

TOWN OF BISCOE, NORTH CAROLINA

PEDESTRIAN TRANSPORTATION PLAN



Division of
Bicycle &
Pedestrian
Transportation



GREENWAYS INC.
planning & design for open space, parks, trails, & alternative transportation



Prepared For:
THE TOWN OF BISCOE, NC
NCDOT

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TOWN OF BISCOE

ACKNOWLEDGEMENTS



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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



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Chapter 1: Introduction

This section provides project background, the benefits of walkable communities, visions and goals for this Plan, and the Plan organization.



1.0 PROJECT BACKGROUND

In 2010, the Town of Biscoe applied for and was awarded a grant from the North Carolina Department of Transportation (NC-DOT) to develop this Pedestrian Transportation Plan. This Plan combines past planning efforts with new research and analysis, and includes a full public input process. The result is a complete, up-to-date framework for moving forward with tangible pedestrian transportation improvements.

The Town already features many pedestrian-friendly elements; however, current conditions within Biscoe are often unsafe for pedestrians. Sidewalk connectivity is lacking in some places with major obstacles such as the railroad and NC 24/27. This Plan will make recommendations to enhance conditions for pedestrians throughout Town, particularly in areas identified by the public and the project steering committee. Beyond physical improvements, this Plan also outlines policies and programs to help encourage people to walk more often, drive more safely, and to grow as a Town with the needs of pedestrians taken into full consideration.

1.1 PLANNING PROCESS

This planning process began with a 'kick-off and fieldwork' meeting in January 2011, followed by a public workshop and development of a Draft Plan. The Plan communicates the current conditions for walking in Biscoe, recommends improvements, and outlines strategies to carry out those recommendations. The planning process concluded in the summer of 2011. Public participation (through the workshop and steering committee meetings) played a key role in Plan development.

1.2 BENEFITS OF WALKABLE COMMUNITIES

When considering the level of dedication in time and valuable resources that it will take to fulfill the goals of this Plan, it is also important to measure the immense value of pedestrian trans-

CHAPTER OUTLINE:

1.0 PROJECT BACKGROUND

1.1 PLANNING PROCESS

1.2 BENEFITS OF WALKABLE COMMUNITIES

1.3 VISIONS AND GOALS

1.4 PLAN COMPONENTS



The Town Hall in Biscoe is a destination along West Main Street.



Walking is a form of transportation, recreation, and exercise.

portation. Walking helps to improve people's health and fitness, enhance environmental conditions, decrease traffic congestion, and will contribute to a greater sense of community.

Scores of studies from experts in the fields of public health, urban planning, urban ecology, real estate, transportation, sociology, and economics have supported such claims and have acknowledged the substantial value of supporting walking as it relates to active living and alternative transportation.

Communities across the United States and throughout the world are implementing strategies for serving the walking needs of their residents, and have been doing so for many years. They do this because of their obligations to promote health, safety and welfare, and also because of the growing awareness of the many benefits of walking.

INCREASED HEALTH AND PHYSICAL ACTIVITY

A growing number of studies show that the design of our communities—including neighborhoods, towns, transportation systems, parks, trails and other public recreational facilities—affects people's ability to reach the recommended daily 30 minutes of moderately intense physical activity (60 minutes for youth). According to the Centers for Disease Control and Prevention (CDC), "physical inactivity causes numerous physical and mental health problems, is responsible for an estimated 200,000 deaths per year, and contributes to the obesity epidemic" (1). The increased rate of disease associated with inactivity reduces quality of life for individuals and increases medical costs for families, companies, and local governments.

The CDC determined that creating and improving places to be active could result in a 25% increase in the number of people who exercise at least three times a week. This is significant considering that for people who are inactive, even small increases in physical activity can bring measurable health benefits. The establishment of a safe and reliable network of sidewalks and trails in Biscoe will have a positive impact on the health of local residents. The Rails-to-Trails Conservancy puts it simply: "Individuals must choose to exercise, but communities can make that choice easier."

ECONOMIC BENEFITS

Walking is an affordable form of transportation. According to the Pedestrian and Bicycle Information Center (PBIC), of Chapel Hill, NC, the cost of operating a car for a year is approximately \$5,170, while walking is virtually free. The PBIC explains, "When safe facilities are provided for pedestrians and bicyclists, more

people are able to be productive, active members of society. Car ownership is expensive, and consumes a major portion of many Americans' income" (2).

Walking becomes even more attractive from an economic standpoint when the rising price of oil (and decreasing availability) is factored into the equation. Since 2000, oil prices have more than quadrupled. The rising cost of fuel reinforces the idea that local communities should be built to accommodate people-powered transportation, such as walking and biking.

From a real estate standpoint, consider the positive impact of trails and greenways, which are essential components of a complete pedestrian network. According to a 2002 survey of homebuyers by the National Association of Home Realtors and the National Association of Home Builders, trails ranked as the second most important community amenity out of a list of 18 choices (incidentally, 'highway access' ranked first). Additionally, the study found that 'trail availability' outranked 16 other options including security, ball fields, golf courses, parks, and access to shopping or business centers (3). Findings from the American Planning Association (How Cities Use Parks for Economic Development, 2002), the Rails-to-Trails Conservancy (Economic Benefits of Trails and Greenways, 2005), and the Trust for Public Land (Economic Benefits of Parks and Open Space, 1999) further substantiate the positive connection between trails and property values across the country.

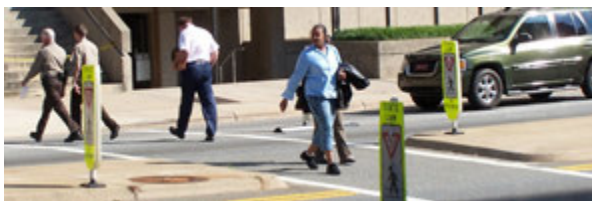
ENVIRONMENTAL IMPROVEMENTS

When people choose to get out of their cars and walk, they make a positive environmental impact. They reduce their use of gasoline, which then reduces the volume of pollutants in the air. Other environmental impacts can be a reduction in overall neighborhood noise levels and improvements in local water quality as fewer automobile-related discharges wind up in the local rivers, streams, and lakes. Furthermore, every car trip replaced with a pedestrian trip reduces U.S. dependency on fossil fuels, which is a national goal.

Trails and greenways are also part of the pedestrian network, conveying their own unique environmental benefits. Greenways protect and link fragmented habitat and provide opportunities for protecting plant and animal species. Aside from connecting places without the use of air-polluting automobiles, trails and greenways also reduce air pollution by protecting large areas of plants that create oxygen and filter air pollutants such as ozone, sulfur dioxide, carbon monoxide and airborne particles of heavy metal. Finally, greenways improve water quality by creating a



The American Tobacco Trail accommodates hundreds of users throughout the City of Durham and creates great appeal for surrounding neighborhoods.



By walking for our trips that are less than 2 miles, we could eliminate 40% of local car trips.

natural buffer zone that protects streams, rivers and lakes, preventing soil erosion and filtering pollution caused by residential development and agricultural and road runoff.

TRANSPORTATION BENEFITS

In 2001, the National Household Travel Survey found that roughly 40% of all trips taken by car are less than 2 miles (4). This is the case in Biscoe where many residents walk to school, work, a restaurant, or even the grocery store. By taking these short trips on foot, rather than in a car, citizens can have a substantial impact on local traffic and congestion. Additionally, many people do not have access to a vehicle or are not able to drive. An improved pedestrian network provides greater and safer mobility for these residents.

According to the Brookings Institution, the number of older Americans is expected to double over the next 25 years. All but the most fortunate seniors will confront an array of medical and other constraints on their mobility even as they continue to seek an active community life (5). Trails that are built as part of the pedestrian transportation network generally do not allow for motor vehicles. However, they do accommodate motorized wheelchairs, which is an important asset for the growing number of senior citizens who deserve access to independent mobility.

Children under the age of 16 are another important subset of our society who deserve access to safe mobility. According to the U.S. Environmental Protection Agency, fewer children walk or bike to school than did so a generation ago: In the past few decades, the percent of students between the ages of 5 and 15 who walked or biked to or from school has dropped from roughly 50% to about 15% (6).

QUALITY OF LIFE

Many factors go into determining the quality of life for the citizens of a community: the local education system, prevalence of quality employment opportunities, and affordability of housing are all items that are commonly cited. Increasingly though, citizens claim that access to alternative means of transportation and access to quality recreational opportunities such as parks, trails, greenways, and bicycle routes, are important factors for them in determining their overall pleasure within their community. Communities with such amenities can attract new businesses, industries, and in turn, new residents. Furthermore, quality of life is positively impacted by walking through the increased social connections that take place by residents being active, talking to one another and spending more time outdoors and in their communities.

1.3 VISIONS AND GOALS

The following vision and goals statements were developed out of the Town’s planning grant application and were reconfirmed early in the planning process, during committee meetings and public outreach efforts. The statements below apply to both the Plan itself, and the desired outcome of its implementation:

- Improve pedestrian safety along roadways to accommodate the heavy number of resident pedestrians.
- Increase pedestrian connectivity by filling sidewalk gaps and providing safe roadway crossings.
- Create walking loops throughout Town that provide both a transportation and recreation function.
- Continue to create an inviting pedestrian environment to increase interest and economic activity through a dedication to making pedestrian improvements that include traffic calming measures, landscaping, and lighting.
- Improve the safety and accessibility for key areas of concern in Biscoe including NC 24/27 crossings, school areas, connections into Downtown, and future development sites.
- Implement strategies in this Plan such as the adoption of policies and guidelines for adequate and safe pedestrian facility development.
- Improve pedestrian safety for students walking to all local schools.
- Improve motorist and pedestrian lawful behaviors through education and enforcement techniques.
- Increase number of pedestrians of all ages, income levels, and backgrounds.
- Keep Biscoe’s economic development and growth cohesive and connected. Integrate new residential and commercial development into the core rather than sprawling beyond the current Town boundaries.
- Continue to program sidewalk maintenance and development into Biscoe’s Capital Improvement Program budget, while also utilizing Powell Bill funds, state funds, and grant funds.



There is opportunity for pedestrian improvements along Main Street, a beautiful gateway and the core of the Town of Biscoe.



A steering committee was formed to guide the pedestrian planning process.

1.4 PLAN COMPONENTS

This Plan document includes the following major components:

This Introduction that presents the background, visions and goals, and the benefits of a walkable Town (Chapter 1).

An assessment of Existing Conditions that overviews existing pedestrian conditions, land use, trip attractors, and also summarizes existing related plans of Biscoe (Chapter 2).

A recommended Pedestrian Network that puts forward a framework of recommended facilities (pedestrian corridors, intersection improvement projects, and greenways) (Chapter 3).

Program Recommendations for education, encouragement, enforcement, and Policy Recommendations (Chapter 4).

Implementation recommendations that outline specific steps for achieving the Plan's key elements including phasing and prioritization of the Pedestrian Network (Chapter 5).

Design Guidelines to guide the Town of Biscoe in current facility design and standards (Chapter 6).

Appendices that provide a summary of public input, funding sources, and federal and state policies.

Pedestrian connectivity to the Deaton-Monroe Recreation Park, one of the major destinations in Town, is essential.



Footnotes

1 US Department of Health and Human Services, Centers for Disease Control and Prevention. (1996). Physical Activity and Health: A Report of the Surgeon General.

2 Pedestrian and Bicycle Information Center. Economic Benefits of Bicycling. http://www.bicyclinginfo.org/why/benefits_economic.cfm

3 Consumer's Survey on Smart Choice for Home Buyers, National Association of Realtors and National Association of Home Builders, April 2002.

4 Pedestrian and Bicycle Information Center. Transportation Benefits of Bicycling. http://www.bicyclinginfo.org/why/benefits_transportation.cfm

5 Brookings Institution (2003). The Mobility Needs of Older Americans: Implications for Transportation Reauthorization. http://www.brookings.edu/reports/2003/07transportation_rosenbloom.aspx

6 International Walk to School in the USA (2008 report). http://www.ecoact.org/PDF/SRTS/International_Walk2School_Talking_Points.pdf

Chapter 2: Existing Conditions

This chapter includes a summary of existing pedestrian conditions, important destinations, and summaries of existing documents relevant to this study. This analysis will lead towards the development of recommendations in Chapter 3.



2.0 OVERVIEW

The Town of Biscoe is in Montgomery County, located along the US 220/I-73/I-74 corridor and split by NC 24/27 highways. The Town was incorporated in 1901 and was dependent on the railroad industry, once an important repair center for railroad equipment. The Town is also adjacent to the Uwharrie National Forest.

The Town of Biscoe has seen relatively stagnant population growth over the past 20 years. A small Town (2.0 square miles) with around 1,700 people, destinations are mostly within walking distance.

One of the key issues facing Biscoe is pedestrian transportation where sidewalk and crosswalk connectivity is lacking. For example, NC 24/27 (East/West Main Street) is a significant obstacle for pedestrians who try to cross this major five-lane highway.

One of the aspects of this Plan is to address the needs of pedestrians within Biscoe by providing connectivity around the Town to local destinations. This Plan addresses safety concerns that exist where barriers prevent connectivity. This section discusses existing land uses, demographics, and pedestrian conditions that impact walking in Biscoe.

2.1 LAND USE AND DEVELOPMENT (Map 2.1)

Current land use is a result of development activity over the past several decades. Multiple land uses can be found throughout the Biscoe area with distinct patterns emerging. These patterns and characteristics have a major influence on pedestrian transportation. Proximity of uses and types of uses matter in a person's choice to walk, along with the quality of environment, ease of access, and safety.

The major features in Biscoe are the US 220/I-73/I-74 corridor which runs north-south on the eastern border of Town,

CHAPTER OUTLINE:

- 2.0 OVERVIEW
- 2.1 LAND USE AND DEVELOPMENT
- 2.2 DEMOGRAPHICS
- 2.3 TRIP ATTRACTORS
- 2.4 PEDESTRIAN CONDITIONS AND ISSUES



Unfortunately, all three local schools, such as Green Ridge Elementary School above, are just outside the southern edge of Biscoe. However, because of the Town's small size, they are still walkable destinations.

NC 24/27 which runs east-west through Town, and the railroad which runs parallel to North/South Main Street. All create obstacles to safe pedestrian travel. NC 24/27 is a five-lane highway serving local and industrial traffic.

One of the most significant challenges faced by the school-age population when walking to school is the location of the three local schools. All three schools are located away from the Town core, just outside the southern tip of Biscoe. A number of students do walk to school but those who live north of NC 24/27 are mostly driven or take the school bus.

The majority of commercial land uses are found along East/West Main Street (NC 24/27) and North/South Main Street. The Wal-Mart is found on the far western edge of Town along West Main Street, but is still within walking distance connected by sidewalks. The original Downtown core buildings and Post Office are found on South Main Street, just south of the main intersection with East/West Main Street.

The Deaton-Monroe Recreation Park is a great local attraction found along Mill Street (just south of West Main Street). A local flea market and farmers market is found along South Main Street, next to the railroad. Residential uses are found in all four quadrants separated by East/West Main Street and North/South Main Street.

2.2 DEMOGRAPHICS

As of the U.S. Census of 2000, there were 1,700 people, 535 households, and 393 families residing in the Town. The population density was 855.8 people per square mile. See Map 2.1 (Population Density) at the end of this chapter.

The Town is somewhat racially mixed with 58% of the population white; 24% African-American; with Hispanic or Latino of any race being 23.4% of the population. The median age is 34 with a spread of age groups (28.6% under the age of 18; 11.2% from 18 to 24; 25.6% from 25 to 44; 19.5% from 45 to 64; and 15.1% who were 65 years of age or older).

The medium household income of Biscoe is \$35,667 with 8.5% of families living below the poverty line. Compared to the 2000 State median household income of \$39,184, this is quite low. The sizeable difference between the medium household income for Biscoe and the State medium household income indicates that the Town has a tremendous opportunity to provide a connected sidewalk system for its residents who may not be able to afford an automobile. Approximately 5.5% of



The Deaton-Monroe Recreation park features a walking loop trail and playground.

the working population does not own a car and 1.6% of the working population walks to work. This is quite typical when compared to all municipalities in the State of North Carolina.

2.3 TRIP ATTRACTORS

The term “trip attractors” refers to places which people commonly walk to or from, or places they would like to walk to or from with improved pedestrian facilities. Providing safe pedestrian connectivity between these destinations are key to promoting walking. Examples of key trip attractors in Biscoe are:

- Grocery stores (Food Lion, Food King, Moore Produce, Biscoe Mart)
- Schools (East Middle School, East Montgomery High School, Green Ridge Elementary School)
- Downtown/Town Hall
- Deaton-Monroe Recreation Park
- Library
- Post Office
- Fast Food restaurants (especially along East Main Street)
- Churches
- Community Center/Library

See Map 2.2 at the end of this chapter for locations of trip attractors.

2.4 PEDESTRIAN CONDITIONS AND ISSUES

As described previously, there are many pedestrians in Biscoe on any given day. These pedestrians are traveling to work, school, the grocery, to visit neighbors and family, to eat at a local fast-food restaurant, to the Post Office, and/or to exercise.

Through a combination of fieldwork and committee input, existing pedestrian conditions were analyzed. The following pages highlight the strengths and weaknesses of the existing pedestrian environment. Map 2.3 at the end of this chapter shows existing facilities.

STRENGTHS OF PEDESTRIAN SYSTEM

A significant amount of walkable places and facilities exist within Biscoe and serve as excellent building blocks for improvement. These include:

- Existing sidewalk along East/West Main Street and North/South Main Street with additional sidewalks on Lambert Street, Mill Street, Brooks Street, and Leach Street.
- 5.4 miles of sidewalk within Town.



The Post Office along South Main Street remains a busy site throughout the day with people accessing by car and by foot.



The Food King is a potential destination for pedestrians along North Main Street in Biscoe. Currently, there are no sidewalks connecting to the store.

TOWN OF BISCOE



Sidewalks are found along the majority of thoroughfares through Biscoe (including West Main Street shown above).



Sidewalk connects pedestrians to the park from the east but not from the west (as shown above).

- A number of curb ramps have been installed throughout Town with sidewalk development, mainly along East/West Main Street and North/South Main Street.

Numerous activities and efforts have been undertaken in the past five to ten years related to municipal pedestrian improvements. The Town of Biscoe has made sidewalk construction a priority utilizing local capital improvement funds to build sidewalk along the two main thoroughfares through Town (East/West Main Street and North/South Main Street). The Town has also utilized Powell Bill funds to develop these sidewalks.

WEAKNESSES OF PEDESTRIAN SYSTEM

Lack of sidewalks (in places): Several important roadways in the Biscoe area lack continuous/connected sidewalks. This is especially true along portions of Mill Street, Aileen Street, Hunsucker Street, Bruton Street, Cedar Creek Road, Green Street, Shady Oak Drive, Sedberry Road, Wright Road, Church Street, the extreme southern segment of South Main Street, and the northern section of North Main Street.

Existing sidewalk issues: In locations, especially along South Main Street, sidewalks exist without curb and clear separation from parking lots or driveways.

Lack of connectivity (in places): There are a few gaps of varying lengths in the existing sidewalk network. These gaps create inhospitable space for pedestrians along roadways between existing sidewalk. One gap is found along Mill Street west of the park.

Inadequate crossing facilities: There are virtually no crossing facilities found in the Town of Biscoe, with the exception of nearly 30 curb ramps. Along with sidewalk needs, this is the most significant issue in which improvements are necessary.

- There were no marked crosswalks at the time of this study.
- In addition, there was no pedestrian signalization, signage, or refuge islands at the time of this study.

Heavy traffic: Traffic is significant, especially along NC 24/27 (East/West Main Street) and North/South Main Street. This makes crossing these roadways difficult for pedestrians without pedestrian crossing treatments.

Driveway Accesses: Several sections of sidewalk traverse oversized commercial driveway entrances/parking lots.

Railroad Crossings: Many crossings throughout Town do not provide adequate pedestrian treatments and are not ADA-compliant.

Pedestrian crashes: Only three crashes have been recorded over the past 10 years; however, it is possible more have occurred. These are displayed in Map 2.3.

SPECIFIC SITES OF CONCERN

1. NC 24/NC 27 (East/West Main Street) crossings
 West Main Street and McCaskill Street: Dozens of employees from a major employer along McCaskill Street cross East Main Street for lunch at fast-food restaurants each day. There are no pedestrian crossing accommodations.

East/West Main Street and North/South Main Street: The largest intersection in Town, this signalized intersection has no pedestrian crossing treatments. At the time of this study, this section of roadway was under construction.

West Main Street/Lambert Street: Sidewalks along Lambert Street lead residents to Main Street, where sidewalk is also found. However, there is no signalized intersection or pedestrian crossing treatment for residents to cross in order to access such destinations as Moore Produce and the park.

2. South Main Street crossings
 South Main Street and Mill Street: Sidewalks are lacking along Mill Street and the west side of South Main Street at this intersection. There are no crossing treatments at this intersection and to make matters worse, the Mill Street railroad crossing is not adequate for pedestrians.

South Main Street and Leach Street: Numerous pedestrians walk from neighborhoods off Leach Street to South Main Street to access such locations as the convenient store at Hyde Street. There are no signalized intersections or crossing treatments for pedestrians.

3. Roads leading to schools lack sidewalk. Cedar Creek Road and the southern end of South Main Street and Aileen Street lack sidewalk so that kids can walk to school safely.



Sidewalk along Mill Street stops at the top of this picture before reaching the railroad crossing, near South Main Street. This railroad crossing is not adequate for pedestrians.



Pedestrians cross South Main Street regularly, especially at the Leach Street intersection.

TOWN OF BISCOE



There is no sidewalk along Cedar Creek Road leading to Green Ridge Elementary School.

4. Sidewalks are lacking along Bruton Street, a roadway through a lower-income community, which sees significant pedestrian activity daily.

5. Sidewalks are missing along Mill Street from the park westward.

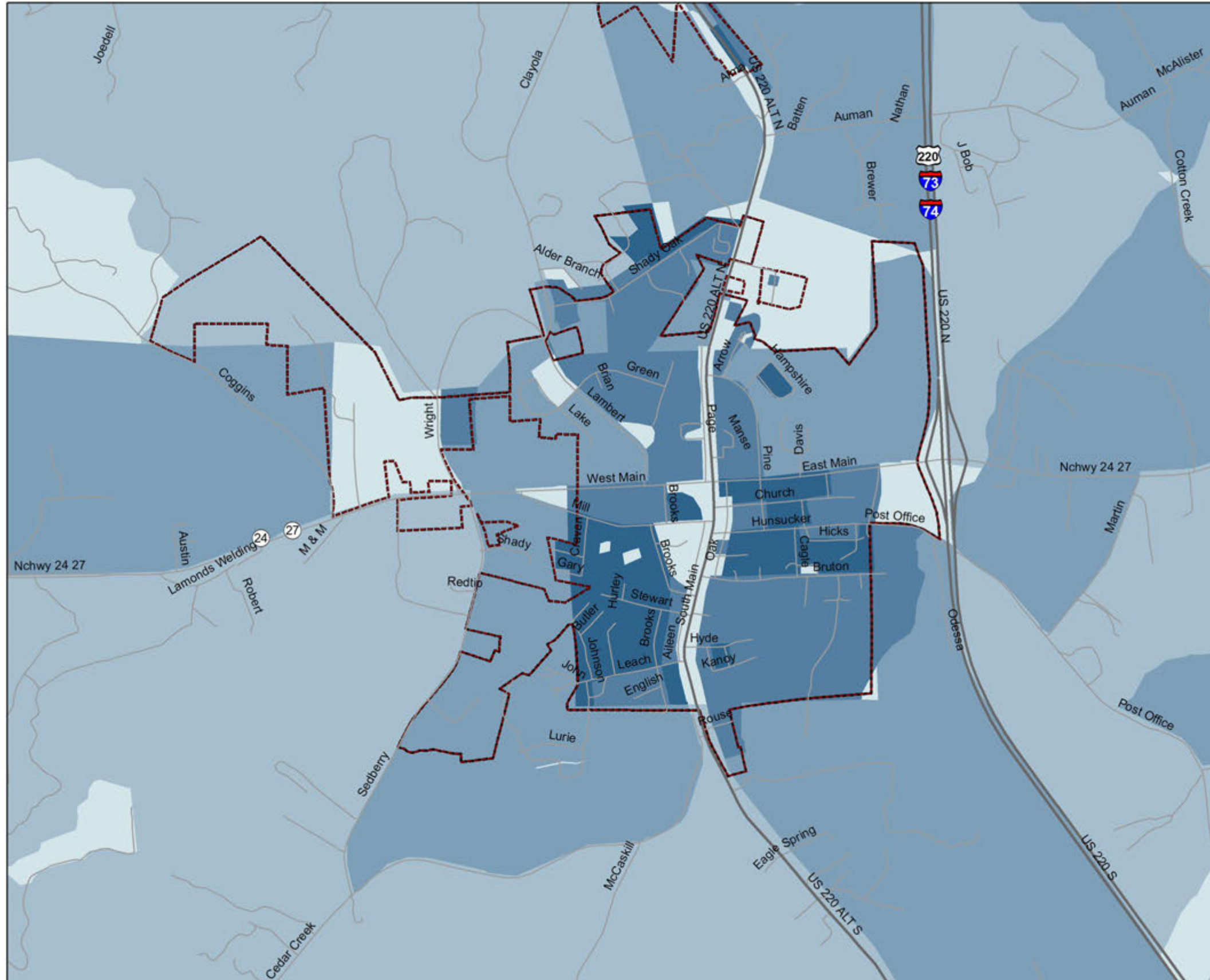
6. Sidewalks are lacking along several key collector roadways making it unsafe for walking out to major roadways. This includes Hunsucker Street, Pine Street, Church Street, Green Street, Shady Oak Drive, Sedberry Road, and Wright Road.

7. Driveway access management is needed in several locations, especially along South Main Street (between Church Street and Bruton Street) and near Hyde Street (convenient store at the corner). At these locations, a separated sidewalk does not exist across large driveway entrances, putting pedestrians at risk.



Sidewalk is found on both sides of this roadway crossing and Biscoe Mart convenient store driveway. In-between is a lack of safe, separated pedestrian space. The location above is South Main Street at Hyde Street.

