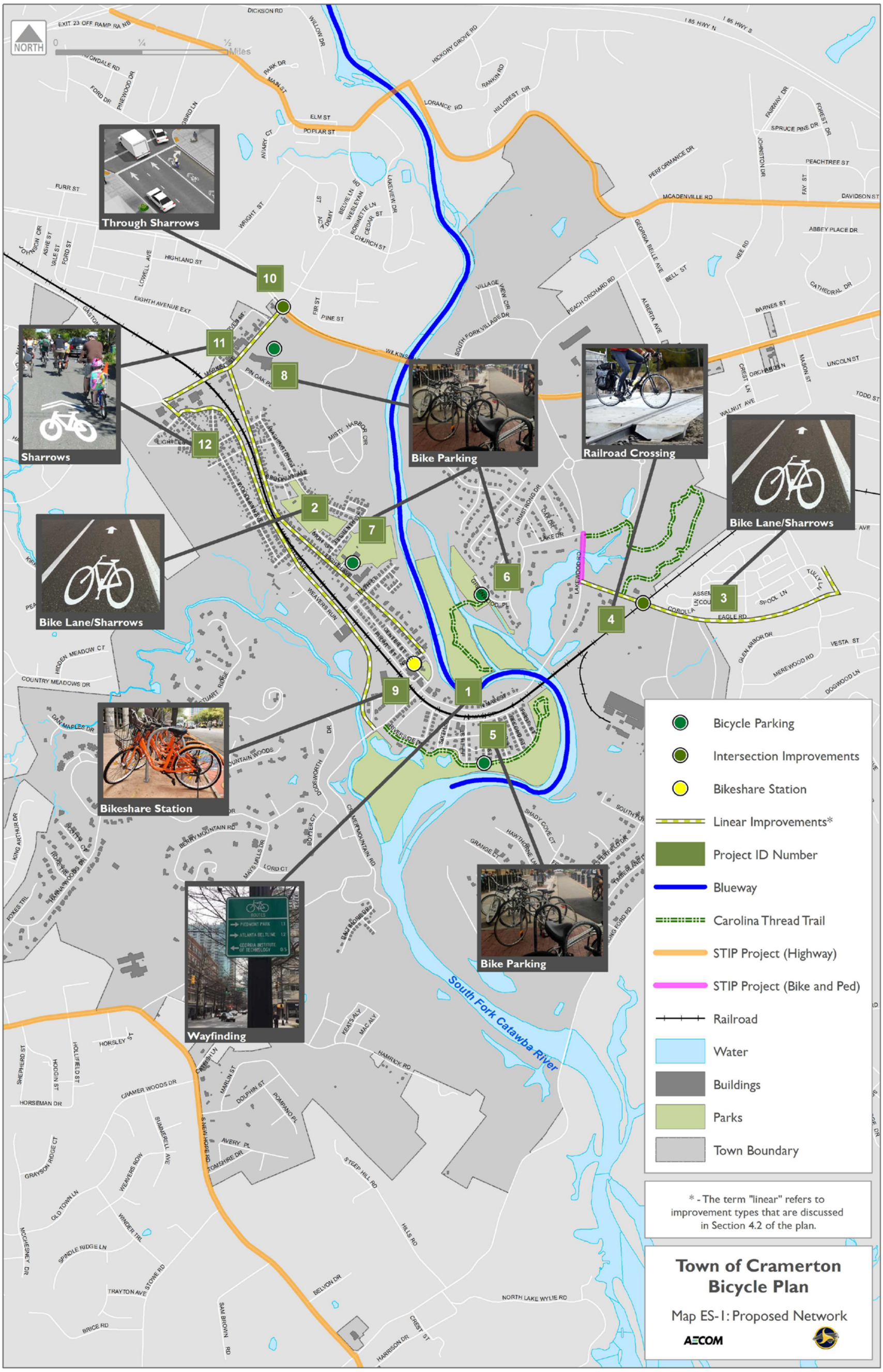
Key Action Steps

The success of this plan depends on its implementation. A BPAC should be formed or a Board of Commissioners member or interested resident committee appointed to continue in the efforts for improving bicycle and pedestrian safety and connectivity in Cramerton. Once the committee is formed, it will meet regularly (as determined by the Board of Commissioners), and report to the Board of Commissioners. It will be comprised of members from the plan Steering Committee and additional residents who reflect the demographics of Cramerton.

A primary responsibility of the BPAC will be to prepare an annual report provided to the Board of Commissioners detailing the progress made on implementing the plan and the BPAC's goals and objectives for the coming year.

Key Action Steps

1. Adopt the *Town of Cramerton Bicycle Plan*.
2. Establish a Bicycle and Pedestrian Advisory Committee or appoint a Board of Commissioners member or interested resident committee who will be responsible for overseeing the implementation of the plan.
3. Strengthen partnerships with surrounding governments and institutions, particularly Belmont and McAdenville.
4. Coordinate with NCDOT Division 12 to incorporate projects on a regional scale.
5. Coordinate with Gaston-Cleveland-Lincoln MPO to include infrastructure projects in the regional planning process.
6. Coordinate with local bicycle organizations and clubs such as the Carolina Thread Trail and South Main Cycles.
7. Include requirements for bicycle facilities in town ordinances and polices.
8. Apply for funding sources and develop local funding for match requirements for the plan's projects and programs.
9. Coordinate with the Catawba Lands Conservancy.
10. Partner with North Carolina Department of Commerce and others to promote ecotourism.
11. Carry out programs that educate residents on the health benefits of bicycling.
12. Program local funds for bicycle projects.
13. Coordinate with Region 4 Active Routes to School Coordinator.
14. Develop a wayfinding program.
15. Apply and participate in NCDOT's Watch for Me NC campaign to raise awareness and provide educational details.
16. Prepare the first Cramerton Bicycle Annual Report.
17. Work with Gaston County Travel and Tourism to add a bikeshare station in downtown Cramerton.



Map ES-1: Town of Cramerton

INTRODUCTION

PROJECT OVERVIEW

1. Introduction and Project Overview

1.1 Background

The Town of Cramerton has a strong commitment to improving its bicycle planning efforts and has identified these goals in the town's *2011-2031 Land Use Plan* (2011) (LUP) and its *Greenway and Pedestrian Trails Master Plan* (2007) (GPTMP). Additionally, the town adopted a Pedestrian Master Plan (2008) to address the pedestrian environment. The *Town of Cramerton Bicycle Plan* (plan) is the town's latest effort to contribute to and promote multi-modal mobility and connectivity that will help guide planning efforts for the town, the Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO), the North Carolina Department of Transportation (NCDOT), and associated local and regional partners. The focus of the development of this bicycle plan is to define the vision and goals, outline recommendations, and identify programs and policies for implementing bicycle infrastructure and amenities to increase active lifestyles and quality of life elements.

The plan has been funded through a grant from the NCDOT Division of Bicycle and Pedestrian Transportation (DPBT) with the Town of Cramerton providing the matching funds. The grant provides funding for local governments to develop comprehensive bicycle plans and pedestrian plans. Cramerton applied for this grant to develop a plan that will provide clarity and strategy to enact the town's vision for safer bicycling connections, the development of new bicycling facilities, and the addition of community education programs that benefit users of all experience and age levels.

The Town of Cramerton is located in the Piedmont Region of North Carolina, approximately 16 miles west of the City of Charlotte. The town was established as a mill town in 1906 as Mayworth with the construction of a cotton spinning mill along the South Fork of the Catawba River. Stuart Warren Cramer acquired the mill in 1910 and renamed the town Cramerton in 1922.

Cramer, a leader in the textile manufacturing industry, influenced the design of mills and their surrounding communities across the South, including Cramerton. Cramer designed the Mays Manufacturing Company as a mill town in what would become a model mill village, Cramerton. This design included paved streets, concrete sidewalks, and new modern homes, with much of this infrastructure still standing today. Cramer and his textile mill most notably produced Cramerton Army Cloth, the "Army khaki," leading into World War II that became the standard issue uniform for the armed forces into the Vietnam War.

Within downtown Cramerton there is one individual historic property—the Mayworth School (North Carolina State Historic Preservation Office (SHPO) survey number GS1076)—that was listed in the National Register of Historic Places (NRHP) in 2002. Its NHRP-listed boundaries encompass an approximately 1.5-acre tract at 236 Eighth Street. There are no other NRHP-listed individual resources or historic districts within Cramerton town limits. In 2001 consultants prepared a planning phase report titled *Gaston County's African American Built Environment Under Jim Crow*. It recommended that the Baltimore Schoolhouse (GS1049) and the Baltimore Historic District (GS1073)—both associated with the African-American mill community of

Baltimore—were potentially NRHP-eligible. They are included on the SHPO Study List of resources that may be NRHP-eligible following further study. However, neither has been listed in the NRHP or officially determined eligible for such listing.

Today the town is home to just over 4,300 residents and is centered on a thriving downtown. In addition to historic buildings, the downtown is comprised of many traditional and specialty shops and businesses, parks and open spaces, and trails. The Cramerton community prides itself on its cohesive and welcoming identity, with the Centennial Center serving as a focal point for community events, shopping, restaurants, and recreation.

Mayworth School (AECOM, 2018)

1.2 Community Vision

During the first Steering Committee meeting, a community vision was developed through an interactive exercise in which committee members responded to a sample vision statement and brainstormed integral characteristics and vision of bicycling in Cramerton. After all ideas were collected, a draft community vision statement was drafted.

During the second Steering Committee meeting, the following vision was discussed and approved. The vision applies to this plan and the desired outcome for its implementation of bicycle projects, policies, and programs in the Town of Cramerton.

> "The Town of Cramerton will be a place accessible to bicyclists of all ages, abilities, and diverse backgrounds with convenient access to bicycle facilities and programs that promote: active living and wellbeing, safety, connectivity, and celebration and discovery of Cramerton's rich culture and history."

1.3 Goals and Objectives

A series of goals were developed during the first Steering Committee meeting and were refined and approved during the second Steering Committee meeting. These goals are both the foundation of objectives and strategies that guide the creation and implementation of the Cramerton Bicycle Plan, and the strategic framework for developing and improving bicycle mobility in the Town of Cramerton. In alignment with the North Carolina Statewide Bicycle and Pedestrian Plan, *WalkBikeNC*, these goals, objectives, and strategies were developed to further encourage consistency among the plans and are indicative of both the state and local desire for safe and abundant bicycle facilities.

Access to Bicycle Facilities Equitably

Provide access to bicycle facilities equitably by creating multiple tiers of bicycle routes: create routes with regional connections for experienced riders, and local, family-oriented routes between community origins and destinations such as parks, neighborhoods, schools, stores, and churches.

Safety for All Ages and Abilities

Improve safety for all ages and abilities by creating safe bicycle infrastructure networks that enhance mobility, remove barriers, and provide transportation options, especially along key corridors.

Environmental and Public Health Benefits

Recognize the environmental and public health benefits of bicycling, including reduced usage of automobiles and more opportunities to create active lifestyles for all residents.

Connections between Community Origins and Destinations

Provide connections between community origins and destinations, including recreational, cultural, and historic sites through bicycle facilities.

Cramerton's Downtown Area and Centennial Center

Connect Cramerton's downtown area and Centennial Center with attractive bicycle facilities that help promote economic development.

Community Education

Educate the community as to the benefits of bicycle activity and applicable rules and regulations.

To accomplish these goals, the Steering Committee developed the following objectives of the plan:

- Implement policies that inform land use decisions and permitting, and promote connectivity between neighborhoods and schools.
- Develop and implement programs that improve bicycle infrastructure for bicyclists' safety, health and wellbeing and educate the community.
- Identify and develop bicycle accommodations and facilities along Cramerton's roadways, including low volume, low speed corridors to provide options for riders of all ages, backgrounds, and abilities.
- Partner with schools, community groups, public health, environmental groups, other stakeholders, and town government to plan and hold events annually that recognize and promote active living, and the health and environmental benefits of walking and biking.
- Involve the Cramerton community in crafting a bicycle plan representative of the community.

- Identify and prioritize multi-modal infrastructure projects such as bicycle lanes to improve safety and connectivity.
- Review and recommend zoning amendments/model ordinances to provide safe bicycle and pedestrian infrastructure in future developments.
- Implement the *Wilkinson Boulevard Study* (Build a Better Boulevard Study).
- Facilitate the development of the Cramerton section of the South Fork Corridor Greenway.
- Identify funding sources and partnerships with local businesses, nonprofits, the Carolina Thread Trail, and the Gaston-Cleveland-Lincoln MPO for implementing the projects, policies, and programs of the plan.

1.4 Purpose and Scope of the Plan

The purpose of this plan is to evaluate the existing bicycle conditions within the Town of Cramerton and recommend programmatic and infrastructure projects and programs to improve safety, connectivity, and wellbeing. This effort was led by NCDOT's DBPT, AECOM as the project consultant, and the locally appointed Steering Committee. Public meetings and a community survey were also conducted for town residents to provide input on planning efforts. Engineering studies and construction plans were not included in the scope of the bicycle plan.

The scope of the plan included the following tasks:

- Analysis of existing conditions and demographics
- Review of existing plans and policies
- Policy and program recommendations
- Infrastructure improvements and cost estimates
- Identification of possible funding sources
- Public input through a Steering Committee and meetings
- Implementation strategies

1.5 Benefits of a Bicycle-Friendly Community

There are many benefits to bicycle planning and the resulting programs and infrastructure projects. A bicycle-friendly community provides many benefits for residents, creates a valuable resource for future generations, and enhances the sense of community through the promotion of improved health, economy, transportation, and environment. Bicycling facilities provide additional recreational and commuting opportunities, which can provide health benefits and improvements to residents and the environment, such as a reduction in vehicle miles traveled, and improved air quality. Bicycling facilities can also benefit the local economy by increasing spending at local businesses and increasing bicycle tourism.

WalkBikeNC, the statewide bicycle and pedestrian plan, established a vision for North Carolina centered around five key benefits: safety, health, economic competitiveness, mobility, and stewardship. The statistics and benefits discussed in this section were compiled from several sources: the *WalkBikeNC* plan, the Pedestrian and Bicycle Information Center based at the University of North Carolina Highway Safety Research Center, the NC Bicycle and Pedestrian Safety Summit 2011, and the *2016 Benchmarking Report* by the Alliance for Biking and Walking.

Health

Infrastructure such as bicycle lanes, trails, and sidewalks promote active living and improve health by providing residents with opportunities to exercise and integrate physical activity into their daily lives, while programs such as Active Routes to School provide education and encouragement for more physical activity. Improving health is of critical importance in North Carolina as 65 percent of adults are either overweight or obese. The state is ranked as the 5th worst in the nation for childhood obesity (NCDOT, 2013).

Economic Competitiveness

Investing in bicycle infrastructure returns economic benefits to communities through increased property values, patronage of local businesses, and tourism. Improving transportation choices in a community encourages better connectivity between people and places and is tied strongly to public health, access to jobs and resources, and business opportunities. As mobility options, bicycling and walking reduce transportation costs and give households more disposable income to spend in the local economy.

Safety

The need to improve safety for bicyclists is urgent. Each year in North Carolina more than 1,000 bicyclists are involved in police-reported crashes with motor vehicles. On average, approximately 20 bicyclists are killed and an additional 60 are seriously injured in the state annually (NCDOT, 2015. Crash Data Tool).

Mobility/Transportation Efficiency and Connectivity

Mobility/Transportation efficiency describes the effectiveness of the transportation system, which includes roads, rail, public transit, and bicycle facilities, to move people and goods safely and quickly. As roads become increasingly congested, one way that communities can improve transportation efficiency is by offering bicycle alternatives to automobiles and designing Complete Streets that accommodate all modes.

Stewardship/Environmental

Transportation is responsible for nearly 80 percent of carbon monoxide and 55 percent of nitrogen oxide emissions in the United States.[1] Bicycle infrastructure encourages stewardship of our natural resources by providing residents with a fossil fuel-free alternative model of transportation and improving air quality. Greenways and trails help connect residents with the outdoors, foster an appreciation for nature, and protect natural resources. Taking more vehicles off the road by providing safe and efficient bicycle conditions can help reduce fuel consumption and vehicle emissions, improve environmental quality including water resources and wildlife habitat, and encourage overall energy conservation and independence.

Quality of Life Benefits

Quality of life is influenced by factors that include, but are not limited to, commuting options, access to recreation including parks and trails, health and safety, and economic competitiveness. Bicycle amenities have a positive contribution to the overall quality of life of a community.

Beanstalk Adventure Playground in Goat Island Park (AECOM, 2018)

[1] Pedestrian and Bicycle Information Center. (2015). *Environmental Benefits of Bicycling and Walking.* Retrieved from: http://www.pedbikeinfo.org/data/factsheet_environmental.cfm

EXISTING CONDITIONS

EVALUATION

2. Existing Conditions

2.1 Overview

Assessing existing conditions in the Town of Cramerton is important to understand the broader scope of those living in the area, where transportation planning plays a key role in connecting the residents with community resources, and planning for future development and growth. This can enable more efficient and sustainable movement to and from resources within the town. The following information on existing conditions was used to formulate and prioritize the projects, policies, and programs recommended in this plan.

2.2 Demographic Analysis

Demographic characteristics were assessed to gain a better understanding of the population living in Cramerton, the community's transportation needs, and any vulnerable populations for compliance with federal policy. Vulnerable populations are those residents of the community who are disadvantaged by ethnicity or race, age, gender, socio-economic status, or other distinguishing factors that disproportionately impact access to resources.

Title VI of the Civil Rights Act of 1964 requires that each federal agency ensure that no person is excluded, denied, or discriminated based on race, color, national origin, age, sex, disability. Executive Order 12898 signed by President Bill Clinton in 1994 requires that each federal agency shall make achieving environmental justice part of its mission. This is relevant to Cramerton since Title VI would apply to federally funded projects that the town would coordinate with federal agencies and apply for federal funds in order to implement the programs and projects recommended by this plan.

Datasets studied include population, age, race characteristics, Hispanic/Latino and minority populations, poverty rates, limited English proficiency (LEP) populations, and zero car households. The demographic analysis was based on 2000 and 2010 U.S. Decennial Census data and 2011-2015 American Community Survey (ACS) 5-year estimate data analyzed at the place, county, and state levels.

Population and Age

The Town of Cramerton is located in Gaston County. With an area of 4.0 square miles, according to the U.S. Census Bureau, the population was 2,976 people in 2000 and grew to 4,165 people in 2010, which is a growth of 40 percent over 10 years. The annualized growth rate is 3.99 percent. Gaston County's population was 190,365 in 2000 and 206,086 people in 2010. The annualized growth rate for Gaston County was 0.83 percent, which shows that Cramerton grew at a faster rate than the rest of the county. In the most recent 2011-2015 ACS 5-year estimate data, these statistics show that Cramerton's population continued to grow to 4,245 with Gaston County's population at 209,807. The growth in Cramerton is higher than statewide

population changes, which experienced an 18.5 percent growth from 2000 to 2010 (8,049,313 people in 2000 and 9,535,483 people in 2010 statewide).

The growing population for the town and county suggests a need for continual dedication to quality of life benefits, such as bicycle infrastructure, to provide safe and accessible transportation and exercise options to all users. In recent years, the town has dedicated many efforts toward these types of improvements, including the development of park space and multi-use trails.

Based on 2011-2015 ACS data, the median age was 41.2 in Cramerton, while Gaston County is slightly younger with a median age 39.8. Both Cramerton and Gaston County are comparable to the state median age of 42.9. The largest age group in both Cramerton and Gaston Country are ages 45 to 54, at 18.1 percent and 14.6 percent respectively. The smallest age groups in both Cramerton and Gaston County are between the ages of 75 to 84 at 3.8 and 4.3 percent, respectively. The proportion of working-age individuals (25-59) in Cramerton and Gaston County is 51.8 and 47.5 percent, respectively. This data suggest that both Cramerton and Gaston County have a larger proportion of working-age individuals, most likely due to job opportunities throughout the region, including Charlotte, and access to family services such as good schools and hospitals.

Improved bicycle infrastructure can help to retain or attract younger populations while also serving current age groups in Cramerton interested in different modes of transportation. Those populations living in the community currently and those aging in place can gain health benefits from bicycle facilities while also benefitting from a greater quality of life.

Minority and Race

The minority population[2] in Cramerton is approximately 11.9 percent of the total population (509 people). The minority population for Gaston County is significantly higher at 25.5 percent (53,567 people).

The Town of Cramerton is predominantly white (89.1 percent), with a small percentage of African-American (5.3 percent), Asian (4.2 percent), American Indian/Alaska Native (0.5 percent), and two or more races (0.8 percent). The Hispanic/Latino population comprises approximately 1.1 percent of Cramerton. Gaston County has a lower composition of predominantly white (76.6 percent) but higher African-American (15.2 percent) populations, with the remainder of its population defined as American Indian/Alaska Native (0.4 percent), Asian (1.3 percent), some other race (4.1 percent), and two or more races (2.2 percent). The Hispanic/Latino population comprises approximately 6.3 percent of Gaston County, which is much higher than the Town of Cramerton. In the state of North Carolina, the white (69.5 percent) and African-American (21.5 percent) populations define the majority with the remainder of the population defined as American Indian, Asian, Hawaiian/Pacific Islander, or other (approximately 9 percent). The Hispanic/Latino population represents 8.8 percent of the population in the state.

[2] Calculated by subtracting White, Non-Hispanic population totals from the total population based on 2011-2015 ACS data.

Such minority and racial compositions indicate a minimally diverse composition of people living in both Cramerton and Gaston County, but Cramerton is less diverse than Gaston County.

Regional Poverty Rates

Individuals living below the poverty line in Cramerton comprise approximately 5.4 percent of the population. This is much lower than the county populations living below the poverty line at 13.7 percent, and lower than the North Carolina poverty rate of 12.8 percent. The Town of Cramerton appears to have a more robust economic environment compared to both the county and state.

Limited English Proficiency

The population in Cramerton that speaks languages other than English is approximately 4.7 percent of the adult individuals age 18 and older. The largest language group other than English is Spanish (2.1 percent) None of these populations, however, speak English "less than very well." In Gaston County, LEP populations are approximately 1.5 percent. Of those that speak English "less than very well," Spanish is the predominant language (1.3 percent of the adult population over 18 years of age).

Vehicles per Household

In Cramerton, 1.7 percent of households have no vehicle available, 34.4 percent of households have one vehicle available and 63.9 percent of households have two or more vehicles available. In Gaston County, 6.5 percent of households have no vehicle available, 33.8 percent of households have one vehicle available and 59.7 percent of households have two more vehicles available. Statewide, 6.5 percent of households have no vehicle available, 32.6 percent of households have one vehicle available, and 60.9 percent of households have two more vehicles available. Bicycle infrastructure projects would particularly benefit residents that do not have access to vehicles or share vehicles within a household.

Means of Transportation to Work

The overwhelming majority of Cramerton's residents commute to work using a car, truck, or van with a total of 89.6 percent of the working population 16 years and older who commute alone using one of these modes. Only 5.2 percent commute by carpooling using a car, truck, or van, 0.9 percent walk, and 0.3 percent use a taxi, motorcycle, or bicycle. Approximately 3.9 percent of the population work from home. Zero percent of the population utilizes transit.

These figures are slightly higher compared to Gaston County and the state of North Carolina, where 84.9 percent and 81.1 percent use a car, truck, or van as a means of transportation to work, respectively. In Gaston County, 9.9 percent of workers carpool using a car, truck, or van, while 9.9 percent of the state uses a similar mode of transportation. In the county, 0.5 percent use public transportation; 0.8 percent walk to work; 0.8 percent use a taxi, motorcycle, or bicycle; and 3.0 percent work from home. Statewide, 1.1 percent use public transportation; 1.8 percent walk to work; 1.3 percent use a taxi, motorcycle, or bicycle; and 4.7 percent work from home.

These statistics show a higher dependency on vehicle usage in Cramerton compared to both county and statewide figures. Supporting the development and use of transportation networks for active modes (bicycle travel) may create more transportation choices to work and enable workforce participation by people with reduced access to vehicles.

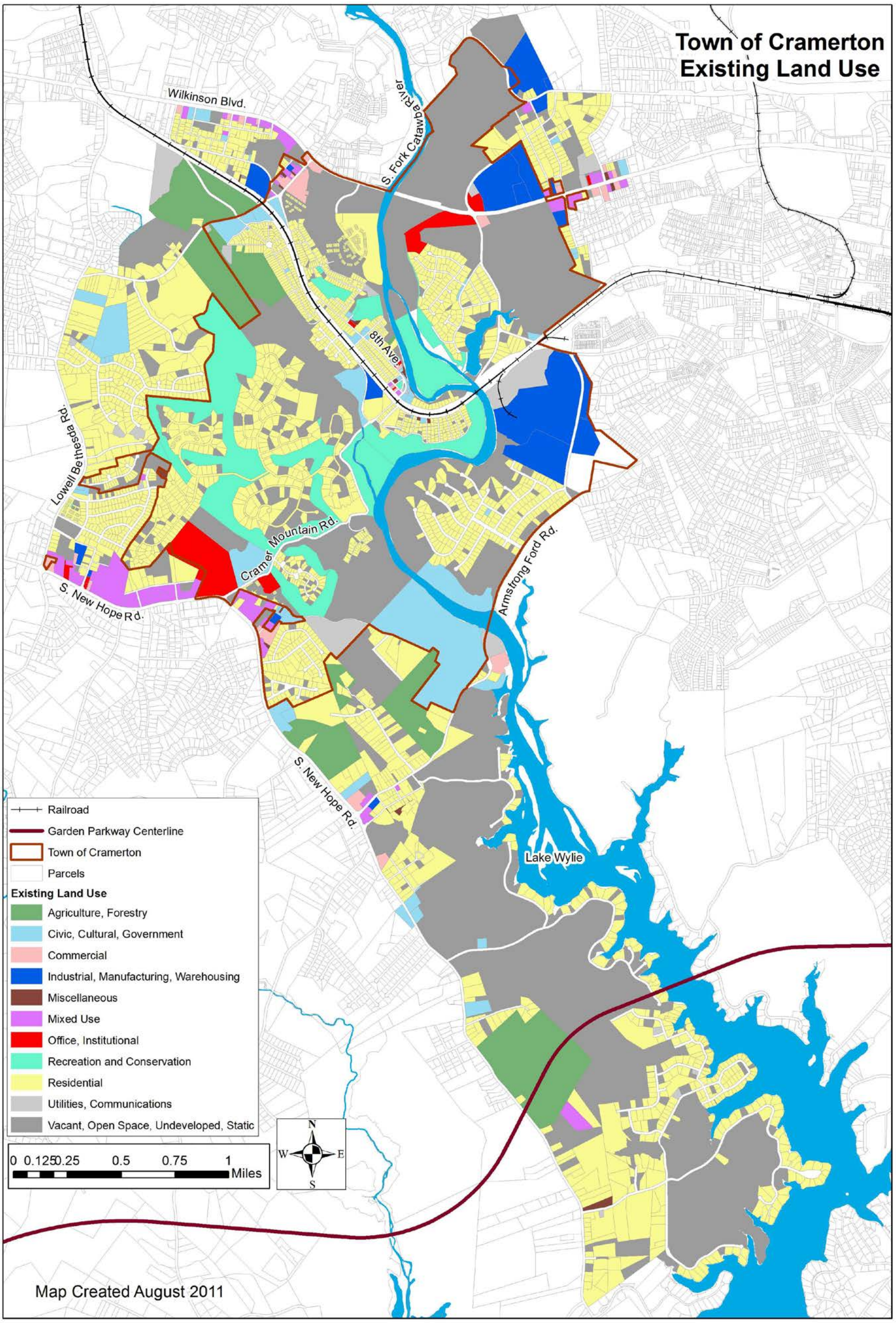
2.3 Land Use and Development

The Town of Cramerton has a strong commitment to expanding its already vibrant community through new development opportunities. The Steering Committee noted two potential development sites, the first of which is located east of the South Fork Catawba River and northeast of downtown and the second located within the Cramerton Extra Territorial Jurisdiction (ETJ) and south of downtown. The town has a historic downtown core with a wide variety of retail, office, civic, and mixed uses in and throughout the municipal limits, some of which are historic buildings that have been adaptively reused. The historic Mayworth School, for example, was redeveloped into affordable housing apartment units for seniors. Civic uses in the downtown core include town hall, community center, post office, fire department, and many churches. Institutional uses within the town include an assisted living facility and medical offices. Single family residential neighborhoods, many of which consist of original old mill town homes, comprise the majority of the town's land uses with much of it located within and near downtown. Open space, parks, and trails weave throughout the residential neighborhoods and are important features of downtown Cramerton. See Figure 2-1 for existing land uses in downtown Cramerton.

