



PEDESTRIAN MASTER PLAN

Town of Clyde, North Carolina

Prepared for:
Town of Clyde

Prepared by:

HNTB

In conjunction with:



December 2012



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ACKNOWLEDGEMENT



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Town of Clyde

Pedestrian Master Plan

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CHAPTER 1: Introduction

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Chapter 1

INTRODUCTION



The Town of Clyde is located in Haywood County situated along US 19/23, the primary east-west arterial through the county. Based on the 2010 Census data there are 1,223 people that live within the town's jurisdictional limits, which is slightly less than the population of 1,324 in 2000. The Town is located within a floodplain area with much of the residential area in the flood-way and 100-year flood plain. Portions of the town are still recovering from the devastating floods that occurred in 2004, which reduced the population by approximately 8%.

Today, pedestrians face the challenge of overcoming major barriers such as Carolina Boulevard (US 19/23), the Norfolk Southern Railway line and the Pigeon River. These man-made and natural barriers hinder pedestrian mobility and force unsafe walking behaviors. The Town recognizes these obstacles and has pursued and received a grant through the North Carolina Department of Transportation (NCDOT) Division of Bicycle and Pedestrian Transportation to complete this pedestrian plan. The purpose of this Pedestrian Master Plan is to provide the Town with specific recommendations for physical improvements as well as policy and organizational recommendations. These recommendations will provide Town officials with the tools to improve pedestrian mobility throughout the community.

BENEFITS OF WALKING

Communities across the country are realizing the importance of walking and physical activity as part of a healthy community and are working hard to ensure pedestrians have a safe and convenient place to walk. The benefits of walking have been well documented and span across multiple aspects of our daily lives. According to the Pedestrian and Bicycle Information Center, there are six major categories of walking benefits:

- » Health Benefits
- » Transportation
- » Environmental & Energy
- » Economic
- » Quality of Life
- » Social Justice

Health Benefits

The health benefits of walking and regular physical activity can help reduce the risk of heart attacks, strokes, diabetes, high blood pressure and other types of health risks. Improved health can also help reduce the risk of obesity and health care costs. Obesity has become a major problem in the United States. In fact, according to the Centers for Disease Control and Prevention, approximately 17% (12.5 million) of children between the ages of 2-19 years old are considered to be obese. The percentage of adults considered obese



is even worse. Approximately 1/3 (35.7%) are considered obese.ⁱ According to the CDC, in 2009, 27.8% of adults within the State of North Carolina (ages 18 and over) were considered to be obese, and in Haywood County, it was slightly higher with 28.8% of adults considered to be obese.ⁱⁱ

Transportation Benefits

Walking is by far the least expensive form of transportation and can be used for many daily trips. For many individuals without a personal automobile, walking is their primary form of transportation. According to 2009 National Household Travel Survey (NHTS), one in 11 U.S. households does not own an automobile. Therefore, providing safe, convenient and properly maintained pedestrian infrastructure is important.

Aesthetic and functional improvements, such as pedestrian lighting, landscaping, wide sidewalks, and timed pedestrian crossings can increase pedestrian safety and improve mobility. These improvements can also help create a sense of identity for the town and promote social interaction.

Environmental & Energy Benefits

Walking can have noticeable benefits on the environment and energy usage. Automobiles create a substantial amount of air pollution through the release of carbon monoxide. Pedestrian facilities, such as sidewalks and greenways, provides individuals with alternative ways to access daily destinations, which can reduce their

i Centers for Disease Control and Prevention Web Site, <http://www.cdc.gov/obesity/data/adult.html>, July 2012.

ii Centers for Disease Control and Prevention Web Site, http://apps.nccd.cdc.gov/DDT_STRS2/CountyPrevalenceData.aspx?mode=OBS



▲ The Pigeon River is a natural amenity that can be leveraged to create greenway opportunities for the Town of Clyde.

dependency on motor vehicles, improving the overall air quality. Greenways also help improve water quality by acting as a buffer from development and storm water runoff.

Economic Benefits

Many economic benefits can be realized with a well connected, well maintained and safe pedestrian system. First and foremost, walking is free. In comparison, the annual cost of operating and maintaining an automobile is approximately \$8,000.ⁱⁱⁱ For people who are unable to drive or can't afford an automobile, providing pedestrian amenities and access to other forms of transportation (e.g. transit) is criti-

iii North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation, Traveling by Foot (<http://www.ncdot.gov/bikeped/travelingfoot/>)

cal. It also allows households to spend income on other household costs. Studies have shown that walking increases the perception of an active, vibrant communities, which translates into investment from developers and the stimulation of economic development. Greenways are now considered an amenity in many communities across the country, which can have a positive impact on property values. A 2002 survey that was sponsored by the National Association of Realtors and the National Association of Home Builders, indicated that trails ranked as the second most important community amenity out of a list of 18 choices.^{iv}

In 2003, the NCDOT Division of Bicycle and Pedestrian Transportation commissioned a study to examine the value of public investment in bicycle facilities and determine the economic benefits accrued in the northern Outer Banks. This area was selected for the study because of existing high levels of bicycle activity and the presence of an extensive system of special bicycle facilities. The study was conducted by the Institute for Transportation Research and Education (ITRE) at North Carolina State University. Some of the significant economic impact findings of the study include:

- » A conservative estimate indicated that the annual economic impact is \$60 million, with 1,400 jobs created/supported each year.
- » 17% of visitors to the area report bicycling activity while there; this is approximately 680,000 bicyclists annually.
- » Over three-fourths of all survey respondents indicated that additional bicycle paths, paved shoulders and bike lanes

iv Consumer’s Survey on Smart Choices for Home Buyers, National Association of Realtors and National Association of Home Builders, April 2002.

should be built.

- » Nine out of ten survey respondents strongly agreed that state and/or federal tax dollars should be used to build more bicycle facilities.

These are just some of the findings from this report. To read the entire technical report, please follow the link below: <http://www.ncdot.gov/bikeped/researchreports/>.

Quality of Life Benefits

In many areas across the country, a communities walkability is an indicator or the quality of life and livability, which many businesses and tourist find attractive. *“In cities and towns where people can be regularly seen out walking, there is a palpable sense that these are safe and friendly places to live and visit.”*^v

Greenways create educational opportunities to inform residents



◀ Greenways have positive impacts on communities and provide opportunities for social interaction (photo credit: Dan Burden)

v Quality of Life Benefits, Pedestrian and Bicycle Information Center, July 2012.



and visitors of a town’s history and local natural resources. The potential greenway that was identified along the Pigeon River that would connect the Youth Sports Complex, Central Haywood High School to the future part that will be developed off of Thickety Road is a perfect example of how a greenway can provide educational opportunities within the town.

Social Justice Benefits

In cities and towns where pedestrian facilities are limited or non-existent, individuals are forced to travel by automobile or walk along roadways that are unsafe for pedestrian travel.



▲ The lack of sidewalks here forces pedestrians to walk in the street - creating a dangerous situation.

“In cities and towns where people can be regularly seen out walking, there is a palpable sense that these areas are safe and friendly places to live and visit.”

For individuals who don’t have the option to travel by automobile, including children, the elderly, those with disabilities or those who can’t afford an automobile, the lack of pedestrian infrastructure “creates an inconvenient and socially unjust barrier to mobility.”^{vi}

VISION AND GOALS

Project Vision

During the Kick-off meeting with the Town Staff and Steering Committee, issues, concerns and opportunities were discussed. Many of these issues and concerns were seen and documented in the field during the walking audit.

This discussion and feedback received during the walking audit, led to the development of a vision statement and a series of goals.

The Town of Clyde will promote a **safe** and **convenient** walking environment for the residents of the town. The Town will also promote a **healthy community** by developing a comprehensive pedestrian network that connects the Town’s **destinations** and is accessible by **all users**.

Goals

- » Improve the safety and visibility of pedestrian crossings at key intersections, especially along Carolina Boulevard.
- » Improve connectivity throughout the Town where feasible

vi Social Justing Benefits, Pedestrian and Bicycle Information Center, July 2012.

- » Improve the maintenance of pedestrian facilities throughout the town
- » Ensure all key intersections are accessible by all users.
- » Develop greenways/trails that connect key existing and future destinations throughout the town.
- » Strengthen zoning requirements to ensure the inclusion of pedestrian facilities within site plan submittals.
- » Develop pedestrian related educational programs and initiatives that inform users of the State’s pedestrian laws and safe walking habits.

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CHAPTER 2: Existing Conditions

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Chapter 2

EXISTING CONDITIONS



In order to begin to develop a network of pedestrian facilities, it is important to understand and assess the existing pedestrian environment. This understanding and assessment began with a meeting and walking audit with the Town Staff, the Steering Committee members and NCDOT. The walking audit provided the staff and steering committee the opportunity to express their concerns and needs about the pedestrian network to NCDOT and the consultant. This exercise was very useful and a lot of good information was gathered that is summarized throughout this chapter. This Chapter summarizes the existing conditions of the pedestrian facilities, including sidewalks, key intersections and greenways. The review also includes existing and previous planning efforts, including the Town's Land Use Plan, the Zoning Ordinance, which includes the draft of the Sidewalk Connectivity Ordinance, Haywood County Comprehensive Bicycle Master Plan, and Haywood County Community College Master Plan report.

Reviewing and assessing existing and previous planning efforts provides the project team with not only an understanding of what the community's needs and concerns are, but it also provides a clear understanding of what the overall vision is for the community as a whole.

DEMOGRAPHIC ANALYSIS

According to the 2010 Census data from the U.S. Census Bureau, 1,223 people live in the Town of Clyde. Of these, 48% are male and 52% are female and an overwhelming majority (95%) are White. The median age of residents is 38, with 20% of the total population over the age of 62.

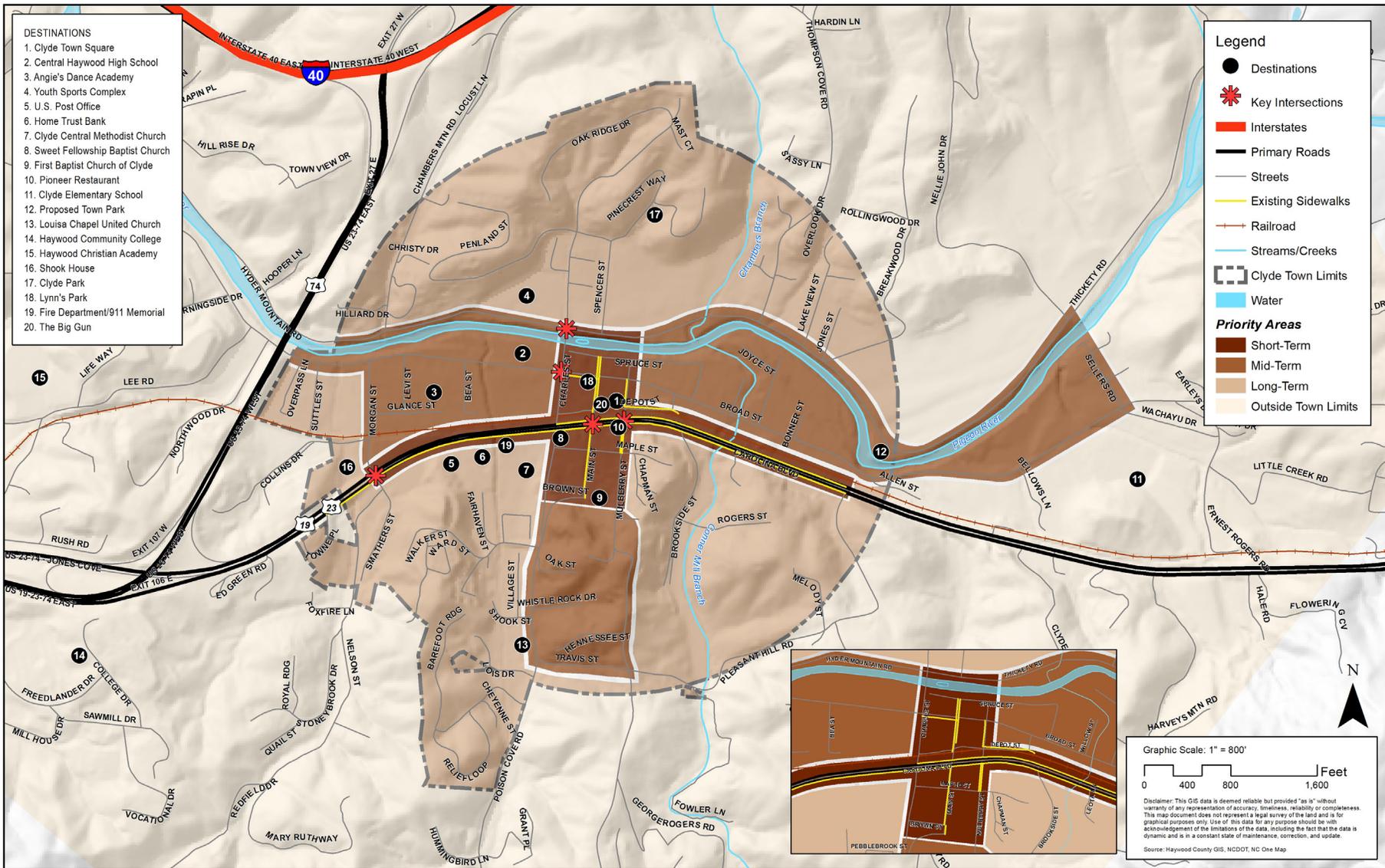
Income can also be a significant factor in transportation choices among residents. Based on U.S. Census Bureau, roughly 19% of the town's population is below the poverty level, compared to the State average of 16% and Haywood County average of 12%. In addition, approximately 1% of the available workforce in Clyde walks to work and 1% of all households lack access to an automobile, which is about 5% lower than the state average (6.47%) and about 4% lower than the county average (4.81%).

LAND USE AND DEVELOPMENT

The Town of Clyde is primarily comprised of residential uses with retail/commercial uses spread throughout, especially along Carolina Boulevard and the historic business district along Main Street. Residential uses are concentrated along Broad Street immediately adjacent to the historic business district, on Penland Street/Oak Ridge Drive north of Town, and south of Town along Ward Street and in the new Barefoot Ridge subdivision with additional significant residential concentrations along Mulberry Street. The Town is home to several institutional uses, including Clyde Elementary School, Central Haywood High School, and Haywood Community College. Also included inside the Town's limits is a youth sports complex that includes facilities for football, baseball and basketball, which is located along Hyder Mountain Road north of the Main Street area.



Chapter 2
EXISTING CONDITIONS



▲ Figure 2.1: Existing Conditions Map

EXISTING PEDESTRIAN SYSTEM

Like many small communities around North Carolina, the Town of Clyde has historically placed emphasis on the automobile and very little on the pedestrian. That trend, however, is slowly changing. The Town recognizes the importance of providing safe and well-maintained pedestrian facilities and has recently upgraded some of the sidewalks and handicap ramps within the central business district and along Carolina Boulevard. Due to the steep terrain and lack of right-of-way on many of the streets outside the central business district, pedestrian facilities, such as sidewalks are missing. The lack of pedestrian facilities beyond the central business district make it difficult for residents and visitors to access destinations by foot.

Sidewalks

The existing sidewalk network is confined to the central business district and along Carolina Boulevard (see Figure 2.1). Currently, there are sidewalks along Main Street, Carolina Boulevard (US 19/23), Maple Street and portions of Broad Street. Some of these sidewalks are located on both sides of the roadway, while others only have them on one side. Most of the sidewalks around the Town Center are new and are in good condition; however, those located



▲ Sidewalks along Carolina Boulevard are older and need of repair

along Carolina Boulevard are older and in need of repair. The sidewalks along the northern side of Carolina Boulevard do not have a buffer that separates them from the road, making the walking experience very uncomfortable and dangerous. In addition, many of the sidewalks are obstructed by utilities or automobiles that are parked on the sidewalk, forcing pedestrians to walk closer to the travel lane or actually walk in the road.

Intersections and Crossings

Currently, there are two signalized intersections within the Town. The first is located at the intersection of Carolina Boulevard and Smathers Street/Morgan Street. This is a four way intersection that has several commercial destinations around it. Improvements are



▲ Marked crosswalks and pedestrian signals at the intersection of Carolina Boulevard and Main Street.

Town of Clyde



needed at the intersection to better facilitate the movement of pedestrians through the intersection. The intersection of Carolina Boulevard and Main Street is the second. This intersection has a marked pedestrian crossing on the west side of the intersection with a pedestrian push-button signal. Additional markings and pedestrian signals are needed at the other approaches for this intersection. The handicap ramps were recently upgraded with truncated domes, but during the walking audit it appeared that these ramps were in slight disrepair.



▲ Marked and signed pedestrian crossing at Carolina Boulevard and Mulberry Street.

In addition to the signalized intersections described above, there is a signed and marked pedestrian crossing on the west side of the intersection of Carolina Boulevard and Mulberry Street. This non-signalized crossing was recently installed by NCDOT because of the

high volume of pedestrian traffic crossing Carolina Boulevard to access the Pioneer Restaurant located on the southwest corner of the intersection. Two additional marked crosswalk are located in the central business district along Main Street. These crossings are not at intersections and do not have pedestrian signals where pedestrians are crossing Main Street or parking access areas.

Greenways

Currently, the Town of Clyde does not operate or maintain any greenways. The Town has been coordinating with the County and surrounding jurisdictions to implement a greenway system, which will be discussed in more detail in the next Chapter 3.

EXISTING AND PREVIOUS PLANNING EFFORTS

Town of Clyde Land Use Plan (Draft April 2012)

The plan outlines several key Goals, Recommendations and Strategies that are relevant to the Pedestrian Plan. These are summarized below.

Goal: Develop and maintain an efficient, multi-modal transportation system that serves the needs of residents the traveling public and businesses.

- » **Recommendation:** Improve Carolina Boulevard in a manner that complements plans for revitalizing the downtown area

Strategies:

- » Convert Carolina Boulevard into a boulevard-style road.

- » Work with NCDOT to control the number of new driveways on Carolina Boulevard - use access management strategies such as frontage roads.

- » **Recommendation:** Improve connectivity between points of interest

Strategies:

- » Use sidewalks, walking trails and bicycle routes to link facilities used by the public.
- » Encourage developers to provide for connections to be made between new, existing and proposed projects.
- » **Recommendation:** Develop plans to provide pedestrian and bicycle facilities in Clyde.

Strategies:

- » Develop pedestrian and bicycle plans to help identify and assess existing facilities and needs, recommend improvements to existing facilities, propose new facilities, and suggest ways to link facilities to each other and to other destinations.
- » Look for opportunities for implementing bicycle and pedestrian plans, such as Safe Routes to School program.
- » **Recommendation:** Provide and promote options for alternate transportation modes in Clyde.

Strategies:

- » Develop a greenway along the Pigeon River.
- » Link downtown sidewalks with other existing and future pedestrian facilities.
- » Require developers to build “complete streets” that accommodate vehicles, pedestrians, bicyclists.
- » Build awareness in the community about the benefits of multi-modal transportation systems.

Goal: To provide high quality, accessible, well-maintained public facilities and services in an efficient and economical manner.

- » **Recommendation:** Develop a consistent set of policies and standards regarding the construction and maintenance of public improvements such as streets, sidewalks, walking trails, bicycle paths, etc.

Strategies:

- » Develop a standards and specifications manual for public improvements.
- » Ensure that standards for public improvements are consistent throughout Town ordinances, policies, etc.