Map 2.1 Population Density



Legend

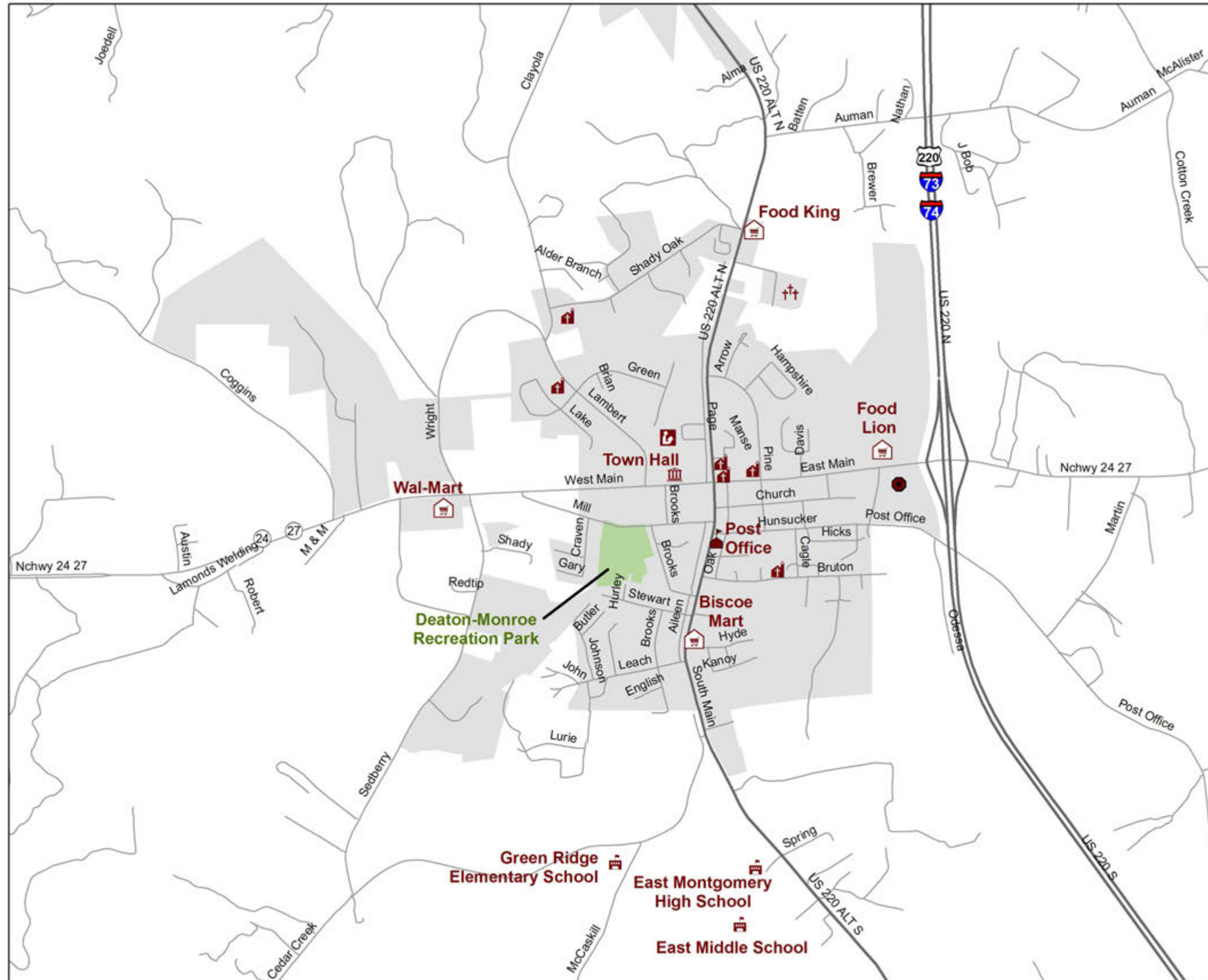
- Major Roads
- Roads
- ⬡ Town Boundary

Population Density (Persons/Square Mile)

Lightest Blue	0
Light Blue	0-71
Medium Blue	71-336
Dark Blue	336-1,943
Darkest Blue	1,943- 15,653



Map 2.2 Trip Attractors

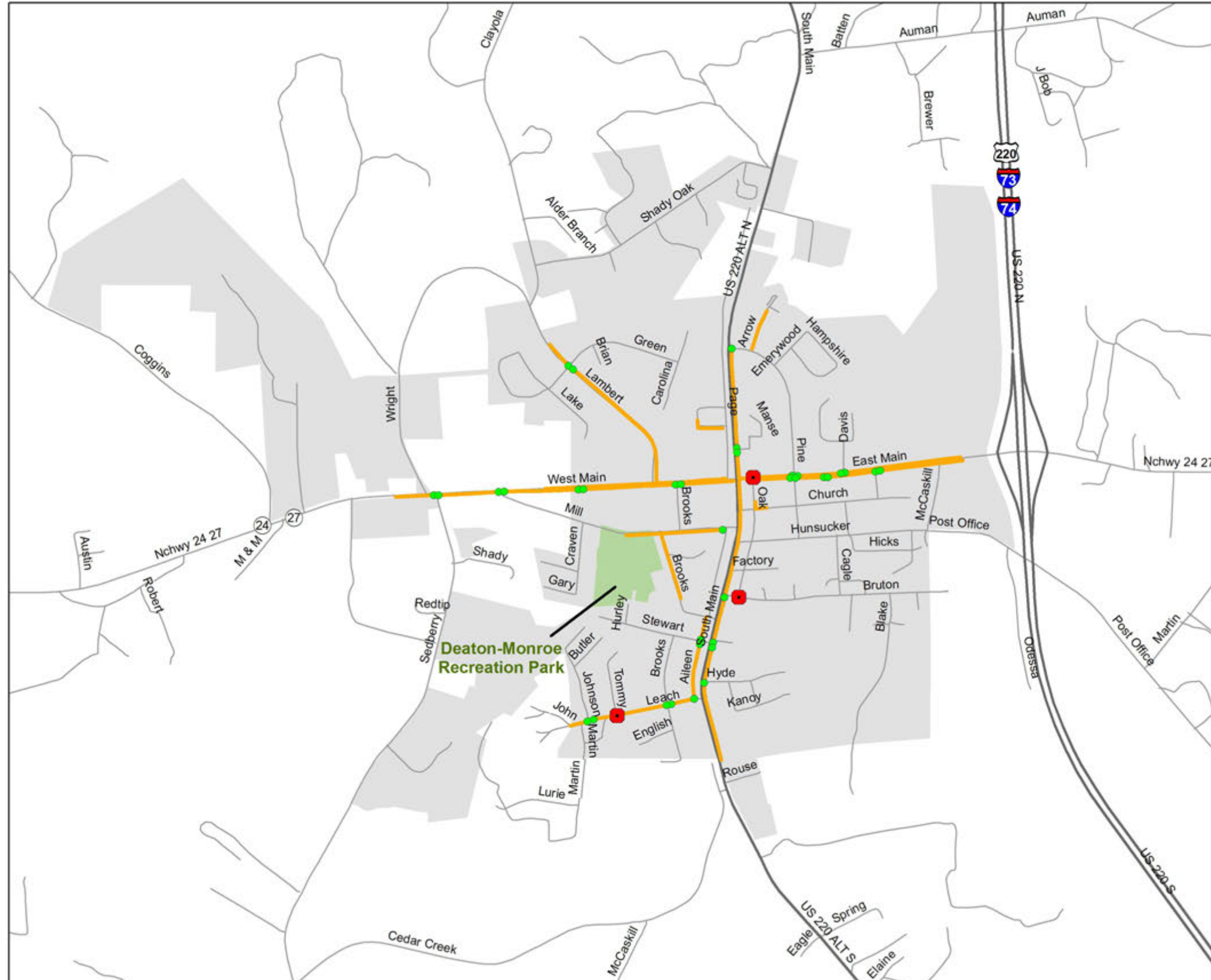


Legend

- Cemetary
- Church
- Community Center/Library
- Employment Center
- Town Hall
- Grocery; Shopping
- Post Office
- School
- Major Roads
- Roads
- Parks
- Town Boundary

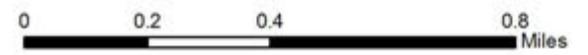


Map 2.3 Existing Pedestrian Conditions



Legend

- Pedestrian Crashes
- Curb Ramps
- Sidewalks
- Major Roads
- Roads
- Parks
- Town Boundary



Chapter 3: Recommended Pedestrian Network

This chapter describes the key recommendations to make Biscoe more pedestrian-friendly. A combination of linear corridor connections, crossing improvements, and pedestrian hub improvements are recommended.

3.0 OVERVIEW

This chapter contains a series of recommended changes to the Town of Biscoe’s physical environment that will create a more connected, comprehensive pedestrian network. It presents the methodology, recommended pedestrian network facilities, and overall pedestrian network map. It also provides detailed recommendations for intersection improvements.

The guiding philosophy in devising this network is the hubs and spokes model. Pedestrian corridors (spokes) should connect to trip attractors (hubs) such as parks, schools, Downtown, shopping centers, and other pedestrian corridors. The network then becomes a practical solution for pedestrian connectivity.



CHAPTER OUTLINE:

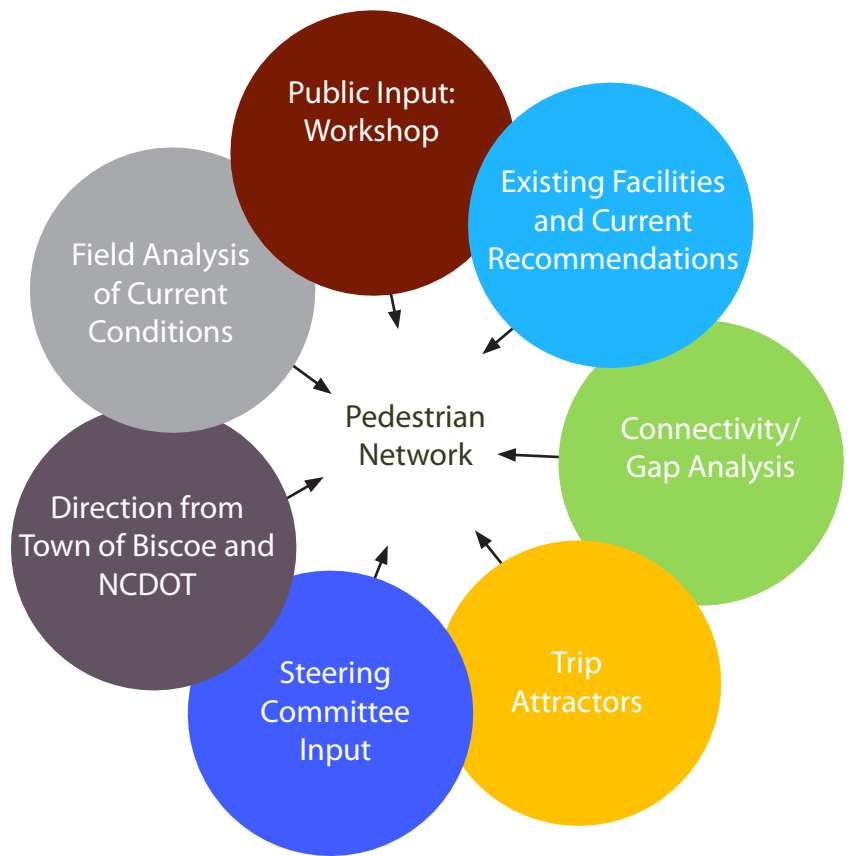
- 3.0 OVERVIEW
- 3.1 METHODOLOGY
- 3.2 THE PEDESTRIAN NETWORK
- 3.3 PRIORITY PROJECTS
- 3.4 ADDITIONAL SIDEWALK, INTERSECTION, AND OTHER IMPROVEMENTS
- 3.5 NC24/27 WIDENING PROJECT AND PLANS
- 3.6 REGIONAL CONNECTIVITY
- 3.7 RECOMMENDED PEDESTRIAN NETWORK MAP
- 3.8 GENERAL COST ESTIMATES



Successful development of the pedestrian network will require a long-term, cooperative effort between the Town of Biscoe, the local North Carolina Department of Transportation Division 8, and other local and state agencies. Cooperative effort is important because Biscoe cannot implement recommendations for pedestrian facilities on state and federal roads without DOT sanction.

3.1 METHODOLOGY

A variety of sources were consulted during the development of the Pedestrian Network: previous plans and studies, maps of existing pedestrian conditions, the consultant's fieldwork inventory, public input, and noted pedestrian trip destinations. Fieldwork included an examination of conditions at all major intersections, conditions along primary corridors, conditions at pedestrian hubs, and a consideration of gap connectivity. Map discussion and analysis was conducted at steering committee meetings and a public meeting to pinpoint specific areas in need of pedestrian improvements.



3.2 THE PEDESTRIAN NETWORK

Three main types of pedestrian projects have been identified for the Town of Biscoe and are outlined on the following pages. They include 1) sidewalks, 2) crossing improvements, and 3) multi-use trails (a.k.a, greenway trails and sidepaths). Conceptually, these pedestrian recommendations can be seen as a network of 'hubs and spokes', with Downtown Biscoe being the central point of connection (see diagram on page 3-1). Parks, schools, shopping centers, and other places where people might walk to and from are the 'hubs', whereas sidewalks, crosswalks, trails, and other pedestrian facilities are the 'spokes' that connect them.

The complete recommended network of sidewalks, crossing improvements, and trails can be found on Map 3.1 at the end of this chapter.

Individual, higher priority projects were developed during this planning process based on input from the Town, committee, and public. Factors used to determine project priorities were:

- Proximity to destinations
- Committee and public input
- High pedestrian activity areas
- Gaps in the current sidewalk network

Individual projects within the network could be developed as opportunities arise, regardless of being one of the priority projects or not. Also, new ordinances should make pedestrian accommodations a mandatory part of any commercial or residential development, especially as recommended in this Plan (as discussed in Chapter 4: Policies and Programs).

SIDEWALKS

The recommended sidewalks in Biscoe aim to expand upon the existing network of downtown sidewalks (Map 3.1). These are mainly along N/S Main Street, E/W Main Street (NC 24/27), Bruton Street, Hunsucker Street, Pine Street, Green Street, and others. Guidance for the design of sidewalk projects is provided in Chapter 6.

PEDESTRIAN FRIENDLY INTERSECTION IMPROVEMENTS

Many of the recommended pedestrian improvements are located at intersections. Consultant fieldwork and public input helped to identify numerous intersections that are in need of minor to significant pedestrian facility improvements (Map 3.1).

It is also recommended that improvements be made to all streets that intersect with E/W Main Street and N/S Main Street by adding highly-visible marked crosswalks across those intersecting streets.



Brooks Street, from West Main Street to Mill Street, passes along the ballfield on the way to the park. A sidewalk along Brooks Street would provide greater access to these destinations.



Above: The intersection of South Main Street and Hunsucker Street at the post office. Adding a high-visibility marked crosswalk, advanced stop line, and better defined curb ramps would enhance this crossing for pedestrians.

At a minimum, intersections with sidewalks approaching intersections should possess curb cuts with ramps and marked crosswalks (which helps to satisfy the standards set forth by the American Disability Act of 1991). Major intersections could have a variety of improvements, such as pedestrian-activated crossing and countdown signals, curb extensions, medians, and pedestrian refuge islands. Some of these treatments have been proven to reduce crashes, as shown in the 2007 FHWA Crash Reduction Factors Study (<http://safety.fhwa.dot.gov>). The table below shows some typical countermeasures and associated crash reduction factors from that study.

Pedestrian Crash Reduction Factors

Countermeasure	Crash Reduction Factor
Install sidewalk	74%
Install pedestrian countdown signal heads	25%
Install pedestrian refuge islands	56%
Improve/install pedestrian crossings	25%

GREENWAYS/SIDEPATHS/MULTI-USE TRAILS

A greenway is defined as a linear corridor of land that can be either natural, such as rivers and streams, or man-made, such as utility corridors or abandoned railroad beds. Most greenways contain trails. Greenway trails can be paved or unpaved, and can be designed to accommodate a variety of trail users, including bicyclists, walkers, hikers, joggers, skaters, horseback riders, and those confined to wheelchairs (hence, the term 'multi-use trail').

Greenway corridors can serve environmental purposes, protecting forests, enhancing water quality, and offering ample opportunities for environmental education. Greenway trails can be constructed of natural materials, gravel, crushed stone, asphalt, or concrete, depending upon the projected usage and surrounding landscape. Greenway trails in Biscoe should be integrated with and serve as an off-road extension of the on-road pedestrian network. Proposed greenway/boardwalk/multi-use trail corridors for Biscoe are illustrated on Map 3.1.

3.3 PRIORITY PROJECTS

East Main Street/McCaskill Street

1

With numerous employees of the Foundry crossing East Main Street to local restaurants and the grocery store, this intersection crossing is in significant need of improvement. Currently, there are no pedestrian crossing facilities with the exception of curb ramps.

Recommendation:

- Provide sidewalk on the northeast and southeast sections of the intersection.
- Stripe high visibility marked crosswalks across East Main Street and across McCaskill Street.
- Add pedestrian countdown signals for crossing East Main Street.
- Provide curb ramps at locations of marked crosswalks.
- Add advanced pedestrian warning signage.
- Enforce speed limits and pedestrian use of marked crosswalk.
- Work with NCDOT to provide accommodations.
- Constraints: utility poles, existing construction

Cost Estimate: \$20,000*

2

Bruton Street Sidewalk

Pedestrians walk along Bruton Street very regularly without a sidewalk.

Recommendation:

- Add sidewalk on one side of Bruton Street from South Main Street to Town limits (3,100 feet). Additional planning, investigation, and public involvement may be necessary to determine the side of the road.
- Provide marked crosswalks across intersecting roadways (Oak Street and Cagle Street).
- If sidewalk is not feasible, consider traffic calming elements such as additional stop signs or speed humps.
- Add project to local capital improvement projects list.
- Constraints: right-of-way and drainage issues

Cost Estimate: \$130,000*

3

Pedestrian Pathways to Schools

Green Ridge Elementary School, East Montgomery High School, and East Middle School are all found just south of the southern tip of Biscoe, on the west side of South Main Street. Sidewalks end north of the school properties.

Recommendation:

- Add sidewalk or sidepath along west side of Aileen Avenue/ Cedar Creek Road to Green Ridge Elementary School (4,300ft).
- Continue sidewalk along the east side of South Main Street to high school entrance (3,000ft) and sidepath along west side (in railroad right-of-way from Leach Street to Eagle Lane) (2,600 ft). Provide adequate crossing facilities such as marked crosswalk and countdown signals to cross South Main Street.
- Consider greenway trail connection between the three schools utilizing sewer easement.
- Seek Safe Routes to School funding for projects



Bruton Street is a lower-income community. Residents walk here regularly. If sidewalk cannot be built, traffic calming such as speed humps is recommended.

*Cost estimates are planning-level only and do not take into consideration any right-of-way acquisition costs. See end of this chapter for general cost estimates used to make these project cost calculations.



The stoplight at South Main Street is the main entrance to the high school. When sidewalk is added to reach this intersection along South Main Street, crossing treatments should be added here.

- Constraints: right-of-way and drainage issues

Cost Estimate for Cedar Creek sidewalk: \$172,000*

Cost Estimate for South Main Street sidewalk and crossing facilities: \$120,000*

Cost Estimate for Sidepath along west side of South Main Street in railroad right-of-way: \$159,500*

4

Page Street/Green Street sidewalk

Page Street and Green Street provide lower traffic volume alternatives for accessing residential areas. Currently, there is no sidewalk present. Much of Green Street has curb and gutter while Page Street is a narrow road with shoulder sections. Different treatments may be needed for these different types of cross sections.

Recommendation:

- Add sidewalk on west side of Page Street and south side of Green Street from West Main Street to Lambert Street (4,000ft). There may be constraints with railroad and right-of-way, especially along Page Street.
- If sidewalk is not feasible, consider traffic calming elements such as speed humps.
- Add project to local capital improvement projects list.
- Constraints: right-of-way and drainage issues

Cost Estimate: \$160,000*

5

Pine Street sidewalk

Pine Street provides a lower traffic volume alternative for accessing residential areas and connects East Main Street to North Main Street. Currently, there is no sidewalk present. From N. Main Street to Pineland Court, there are shoulder sections. South of Pineland, the roadway is wide and features curb and gutter. Therefore, different treatments may need to be applied to the different cross sections.

Recommendation:

- Add sidewalk on north side of Pine Street from East Main Street to North Main Street (2,500ft).
- Provide marked crosswalks across intersecting roadways (Arrow Trail and Emerywood Drive).
- If sidewalk is not feasible, consider traffic calming elements, such as speed humps or stop signs.
- Add project to local capital improvement projects list.
- Constraints: right-of-way and drainage issues; part of cross-section does not include curb and gutter

Cost Estimate: \$105,000*

6

East Main Street/North Main Street

As the main crossroads of the Town, this intersection currently features no pedestrian accommodations. This is a barrier to pedestrian travel.

Recommendation:

- Stripe high visibility marked crosswalks (At a minimum, crosswalks should be marked on the north, south and east sides of the intersection. There may be a conflict with the railroad if providing sidewalk on the west side of the intersection, unless the proposed median and advance stop bars are shifted further away from the railroad tracks to permit space for a crosswalk).
- Add pedestrian countdown signals at all legs where crosswalks are marked.
- Provide curb ramps at locations of marked crosswalks.
- Add advanced pedestrian warning signage.
- Enforce speed limits and pedestrian use of marked crosswalk.
- Work with NCDOT to provide accommodations.
- Ensure sidewalks are appropriately carried over the railroad tracks (to meet ADA requirements).
- Constraints: utility poles, existing construction, commercial driveways

Cost Estimate: \$18,000*

3.4 ADDITIONAL SIDEWALK, INTERSECTION, AND OTHER IMPROVEMENTS

A comprehensive network of sidewalks and crossing improvements are recommended as seen in Map 3.1. These facilities are all important for creating safe pedestrian spaces and connectivity throughout the Town of Biscoe. The following is a list of sidewalk segments and crossing improvements that are in addition to the priority projects listed above. Further planning and analysis will be required in advance of design to determine such things as the most appropriate side of the road for sidewalk to be added. Furthermore, there are many possible constraints that include right-of-way issues, fencing, mailboxes, drainage, lack of curb/gutter, etc. Coordination with NCDOT will be critical on the majority of these projects:

Sidewalks

Shady Oak Drive (North Main Street to Clayola Drive)

- Sidewalk on south side

Clayola Drive/Lambert Street (Shady Oak Drive to existing sidewalk on Lambert Road)

- Sidewalk on east side



With adequate space on Mill Street, a striped facility like a bike lane would create space for biking and walking.

Mill Street (West Main Street to existing sidewalk on Mill Street in front of park)

- Sidewalk on one side (further study of right-of-way is required to determine most appropriate side as park fencing and utility posts currently will not allow for sidewalks on the south side).
- Alternative solution is to utilize wide two-lane roadway surface to add bike lanes/walkways or separated space for pedestrians.

West Main Street (Coggins Road/Town limits to existing sidewalk)

- Sidewalk on north side

West Main Street (Town limits to existing sidewalk)

- Sidewalk on south side

North Main Street (Pine Street to Shady Oak Drive/Town limits)

- Sidewalk on east side

North Main Street (E/W Main Street to Shady Oak Drive/Town limits)

- Sidewalk on west side
- The railroad and right-of-way are potential constraints to this project. Further analysis is required.

Hunsucker Street (South Main Street to McCaskill Street)

- Sidewalk on south side

Oak Street (East Main Street to Hunsucker Street)

- Sidewalk on east side

Church Street (Pine Street to South Main Street)

- Sidewalk on west side
- Driveway/parking lot needs improvement between Oak Street and South Main Street

Pine Street (East Main Street to Church Street)

- Sidewalk on one side

Brooks Street (West Main Street to Mill Street)

- Sidewalk on west side

Brooks Street/Capel Street (South Main Street to existing sidewalk)

- Sidewalk on north side

South Main Street (East/West Main Street to Brooks/Capel Street)

- Sidewalk on west side
- The railroad, right-of-way, and flea market areas are potential constraints to this project. Further analysis is required.

Crossings

Many of the following recommended pedestrian crossing improvements are located at unsignalized intersections. It is often difficult to obtain approval from NCDOT for these types of crossings. If signalization is warranted later, pedestrian enhancements such as marked crosswalks and countdown signals should also be added.

East Main Street/Pine Street

- Provide marked crosswalks crossing Pine Street on both sides
- Provide one marked crosswalk across East Main Street with pedestrian crossing signage.
- Consider curb extensions for Pine Street

South Main Street/Leach Street

- Provide marked crosswalks.
- Provide pedestrian crossing signage.

West Main Street/Lambert Road

- Provide marked crosswalks.
- Provide pedestrian crossing signage.
- Provide median refuge island in current center turn lane.
- Consider HAWK signal.

North Main Street/Shady Oak Drive

- Provide marked crosswalks and countdown signals (across North Main Street)

South Main Street/Mill Street

- Provide marked crosswalks and countdown signals.
- Improve railroad crossing for better pedestrian accessibility.

South Main Street/High School Entrance

- Provide marked crosswalks and countdown signals. Existing stop bars will need to be relocated.
- A constraint for this project is crossing the railroad.

Mill Street/Brooks/Capel Street

- Provide marked crosswalk crossing Brooks Street

South Main Street/Brooks Street

- Provide marked crosswalk and median refuge island (in current turn lane) on north side of intersection crossing South Main Street



Lambert Road (top right in above picture) T's into West Main Street. With many destinations south of West Main Street, a pedestrian crossing treatment, with median island, high-visibility marked crosswalk, and signage would make this crossing more visible and safer.



Creating a defined space for crossing both Hyde Street and the Biscoe Mart entrance for pedestrians along South Main Street would serve to capture the attention of motorists, making it safer for walking.

Other Improvements

East/West Main Street

- Work with NCDOT to establish median islands where possible and to lower speed limits
- Speed limit enforcement needed

South Main Street (at Biscoe Mart)

- Driveway access management issue. Create separated pedestrian space to continue existing sidewalk across Biscoe Mart parking lot entrance

Church Street

- Consider traffic calming measure such as additional stop signs or speed humps

Greenway Corridors

- In existing and future easements, provide greenway trails for recreational access.
- Consider connecting neighborhood communities with trail spurs, including Hampshire Street to Brendana Street. These types of connections will create shorter, safer walking trips for residents.

3.5 NC 24/27 WIDENING PROJECT AND PLANS

At the time of this study, NCDOT had plans to widen NC24/NC 27 (East/West Main Street). Upon review of striping plans for this project, this Plan recommends the consideration of the following:

- NC-24/27 (East/West Main Street) and US-220 Business (North/South Main Street) intersection
 - o North side of Main (NC 24/27) across US-220 Bus. – Consider marked crosswalks here and small sidewalk segment between railroad tracks and US-220 Bus.
 - o Shift stop bar at W. Main Street further west to permit a crosswalk west of railroad tracks. Sidewalks are proposed at both sides of roadway.
 - o Carry the sidewalk across the railroad crossing – north and south sides of W. Main Street.
 - o Install high-visibility crosswalk markings rather than transverse markings.
 - o Construct sidewalk along the west side of S. Main Street extending to the limits of the project.

- o Provide pedestrian signal heads be provided at all legs of this intersection.
- Crosswalk markings at side streets
 - o At a minimum, crosswalk markings are recommended at Pine Street.
- East Main Street and McCaskill Street
 - o Install high visibility crosswalk markings at all four legs.
 - o Provide pedestrian signal heads at all legs of this intersection.
 - o Add sidewalk at the northeast and southeast sections of the intersection.
 - o Add sidewalk on the north and south sides of East Main Street east of McCaskill Street.
- Curb radii
 - o Narrow turn radii if possible to slow turning traffic.

3.6 REGIONAL CONNECTIVITY

The Town of Biscoe should look beyond its Town limits and link pedestrian facilities to neighboring and regional destinations. It is recommended that Biscoe coordinate efforts with surrounding communities, the RPO, and Montgomery County to create long distance connections for alternative transportation and recreation, particularly through greenway corridor development. Regional greenway trail connections will encourage and draw individuals to Biscoe from surrounding areas. Opportunities can come along stream or rail corridors.

3.7 RECOMMENDED NETWORK MAP

See following page (Map 3.1).

3.8 GENERAL COST ESTIMATES

The following are general per unit cost estimates used to produce estimates for the top priority projects listed in this chapter. Costs vary widely across the State of North Carolina and depend on a number of different factors. These estimates were provided by the NCDOT Bicycle and Pedestrian Division based on research across North Carolina.

Sidewalk - \$40/linear foot

Multi-use path (10 feet wide) - \$60/linear foot

Standard marked crosswalk - \$2.40/linear foot

High-visibility marked crosswalk - \$4.80/linear foot

Pedestrian countdown signal - \$500 per signal

Curb ramps - \$1,000 each

Pedestrian signage - \$200 each

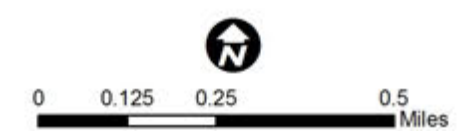
Map 3.1 Recommended Pedestrian Network



1 Priority Project

Legend

- Intersection Improvements
- Recommended Sidewalk
- Recommended Greenway
- Cemetary
- Church
- Community Center/Library
- Employment Center
- Town Hall
- Grocery; Shopping
- Post Office
- School
- Existing Sidewalks
- Major Roads
- Railroad
- Roads
- Parks
- Town Boundary



Chapter 4: Programs and Policies

This section provides guidance for education, encouragement, and enforcement programs. It also establishes key policies for the Town of Biscoe to ensure that future development provides appropriate pedestrian accommodation.



4.0 OVERVIEW

Meeting the goals of this Plan will not only require new facilities; it also requires implementation of pedestrian-related programs and policies. This chapter outlines a toolbox of recommended programs, policies, and in some cases, policy changes for the Town of Biscoe to meet the needs of pedestrians that cannot be met through facility construction alone.

4.1 PROGRAM RECOMMENDATIONS AND RESOURCES

Pedestrian-related programs fall into three main categories: education, encouragement, and enforcement. The programs listed below are provided to demonstrate the variety of opportunities that exist for promoting walking and active lifestyles in Biscoe. The Town should expand programs to reach more people. The Town should work with local volunteers and local community organizations to initiate at least one of the following programs or events (whichever are deemed the most appropriate and/or feasible to those organizing) within the first year of adopting this Plan.

4.1.1 EDUCATION

EDUCATION PRIORITY ACTIONS

- Support the creation of local bicycle and pedestrian advocacy group (possibly as an extension of the existing Parks and Recreation Advisory Board and members of the Steering Committee for this planning process).
- Consider sponsoring a training session for pedestrian design/review
- Download a variety of safety materials for distribution to various age groups and at multiple events and locations

CHAPTER OUTLINE:

4.0 OVERVIEW

4.1 PROGRAM RECOMMENDATIONS AND RESOURCES

4.2 POLICY REVIEW AND RECOMMENDATIONS



A bicycle and pedestrian advisory board/advocacy group would assist the Town in implementing the recommendations of this Plan, especially programs.

EDUCATION PROGRAM INFORMATION

Bicycle and Pedestrian Advisory Board/Advocacy Group

The Town of Biscoe should support the creation of a local bicycle and pedestrian advisory board/advocacy group. This could become a subgroup or extension of duties for the existing Parks and Recreation Advisory Board. Even though this is a pedestrian plan, the needs and objectives of bicycle and pedestrian advocates are closely related, and stand to benefit mutually from their combined efforts. Local advisory boards and commissions are beneficial because they report directly to Town leaders. Pedestrian advocacy groups are beneficial resources for promoting safety, providing feedback on opportunities and obstacles within the bicycle and pedestrian system, and coordinating events and outreach campaigns (such as the programs outlined throughout this section). Advocacy groups play a critical role in encouraging and evaluating the progress of overall Plan implementation.

Public Education

Educational materials can focus on safe behaviors, rules, and responsibilities. Information may include important pedestrian laws, bulleted keys for safe pedestrian travel, safe motor vehicle operation around pedestrians, and general facility rules and regulations. This safety information is often available for download from national pedestrian advocacy organizations, such as the Pedestrian and Bicycle Information Center website, www.walkinginfo.org.

Information can be distributed through brochures, newsletters, newspapers, bumper stickers, and other print media that can be inserted into routine mailings. It can also be posted on municipal websites. Local events should be utilized to distribute information and a representative from the pedestrian advocacy group can answer questions related to pedestrian safety. A booth could also be used to display safety information at various community events.

Internal Education

'Internal' education refers to the training of all people who are involved in the actual implementation of the Pedestrian Transportation Plan. Internal training will be essential to institutionalizing pedestrian issues into the everyday operations of engineering, planning, and parks and recreation departments. Key Town staff, members of the local planning board, RPO, NCDOT Division 8 staff, and Montgomery County staff should all be included in training sessions whenever possible. This training should cover all aspects of the transportation and development



process, including planning, design, development review, construction, and maintenance. This type of 'inreach' can be in the form of brown bag lunches, professional certification programs and attendance at special sessions or conferences. Even simple meetings to go over the Pedestrian Plan and communicate its strategies and objectives can prove useful for staff and newly elected officials that may not have otherwise learned about the Plan.

Environmental and Historic Education/Interpretation
Educational programs and interpretative signage could be developed along future trails and pedestrian routes. Greenway trails provide opportunities for learning outside the classroom. Specific programs that focus on water quality and animal habitat are popular examples. Events such as learning walks about specific animals or insects, tree identification, wildflower walks, environmental issues, stewardship education, and sustainability could be led by area experts. Also, simple educational signage would offer interactive learning opportunities for people who use the trail.

Interpretive Trails/Guided Tours

An educational component to the pedestrian network could be added by developing historical, cultural, and environmental themes for the facilities. The current Historic District Walking Tour can be enhanced by creating guided, walking tours throughout the Town, using signage to identify the events, architecture, and culture that make the Town of Biscoe unique, such as the natural features of the lake and surrounding area. These tours should be simple to navigate and should stand alone as an amenity. However, brochures can be used to supplement signage with more detailed information and a map of the tour. Other ideas to supplement the signage could be organized "talks" or lectures by local experts.