Cramerton Town Hall (AECOM, 2018)

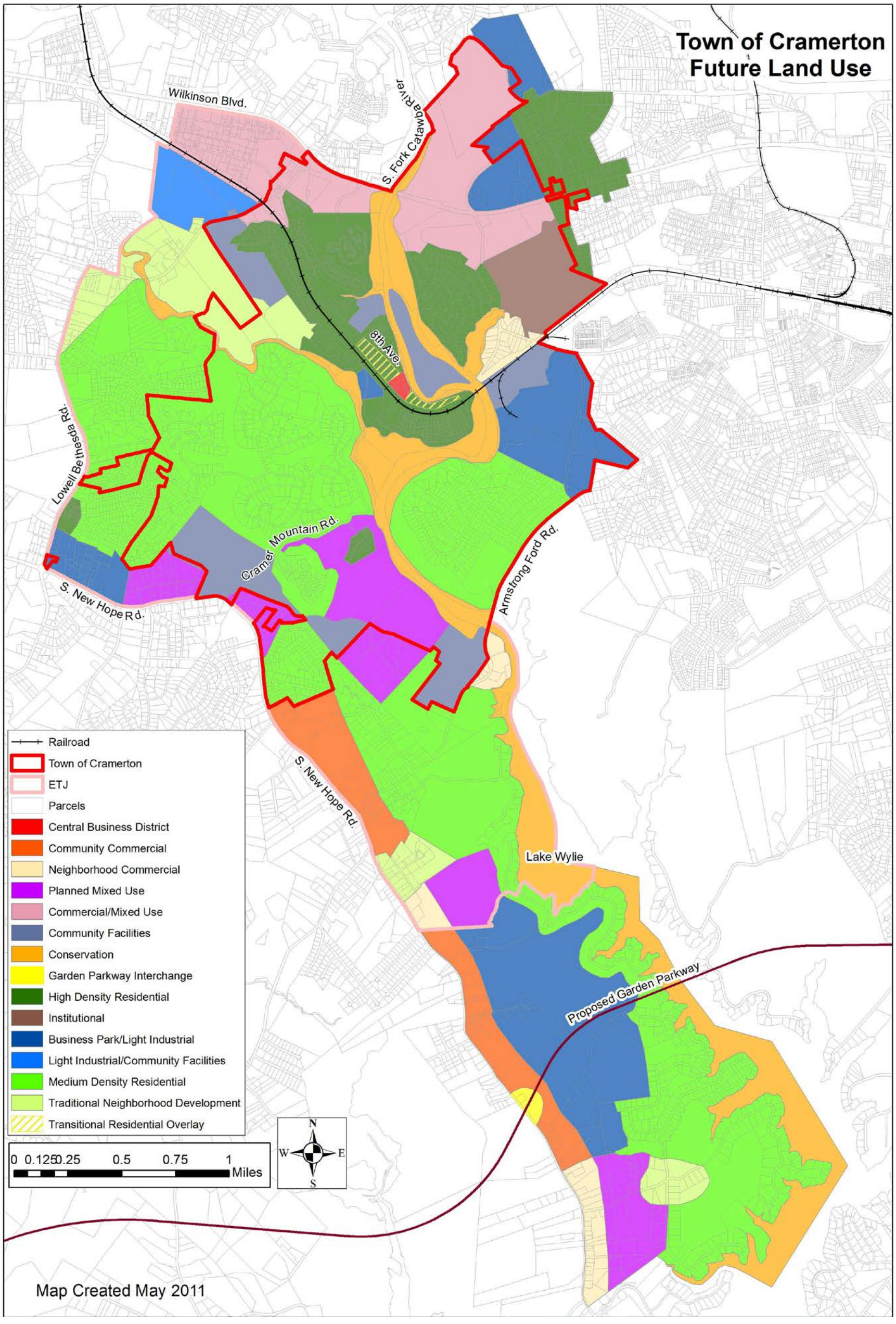
Town of Cramerton 2011-2031 Land Use Plan

The LUP highlights key development areas and potential for future development. Broadly, the LUP recommends a "bullseye" approach with four levels of land uses. At the central cores are areas of commercial activity, such as the downtown central business district and neighborhood centers. Higher density residential development will occur around the commercial centers, including mixed use development and multi-family housing. Connected medium density housing will be promoted around the higher density housing cores. These are considered subdivisions. Beyond the higher and medium density residential areas, high density business and industrial activity will be located along highways and major thoroughfares. These areas typically require cars for access. However, the key to the plan is connecting high and medium-density residential neighborhoods to the central commercial activity, particularly downtown Cramerton. See Figure 2-1 for current land uses in Cramerton and Figure 2-2 for future land uses in downtown Cramerton.



Source: *Town of Cramerton 2011-2031 Land Use Plan*, 2011

Figure 2-1: Existing Land Use in the Town of Cramerton



Source: *Town of Cramerton 2011-2031 Land Use Plan*, 2011

Figure 2-2: Future Land Use in the Town of Cramerton

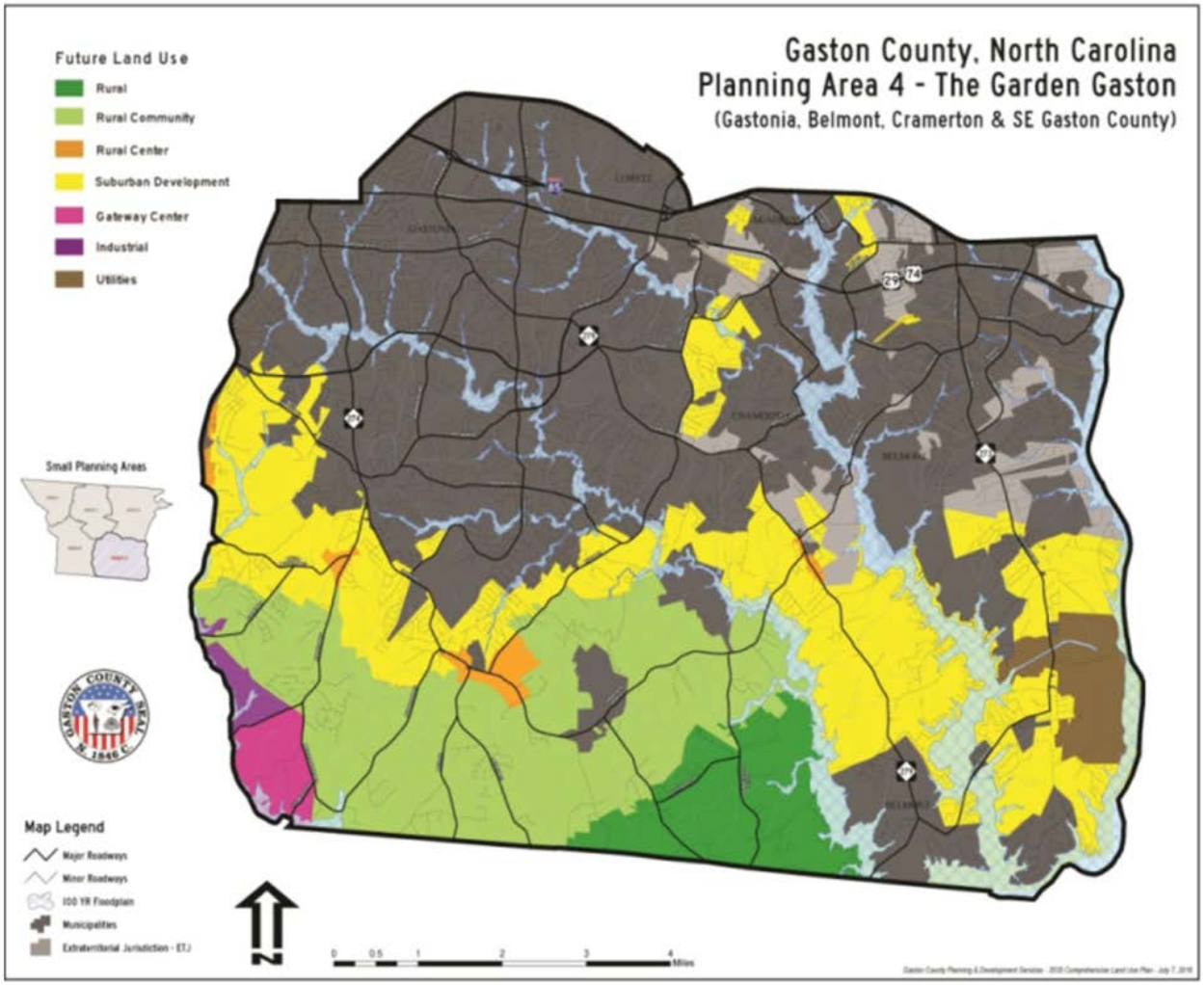
The plan emphasizes multi-modal transportation. Recommendations outlined in the plan specific to bicycle accommodations include the following:

- Coordinate the layout of new developments with the need for traffic circulation and pedestrian facilities.
- Through the road network and greenway network, emphasize connectivity for pedestrians, bicyclists, and vehicles in development projects.
- Promote narrow streets in combination with sidewalks and traffic calming techniques to slow vehicular traffic.
- Continue to use street design techniques that reduce vehicle speeds, minimize the possibility of conflicts, and enhance traveler awareness to maximize pedestrian, bicyclist, and motorist safety and accessibility at the Town's intersections.
- Create a school zone traffic-calming program that uses street design and other techniques to slow traffic and maximize safety to encourage students to walk and bike to school.
- Cramerton should continue to work with the NCDOT and Gaston-Cleveland-Lincoln MPO to ensure that all of the bridges, interchanges, and other transportation structures within the Town have adequate pedestrian and bicycle facilities when they are constructed or reconstructed.
- Minimize barriers to pedestrian and bicycle travel and encourage people to drive at appropriate speeds.
- Develop well-connected street networks.
- Define the parking areas of streets.
- Avoid expanding streets to four or more lanes and advocate for two lane arterial boulevards.
- Design new and redesign old intersections to increase safety and bicycle/pedestrian accessibility.
- Continue to work with NCDOT and GCLMPO to include bicycle/pedestrian infrastructure when roadways are constructed or widened.
- Work with NCDOT and GCLMPO to include bicycle facilities when streets are resurfaced.

Gaston County 2035 Comprehensive Land Use Plan

The *Gaston County 2035 Comprehensive Land Use Plan* (2016) (GCLUP) was developed by the Gaston County Board of Commissioners, Gaston County Planning Board, and stakeholders from various sectors within the county. The plan recognizes the growth of the Charlotte Metropolitan Area and states the eastern portion of the county, including Cramerton, "will likely experience the majority of pressure" of sprawling development and population increases at higher rates than what has been experienced in the past. The primary highlights of the plan include the need for land uses that can absorb population growth while enhancing quality of life for everyone; advocating for a multi-modal transportation network throughout the region with special emphasis on bicycling, pedestrians, and transit; and supporting economic development through land use. The Town of Cramerton is grouped among surrounding municipalities into Planning Area 4, which includes Gastonia and

Belmont. Cramerton is located in a pre-existing developed category, but suburban development is encouraged south and northwest of the town, which is within its ETJ (see Figure 2-3).



Source: *Gaston County 2035 Comprehensive Land Use Plan*, 2016

Figure 2-3: Future Land Use in Gaston County Planning Area 4

2.4 Existing Plans and Programmed Projects

Several plans are in place at the municipal, county, and MPO levels that address multi-modal transportation issues in Cramerton. The *GCLMPO 2045 Metropolitan Transportation Plan* (2018) (MTP), *Town of Cramerton Pedestrian Master Plan* (2008) (CPMP), *Town of Cramerton Greenway and Pedestrian Trails Master Plan* (2007) (GPTMP), and *Carolina Thread Trail Master Plan for Gaston County Communities* (2009) (CTTMP) are the primary guiding plans for the town's development of multi-modal transportation recommendations. These plans are used in addition to the LUP previously discussed.

GCLMPO 2045 Metropolitan Transportation Plan

The MTP addresses multi-modal transportation goals, recommendations, and projects throughout the Gaston-Cleveland-Lincoln MPO's planning area, including bicycling and pedestrian infrastructure in Cramerton. The plan notes there is a greater need for pedestrian infrastructure, although there is also support for bicycling and greenways in the area. Pedestrian infrastructure is considered a greater need because it includes a greater number and diversity of users compared with bicyclists. The plan proposes five bicycling and pedestrian projects within Cramerton, but only two are considered multi-use projects involving a greenway or a sidepath. There are no designated projects specifically for bicycling.

Town of Cramerton Pedestrian Master Plan

In 2008, the Town of Cramerton adopted its CPMP to plan a safe and accessible pedestrian environment and enhance the aesthetics of existing infrastructure to make it more conducive for walking. Many of the plan's goals serve a dual purpose of enhancing bicycling accommodations in Cramerton. Goals listed in the plan that could be used to address bicycling accommodations are listed as follows:

- Develop pedestrian friendly, aesthetically-pleasing circulation corridors that link commercial centers, public facilities, residential neighborhoods, and recreational facilities.
- Provide methods for the Town to increase public awareness of pedestrian routes through means such as maps and mileage.
- Provide methods to improve accessibility for people of all ages and abilities.
- Provide for safe crossing opportunities at major barriers such as railroad corridors, major thoroughfares, and the river.
- Implement traffic calming measures in conjunction with roadway expansion projects, particularly in areas near schools and neighborhoods.

Town of Cramerton Greenway and Pedestrian Trails Master Plan

Adopted in 2007, the GPTMP promotes the interconnectivity of neighborhoods, downtown Cramerton, and parks by greenways and trails. Proposed greenways and trails are designed to connect to existing sidewalk and park facilities. Since the plan was adopted, greenways and trails were built in Goat Island Park and Riverside Park. Proposed greenways have informed the recommendations included in this plan. The Peach Orchard Corridor, in particular, in the GPTMP extending from Goat Island Park to Wilkinson Boulevard is a

proposed greenway through a future residential neighborhood that will also be identified as a bicycling corridor.

Carolina Thread Trail Master Plan for Gaston County Communities

Stuart W. Cramer High School (AECOM, 2018)

The Carolina Thread Trail is a regional network of trails that will eventually span 15 counties. Gaston County's 13.7 miles of trails currently are a part of the network, and 2.1 miles of trails are accessible within or from Cramerton. The trail network is not located on existing roadways, but access points are located along roadways. Existing Carolina Thread Trail is within Cramerton running through Goat Island Park, south of Stuart W. Cramer High School, and Riverside Park. The CTTMP highly prioritizes two segments that involve Cramerton. The first segment will connect Cramerton, north of downtown, to downtown Belmont near Highway 7. The second segment will be located south of I-85 and in the northern portion of Cramerton. The CTTMP also highlights the route along the South Fork River as a priority corridor.

NCDOT State Transportation Improvement Program

NCDOT's most recent State Transportation Improvement Program (STIP), 2018-2027, lists three projects within Cramerton. STIP projects are important to note as they have impacts for proposed projects in the plan and could be opportunities to include bicycling accommodations. First, U-5821 is a road widening project on South New Hope Road (NC 279) to expand from two lanes to a four-lane divided facility with sidewalks and bike lanes currently included in the conceptual design. Construction is scheduled to begin in 2021. Second, EB-5913 is located north of downtown Cramerton and proposes to construct a sidewalk and pedestrian bridge over the South Fork River inlet adjacent to Lakewood Road. Construction is scheduled to begin in 2022. Third, U-6038 on Wilkinson Boulevard will implement an adaptive signal system from Cramerton through Belmont and is scheduled for 2019.

2.5 Community Features

Cramerton Community Center (AECOM, 2018)

Cramerton has several community features that provide important services and enrich the quality of life for its residents. These features serve as potential bicyclist origins and destinations. The Steering Committee reported current bicyclist activity at some of these places. By improving connectivity between these locations and Cramerton's neighborhoods, residents would be

more likely to ride a bicycle. Notable community features include Cramerton Town Hall, Cramerton Community Center, and Stuart W. Cramer High School. These and other features are listed in Table 2-1 and mapped on Map 2-1. The map identifications (ID) in Table 2-1 correspond to the map. An infrastructure project's ability to provide connectivity to these origins and destinations was one variable used to prioritize projects and is discussed further in Section 4.4.

2.6 Transportation Infrastructure and Existing Network

Topography

The topography of Cramerton and the surrounding area plays an important role in bicycling in Cramerton. The mountainous terrain of the area both attracts and deters bicyclists. The lowest point of the town is downtown along the South Fork Catawba River at an elevation of 620 feet. Steeper inclines lead out of downtown into the surrounding municipalities. The two highest points in Cramerton include Berry Mountain Road at 922 feet, and Cramer Mountain at 850 feet, both of which are in the southwestern portion of Cramerton. Cramer Mountain Road, specifically, is a common destination for advanced bicyclists in the region. Steep inclines exiting Cramerton and steep declines entering Cramerton may dissuade bicyclists with beginner or intermediate experience levels.

Cramer Mountain Road near Riverside Park (AECOM, 2018)

Table 2-1: Key Community Destinations

Map ID	Name	Type
E1	Cramerton Middle School	Education
E2	Cramerton Christian Academy	Education
E3	Stuart W. Cramer High School	Education
C1	Cramerton Town Hall	Civic
C2	U.S. Post Office	Civic
R1	Cramerton Community Center	Recreational
R2	Cramer Mountain Country Club	Recreational
R3	Central Park	Recreational
R4	Goat Island Park	Recreational
R5	Riverside Park	Recreational
H1	Mayworth School	Historic
H2	Evergreen Cemetery	Historic
H3	Baltimore Schoolhouse	Historic
●	Place of Worship	Place of Worship

Roads

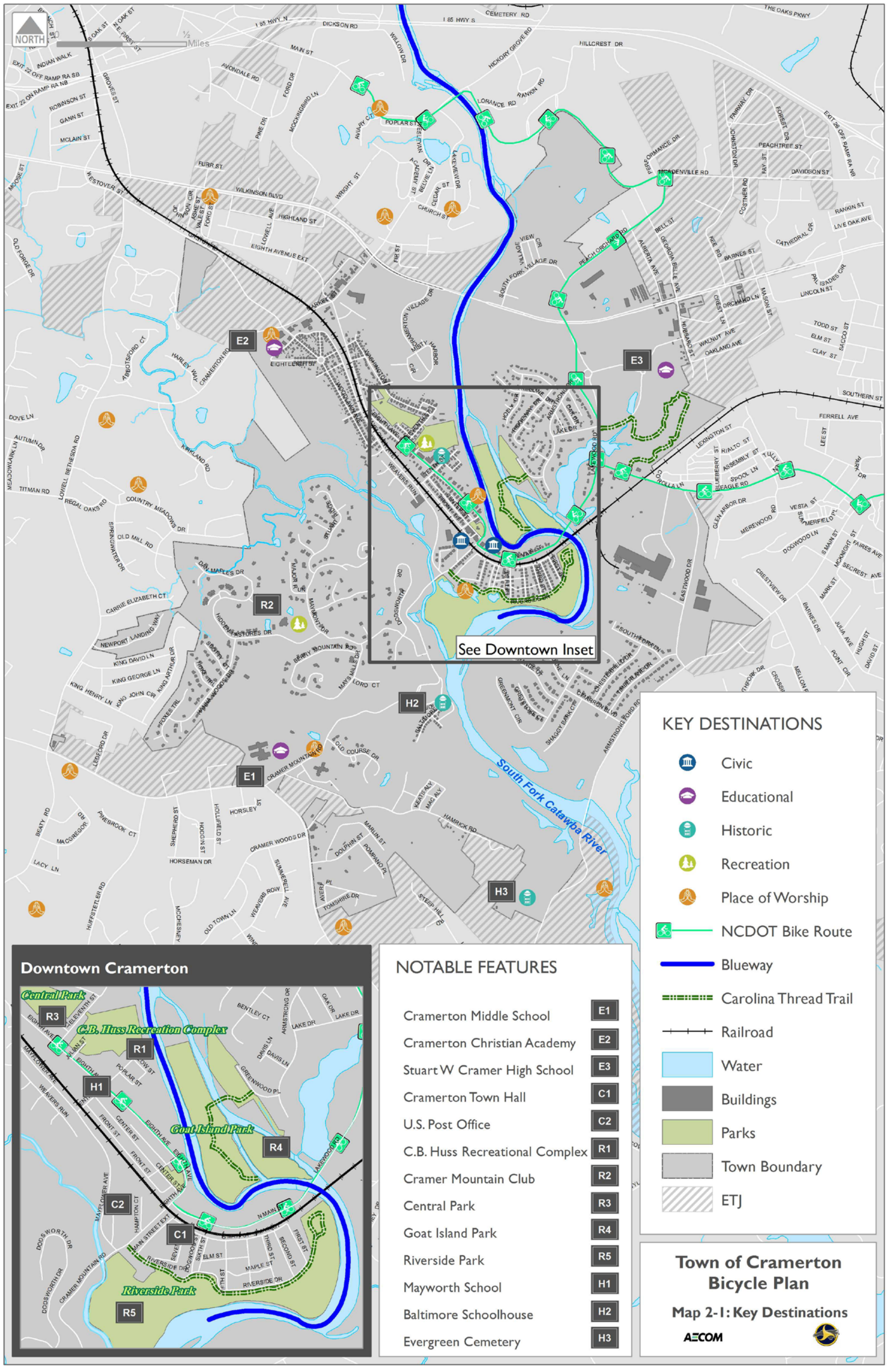
The road network in Cramerton centers on Eighth Avenue and the railroad with some grid elements in residential neighborhoods with downtown Cramerton at the core (reference the inset map on Map 2-1). The town is located in the Piedmont Region of North Carolina and has variable topography and connection to extensive greenway and trail systems located in nearby municipalities.

The northern and southern borders of Cramerton are formed by NC 7 and NC 279 (South New Hope Road), respectively. Each roadway, in addition, is scheduled for a NCDOT STIP widening project (U-5821). The three primary access points to downtown Cramerton include:

- Eighth Avenue: Beginning at Market Street in the north of Cramerton, Eighth Avenue runs south and provides access to Central Park, C.B. Huss Recreation Complex, Goat Island Park, Centennial Center, and Town Hall.
- Cramer Mountain Road: Beginning at South New Hope Road in the south of Cramerton, Cramer Mountain Road runs north towards downtown Cramerton and is the access road for the Cramer Mountain Country Club and Riverside Park.
- Lakewood Road and North Main Street: Lakewood Road runs south from Wilkinson Boulevard (US 29) and intersects with Stuart W. Cramer High School and Eagle Road. As Lakewood Road crosses the South Fork Catawba River moving west, it becomes North Main Street.

Each of these three roadways intersects with each other in downtown Cramerton just east of the railroad underpass. Bicycling activity in Cramerton depends on each of these three roadways for bicyclists wanting to enter or exit the town. Although Cramer Mountain Road and Lakewood Road are used by bicyclists, the Steering Committee agreed to focus on roadways that provide specific connections to key destinations in Cramerton and neighboring Belmont and McAdenville. From a bicycling perspective, Cramer Mountain Road and Lakewood Road are considered roadways for long-distance riding and not destination-specific.

Cyclist using Eagle Road (AECOM, 2018)



Map 2-1: Key Community Features

Wilkinson Boulevard (US 29/74) bisects Cramerton north of downtown and functions as a highway connecting McAdenville, Cramerton, and Belmont. The *Wilkinson Boulevard Corridor Study* (2015) proposes improvements, some of which are Complete Streets improvements, and widening for the highway to facilitate future growth.

Characteristics of the road network in Cramerton including ownership, surface type, length, speed limits, traffic, right-of-way, and barriers and limitations for bicycle infrastructure are summarized in Table 2-2. Most of Cramerton's main roads are two lanes with approximately 10 to 12 foot travel lanes with 25 to 100 feet of right-of-way, with the exception of some downtown cross streets that are one-way, one-lane, with occasional pull-off parking spots along the road. The small road network within the Baltimore District, a small historic residential neighborhood off of Cramer Mountain Road, has 20 feet of right of way and 8-foot travel lanes. Road widenings have not been conducted in the Baltimore District, nor can the current locations of the existing homes accommodate a road widening without damaging the character of the historic neighborhood. Most roads have sidewalks or curb and gutter sections; however, most of these are older and uneven due to deterioration issues, and not as wide as current standards. The pavement widths in Table 2-2 do not include gutter pans. The speed limits vary between 20 mph in the downtown area and 50 mph on Wilkinson Boulevard. Residential streets typically are 35 mph (see Table 2-2).

Rights-of-way were estimated using aerial photography and Gaston County parcel data. Eighth Avenue centers the downtown area and has an estimated right-of-way at approximately 30 feet and 40 feet, including on-street parking and sidewalks, although right-of-way expands to 60 feet from Ninth Street to Main Street. In other areas of the town, the right-of-way varies from approximately 25 to 100 feet with roadway pavement widths of 20 to 40 feet. North Main Street and Lakewood Road have larger rights-of-way in the downtown area, which would more easily accommodate future infrastructure, such as bicycle lanes. Outside of downtown, South New Hope Road, Cramer Mountain Road, Armstrong Ford Road, and Eagle Road have larger rights-of-way potentially to accommodate future infrastructure. These estimates would need to be verified during the feasibility and engineering phases of future projects.