In addition to these goals, recommendations and strategies, the plan identifies additional components that will make downtown and other areas more pedestrian friendly. These include the encouragement of mixed-use types of development as well as the



improvement of wayfinding signage and pedestrian lighting.

Town of Clyde Sidewalk and Connectivity Ordinance (Draft 2012)

The Sidewalk and Connectivity Ordinance is still being finalized and considered for adoption; however, key recommendations from this draft ordinance are worth mentioning and are subject to change based on the adoption.

The Town wishes to improve connectivity for all users (motorists, pedestrians and bicyclists) as part of this ordinance. Design guidelines have not been developed, but required widths of sidewalks have and are based by zoning district. Table 2.1 provides a summary of the required widths by zone. For additional principles outlined by the Sidewalk and Connectivity Ordinance, please see the Appendix.

▼ Table 2.1: Sidewalk requirements by zoning district

Zoning District	Required Sidewalk Width
R-1, R-1A	5-8 ft; one or both sides; or 8 ft multi-use pathway
R-2	5-8 ft; both sides
C-1	6-12 ft; both sides
C-2	6-8 ft; both sides
I-1	Not required
O & I	5-8 ft; one or both sides

Haywood County Comprehensive Bicycle Plan

The Town of Clyde was identified as a “Haywood Hub” along with three other areas within the county. According to the plan, the Hub route requires various improvements to streets and greenways though different land use contexts. Even though these recommendations are for bicyclists, pedestrian facilities should exist for those who choose to stop and visit Clyde once they arrive. The proposed greenway along the Pigeon River should be assessable by pedestrians as well as bicyclists.

Haywood County Comprehensive Transportation Plan (CTP)

The Haywood County CTP does not have any specific pedestrian recommendations for the Town of Clyde; however, the Town should continue to coordinate with the Land of Sky Regional Planning Organization (RPO) and the French Broad River Metropolitan Planning Organization (MPO) on future transportation infrastructure improvements.

SUMMARY OF EXISTING CONDITIONS

Overall the Town of Clyde lacks a comprehensive network of sidewalks and other types of pedestrian facilities to allow individuals to walk to destinations within the Town. Primary residential areas north and south of Carolina Boulevard are separated from the Town’s business district. Pedestrian are unable to access schools, churches, sports complex and other destinations due to the lack of sidewalks or greenways/trails within the Town.

It is the desire of the community to improve conditions in the future so that they can eventually walk to destinations that are within close proximity to them. The recommendations in the following chapters

are aimed at improving these conditions and providing the Town of Clyde with clear direction to implement this plan.

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CHAPTER 3: Pedestrian Network

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Chapter 3

PEDESTRIAN NETWORK



The recommendations outlined in this chapter reflect the community's vision and goals and are based on the inventory of the existing pedestrian facilities. This chapter provides an overview of the plan elements, including sidewalks, greenways, intersection improvements and other non-signalized crossings.

This chapter contains a series of recommended infrastructure improvements to the existing pedestrian network of Clyde. As mentioned in Chapter 2, the Town of Clyde has limited pedestrian facilities today. The recommendations outlined in this chapter are aimed at improving connectivity throughout the town.

The philosophy that guided the development of these recommendations is based on improving pedestrian facilities in key areas where residents need and want to walk. In some locations the steep slope and lack of right-of-way of some of the roadways within the Town make it difficult to create a comprehensive system of sidewalks and greenways; however, focused improvements in certain key areas will vastly improve the mobility of pedestrians.

CHAPTER OUTLINE

The Pedestrian Network includes a combination of several pedestrian transportation elements that are described in detail throughout this chapter. The outline below provides a structure for this discussion.





Priority Areas

To provide the Town of Clyde with clear direction for future infrastructure improvements, an implementation framework has been created. This framework is comprised of short-term, mid-term, and long-term priority areas. These areas are illustrated in Figure 3.1.

- » **Short-Term (0-5 years)** - The Town of Clyde should strive to complete the projects located within this area over the next 5 years. These projects are essential to improving pedestrian mobility within the downtown area.
- » **Mid-Term (6-10 years)** - The projects located in this area are important, and the Town should work to begin securing funding and developing partners to implement these projects within the next 6-10 years. The projects identified here begin to connect other areas of town to downtown.
- » **Long-Term (over 10 years)** - Connectivity to residential areas outside the downtown area are essential; however, these connections will take longer to develop due to funding and physical constraints. Many of the sidewalks within this area can be implemented through sidewalk requirements outlined in the Town's Unified Development Ordinance. These projects should be completed beyond the 10 year time frame.
- » **Outside the Town's Limits (ETJ region)** - Future sidewalk development in this area will take the cooperation of residents and developers. Currently, there's not a huge demand for sidewalks, but as the area grows and more residential units are built, the Town should encourage the development of sidewalks.

The Pedestrian Network

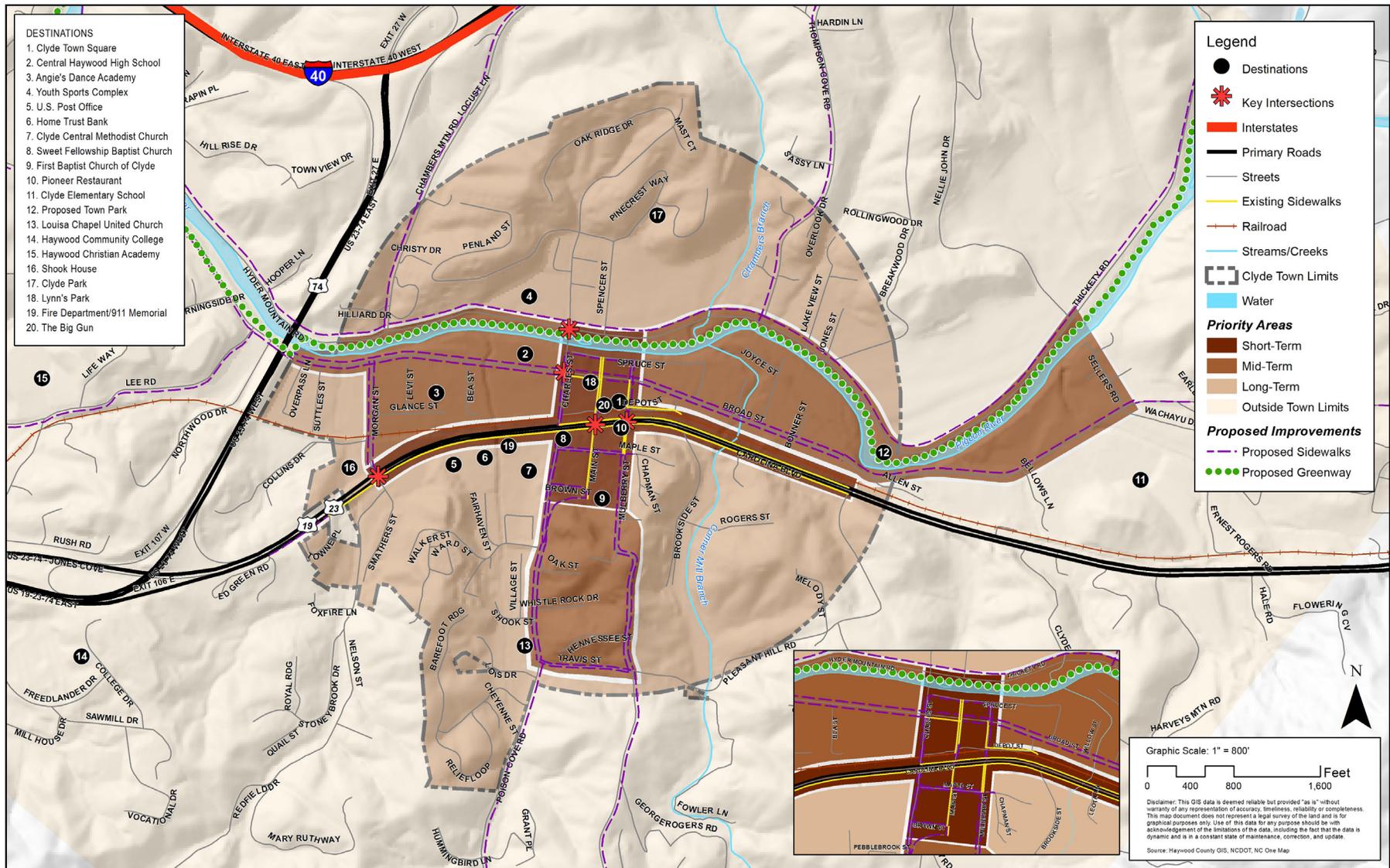
The pedestrian network is comprised of three essential elements - sidewalks, greenways and key intersections. As discussed in Chapter 2, some sidewalks exist today, but many of them are in poor condition and are in need of repair. Other areas don't have any sidewalks, which hinders the ability of pedestrians to walk to their destinations within the Town. Making it even more difficult are the lack of necessary pedestrian facilities at key intersections. This includes striped crosswalks, pedestrian push-button signals, lighting, and directional signage. Finally, greenways provide opportunities for recreational activities and also provide regional connectivity, allowing residents and visitors to walk or bike to destinations outside the Town of Clyde. As the Town begins implementing these projects, there are several potential constraints that they should keep in mind. These could include, but limited to right-of-way obstacles, easement requirements, space limitations, grade issues, ditch issues, and structural barriers.

Sidewalks

As discussed in Chapter 2, sidewalks are confined to Carolina Boulevard and other streets in the downtown area. Some of the sidewalks are only located on one side of the roadway. The recommended Pedestrian Network (Figure 3.1) illustrates the expansion of the existing system.

» Short-Term Priority

It is recommended that within the downtown area (Short-Term Priority Area) all major streets have sidewalks on both sides of the roadway and should be a minimum of 5 feet wide (see Table 3.1: Short-Term Priority Projects). However, in some



▲ Figure 3.1: Town of Clyde Pedestrian Network



instances it is not necessary to provide them on both sides of the roadway. For example, it is recommended that Spruce Street only have sidewalks on the south side of the street. No development exists on the north side, and there are no plans for future development on that side of the street. In addition, Brown Street and a small portion of Main Street and Maple Street south of Carolina Boulevard should only have sidewalks on one side.

▼ Table 3.1: Short-Term Priority Sidewalk Projects

Location	From	To	Length (ft.)	Sidewalk Width	Side of Street
Broad St	Charles St	Mulberry St	340	5 ft. min	Proposed - North side
Broad St	Main St	Mulberry St	562	5 ft. min	Proposed - North and South sides
Brown St	Charles St	Main St	356	5 ft. min	Proposed - North side
Charles St	Carolina Blvd	Spruce St	1,364	5 ft. min	Proposed - West and East sides
Charles St	Carolina Blvd	Ward St	2,092	5 ft. min	Proposed - West and East sides
Main St	Brown St	Ward St	762	5 ft. min	Proposed - North side
Main St	Railroad Tracks	Carolina Blvd	214	5 ft. min	Proposed - West and East sides
Maple St	Charles St	Mulberry St	1,244	5 ft. min	Proposed - North and South sides
Maple St	Mulberry St	Chapman St	124	5 ft. min	Proposed - North side
Mulberry St	Broad St	Maple St	274	5 ft. min	Proposed - East side
Mulberry St	Maple St	Church View Dr	1,198	5 ft. min	Proposed - West and East sides
Mulberry St	Railroad Tracks	Carolina Blvd	216	5 ft. min	Proposed - West and East sides
Mulberry St	Spruce St	Broad St	370	5 ft. min	Proposed - West and East sides
Spruce Street	Charles St	Mulberry St	619	5 ft. min	Proposed - South side
Thickety Rd	Charles St	Just east of Spencer St	685	5 ft. min	Proposed - North side

Improvements need to be made at the railroad crossings on Mulberry Street, Main Street, Charles Street and Smathers Street to improve pedestrian mobility. Currently, steep slope and uneven pavement make the crossings inaccessible for handicapped individuals (see Chapter 6 for guidance on railroad crossings). Ideally, sidewalks should be constructed on both sides of Carolina Boulevard; however, there is a portion along the north side of the road and west of Charles Street that is constrained due to the presence of the railroad. Development potential is limited and sidewalks are not needed.

» Mid-Term Priority

In the Mid-Term Priority Areas, additional sidewalks are

▼ Table 3.2: Mid-Term Priority Sidewalk Projects

Location	From	To	Length (ft.)	Width	Side of Street
Broad St	Mulberry St	East of Bonner	4,188	5 feet min	Proposed - North and South sides
Broad St	Charles St	Overpass Ln	5,164	5 feet min	Proposed - North and South sides
Broad St	East of Bonner St	Sellers Rd	2,955	5 feet min	Proposed - North side
Hyder Mountain Rd	Charles St	Town Limits	2,186	5 feet min	Proposed - North side
Main St	Travis St	Ward St	2,184	5 feet min	Proposed - West and East sides
Morgan St	Carolina Blvd	Broad St	2,084	5 Feet min	Proposed - West and East sides
Mulberry St	Travis St	Church View Dr	3,080	5 feet min	Proposed - West and East sides
Thickety Rd	East of Spencer St	Town Limits	2,906	5 feet min	Proposed - North side
Thickety Rd	Town Limits	Old Clyde Rd	5,541	5 feet min	Proposed - North side
Travis St	Main St	Mulberry St	1,730	5 feet min	Proposed - North and South sides

recommendations along some of the Town’s thoroughfares. North of Carolina Boulevard, sidewalks are recommended on Broad Street, Morgan Street and Hyder Mountain/Thickety Road (Table 3.2). On Broad Street and Morgan Street, sidewalks are recommended on both sides, while only one side is recommended on Hyder Mountain/Thickety Road. These sidewalks will help connect residential areas to the downtown area. On the south side of Carolina Boulevard sidewalks are recommended on Charles Street, Main Street and Mulberry Street.

» Long-Term Priority

In the Long-Term Priority Areas and the areas outside the Town’s limits north of Carolina Boulevard, sidewalks are recommended on Lee Road, Old Clyde Road, Hyder Mountain Road, Chambers Mountain Road, Thompson Cove Road, and Thickety Road (Table 3.3). South of Carolina Boulevard, sidewalks are recommended on Poison Cove Road and

▼ Table 3.3: Long-Term Priority Sidewalk Projects

Location	From	To	Length (ft.)	Width	Side of Street
Thompson Cove Rd	Hyder Mountain Rd	Town Limits	3,843	5 feet min	Proposed - West side
Chambers Mountain Rd	Thickety Rd	Town Limits	4,659	5 feet min	Proposed - West side

Mulberry Street. The development of sidewalks in these areas will address the need for connecting the residential areas of the town to the downtown area.

» Projects in the Town’s ETJ

There are several sidewalk projects that are not located within the Town limits and extend into the Town’s ETJ. These projects are listed in Table 3.4 and should be considered to be a long-term effort. The Town should work with future developers to ensure that as development occurs in the ETJ that sidewalks are being incorporated into the design of the development.

▼ Table 3.4: Sidewalk Projects in the Town’s ETJ

Location	From	To	Length (ft.)	Width	Side of Street
Chambers Mountain Rd	Town Limits	I-40	4,659	5 feet min	Proposed - West side
Chambers Mountain Rd	I-40	Town ETJ	2,329	5 feet min	Proposed - West side
Hyder Mountain Rd	Town Limits	Town ETJ	4,942	5 feet min	Proposed - North side
Lee Rd	Old Clyde Rd	Town ETJ	5,731	5 feet min	Proposed - South side
Mulberry St	Travis St	Stamey Cove Rd	5,441	5 feet min	Proposed - East side
Old Clyde Rd	Sellers Rd	Town ETJ	5,004	5 feet min	Proposed - North side
Old Clyde Rd	US 23-74	Town ETJ	7,627	5 feet min	Proposed - South side
Poison Cove Rd	Travis St	Ratcliff Cove Rd	4,732	5 feet min	Proposed - East side
Thickety Rd	Town Limits	Town ETJ	5,541	5 feet min	Proposed - North side
Thompson Cove Rd	Town Limits	I-40	3,843	5 feet min	Proposed - West side
Thompson Cove Rd	I-40	Town ETJ	2,205	5 feet min	Proposed - West side



Key Intersections

During the kick-off meeting and walking audit with the Steering Committee and the Town staff, it was noted that there were five key intersections that needed improvements to improve pedestrian mobility (see Figure 3.1). Three of these intersections are located on Carolina Boulevard, which is highly traveled and dangerous roadway for pedestrians. Two of those three are currently signalized, but only one has a pedestrian push button signal. Inadequate crossing facilities can confuse both the motorist and the pedestrian, creating unsafe barriers between destinations. These intersections should be improved with crosswalks, pedestrian push-button signals and handicap assessable ramps that comply with Federal and State guidelines (see Table 3.5). Detailed information and illustrations of these guidelines can be found in Chapter 6.



▲ The pedestrian push-button signal at the intersection of Main Street and Carolina Boulevard

The third intersection on Carolina Boulevard is Mulberry Street. Today, there is a striped and signed pedestrian crossing on the west side of the intersection. The crosswalk and signage was installed due to the increased number of pedestrians trying to cross at this location. The Town should coordinate with NCDOT to determine the most appropriate treatment for this location. Additional measures, such as advanced flashing crossing signs, high visibility crosswalks, pedestrian refuges and rectangular rapid flashing beacons (RRFB)

▼ Table 3.5: Key Intersection Projects

Intersecting Streets	Improvement Types				
	Crosswalks	Pedestrian Push-Button Signals	Pedestrian Lighting	Access Ramps	Advanced Pedestrian Crossing Warning
Mid-block crossing on Carolina Blvd between Main Street & Mulberry Street	<ul style="list-style-type: none"> 10 ft wide high visibility on Carolina Blvd. crossings and 6 ft wide Standard on Mulberry St crossings. Provide concrete refuge island 	No	Yes. Match existing lighting at Town Center.	Yes.	Yes
Carolina Boulevard & Main Street	<ul style="list-style-type: none"> 10 ft wide high visibility on Carolina Blvd. crossings and 6 ft wide Standard on Main St crossings 	Yes	Yes. Match existing lighting at Town Center.	Yes. On all approaches	NA
Carolina Boulevard & Smathers/Morgan Street	<ul style="list-style-type: none"> 6 foot wide 	Yes	Yes. Match existing lighting at Town Center.	Yes, except on west side of intersection.	NA
Broad Street & Charles Street	<ul style="list-style-type: none"> 6 foot wide 	No. Stop sign exists.	Yes	Yes	NA
Charles Street & Hyder Mountain Road/Thickety Road	<ul style="list-style-type: none"> 6 foot wide 	No. Stop sign exists.	Yes	Yes	NA

could be installed to increase the visibility and safety of pedestrians. Another alternative to this crossing would be to remove the crossing at the intersection and provide a mid-block crossing between Main Street and Mulberry Street. Please see the priority projects for more information on the mid-block crossing.

The last two key intersections are located in the downtown area in the short-term priority area. The first is the intersection of Broad

Street and Charles Street. Charles Street is the only street that currently crosses the Pigeon River, creating the potential for a high volume of pedestrian traffic, especially if the proposed greenway is built on the north side of the river. This intersection should be enhanced with high visibility crosswalks to improve the visibility of the pedestrian crossing.

Greenways

Clyde’s Draft Land Use Plan recommends the development of a greenway along the Pigeon River. The Pedestrian Network (Figure 3.1) has incorporated that recommendation and identifies an approximate alignment that follows the existing sewer easement. Chapter 6 of this plan provides a detailed cross section and information for the dimensions of a 10 foot wide asphalt greenway.