EDUCATION RESOURCES

[America Walks](http://americawalks.org) is a national coalition of local advocacy groups dedicated to promoting walkable communities. Their mission is to foster the development of community-based pedestrian advocacy groups, to educate the public about the benefits of walking, and, when appropriate, to act as a collective voice for walking advocates. They provide a support network for local pedestrian advocacy groups. <http://americawalks.org>

[Safe Communities](#) is a project of the National Highway Traffic Safety Administration (NHTSA). Nine agencies within the U.S. Department of Transportation are working together to promote and implement a safer national transportation system



Interpretive signage stimulates additional interest in walkways.



Educational campaigns and posters can help communicate a pedestrian safety message.

by combining the best injury prevention practices into the Safe Communities approach to serve as a model throughout the nation. <http://www.nhtsa.dot.gov/safecommunities>

Speed Campaign Tool Kit. The intent of this National Highway Traffic Safety Administration (NHTSA) tool kit is to provide marketing materials, earned media tools, and marketing ideas for communities to distribute to fit local needs and objectives while at the same time partnering with other states, communities, and organizations all across the country on a speed management program. It includes messaging and templates you may choose from to support your speed management initiatives. Free TV and radio materials, posters, billboards, and other media materials can be downloaded here: <http://www.nhtsa.gov/speed/toolkit/index.cfm> Example posters above.

Stepping Out is an online resource for mature adults to learn about ways to be healthy by walking more often, and walking safely. www.nhtsa.dot.gov/people/injury/olddrive/SteppingOut/index.html

'Pedestrian Fatalities Related to School Travel' is a fact sheet pertaining to school age children (NHTSA). <http://www.nhtsa.gov/gtss/kit/pedestrian.html>

Safe Kids Worldwide is a global network of organizations whose mission is to prevent accidental childhood injury, a leading killer of children 14 and under. More than 450 coalitions in 15 countries bring together health and safety experts, educators, corporations, foundations, governments and volunteers to educate and protect families. Visit their website to receive information about programs, involving media events, device distribution and hands-on educational activities for kids and their families. <http://www.safekids.org/>

Rules of the Road for Grandchildren: Safety Tips is an information website for grand parenting. If you are a grandparent, you can play an important role in teaching your grandchildren the "rules of the road." AARP. <http://www.aarp.org/confacts/grandparents/rulesroad.html>

'Streets in America are Unsafe and Unforgiving for Kids' Article by the Pedestrian Safety Roadshow. U.S. Department of Transportation. Federal Highway Administration. <http://www.tfhr.gov/safety/pedbike/articles/unsafe.htm>

'Focusing on the Child Pedestrian.' Pedestrian information related to children from the FHWA. <http://safety.fhwa.dot.gov/roaduser/pdf/PedFacts.pdf>

Eat Smart, Move More is a statewide movement that promotes increased opportunities for healthy eating and physical activity wherever people live, learn, earn, play and pray. <http://www.eatsmartmovemorenc.com/>

NCDOT Division of Bicycle and Pedestrian Transportation provides significant information related to pedestrian programming. <http://www.ncdot.org/transit/bicycle/>

4.1.2 ENCOURAGEMENT

ENCOURAGEMENT PRIORITY ACTIONS

- Encourage children to walk to school, safely, through a combination of programs, listed under encouragement resources
- Establish awareness days
- Encourage the establishment of walking clubs
- Use pedestrian facilities, particularly trails, to promote causes and hold special events for causes
- Utilize future greenways for artwork and plantings



Walk to school days and walking school buses are great ways to encourage children to walk and to educate children in safe pedestrian behavior.

ENCOURAGEMENT PROGRAM INFORMATION

School Programs

Many programs focus on developing safer pedestrian facilities around schools. Programs can be adopted by parents and schools to provide initiatives for walking.

Community leaders, parents and schools across the U.S. are using Safe Routes to School programs to encourage and enable more children to safely walk and bike to school. The National Center for Safe Routes to School aims to assist these communities in developing successful Safe Routes programs and strategies. The Center offers a centralized resource of information on how to start and sustain a Safe Routes to School program, case studies of successful programs as well as many other resources for training and technical assistance. For more information on Safe Routes to School, refer to the 'Encouragement Resources' section on page 4-8.

Awareness Days/Events

Regular or annual events can be devoted to a theme to raise awareness and celebrate issues relating to that theme. A greenway and its amenities can serve as a venue for events that will put the greenway on display for the community. Major holidays, such as July 4th, and popular local events serve as excellent opportunities to include pedestrian information distribution. The following are examples of other national events that can be used to increase use of pedestrian facilities:

Walk to Work Day/International Car Free Day (September 22)

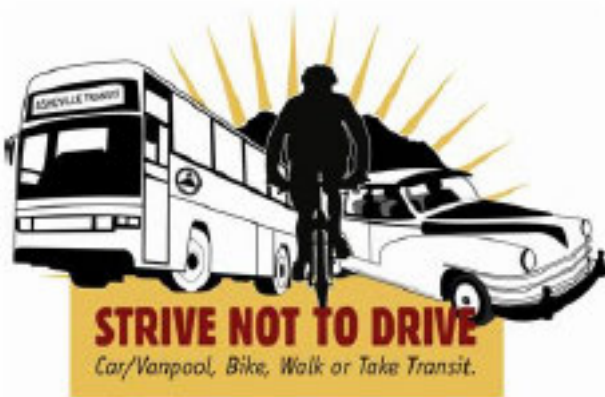
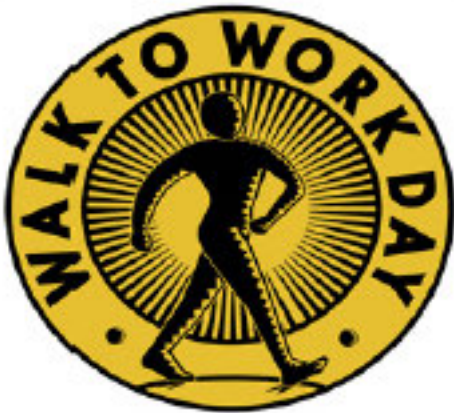
Designate one day a year for people to walk to work to help advance programs, promote active living, and raise awareness for environmental issues. Walk to Work Day can be at the end of an entire week or month of pedestrian promotional activities, including fitness expos, walking and jogging group activities, running and bicycling races and rides, etc.

"Strive Not to Drive Day"

This event example, from the Town of Black Mountain, NC, is an annual event to celebrate and promote the Town's pedestrian achievements for the year throughout their region. Awards for pedestrian commuters, as well as booths, contests, and other events are organized through their local RPO. A similar event could be held in Biscoe, as the Pedestrian Plan is implemented.

National Trails Day

This event is held every year in June. Other events, competi-



tions, races, and tours can be held simultaneously to promote trails in Biscoe.

Earth Day

Earth Day is April 22nd every year and offers an opportunity to focus on helping the environment. Efforts can be made to encourage people to help the environment by walking to destinations and staying out of their vehicles. This provides an excellent opportunity to educate people of all ages.

Use Facilities to Promote Other Causes

Pedestrian facilities, especially trails, could be used for events that promote other causes, such as health awareness. Not only does the event raise money/publicity for a specific cause, but it encourages and promotes healthy living and an active lifestyle, while raising awareness for pedestrian activities. Non-profit organizations such as the American Cancer Society, American Heart Association, and the Red Cross sponsor events such as Breast Cancer Walk, Diabetes Walk, etc.

Pedestrian Activities/Promotion within Local Organizations

The Town of Biscoe has numerous organizations that could help to promote pedestrian activities (e.g. the local Chamber of Commerce, local schools/PTAs, etc). Education, enforcement, and encouragement programs can be advertised and discussed in local organization newsletters, seminars, and meetings. Such organizations could even organize their own group walks, trail clean-ups, and other activities listed in this section.

Art in the Landscape

The inclusion of art along pedestrian corridors and future trails would encourage use of facilities and provide a place for artwork and healthy expression to occur. Artwork could be displayed in a variety of ways and through an assortment of materials. Sculpture gardens could be arranged as an outdoor museum. Art through movement and expression could be displayed during certain hours during the day or during seasonal events. An "Art Walk" could be established as an event featuring destinations throughout the Town that display local art. Artwork can be provided by local schools, special interest clubs and organizations, or donated in honor or memory of someone.

Walking/Running Clubs

Neighborhoods, local groups, or businesses could promote walking or running clubs for local residents or employees to meet at a designated area and exercise on certain days before or after



Above: An example of art along a trail in Minneapolis, MN; Below: A Girls on the Run event in Spartanburg, SC.





The adopt-a-trail program is a great means to get people active on the trail and to assist the Town in routine maintenance.

Below: A Safe Routes to School event in Durham, NC.



work, during lunch breaks, or anytime that works for the group. This informal group could be advertised on local bulletin or information boards. These clubs could be specialized to attract different interest groups. Examples include:

- Relay for Life (cancer support)
- Mother's Morning Club (mom's with strollers)
- Girls on the Run
- Walking Wednesdays (senior groups)
- Weekend Walkabouts
- Lunch Bunch (workers who run during their lunch hour)

Adopt-A-Trail

Local clubs and organizations provide great volunteer services for maintaining and patrolling trails. This idea could be extended to follow tour routes or specified streets/sidewalks. A sign to recognize the club or organization could be posted as an incentive to sustain high quality volunteer service. The Boy Scouts of America serve as a good model for participation in this type of program.

Revenue Generating Events

The Town of Biscoe should consider holding events that can help fund future facilities. Program and event ideas that could be used to generate revenue in Biscoe include:

- Races/triathlons (fees and/or donations)
- Educational walks/Nature walks/Historic walks (fees and/or donations)
- Fund-raisers including dinners/galas
- Concerts (fees and/or donations)
- Events coincident with other local events such as fairs, festivals, historic/folk events, etc.

ENCOURAGEMENT RESOURCES

Safe Routes to School is a national program with \$612 million dedicated from Congress from 2005 to 2009. Local Safe Routes to School programs are sustained by parents, community leaders, and citizens to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school. Recently, the state of North Carolina has started the NC Safe Routes to School Program based off of the national program. The state has funding for infrastructure improvements within 2 miles of schools. This funding can also be used towards the development of school related programs to improve safety and walkability initiatives. The state requires the completion of a competitive application to apply for funding and a workshop at the school to determine what improvements are needed. <http://www.saferoutesinfo.org>

National Walk our Children to School Day is usually held in October with the objective to encourage adults to teach children to practice safe pedestrian behavior, to identify safe routes to school, and to remind everyone of the health benefits of walking. To register walking events in Biscoe, go to the main webpage, and follow the International Walk to School links: www.walktoschool-usa.org

Walk a Child to School in North Carolina. A growing number of community groups throughout the nation, such as health professionals, 'Smart Growth' advocates, traffic safety groups, local PTAs, and elected officials, are promoting walking to school initiatives. In North Carolina, Walk a Child to School Programs have gained a foothold and are growing each year. To date more than 5,000 students in 12 communities in the state have participated. <http://www.walktoschool.org>

'Preventing Pedestrian Crashes: Preschool/Elementary School Children' provides information to parents on pedestrian risks for preschool and elementary school children. Information about the Safe and Sober Campaign is available on the NHTSA website. www.nhtsa.dot.gov/people/outreach/safesobr/15qp/web/sbprevent.html

Kidswalk-to-School is a resource guide to help communities develop and implement a year-long walk-to-school initiative; sponsored by the Centers for Disease Control and Prevention. <http://www.cdc.gov/nccdphp/dnpa/kidswalk/>

4.1.3 ENFORCEMENT

ENFORCEMENT PRIORITY ACTIONS

- Local police should use targeted enforcement to focus on key issues such as motorists speeding, not yielding to pedestrians in crosswalks, parking on sidewalks, etc.
- Conduct a pedestrian and motorist enforcement campaign in the summer of 2011 to crack down on speeding and illegal pedestrian crossings.
- Require all crossing guards to complete an NCDOT Crossing Guard Training Program.
- Establish a crossing guard program for peak school hours.
- Develop a simple brochure that outlines local leash laws, to be distributed as warnings from police officers and as education tools at pet stores and veterinarian offices. This may help to decrease incidents where pedestrians are intimidated or even harmed by unleashed dogs.



A Walk to School Day event in Spartanburg, SC.

ENFORCEMENT PROGRAM INFORMATION

Motorist Enforcement

Based on crash data analysis and observed patterns of behavior, local police can use targeted enforcement to focus on key issues such as motorists speeding, not yielding to pedestrians in crosswalks, parking on sidewalks, etc. In Biscoe, enforcement is critical along major roadways where motorists often speed through Town. Speed trailers, ticketing, and traffic calming campaigns should be used. Also, sidewalk parking is often not enforced but should be in order to maintain pedestrian accessibility, avoid maintenance issues, and comply with local ordinances. All of these key issues should be targeted and enforced consistently. The goal is for pedestrians and motorists to recognize and respect each other's rights on the roadway.

The NCDOT Division of Bicycle and Pedestrian Transportation funded a study on pedestrian issues, including school zone safety, and decided to establish a consistent training program for law enforcement officers responsible for school crossing guards. According to the office of the North Carolina Attorney General, school crossing guards may be considered traffic control officers when proper training is provided as specified in GS20-114.1.

For more information, visit <http://www.ncdot.gov/bikeped/researchreports/>

Pedestrian Enforcement

It is also critical for pedestrians to obey proper laws when walking in Biscoe. For example, pedestrians should use designed crosswalks when crossing roadways, especially NC 24/27. Educational and enforcement campaigns should occur to teach residents about proper behaviors.

Also, observations made by local trail and pedestrian facility users can help to identify conflicts or issues that require attention. To maintain proper use of trail facilities, volunteers could patrol trails, particularly on the most popular trails and on days of heavy use. The volunteer patrol can report suspicious or unlawful activity, as well as answer any questions a trail user may have. The volunteer patrol could be a responsibility of a pedestrian advocacy group or a neighborhood crime watch group.

ENFORCEMENT RESOURCES

NCDOT School Crossing Guard Program

http://www.ncdot.gov/bikeped/about/training/school_crossing_guard/

Crossing guards play very important roles in assuring the safety of children when coming and going to school.



NCDOT's A Guide to North Carolina Bicycle and Pedestrian Laws. <http://www.ncdot.gov/bikeped/lawspolicies/>

For an online resource guide on laws related to pedestrian and bicycle safety (provided by the National Highway Traffic Safety Administration), visit www.nhtsa.dot.gov/people/injury/pedbimot/bike/resource-guide/index.html

4.2 POLICY REVIEW AND RECOMMENDATIONS

While the physical recommendations described in this Plan represent an overall pedestrian network, strong pedestrian-oriented policies and regulations are also necessary to ensure these facilities are developed, especially when new development takes place. The recommended policy statements would help the Town of Biscoe achieve its vision of becoming a pedestrian-friendly community. Town planning staff should become familiar with these policies and regulations to ensure the full suite of policy tools are used and enforced and updated in the existing 1993 Zoning Ordinance. Further tools to initiate pedestrian development are described in Chapter 5 and the appendices.

Policy statements that require pedestrian facilities with development must be somewhat flexible and practical within regulations for physical restrictions. All decisions need to be environmentally sensitive. Sidewalk locations and widths may need to be modified on a case-by-case basis. There must be a proven environmental constraint for pedestrian modifications.

POLICY RECOMMENDATIONS

The current Zoning Ordinance does not adequately address pedestrian facility need and development. Recommended policy statements are provided below for consideration for revision/addition to the current Zoning Ordinance or any future development ordinance created by the Town of Biscoe:

Definitions

Within Section 2: Definitions, or the Definitions section of a future new ordinance, the following should be added:

- [Add New Definition]: Sidewalks

Sidewalk. An improved surface intended to facilitate pedestrian access to or along adjacent streets, properties, or structures, and which is located within the right-of-way of a public street, within the common elements (common area) of a private street, within a sidewalk easement, or along the length of any façade abutting parking areas.

All sidewalks, whether required by this Ordinance or installed voluntarily, shall be constructed to the Town's standard specification for sidewalks and have a minimum width of 5 feet and a minimum thickness of 4 inches of concrete.

Residential sidewalks shall be a minimum of 5 feet in width. Sidewalks serving mixed use and commercial areas shall be a minimum of 8 ft in width (12–15 feet is required in front of retail storefronts). The design standards for all pedestrian facilities in the Town of Biscoe Pedestrian Transportation Plan shall be adhered to for new streets and modifications to existing streets.

- [Add New Definition]: Crosswalks

Shall mean a right-of-way, publicly owned, ten (10) feet or more in width, which cuts across a block for the purpose of improving pedestrian access to adjacent streets or properties. The use of traffic calming devices such as raised intersections, lateral shifts, and roundabouts are encouraged as alternatives to conventional traffic control measures with approval of the Planning Board. A pedestrian crosswalk at least ten feet in width may be required to provide convenient public access to a public area such as a park, greenway, or school, or to a water area such as a stream, river, or lake. Sidewalks and crosswalks must be ADA compliant and shall be installed in accordance to the Biscoe Pedestrian Plan.

- [Add New Definition]: Connectivity

The relative degree of connection between streets, sidewalks, or other means of travel. Regardless of classification, the design and construction of streets and intersections in the Town of Biscoe should aim to serve all types of users, including pedestrians, bicyclists, and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young.

- [Add New Definition]: Cul-de-sac Street

A short local street having one end open to traffic and the other end permanently terminated by a vehicular turnaround. Pedestrian and bicycle connections at the ends of cul-de-sacs should be provided to provide connectivity out of cul-de-sac streets

- [Add New Definition] Greenway:

A linear park network left in its natural state, except for the introduction of trails to be used by pedestrians and bicyclists.

- [Add New Definition] Traffic:

Pedestrians and vehicles including bicycles, automobiles and other conveyances either singly or together while using streets for the purposes of travel.

- [Add Throughout]:
Add pedestrian, bicycle, and alternative non-motorized transportation language and guidelines throughout the entire Zoning Ordinance or new guiding policy document developed in the future. These modes and facilities need to be stressed as equally if not more important than automobile provisions and facilities. Sidewalks, bicycle lanes, pedestrian facilities, and bicycle racks need to be required with all new development and should follow the recommendations and design guidelines set forth in the Biscoe Pedestrian Plan.

Policy Statements

- All development within the Town limits should be required to provide adequate sidewalks, crosswalks, and pedestrian facilities along with connectivity into existing system and overall Town.
- All roads surrounding schools should have sidewalks on both sides of the road with safe crosswalks.
- Pedestrian access should be provided through cul-de-sac and large parking lots, which are typical obstacles to pedestrian connectivity.
- Driveway access management and minimization of curb cuts should be required with all new development. With existing development, consider retrofitting with less curb cuts to minimize pedestrian conflict points.
- Pedestrians and bicyclists should be accommodated on roadway bridges, underpasses, and interchanges and on any other roadways that are impacted by a bridge, underpass, or interchange project (except on roadways where they are prohibited by law). All new bridges should be constructed with bicycle lanes and wide sidewalks.
- Pedestrian facilities should be identified that are not ADA-compliant including missing, damaged, or non-compliant curb ramps, stairs, or sidewalk segments of inadequate width and create a plan for improving them.
- The buffer space between the sidewalk and the curb and gutter should be maximized within the available right-of-way. Four feet is suggested as a minimum on major thoroughfares, but could be decreased in areas with slower and lower volume automobile traffic. Larger buffers are preferred for street tree health and pedestrian comfort. Suggested width is flexible related to environmental constraint.

- Street trees and planting buffers should be required between the sidewalk and the street along all new roadways and sidewalk construction. Keep all vegetation trimmed.

- Private owners (of residences and businesses) should be encouraged to keep their area in and around the sidewalk free of debris and litter.

- Pedestrian facility maintenance should be a priority of the Town. With a sidewalk repair request form in place (as recommended in Chapter 5), citizens can report sidewalk issues. The Town should be proactive in monitoring the condition of sidewalks and crosswalks and work with NCDOT to ensure they are maintained and safe.

- Greenways should be defined as part of the Town of Biscoe's public infrastructure. Greenways are public infrastructure that provides important functions to not only offer transportation alternatives, but to protect public health safety and welfare. Within flood prone landscapes, greenways offer the highest and best use of floodplain land, mitigate the impacts from frequent flooding and offer public utility agencies access to floodplains for inspection, monitoring and management.

Greenways filter pollutants from stormwater and provide an essential habitat for native vegetation that serves to cleanse water of sediment. Greenway trails provide viable routes of travel for cyclists and pedestrians and serve as alternative transportation corridors for urban and suburban commuters. Greenways serve the health and wellness needs of our community, providing close-to-home and close-to-work access to quality outdoor environments where residents can participate in doctor prescribed or self-initiated health and wellness programs. All of these functions make greenways a vital part of community infrastructure.

- Subdividers are required to provide natural buffers along both sides of all perennial streams. Public greenway trails with limited disturbance along perennial and intermittent streams are excellent uses for these spaces and should be dedicated during the subdivision process.

- Encourage utility corridor development practices that allow for maximum compatibility with pedestrian and bikeway corridors. Land purchased and easements negotiated for the purpose of providing utilities (such as water and sewer) can serve a greater community benefit if established to also accommodate a public access for trails.

Chapter 5: Implementation

This section provides guidance for making the recommendation of the previous two chapters a reality. It details key action steps, top priority project packages, staffing needs, performance measures to evaluate future progress, and facility development methods.



5.0 OVERVIEW

The primary barrier to pedestrian facilities—such as sidewalks, safe intersections, and greenways—is funding. Biscoe is a small Town with a small tax base but is an active walking community. Pedestrian improvements should be prioritized to create the greatest impact for residents for the fewest dollars. This can have a big impact on economic development.

Successful implementation will also require the dedication of Town of Biscoe staff, the creation of a Pedestrian and Bicycle Advisory Board, and the support of local advocates. This chapter will serve as a simple guide with key action steps, top priority projects, staffing recommendations, an evaluation and monitoring process, methods of pedestrian facility development and greenway acquisition.

5.1 KEY ACTION STEPS

These following steps are integral to achieving the goals and vision of this Plan. As guiding recommendations and the clearest representation of specific items to accomplish, they should be referred to often. With the exception of the first step, there is no particular order in which these should be addressed.

ADOPT THIS PLAN

Through adoption, the Plan becomes a legitimate planning document of the Town. Adoption shows that the Town of Biscoe has undergone a successful, supported planning process. The Town can then use this document to receive funding through NCDOT and other resources. The Board of Commissioners and Planning staff should become knowledgeable of this Plan and support ordinance amendments and policy recommendations. Finally, this Plan should also be integrated into future Town of Biscoe planning documents.

BEGIN TOP PRIORITY PROJECTS

Steering Committee input, public input, and criteria such as sidewalk gap closure and proximity to schools and other trip

CHAPTER OUTLINE:

- 5.0 OVERVIEW
- 5.1 KEY ACTION STEPS
- 5.2 PRIORITY PROJECTS
- 5.3 STAFFING
- 5.4 PERFORMANCE MEASURES
- 5.5 PEDESTRIAN FACILITY DEVELOPMENT
- 5.6 MAINTENANCE
- 5.7 GREENWAY ACQUISITION
- 5.8 ACTION STEPS TABLE

attractors were used to develop the list of priority projects in Chapter 3. Immediate attention to the high priorities will instantly have a large impact on pedestrian conditions in Biscoe. These high priority projects should be supported by a combination of grants, local funding, and the local Capital Improvement Program.

WORK CLOSELY WITH NCDOT

One of the highest priorities for pedestrian improvements are the crossings of NC 24/27. This is an NCDOT-owned and maintained roadway. It is critical to develop a close relationship with local NCDOT officials during the implementation of this Plan and in the future. In order to make significant changes and improvements for pedestrians crossing major NCDOT arterials, it will be necessary to understand the appropriate reasoning, process, and methods required by NCDOT.

CONDUCT PEDESTRIAN COUNTS

Because many pedestrians were observed walking daily at the time of this study, it will be important to monitor the number of pedestrians in the future. The Town should work with NCDOT to conduct these counts. This data will support future pedestrian improvements in the community.

IMPROVE AND ENFORCE TOWN REGULATIONS

To ensure future development provides pedestrian facilities and improves pedestrian friendliness, regulations should be updated and enforced. These policy recommendations are provided in more detail in Chapter 4. It should be the goal of the Town to update zoning and subdivision regulations as soon as possible and to enforce these. All pedestrian-related regulations should be subject to case-by-case environmental evaluation. The top priority regulations to consider are sidewalk requirements and driveway access management regulations.

PROVIDE A REQUEST FORM FOR SIDEWALKS+ SIDEWALK REPAIR

Several communities across the State have created an on-line sidewalk request form that citizens can use to ask for sidewalks to be built on streets that they use regularly. Utilizing local citizens to help find gaps in the current sidewalk network is highly important because they are familiar with their specific neighborhoods and needs. After these forms are completed the requested sidewalk can be evaluated by a Town staff person and if deemed important for connectivity purposes they should be added to the sidewalk priority project list.

CREATE A BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE (BPAC)

Many communities across the State have commissions for this

purpose. The Town of Biscoe should create a BPAC to embrace an advocacy role for on-road bicycle and pedestrian issues to provide a network of off-road and on-road facilities that connects people to places. The BPAC could be a standalone group or become a sub-committee of the existing Parks and Recreation Advisory Board. The BPAC should help coordinate the implementation of this Plan, develop programs, listen to community needs, promote the pedestrian network, and keep positive momentum going. Consider appointing a liaison or providing formal reports to the Board of Commissioners on development review issues related to pedestrian, bicycle, and greenway planning.

The BPAC can also help monitor the progress of the Town and NCDOT as they develop new facilities and programs. This group can push for additional improvements to build upon the recommendations of this Plan. Coordination with NCDOT, specifically the Division of Bicycle and Pedestrian Transportation and the local division office, will prove critical if this Plan is to be implemented successfully.

TAKE ADVANTAGE OF ALL OPPORTUNITIES

While it is ideal to develop pedestrian facilities in order of priority, it is wise to also create facilities when opportunity arises. Some of the most cost-effective opportunities to provide pedestrian facilities are during routine roadway construction, reconstruction, and repaving projects. A new commercial development or a roadway widening project, for instance, would provide the means to build sidewalks or trails as a component of an existing effort, saving costs.

SEEK MULTIPLE FUNDING SOURCES AND FACILITY DEVELOPMENT OPTIONS

Multiple approaches should be taken to support pedestrian facility development and programming. It is important to secure the funding necessary to undertake the short-term, top priority projects but also to develop a long term funding strategy to allow continued development of the overall system. Capital and Powell Bill funds for sidewalk, crosswalk, and greenway construction should be set aside every year, even if only for a small amount (small amounts of local funding can be matched to outside funding sources). A variety of local, state, and federal options and sources exist and should be pursued including enhancement funds and Safe Routes to School funds. These funding options are described in Appendix C. Other methods of pedestrian facility development and greenway acquisition that are efficient and cost-effective are described later in this chapter.

DEVELOP PEDESTRIAN PROGRAMMING

Programming such as Safe Routes to School and others described in Chapter 4 can help educate and encourage users.

Safe Routes to School offers a number of school workshop opportunities and construction funding for improvements around schools. Public events and media involvement should also be considered when announcing new walkways and upcoming projects.

Top priority programs are:

- Safe Routes to School programs (Town and local schools)
- Walk-to-School and Walk-to-Work Days (Town and local schools)
- Walking school buses (Town and local schools)
- Crossing guard programs (Town and NCDOT)
- Enforcement of proper pedestrian and motorist behavior (Town and NCDOT)

ENSURE PLANNING EFFORTS ARE INTEGRATED REGIONALLY

Combining resources and efforts for pedestrian planning and trail planning with surrounding municipalities, regional entities, and stakeholders is mutually beneficial to all parties involved. Regional, long-distance trails often spark the most excitement, use, and tourism. The Town should remain coordinated with Montgomery County, the Piedmont-Triad RPO, and neighboring municipalities on regional trail initiatives. It is important to stay aware and communicative with other municipal, county, state, and NCDOT efforts to ensure the Town takes advantage of funding opportunities and support. A BPAC member, for example, could have the responsibility of staying in tune and updating the Town on regional trail initiatives.

After adoption by the Town, the Town should ensure that this document is recognized in regional transportation plans, as well as into the official work schedule and planning of the local NCDOT division.

RECORD AND MAP ALL PEDESTRIAN-RELATED CRASHES

The Town of Biscoe Police Department should work to ensure all pedestrian and bicycle crashes are recorded and mapped. The Police Department should develop and maintain a mapped database of all bicycle and pedestrian crashes throughout the area. The database should include very detailed information on the crash, including severity, precise location, reason for accident, etc. This information will be valuable in the future to determine if multiple crashes are occurring in the same area. This data will also serve as an indicator to determine if new pedestrian facilities provide a benefit to safety and a reduction in crashes.

ENSURE THAT GREENWAYS ARE DEVELOPED WITH SEWER LINE/EASEMENT DEVELOPMENT

Future residential development may create sewer easements along creeks in Biscoe. This presents a tremendous opportunity for developing trails along these easements. Off-road walking options are very attractive and provide both transportation and recreational options.

5.2 PRIORITY PROJECTS

The top pedestrian projects in Biscoe are ones that make the most efficient use of limited resources and that serve multiple functions, such as connectivity and safety. These are projects that should occur in the short-term to have an immediate, visible and positive impact. These projects should be incorporated into the Towns' Capital Improvement Program (CIP) and/or State Transportation Improvement Program (TIP). In order to make the State TIP list or the Priority Needs List, the Town of Biscoe will have to work directly to submit needs after adoption of the Plan. The priority projects are described in detail in Chapter 3 and are listed below:

- East Main Street/McCaskill Street - Sidewalk and Crossing Improvements
- Bruton Street - Sidewalk
- Pedestrian Pathways to Schools
- Page Street/Green Street - Sidewalk
- Pine Street - Sidewalk
- East Main Street/North Main Street - Sidewalk and Crossing Improvements

5.3 STAFFING

Town of Biscoe

The Town Manager is currently responsible for the coordination of pedestrian planning. The Town of Biscoe should work closely to address pedestrian accessibility issues with students and citizens. The Town of Biscoe should also implement the policy recommendations of this Plan in relatively short order.