Table 2-2: Cramerton Bike Facilities Inventory by Street

Street	Ownership	Length (miles)	Speed Limit (mph)	Right-of-Way (feet)	Pavement Width (without gutter pan) (feet)	Curb/ Gutter	Existing Bicycle Facilities	Constraints
Armstrong Drive	Town	0.50	20	43	20	Yes	None	Narrow travel lanes
Armstrong Ford Road	State	3.10	35	60	25	No	None	Ditches on both sides of road
Baltimore Drive	Town	0.30	20	20-45	16	No	None	Steep slopes on both sides of roadway, constrained right-of-way
Berry Mountain Road	Town	0.53	20	40	20	Yes	None	Narrow travel lanes
Brooklyn Avenue	Town	704 ft	20	30	15	Yes	None	Narrow travel lanes
Center Street	Town	0.31	20	35	20	Yes	None	Constrained right-of-way, narrow travel lanes, above ground utilities on west side of road
Chesterfield Drive	Town	0.30	35	60	35	Yes	None	Residential subdivision with wide travel lanes and right-of-way provide no constraints
Cimarron Boulevard	Town	0.27	20	100	50	Yes	None	Residential subdivision with wide travel lanes and rightof-way provide no constraints
Cramer Mountain Road	State	1.37	35	85	30	No	None	Steep topography and slopes on both sides of road
Cramerton Road	State	0.85	35	56	20	No	None	Ditches on both sides of road
Dan Maples Drive	Town	1272 ft	35	50	20	Yes	None	Narrow travel lanes
Dodsworth Drive	Town	0.43	35	40	20	Yes	None	Narrow travel lanes

Street	Ownership	Length (miles)	Speed Limit (mph)	Right-of-Way (feet)	Pavement Width (without gutter pan) (feet)	Curb/ Gutter	Existing Bicycle Facilities	Constraints
Eagle Road	State	1.08	35	60	25	No	None	Above ground utilities on south side of the roadway
Eastwood Drive	Town	0.72	35	60	25	No	Protected bicycle lane on western side	Foliage near roadway on south side
Eighteenth Street	Town	930 ft	20	30	20	Yes	None	Narrow travel lanes
Eighth Avenue	State/Town	1.35	35 (from Cramerton Road to 10th Street), 25 (from 10th to Main Street)	30-40	22	Yes	None	Railroad on west side of road
Eleventh Street	Town	979 ft	20	25	15	Yes	None	Narrow travel lanes
Fifteenth Street	Town	575 ft	20	30	25	Yes	None	Constrained right-of-way
Fifth Street	Town	620 ft	20	27	20	No	None	Narrow travel lanes, constrained right-of-way
First Street	Town	547 ft	20	30	20	No	None	Narrow travel lanes, constrained right-of-way
Fourteenth Street	Town	402 ft	20	30	20	Yes	None	Narrow travel lanes, constrained right-of-way
Fourth Street	Town	620 ft	20	27	20	No	None	Narrow travel lanes, constrained right-of-way
Front Street	Town	0.30	20	35	20	Yes	None	Above ground utilities on east side of road and railroad on west side

Street	Ownership	Length (miles)	Speed Limit (mph)	Right-of-Way (feet)	Pavement Width (without gutter pan) (feet)	Curb/ Gutter	Existing Bicycle Facilities	Constraints
Gaston Road	State	1.00	35	60	25	No	None	Above ground utilities on east side of road
Hamrick Road	State	0.835	35	20-50	16-20	Yes, along north side	None	Ditch on south side
Hanna Woods Drive	Town	0.45	35	50	20	Yes	None	Narrow travel lanes
Hidden Pastures Drive	Town	0.83	35	50	20	Yes	None	Narrow travel lanes
Holly Drive	Town	1082 ft	35	40	20	Yes	None	Narrow travel lanes
Lake Drive	Town	928 ft	20	42	20	No	None	Narrow travel lanes
Lakewood Road	State	0.89	20	60	20	No	None	Constrained by right-of-way and above ground utility poles on south side
North Main Street	Town	0.35	35	60	35	Yes	None	Constrained by right-of-way and railroad
Market Street	State	0.45	35	56	30	Yes	None	High volume of vehicle traffic
Mayflower Avenue	State	1.33	20	35	20	Yes	None	Constrained right-of-way, railroad on east side
Maymont Drive	Town	0.90	20	50	20	Yes	None	Narrow travel lanes
Mays Mills Drive	Town	0.37	20	40	20	Yes	None	Narrow travel lanes
New Hope Road (South) (Cramerton portion)	State	3.66 (Cramerton portion)	45	90	40	No	None	High traffic volume, ditches on both sides of road

Street	Ownership	Length (miles)	Speed Limit (mph)	Right-of-Way (feet)	Pavement Width (without gutter pan) (feet)	Curb/ Gutter	Existing Bicycle Facilities	Constraints
Ninth Street	Town	415 ft	20	35	20	Yes	None	One-way road
Oak Drive	Town	680 ft	35	40	20	Yes	None	Narrow travel lanes
Park Street	Town	207 ft	20	30	20	Yes	None	Narrow travel lanes
Patterson Street	Town	282 ft	20	20	16	Yes	None	Constrained right-of-way
Peach Orchard Road	State	0.75	35	70	20	No	None	Ditch on east side of road and above ground utilities on west side of road
Ridgeway Drive	Town	0.28	20	45	20	Yes	None	Narrow travel lanes
Riverside Drive	Town	0.51	20	30	20	Yes, along north side	None	Narrow travel lanes
Scoggins Street	Town	285 ft	20	30	15	Yes	None	Narrow travel lanes
Second Street	Town	631 ft	20	27	20	No	None	Narrow travel lanes, constrained right-of-way
Seventeenth Street	Town	513 ft	20	30	20	Yes	None	Narrow travel lanes
Seventh Street	Town	875 ft	20	27	20	Yes	None	Narrow travel lanes, constrained right-of-way
Sixteenth Street	Town	305 ft	20	30	20	Yes	None	Narrow travel lanes
Sixth Street	Town	433 ft	20	27	20	No	None	Narrow travel lanes, constrained right-of-way
South Main Street	Town	0.29	20	30	20	Yes. along north side	None	Narrow travel lanes, constrained right-of-way and railroad

Street	Ownership	Length (miles)	Speed Limit (mph)	Right-of-Way (feet)	Pavement Width (without gutter pan) (feet)	Curb/ Gutter	Existing Bicycle Facilities	Constraints
Tenth Street	State	1107 ft	20	40	20	Yes	None	Narrow travel lanes, one-way railroad underpass
Third Street	Town	642 ft	20	27	20	No	None	Narrow travel lanes, constrained right-of-way
Thirteenth Street	Town	635 ft	20	30	20	No	None	Narrow travel lanes, constrained right-of-way
Timberlane Drive	Town	0.36	20	60	25	Yes	None	Residential subdivision with wide travel lanes and right-of-way provide no constraints
Treeline Drive	Town	0.27	20	40	20	Yes	None	Narrow travel lanes
Washington Street	Town	0.43	20	30	20	Yes	None	Narrow travel lanes
Wilkinson Boulevard	State	3.75	35-50	100	85	No	None	High traffic volume, at least 4 lanes of traffic
Woodlawn Avenue	Town	0.87	20	30	20	Yes	None	Narrow travel lanes
Woodridge Drive	Town	905 ft	20	40	20	Yes	None	Narrow travel lanes

Bridges

There are eight bridges within Cramerton's town limits, two of which are railroad overpasses. Table 2-3 provides additional information about their locations.

Table 2-3: Bridges

Bridge ID	Location	Maintained by	Bicycling Constraints
350017	Cramerton Road over Duharts Creek	NCDOT	Narrow travel lanes
350016	Market Street over Norfolk Southern Railway	NCDOT	Narrow travel lanes
350326	Cramer Mountain Road over South Fork Catawba River	NCDOT	Narrow travel lanes
350303	Norfolk Southern Railroad over Tenth Street	Norfolk Southern Railroad	One-way travel lane under bridge
350299	Norfolk Southern Railroad over Eighth Avenue	Norfolk Southern Railroad	One-way travel lane under bridge
350006	Lakewood Road over South Fork Catawba River	NCDOT	None known
350007	Lakewood Road over South Fork Catawba River inlet	NCDOT	Narrow travel lanes
350082	Wilkinson Boulevard over South Fork Catawba River	NCDOT	Narrow travel lanes

Railroad

There is currently one operational railway in Cramerton owned and operated by Norfolk Southern. The railway cuts through the center of downtown Cramerton and has had an impact on development and connectivity throughout Cramerton. There are three access points over or under the railway to access downtown Cramerton. Norfolk Southern owns two bridges over Eighth Avenue and Tenth Street, and there is a one-way travel lane under each overpass where vehicles alternate crossing. In addition, a bridge over the railway along Market Street provides access to the north of Cramerton.

Public Transportation

Gaston County ACCESS Central Transportation provides transit services throughout Gaston County. Gaston County ACCESS operates a deviated, fixed route schedule and on-demand transit service for the general public of Gaston County, particularly for Gaston County human service agencies. With this service, users can purchase subscription routes for daily van service to and from the same destination or a demand response service for a one-time scheduled trip. Gaston County ACCESS is available Monday through Friday, 4:00 a.m. to 6:00 p.m. The fare is currently $1.55 per mile.

In addition to Gaston County ACCESS, the Gaston County School System provides school bus transportation to students.

Although public transportation services are limited and do not have fixed transit stops in Cramerton, a connected and safer and connected bicycle network would facilitate improved access to transit. The proposed bicycle network would link to community destinations, residences, and businesses. A connected bicycle network would support future expansion in public transportation by providing safer access to transit on streets and sidewalks. Currently, Gaston County ACCESS vehicles do not provide bicycle storage.

Utilities

Utilities are an important consideration for bicycle planning. Moving or replacing existing utilities to make room for new bicycle infrastructure can be costly and in some cases, cost-prohibitive. Table 2-4 lists where above-ground utilities become barriers to bicycle improvements. Often, multi-use paths are located on the side of the road where utilities are not present. The exact location of utilities would need to be surveyed during the engineering phase of each project. Coordination would need to occur with utility providers before construction. General information about utilities in Cramerton is noted in Table 2-4.

Table 2-4: Utilities

Utility	Provider	Location
Electricity	Duke Energy	Above ground
Telephone	AT&T, Windstream, Time Warner, Delta Com, Comporium	Above ground
TV/Internet	AT&T, Windstream, Time Warner, Delta Com, Comporium	Above and below ground
Natural Gas	PSNC Energy	Below ground
Water	Two Rivers Utilities	Below ground
Sewer	Two Rivers Utilities	Below ground

2.7 Existing Bicycle Facilities and Multi-Use Trails

Cramerton has two signed bicycle routes and one protected bicycle lane—its only on-road bicycle facility—within its border (see Map 2-2). Cramerton collaborates with county and other local municipal and governmental entities, particularly Belmont, McAdenville, and the Carolina Thread Trail, in maintaining an extensive system of recreational bicycle trails and bicycle routes throughout the area. Though limited, Cramerton's bicycling facilities accommodate users from children around schools to experienced cyclists exploring the mountainous topography.

Experienced cyclists use South New Hope Road, Cramer Mountain Road, Armstrong Ford Road, and Eagle Road for long distance riding. Road conditions vary along these routes as the roads have narrow travel lanes, traverse mountainous terrain, encounter steep slopes, and have high volumes of vehicle traffic. Eastwood Drive has a protected bicycle lane, the only one of its kind in the town, which can be accessed by Eagle Road or Armstrong Ford Road.

Children, families, and casual riders have been reported to use trails and neighborhood roads near Stuart W. Cramer High School and Belmont Elementary School. Cramerton's Parks and Recreation Department organizes ongoing rides for children at these locations.

The Carolina Thread Trail includes three trails within Cramerton's town limits. The Goat Island Greenway is a paved multi-use trail that runs through Goat Island Park and is approximately 0.7 mile. The Riverside Greenway is a paved multi-use trail that runs through Riverside Park, provides access to the portages along the South Fork Catawba River, and is approximately 1.0 mile long. Finally, the Stuart W. Cramer High School Trail is a 1.5-mile trail around Stuart W. Cramer High School, which typically is not used for bicycling. These trails utilize existing sidewalks or trails designed specifically for bicycling and pedestrian users.

2.8 Bicycle and Vehicular Traffic Counts and Crash Data

Bicycle Activity

Although actual bicycle counts were not available for this plan, the Steering Committee noted bicycle activity along the Carolina Thread Trail within Cramerton, Goat Island Park, Riverside Park, and around Stuart W. Cramer High School and Belmont Central Elementary School. In addition, they noted activity along South New Hope Road, Cramer Mountain Road, Eighth Avenue, Armstrong Ford Road, and Eagle Road. These hilly roads have become popular attractions for touring bicyclists. The Steering Committee also noted bicycling safety concerns around the schools and hilly roads with high volumes of vehicle traffic.

NCDOT Annual Average Daily Traffic Counts

NCDOT prepares Annual Average Daily Traffic (AADT) counts for state roads, which represent the daily vehicular traffic average over the year at specific points. These counts, in conjunction with field visits and discussions with residents, help identify high traffic areas that may pose safety concerns for bicyclists.

Several roads within Cramerton have traffic counts available. The counts are listed for the most recent year available, 2016. Wilkinson Boulevard, which crosses Cramerton north of downtown and connects the town to McAdenville and Belmont, had the highest traffic count. Traffic was also heavy along the northern and southern edges of Cramerton on Cramerton Road/Market Street and South New Hope Road, respectively. The AADT counts for Cramerton are listed in Table 2-5.

Table 2-5: Annual Average Daily Traffic Counts

Street	Location	AADT (2016)
Armstrong Ford Road	East of downtown and eastern boundary of Eagle Road	9,700
Cramer Mountain Road	Entering Cramerton from the south.	4,500
Cramerton Road	North of downtown and merging into Market Street.	7,800
Eagle Road	Between Lakewood Road and Armstrong Ford Road	5,500
Eighth Avenue	Entering Cramerton from the north and connecting to Market Street	2,900
Lakewood Road	Entering Cramerton in the east and merging into Main Street	4,600
Main Street	Entering Cramerton and intersecting Eighth Avenue downtown	4,600
Market Street	North of downtown and intersecting with Eighth Avenue	9,600
Peach Orchard Road	Northeast of downtown and north of Wilkinson Boulevard	4,600
South New Hope Road	South of downtown and on the southern border of Cramerton	13,000-16,000
Wilkinson Boulevard	West-East highway in north of Cramerton	19,000-26,000

Crash Data

The NCDOT DBPT in collaboration with local law enforcement departments developed the Pedestrian and Bicycle Crash Data Tool dataset for all reported bicycle and pedestrian crashes within the state between the years of 1997 and 2015.

According to this dataset, between a five-year period from 2011 to 2015, two bicycle crashes were reported in the Town of Cramerton. One bicycle crash occurred on a local street with a vehicle overtaking the bicyclist. The injury was marked as unknown. The second bicycle crash was the result of a bicyclist riding out of a driveway or alley, and an injury was reported. Both crashes occurred in daylight without the driver operating the vehicle at excessive speeds.

General safety concerns cited by the Steering Committee include the following:

- Vehicle and bicycle encounters on roadways with high vehicle traffic and mountainous terrain
- Lack of designated and marked bicycle routes
- Lack of connectivity from neighborhoods to schools for children to ride to school
- Overall lack of bicycle facilities

2.9 Existing Bicycle and Pedestrian Programs

Several existing programs within the Town of Cramerton and in nearby municipalities promote and encourage bicycling. The town itself has organized bicycling events in addition to several local and regional groups that promote bicycling.

Cramerton's Parks and Recreation Department organizes ongoing bicycle rides for children during the summer. However, local schools have not participated in the annual Bike to School Day. In fact, both the Steering Committee and community survey cited bicyclist safety as a large concern for why parents will not allow their children to ride to school. While bicycling was cited as occurring at local schools, the Steering Committee and community survey stated that parents drive their children to schools for them to ride.

Gaston County Cyclists Club (GCCC) is a regional membership group of experienced bicyclists that holds weekly rides throughout the area, including Cramerton. While promoting ride events for more experienced bicyclists, the GCCC participates in local charities and civic causes to attract and encourage bicycling for all types of users. South Main Cycles in neighboring Belmont also organizes bicycling activities that include Cramerton. Its Four Peaks Challenge, or Spamerton Route, is a popular ride that ascends over 1,000 feet in elevation over the course of 25 miles.

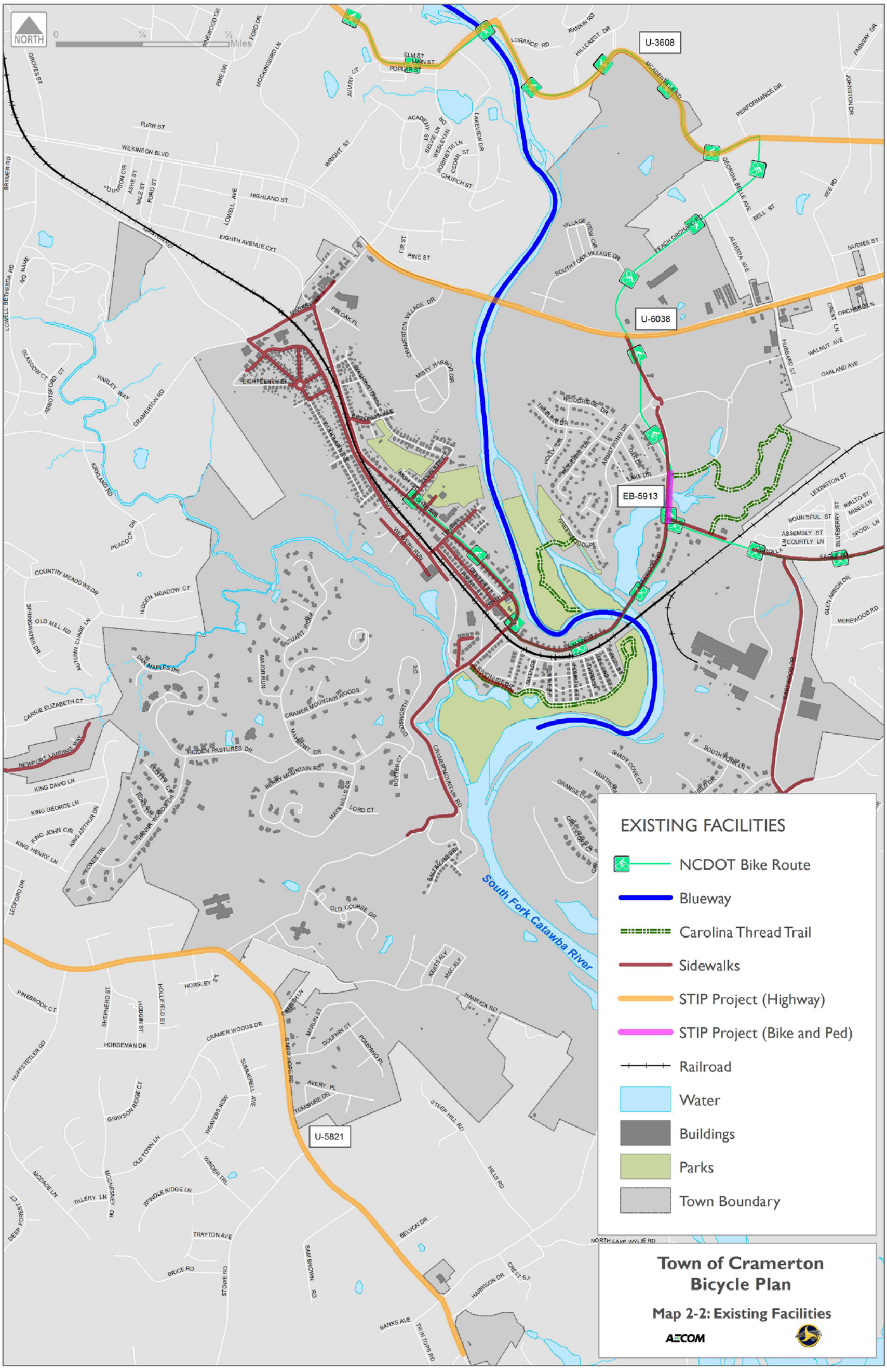
2.10 Opportunities and Constraints

In partnership with the Steering Committee, opportunities for improving bicycle mobility and safety were identified as well as potential constraints to overcome in achieving the community's vision for multi-modal access and safety. Cramerton's location creates bicycle opportunities and challenges to the implementation of associated infrastructure. Connecting new facilities to existing bicycle infrastructure will allow users to explore the natural setting in and around the town, and provide opportunities for bicyclists to experience the small town charm of the community while also providing economic benefits to local businesses.

Opportunities

- Downtown Cramerton maintains an existing network of trails and bicycle routes that connects the historic downtown business district to parks and neighborhoods.
- Increased economic growth and investments may result from visitors using bicycle facilities including nature trails and routes that attract experienced users. The town and the surrounding area are popular among bicyclists drawn to the challenges the hilly terrain provides. Recreational riders in the town commonly access several bicycling routes and trails from downtown Cramerton to the surrounding area, including the parks.
- The existing bicycling culture in the region could be improved by wayfinding along commonly used bicycling routes. Wayfinding signage would promote awareness and improve safety along existing bicycling routes.
- Natural resources and topography can help to draw local and regional visitors.

- Coordination with bicycle organizations/clubs like Safe Routes to School and South Main Cycles will help develop educational and safety programs with local activities and events, such as a bicycle rodeo or providing bicycle helmets to children.
- The town has an opportunity to develop additional bicycle facilities alongside proposed NCDOT STIP projects. Currently, there are no bicycle facilities proposed on the NCDOT STIP, but projects like roadway widening can be leveraged to include bicycle accommodations. The conceptual design for the NC 279 widening currently includes striped bicycle lanes.
- Neighboring municipalities and regional organizations, such as Belmont, can be partners that actively help promote bicycling activities and infrastructure in their municipalities and Gaston County, and Cramerton.



Map 2-2: Existing Facilities

Constraints

- Roadways that are popular among bicyclists are limited by right-of-way constraints and the topography.
- Unsafe intersections impede access to trails and important destinations.
- Many roadways have limited rights-of-way for bicycle lanes and are in need of retrofitting.
- Existing town zoning standards do not require bicycle infrastructure to be constructed as part of development.
- Terrain and right-of-way challenges may increase engineering and construction costs of bicycling infrastructure.
- High vehicle speeds on commonly used bicycling routes and a lack of enforcement make bicyclists feel unsafe.
- Recurring conflict between motorists and bicyclists indicate a cultural norm, in which some motorists do not recognize bicyclists as having a right to the roadway.

PUBLIC INPUT

DATA COLLECTION

3. Public Input

3.1 Steering Committee

The Steering Committee that guided this plan was formed as a dedicated group of local officials, staff, stakeholders, and residents to incorporate a diverse range of community perspectives (Table 3-1). The committee met three times in addition to a conference call for surrounding municipality planning departments throughout the planning process to help shape the plan by identifying goals and objectives, identifying bicycling constraints and opportunities, and prioritizing proposed projects.

At the first Steering Committee meeting on May 30, 2017, the group chose a vision statement for the plan and discussed issues the community is facing with regards to bicycle infrastructure. Members focused on developing a vision and set of goals for the plan. The committee broke into groups during a working session to define bicycle origins, destinations, activity, and areas of concern. These areas of concern were used to start thinking about potential projects, policies, and programs. The committee discussed focusing on connectivity, safety, and implementable projects.

The second Steering Committee meeting was held on August 29, 2017. Sample projects, policies, and programs were presented to the committee in preparation for a working session. The working session captured committee input on bicycle infrastructure projects and relevant policies and programs. Specifically, focus was placed on linear facilities and spot improvements, connections and gaps in bicycle infrastructure, and amenities. The feedback obtained during this meeting was used to develop preliminary recommendations.

Table 3-1: Steering Committee

Steering Committee Members		
Dixie Abernathy	George Berger	Eric Smallwood
Brad Adams	Randi Gates	Gary Spangler
Rodney Baker	LaVerne Partlow	
Bret Baronak	Dave Pettine	

3.2 Public Meetings

The first public meeting was held on August 29, 2017, immediately following the second Steering Committee meeting. The Steering Committee members were instructed on how to serve as facilitators and recorders during the working session to help guide a brief visioning exercise, a mapping exercise that identified opportunities and constraints, and capture suggested bicycle and pedestrian projects, policies, and programs. However, no members of the public attended the meeting.

The second public meeting was held on August 2, 2018 at the Cramerton Town Hall. At this informal public session, boards of the maps and priority projects outlined in the plan were on display in the foyer. Members

of the Steering Committee and an NCDOT corridor engineer were present to discuss the projects and answer questions from the public. Directly following this public session, the Plan was presented to the Town of Cramerton Board of Commissioners.

A copy of all meeting materials is provided in Appendix A: Public Involvement.

3.3 Community Survey

A survey was made available to Cramerton's residents from October to November 2017 to gather local information about current travel behaviors, priorities, and opportunities for bicycling in Cramerton. Information from the survey is included in this plan's recommendations. The following sections summarize the key themes from the 47 survey responses received.

Questions and Results

Within the complete survey, the community's responses to seven questions summarize current bicycling behaviors, concerns with bicycling, and priorities for improving bicycling in Cramerton. The results to these questions are discussed below.

Current Bicycling Trips

The public was asked the destinations of bicycling trips they take and the frequency of those trips. Eighteen destinations were listed, and Chart 3-1 summarizes the top eleven responses according the destinations with most frequent trips (i.e., three or more times per week).

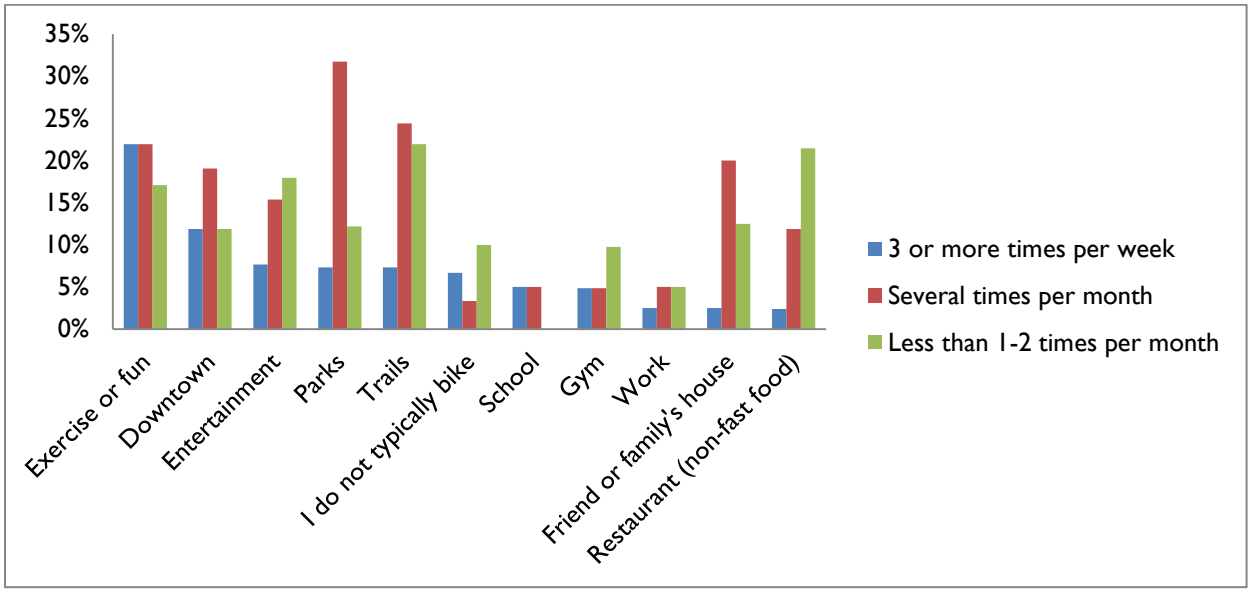


Chart 3-1: Common Bicycling Destinations

Downtown Cramerton and its connectivity to recreational opportunities feature prominently in the public's responses. Recreational destinations comprise three of the top five responses (exercise or fun, parks, and trails). Over 36 percent of respondents travel to recreational destinations three or more times per week, and over 78 percent access recreational destinations several times per month. It follows that downtown destinations, then, rank highly among most frequent destinations because Cramerton's parks and many of its trails are accessed from downtown (see Map 2-1). Nearly 12 percent of respondents access downtown at least three times per week, and over 19 percent access downtown several times per month on a bicycle.

Public Concerns with Bicycling

The public was asked in general how they perceive the difficulty level of bicycling in Cramerton. Chart 3-2 summarizes the results. Over 9 percent of respondents perceive bicycling to be very difficult, while nearly 80 percent of respondents describe bicycling as neither difficult nor easy or somewhat difficult.

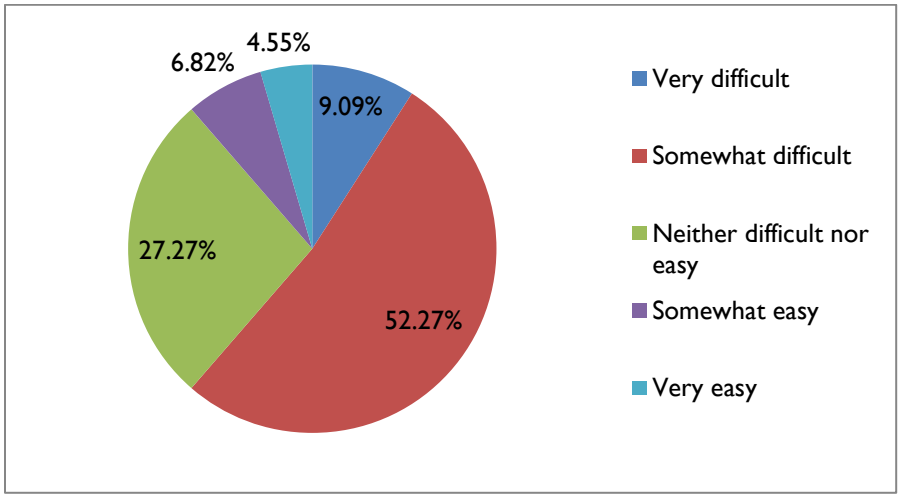


Chart 3-2: Bicycling Difficulty Levels

When asked the reasons why bicycling is difficult or avoided in Cramerton, the public cited two primary reasons. First, over 42 percent noted the limited availability of bicycle facilities such as bicycle lanes or other designated bicycling routes. Second, over 24 percent cited safety concerns, specifically engaging with motorist traffic, as reasons why they do not bicycle.

Priorities for Improving Bicycling

Throughout the questions asking the public about their priorities and suggestions for improving bicycling in Cramerton, responses indicating infrastructural improvements were most common. Policies, educational programs, and more coordination with the public and neighboring municipalities followed. Chart 3-3 lists responses to four opportunities for change according to the respondents' first choice.