The greenway alignment is conceptual and is subject to change once further planning and design are complete. The current alignment

does present some challenges though. In some locations along the present alignment there may not be enough room to construct a 10-foot wide path due to the steep slope and the lack of right-of-way. Table 3.6 provides an overview of the three different segments that are located within the Town of Clyde, where they are located and approximately how long they are. The Town will need to continue to coordinate with the County’s Greenway Committee and adjacent property owners to implement the greenway system.

▼ Table 3.6: Greenway Projects

Location	From	To	Length	Width	Facility Type
Sewer Easement	US 23-74	East to Proposed Town Park following sewer easement	7,519	10 ft asphalt	Proposed - Greenway
Sewer Easement	Proposed Town Park	East to Town’s ETJ following sewer easement	4,625	10 ft asphalt	Proposed - Greenway
Sewer Easement	Town limits	West to Town’s ETJ following sewer easement	5,802	10 ft asphalt	Proposed - Greenway



▲ Existing sewer easement along the north side of Pigeon River looking east.



PRIORITY PROJECTS

At the beginning of this project, several key projects were identified as needing immediate attention. The Town should pursue the implementation of these projects over the next three years. Listed below are the four projects that have been chosen as priority projects. A project cut sheet illustrating the improvements can be found on the following pages. The cut sheets are meant to provide a planning level conceptual illustration of the types of improvements that are recommended.

Each priority project has been given a cost estimate that is meant to provide some perspective on the order of magnitude. The planning level costs are based on 2011 average construction costs throughout the Charlotte region. An industry-standard construction contingency (30%) was added to the planning level costs. The cost estimate does not include right-of-way acquisition, mobilization, utility relocation, grading, traffic control or other detailed costs that are associated with the preparation of engineering drawings and/or actual construction bids. A more detailed engineering study should be preformed for actual planning, design and construction of these facilities.

- » Carolina Boulevard Mid-block crossing between Main Street and Mulberry Street
- » Carolina Boulevard and Main Street Intersection improvements
- » Carolina Boulevard sidewalk improvements toward Haywood Community College
- » Carolina Boulevard Roadway improvements

The intersection of Carolina Boulevard and Smathers/Morgan Street was initially identified as a priority project by the Steering Committee. After further discussion with the adjacent property owners and the Town of Clyde, the intersection was removed as a priority project; however, it should be noted that this intersection will require improvements in the future to better facilitate pedestrians. The lack of curb and gutter and sidewalks on the south side of the intersection make it difficult for pedestrians to navigate through the intersection. The Town should continue to explore ways to improve this intersection without negatively affecting the adjacent businesses.

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PRIORITY PROJECTS

Carolina Boulevard Mid-Block Crossing

Recommended Improvements

- » Remove existing striped crosswalk and pedestrian crossing warning signs at Mulberry Street intersection
- » Install Rectangular Rapid Flash Beacon (RRFB), one on each side of Carolina Boulevard at the mid-block crossing location
- » Install high visibility crosswalks with concrete refuge islands
- » Install new handicap ramps with truncated domes
- » Install curb extensions on the south side of the intersection from Main Street to Mulberry Street

Note: This will shorten the crossing distance for pedestrians, act as a traffic calming measure and better define the on-street parking.

Mid-Block Crossing Improvements						
	Quantity	SF	SY	Unit Cost	Cost	Cost
Concrete refuge islands		293	33	\$25	\$814	\$1,000
Curb extensions		1505	167	\$25	\$4,181	\$5,000
High visibility markings (24" Thermoplastic Pavement Marking Line)	95			\$5	\$475	\$500
ADA Ramps (includes truncated domes)	2			\$1,000	\$2,000	\$2,000
Rectangular Rapid Flash Beacon (RRFB)	2			\$7,500	\$15,000	\$15,000
				Cost	\$22,500	
				Contingency (30%)	\$6,750	
				Total Cost	\$29,250	
					\$30,000	



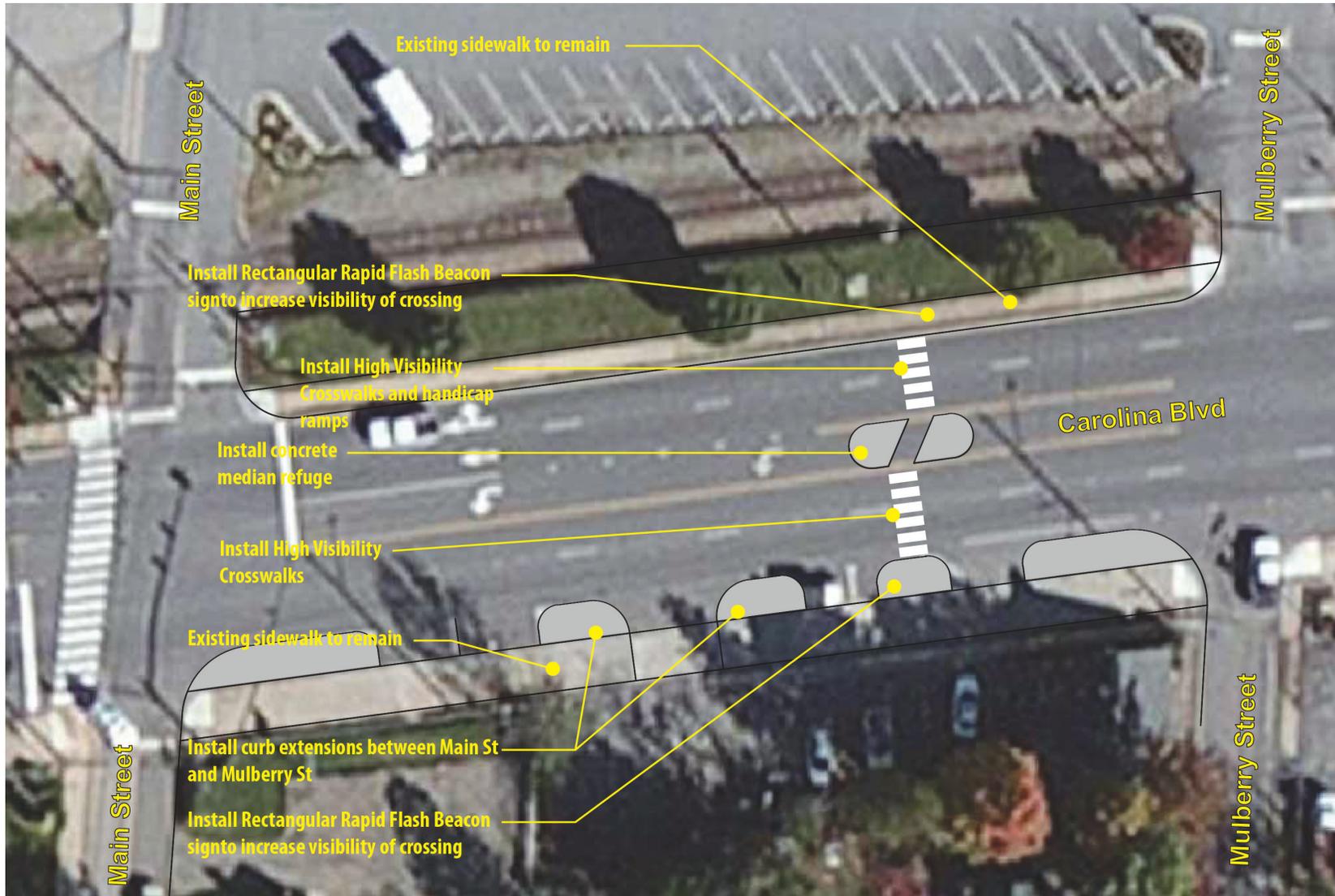
▲ Mid-block crossing location between Main Street and Mulberry Street



▲ An RRFB in Orlando, FL (photo credit: William Carpenter)



▲ Example of an RRFB



▲ Concept of Mid-block improvements between Main Street and Mulberry Street



Main Street / Carolina Boulevard Intersection Improvements

- » Extend sidewalks on the north side of the intersection north into the Town Center
- » Install High Visibility Crosswalks on all approaches
- » Install pedestrian push button signals on all approaches (use the same style that currently exists on the southwest corner of the intersection)
- » Improve railroad crossing for better pedestrian mobility and handicap accessibility (will need to coordinate with the railroad company)
- » Install curb extensions on south side of the intersection
- » Move stop bars for motorists back in accordance with NCDOT standards
- » Stripe pedestrian crossing across parking areas to improve visibility of the crossings.

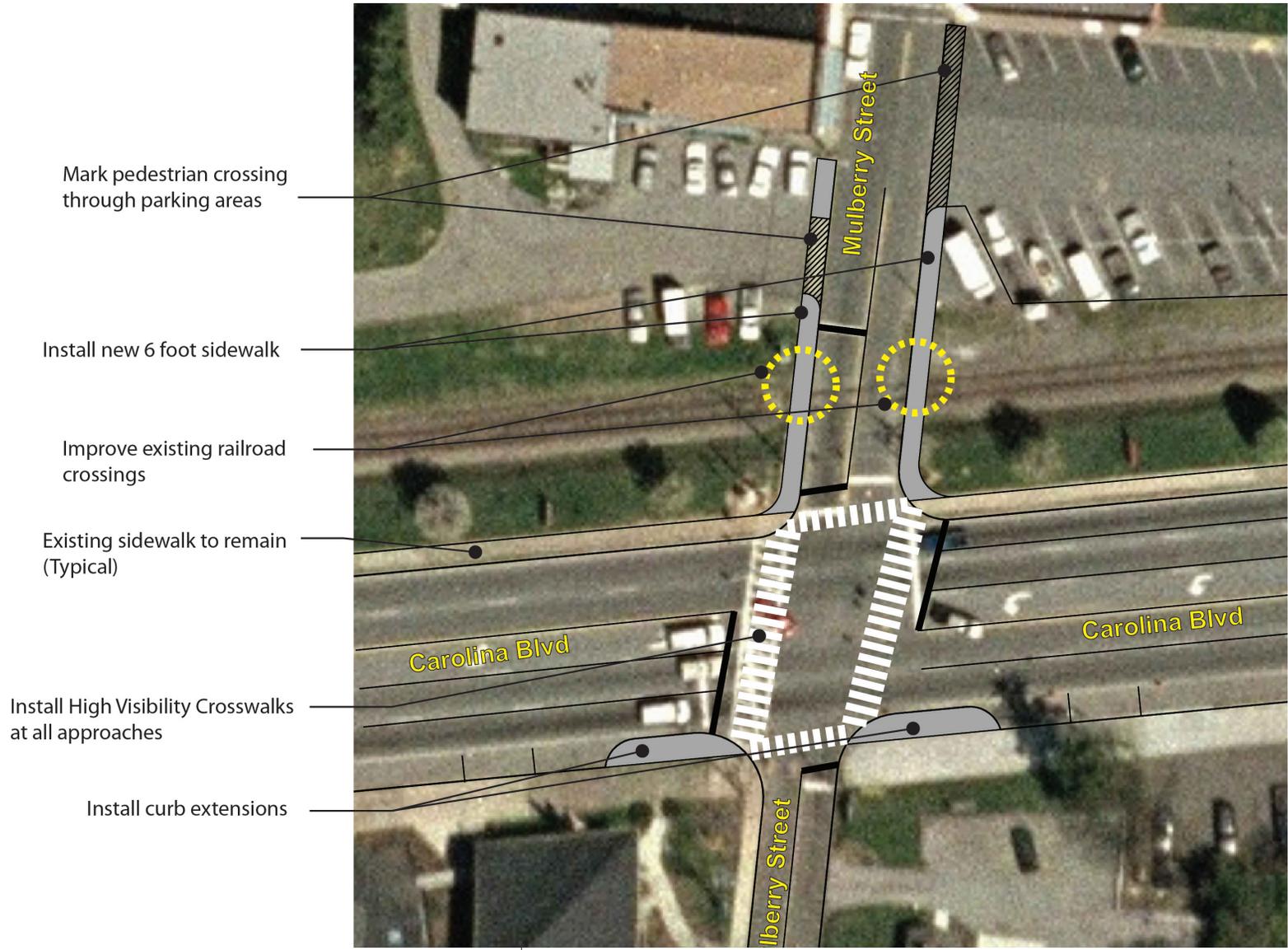
Note: This will shorten the crossing distance for pedestrians, act as a traffic calming measure and better define the on-street parking.



▲ Intersection of Main Street and Carolina Boulevard looking northeast

Main Street Intersection Improvements						
	Quantity	SF	SY	Unit Cost	Cost	Cost
Curb extensions	2	622	69	\$25	\$1,728	\$2,000
4" Concrete Sidewalk		1091	121	\$25	\$3,031	\$4,000
High visibility crosswalk markings (24" Thermoplastic Pavement Marking Line)	520			\$5	\$2,600	\$3,000
ADA Ramps (includes truncated domes)	4			\$750	\$3,000	\$3,000
Pedestrian Pushbutton Signals on pedestals (same as existing)	3			\$11,000	\$33,000	\$33,000

Cost \$45,000
Contingency (30%) \$13,500
Total Cost \$58,500
\$59,000



▲ Carolina Boulevard/Main Street recommended improvements



Carolina Boulevard Sidewalk Improvements toward Haywood Community College

During the initial stages of the Pedestrian Master Plan, the Steering Committee noted that it was important to be able to connect the Haywood Community College with the downtown area of Clyde. Different options were considered, however, only one is recommended in this plan. The Town recently complete a sidewalk project that is located along the south side of Carolina Boulevard from Smathers/Morgan Street to Towne Place. In order to make the connection to the college, this plan recommends the following:

- » Install a 6 foot sidewalk with curb and gutter along the south side of Carolina Boulevard from Towne Place to Tomlynne Place.
- » Provide a buffer between the sidewalk and roadway of at least 5 feet.
- » Install landscaping and lighting to improve the safety and aesthetics.

Carolina Boulevard Sidewalk Project

	Quantity	SF	SY	Unit Cost	Cost	Cost
4" Concrete Sidewalk		2817	313	\$25	\$7,825	\$8,000

Cost \$8,000
 Contingency (30%) \$2,400
 Total Cost \$10,400
 \$11,000



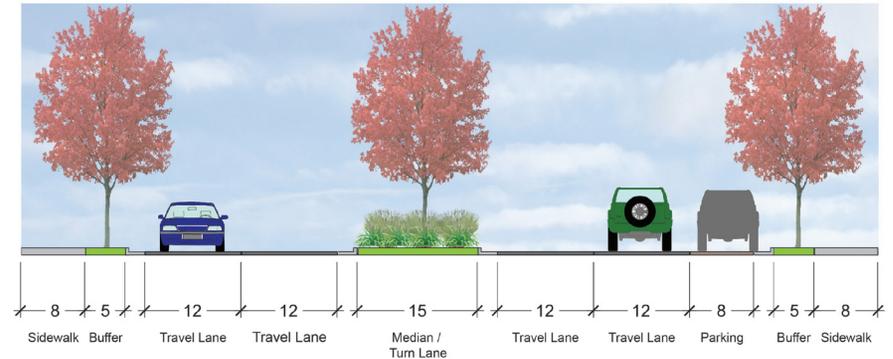
▲ Proposed sidewalk along the south side of Carolina Boulevard between Town Place and Tomlynne Place



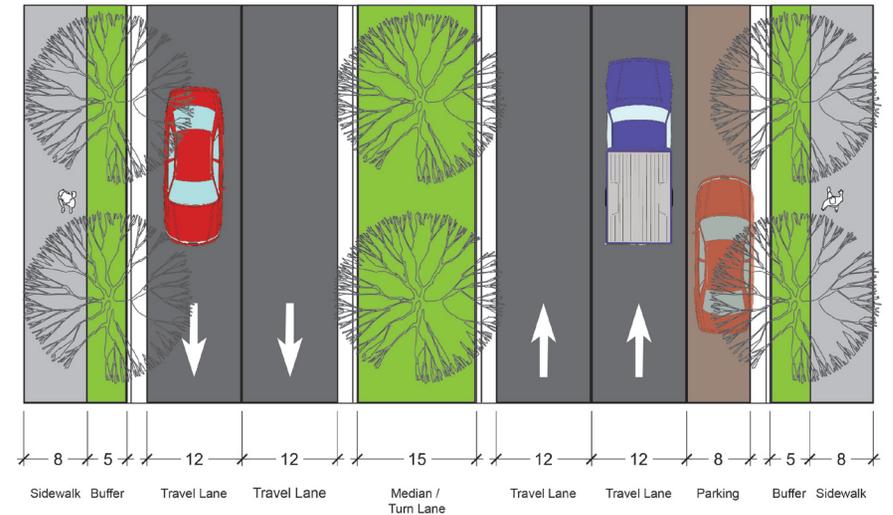
Carolina Boulevard Roadway Improvements

Under the “Goals, Recommendations and Strategies” of the Town’s Comprehensive Land Use Plan, there is a recommendation to convert Carolina Boulevard into a “boulevard style” facility. This plan recognizes that vision and also recommends the Town continue to work with NCDOT and the MPO to convert this corridor into a true boulevard style roadway. Below are some recommended treatments that would work to accomplish this.

- » Work with local Police Department to increase enforcement of the existing posted speed limit of 35 mph along Carolina Boulevard through downtown.
- » Access existing sidewalks along Carolina Boulevard and make immediate improvements to sections that are in disrepair.
- » Long-term improvements are needed to transform Carolina Boulevard into a boulevard and improve walking and biking along the corridor. Improvements include converting sidewalk sections along the southern portion of Carolina Boulevard from 13 feet of sidewalk to an 8 foot sidewalk and 5 foot landscaped buffer.



▲ Carolina Boulevard Typical Cross Section (Proposed)



▲ Carolina Boulevard Typical Plan View (Proposed)

CHAPTER 4: Programs and Policies



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The successful implementation of the Clyde Pedestrian Plan cannot be realized without a strong foundation of policies and programs. Chapter 3 provided an overview of the physical improvements that are needed to create a well connected, safe and efficient pedestrian network.

The long-term success of this plan must consider how these physical improvements will be implemented through various programs and policies. This chapter summarizes the existing programs and policies and identifies others that the Town can use toward implementing the recommendations in this plan.

There are three basic categories for pedestrian related programs and policies: education, encouragement, and enforcement. The list of programs and policies listed here provides the Town with a variety of opportunities for promoting walking and active living. With the Town's limited resources, it is important to work with local volunteers and community organizations to initiate some of these with the first 1-3 years of adopting this plan.

PROGRAMS

Education Programs and Initiatives

There are several types of media and public forums that can be used to inform and advocate for safe pedestrian travel. It is recommended that the Town encourage the development of the following to inform the public on pedestrian related issues and opportunities.

» Local Advocacy Group

The Town of Clyde should form an official Transportation Committee/Advisory Group or similar committee that will oversee the implementation of the recommendations of this plan. The Steering Committee that oversaw the development of this plan could assume this role until an official committee is formed. This Committee will supplement the staff by promoting safe pedestrian travel and coordinating education and outreach opportunities. With the limited resources that the Town has, local advocacy groups and volunteers will play an important role in the implementation of this plan.

» Educational Materials

There are several types of educational materials that are available to the Town through the NCDOT Bicycle and Pedestrian Division (<http://www.ncdot.gov/bikeped/safetyeducation/>). The Town should invest in obtaining some of these to provide to the community at special events throughout the year. In addition to NCDOT, there are several national resources, such as the National Center for Safe Routes to School (<http://www.saferoutesinfo.org/>) and the Pedestrian



Chapter 4 PROGRAMS & POLICIES

Tips for Parents and Other Adults For Teaching Pedestrian Safety to Children



TIP SHEET

Walking is a fun and healthy way to spend time with your children while teaching them skills that can serve them well throughout life. The walk to school is a great time to use these safety tips.