The Board of Commissioners, Town Manager, and Public Works Department are all committed to increasing both the quantity and quality of pedestrian infrastructure. Staff will continue to spearhead initiatives to manifest tangible, on-the-ground results, from this general sentiment of community support. Building upon the momentum generated from this Plan, staff will continue to keep pedestrian infrastructure a high priority in all of its daily planning activities, including site review, maintenance of pedestrian related GIS files, and short to long range planning.

The Public Works Director should be aware of—and be prepared to—implement the recommendations for pedestrian facilities discussed earlier in this Plan. The Public Works Department



could also assist the Town Manager in updating cost estimates for future facilities, and providing practical input on this Plan's design guidelines.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NCDOT Division 8 maintains the state-owned roads in Biscoe, affecting the pedestrian facilities (or sometimes lack thereof) on much of Biscoe's roadway environment. Recommendations for pedestrian facilities on NCDOT roads will have to be carried out through a coordinated effort between the Town of Biscoe and NCDOT Division 8. Some technical assistance could also be provided through NCDOT's Division of Bicycle and Pedestrian Transportation.

POLICE DEPARTMENT

The Town of Biscoe Police Department plays a vital role in pedestrian safety. All local police officers should be educated about North Carolina's pedestrian laws to promote positive interactions between pedestrians and motorists. The Guide to North Carolina Bicycle and Pedestrian Laws, written by the NCDOT Division of Bicycle and Pedestrian Transportation, should be distributed to local law enforcement. Programs such as the Safe Routes to School grants, offer the opportunity for the Police Department to partner with other Town departments and staff to improve pedestrian safety. Refer to Enforcement Resources in Chapter 4 for more information.

VOLUNTEERS

Services from volunteers, student labor, and seniors, or donations of material and equipment may be provided in-kind, to offset construction and maintenance costs. Formalized maintenance agreements, such as adopt-a-trail/greenway or adopt-a-highway can be used to provide a regulated service agreement with volunteers. Other efforts and projects can be coordinated as needed with senior class projects, scout projects, interested organizations, clubs or a neighborhood's community service to provide for many of the program ideas outlined in Chapter 4 of this Plan. Advantages of utilizing volunteers include reduced or donated planning and construction costs, community pride and personal connections to the Town's pedestrian networks.

5.4 PERFORMANCE MEASURES (EVALUATION AND MONITORING)

The Town of Biscoe should establish performance measures to benchmark progress towards achieving the vision of this Plan. These performance measures should be stated in an official report within two years after the Plan is adopted. Performance measures could address the following aspects of pedestrian transportation and recreation in Biscoe:

- Safety. Measures of pedestrian crashes and injuries.

- Facilities. Measures of how many pedestrian facilities have been funded and constructed since the Plan's adoption.
- Education, Encouragement and Enforcement. Measures of the number of people who have participated in part of a pedestrian program since the Plan's adoption.

5.5 PEDESTRIAN FACILITY DEVELOPMENT

This section describes different construction methods for the proposed pedestrian facilities outlined in Chapter 3 of this Plan. Note that many types of transportation facility construction and maintenance projects can be used to create new pedestrian facilities. It is much more cost-effective to provide pedestrian facilities during roadway and transit construction and re-construction projects than to initiate the improvements later as "retrofit" projects.

To take advantage of upcoming opportunities and to incorporate pedestrian facilities into routine transportation and utility projects, an assigned planning staff person should keep track of the Town's projects and any other local and NCDOT transportation improvements. While doing this, he/she should be aware of the different procedures for state and local roads and interstates.

NCDOT TRANSPORTATION IMPROVEMENT PROGRAM (TIP) PROCESS

The Transportation Improvement Program (TIP) is an ongoing program at NCDOT which includes a process asking localities to present their transportation needs to state government. Pedestrian facility and safety needs are an important part of this process. The primary NCDOT source for developing pedestrian and bike facilities is securing identification of a project in the State Transportation Improvement Program (STIP). Every two years, projects are submitted by regional planning organizations (metropolitan planning organizations (MPO) and rural planning organizations (RPO)) throughout the state. Submitted bike and pedestrian projects are prioritized by the Division of Bike and Pedestrian Transportation staff. High priority projects will be used to populate the 5-Year Work Program and the delivery STIP. Please see this site – <http://www.ncdot.gov/performance/reform/> – for further information.

There are two types of projects in the TIP: incidental and independent. Incidental projects are those that can be incorporated into a scheduled roadway improvement project. Independent are those that can stand alone such as a greenway, not related to a particular roadway.

The Town of Biscoe, guided by the priority projects within this Plan, should strongly consider important pedestrian projects along State roads to present to the Piedmont-Triad Rural RPO

and State. Local requests for small pedestrian projects, such as crosswalks and smaller segments of sidewalk, can be directed to the RPO or the local NCDOT Division 8 office. Further information, including the criteria evaluated can be found at: http://www.ncdot.org/transit/bicycle/funding/funding_TIP.html

LOCAL ROADWAY CONSTRUCTION AND RECONSTRUCTION

Pedestrians should be accommodated any time a new road is constructed or an existing road is reconstructed. All new roads with moderate to heavy motor vehicle traffic should have sidewalks and safe intersections. The Town of Biscoe should take advantage of any upcoming construction projects, including roadway projects outlined in local comprehensive and transportation plans. Also, case law surrounding the ADA has found that roadway resurfacing constitutes an alteration, which requires the addition of curb ramps at intersections where they do not exist.

RESIDENTIAL AND COMMERCIAL DEVELOPMENT

As detailed in Chapter 4, the construction of sidewalks and safe crosswalks should be required during development. Construction of pedestrian facilities that corresponds with site construction is more cost-effective than retro-fitting. In commercial development, emphasis should also be focused on safe pedestrian access into, within, and through large parking lots. This ensures the future growth of the pedestrian network and the development of safe communities.

RETROFIT ROADWAYS WITH NEW PEDESTRIAN FACILITIES

For priority pedestrian projects, it may be necessary to add new facilities before a roadway is scheduled to be reconstructed. In some places, it may be relatively easy to add sidewalk segments to fill gaps, but other segments may require removing trees, relocating landscaping or fences, re-grading ditches or cut and fill sections.

BRIDGE CONSTRUCTION OR REPLACEMENT

Provisions should always be made to include a walking facility as a part of vehicular bridges, underpasses, or tunnels, especially if the facility is part of the Pedestrian Network. All new or replacement bridges should accommodate pedestrians with wide sidewalks on both sides of the bridge. Even though bridge replacements do not occur regularly, it is important to consider these in longer-term pedestrian planning. NCDOT bridge policy states that sidewalks shall be included on new NCDOT road bridges with curb and gutter approach roadways. Sidewalks across a new bridge shall be a minimum of five to six feet wide with a minimum handrail height of 42".

SIGNAGE AND WAYFINDING PROJECTS

The Town should consider developing and adopting a signage style policy and procedure, to be applied throughout the entire

community, to make it easier for people to find destinations. Pedestrian route and greenway signs are one example of these wayfinding signs, and they can be installed along routes as a part of a comprehensive wayfinding improvement project. For a step-by-step guide to help non-professionals participate in the process of developing and designing a signage system, as well as information on the range of signage types, visit the Project for Public Places website: www.pps.org/info/amenities_bb/signage_guide. For more information on signage, see Chapter 6: Design Guidelines.

EXISTING TOWN EASEMENTS

The Town has few existing easements throughout Biscoe, offering minor opportunities for greenway facilities. Sewer easements are very commonly used for this purpose offering cleared and graded corridors that easily accommodate trails. This approach avoids the difficulties associated with acquiring land, and it utilizes the Town's existing resources.

5.6 MAINTENANCE

Once pedestrian facilities are in place, it is imperative to keep them maintained and safe for pedestrian travel. For example, the Town should monitor sidewalk and trail conditions and marked crosswalk conditions. The Town should have a plan and budget in place to conduct routine and remedial maintenance. Also, the plan should detail the responsibilities of homeowners and businesses to maintain their storefront and sidewalk areas to improve appearance and safety.

5.7 GREENWAY ACQUISITION

Since not all greenways can be built on existing Town easements, land acquisition is an important component of greenway development. It will be necessary to work with landowners and future development projects. Land acquisition and resource protection methods should be strategic, efficient, and respectful. Non-profit land protection agencies, land trusts, and/or environmental organizations can assist when attempting to acquire or manage property. These entities often have a great deal of experience selling the greenway benefits of conservation. Because these types of organizations do not have the power to condemn land or the power to tax, they often have excellent personal and professional relations with local landowners. Many options are available to obtain different degrees of control and different ownership relationships to regulate resource use. Providing educational material to local landowners and developers about the benefits of greenways and land/easement donations is an excellent means to stimulate greenway acquisition. The following is a list of potential conservation tools, developing partnerships, development regulations, land management techniques, and acquisition/donation.

PARTNERSHIPS

Partnerships with land trusts, local developers, and private land managers can assist the Town of Biscoe in developing greenway facilities.

- Land Trusts
- Private Land Managers

REGULATORY METHODS

This type of resource protection is used to shape the use and development of the land without transferring or selling the land. The rules for this type of tool are established and enforced by a governing body.

- Exactions (Development/Impact Fee, Mandatory Dedications, Fee in Lieu)
- Growth Management Measures
- Performance Zoning
- Incentive Zoning (Dedication or Density Transfers)
- Conservation Zoning (Buffer or Transition Zones)
- Overlay Zoning
- Negotiated Dedications
- Planned Unit Development
- Cluster Development

LAND MANAGEMENT

This type of resource protection refers to developing agreements and/or management plans for public use and greenway easements through private property. This method helps conserve the resources of an open space or greenway parcel or easement.

- Management Plans
- Conservation Easement
- Preservation Easement
- Public Use Easement

ACQUISITION

Land acquisition is a method used to acquire property rights to protect resources or to allow access and free movement of users on a property. This type of method is permanent. Acquisition methods can be divided into two categories: 1) landowners retain ownership of the land and preserve a resource through an easement or other mutual agreement, or 2) land ownership and management is transferred or donated from a landowner to a conservation agency (local government, land trust, or other preservation organization.)

- Donation (Tax Incentives)
- Fee Simple Purchase
- Easement Purchase
- Lease Back Purchase
- Bargain Sale
- Installment Sale
- Right of First Refusal
- Purchase of Development Rights
- Land Banking
- Condemnation

5.8 ACTION STEPS TABLE

PEDESTRIAN TRANSPORTATION PLAN

Task	Lead Agency	Support	Details	Phase
Approve and Adopt this Plan	Town of Biscoe	Biscoe Town Manager/Project Consultant	Official letter of approval expected by Summer 2011. Through adoption, the Plan becomes a legitimate planning document. Adoption shows that the plan has been a successful, supported planning process.	Short Term (2011)
Improve and Enforce Town of Biscoe Regulations	Town of Biscoe	Bicycle/Pedestrian Subcommittee and NCDOT	The recommendations suggested in Chapter 4 reflect the findings and recommendations of this Pedestrian Plan, and clarify some basic policy positions regarding future development and the provision of pedestrian facilities. Some edits are also suggested for consistency in terminology. Also, key additional policy recommendations found in Chapter 4, including Complete Streets, should be implemented. Future development should have pedestrian connectivity and be connected to the rest of Biscoe.	Short Term (2011-2012)
Create official Biscoe Bicycle and Pedestrian Advocacy Group	Town of Biscoe, Pedestrian Plan Steering Committee	Piedmont-Triad RPO	This committee will be instrumental in promoting bicycling/walking and championing implementation of this plan. The group would play a strong role in assisting Biscoe with fundraising, and establishing programs and activities.	Short Term (2011-2012)
Ensure recommendations from this Plan become part of regional Comprehensive Transportation Plan (CTP)	Town of Biscoe	Piedmont-Triad RPO, Montgomery County, NCDOT	Comprehensive Transportation Plans for regions/counties in the Piedmont-Triad RPO are updated regularly. The recommendations from this Plan should be submitted for CTP update	Short Term (2011-2012)
Continue to apply for Safe Routes to School (SRTS) Funding and expand SRTS programs	Town of Biscoe	NCDOT	Each NCDOT Division carries an allotment of SRTS monies. The Town of Biscoe should seek that funding to improve pedestrian facilities around its schools. The Town should also apply for SRTS grant funding for planning, programs, and project implementation. Establish 'walk-to-school' groups and regular walking activities for children through the Safe Routes to School Programs.	Short Term (2011-2012) and continuous
Address driveway access management needs, especially along N/S Main Street, and future development.	Town of Biscoe	Town of Biscoe Public Works, NCDOT	The reduction of driveway entrances and the size of entrances creates less conflict points for pedestrians. It will be important not only to ensure new development practices healthy driveway access management, but also to retrofit areas that need improvement.	Short Term (2011-2012) and continuous
Begin Biannual Project Development Meeting With Project Partners	Town of Biscoe	Montgomery County, NCDOT, Piedmont-Triad RPO, Montgomery County Schools	These meetings will help establish a process of incorporating bicycle and pedestrian improvements into upcoming roadway projects. Certain pedestrian projects recommended in this Plan could be developed as part of a roadway reconstruction, widening, or resurfacing project. Also, recommended projects can become part of TIP project lists. Coordination between all appropriate government agencies will ensure that recommendations in this Plan are implemented.	Short Term (2011-2012) and continuous

Task	Lead Agency	Support	Details	Phase
Identify and Secure Specific Funding Sources for Project Implementation	Town of Biscoe	Bicycle/Pedestrian Subcommittee, Montgomery County, Piedmont-Triad RPO, and NCDOT	Appendix C contains funding opportunities. The Town of Biscoe should also remain updated with the changing funding landscape.	Short Term (2011-2012) and continuous
Develop a Long Term Funding Strategy	Town of Biscoe	Bicycle/Pedestrian Subcommittee, Montgomery County, Piedmont-Triad RPO, and NCDOT	To allow continued development of the overall system, capital funds for bicycle and pedestrian facility construction should be set aside every year, even if only for a small amount (small amounts of local funding can be matched to outside funding sources). Funding for an ongoing maintenance program should also be included in the town operating budgets. Finally, federal legislation and funding should be monitored as a new transportation bill is likely in the near future.	Short Term (2011-2012) and continuous
Enforce both illegal pedestrian and motorist behaviors in Biscoe.	Town of Biscoe Police Department	Town of Biscoe, Bicycle/Pedestrian Subcommittee	Enforcement should be increased on motorist speed limits and proper use of crosswalk by pedestrians through education, warnings, and if necessary tickets.	Short Term (2011-2012) and continuous
Begin education and encouragement programs	Town of Biscoe, Bicycle/Pedestrian Subcommittee	Montgomery County Schools, Piedmont-Triad RPO, others	Education and encouragement programs are an essential component of a comprehensive approach that doesn't just include new infrastructure. Programs can have several goals: safety, healthy living, encouragement incentives, pollution reduction, etc. Once safe pedestrian infrastructure is implemented, existing senior walking clubs should utilize facilities. A program toolbox is provided in Chapter 4.	Short Term (2011-2012) and continuous
Continually Support and Evaluate Implementation of this Plan	Town of Biscoe	Bicycle/Pedestrian Subcommittee, NCDOT, Piedmont-Triad RPO	The different Biscoe departments and boards and Bike/Ped Subcommittee representatives should meet quarterly to assess implementation and evaluate progress.	Short Term (2011-2012) and continuous
Record All Bicycle and Pedestrian Accidents and Incidents	Town of Biscoe Police Department	Bicycle/Pedestrian Subcommittee	The Police Department should begin recording all bicycle and pedestrian accidents and incidents within the town. They should be recorded with a date, time, location, and details.	Short Term (2011-2012) and continuous
Maintain GIS pedestrian facility database	Town of Biscoe	Montgomery County, Piedmont-Triad RPO	Continuously update the pedestrian facility database as new facilities come online and new crash data is published. The Town of Biscoe should lead this effort, but should be coordinated with Montgomery County and the Piedmont-Triad RPO as they maintain numerous countywide GIS data sets.	Short Term (2011-2012) and continuous
Ensure Greenways are Developed as Part of Sewer Line/Easement Construction	Town of Biscoe	Bicycle/Pedestrian Subcommittee	As new development occurs, it is possible that sewer lines will be added. When sewer is installed along local creeks, greenways should be developed along the easements. These greenways can serve both a transportation and recreation function while also providing easy access for sewer maintenance crews.	Short Term (2011-2012) and continuous
Online Form for Bicycle/Pedestrian Facility Request	Town of Biscoe	Bicycle/Pedestrian Subcommittee	Provide a service that allows residents to request bicycle/pedestrian facilities.	Short Term (2011-2012) and continuous

Task	Lead Agency	Support	Details	Phase
Ensure Planning Efforts are Integrated Regionally	Town of Biscoe	Bicycle/Pedestrian Subcommittee, Montgomery County, Piedmont-Triad RPO, NCDOT	Combining resources and efforts with surrounding municipalities, regional entities, and stakeholders is mutually beneficial. Communicate and coordinate with neighboring municipalities/counties on regional greenway corridors; partner for joint-funding opportunities. After adoption by the Town, this document should also be recognized in regional transportation plans.	Short Term (2011-2012) and continuous
Complete Top Priority, Phase 1 Projects	Town of Biscoe	Bicycle/Pedestrian Subcommittee and NCDOT	The priority projects of pedestrian facility development include the most important projects to improve connectivity and safety. Immediate attention to these high priorities will instantly have a large impact on walking conditions in Biscoe. All projects are discussed in Chapter 3.	Short-Medium Term (2011-2015)
Use Updated AASHTO Bicycle and Pedestrian Design Guides	Town of Biscoe	Bicycle/Pedestrian Subcommittee, NCDOT, Piedmont-Triad RPO	Adopting and implementing the Design Guidelines (Chapter 6) is integral for the development of high-standard pedestrian facilities. It will also be important to obtain new published AASHTO bicycle and pedestrian guidelines when published in 2011-2013. The updated bicycle guidelines are expected in 2011, while pedestrian guidelines will come 1-2 years later. Consider utilization of these new guidelines for facilities recommended in this Plan.	Short-Medium Term (2011-2015)
Develop Biscoe Bicycle/Walking Map	Town of Biscoe	Bicycle/Pedestrian Subcommittee	A hardcopy and online map will display bicycle and pedestrian facilities, destinations, and educational materials. A map or series of maps would be developed for Biscoe residents and visitors. These maps should be updated every 3-5 years.	Medium Term (2012-2015)
Staffing/Training	Town of Biscoe	Montgomery County, Piedmont-Triad RPO	Staff from the Town of Biscoe and NCDOT departments should maintain their knowledge with the latest bicycle/pedestrian design guidelines and facility improvements through classes and training sessions.	Medium Term (2012-2015) and continuous
Conduct pedestrian counts.	Town of Biscoe	Bicycle/Pedestrian Subcommittee	Count pedestrians at least once a year at some of the highest pedestrian traffic areas. This will help serve as a baseline of information moving forward with pedestrian planning.	Medium Term (2012-2015) and continuous
Develop a maintenance strategy. Require that businesses maintain and upkeep their storefronts and sidewalks	Town of Biscoe	Bicycle/Pedestrian Subcommittee	A sidewalk and greenway maintenance plan ensures that all existing features be improved and updated when safety is a concern. Part of this maintenance plan should detail the responsibilities of homeowners and business owners to maintain their storefront and sidewalk areas to improve appearance and safety.	Medium Term (2012-2015) and continuous
Define and complete next-phase Projects	Town of Biscoe and Public Works	Bicycle/Pedestrian Subcommittee, NCDOT, Kerr-Tar RPO	In 2013, reevaluate priorities based on what has been completed thus far by creating a new agenda of "next phase" projects. Consider including priority projects that were not completed and consider updating certain aspects of the plan's design standards, programs, and policies based on innovations and new ideas since 2011.	Medium Term (2012-2015)



Chapter 6: Design Guidelines

This chapter provides pedestrian design guidelines for pedestrian features. All pedestrian facility construction should aim to meet these guidelines when possible.



6.0 OVERVIEW

These recommended guidelines originate from and adhere to national design standards as defined by the American Association of State Highway Transportation Officials (AASHTO), the Americans with Disabilities Act (ADA), the Federal Highway Administration (FHWA) Pedestrian Facilities Users Guide, the Manual on Uniform Traffic Control Devices (MUTCD), and the NCDOT. Another major source of information in this chapter is the Pedestrian and Bicycle Information Center, found online at <http://www.walkinginfo.org>. Should the national standards be revised in the future and result in discrepancies with this chapter, the national standards should prevail for all design decisions. A qualified engineer or landscape architect should be consulted for the most up to date and accurate cost estimates.

The sections below serve as an inventory of pedestrian design elements/treatments and provide guidelines for their development. These treatments and design guidelines are important because they represent minimum standards for creating a pedestrian-friendly, safe, accessible community. The guidelines are not, however, a substitute for a more thorough evaluation by a landscape architect or engineer upon implementation of facility improvements. Some improvements may also require cooperation with the NCDOT for specific design solutions.

CHAPTER OUTLINE:

6.0 OVERVIEW

6.1 LINEAR FACILITIES

6.2 CROSSING FACILITIES

6.3 ADDITIONAL TREATMENTS

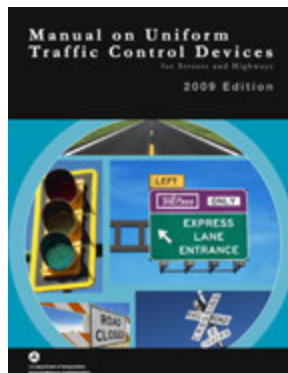
6.4 PEDESTRIAN SIGNAGE AND WAYFINDING

6.5 TRAFFIC CALMING TREATMENTS

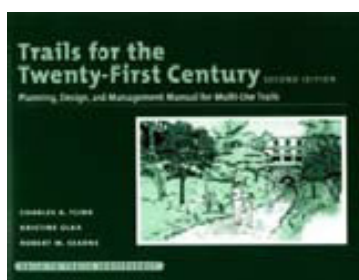
6.6 LAND USE AND PEDESTRIAN TRAVEL



Pedestrian and Bicycle Information Center



The Pedestrian and Bicycle Information Center, AASHTO, the MUTCD, nationally recognized trail standards, and other sources have all informed the content of this chapter.



6.1 LINEAR FACILITIES

SIDEWALKS AND WALKWAYS

Sidewalks and walkways are extremely important public right-of-way components often times adjacent to, but separate from automobile traffic. In many ways, they act as the seam between private residences, stores, businesses, and the street.

There are a number of options for different settings, for both downtown and more rural and/or suburban areas. From a wide promenade to, in the case of a more rural environment, a simple asphalt or crushed stone path next to a secondary road, walkway form and topography can vary greatly. In general, sidewalks are constructed of concrete although there are some successful examples where other materials such as asphalt, crushed stone, or other slip resistant material have been used. The width of the walkways should correspond to the conditions present in any given location (i.e. level of pedestrian traffic, building setbacks, or other important natural or cultural features). FHWA (Federal Highway Administration) and the Institute of Transportation Engineers both suggest five feet as the minimum width for a sidewalk. This is considered ample room for two people to walk abreast or for two pedestrians to pass each other. Often downtown areas, near schools, transit stops, or other areas of high pedestrian activity call for much wider sidewalks.

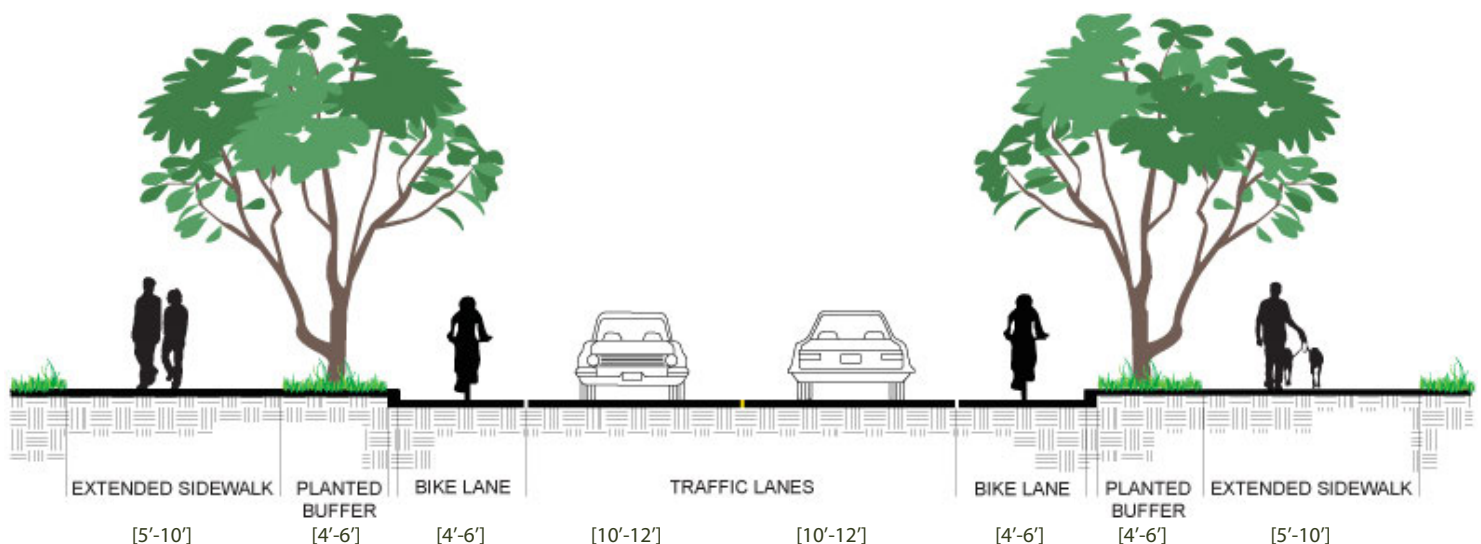


A well designed residential sidewalk will have a width of at least five feet. (Image from <http://www.walkinginfo.org>)



Sidewalk with a vegetated buffer zone. Notice the sense of enclosure created by the large canopy street trees. (Image from <http://www.walkinginfo.org>)

Below: Typical street with bike lanes and adjacent sidewalk.



SIDEWALKS AND WALKWAY GUIDELINES:

Sidewalk Guideline Sources:

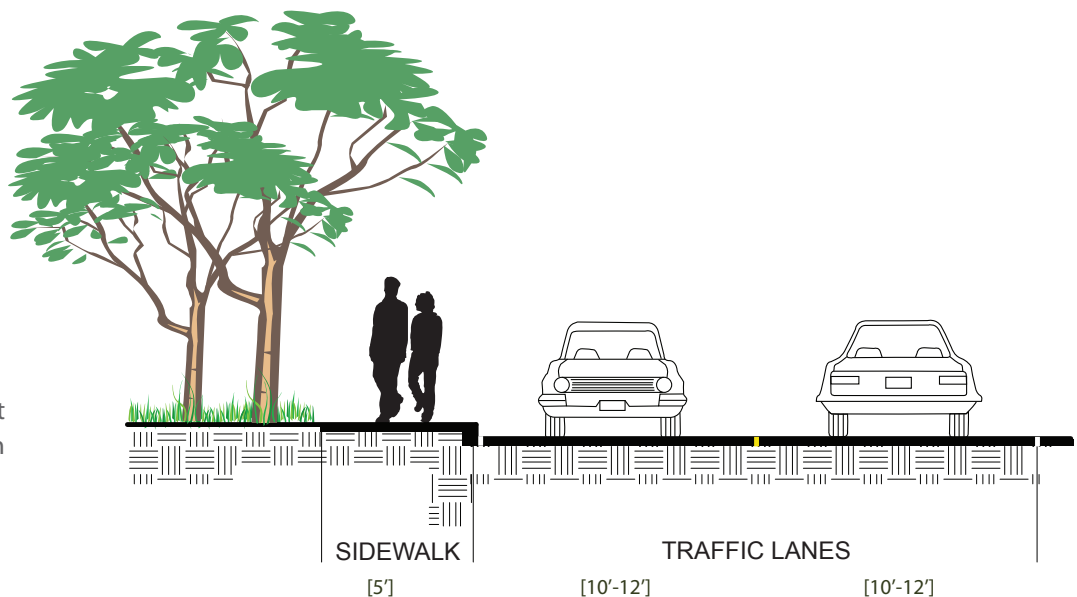
American Association of State Highway and Transportation Officials. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Metro Regional Government. (2005). Portland, Oregon: Transportation Information Center. <http://www.oregonmetro.gov>

* If a greater slope is anticipated because of unusual topographic or existing conditions, the designer should maintain the preferred slope of 1:50 within the sidewalk area, if possible. This can be accomplished either by raising the curb so that the cross-slope of the entire sidewalk can be 1:50, or by placing the more steeply angled slope within the area between the sidewalk and the road.

- Concrete is preferred surface, providing the longest service life and requiring the least maintenance. Permeable pavement such as porous concrete may be considered to improve water quality.
- Sidewalks should be built as flat as possible to accommodate all pedestrians; they should have a running grade of five percent or less; with a two percent maximum cross-slope.
- Concrete sidewalks should be built to minimum depth of four inches; six inches at driveways.
- Sidewalks should be a minimum of five feet wide; sidewalks serving mixed use and commercial areas shall be a minimum of eight feet in width (12–15 feet is required in front of retail storefronts). The maximum cross-slope should be no more than 2% (1:50)*.
- Buffer zone of two to four feet in local or collector streets; five to six feet in arterial or major streets and up to eight feet in busy streets and downtown to provide space for light poles and other street furniture. See the Landscaping section later in this chapter for shade and buffer opportunities of trees and shrubs.
- Motor vehicle access points should be kept to minimum (driveway access management).
- If a sidewalk with buffer on both sides is not feasible due to topography and right-of-way constraints, then a sidewalk or paved shoulder on one side is better than no facility. Each site should be examined in detail to determine placement options.

Right: Where space and topography are limiting and a planted buffer is not possible, this cross section may be applied.