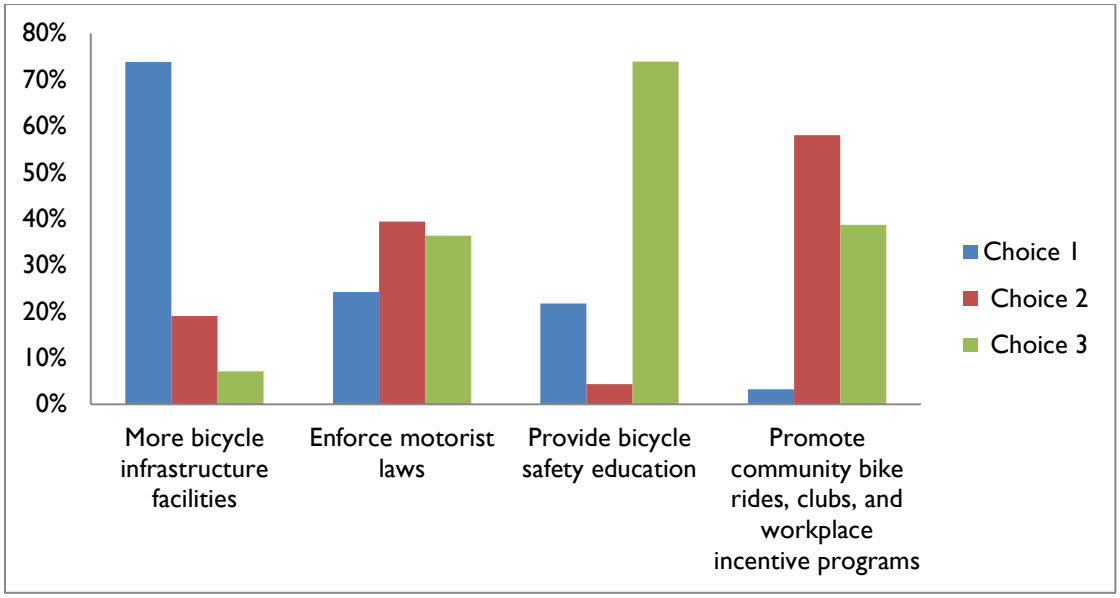


Chart 3-3: Recommended Changes to Make Bicycling Easier

Nearly 74 percent of respondents listed more bicycle infrastructure facilities as their first choice for how Cramerton should improve. The most frequent second choice, furthermore, was to promote community bicycle rides, clubs, and workplace incentive programs, which could indicate interest in enhancing the current bicycling culture for all riders.

The results presented in Chart 3-3 were verified by responses to a question asking how important specific improvements are in supporting bicycling in Cramerton. Infrastructure improvements were listed as most important followed by education and enforcement of traffic laws for motorists and bicyclists. Chart 3-4 summarizes the results.

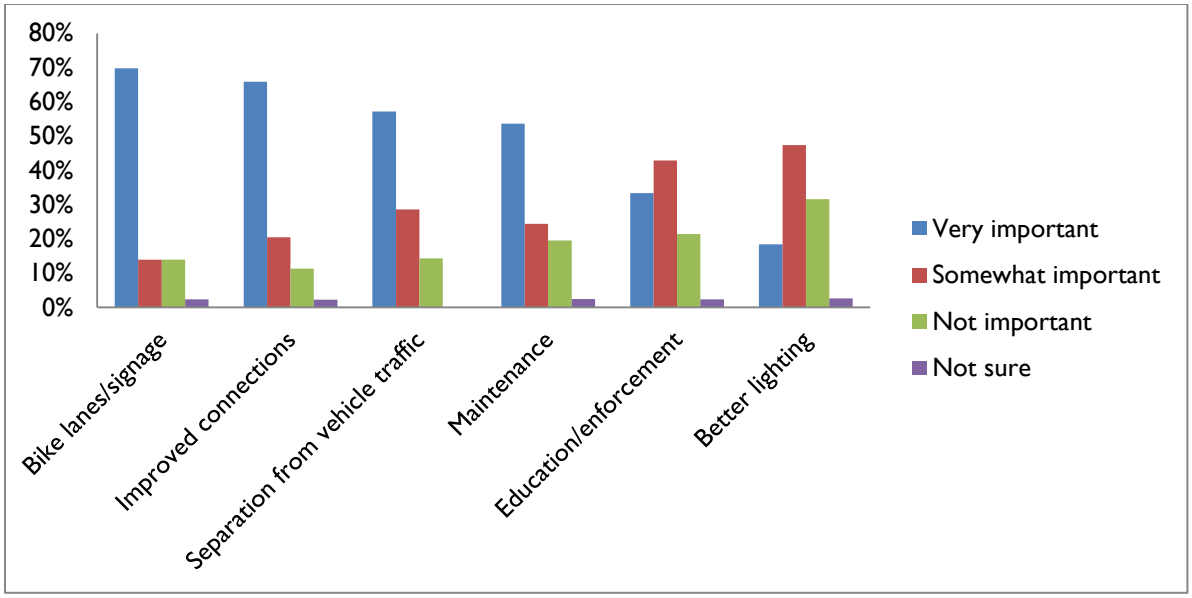


Chart 3-4: Importance of Bicycling Improvements

The top four responses listed as very important include infrastructure, such as bicycle lanes, signage, connectivity between key destinations, and more space between bicyclists and motorists. Education and the enforcement of existing traffic laws follow as another important bicycling improvement with over 33 percent listing it as very important and almost 43 percent as somewhat important.

Moving forward, the public was asked about their policy and program priorities for improving bicycling in Cramerton beyond infrastructure. Chart 3-5 summarizes responses according to the most frequent response.

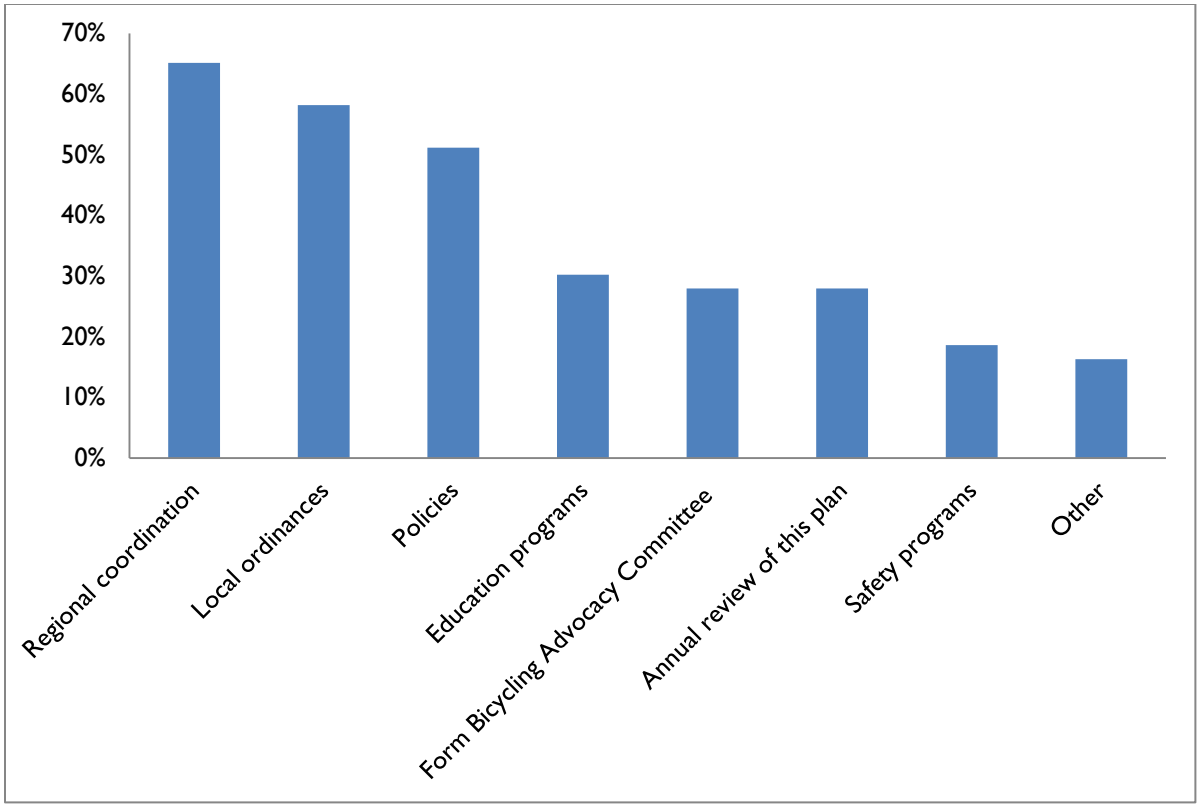


Chart 3-5: Policy and Program Priorities

Coordinating with neighboring municipalities and with the Gaston- Cleveland-Lincoln MPO was the largest response at over 65 percent. Improved and new local ordinances that promote bicycling garnered over 58 percent of responses.

Themes

The most frequently reported purposes of bicycling trips in Cramerton during a typical week involve downtown Cramerton, local parks and trails, and local entertainment at downtown venues. Access to parks and trails emerges as a central theme in which residents' desire connectivity to parks and trails but note a lack of bicycling infrastructure and unsafe roadway conditions for bicyclists that limit access. Although physical activity is a priority among residents, over 61 percent of survey respondents said bicycling in Cramerton is very or somewhat difficult. Specifically, bicycling is difficult because of the limited availability of designated bicycling facilities and safety concerns due to vehicle traffic and speeds. Safety for advanced bicyclists using roadway facilities on hilly bicycling routes was also noted as a difficulty.

Summary

To address the current difficulties in bicycling to parks, trails, and downtown, survey respondents' primary priority is infrastructure, particularly improving and adding bicycling facilities and signage. The second priority is to enforce existing motorist laws, specifically as they pertain to speed limits. Education programs promoting safe bicycling behaviors and safe ways for vehicles to share the road with bicycles are a third priority.

Cramerton residents had opportunities in the survey to provide recommendations with specific locations in need of attention, and the following four points summarize these responses:

- **Connecting neighborhoods, parks and trails, and shopping**: Many respondents recommended complete bicycling networks that allow users to bicycle from their homes to destinations. These improvements primarily include bicycle lanes, but respondents also noted need for bicycle parking throughout Cramerton.
- **Bicycling safely along existing and commonly used bicycling routes**: Several streets and intersections were identified as unsafe because of the lack of bicycle lanes, narrow roadway lanes, and limited vehicle speed regulations. Bicycling to and from schools, in particular, was noted as unsafe for children. Examples include Eighth Avenue, Eagle Road, Market Street, South New Hope Road, and Cramer Mountain Road.
- **Coordinating with neighboring jurisdictions to expand the regional network of bicycle routes**: Bicycling throughout the region surrounding Cramerton was described as a common activity. Advanced bicyclists enjoy the hilly terrain in Cramerton, Belmont, and McAdenville, and the close proximity of these municipalities enables users to access them on a single trip. Respondents encouraged Cramerton officials to coordinate bicycle routes in the region with these neighboring towns and the county, which possibly could include new connections closer to Charlotte.
- **Promoting expansion of bicycle amenities on existing roadways through local ordinances and regulations**: Respondents suggested that Cramerton officials utilize local ordinances to maintain, protect, and expand bicycling facilities as improvements and developments are built.

RECOMMENDATIONS

PROPOSED PROJECTS

4. Recommendations

4.1 Overview

Active transportation—that is, bicycle and pedestrian travel—offers many benefits including improved health, reduced environmental impacts, and fewer financial commitments from decreased dependency on the automobile. This section describes the infrastructure improvements that are recommended to provide the Town of Cramerton with a safe, accessible, and connected bicycle network.

Recommended improvements in this plan include improving wayfinding, on-road bicycle facilities, and crossing improvements. Multi-use facilities (shared use paths, also known as greenways) are not specifically recommended due to the existing, robust, trail system.

All proposed projects are intended to provide safe connections between origins and destinations within the town while promoting exercise and mobility. In addition, connections to neighboring towns, particularly Belmont and McAdenville, were considered in the development of the projects. The projects were developed through collaboration with the Steering Committee, field analysis, and public and neighboring town's input. All bicycle facility recommendations along NCDOT-maintained roadways will require coordination with NCDOT Highway Division 12 and the Gaston-Cleveland-Lincoln MPO as projects are planned and designed, as part of implementation.

4.2 Facility Types

Spot Improvements

Spot improvements address bicycle problems at specific locations such as intersections, short lengths of a roadway, or single destinations. These types of improvements are generally low cost and provide enhancements through surface improvements, signing, access enhancements, or functional upgrades.

Spot Bicycle Facilities

Bicycle Parking: A bicycle rack or object provided specifically for the purpose of supporting and enabling a bicycle to be secured when not in use. A bicycle corral is a type of bicycle parking used in high-demand areas for the parking of multiple bicycles.

Bicycle Signal: A traffic control device that assigns right-of-way to bicyclists and controls bicycle movements in mixed traffic to reduce conflict with motor vehicles and/or pedestrians.

Bicycle Zone: An area in the public right-of-way reserved for bicycling facilities.

Signage: Sign categories include warning (e.g., turn signs), regulatory (e.g., stop signs), guide (e.g., bicycle route signs), school (e.g., school speed limit signs), and emergency signs (e.g., area closed signs).

Spot Multi-use Facilities

Paving Treatments: Paving treatments send a visual cue to motorists, bicyclists, and pedestrians about the functions of a street. They can also create an aesthetic enhancement of a street and be used to delineate separate space for pedestrians or bicyclists. Some examples include colored concrete, brick, and cobblestone.

Trailhead: A trailhead is the primary access point to a shared use path. It may have parking and other amenities at the terminus.

Wayfinding: Comprehensive signage and/or markings to guide travelers to destinations along designated and preferred routes by providing information such as distances or times to reach key destinations or areas.

Linear Improvements

Linear improvements are specific to linear project needs for bicycle problems such as enhancement or new construction of bicycle lanes, implementation of sharrows, or improvements to streetscapes. These types of improvements are generally larger infrastructure projects with higher costs and longer implementation timeframes and together form a network of safe transportation choices for the community.

The following are suggested linear bicycle facilities that could be feasible in the Town of Cramerton based on planning-level analysis and local stakeholder preference. This is not an exhaustive list and are terms defined by NCDOT in *North Carolina Terminology for Active Travel: A Guide to Bicycle and Pedestrian Infrastructure and Networks*.

Linear Bicycle Facilities

A successful bicycle network consists of bicycle facilities that allow for the safe and efficient movements of cyclists within and throughout a given area.

Buffer: A strip of land that separates the sidewalk, or other facilities, from the street to improve the active traveler's level of comfort. A buffer can be comprised of one or multiple zones including the green zone, bicycle zone, parking/transit stop zone, or a combination thereof. Typical elements that contribute to creating a buffer include landscaping strips, parked cars, and/or bicycle lanes.

Bicycle Route: A segment of road identified as a path of travel for bicyclists between destinations that may have directional and informational signage and markings. While these routes are identified for use by bicyclists, they are not necessarily exclusive to bicycle transportation. Routes may exist at the national, state, county, and local level.

Markings: Provide information, guidance, regulation, or warnings to road users. As a proposed implementation method, marking means striping or painting facilities such as shared lane markings or bicycle lanes without any need for additional improvements or adjustments to the roadway.

Paved Shoulder: The portion of the roadway contiguous with the travel lanes that accommodates stopped vehicles, and emergency vehicles and reduces the frequency of pavement maintenance is referred to as a

paved shoulder. Shoulders, where paved and of sufficient width, may be used by bicyclists. Bicycle lane pavement markings may be used to designate the shoulder as a bicycle lane. In rural areas, paved shoulders are also used by pedestrians where a sidewalk is not present.

Reallocation: A technique to modify the number or width of travel lanes to achieve systemic improvements, such as adding a bicycle lane to an existing roadway with confined right-of-way. Variants of reallocation include 4-to-3-lane conversion, lane reduction, road diet, or reconfiguration.

Repave: Proposed implementation method to improve a facility for bicyclists by capitalizing on the routine paving or resurfacing maintenance schedule.

Restripe: Adjustment in the lateral placement of existing travel lanes to reallocate roadway space for bicyclists or create a greater buffer width between motor vehicle lanes and existing or proposed pedestrian facilities. This adjustment does not remove or add any travel lanes for motor vehicles.

Separated Bicycle Lane: A bicycle lane is a designated facility that is physically separated from motor vehicle lanes, exclusively used for bicycle traffic, and is on or adjacent to the roadway. Bicycle lanes are also known as cycle tracks or protected bicycle lanes.

Shared Lane: Shared lanes, often referred to as "sharrows," are open to both bicycle and motor vehicle travel. Shared lanes can be marked with shared lane markings or designated as bicycle boulevards. A shared lane that is at least 14 feet wide allows space so that bicyclists and motorists may travel side-by-side within the same traffic lane.

Widening: Increasing the width of the paved portion of the roadway to specifically improve the roadway segment for a bicycling facility.

Linear Multi-use Facilities

NCDOT adopted a "Complete Streets" policy in 2009, which directs NCDOT to consider and incorporate all modes of transportation when building new projects or making improvements to existing infrastructure. Complete Streets are designed to be safe and comfortable for all users, including pedestrians, bicyclists, transit riders, motorists, and individuals of all ages and capabilities.

Part of designing with Complete Streets principles in mind includes the impact of street patterns on trip length, connectivity between resources, intersection use, and the overall experience of the user. Cyclists can benefit from a street that has been designed with the Complete Streets policy including improvements for children and individuals with accessibility needs, health advantages, improved public transportation services, economic revitalization, safety enhancements, roadway equity, and a more livable community.

Shared Use Path: Also known as a "multi-use trail" or "greenway," a shared use path is a facility designed to meet Americans with Disabilities Act (ADA) standards, which may be used by bicyclists, pedestrians, and other non-motorized users. The shared use path is separated from the roadway by an open space or a physical barrier or within an independent-right-of-way. A rail trail, built within the right-of-way of a former railroad, is considered a type of shared use path.

Sidepaths: A specific type of shared use path facility that is physically separated from the road but located within the roadway right-of-way.

Unimproved Trail: An unpaved/unimproved off-road facility, open for bicyclist and/or pedestrian use, which is not required to meet ADA standards.

4.3 Project Corridors

Bicycle improvements proposed in this plan were developed based on the bicycle routes, locations, and issues identified through the public engagement process and online bicycle survey input. As described in Chapter 3, Steering Committee members and the public were asked to identify community features, origins and destinations, opportunities for bicycling connections, and constraints to bicycle mobility. Based on that input and the data collection in Chapter 3, the team identified six bicycling routes for specific wayfinding improvement and infrastructure recommendations. The seven routes and corresponding projects are shown in Map 4-1: Proposed Bicycling Routes, and the corresponding following ten projects are depicted in Map 4-2:

- Centennial Center — Wayfinding and bikeshare station improvements
- Eighth Avenue — Linear and wayfinding improvements
- Eagle Road — Linear, wayfinding, and railroad crossing improvements
- Riverside Park — Bicycle parking and wayfinding improvements
- Goat Island Park — Bicycle parking and wayfinding improvements
- C.B. Huss Recreation Complex — Bicycle parking and wayfinding improvements
- Market Street — Bicycle parking and wayfinding improvements
- Market Street/Wilkinson Boulevard — Crossing improvements
- Market Street — Linear and wayfinding improvements
- Mayflower Avenue — Linear and wayfinding improvements

The routes and projects were presented to the Steering Committee and the public who were asked to prioritize and provide input on the specific projects.

4.4 Prioritization

The prioritization methodology is depicted in Table 4-1, and results from the prioritization process are provided in Table 4-2. Prioritization results are meant to serve as a general guide. There may likely be opportunities to implement these projects in an order different from the order in which they were prioritized. For example, if NCDOT is repaving Eagle Road, then it would be advantageous to explore shared lane markings even though the project may have ranked lower than other projects. The prioritization in this plan should generally be followed as it directly reflects Steering Committee input and community feedback

captured during public meetings and an online survey. This should not, however, prevent the town from taking advantage of bicycle improvements as opportunities present themselves. It is beneficial to implement bicycle projects on the same road segment simultaneously in order to realize cost savings and minimize disruptions due to construction.

The National Cooperative Highway Research Program (NCHRP) Report 803: Pedestrian and Bicycle Transportation Along Existing Roads - ActiveTrans Priority (APT) Tool Guidebook (2015) was used as a methodology for prioritizing bicycle projects in the Town of Cramerton. These projects were ranked by each individual linear and spot project (see Section 4.2) using the APT provided spreadsheet. Prioritization scores for each corridor improvement were based on a set of eight factors, as prescribed in the APT methodology. These factors were custom-selected for this plan based on input from Steering Committee members in order to best reflect Cramerton's community values and priorities. Weight factors were then applied to indicate the relative importance of different factors. A set of variables for each factor was then designated. Variables are characteristics of the roadways, neighborhoods, or other features related to the proposed project(s) that can be measured qualitatively or quantitatively. The traffic speed of a roadway, bicycle crashes, or results from a public input survey are all examples of measurable characteristics. After data were collected, assessed, and entered into the APT spreadsheet, variables were scaled (normalized along numeric scales). The resulting output is the calculation of priority score and rank for each individual project within the proposed corridor. Table 4-1, on the next page, summarizes the factors, weight of factors, and variables used in the prioritization of projects.

The APT spreadsheet has a series of 10 tabs, each denoting a step in the prioritization process. As stated above, factors are selected, weighted, and variables designated. Each variable is then measured and data are assessed and entered into the spreadsheet.

These variables are then scaled, where a numerical value is assigned to the "yes" and "low" results. This is done so that the variables can be more equitably compared across projects and variables. This information is then processed through a calculation of priority scores where the weight of that factor places either more or less importance in the overall calculation. For example, "Stakeholder Input" for all projects has the highest weight factor of 10, resulting in this being the most important factor with the most weight, where the "Constraints" factor has a weight of 5.

Table 4-1: Prioritization Methodology

Factors	Weight of Factors	Variables
Stakeholder Input	10	• Number of requests (public outreach exercises) • Steering Committee and public comments • Public involvement ranking (public outreach exercise)
Constraints	5	• Available right-of-way • Utility relocation • Order of magnitude cost (based estimate)
Safety	8	• Public involvement (public outreach exercise) • Total bicycle/pedestrian crashes

Factors	Weight of Factors	Variables
Existing Conditions	5	• Posted speed limits • Presence of paved shoulders • Presence of sidewalks
Demand	5	• Proximity to community services • Public involvement (public outreach exercise)
Connectivity	8	• Connection to existing facility/facilities • Public involvement (public outreach exercise)
Equity	5	• Public involvement (public outreach exercise)

Based on The National Cooperative Highway Research Program (NCHRP) Report 803: Pedestrian and Bicycle - Transportation Along Existing Roads - ActiveTrans Priority (APT) Tool Guidebook (2015).

The top prioritized proposed projects are shown as Priority Projects 1 – 5 on pages 56 – 71 on cut sheets. The prioritization informs the organization of the recommendations in Section 4.5.

4.5 Recommended Bicycle Projects

Infrastructure and wayfinding projects were recommended to provide overall improvements to the existing system while offering a robust bicycle network that connects Cramerton facilities and destinations. Policies and programs are also proposed and outlined in Sections 4.7 and 4.8. These are intended to work in tandem with the recommended spot and linear improvements, which are often constructed concurrently.

Project recommendations are shown on Map 4-1 and Map 4-2 later in the chapter. Table 4-3 may be used as reference to these maps.

Table 4-2: Map Identification

Project	Project Type	Map ID
Town of Cramerton and Centennial Center	Wayfinding	1
Eighth Avenue	Sharrows and wayfinding	2
Eagle Road	Bike lanes and wayfinding	3
Eagle Road Railroad Crossing	Crossing improvements	4
Riverside Park	Bicycle parking and wayfinding	5
Goat Island Park	Bicycle parking and wayfinding	6
C.B. Huss Recreation Complex	Bicycle parking	7
Food Lion Shopping Plaza	Bicycle parking and wayfinding	8
Centennial Center	Bikeshare station	9
Wilkinson Boulevard/Market Street	Crossing improvements	10
Market Street	Sharrows and wayfinding	11

Project	Project Type	Map ID
Mayflower Avenue	Sharrows and wayfinding	12

A town bicycling route network was created identifying bicycling routes for users of all experience levels (see Map 4-1). Designated bicycling routes safe for bicyclists of all experience levels were discussed numerous times in Steering Committee meetings, and were identified as areas needing appropriate wayfinding signage for residents and visitors. The steering committee identified three levels of bicycling experience: beginner, intermediate, and advanced. Unique bicycling routes were sought to provide options for bicyclists of each experience level based on common and existing bicycling routes, origins, and destinations. When considered together, three common themes arise:

- Schools are locations where young bicyclists and families bicycle in groups. The Cramerton Parks and Recreation Department, in fact, organizes rides for young bicyclists at Stuart W. Cramer High School.
- Eighth Avenue bisects downtown Cramerton and is an essential bicycling route through the town, providing access to the Centennial Center, Goat Island Park, and planned bicycling routes connecting to Belmont, McAdenville, and into the hills.
- Belmont and McAdenville are interested in providing better bicycling connections with Cramerton and neighboring municipalities.

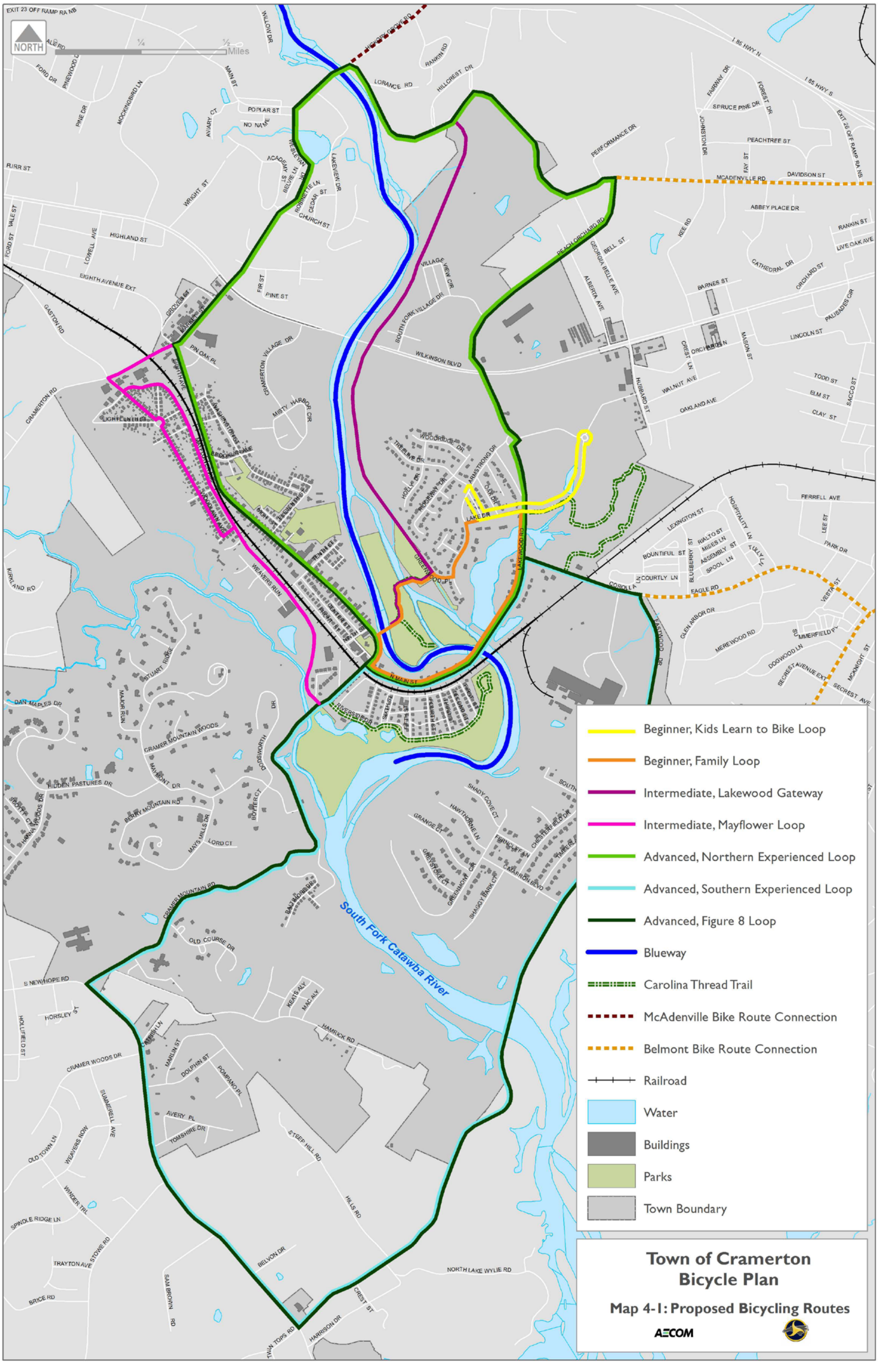
The existing roadways connecting origins and destinations, however, are heavily used by vehicles, and they are considered unsafe to bicyclists, particularly beginner and intermediate bicyclists. Safety concerns include narrow travel lanes, leaving little room between vehicles and bicyclists and hilly roadway slopes that both make it difficult to see bicyclists and enable vehicles to increase their speeds over the speed limit. Within the community survey, respondents identified a lack of enforcement of existing traffic speed limits and laws while not communicating concern with the existing speed limits. Wayfinding signage would contribute to developing a bicycling culture within Cramerton that provides bicycling alternatives to residents and visitors of all experience levels. In addition, wayfinding signage would make vehicle drivers more aware of the presence of bicyclists in the community.