Be a walking role model

Children learn through experience. Walking with parents or another caregiver is an important way for children to practice crossing real streets and picking safe places to walk. There is no magic age when children are old enough to walk without an adult. But, as a parent, you should decide when your child has the skills and experience to deal with traffic safely without you.

As you walk with your child, remember these safety tips:

- Wear bright-colored clothes, and carry flashlights or wear reflective gear if it is dark or hard to see.
- Look for traffic at every driveway and intersection. Be aware of drivers in parked cars that may be getting ready to move.
- Obey all traffic signs and signals.
- Cross the street safely:
 1. Stop at the curb or edge of the street.
 2. Look left, right, left and behind you and in front of you for traffic.
 3. Wait until no traffic is coming and begin crossing.
 4. Keep looking for traffic until you have finished crossing.
 5. Walk, don't run across the street.



Choose the safest route to school

Select a walking route with less traffic and intersections.

- Pick places where there are sidewalks or paths separated from traffic. If there are no sidewalks or paths, walk as far from the motor vehicles as possible and, if possible, on the side of the street facing traffic.
- Limit the number of street crossings. When available, cross at a location with an adult school crossing guard.
- Avoid crossing busy or high-speed streets.

Understand your child's limitations

Children are not small adults. It will take time and practice for a child to develop the ability to deal with lots of traffic. Over time, children develop the ability to accurately judge the speed and distance of oncoming traffic. Young children may think that a car is able to stop, when in fact, it is not. Also, children may think that if they can see a driver, the driver can see them. But, children are smaller and harder for drivers to see. Get down to a child's height to experience their perspective and see what they see.

For more resources and information on Safe Routes to School, please visit the National Center for Safe Routes to School Web site at www.saferoutesinfo.org.

▲ Educational materials like this one developed by the National Center for Safe Routes to School can be easily created and distributed to residents.

» Staff Education

The Town's staff must be properly educated on the most up-to-date pedestrian laws and design requirements from NCDOT and AASHTO. Annual internal training sessions will educate

and Bicycle Information Center (<http://www.walkinginfo.org/>) that the Town should utilize in developing educational materials.

» Web-Based Education

The Town of Clyde should continue to utilize its web page to the fullest extent possible to allow citizens to download useful information regarding the Plan, such as pedestrian laws, safety tips, or maintenance request forms. It is also recommended that the Town consider the creation of a Facebook pedestrian user group, which would allow residents to share ideas and information regarding pedestrian related issues and opportunities with the Town.

Town staff on the latest innovations in pedestrian standards. This training should include the planning, design, development review, construction, and maintenance aspects of the transportation and development process. The planning and public works staff should also incorporate pedestrian issues into their daily tasks.

Web based training, such as webinars, are inexpensive and very accessible that the Town should utilize. It is also recommended that the Town join local and/or national organizations, such as the Association for Pedestrian and Bicycle Professionals. These organizations are very useful in answering questions and providing assistance with pedestrian and bicycle related issues. Also, as pedestrian improvement projects are implemented, the Town's Police Department should be informed about the new pedestrian facilities. Local law enforcement officials will be used to ensure new and existing facilities are functioning efficiently and safely.

» Local Events

The Town hosts an annual Veteran's Day Celebration. This event is an ideal venue that allow Town staff and/or the local advocacy groups to hand out educational materials to the public. This and other Town events are ideal for staff and the local advocacy group to interact with citizens and answer any questions, as well as solicit input from the



▲ Annual Veteran's Day Celebration

general public on the implementation of the Pedestrian Plan.

The Veteran’s Day Celebration provides the Town leaders with an opportunity to educate the community and increase awareness about pedestrian issues within the town. These functions can also enable the Town to plan pedestrian-friendly activities that promote both physical activity and social interaction.

In addition to the Town’s own local events, there are several different pedestrian oriented programs and initiatives that have been developed by affinity groups throughout the nation that can be easily implemented throughout Clyde.

» Eat Smart, Move More

This is a statewide movement that promotes increased opportunities for healthy eating and physical activity wherever people live, learn, earn, play and pray. They work to help communities, schools and businesses make it easy for people to eat healthy food and by physically active. www.eatsmartmovemorenc.com/AboutUs/TheMovement.html



Encouragement Programs

In addition to the various education materials that are available to the Town, there are several different pedestrian oriented programs and initiatives that have been developed by affinity groups throughout the country that can be easily implemented in the Town of Clyde.

Town of Clyde

» Walk a Child to School Initiative

The Walk a Child to School Initiative, supported by advocates nation-wide, emphasizes the importance of providing children with an opportunity to walk or bike to school in a safe environment. In 2010 there were a total of 84 schools registered in North Carolina for the event. www.walktoschool-usa.org



» International Car Free Day

International Car Free Day is an event organized by communities throughout the world with a common goal of taking cars off the streets for most of the day. The event takes place every September 22 and cities like Carborro have participated in the event to promote alternative forms of transportation. www.worldcarfree.net/wcfd/



» National Trails Day

The American Hiking Society developed National Trails Day to inspire communities to use their trails, celebrate their community, appreciate wildlife, and thank all of the people who built and maintain trails within the town. www.americanhiking.org/NTD.aspx





» Citizen Watch Groups

Citizens using on- and off-road facilities are more aware of facility maintenance problems or suspicious activities at certain areas. The community should be encouraged to report any concerns to Town Staff so that issues can be resolved. This can be done by providing a feedback page on the Town’s website or by forming a citizen’s watch group with a liaison on the Pedestrian Plan Committee or Transportation Committee as discussed earlier in this section.

» Public Art Program

Public art, such as the Haywood County “Clyde” Quilt Trails, along pedestrian corridors can involve local artisans and create a sense of community pride. Organizations like “Project for Public Spaces” (www.pps.org/) are dedicated to helping communities create a “public place,” by providing mobile training workshops and free resources.

» Walking/Running Clubs

To promote ongoing wellness, area businesses and schools can create running and walking clubs. These programs can be used to increase pedestrian activity and social interaction among classmates and co-workers. Participants can meet before, during or after work on designated days of the week. Groups with a common thread, like new mothers or senior citizens, can also create clubs, resulting in a strong personal and community bond.

» Walk-to-School

Children and their guardians may choose to participate in programs like the Walking School Bus where neighbors walk to school together, similar to a school bus or carpool. One or more adults volunteer to rotate walking to designated points along the route to school. This is a simple and fun way to encourage students to stay active, while adults can worry less about their child’s safety. Schools that are close in proximity to neighborhoods, like Clyde Elementary, could greatly benefit from a program like this.

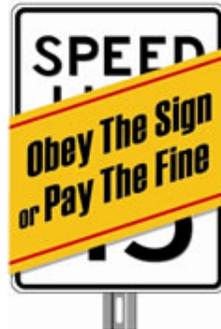
» Haywood County Public Schools

One way to improve the pedestrian infrastructure and to enable community leaders, schools and parents to improve safety and encourage more children, including those with disabilities, to safely walk and bike to school is through NCDOT’s Safe Routes to School grant program. Improvements could include high visibility crosswalks, lighting and more sidewalks that lead into the school properties. Currently, schools within Clyde do not have the necessary facilities for children to be able to walk safely to school. More information for Safe Routes to School can be found in the appendix.

» Speed Prevention TOOLKIT

The intent of this toolkit is to provide municipalities with marketing materials, earned media tools, and marketing ideas that can be distributed to fit local needs and objectives while partnering with other states, communities, and organizations across the country on speed management programs. It includes messaging and templates you may choose from

to support your speed management initiatives. The resources available can be used in several capacities and are built on two message platforms: Enforcement and Social Norming. More information can be obtained at: www.trafficsafetymarketing.gov/CAMPAIGNS/Speed+Prevention/Obey+The+Sign+or+Pay+The+Fine



Enforcement

Motorist Enforcement

Based on conversations with staff and the steering committee members, there is concern over the speed of motorists and safety of pedestrians on Carolina Boulevard. Local police should focus on key issues such as motorists speeding, not yielding to pedestrians in crosswalks, parking on sidewalks, etc. Sidewalk parking, which is a major concern for the Town, is often not enforced but should be in order to maintain pedestrian accessibility and to comply with the Town’s ordinance.

Pedestrian Enforcement

It is important to educate and enforce pedestrians and motorists of the laws that North Carolina has established. The Guide to North Carolina Bicycle and Pedestrian Laws is an excellent resource to use at local events to inform pedestrians of the proper walking habits so that accidents can be prevented. Additional NCDOT law resources can be found at <http://www.ncdot.gov/bikeped/lawspolicies/laws/default.html>



www.ncdot.gov/bikeped/lawspolicies/laws/default.html and the section of the NCDOT Laws Guidebook that contains pedestrian laws can be found at http://www.ncdot.gov/bikeped/download/bikeped_laws_Guidebook-Part-2.pdf.

POLICIES

Overview

Chapter 3 provided an overview of the physical aspects of the pedestrian plan; however, this portion of Chapter 4 outlines policy recommendations that are aimed at strengthening the Town’s current ordinance to ensure that the pedestrian projects are implemented. The Town staff should become familiar with these policies to ensure that new development is incorporating pedestrian facilities in their projects.

Zoning Ordinance

The Town of Clyde has drafted a “Sidewalk and Connectivity Ordinance” that will be incorporated into the existing Zoning Ordinance. It is currently under review. The Sidewalk and Connectivity Ordinance contains information that has a direct correlation with the implementation of pedestrian facilities. The ordinance provides guidance on required sidewalk width by zoning district and if it should be placed on one side or both sides of the street (see Table 2.1 in Chapter 2).

- » **Recommendation:** It is recommended that the Town adopt this ordinance and begin requiring developers to include as part of their design plans. A copy of this draft ordinance is located in the Appendix.

Town of Clyde

Pedestrian Master Plan



Pedestrian Connectivity and Safety

The following proposed requirements are not currently included in the Town's subdivision or zoning ordinance, but are recommended here to help improve pedestrian connectivity and safety throughout the Town.

- » **Recommendation:** Shared parking can reduce the number of driveway cuts along major streets, especially in commercial/retail areas of the town. Reducing driveway cuts reduces conflict points with motorists, which improves pedestrian safety. It is recommended that the Town assess driveway cuts along major thoroughfares like Carolina Boulevard to determine if consolidation of driveways is necessary to improve pedestrian safety and mobility.
- » **Recommendation:** The Town should consider amending their UDO (Section 605.2.g) to include language that would allow utility easement, such as sewer easements, to be utilized for greenway/trail development.
- » **Recommendation:** Ensure that pedestrian connectivity is being considered when two adjacent properties are being connected. Improvements could include sidewalks or clearly marked routes between the parking areas.

STATE POLICY

NCDOT Complete Streets Policy Statement

Transportation, quality of life, and economic development are all undeniably connected through well-planned, well-designed, and context sensitive transportation solutions. To NCDOT, the designations “well-planned”, “well-designed” and “context-sensitive” imply that transportation is an integral part of a comprehensive network that safely supports the needs of the communities and the traveling public that are served.

The North Carolina Department of Transportation, in its role as stewards over the transportation infrastructure, is committed to: providing an efficient multi-modal transportation network in North Carolina such that the access, mobility, and safety needs of motorists, transit users, bicyclists, and pedestrians of all ages and abilities are safely accommodated; caring for the built and natural environments by promoting sustainable development practices that minimize impacts on natural resources, historic, businesses, residents, scenic and other community values, while also recognizing that transportation improvements have significant potential to contribute to local, regional, and statewide quality of life and economic development objectives; working in partnership with local government agencies, interest groups, and the public to plan, fund, design, construct, and manage complete street networks that sustain mobility while accommodating walking, biking, and transit opportunities safely.

This policy requires that NCDOT's planners and designers will consider and incorporate multimodal alternatives in the design and improvement of all appropriate transportation projects within a growth area of a town or city unless exceptional circumstances

exist. Routine maintenance projects maybe excluded from this requirement; if an appropriate source of funding is not available. The entire policy can be review at http://www.bytrain.org/fra/general/ncdot_streets_policy.pdf. In addition to the State’s Complete Street Policy, the following links have been provided that provide additional information on other state policies and guidelines (www.nccompletestreets.org):

- » NCDOT Pedestrian Policy Guidelines - http://www.ncdot.gov/_templates/download/external.html?pdf=http%3A//www.ncdot.gov/doh/preconstruct/altern//value/manuals/ppm/ppm28/ppm28-1.pdf
- » NCDOT Greenway Policy - http://www.ncdot.gov/_templates/download/external.html?pdf=http%3A//www.ncdot.gov/bikeped/download/bikeped_laws_Greenway_Admin_Action.pdf
- » NCDOT Board of Transportation Resolution for Bicycling and Walking - http://www.ncdot.org/transit/bicycle/laws/laws_resolution.html
- » TND Guidelines - <http://www.ncdot.org/doh/preconstruct/altern/value/manuals/tnd.pdf>

FEDERAL POLICIES

Purpose

The United States Department of Transportation (DOT) is providing this Policy Statement to reflect the Department’s support for the development of fully integrated active transportation networks. The

establishment of well-connected walking and bicycling networks is an important component for livable communities, and their design should be a part of Federal-aid project developments. Walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use. Legislation and regulations exist that require inclusion of bicycle and pedestrian policies and projects into transportation plans and project development. Accordingly, transportation agencies should plan, fund, and implement improvements to their walking and bicycling networks, including linkages to transit.

In addition, DOT encourages transportation agencies to go beyond the minimum requirements, and proactively provide convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when appropriate. Transportation programs and facilities should accommodate people of all ages and abilities, including people too young to drive, people who cannot drive, and people who choose not to drive.

Policy Statement

The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including 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.

Town of Clyde

Pedestrian Master Plan



Authority

This policy is based on various sections in the United States Code (U.S.C.) and the Code of Federal Regulations (CFR) in Title 23—Highways, Title 49—Transportation, and Title 42—The Public Health and Welfare. These sections, provided in the Appendix, describe how bicyclists and pedestrians of all abilities should be involved throughout the planning process, should not be adversely affected by other transportation projects, and should be able to track annual obligations and expenditures on nonmotorized transportation facilities.

Recommended Actions

The DOT encourages States, local governments, professional associations, community organizations, public transportation agencies, and other government agencies, to adopt similar policy statements on bicycle and pedestrian accommodation as an indication of their commitment to accommodating bicyclists and pedestrians as an integral element of the transportation system. In support of this commitment, transportation agencies and local communities should go beyond minimum design standards and requirements to create safe, attractive, sustainable, accessible, and convenient bicycling and walking networks. Such actions should include:

- » Considering walking and bicycling as equals with other transportation modes: The primary goal of a transportation system is to safely and efficiently move people and goods. Walking and bicycling are efficient transportation modes for most short trips and, where convenient intermodal systems exist, these nonmotorized trips can easily be linked with transit to significantly increase trip distance. Because of the

benefits they provide, transportation agencies should give the same priority to walking and bicycling as is given to other transportation modes. Walking and bicycling should not be an afterthought in roadway design.

- » Ensuring that there are transportation choices for people of all ages and abilities, especially children: Pedestrian and bicycle facilities should meet accessibility requirements and provide safe, convenient, and interconnected transportation networks. For example, children should have safe and convenient options for walking or bicycling to school and parks. People who cannot or prefer not to drive should have safe and efficient transportation choices.
- » Going beyond minimum design standards: Transportation agencies are encouraged, when possible, to avoid designing walking and bicycling facilities to the minimum standards. For example, shared-use paths that have been designed to minimum width requirements will need retrofits as more people use them. It is more effective to plan for increased usage than to retrofit an older facility. Planning projects for the long-term should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements.
- » Integrating bicycle and pedestrian accommodation on new, rehabilitated, and limited-access bridges: DOT encourages bicycle and pedestrian accommodation on bridge projects including facilities on limited-access bridges with connections to streets or paths.
- » Collecting data on walking and biking trips: The best way to improve transportation networks for any mode is to collect

and analyze trip data to optimize investments. Walking and bicycling trip data for many communities are lacking. This data gap can be overcome by establishing routine collection of nonmotorized trip information. Communities that routinely collect walking and bicycling data are able to track trends and prioritize investments to ensure the success of new facilities. These data are also valuable in linking walking and bicycling with transit.

- » Setting mode share targets for walking and bicycling and tracking them over time: A byproduct of improved data collection is that communities can establish targets for increasing the percentage of trips made by walking and bicycling.
- » Removing snow from sidewalks and shared-use paths: Current maintenance provisions require pedestrian facilities built with Federal funds to be maintained in the same manner as other roadway assets. State Agencies have generally established levels of service on various routes especially as related to snow and ice events.
- » Improving nonmotorized facilities during maintenance projects: Many transportation agencies spend most of their transportation funding on maintenance rather than on constructing new facilities. Transportation agencies should find ways to make facility improvements for pedestrians and bicyclists during resurfacing and other maintenance projects.

Conclusion

Increased commitment to and investment in bicycle facilities and walking networks can help meet goals for cleaner, healthier air;

Town of Clyde

Pedestrian Master Plan

less congested roadways; and more livable, safe, cost-efficient communities. Walking and bicycling provide low-cost mobility options that place fewer demands on local roads and highways. DOT recognizes that safe and convenient walking and bicycling facilities may look different depending on the context — appropriate facilities in a rural community may be different from a dense, urban area. However, regardless of regional, climate, and population density differences, it is important that pedestrian and bicycle facilities be integrated into transportation systems. While DOT leads the effort to provide safe and convenient accommodations for pedestrians and bicyclists, success will ultimately depend on transportation agencies across the country embracing and implementing this policy. Ray LaHood, United States Secretary of Transportationⁱ

Additional information regarding the U.S. Department of Transportation Federal Highway Administration’s program and policies on bicycle and pedestrian mobility can be found at:

- » United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations (March 2010) - http://www.fhwa.dot.gov/environment/bikeped/policy_accom.htm
- » FHWA Policy for Mainstreaming Nonmotorized Transportation (FHWA Guidance – Bicycling and Pedestrian Provision of Federal Transportation Legislation) - <http://www.fhwa.dot.gov/environment/bikeped/bp-guid.htm>

ⁱ U.S. Department of Transportation. Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations. March 15, 2010.

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CHAPTER 5: Plan Implementation



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The recommendations of this plan cannot be realized without the support and continued involvement of multiple groups and organizations. Each of these groups and organizations will have a specific role in the implementation of the Pedestrian Plan. This portion of the chapter provides a detailed explanation of the role each will play in the implementation of this plan. The organizational chart (Figure 5.1) illustrates how the coordination of these different groups will take place.

- Board of Aldermen
- Planning Board
- Town Staff
- Police Department
- Steering Committee
- Haywood County Transportation Group
- North Carolina Department of Transportation
- French Broad River MPO
- Developers
- Residents
- Advocacy Groups

ROLES AND RESPONSIBILITIES

Board of Alderman (BOA)

The Board of Alderman will be responsible for ensuring that improving pedestrian mobility throughout the Town remains a priority moving forward. One of the first steps in this process is the adoption of this plan. Through the adoption of this plan, the Town’s leadership is recognizing the value of pedestrian transportation and the improvement of the quality of life for the residents. To further the implementation of this plan there is a need for a dedicated transportation staff person who will not only oversee the implementation of this plan, but also the coordination of long-range transportation planning, the capital improvement program, plan reviews, coordination with NCDOT and the French Broad River MPO, manage sidewalk projects and the dedication of roadways within the town.