GREENWAY TRAIL

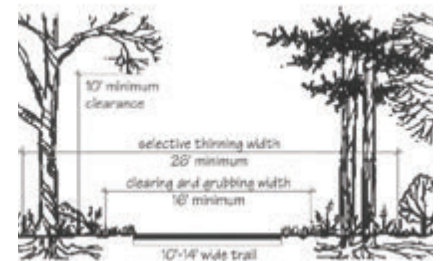
A greenway is defined as a linear corridor of land that can be either natural, such as rivers and streams, or manmade, such as abandoned railroad beds and utility corridors. Many greenways contain trails. Greenway trails can be paved or unpaved, and can be designed to accommodate a variety of trail users, including bicyclists, walkers, hikers, joggers, skaters, horseback riders, and those confined to wheelchairs. Single-tread, multi-use trails are the most common trail type in the nation. These trails vary in width and can accommodate a wide variety of users.

Note: A greenway trail located along a roadway corridor is sometimes referred to as a 'sidepath'.

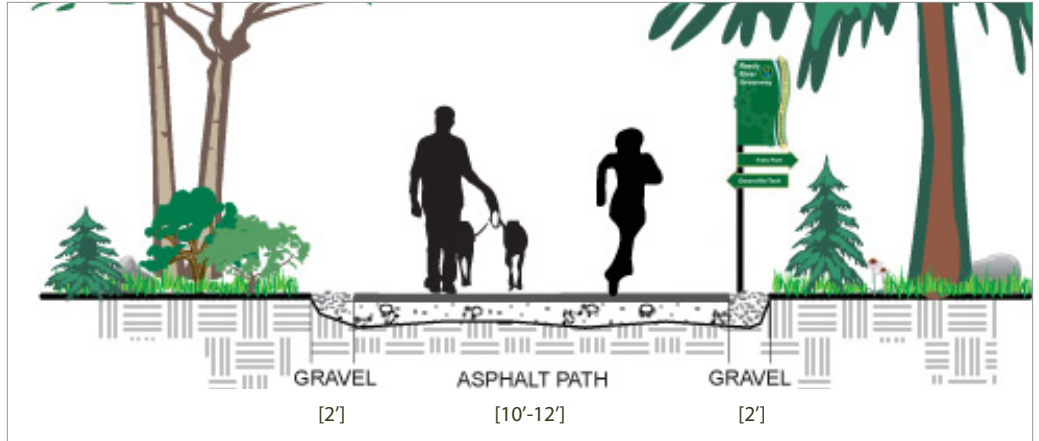
TRAIL GUIDELINES:

- The minimum width for two-directional trails is 10'; however 12'-14' widths are preferred where heavy traffic is expected. Vertical clearance under bridges and other structures should be 8' to 10'.
- Centerline stripes should be considered for paths that generate substantial amounts of pedestrian traffic, or along curved portions of the trail, where sight-lines are limited. Radii minimums should also be considered depending on the different user groups.
- While the vegetative clearing needed for these trails varies with the width of the trail, the minimum width for clearing and grubbing a 10' wide trail is 16'. Selective thinning increases sight lines and distances and enhances the safety of the trail user. This practice includes removal of underbrush and limbs to create open pockets within a forest canopy, but does not include the removal of the forest canopy itself.
- Crossings should be a safe enough distance from neighboring intersections to not interfere (or be interfered) with traffic flow.
- A roadway with flat topography is desirable to increase motorist visibility of the path crossing.
- Motorists and trail users should be warned, such as with signage (including trail stop signs), changes in pavement texture, flashing beacons, raised crossings, striping, etc.
- A refuge is needed where crossing distance is excessive and in conditions exhibiting high volumes/speeds and where the primary user group crossing the roadway requires additional time, such as school children and the elderly.
- The crossing should occur as close to perpendicular (90 degrees) to the roadway as possible.
- If possible, it may be desirable to bring the path crossing up to a nearby signalized crossing in situations with high speeds/ADT and design and/or physical constraints.
- Signalized crossings may be necessary on trails with significant usage when intersecting with demanding roadways, but MUTCD warrants must be met for the installation of a signalized crossing.
- Sidepaths should be constructed along corridors with relatively few intersections and driveways, reducing conflict points.
- Typical pavement design for a paved, off-road, multi-use trail should be based upon the specific loading and soil conditions for each project. Asphalt or concrete trails should be designed to withstand the loading requirements of occasional maintenance and emergency vehicles.

Below: Vegetation clearing guidelines



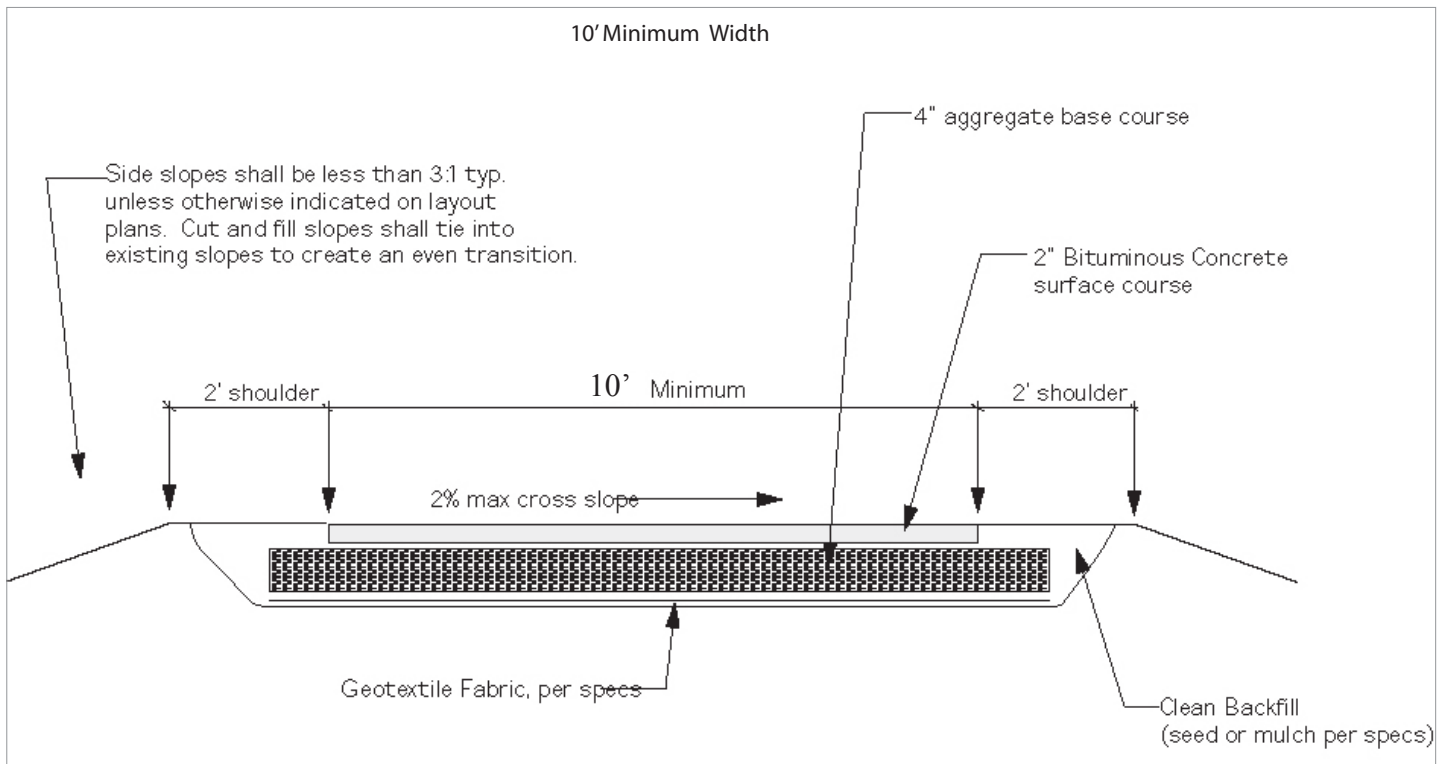
Right: Typical asphalt path section



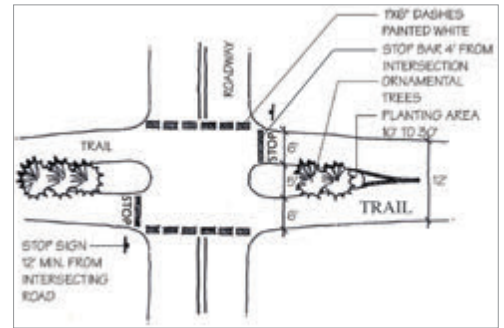
Right: Typical natural surface trail section



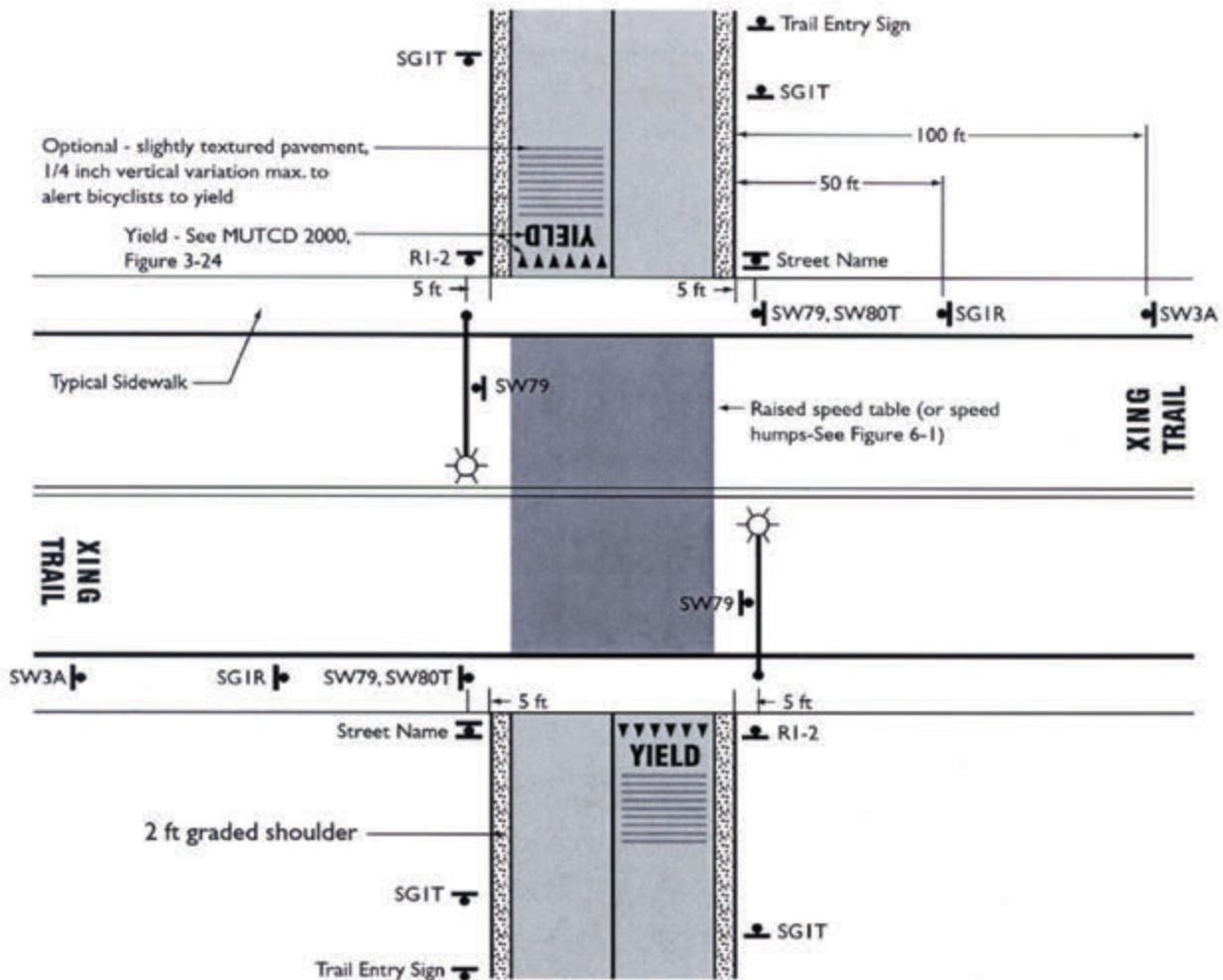
Below: Asphalt pavement construction detail



- **Concrete Trail:** In areas prone to frequent flooding, it is recommended that concrete be used because of its excellent durability. Concrete surfaces are capable of withstanding the most powerful environmental forces. They hold up well against the erosive action of water, root intrusion and subgrade deficiencies such as soft soils. Most often, concrete is used for intensive urban applications. Of all surface types, it is the strongest and has the lowest maintenance requirement, if it is properly installed.
- **Asphalt Trail:** Asphalt is a flexible pavement and can be installed on virtually any slope. One important concern for asphalt trails is the deterioration of trail edges. Installation of a geotextile fabric beneath a layer of aggregate base course (ABC) can help to maintain the edge of a trail. It is important to provide a two foot wide graded shoulder to prevent trail edges from crumbling.
- **Trail and Roadway Intersections:** The images below and at right present detailed specifications for the layout of intersections between trail corridors and roadways. Signage rules for such intersections are available in the Manual for Urban Traffic Control Devices (MUTCD).

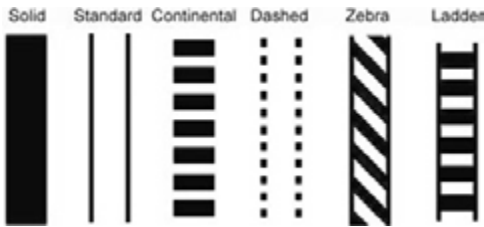


Above and below: Typical greenway trail approaches to a roadway



6.2 CROSSING FACILITIES

MARKED CROSSWALKS



A variety of patterns are possible in designating a crosswalk; an example of a 'continental' design is shown above.

A marked crosswalk designates a pedestrian right-of-way across a street. It is often installed at controlled intersections or at key locations along the street (a.k.a. mid-block crossings). Every attempt should be made to install crossings at the specific point at which pedestrians are most likely to cross: a well-designed traffic calming location is not effective if pedestrians are instead using more seemingly convenient and potentially dangerous location to cross the street. Marked pedestrian crosswalks may be used under the following conditions: 1) At locations with stop signs or traffic signals, 2) At non-signalized street crossing locations in designated school zones, and 3) At non-signalized locations where engineering judgment dictates that the use of specifically designated crosswalks are desirable.

There is a variety of form, pattern, and materials to choose from when creating a marked crosswalk. It is important however to provide crosswalks that are not slippery, are free of tripping hazards, or are otherwise difficult to maneuver by any person including those with physical mobility or vision impairments. Although attractive materials such as inlaid stone or certain types of brick may provide character and aesthetic value, the crosswalk can become slippery. Potential materials can be vetted by requesting case studies from suppliers regarding where the materials have been successfully applied. Also, as some materials degrade from use or if they are improperly installed, they may become a hazard for the mobility or vision impaired.

CROSSWALK GUIDELINES:

- Should not be installed in an uncontrolled environment [at intersections without traffic signals] where speeds exceed 40 mph. (AASHTO, 2004).
- Crosswalks alone may not be enough and should be used in conjunction with other measures to improve pedestrian crossing safety, particularly on roads with average daily traffic (ADT) above 10,000.
- Width of marked crosswalk should be at least six feet; ideally ten feet or wider in downtown areas.
- Curb ramps and other sloped areas should be fully contained within the markings.
- Crosswalk markings should extend the full length of the crossings.
- Crosswalk markings should be white per MUTCD.
- Either the 'continental' or 'ladder' patterns are recommended for intersection improvements for aesthetic and visibility purposes. Lines should be one to two feet wide and spaced one to five feet apart.
- NCDOT typically requires pedestrian facilities (sidewalks) on both sides of a roadway when placing crosswalks.

Crosswalk Guideline Sources:

American Association of State Highway and Transportation Officials. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Metro Regional Government. (2005). Portland, Oregon: Transportation Information Center. <http://www.oregonmetro.gov>

CURB RAMPS

Curb ramps are critical features that provide access between the sidewalk and roadway for wheelchair users, people using walkers, crutches, or handcars, people pushing bicycles or strollers, and pedestrians with mobility or other physical impairments. In accordance with the 1973 Federal Rehabilitation Act and to comply with the 1990 Federal ADA requirements, curb ramps must be installed at all intersections and mid-block locations where pedestrian crossings exist (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/roadway-ramps.cfm>). In addition, these federal regulations require that all new constructed or altered roadways include curb ramps.

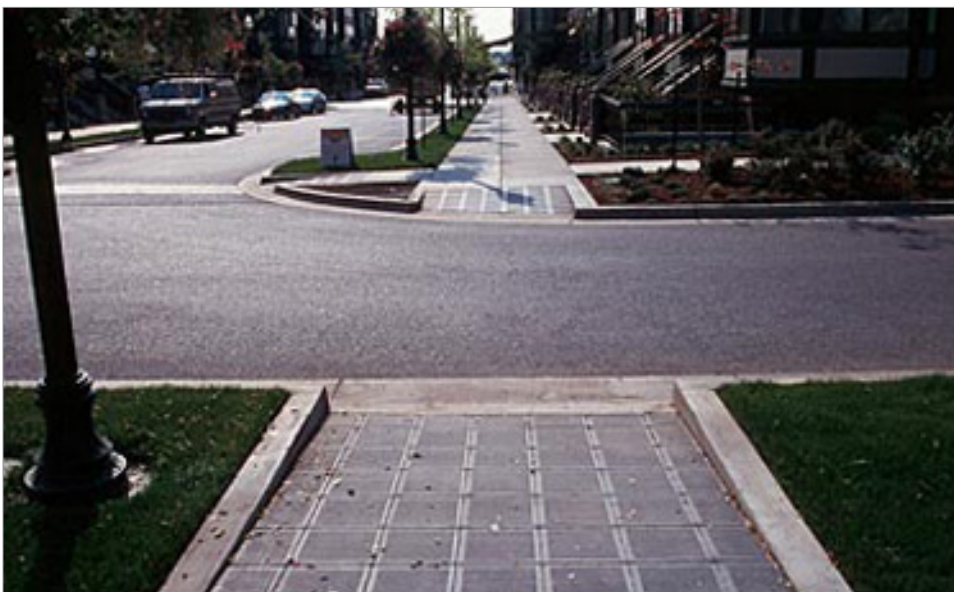
Two separate curb ramps should be provided at each intersection (see image below). With only one large curb ramp serving the entire corner, there is not safe connectivity for the pedestrian. Dangerous conditions exist when the single, large curb ramp inadvertently directs a pedestrian into the center of the intersection, or in front of an unsuspecting, turning vehicle.

CURB RAMP GUIDELINES:

- Two separate curb ramps, one for each crosswalk, should be provided at corner of an intersection.
- Curb ramp should have a slope no greater than 1:12 (8.33%). Side flares should not exceed 1:10 (10%); it is recommended that much less steep slopes be used whenever possible.

Curb Ramp Guideline Sources:

Metro Regional Government.
(2005). Portland, Oregon:
Transportation Information Center.
<http://www.oregonmetro.gov>



Left: The curb ramps shown have two separate ramps at the intersection (visible across the street) (Image from <http://www.walkinginfo.org>).

For additional information on curb ramps see *Accessible Rights-of-Way: A Design Guide*, by the U.S. Access Board and the Federal Highway Administration, and *Designing Sidewalks and Trails for Access, Parts I and II*, by the Federal Highway Administration. Visit: www.access-board.gov for the Access board's right-of-way report.

RAISED OR LOWERED MEDIANS

Medians are barriers in the center portion of a street or roadway. When used in conjunction with mid-block or intersection crossings, they can be used as a crossing island to provide a place of refuge for pedestrians. They also provide opportunities for landscaping that in turn can help to slow traffic. A center turn lane can be converted into a raised or lowered median thus increasing motorist safety.

A continuous median can present several problems when used inappropriately. If all left-turn opportunities are removed, there runs a possibility for increased traffic speeds and unsafe U-turns at intersections. Additionally, the space occupied may be taking up room that could be used for bike lanes or other treatments. An alternative to the continuous median is to create a segmented median with left turn opportunities.

Raised or lowered medians are best suited for high-volume, high-speed roads, and they should provide ample cues for people with visual impairments to identify the boundary between the crossing island and the roadway.

MEDIAN GUIDELINES:

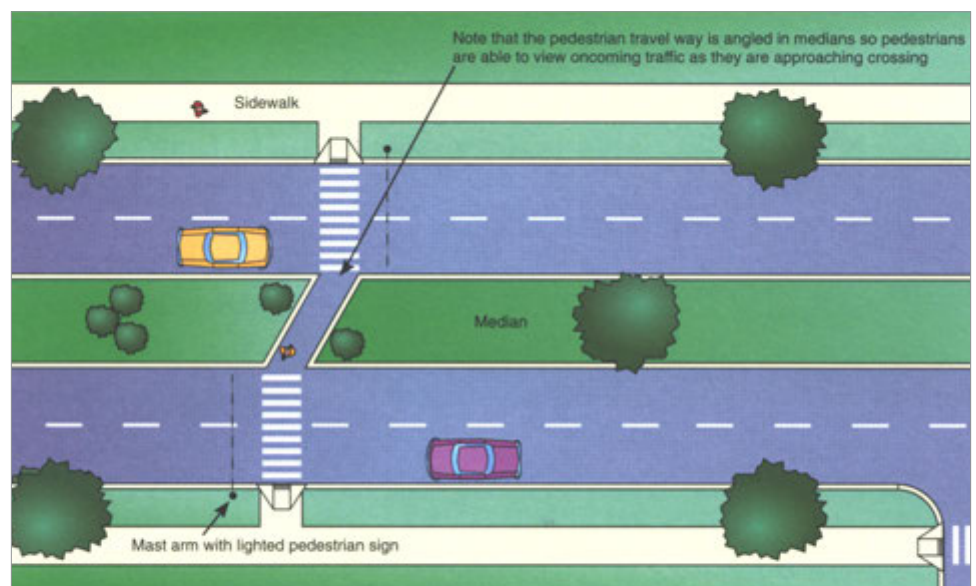
- Median pedestrian refuge islands should be provided as a place of refuge for pedestrians crossing busy or wider roadways at either mid-block locations or intersections. They should be utilized on high speed and high volume roadways.
- Medians should incorporate trees and plantings to change the character of the street and reduce motor vehicle speed.
- Landscaping should not obstruct the visibility between motorists and pedestrians.
- Median crossings should provide ramps or cut-throughs for ease of accessibility for all pedestrians.
- Median crossings should be at least 6 feet wide in order to accommodate more than one pedestrian, while a width of 10 feet (where feasible) should be provided for bicycles, wheelchairs, and groups of pedestrians.
- Median crossings should possess a minimum of a 4 foot square level landing to provide a rest point for wheelchair users.
- Pedestrian push-buttons should be located in the median of all signalized mid-block crossings, where the roadway width is in excess of 60 feet.

Median Guideline Sources:

American Association of State Highway and Transportation Officials. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Metro Regional Government. (2005). Portland, Oregon: Transportation Information Center. <http://www.oregonmetro.gov>

Right: A median used in conjunction with mid-block crossing, serving as a refuge for pedestrians. (Image from AASHTO).



MID-BLOCK CROSSINGS

A Mid-Block Crosswalk is any crosswalk that is not located within an intersection. Midblock crossings are often installed in areas with heavy pedestrian traffic to provide more frequent crossing opportunities. They may also be added near major pedestrian destinations, such as schools or busy commercial areas, where people might otherwise cross at unmarked locations.

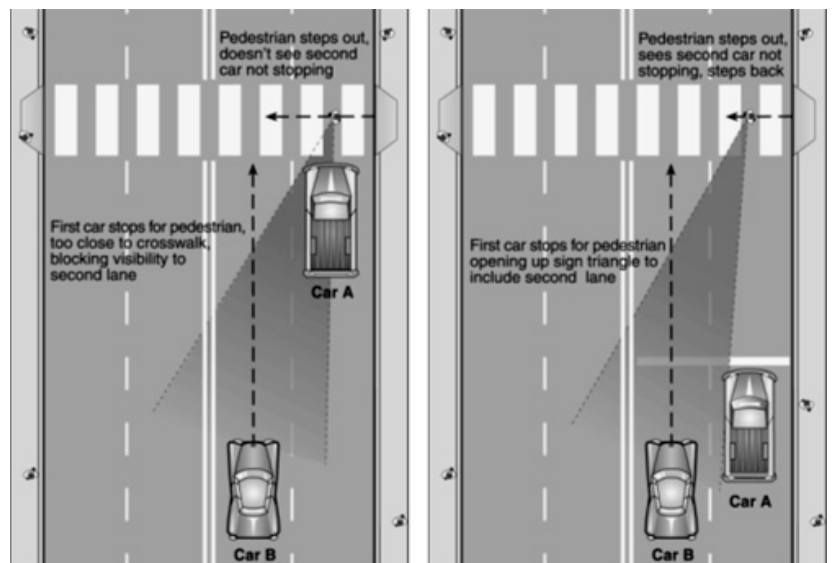
MID-BLOCK CROSSING GUIDELINES:

- Crosswalks at mid-block should not be installed within 300 ft. of another signalized crossing point.
- Utilize advance warning signs when mid-block crossings are present.
- Raised crosswalks are typically used on two-lane streets with less than 35 MPH speed limit.
- It will be the standard practice of NCDOT to install Mid-Block Crosswalks based on an engineering study. All Mid-Block Crosswalks shall be signed and marked in compliance with the Manual on Uniform Traffic Control Devices (MUTCD), the North Carolina Supplement to the MUTCD, the current NCDOT Roadway Standard Drawings, and the standards the NCDOT Policy on Mid-Block Crossings.
- The NCDOT Policy on Mid-Block Crossings can be found at www.ncdot.gov/doh/preconstruct/traffic/tepl/topics/C-36/C-36_pr.pdf

ADVANCE STOP BARS

Moving the vehicle stop bar 15–30 feet back from the pedestrian crosswalk at signalized crossings and mid-block crossings increases vehicle and pedestrian visibility. Advance stop bars are 1–2 feet wide and they extend across all approach lanes at intersections. The time and distance created allows a buffer in which the pedestrian and motorist can interpret each other’s intentions. Studies have shown that this distance translates directly into increased safety for both motorist and pedestrian. One study in particular claims that by simply adding a “Stop Here for Pedestrians” sign reduced pedestrian motorist conflict by 67%. When this was used in conjunction with advance stop lines, it increased to 90% (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/crossings-enhancements.cfm>).

Below: Advance stop bars enhance visibility for pedestrians (Image from www.walkinginfo.org).



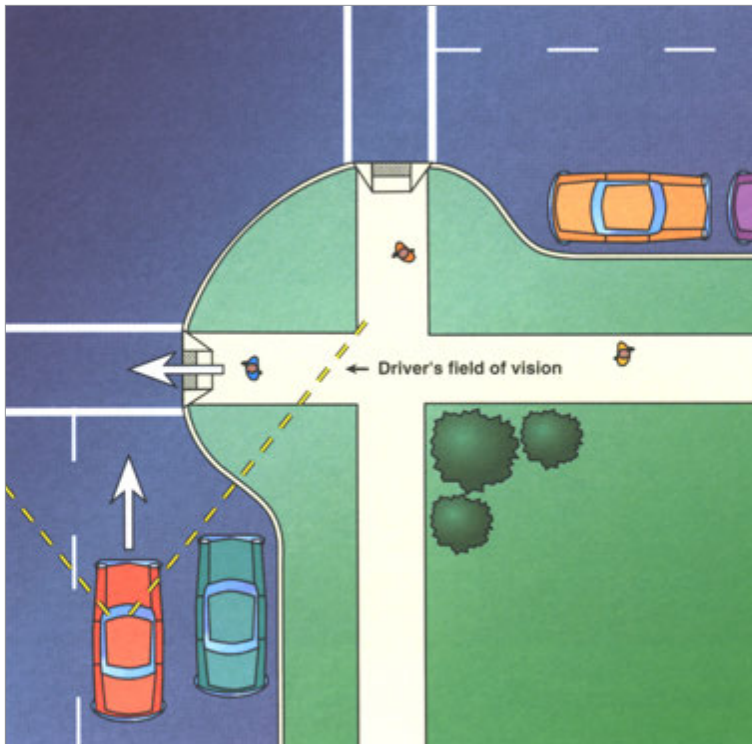
BULB-OUTS

A bulb-out, or curb extension, is a place where the sidewalk extends into the parking lane of a street. Because these curb extensions physically narrow the roadway, a pedestrian's crossing distance—and consequently the time spent in the street—is reduced. They can be placed either at mid-block crossings or at intersections.

*The curb radius of a street corner affects traffic speed and crosswalk length. In general, a smaller (narrow) curb radius is better for pedestrians. A larger (wide) curb radius creates a greater crosswalk length and allows vehicles to move faster around the turn. Reducing the curb radius, especially across busy multi-lane arterials, can increase pedestrian safety by slowing vehicles and minimizing pedestrian crossing distances.

Sightlines and pedestrian visibility are reduced when motor vehicle parking encroaches too close to corners creating a dangerous situation for pedestrians. When placed at an intersection, bulb-outs preclude vehicle parking too close to a crosswalk. Also, bulb-outs at intersections can greatly reduce turning speed, especially if curb radii are set as tight as possible* (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/crossings-curb.cfm>). Finally, bulb-outs also reduce travel speeds when used in mid-block crossings because of the reduced street width.

Bulb-outs should only be used where there is an existing on-street parking lane and should never encroach into travel lanes, bike lanes, or shoulders (Pedestrian and Bicycle Information Center).



By reducing a pedestrian's crossing distance, less time is spent in the roadway, and pedestrian vehicle conflicts are reduced (Image from AASHTO).

BULB-OUT GUIDELINES:

- Bulb-outs should be used on crosswalks in heavy pedestrian areas where parking may limit the driver's view of the pedestrian.
- Where used, sidewalk bulb-outs should extend into the street for the width of a parking lane (a minimum five feet) in order to provide for a shorter crossing width, increased pedestrian visibility, more space for pedestrian queuing, and a place for sidewalk amenities and planting.
- Curb extensions should be used on mid-block crossing where feasible.
- Curb extensions may be inappropriate for use on corners where frequent right turns are made by trucks or buses.

PEDESTRIAN OVERPASS/UNDERPASS

Pedestrian overpasses and underpasses efficiently allow for pedestrian movement across busy thoroughfares. These types of facilities are problematic in many regards and should only be considered under suitable circumstances or where no other solution is possible. Perhaps the best argument for using them sparingly is that research proves pedestrians will avoid using such a facility if they perceive the ability to cross at grade as taking about the same amount of time (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/crossings-overpasses.cfm>).