The Steering Committee identified seven bicycling routes in Cramerton, and they are presented in Table 4-4 and displayed on Map 4-1.

Table 4-3: Proposed Bicycle Route Connectivity

Bicycling Corridor	Experience Level	Location/Extent	Length (miles)
Figure 8 Loop	Advanced	• Eighth Avenue • Market Street • Wesleyan Drive • McAdenville Road • Peach Orchard Road • Lakewood Road • North Main Street • Cramer Mountain Road • South New Hope Road • Armstrong Ford Road • Eastwood Drive • Eagle Road	11.8
Northern Loop	Advanced	• Eighth Avenue • Market Street • Wesleyan Drive • McAdenville Road • Peach Orchard Road • Lakewood Road • North Main Street	5.4
Southern Loop	Advanced	• Lakewood Road • North Main Street • Cramer Mountain Road • South New Hope Road • Armstrong Ford Road • Eastwood Drive • Eagle Road	6.4
Lakewood Gateway	Intermediate	• Goat Island Park • Greenwood Place	1.8
Mayflower Loop	Intermediate	• Mayflower Avenue • Woodlawn Avenue	1.5
Family Loop	Beginner	• Goat Island Park • Greenwood Place • Armstrong Drive • Lake Drive • Lakewood Road • North Main Street	1.6

Bicycling Corridor	Experience Level	Location/Extent	Length (miles)
Kids Learn to Ride Loop	Beginner	• Lake Drive • Armstrong Drive • Stuart W. Cramer High School Entrance Road	1.2



Map 4-1: Proposed Bicycling Routes

Priority Projects 1 through 5

Projects receiving the highest priority rankings (1 through 5) are on the following pages as cutsheets 1-5.

PROJECT 1: Centennial Center wayfinding improvements

Background

The Town of Cramerton attracts bicyclists of many ages and experience levels from children learning to bicycle and experienced bicyclists riding through the hilly terrain. Downtown Cramerton's Centennial Center is a community gathering place, and an important destination for bicyclists of all experience levels and a point through which bicyclists of all experience levels pass. The town has proposed and funded the construction of a Bike Fix-It Station in the Centennial Center that will include bicycle parking and resources for basic maintenance.

Existing Conditions

The Centennial Center is a central space in the town for residents and visitors and experiences much bicycling, pedestrian, and vehicle traffic accessing downtown parks, shopping, and events. In addition to the future Bike Fix-It Station, the town will locate a new veteran's memorial in the Centennial Center. The primary existing bicycle facilities and trails identified in Section 2.7 pass by or have access points near the Centennial Center. Table 4-5 lists existing and proposed bicycle facilities accessed near the Centennial Center.

Table 4-4: Bicycle Facilities Accessed from Centennial Center

Bicycle Facility	Status	Accessible Destinations
Eighth Avenue	Existing	• Town Hall • Goat Island Park • C.B. Huss Recreation Complex • Central Park • Food Lion shopping plaza
North Main Street/Lakewood Road	Existing	• Eagle Road • Eastwood Drive protected bike lane (accessed via Eagle Road) • Belmont Central Elementary School (accessed via Eagle Road) • Stuart W. Cramer High School and Carolina Thread Trail
Cramer Mountain Road	Existing	• Riverside Park and Carolina Thread Trail • Cramerton Middle School • Cramer Mountain Country Club • Mountain bicycle routes • South New Hope Road
Goat Island Park	Existing	• Carolina Thread Trail • South Fork Catawba River • Park amenities
Bike Fix-It Station	Proposed (northwest section of Centennial Center)	

Challenges

Safety has been identified as the primary challenge for bicyclists within and passing through Cramerton. While safety concerns involve several issues, especially infrastructure, a lack of wayfinding signage is a contributing factor. While bicycling facilities are available that connect users to nearby amenities, Cramerton lacks cohesive and consistent wayfinding signage providing information about amenities and bicycle routes. Within Cramerton's road network, the protected bike lane on Eastwood Drive is the only facility with signage and separation from vehicles. Wayfinding assists bicyclists in planning their trips from start to finish and encourages recognizable trip patterns. As bicycle routes become more patterned and recognizable, this helps vehicle drivers know what to expect when they encounter bicyclists.

Project Map 4-1: Centennial Center wayfinding improvements

Recommended Improvements

The recommended improvements are intended to provide bicyclists of all experience levels, both residents and visitors, with direction to identified bicycle corridors and amenities throughout Cramerton and improve safety and visibility for bicyclists. This project will provide standardized wayfinding signage in the Centennial Center that will be implemented throughout Cramerton over the long-term. As a central convergence point for bicycling activity throughout Cramerton, as noted above, wayfinding signage in the Centennial Center will provide information on how to access bicycling corridors, their lengths, the experience levels necessary for each corridor, and nearby amenities. In the long-term, recommended wayfinding signage will be implemented along the bicycling corridors in Cramerton (see Project Map 4-1 and Table 4-6).

Figure 4-1: Centennial Center Wayfinding Improvements

Table 4-5: Centennial Center Wayfinding Improvements

Description	Location/Extent	Recommended Number of Signs	Cost*
Wayfinding signage at the entrance and exit of the Centennial Center on Eighth Avenue	Ninth Street/ North Main Street	2	$650 - $2,000
Wayfinding signage on both sides of the entrance to Goat Island Park on Eighth Avenue		2	$650 - $2,000

*The range of costs is discussed in further detail in Section 4.6.

PROJECT 2: Eighth Avenue linear and wayfinding improvements

Background

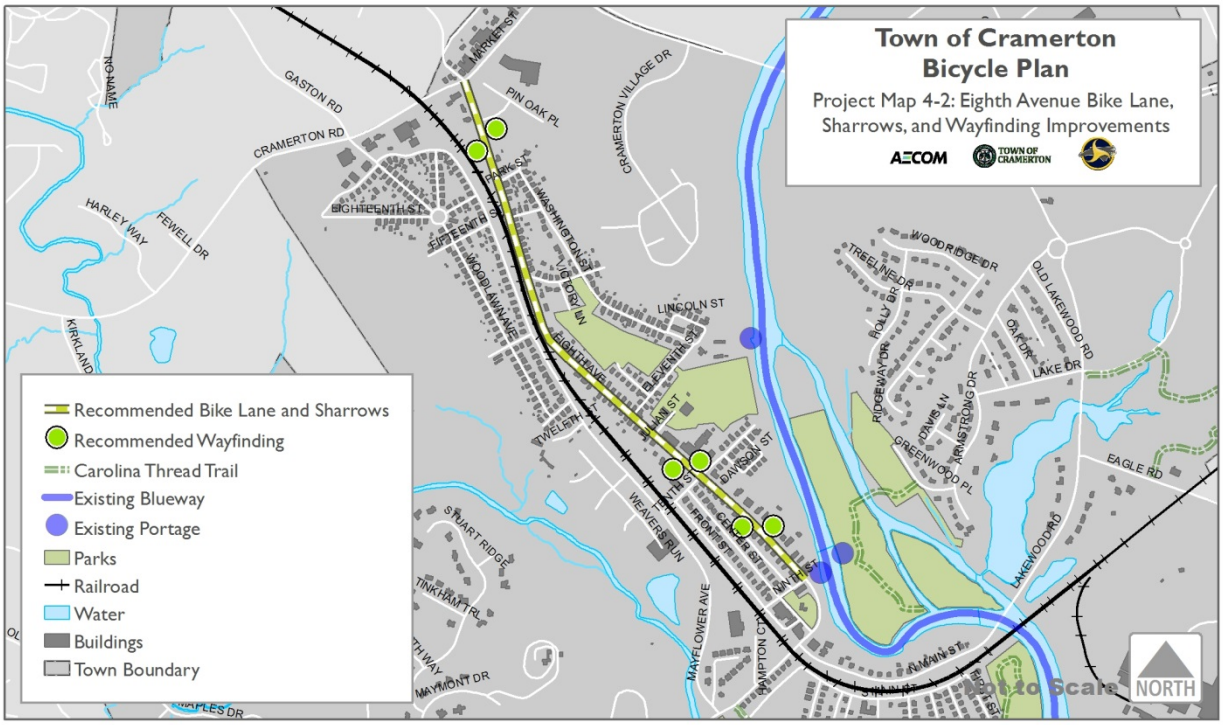
Eighth Avenue is a central roadway for accessing downtown Cramerton, the business district, parks and recreation amenities, and bicycling routes that extend through the surrounding hills. Eighth Avenue provides access to Town Hall, the Centennial Center, Goat Island Park, and C.B. Huss Recreation Complex. In addition, the roadway connects to Cramer Mountain Road, North Main Street/Lakewood Road, and Market Street adjacent to the Food Lion shopping plaza. The Steering Committee noted much existing bicycling activity along the roadway but safety concerns due to the steep slope of the roadway.

Existing Conditions

Eighth Avenue provides access to open space, recreational amenities, businesses, churches, and a residential neighborhood. The roadway is 1.35 miles long. It begins in downtown Cramerton at Riverside Drive and extends northwest to Market Street passing Town Hall, the Centennial Center, and Goat Island Park. As Eighth Avenue moves northwest away from downtown Cramerton, it is on a steady uphill slope to Market Street. It has sidewalks on the eastern side of the street and on the western side from downtown to a point in which the roadway runs parallel to the railway. The road has a curb and gutter on both sides.

Challenges

While bicycling is common along Eighth Avenue, the Steering Committee noted safety challenges to bicyclists due to the steep slope of the roadway. Bicyclists riding northwest away from downtown must climb a steep slope, which creates a hazard as bicyclists are moving at slower speeds than vehicles. Moving southeast, bicyclists are able to accelerate to higher speeds as they ride downhill, which makes slowing a bicycle more difficult. Currently, there is no signage or pavement markings present to inform vehicles and bicycles to share the roadway. Pavement markings and a designated bicycling lane will provide protection to bicyclists struggling to climb uphill and riding natural momentum downhill.



Project Map 4-2: Eighth Avenue linear improvements

Recommended Improvements

The recommended improvements for Eighth Avenue are intended to improve the safety and visibility of bicyclists and provide additional safe connections from downtown Cramerton to Market Street near a prominent commercial area. Due to limitations in available pavement and right-of-way, a dedicated on-road bicycle facility on road is not feasible. In the short term, the recommendation for Eighth Street is to install sharrows in both directions from Main Street to Market Street. The project includes bicycle lane and sharrow pavement markings and signage along the roadway to alert vehicles to the presence of sharrows (see Project Map 4-2 and Table 4-7).

Figure 4-2: Eighth Avenue Recommended Linear and Wayfinding Improvements

Source: AASHTO. 2012. *Guide for the Development of Bicycle Facilities*

Table 4-6: Eighth Avenue Linear and Wayfinding Improvements

Type	Description	Location/Extent	Recommended Number of Signs	Cost*
Linear	Add sharrows on the east and west sides of Eighth Avenue	Ninth Street/Market Street	n/a	$80,000 - $184,000
Spot	Wayfinding signage on both sides of Eighth Avenue	Ninth Street/Market Street	6	$2,000 - $6,000

*The range of costs is discussed in further detail in Section 4.6.

PROJECT 3: Eagle Road linear and wayfinding improvements

Background

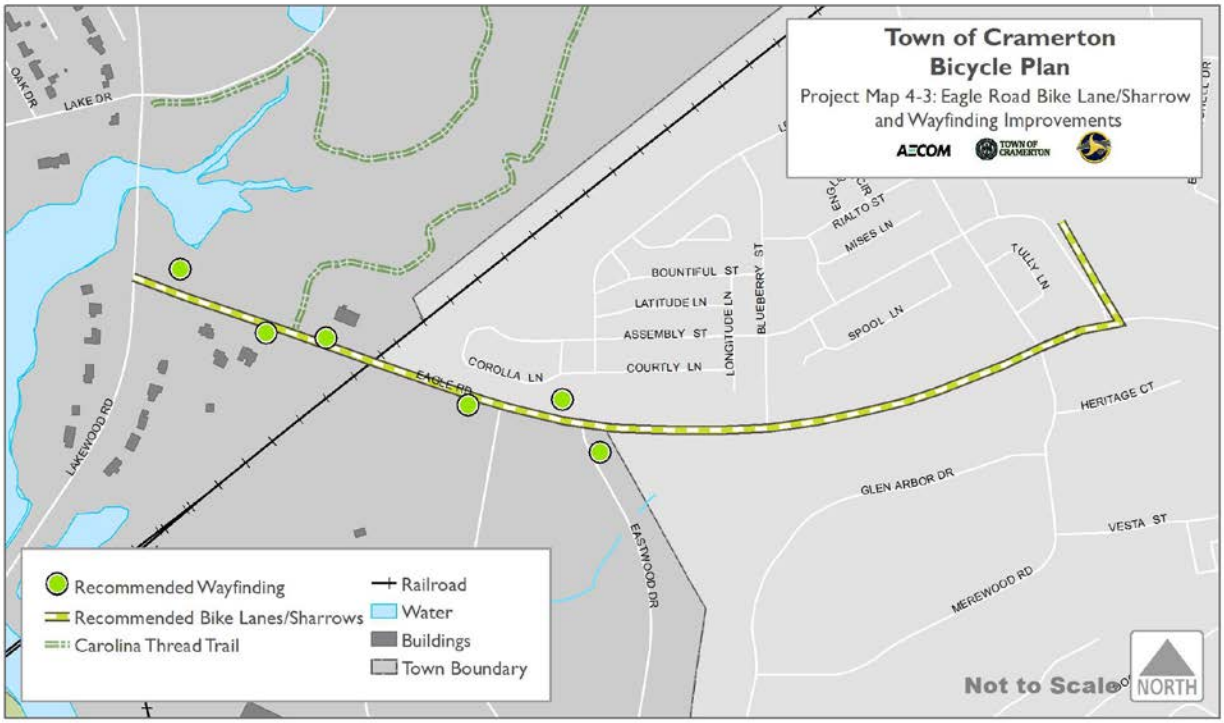
Eagle Road provides a connection between Cramerton and neighboring Belmont. The Steering Committee desired increased bicycling connections between Cramerton and Belmont. Belmont Central Elementary School, which is accessible from Eagle Road, is a common meeting point for bicyclists in both Cramerton and Belmont. In addition, Eagle Road intersects with the northern terminus of Eastwood Drive, which contains the only protected bicycle lane in Cramerton.

Existing Conditions

There is a steady uphill slope as Eagle Road moves east and towards Belmont. There are currently no paved shoulders or curb and gutter along Eagle Road, and the roadway width is limited to 25 feet. Drainage ditches are on both sides of the roadway. There are no pavement markings or signage to alert vehicles of bicyclists. The City of Belmont currently is completing a residential subdivision on the north side of the roadway and plans to implement sidewalks on the north side of the road. The Norfolk Southern Railroad bisects Eagle Road near the intersection of Eagle Road and Lakewood Road.

Challenges

There are many challenges to create bicycling improvements along Eagle Road. First, the existing 25-foot roadway width is of insufficient size to implement bicycle lanes on either side of the road. An additional 5 feet of pavement is required to implement a bicycle lane on the uphill side of the road. Second, because there is limited roadway space for bicyclists, the 35 mph speed limit creates a safety challenge in which many bicyclists do not feel safe with passing vehicles. Third, the land north of Eagle Road and east of the railroad is part of Belmont. The southern side of Eagle Road is a part of Cramerton. Coordination with Belmont is required for recommendations that involve the land north of Eagle Road.



Project Map 4-3: Eagle Road linear improvements

Recommended Improvements

The recommended improvements for Eagle Road are intended to improve the safety and visibility of bicyclists and provide additional safe connections to Belmont and Belmont Central Elementary School. Recommendations include widening the road to accommodate bicycle lanes on both sides of the road. Incorporating bike lanes along Eagle Road would be the safest opportunity for bicyclists to travel between Cramerton and Belmont and access the protected bike lane on Eastwood Drive. The project begins at Lakewood Road and ends at Belmont Central Elementary School on Assembly Street. The project includes road widening, addition of bicycle lanes and signage along the roadway to alert vehicles to the presence of a bicycle lanes (see Project Map 4-3 and Table 4-8). A long-term recommendation is to consider constructing a side path on one side of the road.

Figure 4-3: Eagle Road Recommended Linear and Wayfinding Improvements

Table 4-7: Eagle Road Linear and Wayfinding Improvements

Type	Description	Location/Extent	Recommended Number of Signs	Cost*
Linear	Widen Eagle road to accommodate 5-foot bike lanes	Lakewood Road/ Belmont Central Elementary School	n/a	$463,400 - $642,000
Linear	Add bike lanes on both sides of Eagle Road after the road is widened	Lakewood Road/ Belmont Central Elementary School	n/a	$638,000 - $906,800
Spot	Wayfinding signage on both sides of Eagle Road	Lakewood Road/ Belmont Central Elementary School	6	$2,000 - $6,000

*The range of costs is discussed in further detail in Section 4.6.

PROJECT 4: Eagle Road railroad crossing improvements

Background

Norfolk Southern Railroad owns and operates a railway through Cramerton that crosses Eagle Road east of the intersection of Lakewood Road and Eagle Road. Railroad crossings often are considered unsafe for bicyclists as bicycle wheels can get caught in the flangeway between the asphalt and tracks. In addition, asphalt along railroad crossings heave and crack over time making it hazardous for bicycles. Improvements to this crossing would provide safe and smooth crossing conditions for bicyclists and reduce the risk of bicycle damage or bicyclists falling.

Existing Conditions

Currently, the railroad crossing on Eagle Street consists of asphalt abutting the railroad tracks and between the tracks. Rubber strips are in the flangeway. The asphalt, however, has begun to crack and heave resulting from the stress of trains passing over it. The width of the asphalt at the crossing is the same as the roadway, so bicyclists passing occupy the road with vehicles.

Challenges

Making improvements to the railroad crossing requires coordination with Norfolk Southern, which owns the railroad, for the project design and construction. In addition, there is a Cramerton Emergency Medical Services (EMS) facility in the northwest quadrant of Eagle Road and the railroad, and ambulances use Eagle Road. Coordination with EMS will be required during project construction if Eagle Road will be closed for any length of time.

Project Map 4-4: Eagle Road railroad crossing improvements

Recommended Improvements

The recommended improvements at the railroad crossing on Eagle Road are intended to improve the safety of bicyclists crossing the railroad tracks. AASHTO recommendations in the *Guide for the Development of Bicycle Facilities* will be used to implement a bicycle crossing across the railroad tracks. Concrete is recommended for the crossing surface. Concrete is preferred to rubber, timber, and asphalt. Both rubber and timber become slippery when wet and degrade faster over time. Asphalt heaves over time and requires maintenance to prevent asphalt buildup next to the railroad tracks. The flange openings between the concrete and track should be filled with rubber, which is recommended for heavy rail lines. Rubber fillers become depressed by rail wheels as the train rides over the filler, but the filler rises again after the train has passed to keep the flangeway opening limited. A shorter flangeway decreases the risk of bicycle wheels getting caught (see Project Map 4-4 and Table 4-9).

Figure 4-4: Eagle Road Recommended Railroad Crossing Improvements

Table 4-8: Eagle Road Railroad Crossing Improvements

Type	Description	Location/Extent	Cost*
Spot	Install concrete crossing with rubber in the flange opening.	Eagle Road at Norfolk Southern Railroad crossing	$12,500

*The range of costs is discussed in further detail in Section 4.6

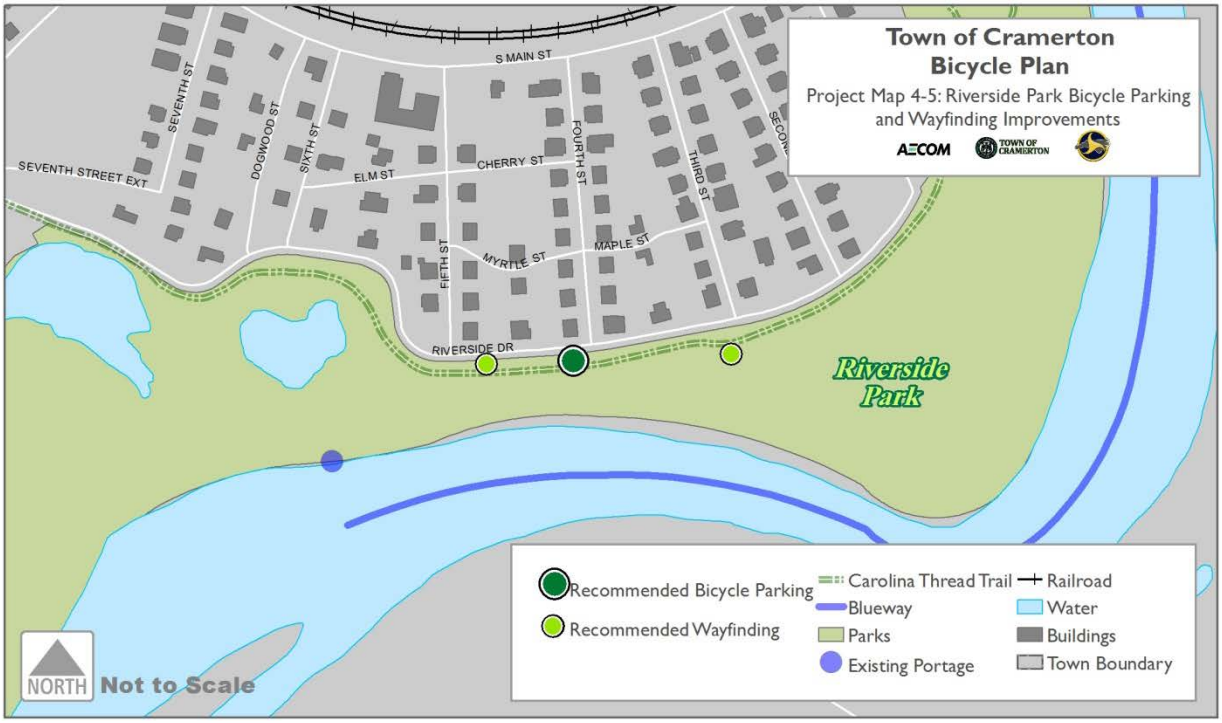
PROJECT 5: Riverside Park bicycle parking improvements

Connections

Riverside Park is a site for a variety of bicycling and pedestrian activities. As part of the Carolina Thread Trail, it offers paved and unpaved trails accessible to all types of users, including children and families. Located along the South Fork Catawba River, Riverside Park has a portage used for kayaks and canoes and provides space for fishing. Currently, pedestrians are able to access Riverside Park via sidewalks, and vehicles access Riverside Park's parking lot via Riverside Drive.

Existing Conditions

While the Carolina Thread Trail in Riverside Park accommodates bicycles, there is no bicycle parking available in the park closest to the river access and area where most recreational activity occurs. Residents and visitors are able to walk and drive to Riverside Park, but bicycling carries a risk as bicyclists are unable to lock their bicycles if they want to stay in the park. Bicycle parking would allow bicyclists to access and stay in Riverside Park instead of just passing through on the trails.



Project Map 4-5: Riverside Park bicycle parking and wayfinding improvements

Recommended Improvements

The recommended improvements at Riverside Park include implementing a bicycle parking rack in the open space adjacent to the Riverside Park parking lot. The bicycle rack should accommodate 10 bicycles using 5 inverted U loops. To maintain the aesthetic character of the park, the bicycle rack area will be unpaved with mulch cover with the legs of the hoops being embedded in concrete footing (see Project Map 4-5 and Table 4-10).

Figure 4-5: Riverside Park Bicycling Parking Improvements

Table 4-9: Riverside Park Bicycling Parking Improvements

Type	Description	Location/Extent	Recommended Number of Signs	Cost*
Spot	Construct bicycle parking station at the pedestrian entrance to Riverside Park and adjacent to the vehicle parking lot	Riverside Park	n/a	$2,700
Spot	Wayfinding signage on both sides of shared path in Riverside Park	From Riverside Park entrance to Riverside Drive	2	$650 - $2,000

*The range of costs is discussed in further detail in Section 4.6.

Priority Projects 6 through 12

The Steering Committee identified seven additional locations for recommended spot improvements, and these recommendations were scored 6 through 12 in the prioritization process. These projects are outlined below (see Table 4-11).

PROJECT 6: Goat Island Park bicycle parking improvements

Background

Goat Island Park is a central recreational and open park space in downtown Cramerton. A bridge over the South Fork Catawba River provides access from the Centennial Center, and there is a playground and multi-use trails within and extending from the park. River access is provided on both sides of the river at two kayak and canoe portages.

Existing Conditions

Access to Goat Island Park is designed for pedestrians and golf carts, but there currently is no bicycle parking available on either side of the South Fork Catawba River. Visitors driving to Goat Island Park have two options for parking. At the western entrance, vehicles can park at the Centennial Center, and pedestrians walk across the pedestrian bridge over the South Fork Catawba River. Visitors at the eastern entrance use a parking lot off of Greenwood Place accessed by Armstrong Drive. They can then walk across another pedestrian bridge to Goat Island Park. Kayak and canoe portages are located near each pedestrian bridge. Neither entrance has bicycle parking. Currently, bicyclists can only pass through the park or risk parking their bicycles without appropriately locking them.

Recommended Bicycle Elements	**Bicycle parking adjacent to the vehicle parking lot in Goat Island Park accessed from Armstrong Drive and Greenwood Place.**

PROJECT 7: C.B. Huss Recreation Complex bicycle parking improvements

Background

The C.B. Huss Recreation Complex contains many town recreational and community amenities. It provides open space, a kayak and canoe portage, a community pool, and community center used for many types of meetings. The Cramerton Parks and Recreation Department plans many of its community events to be held or begin at the recreation complex. It is accessed off of Eighth Avenue and is within walking distance of downtown Cramerton. Steering Committee meetings for this plan were held at this location.

Existing Conditions

C.B. Huss Recreation Complex consists of recreational and community center facilities owned and operated by the town. A trail behind the Community Center leads to a kayak and canoe portage along the South Fork Catawba River. There is no bicycle parking available, but there is vehicle parking at the Community Center and Rader Staff Development Center. Because the town owns the entirety of the C.B. Huss Recreation Complex property, providing bicycle parking would not require coordination with private property owners or the acquisition of additional property. The terrain to the north side of the road slopes downward and contains heavy vegetation. Speeds along Washington Street/Alt US 74 are 45 mph.

Opportunities

Because the C.B. Huss Recreation Complex is accessed from Eighth Avenue, the recommended linear improvements on Eighth Avenue (Project 2) could facilitate increased bicycling activity to the recreation complex. In addition, because the town owns the recreation complex, identifying a location for bicycle parking would not require additional right of way or property acquisition.

Recommended Bicycle Elements	**Bicycle parking adjacent to the vehicle parking lot in the C.B. Huss Recreation Complex accessed from Eighth Avenue.**

PROJECT 8: Market Street Food Lion shopping plaza bicycle parking improvements

Background

The Food Lion shopping plaza on Market Street in north Cramerton serves as the nearest grocery store for the town and contains many other stores. The Steering Committee identified bicycling as a transportation alternative to access this shopping area for residents without access to vehicles and the lack of public transit.

Existing Conditions

Market Street provides access to the shopping plaza and the parking lot. In addition to Food Lion, there is a Dollar General and two restaurants. Currently, bicycling access to the shopping plaza is limited. Market Street is a five-lane roadway with no bicycling facilities and intersects with Wilkinson Boulevard (US 74/29). Once on the shopping plaza property, there is no bicycle parking available. The northern portion of Eighth Avenue crosses Market Street just south of the shopping plaza. Because of its proximity to Eighth Avenue, the Steering Committee identified this plaza as an opportunity to provide bicycle parking. Observations of this site included several bicyclists on Market Street and turning to go downhill on Eighth Avenue.