The Town has to leverage all resources to identify, pursue, and secure funding to implement the projects identified in this plan. Many funding opportunities exist at various levels: Federal, State and Regional (see the list of funding in the Appendix). To be competitive for these funding opportunities it is imperative that the Town has a dedicated staff person to oversee and manage these tasks. Although various funding opportunities exist with many agencies the competition of these resources is intense.

Municipalities that have dedicated transportation staff typically do better job of tapping into these resources than the ones that do not. In addition, the Board of Alderman should be prepared to do the following:



- » Approve ordinance updates and changes that will strengthen pedestrian-related policies.
- » Support the expenditure of local funding for the development and maintenance of pedestrian facilities, such as sidewalks, greenways and intersection improvements.
- » Support and encourage Town staff to obtain grants and other types of funding for the development of pedestrian facilities.

Town Planning Board

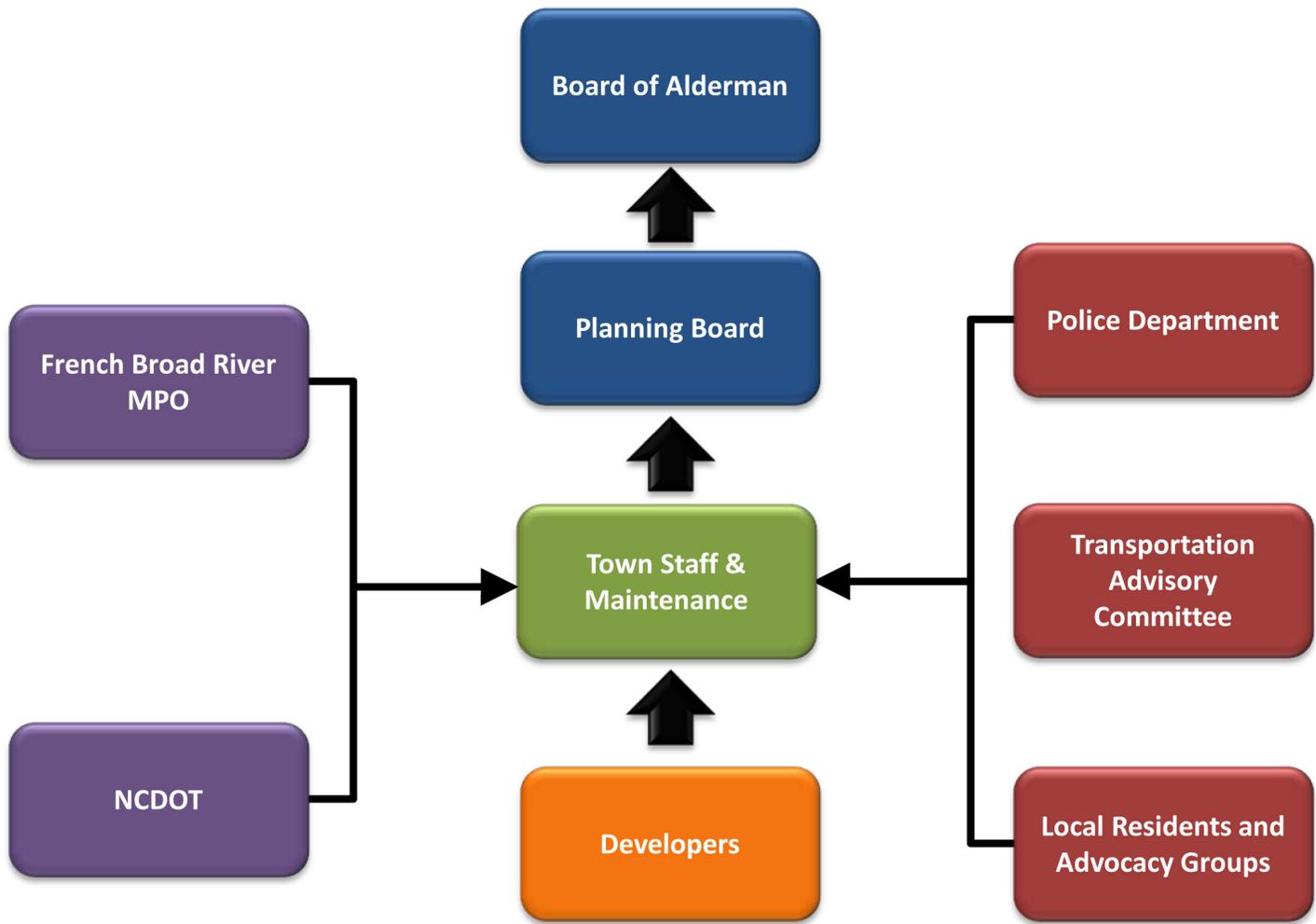
The Town's Planning Board serves as an advisory board to the Board of Alderman and provides recommendations on planning and zoning related matters. Therefore, the Planning Board will review any policy changes related to this plan. It will be critical for the Planning Board to become familiar with the Pedestrian Master Plan and be ready to support the recommendations.

Town Staff

The Town's Staff should be the primary contact for monitoring the implementation of the Pedestrian Plan. They should be involved in the plan review process to ensure that pedestrian facilities are being considered and that proposed projects are consistent with the goals of the Pedestrian Plan. The Town's Staff should be prepared to do the following:

- » Updating and maintaining the GIS database for the pedestrian system and working with Haywood County GIS Department to ensure pedestrian related files are up-to-date.

- » Pursue grants and other alternative funding sources to implement the pedestrian projects outlined throughout this report.
- » Establish a Pedestrian Safety and Education Program.
- » Establish a Transportation Advisory Committee (TAC), which could be formed from the Steering Committee that was involved in this process.
- » Meet with the TAC on a regular basis and provide updates on pedestrian related issues and infrastructure projects. Encourage them to attend public events to assist the Town in promoting pedestrian safety and education.
- » Coordinate with NCDOT and the French Broad River MPO to ensure pedestrian facilities are incorporated into new roadway and reconstruction projects.
- » Continue to coordinate with the MPO on future multi-modal projects to ensure pedestrian facilities are considered.
- » Review development plans to ensure the inclusion of pedestrian facilities, such as sidewalks, handicap ramps and crosswalks.
- » Reach out to health organizations and other advocacy groups to assist in promoting walking and healthy lifestyle habits.
- » Coordinate with the Police Department to develop safety and education programs and information to be shared with citizens
- » Coordinate with Haywood County and surrounding



▲ Figure 5.1: Town of Clyde Pedestrian Plan Implementation Organizational Framework



jurisdictions on the development of greenways within the Town of Clyde.

- » Present changes/updates to the Town’s Subdivision and Zoning Ordinances
- » Work with the Board of Alderman to develop a designated local funding mechanism for pedestrian-related infrastructure.

Town Maintenance Department

The Maintenance Department will play a critical role in the implementation and continued maintenance of the pedestrian facilities. They currently work with NCDOT to identify capital improvements that are needed within the Town. It will be important for the Maintenance Department and NCDOT to become familiar with the recommendations within this plan to ensure that they are included in roadway improvement projects.

The Maintenance Department will be responsible for the construction and maintenance of the facilities on town-owned roadways. They will also be responsible for working with Town staff on the construction and maintenance of any town-owned and maintained greenways. Proper maintenance of these facilities will be critical to the success of the pedestrian program. The Town should create specific roadway maintenance procedures including: repairs, trash removal, mowing and vegetation clearing, edging, and snow and ice removal.

The Maintenance Department will need to become familiar with the Standards and Guidelines that are defined in Chapter 6. They should also become familiar with other national standards and guidelines from AASHTO, ITE and NCDOT. Finally, they should coor-

dinate with the Planning and Zoning Department on new construction and reconstruction projects to allow for sufficient review time.

Police Department

The Town’s Police Department should work with the Town Staff to educate the community regarding pedestrian laws and safe walking habits. The Police Department is a great resource and the Town should continue to forge a partnership to assist in educating both pedestrians and motorists.

The Police Department should be prepared to:

- » Assist the Town in understanding and enforcing pedestrian-related laws in North Carolina.
- » Enforce all laws (pedestrian and motorist) to increase pedestrian safety. These include, but are not limited to speeding, aggressive driving, running red lights, no turning on red, etc.
- » Initiate educational opportunities for the Town and citizens
- » Provide an opportunity for users to call in and report issues related violations or accident spots. This can be done through an online tool or a hotline.
- » Patrol the community to ensure safety of communities and of future greenways and trails and to work with the Town on identifying opportunities for connectivity.

Haywood County Transportation Group

The Haywood Transportation Group is the elected officials and town staff representatives to the French Broad River Metropolitan Planning Organization (MPO). It also includes the Haywood Public Transit director as well. The group assembled in order to communicate and organize locally and stand unified at the MPO. Their goal is to work together, support each jurisdiction and be better prepared as whole group. Transportation projects must now have a priority and be approved by the MPO. The group wants to be unified and support each other in order to get their projects prioritized with the MPO. This plan recommends the continued coordination of the group and the inclusion of the pedestrian projects identified in this plan.

Transportation Committee

It is recommended that the Town create a Transportation Committee that will be responsible for coordinating with the Town to implement the recommendations in this plan. Their support will be critical during the implementation of the plan and they should coordinate and meet with the Town staff to:

- » Evaluate the progress of the Plan
- » Assist the Town during pedestrian-related events to promote walking and healthy lifestyle characteristics
- » Act as the liaison between the Town and the community
- » Work with Town staff to continue to look for opportunities for pedestrian connectivity

- » Coordinate with Town staff to evaluate and assess all transportation related projects within the town

Developers

Developers will continue to play an important role in the development of pedestrian facilities. As new development occurs, developers should work closely with the Town and be prepared to do the following:

- » Developers should become familiar with the benefits of providing pedestrian amenities, such as sidewalks and greenways.
- » Developers should also become familiar with the Standards and Guidelines that are outlined in Chapter 5.
- » Finally, developers will participate in the implementation of the plan through compliance with the Zoning Ordinance, especially with the Town’s Sidewalk Connectivity Ordinance.

North Carolina Department of Transportation (NCDOT)

NCDOT should continue to work closely with the Town to construct and maintain pedestrian facilities. NCDOT should encourage the Town to adopt the states policy to create “Complete Streets” as their own. In 2009 the NCDOT Board of Transportation approved a Complete Streets policy which according to the policy will “guide existing decision-making and design processes to ensure that all users are routinely considered during the planning, design, construction, funding and operation of North Carolina’s transportation network”.

Town of Clyde



The full description of the policy can be found at the following web link: http://www.bytrain.org/fra/general/ncdot_streets_policy.pdf

NCDOT should be prepared to do the following:

- » Endorse the Town's Pedestrian Master Plan and commit to assist in the implementation of the plan, especially on all state maintained roads. It is also recommended that the Town work with the MPO to incorporate the recommendations from this plan into the County's Comprehensive Transportation Plan (CTP).
- » Work with the Town on future roadway projects, and provide sufficient time for coordination with the Town staff.
- » The Town should continue to partner with NCDOT to identify issue areas and work on solutions to improve pedestrian mobility and safety. Partnering with them on future projects will not only save the Town from having to fund 100% of the projects cost, it will also strengthen the relationship with NCDOT.

French Broad River MPO

The French Broad River MPO works with NCDOT to develop transportation plans, travel models, transit plans, and bicycle and pedestrian plans. They also work with the state on funding issues for transportation improvements, project planning issues, and other issues such as environmental and air quality concerns. Lastly, the MPO works with local jurisdictions, such as the Town of Clyde to coordinate land use and transportation planning.

One of the MPO's responsibilities is to create a Transportation Improvement Plan (TIP) which is a detailed list of transportation projects that have federal and state funding. The TIP includes funding information and the anticipated schedule for highway, public transit, rail, bicycle, and pedestrian projects. The TIP is updated at least every two years.

In addition to the TIP, the MPO produces the Long Range Transportation Plan (LRTP), which is a 25-year plan for transportation improvements. This document looks at long-term improvements that are needed for the MPO region. It will be important to the successful implementation of this plan for the Town of Clyde to coordinate closely with NCDOT and the MPO on future transportation improvement projects to ensure pedestrian facilities are included.

Local Residents and Advocacy Groups

The residents of the town and the advocacy groups will play a critical role in the implementation of this plan. The Town staff should work with local advocacy groups and engage them in the education process, especially as it relates to the benefits of an active lifestyles and healthy eating habits. The residents and the advocacy groups should be prepared to do the following:

- » Attend Board of Alderman (BOA) and Planning Board meetings where pedestrian related issues are being discussed. It is important to illustrate to the BOA and the Planning Board that pedestrian safety and improvements are a priority to the community.
- » Volunteer to assist at pedestrian related events and gather support amongst friends, family and neighbors.

- » Continue to look for opportunities for partnerships and improving pedestrian connectivity.

PROGRAMS AND POLICIES

This plan has identified many pedestrian improvement projects as well as safety and education programs that will be implemented over the next several decades. This chapter has provided an overview of the coordination that must take place between the agencies and groups of individuals in order to implement those projects and programs. The programs and policies that were outlined in Chapter 4 are equally important as the projects themselves.

PROGRAM MONITORING

As the Town begins to implement this Plan it will be critical to monitor its progress. Therefore, it is recommended that the Town develop a system of measuring the performance of the program. These performance measures should be based on safety, usage, education, and level of completion. Data that can be easily accessed and distributed should be used to develop the performance measures. For example, pedestrian safety can be measured by the amount of pedestrian crashes that are recorded by law enforcement. That is why it will be extremely important to ensure that law enforcement is properly recording these incidences, so that the Town can measure the success of certain pedestrian improvements.

FACILITY DEVELOPMENT

The Town should be involved in the planning and design of any new or reconstructed roadway or bridge to ensure that pedestrian

facilities are incorporated. There are several ways that the Town can implement the proposed projects in the Pedestrian Plan including:

- » Utilizing roadway and bridge construction and reconstruction projects
- » Retrofitting existing roadways with new pedestrian facilities
- » Through the NCDOT TIP process

Roadway/Bridge Construction & Reconstruction

The Town should ensure that pedestrian facilities are included as part of any new or reconstructed roadway, bridge, and underpass. NCDOT bridge policy supports pedestrian facilities if certain criteria are met <https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Bridge%20Policy.pdf> According to the policy sidewalks should be a minimum of 5.5 feet with 42-inch railings on the outside to protect the pedestrian from falling off the bridge.

Roadway projects that require the installation or modification of culverts for streams and creeks should provide sufficient room for pedestrian access through the culvert, especially if greenways or pedestrian paths are planned for the area.

Operation and Maintenance

Currently, maintenance of the existing pedestrian system is a noticeable issue for the Town. Proper maintenance of the pedestrian facilities is essential to the sustainability of the pedestrian system. If the facilities are not maintained properly they will fall into disrepair and pedestrians won't be able to use the



- ▲ Proper maintenance of pedestrian facilities is going to be key to the successful implementation of the pedestrian plan.

facilities. During site visits and the walking audit, participants found signs of disrepair and lack of maintenance, such as weeds and grass that were overtaking some of the sidewalks and trip hazards along many of the sidewalks. Over time, this can reduce the amount of usable space on the sidewalk.

The operation and maintenance of the pedestrian system will be a collaborative effort of various departments and organizations. The success of the Pedestrian Plan will rely on the ability of these organizations and departments to cohesively work together on a daily basis.

Additionally, there should be a system in place that allows users to provide suggestions and feedback regarding maintenance issues.

Part of that system should include for a timely response to the user. The Town's web page would be an ideal location for a user feedback form and maintenance request form.

ACTION ITEM MATRIX

In order to begin implementation of the Pedestrian Master Plan, the Town will need to complete several action items. The Action Item Matrix (Table 5.1) provides a series of action steps or tasks associated with the implementation of this plan.

These action steps have been organized by the following categories: Planning, Funding, Development/Construction, Maintenance, Education, and Coordination

Under each category are tasks that are critical to the implementation of the recommendations in this plan. These tasks have been broken down into scheduled priorities based on the following:

- » Immediate (1-3 years)
- » Short-Term (3-5 years)
- » Mid-Term (5-10 years)
- » Long-Term (over 10 years), and
- » On-Going.

The Town of Clyde should use this matrix to monitor the implementation of the recommendations within this plan. Town

▼ Table 5.1: Action Items

Action Items		Scheduled Priority	Status	Agency/ Department
Planning				
P.1	Adopt the Pedestrian Master Plan	Immediate		BOA
P.2	Incorporate Standards and Guidelines (Chapter 6) into the Town's Development Standards	Immediate		BOA/TS
P.3	Adopt the Sidewalk Connectivity Ordinance	Immediate	In-Progress	BOA
P.4	Establish a Transportation Committee (TC)	Immediate		BOA
P.5	Establish a tool (online or hot line) to allow pedestrian to report issues and/or concerns	Short-Term		TS/PD
P.6	Amend existing local ordinances to incorporate the recommendations in this plan and continue to assess and evaluate the effectiveness of them.	On-Going		TS/BOA/PB
P.7	Continue to review land development plans for the inclusion of pedestrian facilities (i.e. sidewalks and greenways/trails)	On-Going		TS/BOA/PB
P.8	Continually assess and evaluate the progress of the Pedestrian Master Plan	On-Going		TS/BOA/PB
Funding				
F.1	Pursue Safe Routes to School grants for programs, policies and infrastructure projects	Immediate		TS/BOA
F.2	Develop a long-term funding strategy for the development and maintenance of pedestrian facilities	Immediate		TS/BOA/PB
F.3	Pursue additional grants to implement pedestrian programs and projects	On-Going		TS/BOA/PB
F.4	Continue to pursue funding for the acquisition of land and construction of the proposed greenway identified on Figure 3.1.	On-Going		BOA
F.5	Continue to participate in the project prioritization process of the French Broad River MPO and coordinate with any available CMAQ or other funding opportunities	On-going	In-Progress	TS/BOA/PB
Development/Construction				
D.1	Repair existing sidewalks within the downtown area	Immediate		BOA/MD
D.2	Continue to coordinate with Haywood County to construct the proposed greenway that follows the Pigeon River and is illustrated on Figure 3.1	Long-Term		HGC/BOA/PB/TS/TC
D.3	Include pedestrian facilities into the construction of new and reconstructed roadways	On-Going		BOA/NCDOT



▼ Table 5.1: Action Items (continued)

Action Items		Scheduled Priority	Status	Agency/ Department
Development/Construction (continued)				
D.4	Complete sidewalks in the downtown area	Short-Term		BOA/MD
D.5	Complete sidewalks within the mid-term area	Mid-Term		BOA/MD
D.6	Complete sidewalks within the long-term area	Long-Term		BOA/MD
Maintenance				
M.1	Improve existing sidewalks and pedestrian crossings that are in disrepair	Immediate	On-going	BOA/MD
M.2	Develop a system for users to be able to call in maintenance concerns	Short-Term	On-going	TS/MD
Education				
E.1	Develop communication program to educate the community about the Pedestrian Master Plan	Short-Term		TS
E.2	Work with local media to raise pedestrian safety awareness and obtain informational handouts from NCDOT that contain pedestrian safety information and laws	Short-Term		BOA/TS/ NCDOT
E.3	Work with the local police department to improve enforcement of the laws (pedestrian and motorist)	Short-Term	On-Going	TS/BOA/ NCDOT
Coordination				
C.1	Initiate communication with surrounding municipalities to discuss pedestrian related issues and to coordinate on adjacent pedestrian projects	Immediate	On-Going	BOA/PB/TC/ MPO
C.2	Initiate discussions with local and regional health organizations to educate community about benefits of walking	Immediate	On-Going	TS
C.3	Coordinate with NCDOT Division 14 to ensure pedestrian facilities are incorporated into all roadway projects	Immediate	On-going	TS/BOA/PB/ TC/NCDOT

▼ Table 5.1: Action Items (continued)

Action Items		Scheduled Priority	Status	Agency/ Department
Coordination (continued)				
C.4	Coordinate with the county transit system to ensure the inclusion of benches, shelters, lighting and trash receptacles in any existing and future transit improvement projects	Short-Term	On-going	BOA/TS
C.5	Work with County Public School official to improve pedestrian connectivity to schools	Mid-Term	Ong-Going	BOA/PB/TS/TC/NCDOT
C.6	Per the Town’s Land Use Plan, begin discussions with NCDOT to transform Carolina Boulevard into an actual boulevard type street with wide sidewalks, landscape buffers, pedestrian lighting, and slower posted speed limits.	Mid-Term	On-Going	BOA/PB/TS/TC/NCDOT

staff should review the matrix and update it as projects or action items are completed and as new one are identified. The successful implementation of this plan will require the involvement of various agencies and departments. For each action item, these agencies and departments have been identified. The names have been abbreviated for the purpose of the table and include the following: Board of Alderman (BOA), Planning Board (PB), Town Staff (TS), Transportation Committee (TC), Police Department (PD), Maintenance Department (MD), Haywood Greenway Committee (HGC), North Carolina Department of Transportation (NCDOT).