The other areas of contention arise with the high cost of construction. There are also ADA requirements for stairs, ramps, and elevators that in many cases once complied with result in an enormous structure that is visually disruptive and difficult to access.

Overpasses work best when existing topography allows for smooth transitions. Underpasses as well work best with favorable topography when they are open and accessible, and exhibit a sense of safety. Each should only be considered with rail lines, high volume traffic areas such as freeways, and other high volume arteries.

OVERPASS/UNDERPASS GUIDELINES:

- Over and underpasses should be considered only for crossing arterials with greater than 20,000 vehicle trips per day and speeds 35 - 40 mph and over.
- Minimum widths for over and underpasses should follow the guidelines for sidewalk width.
- Underpasses should have a daytime illuminance minimum of 10 fc achievable through artificial and/or natural light provided through an open gap to sky between the two sets of highway lanes, and a night time level of 4 foot-candle.
- Consider acoustics measures within underpasses to reduce noise impacts to pedestrians and bicyclists.



Example trail overpass (above) and underpass (below).

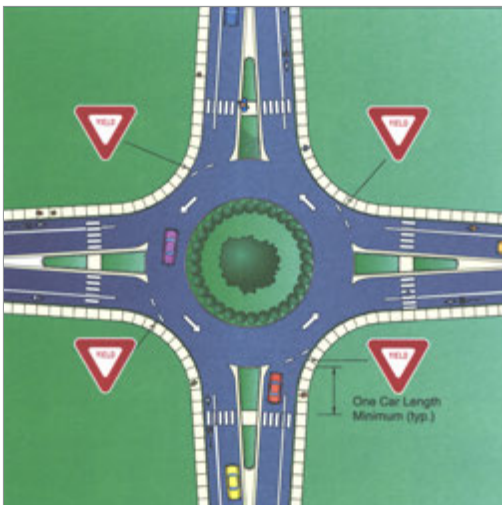


ROUNABOUTS

A roundabout is a circular intersection that maneuvers traffic around in a counterclockwise direction so that cars make a right-hand turn onto a desired street. Vehicles from approaching streets are generally not required to stop although approaching vehicles are required to yield to motorists in the roundabout. It is believed that this system eliminates certain types of crashes at traditional intersections.

Every effort must be made to prompt motorists to yield to pedestrians crossing the roundabout. A low design speed is required to improve pedestrian safety. Splitter islands and single lane approaches both lend to pedestrian safety as well as other urban design elements discussed in this chapter.

Typical roundabout
(Image from AASHTO)



Problems also arise with the vision-impaired because there are not proper audible cues associated with when to cross. Studies are underway to develop and test solutions. Auditory accessible pedestrian signals placed on sidewalks and splitter islands are one solution, but again there is no research to prove their efficacy.

ROUNABOUT GUIDELINES:

- The recommended maximum entry design speed for roundabouts ranges from 15 mph for 'mini-roundabouts' in neighborhood settings, to 20 mph for single-lane roundabouts in urban settings, to 25 mph for single-lane roundabouts in rural settings.
- Refer to roundabout diagram for typical crosswalk placement.
- Please refer to FHWA's report, Roundabouts, an Information Guide, available online through: www.fhrc.gov. The report provides information on general design principles, geometric elements, and provides detailed specifications for the various types of roundabouts.



Above: A pedestrian walks through a pedestrian refuge island, as part of a roundabout.

TRAFFIC SIGNALS

Traffic signals assign the right of way to motorists and pedestrians and produce openings in traffic flow, allowing pedestrians time to cross the street. When used in conjunction with pedestrian friendly design, proper signalization should allow for an adequate amount of time for an individual to cross the street. The suggested amount of pedestrian travel speed recommended in the Manual on Uniform Traffic Control Devices (MUTCD) is 4ft/sec; however, this does not address the walking speed of the elderly or children. Therefore, it is suggested that a lower speed of 3.5ft/sec be used whenever there are adequate numbers of elderly and children using an area.

Engineering, as well as urban design judgment, must be used when determining the location of traffic signals and the accompanying timing intervals. Although warrants for pedestrian signal timing have been produced by the MUTCD, each site must be analyzed for factors including new facility and amenity construction (i.e. a popular new park or museum) to allow for potential future pedestrian traffic volume. In addition, creating better access to existing places may in fact generate a higher pedestrian volume.

Fixed timed sequencing is often used in high traffic volume commercial or downtown areas to allow for a greater efficiency of traffic flow. In such instances, the pedestrian speed must be carefully checked to ensure safety.

RIGHT TURN ON RED RESTRICTIONS

Introduced in the 1970's as a fuel saving technique, the Right Turn on Red (RTOR) law is thought to have had a detrimental effect on pedestrians. The issue is not the law itself but rather the relaxed enforcement of certain caveats within the law such as coming to a complete stop and yielding to pedestrians. Often motorists will either nudge into a crosswalk to check for oncoming traffic without looking for pedestrians or slow, but not stop, for the red-light while making the turn.

There is legitimate concern that eliminating an RTOR will only increase the number of right-turn-on-green conflicts where all of the drivers who would normally have turned on red, now are anxious to turn on green. As discussed in the prior section, LPI or exclusive pedestrian intervals may help to alleviate this problem. Eliminating RTOR should be considered on a case-by-case basis and only where there are high pedestrian volumes. This can be done by simple sign postings as illustrated at right.



A low cost sign that restricts right-hand turns at a red light (Image from <http://www.walkinginfo.org>).



Typical Pedestrian Signal Indicators
(with countdown display).

PEDESTRIAN SIGNALS

There are a host of traffic signal features and enhancements that can greatly improve the safety and flow of pedestrian traffic. These include countdown signals, the size of traffic signals, positioning of traffic signals, audible cues, and timing intervals which are discussed below (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/crossings-signals.cfm>).

As of 2008, new federal policy requires all new pedestrian signals to be of the countdown variety. In addition, all existing signals must be updated to countdown within 10 years (updated in MUTCD). Countdown signals have proven to be an effective measure of crash reduction (25% crash reduction in 2007 FHWA study).

Countdown signals are pedestrian signals that show how many seconds the pedestrian has remaining to cross the street. The countdown can begin at the beginning of the WALK phase, perhaps flashing white or yellow, or at the beginning of the clearance, or DON'T WALK phase, flashing yellow as it counts down. Audible cues can also be used to pulse along with a countdown signal.

Signals should be of adequate size, clearly visible, and, in some circumstances, accompanied by an audible pulse or other messages to make crossing safe for all pedestrians. Consideration should be paid to the noise impact on the surrounding neighborhoods when deciding to use audible signals.



Audible cues can also be used to pulse along with a countdown signal.

The timing of these or other pedestrian signals needs to be adapted to a given situation. In general, shorter cycle lengths and longer walk intervals provide better service to pedestrians and encourage better signal compliance. For optimal pedestrian service, fixed-time signal operation usually works best. Pedestrian pushbuttons may be installed at locations where pedestrians are expected intermittently. Quick response to the pushbutton or feedback to the pedestrian (e.g.- indicator light comes on) should be programmed into the system. When used, pushbuttons should be well-signed and within reach and operable from a flat surface for pedestrians in wheelchairs and with visual disabilities. They should be conveniently placed in the area where pedestrians wait to cross. Section 4E.09 within the MUTCD provides detailed guidance for the placement of pushbuttons to ensure accessibility (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/crossings-signals.cfm>).

There are three types of signal timing generally used: concurrent, exclusive, and leading pedestrian interval (LPI). The strengths and weaknesses of each will be discussed with an emphasis on when they are best employed.

When high-volume turning situations conflict with pedestrian movements, the exclusive pedestrian interval is the preferred solution. The exclusive pedestrian intervals stop traffic in all directions. In order to keep traffic flowing regularly, there is often a greater pedestrian wait time associated with this system. Although it has been shown that pedestrian crashes have been reduced by 50% in some areas by using these intervals, the long wait times can encourage some to cross when there is a lull in traffic (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/crossings-signals.cfm>).

An LPI gives pedestrians an advance walk signal before the motorists get a green light, giving the pedestrian several seconds to start in the crosswalk where there is a concurrent signal. This makes pedestrians more visible to motorists and motorists more likely to yield to them. This advance crossing phase approach has been used successfully in several places, such as New York City, for two decades and studies have demonstrated reduced conflicts for pedestrians. The advance pedestrian phase is particularly effective where there is a two-lane turning movement. There are some situations where an exclusive pedestrian phase may be preferable to an LPI, such as where there are high-volume turning movements that conflict with the pedestrians crossing.

The use of infrared or microwave pedestrian detectors has increased in many cities worldwide. These devices replace the traditional push-button system. They appear to be improving pedestrian signal compliance as well as reducing the number of pedestrian and vehicle conflicts. The best use of these devices is when they are employed to extend crossing time for slower moving pedestrians.

PEDESTRIAN SIGNAL GUIDELINES:

- Pedestrian signals should be placed in locations that are clearly visible to all pedestrians.
- Larger pedestrian signals should be utilized on wider roadways, to ensure readability.
- Pedestrian signal pushbuttons should be well-signed and visible.
- Pedestrian signal pushbuttons should clearly indicate which crossing direction they control.
- Pedestrian signal pushbuttons should be reachable from a flat surface, at a maximum height of 3.5 feet and be located on a level landing to ensure ease of operation by pedestrians in wheelchairs.
- Walk intervals should be provided during every cycle, especially in high pedestrian traffic areas.

RAILROAD CROSSINGS

Where bicycle or pedestrian facilities cross railroads at grade, the primary issues relate to trespassing and safety concerns. There is greater difficulty of crossing the tracks if the crossing is not perpendicular. People using wheelchairs can have difficulty crossing railroad tracks if the gap between railroad tracks and flange way is wide, or if there is a significant vertical change between the sidewalk and the tracks.

Common issues at these intersections include:

- Sidewalk may not continue through railroad crossing leaving many pedestrians with the only choice to enter the roadway.
- Pedestrians and bicyclists in wheelchairs may catch wheel in flange way gap if crossing is less than 45 degrees.
- Limited sight lines and visibility may not allow pedestrians and bicyclists to see approaching trains.
- Pedestrians may cross tracks illegally or trespass.
- Crossing gates for pedestrians or bicyclists may not be provided.

Pedestrians and bicyclists can be accommodated at at-grade railroad crossings by modifying the intersection to provide for a close to 90-degree crossing, and providing structures such as fences and mast arms to discourage trespassing.

Advanced Warning Devices at Trail-Rail Crossings

A variety of warning devices are available for trail-rail crossings. In addition to the MUTCD standard devices, there are innovative treatments developed to encourage cautious bicyclist and pedestrian behavior.

There are two categories of advanced warning devices:

- Passive warning devices: signs and pavement markings that alert trail users that they are approaching a trail-rail crossing and direct them to proceed with caution and look for trains.
- Active warning devices: advise trail users of the approach or presence of a train at railroad crossings. These consist of bells, flashing lights, automatic gates, and other devices that are triggered by the presence of an approaching train (see

RAILROAD CROSSING TREATMENTS:

- Install signage in advance of crossing to warn bicyclists and pedestrians.
- Construct sidewalks so they cross railroad tracks at close to a 90-degree angle.



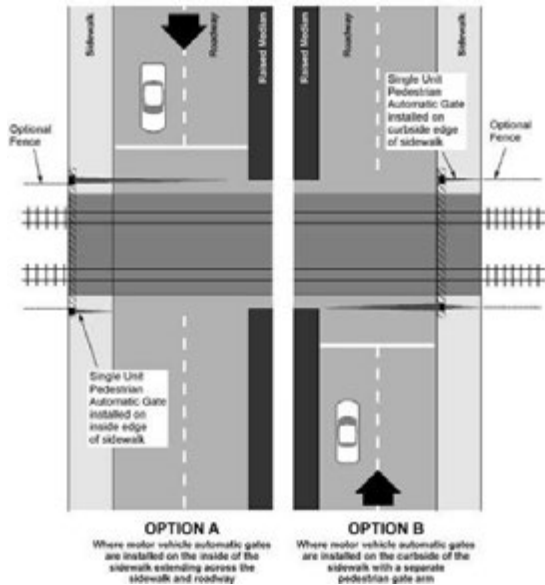
Examples of railroad crossing in Biscoe. The lack of continuous sidewalk is a significant issue here.



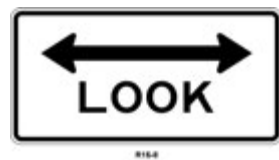
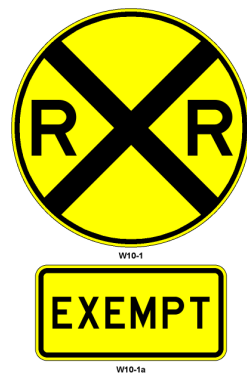
Examples of railroad pedestrian crossings with active warning devices.

- Provide flange way so that crossing is level and flush with the top of the rail at the outer edge. Between the rails, flange way gaps should not exceed 2.5 inches (passenger only) to 3 inches (freight).
- Install detectible warnings in advance of crossing.
- Construct pedestrian-only crossing gates.
- Install fencing along tracks to discourage trespassing or illegal crossing.
- Remove abandoned railroad tracks.
- Ensure sight is not obstructed by vegetation, topography, or structures.

For more information, see "Railroad-Highway Grade Crossing Handbook - Revised Second Edition" (FHWA, 2007) and "Guidance on Traffic Control Devices at Highway-Rail Grade Crossings" (FHWA, 2002).



Source: Railroad-Highway Grade Crossing Handbook-Revised Second Edition (FHWA, 2007).



Standard MUTCD devices for railroad crossings.

6.3 ADDITIONAL TREATMENTS

LANDSCAPING

The introduction of vegetation in an urban environment can provide a welcomed intervention of nature into a place that is otherwise hardened from buildings, concrete, and asphalt. It can be used to provide a separation buffer between pedestrians and motorists, reduce the width of a roadway, calm traffic by creating a visual narrowing of the roadway, enhance the street environment, and help to generate a desired aesthetic.

Street trees and other plantings provide comfort, a sense of place, and a more natural and inviting setting for pedestrians. Landscaping and the aforementioned street furniture make people feel welcome.

Landscaping used on Sea Street in Seattle, Washington shows how stormwater treatment can be tied to aesthetically pleasing plantings. (Image from Seattle, WA, Public Utilities: Seattle.gov)



There are also some instances where islands of vegetation are created to collect and filter stormwater from nearby streets and buildings. These islands are referred to as constructed wetlands, rain gardens, and/or bioswales. When these devices are employed, the benefits listed above are coupled with economic and ecologic benefits of treating stormwater at its source. There are many examples of this in Oregon and Washington, particularly Seattle's Green Streets Program. Using thoughtful design to treat stormwater as an amenity rather than waste to be disposed of in an environmentally harmful manner is gaining popularity nationwide.

An issue with this or any landscaping treatment is that of ongoing maintenance. The responsibility often falls on local municipalities although there are instances where local community groups have provided funding and volunteers for maintenance. The best way to address the maintenance issue is to design using native plant material that is already adapted to the local soil and climate. Growth pattern and space for maturation, particularly with larger tree plantings, are important to avoid cracking sidewalks and other pedestrian obstructions.

Street trees buffer and soften urban environments in a number of psychological, physical, and ecological ways; their shade is particularly helpful to pedestrians in North Carolina during summer months.



ROADWAY LIGHTING IMPROVEMENTS

Proper lighting in terms of quality, placement, and sufficiency can greatly enhance a nighttime urban experience as well as create a safe environment for motorists and pedestrians. Two-thirds of all pedestrian fatalities occur during low-light conditions (AASHTO, 2004: Guide for the Planning, Design, and Operation of Pedestrian Facilities). Attention should be paid to crossings so that there is sufficient ambience for motorists to see pedestrians. To be most effective, lighting should be consistent, adequately spaced, and distinguished, providing adequate light.

In most cases, roadway street lighting can be designed to illuminate the sidewalk area as well. The visibility needs of both pedestrian and motorist should be considered. In commercial or downtown areas and other areas of high pedestrian volumes, the addition of lower level, pedestrian-scale lighting to streetlights with emphasis on crossings and intersections may be employed to generate a desired ambience. A variety of lighting choices include mercury vapor, incandescent, or less expensive high-pressure sodium lighting for pedestrian level lighting. Roadway streetlights can range from 20-40 feet in height while pedestrian-scale lighting is typically 10-15 feet.

It is important to note that every effort should be made to address and prevent light pollution. Also known as photo pollution, light pollution is 'excess or obtrusive light created by humans.

GUIDELINES:

- Ensure pedestrian walkways and crossways are sufficiently lit.
- Consider adding pedestrian-level lighting in areas of higher pedestrian volumes, downtown, and at key intersections.
- Install lighting on both sides of streets in commercial districts.
- Use uniform lighting levels.
- Use full cut-off light fixtures to avoid excess light pollution.
- Space lights every 100 feet (based on a consideration of other communities throughout the country).



The pedestrian-scale lighting shown here in Hickory, NC should be used in areas where pedestrian lighting is desired.

STREET FURNITURE AND WALKING ENVIRONMENT

As part of a comprehensive sidewalk and walkway design, all street furniture should be placed in a manner that allows for a safe, pleasurable, and accessible walking environment. Good-quality street furniture will show that the community values its public spaces and is more cost-effective in the long run. Street furniture includes benches, trash bins, signposts, newspaper racks, water fountains, bike racks, restaurant seating, light posts, and other ornaments that are found within an urban street environment. Street furniture should mostly be considered in the downtown area and other important pedestrian-active areas.

In addition to keeping areas free of obstruction from furniture, a walking environment should be clean and well maintained. Attention to removing debris, trimming vegetation, allowing for proper stormwater drainage, providing proper lighting and sight angles, and repairing or replacing broken or damaged paving material can make an enormous difference in pedestrian perception of safety and aesthetics. Special attention should be paid to the needs of the visually impaired so that tripping hazards and low hanging obstructions are removed.

GUIDELINES:

- Ensure proper placement of furniture; do not block pedestrian walkway or curb ramps or create sightline problems.
- Wall mounted Objects = not to protrude more than 4" from a wall between 27" and 7' from the ground.
- Single post mounted Objects = not to protrude more than 4" from each side of the post between 27" and 7' from the ground.
- Multiple Post Mounted Objects = lowest edge should be no higher than 27" and no lower than 7'.
- Place street furniture at the end of on-street parking spaces rather than in middle to avoid vehicle-exiting conflict.

The street furniture shown here (Downtown Belmont, NC) is placed in such a manner so as to create a safe, pleasurable, and accessible walking environment.



TRANSIT STOP TREATMENTS

Where transit opportunities are available, it is appropriate to consider some of the basic elements of a well designed, accessible, and functional transit stop.

Bus or other transit stops should be located in places that are most suitable for the passengers. For example, stops should be provided near higher density residential areas, commercial or business areas, and schools, and connected to these areas by sidewalk. Some of the most important elements to consider are the most basic: sidewalk connectivity to the stops, proper lighting, legible and adequate transit stop signage, shelter, seating, trash bins, bicycle and even car parking. Transit stops create an area of activity and may generate additional business and pedestrian traffic. Therefore, an opportunity is created to provide adequate sidewalks and other pedestrian oriented design elements. At a minimum, marked crosswalks (especially at mid-block stops), curb ramps, and proper sidewalk widths should be considered.

As with any human scale design element discussed, safety is an important factor to consider when locating bus stops. In the case of a bus stop, special attention should be paid to the number of lanes and direction of traffic when deciding to locate a stop on the near or far side of an intersection. Also special consideration must be paid to the wheelchair lifts in terms of how and where the mobility impaired will exit and enter the bus.

Local walking and biking maps should also be provided at bus stops, so that people are aware of the nearby destinations and how best to get there without an automobile.



This typical transit stop has all of the key features of shelter, ample seating, bicycle parking, landscaping, and trash bins (Image from <http://www.walkinginfo.org>).

6.4 PEDESTRIAN SIGNS AND WAYFINDING

For a step-by-step guide to help non-professionals participate in the process of developing and designing a signage system, as well as information on the range of signage types, visit the Project for Public Places website: http://www.pps.org/info/amenities_bb/signage_guide

Signage provides important safety and wayfinding information to motorists and pedestrian residents and tourists. From a safety standpoint, motorists should be given advance warning of upcoming pedestrian crossings or of traffic calming areas. Signage of any type should be used and regulated judiciously. An inordinate amount of signs creates visual clutter. Under such a condition, important safety or wayfinding information may be ignored resulting in confusion and possible pedestrian vehicle conflict. Regulations should also address the orientation, height, size, and sometimes even style of signage to comply with a desired local aesthetic.



Regulatory signage is used to inform motorists or pedestrians of a legal requirement and should only be used when a legal requirement is not otherwise apparent (AASHTO, 2004: Guide for the Planning, Design, and Operation of Pedestrian Facilities). The in-street ped crossing sign (shown at left) is particularly useful as a recent New York study showed motorist compliance at a crosswalk up to 60% from 25% when the sign was applied.

Below: Typical traffic signs found around pedestrian friendly places.

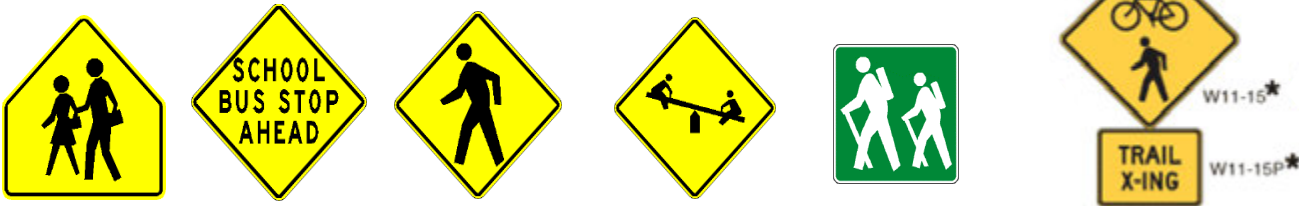
Sign	MUTCD Code	MUTCD Section	Conventional Road	
Yield here to Peds	R1-5	2B.11	450x450 (18x18)	Regulatory
Yield here to Peds	R1-5a	2B.11	450x600 (18x24)	
In-Street Ped Crossing	R1-6, R1-6a	2B.12	300x900 (12x36)	
Peds and Bikes Prohibited	R5-10b	2B.36	750x450 (30x18)	
Peds Prohibited	R5-10c	2B.36	600x300 (24x12)	
Walk on Left Facing Traffic	R9-1	2B.43	450x600 (18x24)	
Cross only at Crosswalks	R9-2	2B.44	300x450 (12x18)	
No Ped Crossing	R9-3a	2B.44	450x450 (18x18)	
No Hitch Hiking	R9-4	2B.43	450x600 (18x24)	
No Hitch Hiking (symbol)	R9-4a	2B.43	450x450 (18x18)	
Bikes Yield to Peds	R9-6	9B.10	300x450 (12x18)	
Ped Traffic Symbol	R10-4b	2B.45	225x300 (9x12)	
School Advance Warning	S1-1	7B.08	900x900 (36x36)	School, Warning, Informational
School Bus Stop Ahead	S3-1	7B.10	750x750 (30x30)	
Pedestrian Traffic	W11-2	2C.41	750x750 (30x30)	
Playground	W15-1	2C.42	750x750 (30x30)	
Hiking Trail	I-4	--	600x600 (24x24)	
<ol style="list-style-type: none"> 1. Larger signs may be used when appropriate. 2. Dimensions are shown in millimeters followed by inches in parentheses and are shown as width x height. 3. First dimension in millimeters; dimensions in parentheses are in inches. 4. All information in table taken directly from MUTCD. 				

TOWN OF BISCOE

Regulatory Signs



School, Warning, and Informational Signs



Warning signage is used to inform motorists and pedestrians of unexpected or unusual conditions. When used, they should be placed to provide adequate response times. These include school warning signs and pedestrian crossing signs.

Below: Wayfinding signs promote aesthetics as well as provide important information (image from Stefton, UK: <http://www.sefton.gov.uk>)

Informational and wayfinding signage can provide information providing guidance to a location along a trail or other pedestrian facility. Wayfinding signage should orient and communicate in a clear, concise and functional manner. It should enhance pedestrian circulation and direct visitors and residents to important destinations. In doing so, the goal is to increase the comfort of visitors and residents while helping to convey a local identity.

Maintenance of signage is as important as walkway maintenance. Clean, graffiti free, and relevant signage enhances guidance, recognition, and safety for pedestrians.



BRIDGES

Provisions should always be made to include a walking facility as a part of vehicular bridges, underpasses, or tunnels, especially if the facility is part of the Pedestrian Network. All new or replacement bridges, other than those for controlled access roadways, should accommodate pedestrians with wide sidewalks on both sides of the bridge. Even though bridge replacements do not occur regularly, it is important to consider these in longer-term pedestrian planning.

Sidewalks along bridges are more difficult to design because overall space is at a premium and the edges of the sidewalk are limited by the roadway and a railing. Where practical, pedestrians should not be forced to walk uncomfortably close to a railing, and a protective barrier may be desirable at the curb.

It is DOT bridge policy that within Urban Area boundaries (which are ambiguously defined as the “outer limits of potential urban growth”), sidewalks shall be included on new bridges with curb and gutter approach roadways with no controlled access. Sidewalks should not be included on controlled access facilities. A determination on whether to provide sidewalks on one or both sides of new bridges will be made during the planning process according to the DOT Pedestrian Policy Guidelines. When a sidewalk is justified, it should be a minimum of five to six feet wide with a minimum handrail height of 42”.

It is also DOT bridge policy that bridges within the Federal-aid urban boundaries with rural-type roadway sections (shoulder approaches) may warrant special consideration. To allow for future placement of ADA acceptable sidewalks, sufficient bridge deck width (typically 7.5’ for one side) should be considered on new bridges in order to accommodate the placement of sidewalks. The full Bridge Policy for NCDOT can be download as a Microsoft Word document at this address:

www.ncdot.org/doh/preconstruct/altern/value/manuals/bpe2000.doc

BRIDGE GUIDELINES:

- Sidewalks should be included on roadway bridges with no controlled access with curb and gutter approach in Urban Areas.
- Sufficient bridge deck width should be considered on new bridges with rural-type shoulder approaches for future placement of sidewalks.
- Sidewalk should be at least 5' to 6' wide. 8' is desirable.
- Minimum handrail height should be 42".
- A wall, bollards, or fencing may be used to separate the sidewalk and the roadway.

TOWN OF BISCOE

RECTANGULAR RAPID FLASH BEACON (RRFB)

Also known as “Light Emitting Diode (LED) Rapid-Flash System”, “Stutter Flash” or “LED Beacons”, 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 an irregular flash pattern that is similar to emergency flashers on police vehicles and may be installed on either two-lane or multi-lane roadways.

An official FHWA-sponsored experimental implementation and evaluation conducted in St. Petersburg, Florida found that RRFBs at pedestrian crosswalks are dramatically more effective at increasing driver yielding rates to pedestrians than traditional overhead beacons.

RRFB GUIDELINES:

- Currently, state and federal approval is required for use.
- Flashers should only flash during the times when crossings occur). This can be done with a time clock, pedestrian push button to activate the flasher, or through automatic pedestrian detection devices.
- RRFBs can also use use automated passive (e.g., video or infrared) pedestrian detection, and should be unlit when not activated.
- RRFBs typically receive power by standalone solar panel units, but may also be wired to a traditional power source.
- Warning flashers can be mounted over the road or along the side of the road, and when used should be used in conjunction with advance warning signs
-

HIGH INTENSITY ACTIVATED CROSSWALK (HAWK)

The FHWA's Office of Safety Research recently completed a report on the High Intensity Activated Crosswalk (HAWK)— also known as the Pedestrian Hybrid Signal in the Manual on Uniform Traffic Control Devices (MUTCD). The HAWK is a pedestrian activated beacon located on the roadside and on mast arms over major approaches to an intersection. The HAWK signal head consists of two red lenses over a single yellow lens. It displays a red indication to drivers when activated, which creates a gap for pedestrians to use to cross a major roadway. The HAWK is not illuminated until it is activated by a pedestrian, triggering the warning flashing yellow lens on the major street. From the evaluation that considered data for 21 HAWK sites and 102 unsignalized intersections, the following changes in crashes were found after the HAWK was installed: a 29 percent reduction in total crashes, a 15 percent reduction in severe crashes, and a 69 percent reduction in pedestrian crashes. The HAWK is now an MUTCD approved device, so a request for experimentation is not necessary. For more details, visit this website: <http://mutcd.fhwa.dot.gov/htm/2009/part4/part4f.htm> (Source: FHWA Office of Safety, Pedestrian Forum, Fall 2010)



Activated, solar-powered, roadside RRFB at a mid-block crosswalk.

The MUTCD gave interim approval to RRFBs for optional use in limited circumstances in July 2008. The interim approval allows for usage as a warning beacon to supplement standard pedestrian crossing warning signs and markings at either a pedestrian or school crossing; where the crosswalk approach is not controlled by a yield sign, stop sign, or traffic-control signal; or at a crosswalk at a roundabout.

The MUTCD interim approval memo also contains other provisions for the implementation of the device and should be reviewed. For more details, see the see 2009 MUTCD, page 523, Section 4L.03

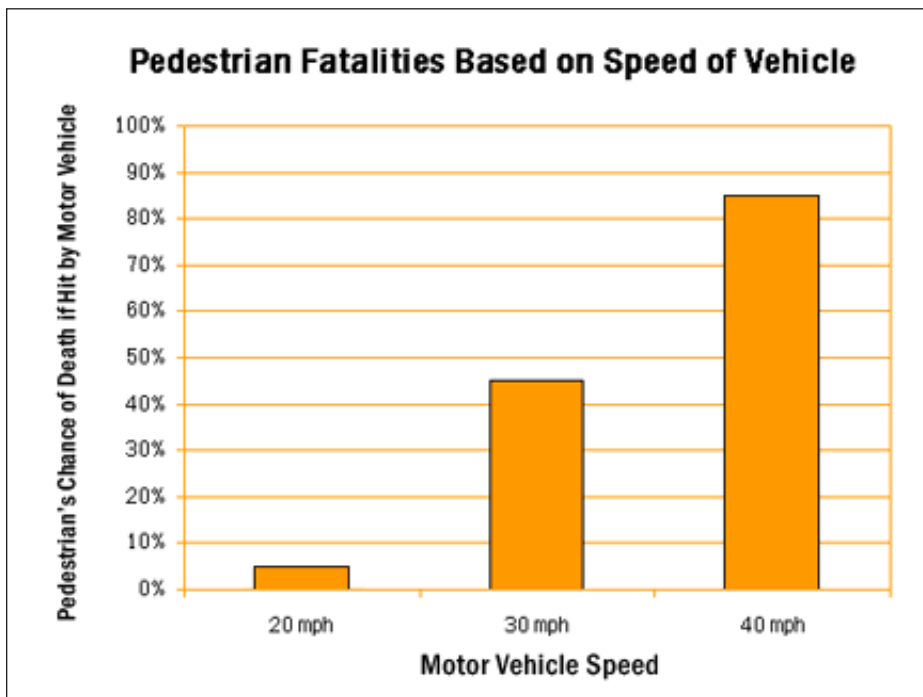


Above: HAWK signal.