Opportunities

In conjunction with Projects 1 and 2, Eighth Avenue and Market Street are identified as bicycling corridors, and a bicycle lane and sharrows are recommended on Eighth Avenue. As an important connection to the Food Lion shopping plaza the completion of Project 2 would provide safer bicycling access to the Food Lion shopping plaza and encourage more bicycling.

Challenges

Identifying space for bicycling parking in the Food Lion shopping plaza requires coordination with the property owners. Suitable space for bicycle parking likely sits on private property.

Recommended Bicycle Elements	**Bicycle parking within the Food Lion shopping plaza and adjacent to the vehicle parking lot off of Market Street.**

PROJECT 9: Centennial Center bikeshare station improvements

Background

Projects 1 and 2 express the importance of the Centennial Center to Cramerton, the downtown business district, and the community's social, cultural, and recreational life. The Centennial Center is the focal point of all these things. For this reason the town will implement the Bike Fix-It Station and new veterans' memorial on the Centennial Center grounds. The Steering Committee identified a bikeshare station as a way to provide additional bicycling opportunities to bicyclists of all experience levels in downtown Cramerton.

Existing Conditions

Currently, the Centennial Center is at the center of downtown Cramerton and is adjacent to or nearby many restaurants, local shops, churches, parks, and Town Hall. Goat Island Park, which provides connections to the Carolina Thread Trail and proposed beginner and intermediate bicycling corridors, can be accessed easily and safely from the Centennial Center. A bikeshare station would provide residents and visitors without bicycles additional recreational opportunities to enjoy downtown. Gaston County Travel and Tourism could be a potential partner for the development and installation of a bikeshare station in downtown Cramerton.

Challenges

Bikeshare has become a popular active transportation alternative in cities, but it is more difficult to implement in small towns like Cramerton. Bicycles must be purchased and maintained, and the bikeshare station must be managed by personnel who release and collect bicycles from customers. A common bikeshare model for small towns is for a local bicycle shop to rent bicycles to residents and visitors on an hourly or daily basis. South Main Cycles in neighboring Belmont provides this type of service.

Recommended Bicycle Elements	**Provide a bikeshare station within the proposed Bike Fix-It Station. The Bike Fix-It Station already contains a bicycle parking rack, and the bikeshare station will include an additional covered bicycle parking rack for rental bicycles, new bicycles, and locks.**

PROJECT 10: Market Street and Wilkinson Boulevard crossing improvements

Background

Market Street intersects Wilkinson Boulevard near the Food Lion shopping plaza in northern Cramerton. Market Street provides a bicycling connection from Cramerton to McAdenville and the Food Lion shopping plaza described in Project 8. Wilkinson Boulevard (US 74/29) crosses through north Cramerton from west to east and links Gastonia to Charlotte. The Gaston-Cleveland-Lincoln MPO produced The *Wilkinson Boulevard*

Corridor Study, which proposes lane widenings and corridor improvements to Wilkinson Boulevard in Belmont, Cramerton, and McAdenville. The Steering Committee noted that Market Street is in need of crossing improvements for bicyclists as it crosses Wilkinson Boulevard. Crossing improvements on Market Street at this intersection can improve safety for bicyclists traveling between Cramerton and McAdenville.

Existing Conditions

The Market Street and Wilkinson Boulevard intersection is four-legged. Wilkinson Boulevard contains seven lanes of traffic each of which is approximately 12 feet in width. Currently, Wilkinson Boulevard is not designated as a bicycling route, and the Steering Committee noted that bicycling is not promoted along the roadway due to high vehicle traffic and speeds. Market Street includes 8 foot to 10 foot lanes with no curb and gutter, no shoulders and no sidewalks, and posted speed limits of 35 mph. Right-of-way in the corridor is approximately 40 feet. At the intersection with Wilkinson Boulevard, Market Street has four travel lanes.

Challenges

Challenges to implementing crossing improvements along Market Street at the intersection with Wilkinson Boulevard include right-of-way constraints and limited travel lanes, which restricts the opportunities for installing bicycling improvements. It is challenging to widen the roadway to implement a bicycle lane on the northbound travel lane on Market Street between the right turn lane and through lane. The same constraints exist on the southbound travel lane on Market Street between the through lane and left turn lane. The only opportunity to implement bicycling facilities on Market Street at this intersection is to add shared lane pavement markings on the northbound and southbound through lanes. Bicyclists still must ride among vehicle traffic on Market Street without protection. The Steering Committee noted the pursuit of recommendations from the *Wilkinson Boulevard Corridor Study*, which includes the intersection with Market Street. As that roadway changes, the town should consider a feasibility study considering a road diet along Market Street from Eighth Avenue to Wilkinson Boulevard. The current AADT of 9,600 could accommodate a roadway reduction to then implement more bicycling and pedestrian accommodations.

Recommended Bicycle Elements	**Shared lane pavement markings and bicycle warning signage (MUTCD W11-1) along Market Street on the northbound and southbound travel lanes on both sides of the intersection with Wilkinson Boulevard.**

PROJECT 11: Market Street linear improvements

Background

Market Street provides a connection from Cramerton to neighboring McAdenville from south to north. The Steering Committee noted that experienced bicyclists use Market Street on long distance routes passing through Cramerton, McAdenville, and Belmont. Project 10 in this plan addresses crossing improvements to the intersection of Market Street and Wilkinson Boulevard near the Food Lion shopping plaza in northern Cramerton. This project would connect with the shared lane markings at the Market Street and Wilkinson Boulevard intersection. Shared lane markings extending from the intersection of Market Street and Wilkinson Boulevard to Eighth Avenue and Woodlawn Avenue would provide a safer connection for bicyclists entering

and exiting Cramerton using Market Street. In addition, this project would connect projects 2, 8, 10, and 12 in this plan, thereby facilitating greater bicycling connectivity in northern Cramerton.

Existing Conditions

The portion of Market Street from Woodlawn Avenue to Wilkinson Boulevard is 0.4 miles long and provides access to commercial plazas on the northbound and southbound sides of the roadway. Market Street contains four lanes of traffic each of which is approximately 8 to 10 feet in width with no curb and gutter, no shoulders and no sidewalks, and posted speed limits of 35 mph. Right-of-way in the corridor is approximately 40 feet. The northbound and southbound portions of Market Street from Woodlawn Avenue to Eighth Avenue include one travel lane in each direction. Beginning at Eighth Avenue, Market Street has two lanes of traffic in both directions from Eighth Avenue to the northern entrance of the Food Lion shopping plaza. From that northern entrance to the intersection of Wilkinson Boulevard, there are three travel lanes in the northbound side of the roadway and one lane on the southbound side. The northbound side includes a left turn only lane, a through lane, and a right turn only lane.

Challenges

Challenges to implementing shared lane markings along the northbound and southbound sides of Market Street include potential conflicts between bicyclists and motorists in the southbound travel lane beyond the intersection with Wilkinson Boulevard and southbound bicyclists shifting travel lanes to turn left onto Eighth Avenue. An additional challenge is making any improvement to Market Street on the northern side of the intersection of Market Street and Wilkinson Boulevard because it is outside of the Cramerton municipal boundary and ETJ. Coordination with neighboring McAdenville would be required to continue the shared lane markings improvements along Market Street beyond Cramerton, which is identified as part of a bicycle route in this plan.

Recommended Bicycle Linear Elements	**Shared lane pavement markings and bicycle warning signage (MUTCD W11-1) along Market Street on the northbound and southbound travel lanes from Woodlawn Avenue to the intersection with Wilkinson Boulevard or the limits of Project 10.**
Recommended Bicycle Spot Elements	**Wayfinding signage on both sides of the roadway at two locations to provide guidance to bicyclists on the bicycle route connections available.**

PROJECT 12: Mayflower Avenue linear improvements

Background

Mayflower Avenue connects Cramer Mountain Road to Market Street on the west side of the railroad. Mayflower Avenue extends along the eastern side of a residential neighborhood that connects to Market Street through Woodlawn Avenue. Because it is located on the western side of the railroad, the residential neighborhood along Mayflower Avenue has limited access to downtown Cramerton, which provides a central link for bicycling routes throughout the Cramerton and surrounding municipalities. The two entrances to downton Cramerton from Mayflower Avenue are under the Tenth Street and Eighth Avenue underpasses. In

addition, the southern end of Mayflower Avenue is near the entrance to Riverside Park on Riverside Drive and bicycling routes moving west on Cramer Mountain Road.

Existing Conditions

Mayflower Avenue from Cramer Mountain Road to Woodlawn Avenue is 1.2 miles long passing along the eastern end of the Woodlawn Avenue historic neighborhood. Mayflower Avenue connects to Market Street through Woodlawn Avenue for 330 feet. Along this short stretch of Woodlawn Avenue are entrances to Cramerton Free Will Baptist Church and Cramerton Christian Academy. The topography along Mayflower Road rises approximately 125 feet from Cramer Mountain Road to Market Street. The travel lanes along Mayflower Avenue are 10 feet wide with a posted speed limit of 20 mph. Woodlawn Avenue also has 10-foot travel lanes and a speed limit of 20 mph.

Challenges

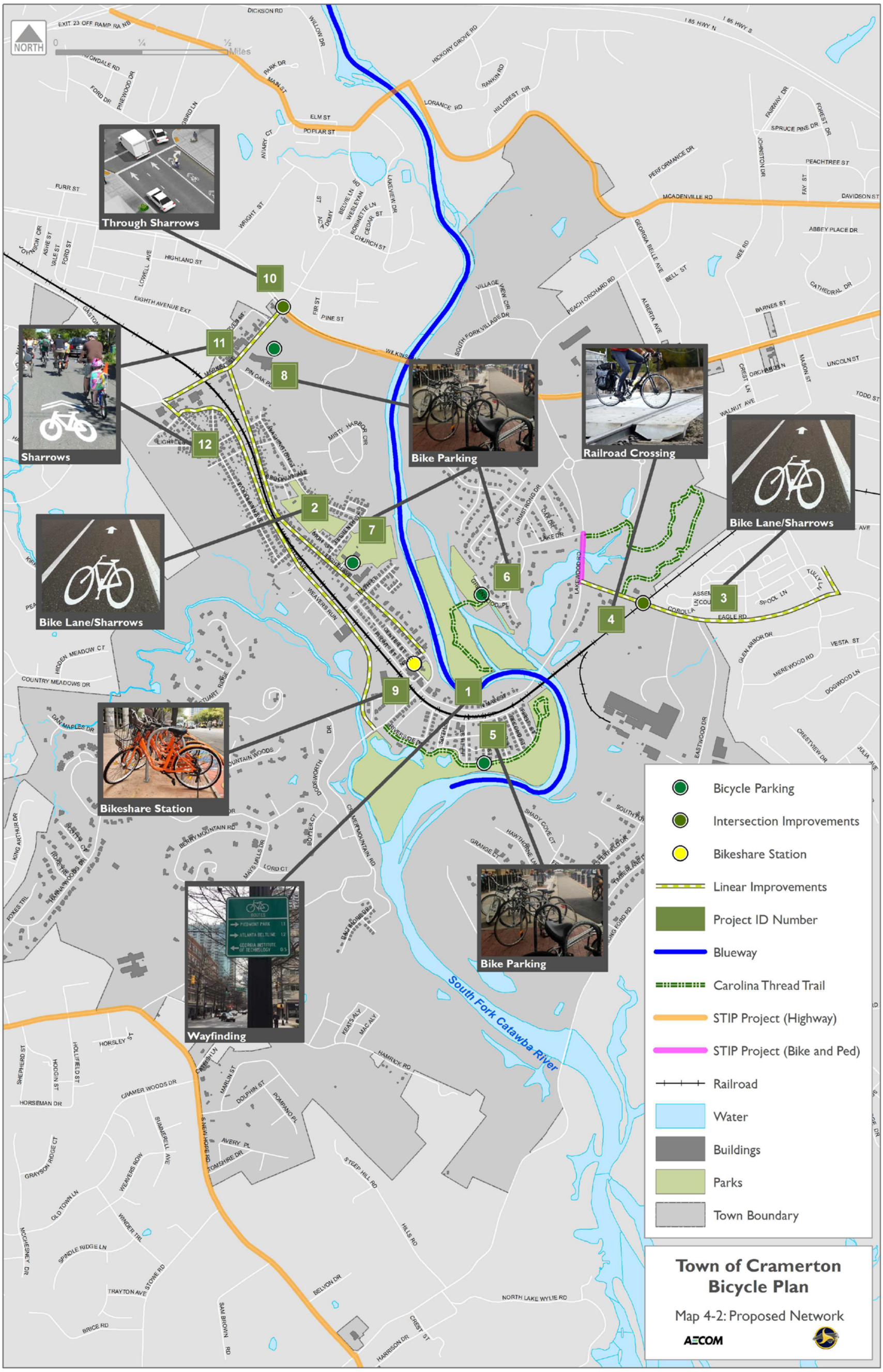
Challenges to the safe and effective use of implemented shared lane markings along the northbound and southbound sides of Mayflower Avenue include the topography and narrow travel lanes. The steep slopes along Mayflower Avenue are difficult for an average bicyclist to climb, and there are safety concerns for bicyclists traveling downhill at higher speeds. Traveling at faster speeds down Mayflower Avenue could pose a safety hazard as motorists approach bicyclists from behind. These challenges could be addressed by additional signage alerting motorists or traffic calming measures.

Recommended Bicycle Linear Elements	**Shared lane pavement markings and bicycle warning signage (MUTCD W11-1) along Mayflower Avenue on the northbound and southbound travel lanes from Cramer Mountain Road to Woodlawn Avenue and then from Woodlawn Avenue to Market Street.**
Recommended Bicycle Spot Elements	**Wayfinding signage on both sides of the roadway at two locations to provide guidance to bicyclists on the bicycle route connections available.**

Table 4-10: Recommended Projects 6 through 12

Recommended Improvement	Project Extents	Facility Group	Cost Estimate	Potential Implementation Constraints
PROJECT 6: Goat Island Park Bicycle Parking Improvement (Map ID 6)				
Construct bicycle parking rack	Goat Island Park entrance on Greenwood Place	Bicycle – Spot	$2,700	Fiscal constraints
Install wayfinding signage for bicycling corridors (recommended 2 signs)	Goat Island Park entrance on Greenwood Place	Bicycle – Spot	$650 -$1,990	Fiscal constraints
PROJECT 7: C.B. Huss Recreation Complex Bicycle Parking Improvement (Map ID 7)				
Construct bicycle parking rack	C.B. Huss Recreation Complex off of Eighth Avenue	Bicycle – Spot	$2,700	Fiscal constraints
PROJECT 8: Market Street Bicycle Parking Improvements (Map ID 8)				
Construct bicycle parking rack	Food Lion shopping plaza on Market Street	Bicycle – Spot	$2,700	The land available for a bicycle parking rack is privately owned and will require the town to coordinate with the shopping plaza owners to implement a bicycle rack
Install wayfinding signage for bicycling corridors (recommended 4 signs)	Market Street from Eighth Avenue to Wilkinson Boulevard	Bicycle – Spot	$1,300 to $4,000	Fiscal constraints
PROJECT 9: Centennial Center Bikeshare Station Improvements (Map ID 9)				
Construct additional bicycle parking rack for bikeshare station	Centennial Center on Eighth Avenue	Bicycle – Spot	$2,700	Fiscal constraints

Recommended Improvement	Project Extents	Facility Group	Cost Estimate	Potential Implementation Constraints
Purchase and maintain rental bicycles	Centennial Center on Eighth Avenue	Bicycle – Spot	$3,000	Acquiring and maintaining bikeshare bicycles will require the town to devote staff to renting out bicycles, making sure they are returned, and repairing and maintaining bicycles and could require coordination with Gaston County Travel and Tourism
PROJECT 10: Market Street/Wilkinson Boulevard Bicycle Crossing Improvements (Map ID 10)				
Shared lane markings (sharrows)	Market Street from Food Lion shopping plaza to Forest Heights Drive	Bicycle – Linear	$14,500 to $28,500	Posted speeds and traffic volumes may prohibit this road from being designated as a bicycle route
Share the road signage	Market Street from Food Lion shopping plaza to Forest Heights Drive	Bicycle – Spot	$1,300 to $4,000	Fiscal constraints
PROJECT 11: Market Street Linear Improvements (Map ID 11)				
Shared lane markings (sharrows)	Market Street from Woodlawn Avenue to Wilkinson Boulevard	Bicycle – Linear	$18,500 to $38,300	Fiscal constraints
Wayfinding signage	Market Street from Woodlawn Avenue to Wilkinson Boulevard	Bicycle – Spot	$1,300 to $4,000	Fiscal constraints
PROJECT 12: Mayflower Avenue Linear Improvements (MAP ID 12)				
Shared lane markings (sharrows)	Mayflower Avenue from Cramer Mountain Road to Woodlawn Avenue and Market Street	Bicycle – Linear	$47,500 to $110,300	Topography, narrow travel lanes, and fiscal constraints
Wayfinding signage	Mayflower Avenue from Cramer Mountain Road to Woodlawn Avenue and Market Street	Bicycle – Spot	$1,300 to $4,000	Fiscal constraints



Map 4-2: Proposed Bicycle Projects and Network

4.6 Cost Estimates for Recommended Bicycle Facilities

How Estimates Were Derived

Costs for bicycle infrastructure projects were estimated primarily using NCDOT's Bicycle and Pedestrian Facility Construction Cost Estimator Tool. The Pedestrian and Bicycle Information Center (PBIC)'s report titled *Costs for Pedestrian and Bicyclist Infrastructure Improvements* was used in cases where the NCDOT tool did not include a specific project type recommended by this plan. PBIC receives funding from the U.S. Department of Transportation Federal Highway Administration and is part of the University of North Carolina Highway Safety Research Center.

The NCDOT tool was released in fall 2016 in order to improve the accuracy of bicycle and pedestrian cost estimates. The tool establishes a common estimation methodology and derives average costs from more than 80 bicycle and pedestrian projects across the state. The tool is currently in a beta version and should be viewed as a complementary resource at this time. The PBIC report was published in October 2013 with over 1,700 cost figures from construction and engineering bids compiled nationwide in order to provide cost estimates for over 70 types of bicycle and pedestrian facilities. The report provides the average, median, high, and low cost estimates for each item. The median estimate was used for the purposes of this plan as the average estimate may be skewed by outliers.

The NCDOT tool was used to estimate costs for bicycle lanes, shared lane markings, and intersection treatments. For other types of projects not included in the NCDOT tool, wayfinding signage and bicycle parking, PBIC estimates were used.

The costs reported in this plan include preliminary engineering, high-level right-of-way costs, engineering and inspection, and construction. They do not include the costs of complementary site amenities such as trash receptacles, restroom facilities, benches, landscaping, water fountains, etc.

Range and Adjustment Factors

To account for uncertainty at this stage in the planning process, the costs for each project are reported as a range. The NCDOT tool includes percentile cost estimates so the 50th and 75th percentiles constitute the range. The PBIC report did not include percentile costs, so a 10 percent range is reported for those projects. Costs from both the NCDOT tool and PBIC resource are shown in 2016 dollars, adjusted by an annual inflation factor of 3.5 percent.

The estimated costs are approximate and are subject to change based on the current price of materials and labor. They are dependent on the actual conditions, which will be determined during the planning and engineering phase. The estimates provided are intended to serve as a relative guide for a rough order of cost magnitude.

Estimated costs for bicycle infrastructure projects are included in cutsheets 1-5 for highly prioritized projects and in Table 4-11.

4.7 Recommended Policies and Programs

Cramerton Ordinances and Codes Review

The Town of Cramerton's Code of Ordinances and Land Development Code were reviewed in order to understand how they influence the planning of bicycle enhancements (see Table 4-12 and Table 4-13). The Code of Ordinances describes specific requirements for traffic control, bicycling access on roadways, and regulations for sidewalks and shared-use paths. The Land Development Code provides specific requirements for residential and non-residential developments. One of the most cost-effective strategies for implementing this plan is to establish land development regulations and street design policies that promote bikeable new development and capital projects.

The consultant team reviewed policy and regulatory language from other communities in North Carolina and the United States to better understand policies, regulations, and standards that have been successful in implementing land use and transportation integration, transportation system connectivity, Complete Streets, and bicycle infrastructure and parking. The purpose of this review is to enable the Town of Cramerton to maximize bicycle improvements in conjunction with new development, redevelopment, and corridor improvement projects. If a change in existing policy is necessary to improve bicycle access, then a modified policy was recommended as part of this review.

Table 4-11: Cramerton Code of Ordinances Review and Recommendations

Code of Ordinances Section	Current Policy	Recommended Changes and Comments
Chapter 72.23 Parking of Bicycles	No person may park a bicycle upon a street other than upon the roadway against the curb or upon the sidewalk in a rack to support the bicycle or against a building or at the curb, in a manner as to afford the least obstruction to pedestrian and vehicular traffic.	This ordinance addresses bicycle parking. However, it can be modified to require bicycle parking racks in downtown Cramerton, parks, and community facilities for any town or development project. The City of Wilson UDO Chapter 9, Parking and Driveways, Section 9.4 and 9.6 provides an example. Bicycles should receive equal consideration to pedestrian and vehicular traffic. The ordinance currently lacks language about the design and location standards for bicycle parking. This ordinance currently only regulates the behaviors of bicyclists and does not address the creation of new bicycle parking on public property and new developments. The Cramerton Land Development Code reviewed in Table 4-13, furthermore, lacks language about the design and location of bicycle parking racks in new developments. The town should consider adding new standards to address the implementation of new bicycling parking racks in its Land Development Code. The Association of Pedestrian and Bicycle Professionals' Bicycle Parking Guidelines provides good standards for bicycle parking design and placement.
Chapter 73.01 Traffic-control Signals Required at Railroad Crossings	The railway company owning or operating the tracks shall be responsible for installing and maintaining appropriate traffic-control devices to regulate motor vehicle traffic at the railroad crossings.	The Norfolk Southern Railroad owns and operates the railroad through Cramerton. However, the town should consider including a provision to coordinate with the railway company for crossing improvements beyond the typical traffic-control devices used to regulate motor vehicle traffic, particularly for bicycling improvements.

Code of Ordinances Section	Current Policy	Recommended Changes and Comments
Chapter 74.16 Riding on Roadways and Bicycle Paths	• Every person operating a bicycle upon a roadway shall ride as near to the right side of the roadway as practicable, exercising due care when passing a standing vehicle or one proceeding in the same direction. • Persons riding bicycles upon a roadway shall not ride more than two abreast, except on paths or parts of roadways set aside for the exclusive use of bicycles. • Wherever a usable path for bicycles has been provided adjacent to a roadway, bicycle riders shall use the path and shall not use the roadway.	A few projects proposed in this plan incorporate shared-lane markings and wayfinding signage for bicyclists, which include bicyclists using more of the roadway than the far right-hand side of the roadway. Bicyclists often feel safer being more secure in the roadway. Recommend modifying this ordinance to address shared-lane markings. Chapter 4 of NCDOT's *Complete Streets Planning and Design Guidelines* (http://completestreetsnc.org) can be used for guidance.
Chapter 74.17 Riding on Sidewalks	No person shall ride a bicycle on the sidewalks on Center Street on either side thereof between Eighth Avenue and Ninth Street or upon Eighth Avenue between North Main Street and Ninth Street.	These policies are important in maintaining safe bicycling and pedestrian networks and minimizing conflicts between bicyclists and pedestrians. Although it is discouraged for bicyclists to ride on sidewalks, the town should consider maintaining this policy as the roadway network is developed to be more conducive to safe bicycling. When proposed projects are described in Section 4.5 of this plan, improvements to bicycling infrastructure are located in the roadway and not on the sidewalk. Consider using NCDOT's *Complete Streets Planning and Design Guidelines* (http://completestreetsnc.org) as a basis for street design guidelines. This document can be adopted by reference in development regulations. Chapter 4: Planning and Design Elements provides guidance on designing space for bicyclists while addressing separate space for pedestrians.

The Land Development Code provides specific guidelines for design and characteristics of new residential and non-residential developments. Table 4-13 reviews the codes that apply to bicycling improvements.

Table 4-12: Cramerton Land Development Code Review and Recommendations

Land Development Code Section	Current Policy	Recommended Changes and Comments
Section 10.1.11 Off-Street Parking Space Requirements	Summary: The section lists the equations used to derive the total required parking spaces for non-residential off-street parking.	This ordinance should address bicycle parking. A common incentive for developers to build new bicycle parking is to decrease the amount of required vehicle parking for the installation of bicycle parking. The City of Wilson UDO Chapter 9, Parking and Driveways, Section 9.4 and 9.6 provides an example. Bicycles should receive equal consideration when calculating parking needs with specific calculations provided for determining the amount of bicycle parking provided by the zoning district or land use type. Design and location standards for bicycle parking should be clearly stated. Different standards of bicycle parking are needed for short-term visitors and customers and for longer term users like employees, residents, and students. The Association of Pedestrian and Bicycle Professionals' *Bicycle Parking Guidelines* provides good standards for bicycle parking design.

Land Development Code Section	Current Policy	Recommended Changes and Comments
Section 12.1.3 Density Bonus	The Town Board may approve a density bonus of up to forty percent over the basic density normally allowed when granting the conditional use permit. Such density bonus must be based upon the amount of unobstructed open space greater than the minimum fifty percent and the amount of land area to be used for Improved Common Open Space.	Consider a density bonus policy in which developers are provided a density bonus to apportion land adjacent to roadways for bicycle facilities, such as bike lanes or shared-use paths. This policy would be used to maintain bicycle connectivity between existing facilities and add new bicycle and pedestrian facilities to the network as new residences and subdivisions are developed in Cramerton. The Steering Committee noted, however, that opportunities for future development are limited and there are no new developments in progress currently. Chapter 4 of NCDOT's *Complete Streets Planning and Design Guidelines* (http://completestreetsnc.org) provides specific design guidance and recommendations for bicycling facilities on a variety of street types including the following: • Main Street • Avenue • Boulevard • Parkway • Rural Road • Local/Subdivision Street
Section 12.2.2 Planned Unit Developments (Mixed use) Project Requirements	Private streets within the development shall be so designed and constructed to carry vehicular traffic from public street to parking or service areas within the development. All private streets (except those which access residential dwellings only) shall, as a minimum, meet the following requirements: • Minimum pavement widths (back of curb to back of curb); local access street—thirty-two (32) feet; collector street—forty (40) feet. • All streets and parking areas shall be paved and bordered by a curb and gutter. Although standard curb and gutter is preferred, valley curb and gutter (per NCDOT Subdivision Roads Minimum Criteria Construction Standards) is also allowed. Storm drainage shall be installed in accordance with applicable Town and State standards.	Consider requirements similar to those in the section on density bonuses. Specific recommendations for including greenways, shared use paths, sidewalks, and/or bicycle facilities should be listed. Chapter 4 of NCDOT's *Complete Streets Planning and Design Guidelines* (http://completestreetsnc.org) provides specific design guidance and recommendations for building greenways, shared use paths, and bicycle facilities for the following street types: • Main Street • Avenue • Boulevard • Parkway • Rural Road • Local/Subdivision Street

Land Development Code Section	Current Policy	Recommended Changes and Comments
Section 12.4 Traditional Neighborhood Developments	B. (2) e. Typical street widths (as measured from edge of pavement to edge of pavement as opposed to including curb and gutter) shall be: 34-38 feet for a main street with marked parking on both sides, 32-34 feet for lesser streets with marked parking on both sides); 27-29 feet for through streets with marked parking on one side, 24-26 feet for standard streets with unmarked parking allowed to stagger from side to side; 20-24 feet for low density local streets with unmarked parking on one side; 20 feet for one-way streets with parking on one side; and 12-14 feet with a 20 foot easement for residential alleys and commercial alleys typically being 24 feet. Where possible, streets are encouraged to narrow to 22-24 feet at intersections and at mid-block cross walks. Curve radii at intersections are 10-20 feet, depending on street function. Standard vertical curb is preferred, and it is required on all residential streets without driveways (auto access is provided via a rear alley) and all commercial streets. B. (2) i. Parking lots shall not front along a street. On-street parking is provided throughout the development, and particularly so on streets with commercial buildings and attached housing. Where additional parking is needed, it is provided behind buildings in the interior of the block. The calculation of parking needs for nonresidential uses should always take into consideration available on-street parking and the expected walkable patronage.	Consider requirements similar to those in the section on density bonuses. Specific recommendations for including greenways, shared use paths, sidewalks, and/or bicycle facilities should be listed. Chapter 4 of NCDOT's *Complete Streets Planning and Design Guidelines* (http://completestreetsnc.org) provides specific design guidance and recommendations for building greenways, shared use paths, and bicycle facilities for the following street types: • Main Street • Avenue • Boulevard • Parkway • Rural Road • Local/Subdivision Street This ordinance should also address bicycle parking on properties with nonresidential uses. A common incentive for developers to build new bicycle parking is to decrease the amount of required vehicle parking for the installation of bicycle parking. The City of Wilson UDO Chapter 9, Parking and Driveways, Section 9.4 and 9.6 provides an example. Bicycles should receive equal consideration when calculating parking needs with specific calculations provided for determining the amount of bicycle parking provided by zoning district or land use type. Design and location standards for bicycle parking should be clearly stated. Different standards of bicycle parking are needed for short-term visitors and customers and for longer term users like employees, residents, and students. The Association of Pedestrian and Bicycle Professionals' Bicycle Parking Guidelines provides good standards for bicycle parking design.