FUNDING OPPORTUNITIES

Various funding is available that the Town can utilize to assist in the implementation of the Pedestrian Plan. The funding can be used for planning, design and construction of pedestrian improvement projects as well as educational programs. There are several different types of funding at the federal, state and local levels. These funding opportunities are summarized in the Appendix at the end of this report.

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CHAPTER 6: Standards and Guidelines



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Chapter 6

STANDARDS & GUIDELINES



This chapter provides the Town of Clyde with a compilation of standards and guidelines that should be used in developing future pedestrian facilities. The standards and guidelines adhere to national and state standards that have been defined by the American Association of State Highway Transportation Officials (AASHTO), the Manual on Uniform Traffic Control Devices (MUTCD) and the North Carolina Department of Transportation (NCDOT). This chapter should be a guide for the development of new pedestrian facilities as well as retrofitting existing pedestrian facilities. The standards and guidelines should only be used as a reference and a licensed engineer should always be consulted when designing and constructing future pedestrian facilities.

- Crosswalks
- Curb Extensions
- Greenways
- Curb Ramps
- Lighting
- Mid-Block Crossings
- Sidewalks
- Signage
- Signalization
- Overpasses
- Underpasses
- Railroad Crossings

CROSSWALKS

Crosswalks are just one of many components needed to facilitate pedestrians safely across roadways. Crosswalks serve two basic functions:

- » Inform motorists of the location of a pedestrian crossing so that they have time to lawfully yield to a crossing pedestrian
- » Assure the pedestrian that a legal crosswalk exists at a particular location.

They are often used in conjunction with other pedestrian components, such as sidewalks, pedestrian signals, stamped asphalt, etc. In most cases, marked crosswalks alone should not be installed within an uncontrolled environment when speeds are greater than 40 mph. It should also be noted that NCDOT typically requires that sidewalks are installed on both sides of the roadway where crosswalks are being considered.

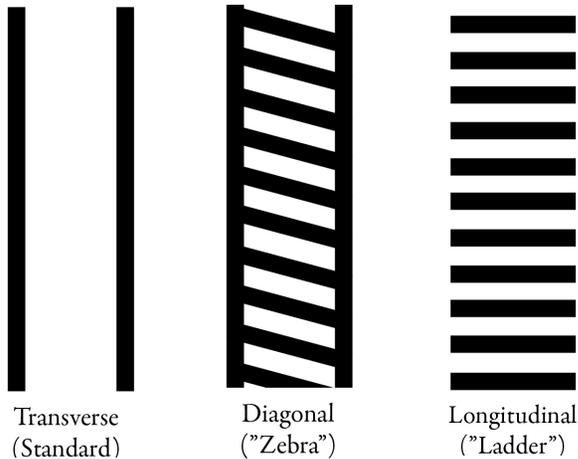
Type of Crosswalks

According to AASHTO, there are three basic types of marked crosswalks: *Transverse, Longitudinal, and Diagonal*. Transverse is the most commonly used and the least expensive of the three crosswalks. These are typically used in areas where there are low traffic volumes and vehicular speeds.

The Transverse treatment can be used in conjunction with other types of treatment, such as stamped asphalt or brick pavers to increase the visibility of the crosswalk.



Longitudinal and Diagonal are often referred to as the “Ladder” or “High Visibility” and “Zebra.” These types of treatments increase the visibility of the crosswalk and can increase the safety of the pedestrian. They can be very useful for mid-block crossings, areas where traffic volumes are high, vehicle speeds are greater and around schools.



▲ Three major crosswalk types

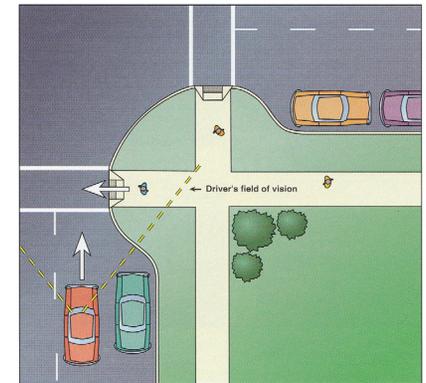
In some locations, such as schools, raised crosswalks are needed in conjunction with striped crosswalks to slow down or “calm” vehicular speeds. Raised crosswalks are typically located at mid-block locations and are used on 2-lane roadways with posted speeds less than 35 mph. Where raised crosswalks are used, detectable truncated dome warnings are needed at the curb lines and visible pavement markings are required on the roadway approach slopes. The width of a crosswalk can vary, however, AASHTO recommends a minimum of 6-feet and up to 10-feet in a central business district.

CURB EXTENSIONS

Curb extensions significantly improve pedestrian crossings by reducing the pedestrian crossing distance, visually and physically

narrowing the roadway, improving the ability of pedestrians and motorists to see each other, and reducing the time that pedestrians are in the street.

On streets that allow on-street parking, curb extensions extend the sidewalk or curb line out into the parking lane, which reduces the overall street width. They improve pedestrian crossings by reducing the pedestrian crossing distance and increase the visibility of the pedestrian for the motorist. Curb extensions narrow the road, forcing the motorist to slow down as they enter the intersection; therefore acting as a traffic calming device.



▲ AASHTO's curb extension example

In general, curb extensions should only be implemented where on-street parking is allowed. They should extend the width of the parking lane, approximately 6-feet from the curb, and never encroach into travel lanes, bicycle lane or shoulders. When considering curb extensions, truck traffic should be considered and accounted for. Curb extensions and tighter radii hinder the ability of larger trucks to make the turning movement at intersections.

In addition to curb extensions, curb radii should be evaluated for both pedestrians and motorists. Curb radii should balance the needs of the pedestrian as well as larger trucks and buses. According to the AASHTO Guide, curb radii should be appropriate for the largest design vehicle which makes a specific turning maneuver



with sufficient frequency to serve as an appropriate. Large turning radii make it easier for large vehicles to make the turn, however, large radii increase the crossing distance for pedestrians and the speeds of motorists. Tighter or smaller turning radii decrease the crossing distance for pedestrians and speeds of motorists, making the pedestrian environment safer. Smaller radii that limit the speeds of turning vehicles may reduce the operational efficiency of an arterial intersection. A curb radii that protrudes into the turning radius of the design vehicle could cause vehicles to drive over and damage the curb, as well as increase the potential of hitting a pedestrian standing at the curb. Additional information regarding curb extensions and curb radii on pages can be found on pages 73-74 of the AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities.

GREENWAYS

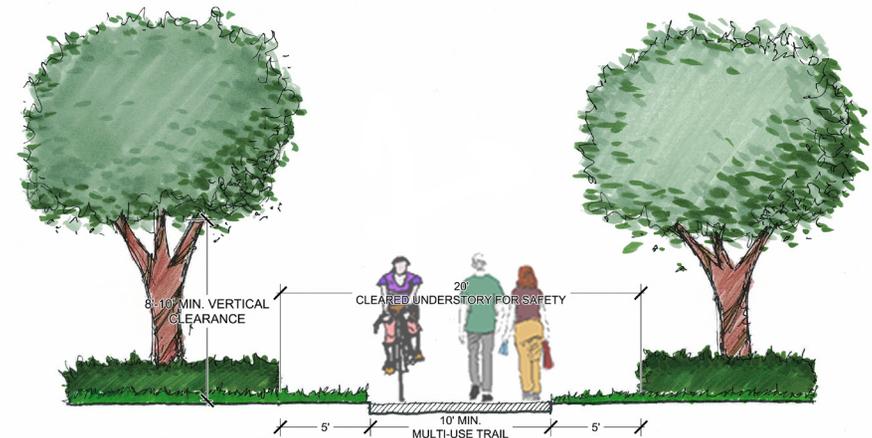
Greenways are most commonly known as a vegetated natural buffer that can help improve water quality, reduce the impacts of flooding, and provide wildlife habitat. Greenways also provide recreation and fitness opportunities for individuals, serve as alternative transportation corridors, and can have positive economic impacts for communities. They are intended for all types of users, including walkers, joggers, bicyclists, roller bladders and other non-motorized modes of travel. Greenways are



▲ Greenways provide recreational and learning opportunities for all age groups. (Photo credit: Dan Burden)

typically located adjacent to creeks and streams and should not be confused with sidewalks. Locating greenways adjacent to natural water features is not always feasible due to environmental or physical constraints, therefore more and more communities are working with utility companies to locate greenways within utility rights-of-way, such as sewer easements and overhead power lines.

Greenways can be designed to accommodate a variety of users and can be paved or unpaved trails. They should be a minimum of 10-foot wide and include 2-foot graded shoulders. Greater widths of 12-14 feet are encouraged where significant traffic is anticipated.



▲ Typical greenway cross section showing clearance zones and widths of trail and shoulder areas.

Town of Clyde



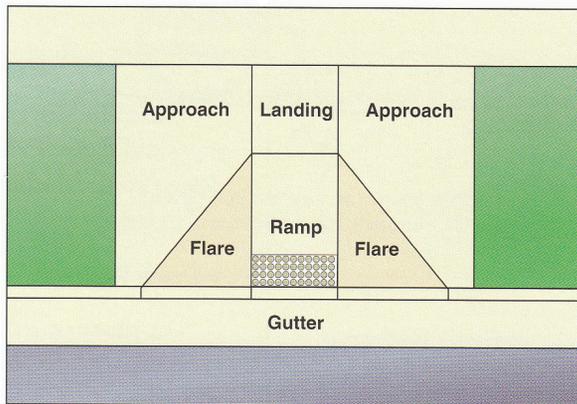
CURB RAMPS

Curb ramps are an essential component of the pedestrian system and are used at intersections and mid-block crossings to facilitate pedestrians from sidewalks into roadways so that they can cross the street. Curb ramps are needed for individuals using wheelchairs and scooters, people pushing strollers and pulling luggage. The design of these ramps is critical to the safety of the pedestrian as well as the motorists. Items such as utility poles, traffic signs, signals, signal control boxes and street name signs should be located so that do not obstruct the pedestrian route.

According to AASHTO there are four basic components of a standard curb ramp design: Ramps, Landings, Flares, and Gutters.

The construction of new curb ramps should be a minimum of 4-feet wide, not including the flared sides. Federal regulations require that the maximum grade of the curb ramp be no more than 8.33% or a ratio of 1:12. If the landing is less than the recommended 4-foot deep, the slope of the flares may not exceed 8.33%. If the landing width is greater than 4-feet, then it is recommended that the slope of the flares be 10% so that tripping can be avoided.

Finally, all ramps are required to have detectable warnings located at the curb line for the

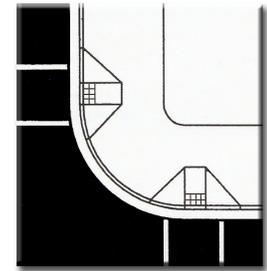


full width of the ramp or walkway. The American with Disabilities Act Accessibility Guidelines (ADAAG) specifies that detectable warnings shall consist of raised *truncated domes* and specifies the dimensions and patterns of truncated domes to be used. For more information regarding the specific design criteria of curb ramps, please see the AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities and the ADAAG (<http://www.access-board.gov/adaag/html/adaag.htm>).

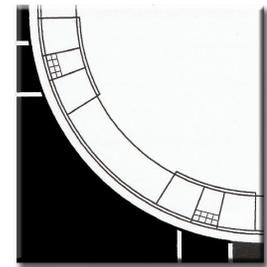
The type of curb ramp to be used is based on the function of the sidewalk and border width, curb height, curb radius, and topography of the street corner. AASHTO identifies three basic types of curb ramps: *perpendicular, parallel, and diagonal*.

Perpendicular ramps are generally used where the curb radius is smaller and the vehicular speeds are relatively low. They are perpendicular to the face of the curb and available for each approach.

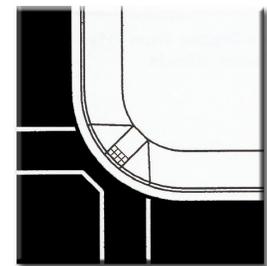
Parallel ramps require users continuing along the sidewalk to negotiate two ramp grades. It also requires careful attention to the construction of the landing at the bottom of the ramp in order to limit the accumulation of water



▲ Perpendicular Ramps



▲ Parallel Ramps



▲ Diagonal Ramps

and/or debris. A minimum of 4-feet is required between the two ramps (AASHTO: 86).

The Diagonal ramp is a single perpendicular ramp that is located at the apex of the corner. Diagonal curb ramps typically force pedestrians to enter the intersection before they are able to enter the crosswalk. This is especially dangerous for individuals with visual impairments because it directs them away from the crosswalk. In order to facilitate pedestrians into the appropriate crosswalk, a clear space should be provided that is a minimum of 4-feet from the edge of the ramp. This clear space should not extend into a travel lane.

LIGHTING

The proper lighting will greatly enhance the safety and experience for the pedestrian. It not only improves the overall safety, but is also improves vehicle and pedestrian operations. Insufficient lighting will deter pedestrians from using the facility, decreasing the value of the improvement. Lighting should be placed wherever there is significant pedestrian activity, particularly around schools, parks, residential areas and downtown. It is also very important to ensure that all pedestrian crossings are well lit and



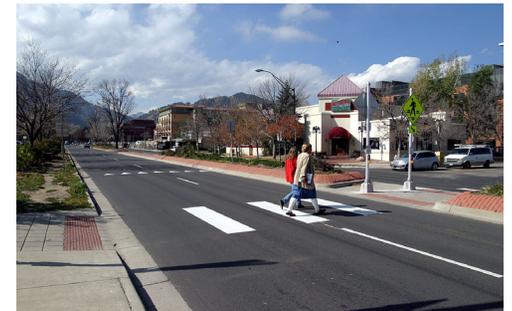
▲ Pedestrian lighting similar to this in Charlotte, NC, improves safety and visibility for the pedestrian.

signed so that motorists are aware of the crossing.

The North Carolina Department of Transportation (NCDOT) recommends that on major arterials in urban or suburban areas, continuous street lighting should be provided. On wide arterials, they recommend the installation of double-sided lighting (both sides of the road). For new construction, street light poles should be located at least 6-feet from the curb face and out of the sidewalk. Whenever possible it is recommended that street lights, traffic signals and power distribution lines be located on a single pole. The Town of Clyde will need to coordinate with NCDOT on future roadway improvements to ensure that the proper lighting is provided for the pedestrian.

MID-BLOCK CROSSINGS

Mid-block crossings are useful where the distance between existing intersections is relatively far apart or where pedestrian related land uses are between intersections. They can also be useful in facilitating greenway users across the roadway. When designed and constructed correctly, mid-block crossings allow pedestrians to cross one direction of traffic at a time and provide a refuge island halfway across the street.



▲ Mid-block crossings can provide a way for pedestrians to safely cross a busy thoroughfare.

The placement and type of mid-block crossings is dictated by several factors

Town of Clyde

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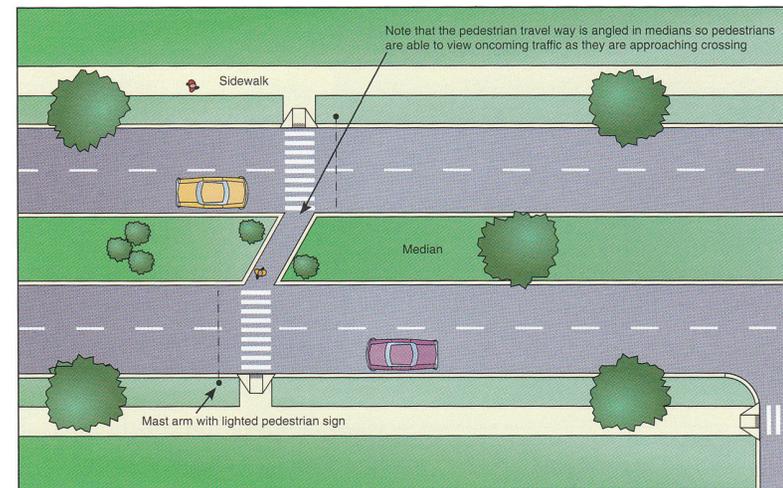


including pedestrian volume, traffic volume, roadway width, traffic speed and type, desired paths for pedestrians, and adjacent land use. Since mid-block crossings are not generally expected by motorists, they should be used only where truly needed and should be well signed and marked. Crosswalks at mid-block should not be installed within 300 feet of another signalized crossing point. When installing a mid-block crossing, advance warning signs should be utilized to inform motorists of the crossing.

The following are attributes where mid-block crossings can be most effective as defined by AASHTO:

- » The location is already a source of a substantial number of mid-block crossings.
- » Where a new development is anticipated to generate mid-block crossings.
- » The land use is such that pedestrians are highly unlikely to cross the street at the next intersection.
- » The safety and capacity of adjacent intersections or large turning volumes create a situation where it is difficult to cross the street.
- » Spacing between adjacent intersections exceeds 660-feet.
- » The vehicular capacity of the roadway may not be substantially reduced by the mid-block crossing.
- » Adequate sight distance is available for both pedestrians and motorists.

In general, there are two types of mid-block crossings: signalized and non-signalized. Signalized mid-block crossing should be used where the crossing distance exceeds 60-feet. The basic components necessary to complete a signalized mid-block crossing include curb ramps, striped crosswalks, “cut-through” in the median, pedestrian actuated signals next to the curb ramps and within the median. The “ladder” or “high visibility” crosswalk treatment is recommended for the crosswalks to improve visibility of the crossing. The median crossing should be at least 6-feet in width with a level landing that is a minimum of 4-feet square, providing a balanced resting space.