6.5 TRAFFIC CALMING TREATMENTS

Traffic calming is a procedure in which the arrangement of the street and its elements encourages slower traffic to ensure safe speeds. Typically, compliance with traffic control devices are optional but with the use of physical and visual cues that traffic calming introduces, drivers are forced to respond to the calming procedures.

Research on effective traffic calming in the U.S. suggests that traffic calming can effectively reduce the speed of vehicular traffic, decrease the number of automobile accidents, and contribute to noise reduction. Research also supports that the use of multiple traffic calming procedures will exponentially reduce the number of crashes.



Above: Graph from Killing Speed and Saving Lives, U.K. Department of Transportation, London, 1987.

Right: Example of multi-modal intersection with traffic calming elements.





The curb extension makes motorists reduce speeds for turning and provides street parking.

CURB EXTENSIONS (BULB OUTS)

A curb extension (also known as a bulb out) is the additional sidewalk space allocated along the street as a traffic calming measure. By extending the curb, the street becomes more narrow to vehicular traffic thus slowing down traffic speeds. The curb extension also reduces the crossing distance for a pedestrian decreasing the time of a pedestrian in the street. The extension also improves the visibility of both motorists and pedestrians.

Curb extensions also prevent motorists from parking vehicles too close to crosswalks and curb ramps leaving the space open for pedestrian movement. Motor vehicles, parked too close to corners, present a threat to pedestrian safety, since they block sight lines, obscure visibility of pedestrians and other vehicles, and make turning particularly difficult for emergency vehicles and trucks.

Extensions to the curb are only recommended where parking exists. Curb extensions must not intervene with the adjacent drive lanes, bicycle lanes, or roadway shoulders. The turning needs of larger vehicles, such as school buses, need to be considered in curb extension design as well.



The curb extension narrows the width of the street and can be used in combination with crosswalk markings.

CHOKERS

Chokers are a design tool used to widen sidewalks or planting beds along vehicular corridors to decrease the width of the travel lane. By narrowing the street, effectively reducing the travel lanes by half of a lane wide, the choker forces motorist to yield to each other and slow down. In order for this to function effectively, the width of the travel lane cannot be wide enough for two cars to pass. Sixteen feet is typically effective (and will permit emergency vehicles to pass unimpeded).

Chokers can be created by bringing both curbs in, or they can be done by more dramatically widening one side at a midblock location. They can also be used at intersections, creating a gateway effect when entering a street.



The choker produces a narrow passage for vehicular traffic.

This choker narrows the street from two lanes to one. Traffic is forced to slow down and, in some cases, wait for an approaching vehicle to pass before proceeding.



CROSSING ISLANDS (CENTER ISLANDS, PEDESTRIAN ISLANDS, MEDIAN SLOW POINTS)



Crossing islands allow pedestrians to be concerned with one direction of traffic at a time. The roadway markings in the design shown here also help make motorists aware that a pedestrian may be crossing.

Crossing islands are pedestrian refuge areas raised to curb height typically located in the center of street, intersections or midblock crossways. Center crossing islands protect pedestrians from vehicles and subsequently allow users to watch one direction of traffic at a time.

Where midblock or intersection crosswalks are installed at uncontrolled locations (i.e., where no traffic signals or stop signs exist), crossing islands should be considered as a supplement to the crosswalk. They are also appropriate at signalized crossings. If there is enough width, center crossing islands and curb extensions can be used together to create a highly improved pedestrian crossing.

Curb extensions may be built in conjunction with center crossing islands where there is street parking. Care should be taken to maintain bicycle access. Bicycle lanes must not be eliminated or squeezed in order to create the curb extensions or islands.



Crossing islands may be added to the middle of a street when the street is very wide.



Crossing island allows pedestrians to stop before completely crossing a road.

CHICANE

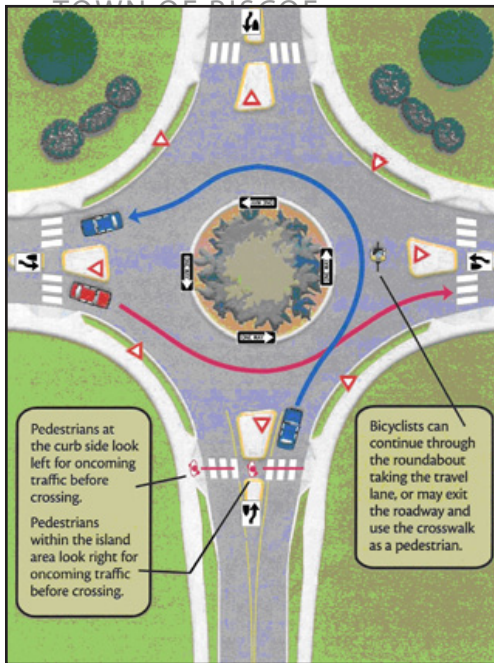
A chicane is a traffic method used to narrow and/or turn the roadway with the use of divergent paths and shifting parking lanes. When motorists are prevented from driving in a direct linear fashion, their speeds are normally reduced. Using chicanes is a successful way to force motorists to shift travel lanes and restrict direct forward movement. Shifts can be created by moving street parking from one side to the other or by building landscaped islands that gradually cause the motorist to maneuver the obstacles in order to continue progression.



A chicane on a one-lane road.



This chicane narrows the street to fewer lanes and requires traffic to move slowly.



Movement within a roundabout.



A traffic mini-circle helps reduce vehicle speeds, but still allows cars and emergency vehicles to pass through the intersection with little difficulty.



Roundabouts (and other circular intersection types) allow for landscaping, monuments, and other aesthetic uses within the central island.

MINI CIRCLES (ROUNDBABOUTS)

Mini-circles are traffic islands raised to curb height, located at the center of an intersection. The design of a mini-circle is intended to force motorists to reduce speed in order to turn in a circular motion. Drivers making left turns are directed to go on the far side of the circle prior to making the turn. Drivers going straight must go around the circle before proceeding. And drivers going right must yield to traffic that is in the mini-circle.

The center portion of the mini-circle is usually landscaped with various plant materials that allow motorists and pedestrians clear sights to all sides of the intersection. In locations where landscaping is not feasible, traffic circles can be enhanced through specific pavement materials.

Mini-circles are designed to slow traffic but because they do not have the capability of controlling right turns at the intersection, pedestrians and cyclists do encounter potential risk. In order to compensate for this risk, right curb radii should complement this treatment to discourage high speed right turn maneuvers. Large vehicles (i.e. delivery and fire trucks) can be accommodated with a roll-curb on the mini-circle.

Cyclist and pedestrian needs can also be accommodated by moving crosswalks away from the mini-circle to a mid-block crossing or next intersection.



Vehicles entering the roundabout give way to vehicles in the roundabout.

SPEED HUMPS

Speed humps are 3"-4" raised mounds that extend the width of the street to deter motorists from excessive speeds. Speed humps should not be confused with the speed "bump" that is often found in mall parking lots. Generally, speed humps are 12 feet to 14 feet in length and span the width of the road. The length and height of the speed humps determine the speed at which traffic will travel over the devices. Shorter lengths and greater heights slow cars most drastically.

The traditional 12 foot hump has a design speed of 15 to 20 mph, a 14 foot hump a few miles per hour higher, and a 22 foot table has a design speed of 25 to 30 mph. The longer humps are much gentler for larger vehicles.

A warning sign notifies motorists before humps. Humps generally have pavement markings to enhance visibility and a taper edge near the curb to allow a gap for drainage.



Speed humps are used on streets to reduce speed, causing motorists to slow down.

STOP SIGNS

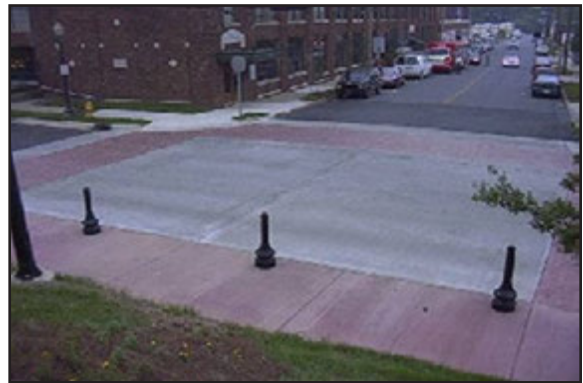
Simple stop signs are an alternative to speed humps. These may be preferred by local residents and by emergency responders such as fire departments. Stop signs can produce a similar result to speed humps by forcing motorists to slow down frequently along a given roadway. The spacing of stop signs is important to not allow motorists to reach high speeds in between the stop signs.

RAISED INTERSECTION

A raised intersection is a speed table that spans the area of the entire intersection. Each side of the intersection has a ramp for the vehicle approach, which elevates the entire intersection to the level of the sidewalk. They can be built with a variety of materials, including asphalt, concrete, stamped concrete, or pavers. The crosswalks on each approach are also elevated as part of the treatment to enable pedestrians to cross the road at the same level as the sidewalk, eliminating the need for curb ramps. Use detectable warnings to mark the boundary between the sidewalk and the street.



A raised intersection slows all vehicular movements through the intersection and improves pedestrian crossings in all directions.



The raised intersection above enhances the pedestrian environment at the urban crossings.



Raised intersections, like the one above, reduce vehicle speeds at busy intersections.

RAISED PEDESTRIAN CROSSING

A raised pedestrian crossing is also a speed table, with a flat portion the width of a crosswalk, usually 10 feet to 15 feet. Raised intersections and crosswalks encourage motorists to yield to the vehicular ramp and elevated pedestrians.



A raised pedestrian crossing provides a continuous route for the pedestrian at the same level as the sidewalk. Pavement markings may be used on the slope to make the crossing visible to motorists.



The raised crosswalk helps reduce vehicle speeds and the measures tend to have a predictable speed reduction solution.

SPEED TABLE

A speed table is a broad portion of a speed hump, used as a pedestrian crossing. The speed table can either be parabolic, making it more like a speed hump, or trapezoidal, which creates the flat table like surface. Speed tables can be used in combination with curb extensions where street parking exists.



The speed table (above) causes less of a delay than humps and are typically preferred by fire departments over speed humps.



The speed table design (above) allows cars to pass without slowing as significantly as with speed humps.

GATEWAYS

A gateway is a physical landmark that indicates a change in environment from a higher speed major roadway to a minor road (lower speed district). Gateways can include different traffic calming techniques such as of street narrowing, medians, signing, archways, roundabouts, or other identifiable features. Gateways reveal to motorist that an area of slower speeds has been reached. This can help achieve the goal of meeting expectations and preparing motorists for a different driving environment. Gateways are only an introduction and slower speeds are not likely to be maintained unless the entire area has been redesigned or other traffic-calming features are used.



Gateways produce an expectation for motorists to drive more slowly and watch for pedestrians when entering a commercial, business, or residential district from a higher speed roadway.

Creative gateways help establish a unique image for an area.



LANDSCAPING

Landscaping along the corridor can work as a buffer to separate pedestrians from vehicles, reduce the visual width of the roadway (which encourages slower speeds), and provide an aesthetic appeal to the street. This can include a variety of trees, bushes, and/or flowerpots, which can be planted in the buffer area between the sidewalk or walkway and the street.

Choosing appropriate plants, providing adequate space for maturation, and preparing the ground can help ensure that the plants survive with minimal maintenance and don't buckle the sidewalks as they mature. The following guidelines should be considered: plants should be adapted to the local climate and fit the character of the surrounding area—they should survive without protection or intensive irrigation; and the plant's growth patterns should not obscure signs or pedestrians' and motorists' views of each other.



The landscaping enhances the street environment.



The landscaping on this street calms traffic by creating a visual narrowing of the roadway.



Landscaping with low shrubs, ground cover, and mature trees that are properly pruned can add shade, color, and visual interest to a street.

PAVING MATERIALS

Paving materials are important to the function and look of a street, both in the road and on the sidewalk. Paving materials can also increase crosswalk visibility and act as a physical traffic calming device when using paved brick or cobblestone. Textured crosswalks should be marked with reflective lines since these types of crosswalks are not as visible, especially at night or on rainy days.

Smooth travel surfaces are best for all pedestrians. The pedestrian path material should be firm, planar, and slip-resistant. Concrete is the preferred walking surface. A different look can be achieved by using stamped concrete or concrete pavers, which are available in a variety of colors and shapes. Colored paving can often enhance the function of portions of the roadway, such as a colored bicycle lane. This can create the perception of street narrowing, in addition to enhancing the travel facility for bicyclists.



Brick or cobblestone streets help slow traffic and create a feeling that the street is not a highway or fast-moving arterial.



This paving creates an aesthetic enhancement to the street.

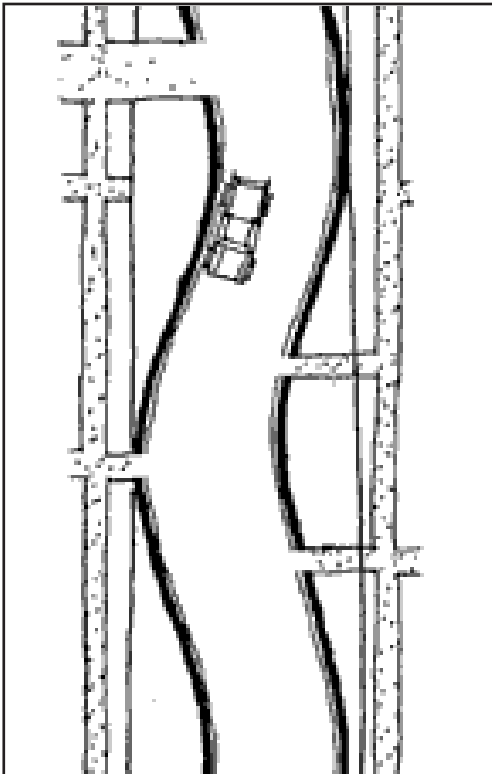
SERPENTINE DESIGN

Serpentine roadway design is when a street is aligned in a wave fashion to shift traffic left and right with the use of built-in visual enhancements. This allows movement but forces vehicles to reduce speed. The opportunities for significant landscaping can be used to create a park-like atmosphere.

Such designs are usually implemented with construction of a new neighborhood street or during reconstruction of an existing street corridor. This type of design can be more expensive than other traffic-calming options and needs to be coordinated with driveway access.



The serpentine street is a curving roadway that helps slow traffic through the use of curbs and landscaping.



The serpentine design changes the entire look of a street to send a message to drivers that the road is not for fast driving.



The opportunities for significant landscaping can be used to create a park-like atmosphere.

WOONERF

A woonerf (“Street for living”) is a Dutch term for a common space created to be shared by pedestrians, bicyclists, and low-speed motor vehicles.

They are typically narrow streets without curbs and sidewalks. Vehicles are slowed by placing trees, planters, parking areas, and other obstacles in the street. Motorists become the intruders and must travel at very low speeds below 10 mph. This makes a street available for public use that is essentially only intended for local residents. A woonerf identification sign is placed at each street entrance.

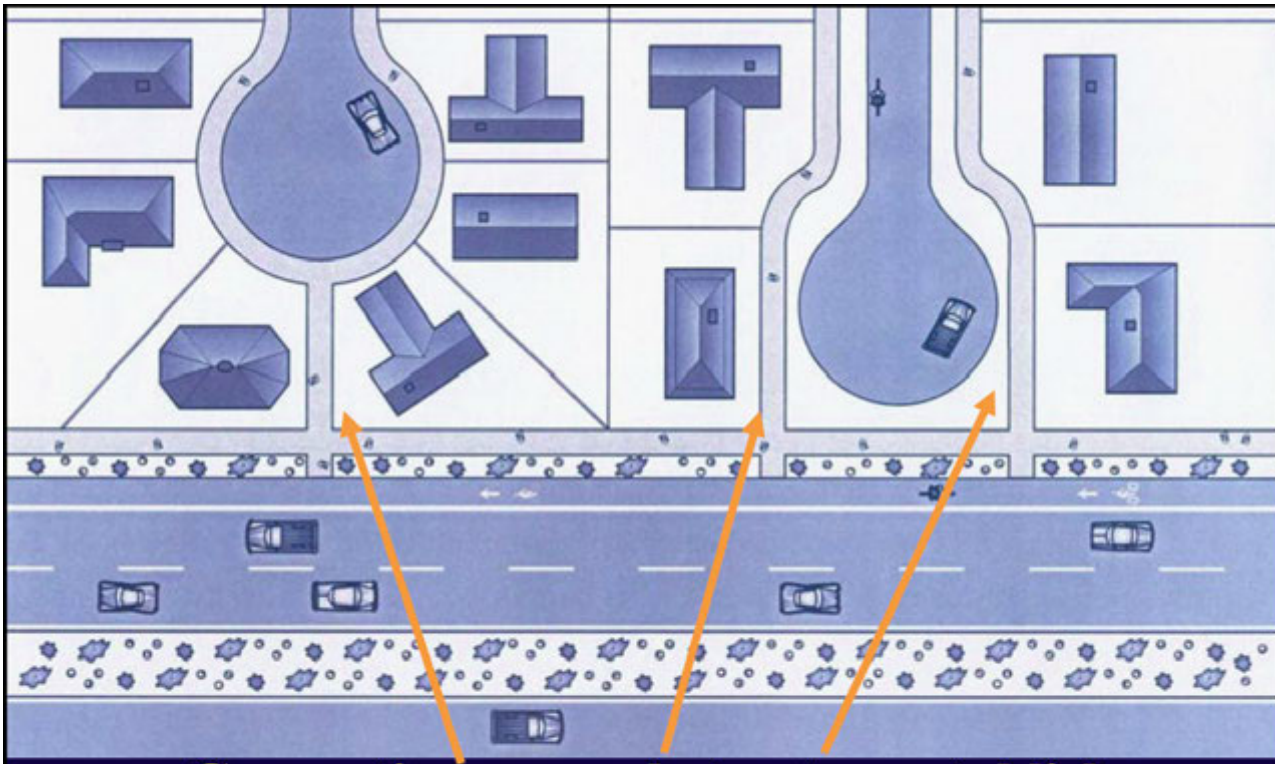
Consideration must be given to provide access by fire trucks, sanitation vehicles and other service vehicles if needed.



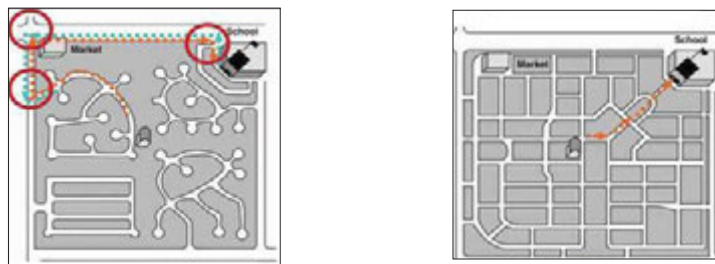
Motorists, cyclists, and pedestrians share the space on this woonerf or living street.

6.6 LAND USE AND PEDESTRIAN TRAVEL

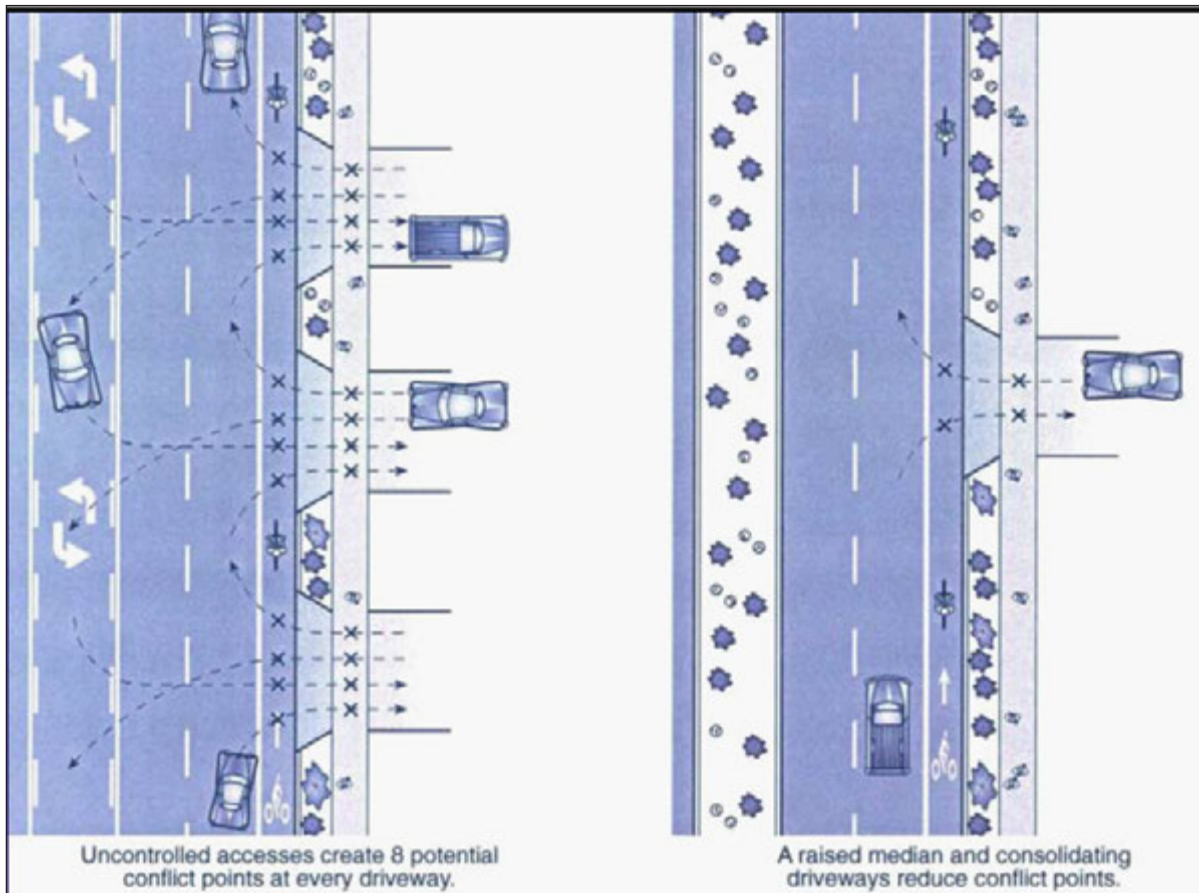
The land use and development environment plays a major role in the walkability of an area. The following are brief examples of the importance of connectivity, not only along corridors and across roadways, but also between neighborhoods and into commercial sites.



The above example shows the effectiveness of connecting a traditional cul-de-sac neighborhood to a collector or arterial road.



The above example communicates the difference between a connected street and pedestrian network (on right) versus separated cul-de-sac neighborhoods. A person living in the scenario to the right will have a longer trip to school and will likely be forced to travel by automobile. A person living in the scenario could walk to school safely and easily. This scenario, used consistently, would significantly reduce traffic.



Driveway access management is a key issue throughout the United States. A high number of driveway accesses and/or wide driveway accesses create more conflict points between motorists, bicyclists, and pedestrians. The Town of Biscoe should attempt to retrofit and build new development with the goal of achieving the scenario to the right.



Pedestrian connectivity is critical not only between destinations but within destinations. The example shown above shows an excellent commercial area with clear pedestrian pathways of travel.

Appendix A: Public Input This appendix provides a summary of public input received during this planning process.



A.0 OVERVIEW

Public input was received and incorporated into the development of this Plan. Input came through two mechanisms: a citizen and staff-based Steering Committee, and a public workshop.

A.1 CITIZEN AND STAFF-BASED STEERING COMMITTEE

This committee, composed of citizens and Town staff, met twice during the planning process. The group established visions and goals for the Plan, identified areas of need in the Biscoe area, and provided comment on draft recommendations. Members of the Committee marked up maps and identified pedestrian problem areas and possible solutions. The goals are listed in Chapter 1 and input from the Committee is reflected throughout the recommendations of this planning document.

The Steering Committee also provided comment on the Draft Plan. These comments led to revisions made by the Consultant in the development of the Final Plan.

A.2 PUBLIC WORKSHOP

The public were invited to a meeting of the Parks and Recreation Advisory Board in April 2011. Approximately 10 Biscoe citizens, including Committee members, attended the public workshop. Town staff and citizens were present to receive a presentation about the Draft Pedestrian Plan recommendations and provide comment. Comments were addressed during the development of this Plan.

CHAPTER OUTLINE:

A.0 OVERVIEW

A.1 CITIZEN AND STAFF-BASED STEERING COMMITTEE

A.2 PUBLIC WORKSHOP



Committee members review a base map during the kickoff meeting, identifying areas where pedestrian improvements are needed.



Photos from the public workshop event in April 2011.



Appendix B: State and Federal Policies

This appendix provides a summary of state and federal policies as they relate to the incorporation of bicycle and pedestrian facility development as part of a comprehensive transportation approach.



B.0 OVERVIEW

A number of federal and state pedestrian policies have been developed in recent years. This appendix covers a number of these policies that are intended to better integrate walking and bicycling into transportation infrastructure.

B.1 UNITED STATES DEPARTMENT OF TRANSPORTATION BICYCLE AND PEDESTRIAN POLICY

A United States Department of Transportation (US DOT) policy statement regarding the integration of bicycling and walking into transportation infrastructure recommends that, "bicycling and walking facilities will be incorporated into all transportation projects" unless exceptional circumstances exist. The Policy Statement was drafted by the U.S. Department of Transportation in response to Section 1202 (b) of the Transportation Equity Act for the 21st Century (TEA-21) with the input and assistance of public agencies, professional associations and advocacy groups. USDOT hopes that public agencies, professional associations, advocacy groups, and others adopt this approach as a way of committing themselves to integrating bicycling and walking into the transportation mainstream. The full statement reads as follows, with some minor adjustments for applicability in Biscoe:

1. Bicycle and pedestrian ways shall be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:

- Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right of way or within the same transportation corridor.
- The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Excessively disproportionate is defined as exceeding twenty percent

CHAPTER OUTLINE:

B.0 OVERVIEW

B.1 USDOT BICYCLE AND PEDESTRIAN POLICY

B.2 USDOT 2010 POLICY STATEMENT

B.3 FHWA MEMORANDUM

B.4 NCDOT 2009 COMPLETE STREETS POLICY

B.5 NCDOT BOARD OF TRANSPORTATION RESOLUTION

B.6 NCDOT ADMINISTRATIVE ACTION

B.7 GUIDELINES FOR NCDOT

B.8 NCDOT PEDESTRIAN POLICY GUIDELINES

B.9 NCDOT's TND STREET DESIGN GUIDELINES

B.10 NCDOT ONLINE RESOURCES LIST

of the cost of the larger transportation project.

- Where sparsity of population or other factors indicate an absence of need. For example, on low volume, low speed residential streets, or streets with severe topographic or natural resource constraints.

2. In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day. Paved shoulders have safety and operational advantages for all road users in addition to providing a place for bicyclists and pedestrians to operate. Rumble strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of four feet in which a bicycle may safely operate.

3. Sidewalks, shared use paths, street crossings (including over- and undercrossings), pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated and maintained so that all pedestrians, including people with disabilities, can travel safely and independently.

4. The design and development of the transportation infrastructure shall improve conditions for bicycling and walking through the following additional steps:

- Planning projects for the long-term. Transportation facilities are long-term investments that remain in place for many years. The design and construction of new facilities that meet the criteria in item 1) above should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements. For example, a bridge that is likely to remain in place for 50 years, might be built with sufficient width for safe bicycle and pedestrian use in anticipation that facilities will be available at either end of the bridge even if that is not currently the case.

- Addressing the need for bicyclists and pedestrians to cross corridors as well as travel along them. Even where bicyclists and pedestrians may not commonly use a particular travel corridor that is being improved or constructed, they will likely need to be able to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible and convenient.

- Getting exceptions approved at a senior level. Excep-

tions for the non-inclusion of bikeways and walkways shall be approved by a senior manager and be documented with supporting data that indicates the basis for the decision.

- Designing facilities to the best currently available standards and guidelines. The design of facilities for bicyclists and pedestrians should follow design guidelines and standards that are commonly used, such as the AASHTO Guide for the Development of Bicycle Facilities, AASHTO's A Policy on Geometric Design of Highways and Streets, and the ITE Recommended Practice "Design and Safety of Pedestrian Facilities. (Many of these guidelines are summarized in Chapter 4: Bicycle Facility Standards)

(Retrieved from <http://www.fhwa.dot.gov/environment/bikeped/design.htm> on 5/6/2008)

B.2 United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations (March 2010)

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.

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; 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 Transportation

B.3 FHWA MEMORANDUM ON MAINSTREAMING BICYCLE AND PEDESTRIAN PROJECTS

(See pages B-8 through B-10)




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Environment

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**U.S. Department of
Transportation
Federal Highway Administration**

Memorandum

Subject: ACTION: Transmittal of Guidance on Bicycle and Pedestrian Provisions of the Federal-aid Program

Date: February 24, 1999

From: Kenneth R. Wykle
Federal Highway Administrator

**In reply, HEPH-30
refer to:**

To:
Division Administrators
Federal Lands Highway Division Engineers

This memorandum transmits the Federal Highway Administration's (FHWA) Guidance on the Bicycle and Pedestrian Provisions of the Federal-aid Program and reaffirms our strong commitment to improving conditions for bicycling and walking. The nonmotorized modes are an integral part of the mission of FHWA and a critical element of the local, regional, and national transportation system. Bicycle and pedestrian projects and programs are eligible for but not guaranteed funding from almost all of the major Federal-aid funding programs. We expect every transportation agency to make accommodation for bicycling and walking a routine part of their planning, design, construction, operations and maintenance activities.