Land Development Code Section	Current Policy	Recommended Changes and Comments
Section 15.21 Paving Widths	• Minor thoroughfares, which are determined by the town engineer to be four twelve-foot traffic lanes, shall have a paving width of not less than 53 feet back of curb to back of curb. • Minor thoroughfares, which are determined by the town engineer to be three twelve-foot traffic lanes, shall have a paving width of not less than 41 feet back of curb to back of curb. • Collector streets, which are determined by the town engineer to be three twelve-foot traffic lanes, shall have a paving width of not less than 41 feet back of curb to back of curb. • Other collector streets, which are determined by the town engineer to be three twelve-foot traffic lanes, shall have a paving width of not less than 41 feet back of curb to back of curb. • Residential streets shall have a paving width of not less than 28 feet back of curb to back of curb. [Two twelve-foot traffic lanes].	Codes for minor thoroughfares and collector streets include paving widths with adequate space for shared-lane markings, bike lanes, and wide paved shoulders. These are opportunities for bicycle facilities to be required as a condition to any project that involves roadway construction, paving, or repaving. Two projects proposed in this plan incorporate shared-lane markings, which include bicyclists using more of the roadway than the far right-hand side of the roadway. Bicyclists often feel safer being more secure in the roadway. Recommend modifying this ordinance to address shared-lane markings and bike lanes. Chapter 4 of NCDOT's *Complete Streets Planning and Design Guidelines* (http://completestreetsnc.org) can be used for guidance. Chapter 4 of NCDOT's *Complete Streets Planning and Design Guidelines* (http://completestreetsnc.org) provides specific design guidance and recommendations for building greenways, shared use paths, and bicycle facilities for the following street types: • Main Street • Avenue • Boulevard • Parkway • Rural Road • Local/Subdivision Street
Section 15.29 Open Space	• Parks and Recreation Advisory Committee. • The Parks and Recreation Advisory Committee shall review and make recommendations on all dedications of open space for public use and/or ownership, and developments in which include all or part of any planned Town park, greenbelt, or other open space. The Parks and Recreation Advisory Committee shall also review any variance requests to this section and any request for payment in lieu of dedication for recreation and open space purposes.	Recommend expanding this Parks and Recreation Advisory Committee to include all bicycling and pedestrian issues for Cramerton. This new group would be the Bicycle and Pedestrian Advisory Committee (BPAC) with expertise and interest in bicycling and pedestrian infrastructure, policies, and programs to begin the implementation of projects in this plan. Individuals from the Carolina Thread Trail or Safe Routes to School could provide this expertise.

Gaps in Ordinances and Codes

The review presented in Table 4-12 and Table 4-13 indicates policy, regulation, and standards areas that are not yet addressed in Cramerton's Code of Ordinances and Land Development Code. This section summarizes recommendations offered in Table 4-12 and Table 4-13 and adds specific recommendations based on the gaps identified. Recommendations are as follows:

- **Complete Streets Policies**: Incorporate the installation of bicycle lanes and shared-lane markings as part of a set of Complete Streets policies in the Cramerton Land Development Code. Chapters 3 and 4 of NCDOT's *Complete Streets Planning and Design Guidelines* outline the standards for the types of bicycle lanes and shared-use lanes that could be implemented in downtown Cramerton and any future developments. These guidelines suggest bicycle lanes be 6 feet wide in a Main Street context. However, with roadway, topographic, and fiscal constraints, shared lane markings, such as sharrows, could be preferred for the roadways with slower speeds and limited right-of-way. For streets with speed limits less than 35 mph, the guidelines suggest shared lane markings with the road lane being 13 feet wide. The town should consider including language in the Land Development Code for road lanes to be a minimum of 13 feet wide so as to accommodate bicycles.
- **Bicycle Parking**: The Cramerton Code of Ordinances and Land Development Code does not have standards for the development of new bicycle parking in the town. The PBIC outlines several recommendations for how to include bicycling parking standards in policies, regulations, and standards.

Develop a standard for developments to include a specific amount and type of bicycle parking in new developments.

Include Complete Streets standards for street design that include connectivity requirements for vehicles, pedestrians, and bicyclists. This recommendation would be useful particularly for downtown Cramerton, which has the greatest amount of bicyclist and pedestrian traffic in the same locations along with vehicles.

Require non-residential developments to include bicycle parking alongside vehicle parking. The Cramerton Land Development Code provides guidelines for identifying the number of vehicle parking spaces required for a development, but it does not include bicycle parking. This policy can be framed positively by offering incentives to developers. For example, including bicycle parking can reduce the number of vehicle parking spaces required for the development, which provides the developer with more land space.

- **Connecting to Existing Greenways and Trails**: The town should add policies that require a conservation easement for new developments around existing greenways and trails to protect their access and ensure that bicyclists and pedestrians are able to retain access to the greenway or trail. The Land Development Code addresses density bonuses for developments providing open space, but specific mention of maintaining connections to existing open spaces, such as greenways and trails, should be made.

Wayfinding

Wayfinding is the practice of using signage at strategic and decision points to inform people how to navigate the environment around them and to direct them in the right directions. Bicycle wayfinding involves using a comprehensive and cohesive system of signage and/or pavement markings to direct bicyclists to their desired destinations.

As described in the recommended bicycle projects earlier in this plan, it is recommended the Town of Cramerton develop and implement a wayfinding program along commonly used bicycling routes. The Steering Committee identified areas and destinations needing appropriate wayfinding signage for residents and visitors.

Chapter 9 of the Manual on Uniform Traffic Control Devices provides national guidance on bicycle wayfinding signs, including guidance on mounting height and lateral placement of bicycle wayfinding signs. The National Association of City Transportation Officials (NACTO) publishes a bikeway design guide, which includes additional guidance on bicycle wayfinding, including recommendations that:

- Wayfinding signage be added at decision points along bicycle routes
- Travel time, distance, and directional arrows be used to direct cyclists to destinations
- The closest destination to a sign be placed at the top, with more distant destinations placed further down
- A consistent and easy to read font be used on all signage

Wayfinding guidance for the Town of Cramerton can be found in Appendix B. More information on effective wayfinding is available at https://nacto.org/publication/urban-bikeway-design-guide/bikeway-signing-marking/bike-route-wayfinding-signage-and-markings-system/.

4.8 Recommended Programs

In addition to recommended infrastructure and policy improvements, the planning team looked at programs that, if implemented, could encourage non-motorized transportation usage in the town and improve safety conditions for bicyclists. While specific programs identified based on Steering Committee and public feedback are recommended below, an overarching recommendation would be to expand the Parks and Recreation Committee into a Bicycle and Pedestrian Advisory Committee (BPAC). This recommendation is being made outside of the public involvement process, but is being made to help implement some of the other program recommendations as well as some of the other recommendations being made in this plan.

The Steering Committee and public were asked to identify and prioritize the types of programs they would like to see recommended in the plan. Overall, updating town ordinances–including the UDO and the zoning ordinance–to include bicycle and pedestrian specific facilities and adopting Complete Streets considerations scored the highest. Recommendations from this program are reflected in Section 4.7.

The next four top scoring programs identified by the Steering Committee and the public were as follows:

- Safety campaigns to educate bicyclists, pedestrians, and drivers.
- Enhance safe access to schools.
- Provide group and community bicycling events.
- Enforce existing driving laws and speed limits.

Programs specific to these categories are discussed below.

Bicycle and Pedestrian Advisory Committee

The development of a BPAC includes having the Cramerton Board of Commissioners expand the Parks and Recreation Committee to include bicycle planning efforts and program implementation in Cramerton. Based on a town the size of Cramerton, a committee is recommended (rather than an appointed individual).

The BPAC should include some existing Steering Committee members, town planning staff, and residents concerned about bicycle and pedestrian issues and needs in the community. Membership of the BPAC should reflect the demographic makeup of the town in terms of age, race, and socioeconomic status. Representatives from community groups, schools, and businesses should be included. The BPAC would be charged with the principal objective of advocating for bicycle and pedestrian safety and mobility through education, encouragement, and enforcement campaigns and infrastructure projects.

The BPAC would research funding opportunities, assist with submission of grant applications, and play a role in selecting and monitoring the work of consultants and contractors designing and constructing bicycle and pedestrian infrastructure. It would also serve to form partnerships between schools, businesses, and neighboring municipalities. The BPAC should meet regularly and provide updates to the Cramerton Board of Commissioners. In addition to helping implement proposed projects the Board of Commissioners should promote education, safety, encouragement, enforcement and evaluation, events, and beautification programs. Specifically, the BPAC should work and coordinate with the following organizations.

- Town of Cramerton Parks and Recreation Department
- Carolina Thread Trail
- Gaston County DHHS- Public Health
- Gaston County Travel and Tourism
- Catawba Lands Conservancy
- Active Routes to School Region 4
- Gaston-Cleveland-Lincoln MPO

Safety Campaigns to Educate Bicyclists, Pedestrians, and Drivers

The public comment form for this plan indicated "promote good road user behavior" as one of the top scoring programmatic goals for this plan. It was noted several times during the planning process that roads are unsafe for bicyclists not only because of the lack of facilities for those users, but because of vehicular driver behavior.

Watch for Me NC is a comprehensive campaign aimed at reducing the number of bicyclists and pedestrians hit and injured in crashes with vehicles. The campaign consists of educational messages on traffic laws and safety, and an enforcement effort by area police. With more than

2,400 pedestrians and 960 bicyclists hit by vehicles each year in North Carolina, NCDOT in collaboration with municipalities and universities has launched the Watch for Me NC campaign to reduce crashes through education and enforcement. Education materials in the form of a website, public service announcements, pamphlets, bus wraps, billboards, and bumper stickers have been developed and distributed to increase awareness of pedestrians and bicyclists and applicable laws. Many of the materials can be distributed at local festivals and other events, at local bicycle shops and other businesses, and in renters' information packets and property owners' guest information books. The campaign also provides increased training to law enforcement. Cramerton may coordinate with the City of Asheville, which has participated in the Watch for Me NC campaign.

Many of these resources are downloadable from Watch for Me NC at www.watchformenc.org/.

Enhance Safe Access to Schools

Safe Routes to School (SRTS) is a program that enables and encourages children to walk and bicycle to school. The program helps make walking and bicycling to school a safe and more appealing method of transportation for children. SRTS facilitates the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.

Currently, none of Cramerton's elementary or middle schools participate in the annual walk or bike to school days coordinated by the Region 4 Active Routes to School Coordinator. To improve both safety and access to schools, the town should work with its Region 4 and NCDOT to develop a SRTS plan for Gaston County Schools. A SRTS plan would identify barriers to walking and bicycling to school and identify solutions using a combination of education, encouragement, engineering, and enforcement strategies.

Active Routes to School (ARTS) is the North Carolina SRTS project that is supported by a partnership between NCDOT and the Division of Public Health. The goal of the project is to increase the number of North Carolinians that meet the physical activity recommendations by increasing the number of elementary and middle school students who safely walk and bicycle to or at school.

More information on SRTS can be found at https://www.ncdot.gov/bikeped/safetyeducation/safeRoutesToSchools/.

In addition to the SRTS, the town could facilitate New Hope Elementary, Cramerton Middle School, and Cramerton Christian Academy participation in the NCDOT program Let's Go NC! - Pedestrian and Bicycle Safety Curriculum. Aimed to instruct children between grades k-5, the program focuses on walking and biking safety and skills. As a way to promote healthy and active lifestyles, a curriculum was developed that includes aspects of the SRTS program, and classroom, video, and exercise materials.

More information can be found at www.connect.ncdot.gov/projects/BikePed/Pages/LetsGoNC.aspx.

Group and Community Bicycling Events

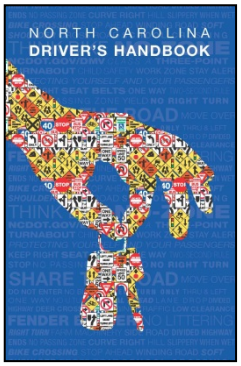
Once some of the recommended projects are constructed, it would create a perfect opportunity for regular special events. A festival could be set up at the Centennial Park, Goat Island Park, Riverside Park, or on a greenway spurring a new experience that may draw more interest in bicycle facilities.

An international trend is to turn major town roads into "Sunday Parkways." This concept takes long strips of roadways (linear or in a looping pattern) and converts one or both directions of traffic for bicycle rides or pedestrian malls during a portion of every Sunday and holiday. This encourages people to get out and walk or bicycle, increases the amount of public space, and motivates people to walk more often throughout the rest of the week. This concept is included in the statewide *WalkBikeNC* Plan. In planning any Open Street event, merchants and other business owners should be consulted to accommodate potential impacts on access and sales.

Enforcing Existing Driving Laws and Speed Limits

Education is essential for teaching and reminding drivers of all ages the applicable laws and responsibilities of motorists as they pertain to safely sharing the road with bicyclists and pedestrians. This also includes educating police officers on bicycle and pedestrian laws.

Although children aged 5 to 15 years are not yet old enough to drive, it can be expected that the majority will become automobile users. Educating elementary and middle school students (the future driving population) about bicycle and pedestrian safety provides excellent opportunities to make a difference in a two-fold manner.



Bicyclist safety, as well as how to safely maneuver an automobile while in the presence of bicycles and pedestrians can be an instrumental part of any driver's education program in Cramerton. This training will allow new generations to be more aware of the simple fact that motorized vehicles do not have sole right to the transportation network, and it is everyone's responsibility to be careful when in the roadways. The Town of Cramerton Parks and Recreation Director already conducts group bicycle rides with children that serve as educational opportunities for children to learn how to bike and understand the rules of bicycling on the road. This is an additional opportunity to provide education on how to safely share the road.

More information can be found at www.ncdot.gov/dmv.

The North Carolina Bicycle and Pedestrian laws can be found at www.ncdot.gov/bikeped/lawspolicies/. Additional information about bicycle laws in North Carolina can also be found at https://www.bikelaw.com/wp-content/uploads/2014/11/BIKELAW_RG_NC_Web.pdf.

IMPLEMENTATION

STRATEGY

5. Implementation Strategy

5.1 Key Action Steps

The BPAC would be entrusted with overseeing the implementation of the plan with assistance from town staff and participation by the stakeholders. The BPAC would be responsible for meeting regularly to receive updates and guide progress on the action steps. It would also author an annual progress report on bicycle and pedestrian conditions in Cramerton.

In addition, all bicycle and pedestrian facility recommendations along NCDOT-maintained roadways would require review and approval by NCDOT Highway Division 12 prior to implementation. The key actions are listed in Table 5-1.

Table 5-1: Key Actions

Action	Description	Stakeholder	Timeline
Adopt the Town of Cramerton Bicycle Plan	Present the plan to the Cramerton Board of Commissioners for adoption.	Board of Commissioners and town staff	August 2018
Establish a Bicycle and Pedestrian Advisory Committee (see Section 4.8)	Expand the Parks and Recreation Committee to become the Bicycle and Pedestrian Advisory Committee to begin implementing the plan.	Board of Commissioners and town staff	Fall 2018
Strengthen partnerships with surrounding governments and institutions	Hold an initial meeting with representatives of neighboring communities and stakeholders to provide an overview of the plan's recommendations and identify opportunities for collaboration.	Belmont and McAdenville	Fall 2018 / ongoing
Coordinate with NCDOT Division 12	Hold an initial meeting with NCDOT Division 12 to discuss how the plan's bicycle projects may be incorporated in upcoming transportation projects, including roadway resurfacing projects. Additional coordination is recommended via the BPAC to coordinate with the NCDOT Division 12 3-year road resurfacing schedule (including any short term changes) to accomplish the projects that require pavement markings.	NCDOT Division 12 and town staff	Ongoing
Coordinate with Gaston-Cleveland-Lincoln MPO to include infrastructure projects in the regional planning process	Hold an initial meeting with Gaston-Cleveland-Lincoln MPO to review the plan's infrastructure projects to include where appropriate in regional plans including any future updates to the *Comprehensive Transportation Plan (CTP) and Metropolitan Transportation Plan (MTP)*	Town staff and Gaston-Cleveland-Lincoln MPO	Fall 2018 / ongoing

Action	Description	Stakeholder	Timeline
Coordinate with local bicycle organizations and clubs such as the Carolina Thread Trail and South Main Cycles	Hold an initial meeting with representatives from the organizations to review the plan's goals and objectives and to discuss potential opportunities for collaboration with items such as the continuation of a Regional Bicycle Network, programs, and policies.	Town staff, BPAC/appointee, and representatives from the bicycle organizations	Fall 2018
Include requirements for bicycle facilities in town ordinances and policies (see Section 4.7)	Draft amendments to town ordinances and policies following the recommendations of this plan for bicycle infrastructure in existing and new development.	Board of Commissioners and town staff	Fall 2018
Apply for alternative funding sources for the plan's projects and programs	Refer to the funding sources identified in this plan in Appendix E; apply for funds in addition to the STIP process to implement programs and projects. Establish a fund to use for local match requirements.	BPAC and town staff	Ongoing
Coordinate with the Catawba Lands Conservancy (CLC)	Develop a partnership between the town and the CLC that can identify strategies and funding sources for projects that enhance both the town and the CLC.	BPAC, town staff and CLC	Ongoing
Partner with Gaston County Travel and Tourism	Work to add a bikeshare station in downtown Cramerton	BPAC and town staff	Ongoing
Partner with NC Department of Commerce	Develop and partnership between the NC Department of Commerce, the Gaston Regional Chamber of Commerce, and the Carolina Thread Trail that will serve to promote ecotourism in the town.	Town staff, NC Department of Commerce, Gaston Regional Chamber of Commerce, CTT	Fall 2018/ ongoing
Carry out programs that educate residents on the health benefits of biking (see Section 4.8)	Partner with the Gaston County Health Department, local schools, and other community organizations to implement encouragement and educational programs.	BPAC and town staff	Fall 2018/ ongoing
Town budget and capital planning	Identify potential funding sources for bicycle programs, projects and maintenance in the town's budget such as Powell Bill funds. Begin to accumulate funds that can be used for the local match required for most projects.	BPAC, Board of Commissioners and town staff	Fall 2018

Action	Description	Stakeholder	Timeline
Coordinate with Region 4 Active Routes to School Coordinator (see Section 4.8)	Continue meeting with the Region 4 Active Routes to School Coordinator to establish and develop policy for implementation and/or training or programs for Cramerton.	BPAC, town staff, NCDOT, NC Division of Public Health	Fall 2018
Wayfinding Study	Confirm locations for wayfinding signage and develop a system of unique and branded signs, possibly using a local artist.	BPAC, Board of Commissioners, town staff	Fall 2018
Watch for Me NC (see Section 4.8)	Apply to participate in NCDOT's Watch for Me NC campaign to raise awareness and provide educational resources to promote bicycle and pedestrian safety to residents, drivers, and law enforcement.	BPAC, and town staff	Winter 2019/ Ongoing
Cramerton Bicycle and Pedestrian Annual Report/Memo	Prepare the first Cramerton Bicycle and Pedestrian Annual Report assessing progress made over the past year using the performance and evaluation measures included in this plan.	BPAC and town staff	Winter 2019
Hold community bicycling events (see Section 4.8)	Plan and implement a special event centered on bicycling and walking to create a new experience to draw interest in bicycle facilities.	BPAC and town staff	Ongoing

5.2 Project Development Strategy

The development process to prepare for a project's construction involves six key components described below. This strategy can be used to implement infrastructure projects proposed in this plan. When applicable, each component of the strategy will incorporate action steps described in Table 5-1 demonstrating how town officials can implement the project practically.

- Identification of funding source(s)
- Public involvement
- Feasibility Study (right-of-way availability and needs)
- Engineering and design
- Analysis of affected property owners
- Design-level cost estimates

The project development process will vary depending on whether the project is on-road or off-road on a new location. Wide paved shoulders and bicycle lane markings are on-road facilities because they are typically constructed within the road right-of-way. Shared use paths are typically an example of off-road facilities

because they would require new location rather than being built within an existing right-of-way, unless (for example) an existing utility easement is used.

Achieving the vision, goals, and objectives of this plan will require the commitment of town officials and staff, BPAC, the Gaston-Cleveland-Lincoln MPO, and NCDOT, and support and leadership from the community and other partner organizations. Guided by the goals, objectives, and strategies, the town will continue working to improve bicycle safety and connectivity.

The implementation strategy for this plan includes several components to assist with translating this document into implemented programs and constructed bicycle facilities:

- **Key Action Steps**: Describing actions to help the town implement the recommendations of this plan and improve overall bicycling and pedestrian facilities
- **Project Development Strategies**: Utilizing key action steps to implement specific projects
- **Funding Process and Sources**: Identifying and mobilizing funding for projects
- **Performance Evaluation Measures**: Evaluating the effectiveness of projects

Identification of Funding Sources

Funding for bicycle infrastructure projects needs to be identified early in project development. Many funding options are presented in Section 5.4. Relevant action steps include the following:

- Coordinate with Gaston-Cleveland-Lincoln MPO to include infrastructure projects in the regional planning process
- Coordinate with neighboring municipalities, particularly Belmont and McAdenville, to integrate bicycling infrastructure projects and programs
- Apply for alternative funding sources for the plan's projects and programs
- Coordinate with the Carolina Thread Trail
- Partner with North Carolina Department of Commerce
- Town budget planning

Public Involvement

This is a critical component for soliciting community input on the location, design, and function of the proposed facility. In addition, public involvement is critical in forming partnerships with local advocacy organizations and educating the community about the overall benefits of bicycling. Public involvement should be included in all phases of project development. Practical action steps include the following:

- Establish a Bicycle and Pedestrian Advisory Committee
- Coordinate with local bicycle organizations and clubs such as South Main Cycles and Carolina Thread Trail

- Carry out programs that educate residents on the health benefits of biking
- Wayfinding study
- Watch for Me NC

Feasibility Study (Right-of-Way Availability and Needs)

Regardless of whether the proposed facility is on-road or off-road, the project may require a feasibility study. A feasibility study would likely be done for each proposed project, or a small group of inter-related projects. The study will examine the utility and right-of-way issues associated with a proposed facility and provide concept plans, profiles, and high level cost estimates. The study will determine utility constraints, and whether right-of-way acquisition is necessary for the project. The study should be conducted in consultation with NCDOT where occurring within an NCDOT right-of-way. The Town of Cramerton may need to fund or provide a local contribution toward these studies.

Some of the bicycle projects proposed in this plan would be on-road facilities within NCDOT rights-of-way that require coordination with NCDOT. On NCDOT roads in town, bicycle lanes or sharrows have the potential to be accomplished cost-effectively through division's resurfacing projects. Projects 2, 3, and 10 may be implementable through this approach as they are on NCDOT owned/maintained roads. As identified in the key action steps table, coordination with NCDOT Division 12 should be initiated following the adoption of this plan. There may be opportunities to include the on-road bicycle facilities proposed by this plan in road repaving and widening projects. An important role for the BPAC would be to monitor the NCDOT Division 12 resurfacing schedule. This could be accomplished through arranging quarterly check-ins with the Division Operations and Maintenance personnel to determine upcoming resurfacing plans. Although NCDOT communicates with local municipalities concerning upcoming resurfacing plans, coordination with NCDOT is recommended to ensure projects in this plan can be implemented through resurfacing.

Feasibility studies could require coordination at multiple levels from the town to NCDOT. The following actions would assist in coordinating and conducting feasibility studies:

- Adopt the Town of Cramerton Bicycle Plan
- Strengthen partnerships with Gaston County and the Gaston-Cleveland-Lincoln MPO
- Coordinate with NCDOT Division 12
- Coordinate with Gaston-Cleveland-Lincoln MPO to include infrastructure projects in the regional planning process
- Town budget planning

Engineering and Design

In the engineering and design phase, concepts developed in the feasibility study will be developed and advanced using more in-depth engineering to develop a preliminary design. During this phase additional, more specific information on right-of-way and utility constraints will be developed. As with the feasibility study, the planning and design phase should be conducted in consultation with NCDOT where occurring

within an NCDOT right-of-way. The Town of Cramerton may need to fund or provide a local contribution toward these studies. Because engineering and design follow feasibility studies closely, many applicable action steps are the same:

- Coordinate with NCDOT Division 12
- Coordinate with Gaston-Cleveland-Lincoln MPO to include infrastructure projects in the regional planning process
- Town budgeting and planning

Analysis of Affected Property Owners

It is best to develop projects within existing town or NCDOT right-of-way to minimize right-of-way acquisition and costs. Typically, bicycling and pedestrian infrastructure projects, including those in this plan, utilize existing roadways, sidewalks, and rights-of-way. However, if a project requires the acquisition of additional rights-of-way, the feasibility study, engineering, and design identify property owners who could be impacted by a project's alignment and construction. Once those property owners are identified, town officials should coordinate with NCDOT on the process to initiate contact with impacted property owners and acquire right-of-way.

Bicycling projects that could require the acquisition of rights-of-way typically include those that are not utilizing existing roadways. Shared use paths, such as any of the Carolina Thread Trail, are examples. Although there are no shared-use paths proposed in this plan, these types of improvements may be desired by the community in the future. This information is provided for future reference, as applicable.

Shared-use paths are considered off-road facilities that require different strategies for project development. Off-road facilities are constructed outside of the road right-of-way. Private land or an easement would need to be acquired to accommodate the shared-use path. Cramerton may partner with Gaston County as well as conservation and land trust organizations, such as the Catawba Lands Conservancy of North Carolina (CLC), to secure needed easements or acquire land for the shared use projects.

For facilities that are planned adjacent to streams and waterbodies, it is important to consider buffer regulations and applicable watershed protection regulations. Cramerton is in the Catawba River Basin. During the engineering phase, coordination should be undertaken with the Gaston County Soil and Water Conservation District and the North Carolina Department of Environment and Natural Resources (NCDENR) in order to ensure that facilities are engineered to avoid buffer zones and/or ecologically sensitive areas. These facilities may be designed in conjunction with enhancing or constructing vegetated stream buffers to improve water quality. Such projects may be eligible for funding from the Clean Water Management Trust Fund.

Design-level Cost Estimates

A critical component of a project's engineering and design is developing the design-level cost estimates for proposed project alternatives. Detailed cost estimates allow the town board of commissioners to evaluate

alternatives, present options to the public, receive public input, and ultimately decide on the alternative that best fits the town's goals and budget. Design-level cost estimates are generated by the project engineers tasked with designing the project alternatives. Cost estimates include the following details:

- Roadway/path/sidewalk construction
- Utility construction or relocation
- Right-of-way acquisition
- Contingencies that could arise in the course of project construction

5.3 Funding Sources

Funding for bicycle projects will likely not come from a single source, and instead will need to be combined with several funding sources that can be used for a variety of activities, including: programs, planning, design, implementation, and maintenance. Although funding is available from outside sources, it is highly recommended that the town establish a source of local matching funds for potential grants. Even small amounts of local funding are essential for matching and leveraging outside sources. Local matching funds can be achieved through allocations to a reserve fund from the capital budget. In addition, many grants allow in-kind matching (e.g., local staff time).

This section discusses the state funding process and other potential funding sources. There are two main sources of funding, NCDOT STIP funding, and NCDOT Division 12.

State Funding Process for Transportation Improvements

In June 2013 the North Carolina General Assembly overhauled the process for funding state transportation projects with the Strategic Transportation Investments law (House Bill 817). This law establishes the Strategic Mobility Formula to allocate funds based on quantitative criteria and local input. The formula is intended: "to maximize North Carolina's existing transportation funding to enhance the state's infrastructure and support economic growth, job creation and high quality of life."