The “cut-through” within the median should be angled if possible to force the pedestrian to make eye contact with oncoming vehicular traffic and to improve visibility for both the pedestrian and motorist. Landscaping can be incorporated into the median, but should be placed so as not to reduce visibility. To increase visibility and to

warn motorists of a mid-block crossing, flashing pedestrian signals can be installed prior to the crossing. This additional measure could be very useful along Carolina Boulevard where traffic volumes and speeds are greater. Further study and analysis will need to be completed to determine the appropriate treatments for these crossings.

Non-signalized mid-block crossings can be located on roadways that have speeds less than 40 mph. These are generally used on 2-4 lane roadways that have low traffic volumes and/or low vehicular speeds. Again, it is recommended that the cut-through be angled to force eye contact and to increase the visibility of the pedestrian. To review NCDOT’s policy on Mid-Block Crossings, please follow this link: http://www.ncdot.org/doh/PRECONSTRUCT/traffic/tepl/Topics/C-36/C-36_pr.pdf.

SIDEWALKS

Sidewalks are one of the most important components to the overall pedestrian system. They are typically adjacent to the roadway and are often buffered by a landscape buffer. Sidewalks usually get built under four conditions according to the AASHTO Guide for planning, Design, and Operation of Pedestrian Facilities: (1) new construction in areas with existing or anticipated pedestrian use, (2) new construction with no initial pedestrian presence, (3) reconstruction of existing sidewalks that do not presently accommodate the needs of all users, and (4) addition of sidewalks in reconstruction projects in areas of pedestrian activity and where pedestrian needs are not being met.

Sidewalk widths can vary, however, the Town’s draft sidewalk ordinance recommends the minimum width of 5-6 feet depending on the zone that it is located in (refer to Chapter 2 for summary).

Town of Clyde

Pedestrian Master Plan



- ▲ Sidewalks located along Carolina Boulevard are very wide in some locations and could benefit from adding a landscape buffer to separate the sidewalk from the roadway.

To improve pedestrian safety and enhance the overall walking experience, AASHTO recommends that sidewalks be buffered from the roadway. Along local or collector roadways the buffer width should be 2-4 feet and along arterials or major streets the buffer width should be at least 5-6 feet.

Sidewalks and Driveways

Conflicts between driveways and sidewalks are often unavoidable. Typically sidewalks located within residential areas experience fewer conflicts with driveways than sidewalks located in commercial areas. Commercial areas experience higher traffic volumes, there-



fore have the greatest potential for vehicle-pedestrian conflicts. The preferred treatment for driveway design, which is explained in detail in the Driveway Design section of the AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, places the driveway slope in the planting strip. By placing the driveway slope within the planting strip, it allows for a recommended 4 foot continuous level walkway.

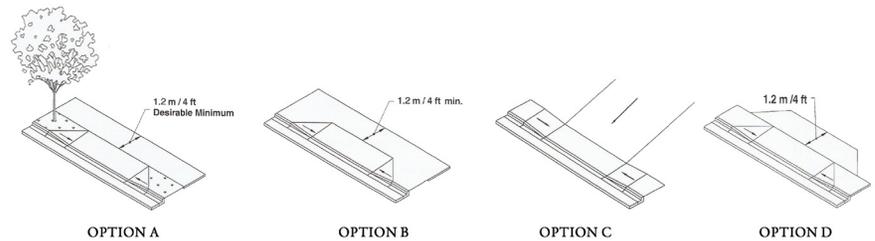


▲ In this example, the sidewalk remains level and the driveway apron is located in the planting strip.

There are a total of four basic and acceptable driveway designs that the Town should become familiar with for future development. These are summarized below, but can be found on page 62 of the AASHTO Guide for Planning, Design, and Operation of Pedestrian Facilities.

- » Option A (Best) - The planting strip allows the sidewalk to remain level and in a continuous direction.
- » Option B (Acceptable) - The wide sidewalks allow a 4-foot wide path of travel behind the driveway cut.

- » Option C (Where necessary) - The driveway with dipped sidewalks should only be used when necessary.
- » Option D (Where necessary) - The driveway with sidewalk behind should only be used when necessary.



SIGNAGE

Signage plays a significant role in the safety of the pedestrian and motorist. For instance, signage should be provided for motorists in advance of a pedestrian crossing so that they have sufficient time to yield to the pedestrian.

In general there are three basic types of signs that are used to direct pedestrian and vehicular traffic:

- » Regulatory
- » Warning
- » Wayfinding

Regulatory

Regulatory signs are used to inform motorists or pedestrians of legal requirements and should only be used when the legal requirement is not otherwise apparent. With the exception of STOP and YIELD signs, regulatory signs are rectangular in shape, usually contain a black legend on a white background, and are reflectorized or illuminated.

Chapter 2 of the MUTCD provides specific guidance on the use of regulatory signs. Illustrated to the right are just some examples of the regulatory signs used for pedestrian facilities. A complete list and description of each can be found at <http://mutcd.fhwa.dot.gov/pdfs/2009/part2b.pdf>.



Warning Signs

Warning signs are typically used to inform motorists and/or pedestrians of unusual or unexpected conditions, such as mid-block crossings. Warning signs should be placed far enough in advance to warn users and to provide sufficient response time. Warning signs, like Regulatory signs, are very distinctive and generally diamond-shaped with black letters or symbols on a yellow background. They too are reflectorized or illuminated to increase visibility.

Town of Clyde

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As a rule, the placement of warning signs in advance of the subject condition should be based on the posted speed limit within the subject area. According to AASHTO, the pedestrian crossing sign (MUTCD W11-2) serves two functions. First it provides advanced warning to motorists of possible pedestrian conflicts, and secondly, at a crosswalk it advises the motorists of the potential that a pedestrian may be attempting to cross. Chapter 2 of the MUTCD provides guidance on the use of warning signs (<http://mutcd.fhwa.dot.gov/pdfs/2009/part2c.pdf>).

To increase driver awareness and visibility of an unsignalized crossing, the Rectangular Rapid Flash Beacon (RRFB) can be used. RRFBs are user-actuated amber LEDs that supplement warning signs at unsignalized intersections or mid-block crosswalks. They can be activated by pedestrians manually by a push button or passively by a pedestrian detection system. RRFBs use



▲ RRFBs increase visibility and driver awareness



an irregular flash pattern that is similar to emergency flashers on police vehicles and can be installed on either two-lane or multi-lane roadways. Additional information on RRFBs can be found at <http://safety.fhwa.dot.gov/intersection/resources/techsum/fhwasa09009/>.

Wayfinding

Wayfinding signs can be used for both motorists and pedestrians. They are especially useful for visitors that may not know where certain destinations are within the Town. They help orient and inform users where destinations are and how far to the actual location.

For pedestrians, signs should be installed in locations where multiple destinations exist. For example, there are many destinations within close proximity to the Town Center where wayfinding signs would be useful. Wayfinding signage should be easy to understand and should orient and communicate in a clear and concise manner.



▲ Wayfinding Signage should be installed to orient pedestrians to destinations.

SIGNALIZATION

Traffic signals assign the right-of-way to vehicular and pedestrian traffic. Traffic signals benefit pedestrians by stopping vehicular traffic and allowing the pedestrian to cross the street safely. When traffic signals are installed and timed correctly, they can improve the efficiency of the overall transportation network. The MUTCD recommends that traffic signal timing for pedestrians be based on a

pedestrian crossing speed of 4-feet per second. However, this does not reflect the walking speeds of every user, especially children, persons with disabilities or elderly people. In order to accommodate all types of users, it is recommended that a pedestrian speed of 3-feet per second be used. See page 103 of AASHTO's Guide for the Planning, Design and Operation of Pedestrian Facilities for further guidance on traffic signal timing.

Pedestrian Signal Controls

Pedestrian signals controls or push buttons should be installed at all signalized intersections where pedestrian traffic is being facilitated across the roadway. The signal controls should be located within a reasonable distance from the curb ramp. The MUTCD provides the following guidance for locating push buttons at intersections where two control devices are located.

- » Adjacent to a level all-weather surface to provide access from a wheelchair, and where there is an all-weather surface, wheelchair accessible route to a ramp
- » Within 5-feet of the crosswalk extended
- » Within 10-feet of the edge of the curb, shoulder, or pavement



▲ Existing push button signal at the intersection of Carolina Boulevard and Main Street.

- » Parallel to the crosswalk to be used

The mounting height for pedestrian push button detectors should be approximately 3.5-feet, but no higher than 4-feet as defined by the MUTCD. This allows easy access for those in a wheelchair to be able to reach and activate the signal. Individuals with visual impairments need audible or tactile cues to assist them when crossing a roadway. This type of signal is known as “accessible pedestrian signal” and should be used wherever a pedestrian actuated signal exists. The MUTCD provides very specific guidance on pedestrian signals. This information can be found at: <http://mutcd.fhwa.dot.gov/pdfs/2009/part4.pdf>.

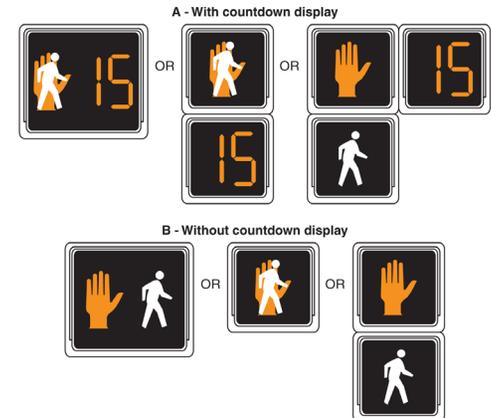
Pedestrian Signal Heads

Pedestrian signal heads provide special types of traffic signal indicators exclusively intended for controlling pedestrian traffic. These indicators consist of illuminated symbols of a WALKING PERSON (symbolizing WALK) and an UPRAISED HAND (symbolizing DON'T WALK). The signal heads should be mounted no lower than 7-feet, but no higher than 10-feet above sidewalk level. The signal head should also be mounted so that it is clearly visible for pedestrian crossing from the opposite side of the roadway.

The countdown clock seen above is a device that is typically located directly under the WALKING PERSON and UPRAISED HAND signal indications, with numbers large enough to be easily read from the far curb. When the flashing UPRAISED HAND signal indication begins, the countdown clock shows the number of seconds remaining until the steady UPRAISED HAND signal indication begins. The countdown indicator signal head is the standard for NCDOT and is currently used at the intersection of Carolina Boulevard and Main Street. The MUTCD states the following regarding pedestrian signal

head indicators:

- » A steady WALKING PERSON (symbolizing WALK) signal indication means that a pedestrian facing the signal indication is permitted to start to cross the roadway in the direction of the signal indication, possibly in conflict with turning vehicles. The pedestrian shall yield the right-of-way to vehicles lawfully within the intersection at the time that the WALKING PERSON (symbolizing WALK) signal indication is first shown.
- » A flashing UPRAISED HAND (symbolizing DON'T WALK) signal indication means that a pedestrian shall not start to cross the roadway in the direction of the signal indication, but that any pedestrian who has already started to cross on a steady WALKING PERSON (symbolizing WALK) signal indication shall proceed to the far side of the traveled way of the street or highway, unless otherwise directed by a traffic control device to proceed only to the median of a divided highway or only to some other island or pedestrian refuge area.



- » A steady UPRAISED HAND (symbolizing DON'T WALK) signal indication means that a pedestrian shall not

▲ Typical Pedestrian Signal Indicators from the MUTCD.



enter the roadway in the direction of the signal indication.

- » A flashing WALKING PERSON (symbolizing WALK) signal indication has no meaning and shall not be used

According to AASHTO and the MUTCD, research indicates that many pedestrians don't understand the meaning of these indicators; therefore educational signage can be placed near the pushbutton. The MUTCD recommends the use of R10-2 through R10-32P to educate pedestrians who may not comprehend the meaning of the pedestrian indicators. These can be found in Chapter 2B of the MUTCD.



- ▲ Crossing major thoroughfares and highways can be difficult for pedestrians. Pedestrian bridges like this can provide safe alternatives.

OVERPASSES

There are situations where pedestrian crossings cannot be accommodated “at-grade” and other ways have to be explored to safely facilitate pedestrians across the roadway. These are most commonly known as “overpasses or “underpasses” and can be very expensive to build. Typically, overpasses are created by utilizing pedestrian bridges and are used to cross major obstacles such as railroads, highways and even rivers and streams.

Many times providing ramps or steps can be challenging, especially if acquisition of private property is required. Overpasses need to either provide elevator access or meet Americans with Disabilities Act (ADA) ramp criteria for maximum slope (8.33%), level landings for every 30-inch rise in elevation, and handrails on both sides (AASHTO: 97). Overpasses or bridges must also maintain specific vertical and horizontal widths. The minimum inside width of a pedestrian bridge should be 8-feet, however if the bridge is enclosed to prevent dropping of debris onto the roadway below, the visual tunnel effect may require widening the bridge to 14-feet to provide a feeling of security for all bridge users.

UNDERPASSES

Similar to overpasses, underpasses are often utilized to provide continuous and uninterrupted access across a busy thoroughfare or other major obstacles, such as railroads. When designing an underpass it necessary to maintain a minimum vertical clearance of 8-feet for short distances and 10-feet for long distances. Underpasses typically require shorter ramps and less right-of-way than overpasses. A disadvantage of underpasses is that they can become expensive to construct, especially if the roadway has to be elevated in order to relocate utilities. Also, if the underpass is not



- ▲ Underpasses can provide a continuous and uninterrupted option for greenways and other types of pedestrian facilities.

well lit, it can create an unsafe environment, discouraging use.

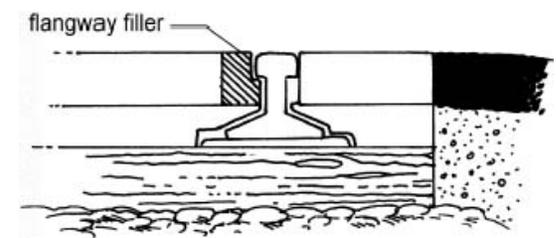
When considering the use of underpasses, drainage must be considered, especially if located near a creek or stream. Underpasses should be wide enough to for use by multiple users, and the longer the tunnel, the wider it should be. This provides a sense of security as people are passing by one another. Sufficient lighting should be provided within the underpass to create a safer environment for the user as well.

AASHTO recommends that the minimum width of an underpass be 12-feet. If the underpass structure is longer than 60-feet, a wider width of the underpass is recommended. For short underpasses a vertical clearance of 8-feet is sufficient, however, similar to the width of the underpass, the longer the structure the more vertical clearance that should be provided.

RAILROAD CROSSINGS

There are several railroad crossings in the Town of Clyde within the downtown area, including Mulberry Street, Main Street, Charles Street, and Morgan Street. According to the AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, pedestrian crossings at railroads must be designed in accordance with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) to avoid situations in which wheelchair casters rotate when they hit the top of a rail and drop into the flangeway. The crossing must be level and flush with the top of rail at the outer edge and between the rails. The crossing should be as close as possible to perpendicular with tracks, and flangeway gaps that do not exceed 2.5 inches (3 inches for tracks that carry freight) must be provided.

In addition to flangeways, detectable warnings to alert pedestrians with vision impairments should be placed where railways cross any accessible pedestrian route. Additional information regarding railroad crossings can be located on page 66 of the AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities and online at the Federal Highway Administration Office of Planning, Environment, and Realty web page: http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks208.cfm.



- ▲ The “flangeway filler” eliminates the gap in the path of travel for pedestrians crossing railroad tracks.

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APPENDIX

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TERMINOLOGY

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TERMINOLOGY

AASHTO: Is the American Association of State Highway and Transportation Officials, which is a nonprofit, nonpartisan association representing highway and transportation departments of all transportation modes.

ADA: Refers to the American Disabilities Act of 1991 which gives civil rights protections to individuals with disabilities including equal opportunities in public accommodations, employment, transportation, state and local government services, and telecommunications.

Connectivity: The logical and physical interconnection of functionally related points so that people can move among them

Crosswalk: A designated point on a road at which some means are employed to assist pedestrians who wish to cross a roadway or intersection. They are designed to keep pedestrians together where they can be seen by motorists, and where they can cross most safely with the flow of vehicular traffic.

Curb Extension: A section of sidewalk at an intersection or mid-block crossing that reduces the crossing width for pedestrians and is intended to slow the speed of traffic and increase driver awareness

FHWA: Stands for the Federal Highway Administration who carries out the Federal highway programs in partnership with the State and local agencies to meet the Nation's transportation needs.

Greenway/Trail: Is a linear path or open space, often composed of natural vegetation. Greenways can be used to create connected networks of open space that include traditional parks and

natural areas specifically designed for pedestrian and bicycle use. Greenways provide an off-street component to the bicycle network.

Intersection: Is where two or more pathways or roadways join together

LRTP: Stands for the Long Range Transportation Plan that is managed by the MPO and is a federally mandated, long-term planning document detailing the transportation improvements and policies to be implemented in the MPO's planning area.

Median: Is considered to be a physical barrier that is constructed of concrete, asphalt, or landscaping, that separates two directions of traffic

Multi Use Path: Is a paved path (concrete or asphalt), typically 10-foot wide, physically separated from motorized vehicular traffic by an open space or landscaped barrier and located within the highway right-of-way.

MPO: MPO stands for Metropolitan Planning Organization and is a federally mandated and federally funded transportation policy-making organization in the United States that is made up of representatives from local governmental transportation authorities. The Town of Clyde is part of the French Broad River MPO.

MUTCD: Is the Manual of Uniform Traffic Control Devices, which is the national standards guidebook on signage and pavement marking for roadways

NCDOT: North Carolina Department of Transportation



Appendix A
TERMINOLOGY

Pedestrian: Is a person that is traveling by foot or a person on roller skates, roller blades, child's tricycle, non-motorized wheelchair, skateboard, or other non-powered vehicles (excluding bicycles)

Quality of Life: Is a measure of the standard of living which considers non-financial factors such as health, functional status and social opportunities that are influenced by disease, injury, treatment or social and political policy

ROW (right of way): Is an easement held by the local jurisdiction over land owned by the adjacent property owners that allows the jurisdiction to exercise control over the surface and above and below the ground of the right-of-way; usually designated for passage

Safe Routes to School: Is a federal program that provides funding to encourage and facilitate the planning and implementation of bicycle and pedestrian projects near schools.

Sidewalk: Is typically a concrete facility that is located in the public right-of-way adjacent to a roadway. The facility can also be asphalt, brick or other materials.

Thoroughfare: Is a road that leads at either end to another street and

Transportation Committee: Is a group of volunteers who works with the Town staff to provide direction and guidance for the implementation of the Pedestrian Plan.

FUNDING OVERVIEW



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FUNDING OVERVIEW

There are several opportunities that the Town of Clyde can capitalize on to help pay for the pedestrian improvements outlined in this report. The following provides a summary of the various local, state and federal funding sources that are available for the Town to use. The list below represents many of the core funding strategies that are available, but is by no means an exhaustive list of funding sources. There are many other sources available that should be researched and pursued as well.

Local Funding

There are several local funding opportunities that the Town can use to implement the recommendations in this Pedestrian Master Plan. The following list of funding sources provides a brief explanation of these funds and what they can be used for.

Local General Funds

The Town currently dedicates \$30,000 to \$50,000 from the local general fund that goes toward the sidewalk program. Currently, these funds are used for maintenance and not for the installation of new sidewalks.

Powell Bill Fund

Currently, there is approximately \$35,000 to \$40,000 in the Powell Bill Fund that is used for transportation improvement projects.

State Funding

There are several state funding sources that can be used to

implement the Pedestrian Master Plan. Many of the state funding sources are actually funded by the federal government, but are administered through the state agencies. The North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation has been funding pedestrian related infrastructure and non-infrastructure projects.