The formula funds projects according to the three following categories:

- Division Needs (30 percent)
- Regional Impact (30 percent)
- Statewide Mobility (40 percent)

The local NCDOT division and metropolitan or rural planning organization (M/RPO) provide MPO or RPO input in the Division Needs Category. Cramerton is within the Gaston-Cleveland-Lincoln MPO.

Bicycle projects (separate from facilities included as part of a roadway project) may be funded through (NCDOT's Division 12) Division Needs category with certain restrictions.

Highway Safety Improvement Program Funding

The Highway Safety Improvement Program (HSIP) could potentially fund bicycle infrastructure projects in Cramerton. HSIP funds bicycle projects based on crash history and safety factors through a competitive process. It is administered by the NCDOT Transportation Mobility and Safety Unit.

Other Funding Sources

Cramerton should consider alternate funding sources to augment state funds for bicycle projects, which are limited and competitive. The programs listed below may be used to fund entire projects or be directed towards covering the cost of amenities such as bicycle parking and wayfinding signage. Additional and more detailed information concerning what these funds can be used for, the required local match, and other characteristics is included in Appendix E: Funding Sources.

Federal Funding Sources

- Fixing America's Surface Transportation (FAST ACT)
- Congestion Mitigation and Air Quality Improvement (CMAQ)
- Highway Safety Improvement Program (HSIP)
- State and Community Highway Safety Grant Program (Section 402)
- Surface Transportation Program (STP)
- Transportation Alternatives Program (TA or TAP)
- Urbanized Area Formula Program (UZA)
- Safe Routes to School

State Funding Sources

- Clean Water Management Trust Fund
- Land and Water Conservation Fund
- Parks and Recreation Trust Fund (PARTF)
- Powell Bill
- Recreational Trails Program
- Strategic Mobility Formula

Local Funding Sources

- Capital Reserve Fund

- Community Crowdfunding
- Fees
- General Obligation Bonds
- Special Tax District

Nonprofit Funding Sources

- Blue Cross Blue Shield of North Carolina Foundation
- Carolina Thread Trail
- Kate B. Reynolds Charitable Trust
- Robert Wood Johnson Foundation

Local "Crowdfunding"

In the last several years the internet has revolutionized fundraising. This new form of fundraising, called crowdfunding, enables people all over the world to start a fundraising effort and provides an easy mechanism for others to make donations. Platforms, such as Indiegogo, are online communities that act as funding platforms for a diverse range of projects. Individuals or organizations post projects for a nominal fee and individuals make contributions via credit card. Costs include a 4 percent fee charged by the crowdfunding platform (e.g., Indiegogo) and a 3 to 5 percent fee charged by the credit card company.

This type of fundraising is likely to be a minor source, but might be useful for funding spot improvements, such as crosswalk markings or benches.

Indiegogo: Similar to the successful crowdfunding platform, Kickstarter, Indiegogo is more locally oriented and trends toward civic-based projects. http://www.indiegogo.com/.

5.4 Performance and Evaluation Measures for Plan Implementation

In order to evaluate the progress and effectiveness of the *Town of Cramerton Bicycle Plan*, Table 5-2 lists evaluation criteria and examples of achieved progress that the BPAC and Town Board of Commissioners can use. These criteria and milestones are based on the goals and objectives of this plan. The table is intended to serve as a general guide–the BPAC should tailor these evaluation criteria to the community by adopting more specific, locally applicable quantitative metrics.

The evaluation of the plan should occur annually and be published in the form of a memo or report made available to the residents of Cramerton. The report should detail the progress made to date and the priorities for the coming year. This annual report will help to demonstrate the benefits of bicycle and pedestrian infrastructure and programs and generate further support for the ongoing work of the BPAC or appointment of a single board member, resident liaison, or advocate for bicycle activities.

Table 5-2: Performance and Evaluation Measures for Plan Implementation

Plan Goal	Objectives	Performance Evaluation	Proposed Projects and Programs
Goal 1: Access to Bicycle Facilities Equitably			
Provide access to bicycle facilities equitably by creating multiple tiers of bicycle routes: through routes with regional connections for experienced riders, and local, family-oriented routes between community origins and destinations such as parks, neighborhoods, schools, stores and churches	• Implement policies that inform land use decisions and permitting, and promote connectivity between neighborhoods and schools • Identify and develop bicycle accommodations and facilities along Cramerton's roadways, including low volume, low speed corridors to provide options for riders of all ages, backgrounds and abilities	• Number of wayfinding signs installed • Number and locations of bicycle parking racks constructed • Bicyclist counts along designated bicycle routes, particularly around community origins and destinations	• Implementation of wayfinding signage: Projects 1, 2, 3, 5, 6, 8, 11, 12 • Bicycle parking throughout the town: Projects 5, 6, 7, 8 • Bikeshare station with bicycles for all users: Project 9
Goal 2: Safety for All Ages and Abilities			
Improve safety for all ages and abilities by creating safe bicycle infrastructure networks that enhance mobility, remove barriers and provide transportation options, especially along key corridors.	• Develop and implement programs that improve bicycle infrastructure for bicyclist safety and educate the community. • Review and recommend zoning amendments/model ordinances to provide safe bicycle and pedestrian infrastructure in future developments.	• Number of bicycle and pedestrian-related crashes • Reduction in existing speed limits to increase safety and prevent potential incidents annually	• Designation of bicycle routes for all experience levels: Project 1 • Improved crossing over railroad: Project 4 • Bicycle parking availability at key downtown locations: Projects 5, 6, 7, 8 • Crossing improvements for experienced bicyclists at Wilkinson Boulevard: Project 10
Goal 3: Environmental and Public Health Benefits			

Plan Goal	Objectives	Performance Evaluation	Proposed Projects and Programs
Recognize the environmental and public health benefits of bicycling, including reduced usage of automobiles and more opportunities to create active lifestyles for all residents.	Partner with schools, community groups, public health, environmental groups, other stakeholders and town government to plan and hold events annually that recognize and promote active living, and the health and environmental benefits of walking and biking.	• Number of partnerships established with schools, community groups, the county health department, environmental groups, and town government to plan and hold "X" number of events • Construct new/upgraded bicycle and pedestrian facilities expanding recreational opportunities	• Wayfinding signage communicating more opportunities for recreational activity: Project 1, 2, 3, 5, 6, 8, 11, 12 • Expansion of the Parks and Recreation Committee into the BPAC • Coordination with Active Routes to School Region 4 and Health Education Coordinator
Goal 4: Connections between Community Origins and Destinations			
Provide connections between community origins and destinations, including recreational, cultural and historic sites through bicycle facilities.	• Implement policies that inform land use decisions and permitting, and promote connectivity between neighborhoods and schools • Identify and prioritize multi-modal infrastructure projects such as bicycle lanes to improve safety and connectivity.	• Implemented infrastructure projects that connect cultural sites and natural resources annually • Interpretive signage and maps on bicycle and pedestrian facilities that describe the cultural and natural context of the area	• Wayfinding signage throughout the town: Projects 1, 2, 3, 5, 6, 8, 11, 12 • Easily accessible bicycle parking: Projects: 5, 6, 7, 8 • Infrastructure improvements on key connecting corridors: Projects 2 and 3
Goal 5: Cramerton's Downtown Area and Centennial Center			
Connect Cramerton's downtown area and Centennial Center with attractive bicycle facilities that help promote economic development.	• Involve the Cramerton community in crafting a bicycle plan representative of the community. • Identify and prioritize multi-modal infrastructure projects such as bicycle lanes to improve safety and connectivity.	• Develop education and incentive programs that promote household savings from alternative transportation modes, tourism, development goals, and property value • Install bikeshare station	• Centennial Center wayfinding signage: Project 1 • Centennial Center bikeshare station: Project 9 • Implement the proposed Centennial Center Bike Fix-It Station
Goal 6: Community Education			

Plan Goal	Objectives	Performance Evaluation	Proposed Projects and Programs
Educate the community as to the benefits of bicycle activity and applicable rules and regulations.	• Develop and implement programs that improve bicycle infrastructure for bicyclist safety and educate the community. • Involve the Cramerton community in crafting a bicycle plan representative of the community.	Implement programs or establish partnerships to promote and develop encouragement of recreational bicycle and pedestrian activities	• Expansion of the Parks and Recreation Committee into the BPAC • Partnerships with local advocacy organizations like Carolina Thread Trail and South Main Cycles • Implement the proposed Centennial Center Bike Fix-It Station

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APPENDICES

Appendix A: Public Involvement

This appendix will be completed with the following documents:

- First Steering Committee Meeting Agenda
- First Steering Committee Meeting Sign-In Sheet
- First Steering Committee Meeting Minutes
- First Steering Committee Meeting Presentation and Map
- Second Steering Committee Meeting and Public Meeting Agenda
- Second Steering Committee Meeting and Public Meeting Sign-In Sheet
- Second Steering Committee Meeting and Public Meeting Minutes
- Second Steering Committee Meeting and Public Meeting Presentation and Handouts
- Third Steering Committee Meeting and Public Meeting Agenda
- Third Steering Committee Meeting and Public Meeting Sign-In Sheet
- Third Steering Committee Meeting and Public Meeting Presentation and Handouts

Appendix B: Wayfinding Guidance

I. Development Guidelines

This section identifies specific guideline recommendations for development bicycling wayfinding signage in the Town of Cramerton, in accordance with the Town of Cramerton Bicycle Plan.

- Wayfinding signage that includes information on how to access bicycling corridors, corridor lengths, experience level necessary, and nearby points of interest.
- Effective use of fonts and color to easily communicate a wide variety of information.
- Clear, easy to read, and visible for bicycles/pedestrians and vehicles alike.
- Strategic location of signage at key junctions to maximize utility and readability.
- Aesthetically pleasing and enhances the style identity of the Town of Cramerton.
- Consistent and cohesive style and content throughout all signage.

II. Color Palette

The use of color is a critical component of the Town of Cramerton's bicycle wayfinding signage. Unified color communicates a common aesthetic identify throughout the town. Additionally, it helps draw attention to signage and establish normal bicycle routes helpful for bicyclists and drivers alike, thereby increasing safety. It is important that wayfinding signage content be readable and visible at all times of day, as well as in poor weather conditions. This section offers guidance on primary color usage for signage, as well as secondary colors which color-code specific bicycle routes and skill levels.

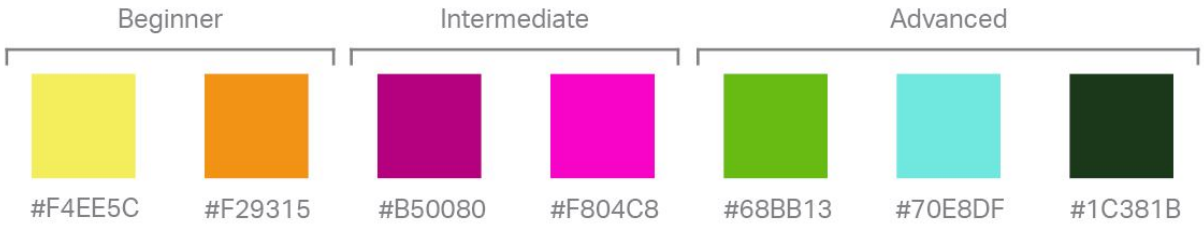
Primary colors

One primary color should be selected as the primary color for the wayfinding signage background. The palette below identifies potential primary color options. The *Cramerton Branding Manual* and the *AASHTO Guide for the Planning, Design, and Operation of Bicycle Facilities 2010* were considered in the selection of the options below.

Secondary colors: color-coding bicycle routes and experience levels

The Town of Cramerton Bicycle Plan categorizes the town's seven discrete bicycle routes by skill level: beginner, intermediate, or advanced. It is recommended that bicycling wayfinding signage include the appropriate color along with route name to increase the ease by which cyclists identify routes and their required skill levels. Vehicular drivers will also be more informed of the skill level of bicyclists that they interact with on shared portions of routes.

While the provided palette represents the route color-coding included in the plan, the Town should choose its preferred color scheme to best communicate routes and skill levels in accordance with its style manual. In the palette below, route levels are delineated by color family: beginner is represented by yellow/orange; intermediate is pink/purple; and advanced is green/blue.



III. Type Fonts

The typography of wayfinding signage should be simple, clean, and contemporary to ensure readability at day night, and in poor weather conditions. A sans serif typographic font will achieve this and also communicate the modern and fresh branding identity of the Town of Cramerton. White font on the darker, primary color background is recommended. Font type should be consistent throughout all wayfinding signage. Potential sans serif fonts suitable for wayfinding signage are included below.

Blue Highway

Blue Highway Regular, identified as a primary typeface in the *Cramerton Branding Manual.*

BLUE HIGHWAY

Blue Highway D, identified as a primary typeface in the *Cramerton Branding Manual.*

Highway Gothic

Highway Gothic, developed by the Federal Highway Administration. It was also previously the primary font for all highway signs.

Clearview Hwy-2 W

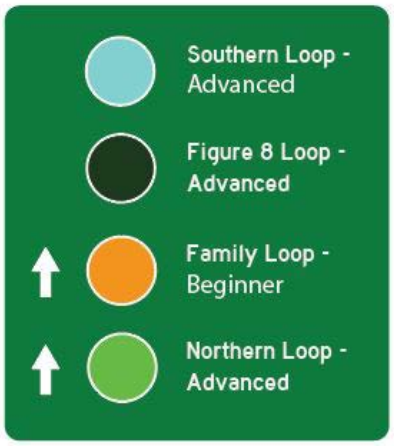
Clearview Highway – 2 W, of the Clearview font series recently reinstated by the FHWA for usage on highway signage.

IV. Application to Priority Projects

Examples of how this wayfinding guidance could be applied to the priority projects outlined in this bicycle plan are included below.

Sample 1

Sample 2



Sample 3

Wayfinding improvements at Centennial Center is a priority project based on its prominent location in the town of Cramerton. Wayfinding signage can be implemented in a variety of ways. *Sample 1* combines nearby points of interest and their distance with locations of nearby bicycle routes. *Sample 2* is designed as a pedestrian wayfinding sign, indicating the mileage and walking distance to points of interest. (Distances included on sample signage are suggestive and not definitive.)

Wayfinding improvements on Eagle Road and Eighth Avenue are also priority projects. For these corridors, *Sample 1* or *Sample 3* signage are possible options. *Sample 3* is composed of bicycle routes that the cyclist is currently riding as well as nearby routes and their directions.

Appendix C: State and Federal Policies

Applicable state and federal policies pertaining to bicycle and pedestrian programs and facilities are summarized in Table C-1.

Table C-1: State and Federal Policies

Policy	Applicability to Bicycle and Pedestrian Planning
Federal Policies	
Americans with Disabilities Act (ADA) (1990)	Ratified in 1990, ADA prohibits discrimination on the basis of disability. Title III pertains to public accommodations including transportation. Federally funded bicycle and pedestrian projects must comply with the Americans with Disabilities Act.
American Association of State Highway & Transportation Officials (AASHTO)	AASHTO publishes design standards for transportation facilities including bicycle and pedestrian projects. These standards are often adopted by state departments of transportation, helping in the design of safe and efficient bicycle and pedestrian facilities.
Manual on Uniform Traffic Control Devices (MUTCD) (2009)	The MUTCD defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel. The MUTCD is published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F.
Moving Ahead for Progress in the 21st Century (MAP-21) (2012)	MAP-21 funds surface transportation programs and creates a streamlined, performance-based, and multi-modal program to address the many challenges facing the U.S. transportation system. MAP-21 reorganizes many of the dedicated bicycle and pedestrian funding programs into other functions. Applicable programs under MAP-21 for bicycle and pedestrian projects include: Transportation Alternatives Program (TAP), Congestion Mitigation and Air Quality Improvement (CMAQ), and Surface Transportation Program (STP).
Title VI of the Civil Rights Act of 1964 and Executive Order 12898 (1964, 1998)	Title VI of the Civil Rights Act of 1964 requires that each federal agency ensure that no person is excluded, denied, or discriminated based on race, color, national origin, age, sex, disability. Executive Order 12898 signed by President Bill Clinton in 1994 requires that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.
United States Department of Transportation Mission Statement (2010)	The USDOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including (US) DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.

Policy	Applicability to Bicycle and Pedestrian Planning
State Policies	
NCDOT Bicycle Policy	The NCDOT Bicycle Policy states that bicycling is a "bona fide" highway purpose subject to the same rights and responsibility and eligible for the same considerations as other highway purposes. It also designates bicycle facility planning be included in the state thoroughfare and project planning process. http://www.ncdot.gov/bikeped/download/bikeped_laws_Bicycle_Policy.pdf
NCDOT Board of Transportation Resolution for Bicycling and Walking	The resolution states that the North Carolina Board of Transportation strongly reaffirms its commitment to improving conditions for bicycling and walking, and recognizes non-motorized modes of transportation as critical elements of the local, regional, and national transportation system. . It also acknowledges the benefits that bicycling and walking offer: cleaner air, reduced congestion, more livable communities, more efficient use of road space and resources and healthier people. http://www.ncdot.gov/bikeped/download/bikeped_laws_BOT_Mainstreaming_Resolution.pdf
NCDOT Bridge Policy	The NCDOT Bridge Policy states that sidewalks should be included on new bridges with curb and gutter approaches that are not controlled access facilities. Sidewalks may be on one or both sides of the bridge. The sidewalk should be a minimum of 5 to 6 feet wide. https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Bridge%20Policy.pdf
NCDOT Complete Streets	Adopted in July 2009, the Complete Streets policy is to accommodate all modes of transportation wherever safe and appropriate; increases connectivity between neighborhoods, streets, and transit systems; and improves safety for pedestrian, cyclists, and motorists. http://www.completestreetsnc.org/
NCDOT Division of Bicycle and Pedestrian Transportation	The NCDOT Division of Bicycle and Pedestrian Transportation assists communities across the state improve bicycle and pedestrian safety and mobility. The Division provides technical assistance, funding for research and planning, and resources such as the Watch for Me NC campaign.
NCDOT Greenway Policy	In 1994, NCDOT adopted guidelines to consider greenways and greenway crossings during the highway planning process. This policy was incorporated so that critical corridors which have been adopted by localities for future greenways will not be severed by highway construction. http://www.ncdot.gov/_templates/download/external.html?pdf=http%3A//www.ncdot.gov/bikeped/download/bikeped_laws_Greenway_Admin_Action.pdf AND http://www.ncdot.gov/bikeped/download/GuidelinesForGreenwayAccommodations.pdf
NCDOT Mission Statement	NCDOT's mission is: "Connecting people and places safely and efficiently, with accountability and environmental sensitivity to enhance the economy, health and wellbeing of North Carolina." Bicycle and pedestrian facilities help to accomplish this mission by improving safety, encouraging physical activity, and providing environmentally friendly alternatives to motorized transportation.
NCDOT Pedestrian Policy Guidelines	The NCDOT Pedestrian Policy states that the Department of Transportation will replace existing sidewalks disturbed as a result of a highway improvement. The Department is authorized to construct new sidewalks adjacent to State highway improvement projects at the request of the municipality provided the municipality agrees to reimburse for the construction cost of the sidewalks. Maintenance of sidewalks will be the responsibility of the municipality. http://www.ncdot.gov/bikeped/download/bikeped_Ped_Policy.pdf

Policy	Applicability to Bicycle and Pedestrian Planning
Strategic Mobility Formula	The Strategic Transportation Investments (STI) law signed June 2013 establishes the Strategic Mobility Formula for funding transportation projects in North Carolina. The formula divides bicycle and pedestrian projects into incidental and independent projects. Incidental projects are included in larger transportation projects while independent projects are standalone such as adding a sidewalk to an existing road. Independent projects are capped at 20 projects per M/RPO annually.

Sources: Advocacy Advance, American Association of State Highway and Transportation Officials, Federal Highway Administration, North Carolina Department of Transportation, United States Department of Transportation

Appendix D: Design Guidelines

General design guidelines for bicycle and pedestrian facilities are linked below and can provide general bicycle and pedestrian planning and design guidelines, as well as typical cross-sections and bicycle and pedestrian design considerations. NCDOT adheres to these guidelines and the state Complete Streets guidelines in its design of bicycle and pedestrian facilities. NCDOT has made these guidelines and resources available at https://connect.ncdot.gov/projects/BikePed/pages/guidance.aspx. Table D-1 is a summary of these resources along with links. At the conclusion of Appendix D, specific examples of wayfinding signage are provided.

Table D-1: NCDOT Design Guidelines and Resources

Document	Link
American Association of State Highway and Transportation Officials (AASHTO) *Bicycling and pedestrian facilities on state roads*	
Guide for the Development of Bicycle Facilities	https://bookstore.transportation.org/Item_details.aspx?id=1943
Guide for the Planning, Design, and Operations of Pedestrian Facilities	https://bookstore.transportation.org/item_details.aspx?id=119
Federal Highway Administration (FHWA)	
Accessibility Guidance	https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/index.cfm
Design Guidance	
Facility Guidance	https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/index.cfm
Facility Operations	
Manual on Uniform Traffic Control Devices (MUTCD) *State roads*	
Part 4E: Pedestrian Control Features	https://mutcd.fhwa.dot.gov/htm/2003r1r2/part4/part4e.htm
Part 7: Traffic Controls for School Areas	https://mutcd.fhwa.dot.gov/htm/2003r1r2/part7/part7-toc.htm
Part 9: Traffic Controls for Bicycle Facilities	https://mutcd.fhwa.dot.gov/htm/2003r1r2/part9/part9-toc.htm
2009 NC Supplement to MUTCD	https://connect.ncdot.gov/resources/safety/TrafficSafetyResources/2009%20NC%20Supplement%20to%20MUTCD.pdf
National Association of City Transportation Officials (NACTO) *Locally maintained streets and shared use paths*	
Urban Bikeway Design Guide	https://nacto.org/publication/urban-bikeway-design-guide/
Urban Street Design Guide	https://nacto.org/publication/urban-street-design-guide/
Safe Routes to School (SRTS) Non-Infrastructure	
National Center for Safe Routes to School	http://www.saferoutesinfo.org/
National Partnership for Safe Routes to School	http://www.saferoutespartnership.org/

Document	Link
US Access Board *Locally maintained streets and shared use paths*	
ABA Accessibility Standards	https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/guide-to-the-aba-standards/single-file-version
ADA Accessibility Guidelines	https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/ada-aba-accessibility-guidelines-2004
ADA Accessibility Standards	https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards
Public Rights-of-Way, Streets & Sidewalks, and Shared Use Paths	https://www.access-board.gov/guidelines-and-standards/streets-sidewalks
North Carolina Department of Transportation (NCDOT) *State Roads*	
Statewide Pedestrian and Bicycle Plan	https://www.ncdot.gov/bikeped/walkbikenc/#toolbox
Glossary of North Carolina Terminology for Active Transportation	https://connect.ncdot.gov/projects/BikePed/Documents/NC%20Terminology%20for%20Active%20Travel.pdf
NCDOT Complete Streets	http://www.completestreetsnc.org/
Evaluating Temporary Accommodations for Pedestrians	https://connect.ncdot.gov/projects/wztc/Documents/AccomPedinWZProc.pdf
NC Local Programs Handbook	https://connect.ncdot.gov/municipalities/Funding/Pages/LPM%20Handbook.aspx/
Traditional Neighborhood Development Guidelines	https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Traditional%20Neighborhood%20Development%20Manual.pdf

Appendix E: Funding Sources

Table E-1 provides a list of funding sources, eligible projects, potential award amounts, and match requirements for bicycle and pedestrian infrastructure projects and programs in Cramerton.

Table E-1: Funding Sources

Source	Eligible Projects	Characteristics and Requirements
Federal Funding Sources		
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	• Projects to improve air quality and reduce traffic congestion • Projects must be in STIP • Technical assistance	• Typically requires 20% match • $2 billion authorized in FY 2013
Highway Safety Improvement Program (HSIP)	• Bicycle or pedestrian projects on any public road, bicycle path, or trail	• Typically requires 10% match • $2 billion authorized in FY 2013
State and Community Highway Safety Grant Program (Section 402)	• Education, enforcement, and research programs designed to reduce traffic crashes, deaths, injuries, and property damage • Administered by the Governor's Representative for Highway Safety	• $235 million authorized in FY 2013
Surface Transportation Program (STP)	• Projects on federal-aid highway • Safety brochure or book • Technical assistance	• Typically requires 20% match • $10 billion authorized in FY 2013
Transportation Alternatives Program (TAP)	• Bicycle and pedestrian facilities • Recreational trails • Safe Routes to School projects • Technical assistance • Programmed through the Strategic Transportation Investments – Strategic Mobility Formula process	• Typically requires 20% match • Can be received directly by local governments • $808 million authorized in FY 2013
Urbanized Area Formula Program (UZA)	• Public transportation projects • In urbanized areas of more than 200,000 at least 1% of funds must be used for bicycle and pedestrian facilities	• Typically requires 20% match • $2 billion authorized in FY 2013

Source	Eligible Projects	Characteristics and Requirements
State Funding Sources		
Clean Water Management Trust Fund (CWMTF)	• Projects that enhance or restore degraded waters, acquire land with ecological, cultural, and historic significance • Greenway (shared use path) projects are eligible	• Requires matching funds • Annual grant cycle
Land and Water Conservation Fund (LWCF)	• Land acquisition and/or development projects for public outdoor recreation and/or to protect outstanding natural or scenic resources • Projects must be on a single site	• Requires 50% match • Administered by the Division of Parks and Recreation
Parks and Recreation Trust Fund (PARTF)	• Acquisition and/or development of park and recreational projects	• Requires 50% match • Administered by the Division of Parks and Recreation
Powell Bill	• "Maintaining, repairing, constructing, reconstructing or widening of any street or public thoroughfare within the municipal limits or for planning, construction, and maintenance of bikeways, greenways or sidewalks."	• Annual allocation from the State to qualifying municipalities • $135,878.20 awarded to Rutherfordton in FY 2016
Recreational Trails Program	• Trail construction • Trail facilities and amenities • Programs that promote safety and environmental protection as they relate to recreational trail projects	• Maximum grant award $200,000 • Requires 25% match • Federal funds managed by the Division of Parks and Recreation
Strategic Mobility Formula	• Limited funding for bicycle and pedestrian projects that are at least $100,000 and included in a locally adopted plan • Programmed through the Strategic Transportation Investments – Strategic Mobility Formula process	• State funds may not be used for a local match (except for Powell Bill funds) • MPOs/RPOs may submit up to 20 bicycle/pedestrian projects • Right-of-way is not an eligible expense
Safe Routes to School (SRTS)	• Infrastructure projects within 2 miles of a K-8 school • Project must be within the public right-of-way	• No match required • Currently funding with leftover SRTS funds, once expended TAP funds will be used and programmed through the Strategic Transportation Investments – Strategic Mobility Formula process

Source	Eligible Projects	Characteristics and Requirements
Local Funding Sources		
Capital Reserve Fund	• May be used to fund bicycle and pedestrian infrastructure projects	• The Town Board of Commissioners would establish the fund through an ordinance • May be financed through town budget allocations, grants, and donations
Community Crowdfunding	• Unrestricted source of funds, would apply to bicycle and pedestrian linear facilities and spot improvements	• Town residents make monetary contributions through online platforms such as Citizenvestor • Town would pay a nominal fee
Fees	• The fee ordinance would establish which projects are eligible • Shared use path projects may be eligible for funds generated by stormwater fees as these projects could mitigate the effects of runoff	• Would require adoption by the Town Board of Commissioners • Fee types may include stormwater fees assessed per area of impervious surface or streetscape fees assessed per length of street frontage
General Obligation Bonds	• May be used to fund bicycle and pedestrian infrastructure projects	• Would require adoption by the Town Board of Commissioners • Would require approval by town residents
Special Tax District	• May be levied by the municipality to raise funds to provide services or fund projects such as bicycle and pedestrian infrastructure projects	• Would require adoption by the Town Board of Commissioners
Tax Increment Financing	• Bicycle and pedestrian infrastructure improvements, land acquisition, utilities, and other improvements	• Increased property values resulting from the constructed facility are used to pay the debt borrowed to build the facility

Sources: Advocacy Advance, MAP-21 Find It, Fund It!; NCDOT, Strategic Transportation Investments; NC Clean Water Management Trust Fund; NC Division of Parks and Recreation.