NCDOT annually sets aside \$6 million for the construction of bicycle and pedestrian improvements that are independent of scheduled highway projects in communities throughout the state. Types of projects include shared-use paths, wide-paved shoulders, bike lanes, and sidewalks. These independent projects are funded through the Strategic Prioritization/State Transportation Improvement Program (STIP) process.

The strategic prioritization process serves as the primary input source for the STIP. Metropolitan Planning Organizations, (MPOs), Rural Planning Organizations (RPOs), NCDOT Divisions, and the Division of Bicycle and Pedestrian Transportation (DBPT) as well as other units at NCDOT may submit projects through the prioritization process. For bike and pedestrian projects, the DBPT utilizes a project prioritization methodology with defined criteria to rank all bike/pedestrian projects. This process occurs every two years. Priority projects are included in the developmental STIP (years 6 to 10) and the 10-year Program & Resource Plan.

Bicycle and pedestrian accommodations such as bike lanes, widened paved shoulders, sidewalks and bi-cycle-safe bridge design are frequently funded as incidental features of highway projects. Most pedestrian safety accommodations built by NCDOT are included as part of scheduled highway improvement projects funded with a combination of federal and state roadway construction funds or with a local fund match.



NCDOT's Sidewalk Program – Each year, a total of \$1.4 million in STP-Enhancement funding is set aside for sidewalk construction, maintenance and repair. Each of the 14 highway divisions across the state receives \$100,000 annually for this purpose. Funding decisions are made by the district engineer. Prospective applicants are encouraged to contact their district engineer for information on how to apply for funding.

Safe Routes to Schools Program

Safe Routes to School (SRTS) is a program that enables and encourages children to walk and bike to school. The program helps make walking and bicycling to school a safe and more appealing method of transportation for children. SRTS facilitates the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools. The North Carolina Safe Routes to School Program is supported by federal funds through SAFETEA-LU and MAP-21 legislation.

Different types of reimbursable funding opportunities are available through this program which include; Action Plans or School Travel Plans, Non-Infrastructure Program funding, Infrastructure Program funding, and Highway Division Funds. Please note that all SRTS projects “shall be treated as projects on a Federal-aid system under chapter 1 of title 23, United States Code.” Although no local match is required and all SRTS projects are 100% federally funded, agencies are encouraged to leverage other funding sources that may be available to them, including grant awards, local, state, or other federal funding. SRTS funds can be used for any school public or private, K-8, in a municipality or in the county jurisdiction.

The following provides information about the program.

- » Action Plans or School Travel Plans: These are plans to improve pedestrian and bicycle safety within a two-mile radius of schools that are grades K-8. The Action Plans provide a framework for identifying projects, programs and activities that will make walking and bicycling to school safer and more appealing.
- » Non-Infrastructure Funds: are used for pedestrian and bicycle education, encouragement, evaluation and enforcement. These grants are good for developing programs that inspire children to walk and bike to school.
- » Infrastructure Funds: are funds that are awarded for the planning, design, and construction of pedestrian and bicycling facilities within a 2-mile radius of a school. Funding requests typically range from \$100,000 to \$300,000 per project. Types of projects may include sidewalk improvements, crossing improvements, on-street bike and pedestrian improvements, bike parking, traffic calming, and traffic separation devices among others. An adopted Comprehensive Transportation Plan or other type of pedestrian and bicycle plan that identifies needed infrastructure improvements is helpful in obtaining these grants.
- » Highway Division Funds: are funds that are allocated by each of NCDOT's 14 Highway Divisions and the SRTS office to fund infrastructure projects on state-maintained roadways. The projects must be within 2-miles of a school serving grades K-8 to be eligible. The funding amounts can be used to improve conditions for walking and biking to school.

For additional information please contact Ed Johnson, Safe Routes



to School Coordinator, at NCDOT.

Contact Information:

Ed Johnson, ASLA, RLA

SRTS Coordinator

NCDOT, Division of Transportation Mobility and Safety Traffic Management Unit

1561 Mail Service Center

Raleigh, NC 27699-1561

Email: erjohnson2@ncdot.gov

Direct 919.329.8497 Branch 919.773.2800

Governor's Highway Safety Program (GHSP)

The GHSP provides funds for pedestrian and bicycle related initiatives upon approval. This is an annual program and the amounts of the funds vary from year to year, according to the specific amounts requested.

North Carolina Parks and Recreation Trust Fund (PARTF)

In 1994 the North Carolina General Assembly established the Parks and Recreation Trust Fund (PARTF). PARTF was established to fund improvements in the state's park system, to fund grants for local governments and to increase the public's access to the state's beaches. PARTF funds are used to acquire, build, and renovate parks. They provide a dollar-for-dollar match up to \$500,000. The Town should apply for this grant money to build greenways and other recreational facilities that serve the general public. To find out more information about the PARTF program, please visit the following web page www.ncparks.gov/About/grants/partf_main.php.

The North Carolina Conservation Tax Credit Program

North Carolina recognizes the importance of land conservation to its economy, and offers a tax credit program to promote conservation of ecosystem functions (fish and wildlife conservation and conservation of natural areas), ecosystem services (farmland conservation) and other public benefits (public access to public trails, waters, and beaches). This program is managed by the North Carolina Department of Environment and Natural Resources, provides an incentive (in the form of an income tax credit) for landowners that donate interests in real property for conservation purposes. Property donations can be fee simple or in the form of conservation easements or bargain sale. More information on this program can be obtained at the following web page: www.onencnaturally.org/pages/ConservationTaxCredit.html

North Carolina Trails Program

This program is administered through the North Carolina Division of Parks and Recreation. The program originated in 1973 and is dedicated to helping citizens, organizations and agencies plan, develop and manage all types of trails. The North Carolina Division of Parks and Recreation offers two types of grants. The first is the Adopt-A-Trail Grant and the other is the Recreational Trails Program Grant. To find out more information about this program, please visit their web page at www.ncparks.gov/About/trails_main.php.

National Funding Sources

There are a wide range of national funding opportunities that can be used for the development of bicycle facilities. The following list represents the most widely referenced and used.

Congestion Mitigation & Air Quality Improvement Program

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) provides \$6 billion in funding for surface transportation and other related projects that contribute to air quality improvements and reduce congestion. The Town should actively pursue CMAQ funding. To find more information regarding CMAQ funding, please use the following link: www.fhwa.dot.gov/environment/air_quality/cmaq/index.cfm

MAP-21 (Moving Ahead for Progress in the 21st Century Act):

On July 6, 2012, President Obama signed into law P.L. 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21). Funding surface transportation programs at over \$105 billion for fiscal years (FY) 2013 and 2014, MAP-21 is the first long-term highway authorization enacted since 2005. MAP-21 represents a milestone for the U.S. economy – it provides needed funds and, more importantly, it transforms the policy and programmatic framework for investments to guide the growth and development of the country’s vital transportation infrastructure.

MAP-21 creates a streamlined, performance-based, and multimodal program to address the many challenges facing the U.S. transportation system. These challenges include improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery.

MAP-21 builds on and refines many of the highway, transit, bike, and pedestrian programs and policies established in 1991. This summary reviews the policies and programs administered by the Federal Highway Administration. The Department will continue to make progress on transportation options, which it has focused on in the past three years, working closely with stakeholders to ensure

that local communities are able to build multi-modal, sustainable projects ranging from passenger rail and transit to bicycle and pedestrian paths.

To read more about MAP-21 please visit <http://www.fhwa.dot.gov/map21/summaryinfo.cfm>.

Other Funding Sources

BlueCross BlueShield of North Carolina Foundation

The Foundations primary objective is to invest in clearly-defined and results-oriented project that further their mission of improving the health and well-being of North Carolinians. Since they were founded in 2000, they have invested more than \$78 million into communities across the state by supporting more than 570 grants and special initiatives. Their grantmaking is guided by three focus areas:

- » Health of Vulnerable Populations
- » Health Active Communities
- » Community Impact through Nonprofit Excellence

To learn more about the foundation and how to apply for grants, please go to: <http://www.bcbsncfoundation.org/grants/>

The Robert Wood Foundation

The Robert Wood Johnson Foundation was established in 1972 and today it is the largest U.S. foundation devoted to improving the health and health care of all Americans. Grant making is concentrat-



ed in four areas:

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

For additional information on the foundation and how to apply, please visit their web page at: <http://www.rwjf.org/en/grants.html>

North Carolina Community Foundation

The North Carolina Community Foundation, established in 1988, is a statewide foundation seeking gifts from individuals, corporations, and other foundations to build endowments and ensure financial security for nonprofit organizations and institutions throughout the state. The foundation also manages a number of community affiliates throughout North Carolina, that make grants in the areas of human services, education, health, arts, religion, civic affairs, and the conservation and preservation of historical, cultural, and environmental resources. The foundation also manages various scholarship programs statewide. More information about their grants can be found at: <http://www.nccommunityfoundation.org/section/grants>

Duke Energy Foundation

Funded by Duke Energy shareholders, this non-profit organization

makes charitable grants to selected non-profits or governmental subdivisions. Each annual grant must have:

- » An internal Duke Energy business “sponsor”
- » A clear business reason for making the contribution

The grant program has four focus areas: Environment, Economic Development, Education, and Community Vitality. Related to this project, the Foundation would support programs that support conservation, training and research around environmental and energy efficiency initiatives. Web site: <http://www.duke-energy.com/community/foundation.asp>.

National Trails Fund

American Hiking Society’s National Trails Fund is the only privately funded, national grants program dedicated solely to building and protecting hiking trails. Created in response to the growing backlog of trail maintenance projects, the National Trails Fund has helped hundreds of grassroots organizations acquire the resources needed to protect America’s cherished hiking trails. To date, American Hiking Society has funded 174 trail projects by awarding over \$500,000 in National Trails Fund grants. More information on the National Trails Fund, including applying for grants, can be found at: <http://www.americanhiking.org/NTF/>

The Trust for Public Lands

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land for human enjoyment and well being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of



life of American communities. TPL's legal and real estate specialists work with landowners, government agencies, and community groups to:

- » Create urban parks, gardens, greenways, and riverways
- » Build livable communities by setting aside open space in the path of growth
- » Conserve land for watershed protection, scenic beauty, and close-to home recreation safeguard the character of communities by preserving historic landmarks and landscapes.

The following are TPL's Conservation Services:

- » Conservation Vision: TPL helps agencies and communities define conservation priorities, identify lands to be protected, and plan networks of conserved land that meet public need.
- » Conservation Finance: TPL helps agencies and communities
- » Identify and raise funds for conservation from federal, state, local, and philanthropic sources.
- » Conservation Transactions: TPL helps structure, negotiate, and complete land transactions that create parks, playgrounds, and protected natural areas.
- » Research and Education: TPL acquires and shares knowledge of conservation issues and techniques to improve the practice of conservation and promote its public benefits.

Since 1972, TPL has worked with willing landowners, community

groups, and national, state, and local agencies to complete more than 3,000 land conservation projects in 46 states, protecting more than 2 million acres. Since 1994, TPL has helped states and communities craft and pass over 330 ballot measures, generating almost \$25 billion in new conservation-related funding. For more information, visit <http://www.tpl.org/>.

DRAFT SIDEWALK CONNECTIVITY ORDINANCE



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Town of Clyde
Sidewalk and Connectivity Ordinance

Insert into Zoning Ordinance
ARTICLE X CIRCULATION AND CONNECTIVITY

Section 1000. Purpose

An interconnected street and sidewalk system is necessary in order to promote orderly and safe development by ensuring that streets and sidewalks function in an interdependent manner, provide adequate access for emergency and service vehicles, enhance access by ensuring connected transportation routes, and provide continuous, alternative, and comprehensible traffic routes. This Article is to ensure local and regional transportation interconnectivity options while also maintaining and enhancing the Town's small town character. It is the intent of this Article to build streets and sidewalks that are integral components of the community's overall design. Streets and sidewalks shall complement each neighborhood and commercial district, while accommodating multiple modes of travel.

Section 1001. Goals of connectivity and sidewalks:

- Support the creation of a highly connected transportation system within Clyde in order to provide choices for drivers, bicyclists, and pedestrians;
- Promote walking and bicycling;
- Connect neighborhoods to each other and to local destinations such as schools, parks, and shopping centers;
- Reduce vehicle miles of travel and travel time;
- Reduce travel times and increase efficiency of public service delivery (e.g., school buses, refuse collection, mail delivery) and emergency responders; and
- Reduce reliance on thoroughfares for short trips so that thoroughfares can better serve regional travel needs and widening beyond four lanes can be avoided; and
- Ensure that pedestrian connections serve all citizens of Clyde

Section 1002. Infrastructure Design Guidelines

All infrastructure shall be designed and installed in accordance with the Town's *Standard Specifications and Details* manual and the requirements of this chapter. *(Need to develop this manual with specifications for sidewalk construction)*

Section 1003. Provisions for Street Design

New development or redevelopment with frontages on existing publicly-maintained streets shall be required to upgrade all street frontages to meet the standards of this Ordinance including sidewalks, street trees, curb and gutter, and right-of-way reservation. Payment in lieu of physical improvements may be permitted by the Board of Alderman according to the provisions in Section 606 of the Subdivision Ordinance. The following specifications shall apply to street design.

Section 1003. Streets

The Town views streets as important public space and, in an effort to protect this investment, has developed a set of principles which permit this space to be used comfortably and safely by motorists, pedestrians and cyclists.

1. Streets shall interconnect within a development and with adjoining development. Street stubs shall be provided to adjacent property to provide for future connections.
2. Streets shall be constructed with sidewalks and consider multi-modal transportation e.g. bicycles .
3. Streets shall be landscaped with street trees per the requirements of the Landscape Ordinance.
4. The use of horizontal traffic calming devices (such as landscaped bulb-outs, medians, traffic circles, or roundabouts) is encouraged subject to approval by the Town of Clyde Planning Board and Board of Aldermen.

Section 1004. Connectivity in Subdivisions.

Connectivity shall be defined by the ratio of links to nodes in any subdivision.

1. The connectivity ratio shall be the number of street links divided by the number of nodes or end links, including cul-de-sac heads.
2. A link shall be any portion of a street, other than an alley, defined by a node at either end. Stub-outs to adjacent property shall be considered links. For the purpose of determining the number of links in a development, boulevards, median-divided roadways, and divided entrances shall be treated the same as conventional two-way roadways.
3. A node shall be the terminus of a street or the intersection of two or more streets.



- a. Any curve or bend of a street that exceeds 75 degrees shall receive credit as a node. Any curve or bend of a street that does not exceed 75 degrees shall not be considered a node.
- b. A divided entrance shall only count once.

Section 1005. Connectivity Within Existing Street Patterns

1. Connectivity shall be defined as the continuation of the traditional grid pattern established by the existing road network and creation of new blocks according to the Town of Clyde Block Standards – yet to be created.
2. Rights-of-way shall intersect at right angles, unless otherwise allowed by the NCDOT District Engineer or designee where the site design demonstrates that the intersections do not have a negative effect on public safety or services, including but not limited to pedestrian mobility, emergency response, or trash collection.

Section 1006. Required Ratio

1. The street network for any subdivision with internal roads or access to any public road shall achieve a connectivity ratio of not less than 1.40 in all zoning districts, measured within the subdivision.
2. Street links and nodes along a collector or arterial street providing access to proposed subdivision shall not be considered in computing the connectivity ratio
3. Stub-outs shall be considered as being present as a link at the ratio of one line per side for purposes of determining if the required ratio has been met.

EXAMPLE 1: Does not meet ratio
 (13 links/11 nodes = 1.18)

EXAMPLE 2: Modified to meet ratio
 (16 links/11 nodes = 1.45)

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4. External Access Required

- a. Except within existing street networks, external access to development shall be provided as indicated below. In determining the number of access points that shall be required, the cumulative impacts of prior developments on the roads shall be considered.
 - i. For developments with 25 or fewer units, at least one point of access to the roadway network shall be provided.
 - ii. For developments with between 25 and 60 units, at least two points of access to the roadway network shall be provided.
 - iii. For developments with 61 or more units, at least three points of access to the roadway network shall be provided.
- b. A divided entrance shall count as one point of access.
- c. Where a stream crossing that is required to meet the standards is rejected by the North Carolina Department of Environment and Natural Resources (DENR) then the plan is rejected by the Town.

Section 1004. Sidewalks



Appendix C
DRAFT SIDEWALK CONNECTIVITY ORDINANCE

Sidewalks, shall be constructed along streets (including cul-de-sacs) as indicated in the table below. The following standards shall apply:

Zoning Districts	R-1, R-1A	R-2	C-1	C-2	I-I	O & I
Sidewalk requirements	5-8 ft; one or both sides; or multi-use pathway	5-8 ft; both sides	6-12 ft; both sides	6-8 ft; both sides	Not required	5-8 ft; one or both sides

1. Sidewalks shall have a minimum width of 5 feet.
2. Sidewalks shall be required on both sides of all roads except where:
 - a. Net residential densities of developed areas are three dwelling units per acre or less, in which case sidewalks shall only be required on one side;
 - b. Sidewalks may only be required on one side in O & I and are not required in I-I.
3. Developments in R-1 or R-1A districts shall provide a multi-use pathway of a minimum 8 feet in width, if only one side of the street contains a sidewalk. Multi-use path must be constructed of asphalt or similar material along one side of thoroughfare or collector road frontages or as designated on an adopted plan.
4. Sidewalks along thoroughfares, collector streets, and/or streets with fronting commercial and/or multi-family uses shall have a minimum width of 6 feet.
5. Unless otherwise specified by an adopted area plan, street frontages with mixed-use or commercial buildings having setbacks of 10 feet or less from the right-of-way and ground floor commercial space, shall be constructed with sidewalks a minimum of 8 feet in width. Where there is also on-street parking and retail uses along the street frontage, the minimum sidewalk width shall be 12 feet with trees in tree wells or other tree protection as

approved by the Town Planner.

6. Sidewalks shall be placed far enough from the curb to accommodate the minimum planting strip width required in Section 1204. *Street Trees* of the Landscape Ordinance.
7. All sidewalks shall be paved with broom-finished concrete, paving brick or concrete pavers. Similar materials may be permitted by the Planning Board on a case-by-case basis, in compliance with ADA standards.

Section 1005. Street Trees

All street trees shall be installed in accordance with the provisions of the Landscape Ordinance, Section 1204. *Street Trees*, and shall conform to the regulations of NCDOT, where required.

Section 1006. Bikeways

1. *Bike lanes or separate off-street multi-use paths shall be installed on developer-built or modified roadways where designated for such by the Town of Clyde Comprehensive Pedestrian and Bicycle Plan or subsequently adopted plan; and/or as specified in item 3 below where the adopted plan does not provide sufficient guidance.*
2. *Where a proposed development does not include new or widening of existing collector or thoroughfare streets, the developer shall reserve right-of-way sufficient to accommodate the appropriate bikeway facility.*
3. *Bike lanes and bike paths shall be designed according to the North Carolina Bicycle Facilities Planning and Design Guidelines published by NCDOT and shall include all appropriate signage and pavement markings. Variations from the NCDOT standards may be allowed subject to approval from the Administrator based on the standards below.*
4. *Bicycle facilities shall be included in the areas designated by the Town's Comprehensive Bicycle Plan, or subsequently adopted plan. Parking standards often require bicycle parking. Should Clyde's parking standards be revised to require bicycle parking?*

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PEDESTRIAN MASTER PLAN

Town of Clyde, North Carolina