The Transportation Equity Act for the 21st Century (TEA-21) continues the call for the mainstreaming of bicycle and pedestrian projects into the planning, design, and operation of our Nation's transportation system. Under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Federal spending on bicycle and pedestrian improvements increased from \$4 million annually to an average of \$160 million annually. Nevertheless, the level of commitment to addressing the needs of bicyclists and pedestrians varies greatly from State to State.

The attached guidance explains how bicycle and pedestrian improvements can be routinely included in federally funded transportation projects and programs. I would ask each division office to pass along this guidance to the State DOT and to meet with them to discuss ways of expediting the implementation of bicycle and pedestrian projects. With the guidance as a basis for action, States can then decide the most appropriate ways of mainstreaming the inclusion of bicycle and pedestrian projects and programs.

Bicycling and walking contribute to many of the goals for our transportation system we have at FHWA and at the State and local levels. Increasing bicycling and walking offers the potential for cleaner air, healthier people, reduced congestion, more liveable communities, and more efficient use of precious road space and resources. That is why funds in programs such as Congestion Mitigation and Air Quality Improvement, Transportation Enhancements, and the National Highway System, are eligible to be used for bicycling and

walking improvements that will encourage use of the two modes.

We also have a responsibility to improve the safety of bicycling and walking as the two modes represent more than 14 percent of the 41,000 traffic fatalities the nation endures each year. Pedestrian and bicycle safety is one of FHWA's top priorities and this is reflected in our 1999 Safety Action Plan. As the attached guidance details, TEA-21 has opened up the Hazard Elimination Program to a broader array of bicycle, pedestrian, and traffic calming projects that will improve dangerous locations. The legislation also continues funding for critical safety education and enforcement activities under the leadership of the National Highway Traffic Safety Administration. If we are successful in improving the real and perceived safety of bicyclists and pedestrians, we will also increase use.

You will see from the attached guidance that the Federal-aid Program, as amended by TEA-21, offers an extraordinary range of opportunities to improve conditions for bicycling and walking. Initiatives such as the Transportation and Community and System Preservation Pilot Program and the Access to Jobs program offer exciting new avenues to explore.

Bicycling and walking ought to be accommodated, as an element of good planning, design, and operation, in all new transportation projects unless there are substantial safety or cost reasons for not doing so. Later this year (1999), FHWA will issue design guidance language on approaches to accommodating bicycling and pedestrian travel that will, with the cooperation of AASHTO, ITE, and other interested parties, spell out ways to build bicycle and pedestrian facilities into the fabric of our transportation infrastructure from the outset. We can no longer afford to treat the two modes as an afterthought or luxury.

The TEA-21 makes a great deal possible. However, in the area of bicycling and walking in particular, we must work hard to ensure good intentions and fine policies translate quickly and directly into better conditions for bicycling and walking. While FHWA has limited ability to mandate specific outcomes, I am committed to ensuring that we provide national leadership in three critical areas.

- The FHWA will encourage the development and implementation of bicycle and pedestrian plans as part of the overall transportation planning process. Every statewide and metropolitan transportation plan should address bicycling and walking as an integral part of the overall system, either through the development of a separate bicycle and pedestrian element or by incorporating bicycling and walking provisions throughout the plan. Further, I am instructing each FHWA division office to closely monitor the progress of projects from the long-range transportation plans to the STIPs and TIPs. In the coming months, FHWA will disseminate exemplary projects, programs, and plans, and we will conduct evaluations in selected States and MPOs to determine the effectiveness of the planning process.
- The FHWA will promote the availability and use of the full range of streamlining mechanisms to increase project delivery. The tools are in place for States and local government agencies to speed up the delivery of bicycle and pedestrian projects - it makes no sense to treat installation of a bicycle rack or curb cut the same way we treat a new Interstate highway project - and our division offices must take a lead in promoting and administering these procedures.
- The FHWA will help coordinate the efforts of Federal, State, metropolitan, and other relevant agencies to improve conditions for bicycling and walking. Once again, our division offices must ensure that those involved in implementing bicycle and pedestrian projects at the State and local level are given maximum opportunity to get their job done, unimpeded by regulations and red tape from the Federal level. I am asking each of our division offices to facilitate a dialogue among each State's bicycle and pedestrian coordinator, Transportation Enhancements program manager, Recreational Trails Program administrator, and their local and FHWA counterparts to identify and remove obstacles to the implementation of bicycle and pedestrian projects and programs.

In less than a decade, bicycling and walking have gone from being described by my predecessor Tom Larson as "the forgotten modes" to becoming a serious part of our national transportation system. The growing acceptance of bicycling and walking as modes to be included as part of the transportation mainstream started with passage of ISTEA in 1991 and was given a considerable boost by the Congressionally-mandated National Bicycling and Walking Study. That study, released in 1994, challenges the U.S. Department of Transportation to double the percentage of trips made by foot and bicycle while simultaneously reducing fatalities and injuries suffered by these modes by 10 percent - and we remain committed to achieving these goals.

The impetus of ISTEA and the National Bicycling and Walking Study is clearly reinforced by the bicycle and pedestrian provisions of the TEA-21. The legislation confirms the vital role bicycling and walking must play in creating a balanced, accessible, and safe transportation system for all Americans.

[FHWA Guidance \(1999\)](#) - Bicycle and Pedestrian Provisions of Federal Transportation Legislation

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United States Department of Transportation - **Federal Highway Administration**

B.4 NCDOT JULY 2009 BOARD OF TRANSPORTATION: DIVISION OF BICYCLE AND PEDESTRIAN TRANSPORTATION COMPLETE STREETS POLICY

A. Definition

Complete Streets is North Carolina's approach to interdependent, multi-modal transportation networks that safely accommodate access and travel for all users.

B. 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 may be excluded from this requirement; if an appropriate source of funding is not available.

C. Purpose

This policy sets forth the protocol for the development of transportation networks that encourage non-vehicular travel without compromising the safety, efficiency, or function of the facility. The purpose of this policy is to 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.

D. Scope and Applicability

This policy generally applies to facilities that exist in urban or suburban areas, however it does not necessarily exclude rural setting; and is viewed as a network that functions in an interdependent manner.

There are many factors that must be considered when defining the facility and the degree to which this policy applies, e.g., number of lanes, design speeds, intersection spacing, medians, curb parking, etc. Therefore, the applicability of this policy, as stated, should be construed as neither comprehensive nor conclusive. Each facility must be evaluated for proper applicability.

Notwithstanding the exceptions stated herein, all transportation facilities within a growth area of a town or city funded by or through NCDOT, and planned, designed, or constructed on state maintained facilities, must adhere to this policy.

E. Approach

It is the Department's commitment to collaborate with cities, towns, and communities to ensure pedestrian, bicycle, and transit options are included as an integral part of their total transportation vision. As a partner in the development and realization of their visions, the Department desires to assist localities, through the facilitation of long-range planning, to optimize connectivity, network interdependence, context sensitive options, and multimodal alternatives.

F. Related Policies

This policy builds on current practices and encourages creativity

for considering and providing multi-modal options within transportation projects, while achieving safety and efficiency.

Specific procedural guidance includes:

- Bicycle Policy (adopted April 4, 1991)
- Highway Landscape Planting Policy (dated 6/10/88)
- Board of Transportation Resolution: Bicycling & Walking in North Carolina, A Critical Part of the Transportation System (adopted September 8, 2000)
- Guidelines for Planting within Highway Right-of-Way
- Bridge Policy (March 2000)
- Pedestrian Policy Guidelines – Sidewalk Location (Memo from Larry Goode, February 15, 1995)
- Pedestrian Policy Guidelines (effective October 1, 2000 w/ Memo from Len Hill, September 28, 2000)
- NCDOT Context Sensitive Solutions Goals and Working Guidelines (created 9-23-02; updated 9-8-03)

G. Exceptions to Policy

It is the Department's expectation that suitable multimodal alternatives will be incorporated in all appropriate new and improved infrastructure projects. However, exceptions to this policy will be considered where exceptional circumstances that prohibit adherence to this policy exist. Such exceptions include, but are not limited to:

- facilities that prohibit specific users by law from using them,
- areas in which the population and employment densities or level of transit service around the facility does not justify the incorporation of multimodal alternatives,

It is the Department's expectation that suitable multimodal alternatives will be incorporated as appropriate in all new and improved infrastructure projects within a growth area of a town or city.

As exceptions to policy requests are unique in nature, each will be considered on a case-by-case basis. Each exception must be approved by the Chief Deputy Secretary.

Routine maintenance projects maybe excluded from this requirement; if an appropriate source of funding is not available.

H. Planning and Design Guidelines

The Department recognizes that a well-planned and designed transportation system that is responsive to its context and meets the needs of its users is the result of thoughtful planning. The Department further recognizes the need to provide planners, designers and decision-makers with a framework for evaluating and incorporating various design elements into the planning, design, and construction phases of its transportation projects. To this end, a multi-disciplined team of stakeholders, including transportation professionals, interest groups, and others, as appropriate, will be assembled and charged with developing comprehensive planning and design guidelines to support this policy.

These guidelines will describe the project development process and incorporate transparency and accountability where it does not currently exist; describe how (from a planning and design perspective) pedestrians, bicyclists, transit, and motor vehicles will share roads safely; and provide special design elements and traffic management strategies to address unique circumstances.

An expected delivery date for planning and design guidelines will be set upon adoption of this policy.

I. Policy Distribution

It is the responsibility of all employees to comply with Departmental policies. Therefore, every business unit and appropriate private service provider will be required to maintain a complete set of these policies. The Department shall periodically update departmental guidance to ensure that an accurate and up-to-date information is maintained and housed in a policy management system.

B.5 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION BOARD OF TRANSPORTATION RESOLUTION: BICYCLING AND WALKING IN NORTH CAROLINA. A CRITICAL PART OF THE TRANSPORTATION SYSTEM
(ADOPTED BY THE BOARD OF TRANSPORTATION ON SEPTEMBER 8, 2000)

The North Carolina Board of Transportation strongly reaffirms its commitment to improving conditions for bicycling and walking, and recognizes nonmotorized modes of transportation as critical elements of the local, regional, and national transportation system.

WHEREAS, increasing bicycling and walking offers the potential for cleaner air, healthier people, reduced congestion, more liveable communities, and more efficient use of road space and resources; and

WHEREAS, crashes involving bicyclists and pedestrians represent more than 14 percent of the nation's traffic fatalities; and

WHEREAS, the Federal Highway Administration (FHWA) in its policy statement "Guidance on the Bicycle and Pedestrian Provisions of the Federal-Aid Program" urges states to include bicycle and pedestrian accommodations in its programmed highway projects; and

WHEREAS, bicycle and pedestrian projects and programs are eligible for funding from almost all of the major Federal-aid funding programs; and

WHEREAS, the Transportation Equity Act for the 21st Century (TEA-21) calls for the mainstreaming of bicycle and pedestrian projects into the planning, design and operation of our Nation's transportation system;

NOW, THEREFORE, BE IT RESOLVED, the North Carolina Board of Transportation concurs that bicycling and walking accommodations shall be a routine part of the North Carolina Department of Transportation's planning, design, construction, and operations activities and supports the Department's study and consideration of methods of improving the inclusion of these modes into the everyday operations of North Carolina's transportation system; and

BE IT FURTHER RESOLVED, North Carolina cities and towns are encouraged to make bicycling and pedestrian improvements an integral part of their transportation planning and programming.

B.6 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION ADMINISTRATIVE ACTION TO INCLUDE LOCAL ADOPTED GREENWAYS PLANS IN THE NCDOT HIGHWAY PLANNING PROCESS

(ADOPTED JANUARY 1994)

In 1994 the NCDOT adopted administrative guidelines to consider greenways and greenway crossings during the highway planning process. This policy was incorporated so that critical corridors which have been adopted by localities for future greenways will not be severed by highway construction. Following are the text for the Greenway Policy and Guidelines for implementing it.

In concurrence with the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and the Board of Transportation's Bicycle Policy of 1978 (updated in 1991) and Pedestrian Policy of 1993, the North Carolina Department of Transportation recognizes the importance of incorporating local greenways plans into its planning process for the development and improvement of highways throughout North Carolina.

NCDOT Responsibilities: The Department will incorporate locally adopted plans for greenways into the ongoing planning processes within the Statewide Planning (thoroughfare plans) and the Planning and Environmental (project plans) Branches of the Division of Highways. This incorporation of greenway plans will be consistent throughout the department. Consideration will be given to including the greenway access as a part of the highway improvement.

Where possible, within the policies of the Department, within the guidelines set forth in provisions for greenway crossings, or other greenway elements, will be made as a part of the highway project or undertaken as an allowable local expenditure.

Local Responsibilities: Localities must show the same commitment to building their adopted greenway plans as they are requesting when they ask the state to commit to providing for a certain segment of that plan. It is the responsibility of each locality to notify the Department of greenway planning activity and adopted greenway plans and to update the Department with all adopted additions and changes in existing plans.

It is also the responsibility of each locality to consider the adopted transportation plan in their greenways planning and include its adopted greenways planning activities within their local transportation planning process. Localities should place in

priority their greenways construction activities and justify the transportation nature of each greenway segment. When there are several planned greenway crossings of a proposed highway improvement, the locality must provide justification of each and place the list of crossings in priority order. Where crossings are planned, transportation rights of way should be designated or acquired separately to avoid jeopardizing the future transportation improvements.

B.7 GUIDELINES FOR NCDOT TO COMPLY WITH ADMINISTRATIVE DECISION TO INCORPORATE LOCAL GREENWAYS INTO HIGHWAY PLANNING PROCESS

- Thoroughfare plans will address the existence of greenways planning activity, which has been submitted by local areas. Documentation of mutually agreed upon interface points between the thoroughfare plan and a greenway plan will be kept, and this information will become a part of project files.
- Project Planning Reports will address the existence of locally adopted greenways segment plans, which may affect the corridor being planned for a highway improvement. It is, however, the responsibility of the locality to notify the Department of the adopted greenways plans (or changes to its previous plans) through its current local transportation plan, as well as its implementation programs.
- Where local greenways plans have not been formally adopted or certain portions of the greenways plans have not been adopted, the Department may note this greenway planning activity but is not required to incorporate this information into its planning reports.
- Where the locality has included adopted greenways plans as a part of its local transportation plan and a segment (or segments) of these greenways fall within the corridor of new highway construction or a highway improvement project, the feasibility study and/or project planning report for this highway improvement will consider the effects of the proposed highway improvement upon the greenway in the same manner as it considers other planning characteristics of the project corridor, such as archeological features or land use.

- Where the locality has justified the transportation versus the leisure use importance of a greenway segment and there is no greenway alternative of equal importance nearby, the project planning report will suggest inclusion of the greenway crossing, or appropriate greenway element, as an incidental part of the highway expenditure.
- Where the locality has not justified the transportation importance of a greenway segment, the greenway crossing, or appropriate greenway element, may be included as a part of the highway improvement plan if the local government covers the cost.
- A locality may add any appropriate/acceptable greenway crossing or greenway element at their own expense to any highway improvement project as long as it meets the design standards of the NCDOT.
- The NCDOT will consider funding for greenway crossings, and other appropriate greenway elements only if the localities guarantee the construction of and/or connection with other greenway segments. This guarantee should be in the form of inclusion in the local capital improvements program or NCDOT/municipal agreement.
- If the state pays for the construction of a greenway incidental to a highway improvement and the locality either removes the connecting greenway segments from its adopted greenways plans or decides not to construct its agreed upon greenway segment, the locality will reimburse the state for the cost of the greenway incidental feature. These details will be handled through a municipal agreement.
- Locality must accept maintenance responsibilities for state-built greenways, or portions thereof. Details will be handled through a municipal agreement.

B.8 NCDOT PEDESTRIAN POLICY GUIDELINES

(See pages B-19 through B-20)

**DEPARTMENT OF TRANSPORTATION
PEDESTRIAN POLICY GUIDELINES
EFFECTIVE OCTOBER 1, 2000**

These guidelines provide an updated procedure for implementing the Pedestrian Policy adopted by the Board of Transportation August 1993 and the Board of Transportation Resolution September 8, 2000. The resolution reaffirms the Department's commitment to improving conditions for bicycling and walking, and recognizes non-motorized modes of transportation as critical elements of the local, regional, and national transportation system. The resolution encourages North Carolina cities and towns to make bicycling and pedestrian improvements an integral part of their transportation planning and programming.

REQUIREMENTS FOR DOT FUNDING:

REPLACEMENT OF EXISTING SIDEWALKS:

The Department will pay 100% of the cost to replace an existing sidewalk that is removed to facilitate the widening of a road.

TIP INCIDENTAL PROJECTS:

DEFINED: Incidental pedestrian projects are defined as TIP projects where pedestrian facilities are included as part of the roadway project.

REQUIREMENTS:

1. The municipality and/or county notifies the Department in writing of its desire for the Department to incorporate pedestrian facilities into project planning and design. Notification states the party's commitment to participate in the cost of the facility as well as being responsible for all maintenance and liability. Responsibilities are defined by agreement. Execution is required prior to contract let.

The municipality is responsible for evaluating the need for the facility (ie: generators, safety, continuity, integration, existing or projected traffic) and public involvement.

2. Written notification must be received by the **Project Final Field Inspection (FFI) date**. Notification should be sent to the Deputy Highway Administrator - Preconstruction with a copy to the Project Engineer and the Agreements Section of the Program Development Branch. Requests received after the project FFI date will be incorporated into the TIP project, if feasible, and only if the requesting party commits by agreement to pay 100% of the cost of the facility.
3. The Department will review the feasibility of including the facility in our project and will try to accommodate all requests where the Department has acquired appropriate right of way on curb and gutter sections and the facility can be installed in the current project berm width. The standard project section is a 10-ft berm (3.0-meter) that accommodates a 5-ft sidewalk. In accordance with

AASHTO standards, the Department will construct 5-ft sidewalks with wheelchair ramps. Betterment cost (ie: decorative pavers) will be a Municipal responsibility.

4. If the facility is not contained within the project berm width, the Municipality is responsible for providing the right of way and/or construction easements as well as utility relocations, at no cost to the Department. This provision is applicable to all pedestrian facilities including multi-use trails and greenways.
5. A cost sharing approach is used to demonstrate the Department’s and the municipality’s/county’s commitment to pedestrian transportation (sidewalks, multi-use trails and greenways). The matching share is a sliding scale based on population as follows:

MUNICIPAL POPULATION	DOT PARTICIPATION	LOCAL PARTICIPATION
> 100,000	50%	50%
50,000 to 100,000	60%	40%
10,000 to 50,000	70%	30%
< 10,000	80%	20%

Note: The cost of bridges will not be included in the shared cost of the pedestrian installation if the Department is funding the installation under provision 6 - pedestrian facilities on bridges.

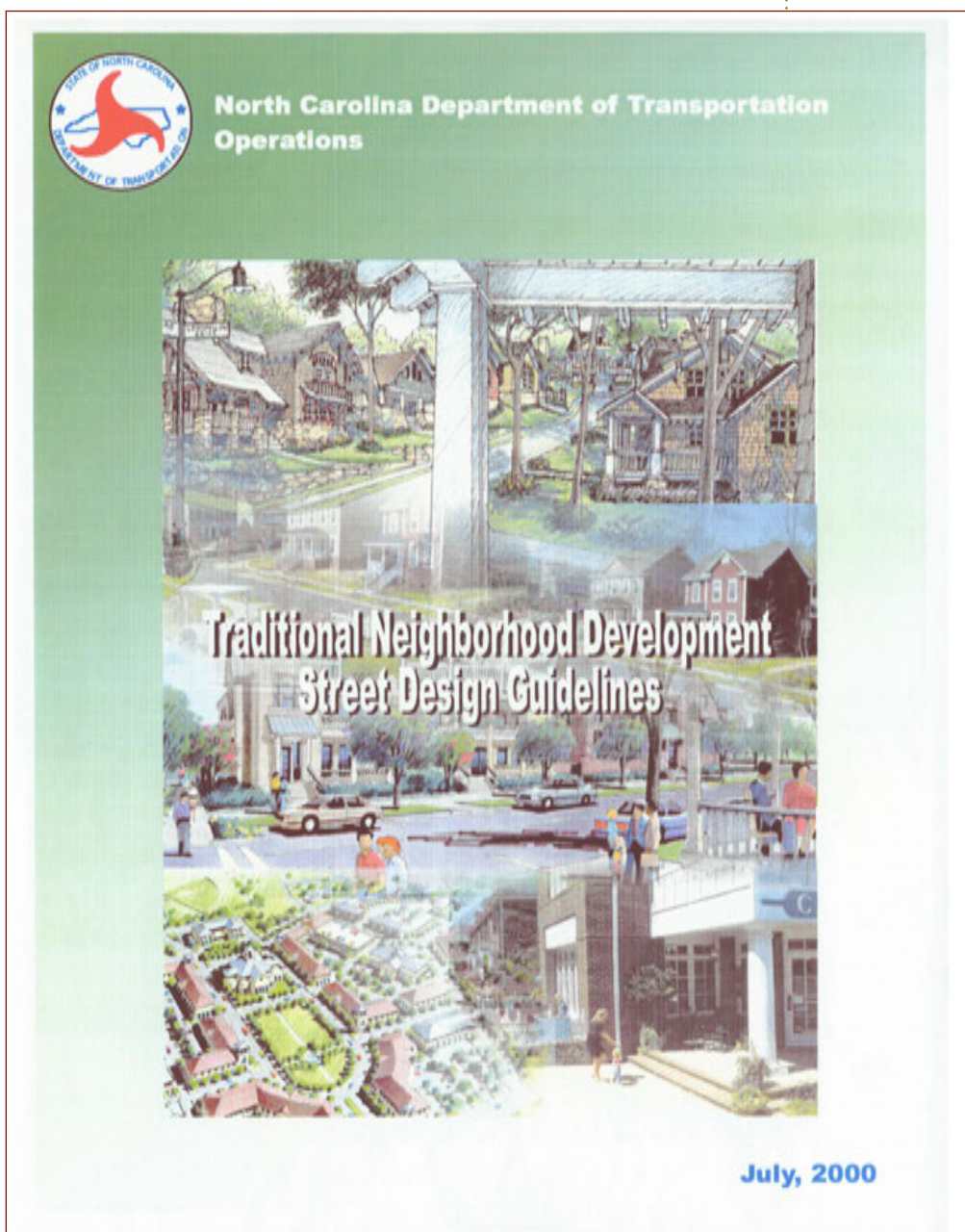
6. For bridges on streets with curb and gutter approaches, the Department will fund and construct sidewalks on both sides of the bridge facility if the bridge is less than 200 feet in length. If the bridge is greater than 200 feet in length, the Department will fund and construct a sidewalk on one side of the bridge structure. The bridge will also be studied to determine the costs and benefits of constructing sidewalks on both sides of the structure. If in the judgement of the Department sidewalks are justified, funding will be provided for installation. The above provision is also applicable to dual bridge structures. For dual bridges greater than 200 ft in length, a sidewalk will be constructed on the outside of one bridge structure. The bridges will also be studied to determine if sidewalks on the outside of both structures are justified.
7. FUNDING CAPS are no longer applicable.
8. This policy does not commit the Department to the installation of facilities in the Department’s TIP projects where the pedestrian facility causes an unpractical design modification, is not in accordance with AASHTO standards, creates an unsafe situation, or in the judgement of the Department is not practical to program.

INDEPENDENT PROJECTS

DEFINED: The DOT has a separate category of funds for all independent pedestrian facility projects in North Carolina where installation is unrelated to a TIP roadway project. An independent pedestrian facility project will be administered in accordance with Enhancement Program Guidelines.

B.9 NCDOT'S TRADITIONAL NEIGHBORHOOD DEVELOPMENT STREET DESIGN GUIDELINES

These guidelines are available for proposed TND developments and permits localities and developers to design certain roadways according to TND guidelines rather than the conventional subdivision street standards. The guidelines recognize that in TND developments, mixed uses are encouraged and pedestrians and bicyclists are accommodated on multi-mode/shared streets. For completed document, go to: <http://www.ncdot.org/doh/preconstruct/altern/value/manuals/tnd.pdf>



B.10 NCDOT ONLINE PEDESTRIAN PLANNING AND DESIGN RESOURCES LIST

Developing a Pedestrian Safety Action Plan Workshop

June 2008

Useful On-Line Pedestrian Planning and Design Resources

NCDOT Division of Bicycle & Pedestrian Transportation	http://www.ncdot.org/transit/bicycle/
Board of Transportation Resolution on Mainstreaming	http://www.ncdot.org/transit/bicycle/laws/laws_resolution.html
NCDOT Pedestrian Policy Guidelines	http://www.ncdot.org/transit/bicycle/laws/ped_guide.pdf
NCDOT Greenways - Administrative Process	http://www.ncdot.org/transit/bicycle/laws/laws_greenway_admin.html
Funding	http://www.ncdot.org/transit/bicycle/funding/funding_intro.html
Project Types	http://www.ncdot.org/transit/bicycle/projects/project_types/bpt_intro.html
Crash Data	http://www.ncdot.org/transit/bicycle/safety/safety_crashdata.html
DBPT Long Range Plan	http://www.ncdot.org/transit/bicycle/projects/intro/projects_long_range.html
Safe Routes to School Program	http://www.ncdot.org/transit/bicycle/saferoutes/SafeRoutes.html

NCDOT Division of Highways <http://www.ncdot.org/doh/>

Alternative Delivery Unit – Publications for Download	http://www.ncdot.org/doh/preconstruct/altern/value/manuals/
Bridge Policy 2000	http://www.ncdot.org/doh/preconstruct/altern/value/manuals/bpe2000.doc
Curb Cuts & Ramps for Disabled Persons	http://www.ncdot.org/doh/preconstruct/altern/value/manuals/handi.pdf
Traditional Neighborhood Development Manual	http://www.ncdot.org/doh/preconstruct/altern/value/manuals/tnd.pdf
ADA – Detectable Warnings	http://www.ncdot.org/doh/preconstruct/ps/std_draw/06english/08/default.html
Highway Design Branch – Design Manual	http://www.ncdot.org/doh/preconstruct/altern/value/manuals/designmanual.html
Policy and Procedure Manual (See Section 28)	http://www.ncdot.org/doh/preconstruct/altern/value/manuals/ppm/
Policy on Street & Driveway Access	http://www.ncdot.org/doh/preconstruct/altern/value/manuals/pos.pdf
Traffic Engineering and Safety Systems Branch	http://www.ncdot.org/doh/preconstruct/traffic/
NC Supplement to the Manual on Uniform Traffic Control Devices	http://www.ncdot.org/doh/preconstruct/traffic/MUTCD/
Crosswalks/Mid-Block Signing and Pavement Markings	http://www.ncdot.org/doh/preconstruct/traffic/tepl/Topics/C-36/C-36.html



Developing a Pedestrian Safety Action Plan Workshop

June 2008

UNC Highway Safety Research Center <http://www.hsrc.unc.edu>

Pedestrian & Bicycle Information Center <http://www.pedbikeinfo.org/index.htm>

Walking <http://www.walkinginfo.org/>

Engineer Pedestrian Facilities <http://www.walkinginfo.org/engineering>

Pedestrian Safety Guide & Countermeasure Selection System (PEDSAFE) <http://www.walkinginfo.org/pedsafe/>

Develop Plans and Policies <http://www.walkinginfo.org/develop>

National Center for Safe Routes to School <http://www.saferoutesinfo.org>

Federal Highway Administration Bicycle & Pedestrian Program <http://www.fhwa.dot.gov/environment/bikeped/>

Bicycle and Pedestrian Provisions of Federal Transportation Legislation <http://www.fhwa.dot.gov/environment/bikeped/bp-guid.htm>

Bicycle & Pedestrian Programs <http://www.fhwa.dot.gov/environment/bikeped/overview.htm>

Program & Design Guidance <http://www.fhwa.dot.gov/environment/bikeped/guidance.htm>

Links to Other Resources <http://www.fhwa.dot.gov/environment/bikeped/bipedlnk.htm>

Publications <http://www.fhwa.dot.gov/environment/bikeped/publications.htm>

Pedestrian Safety http://safety.fhwa.dot.gov/ped_bike/ped/index.htm

Pedestrian & Bicycle Safety Research Page <http://www.fhrc.gov/safety/pedbike/index.htm>

National Highway Traffic Safety Administration – Traffic Safety: Pedestrians <http://www.nhtsa.gov/portal/site/nhtsa/menuitem.dfedd570f698cabbbf30811060008a0c/>

National Center for Bicycling & Walking <http://www.bikewalk.org/>





Appendix C: Funding

This appendix provides a funding strategy along with a listing and description of state, federal, local, and private funding sources.



C.0 OVERVIEW

The primary purpose of this appendix is to define and describe possible funding sources that could be used to support the planning, design and development of pedestrian and greenway improvements.

Implementing the recommendations of this plan will require a strong level of local support and commitment through a variety of local funding mechanisms. Perhaps most important is the addition of sidewalk and greenway recommendations from this Plan into Biscoe's Capital Improvement Program (CIP). Pedestrian improvements should become a high priority and be supported through the CIP and local bonds.

The Town of Biscoe should also seek a combination of funding sources that include local, state, federal, and private money. Currently, the funding landscape is uncertain and changing. It will be critical to keep abreast of funding program changes at the federal, state, and regional level.

Fortunately, the benefits of protected greenways and sidewalks are many and varied. This allows programs in Biscoe to access money earmarked for a variety of purposes including water quality, hazard mitigation, recreation, air quality, alternate transportation, wildlife protection, community health, and economic development. Competition is almost always stiff for state and federal funds, so it becomes imperative that local governments work together to create multi-jurisdictional partnerships and to develop their own local sources of funding. These sources can then be used to leverage outside assistance. The long term success of this plan will almost certainly depend on the dedication of a local revenue stream for greenways and sidewalks. An important key to obtaining funding is for Biscoe to have adopted plans for greenway, bicycle, pedestrian or trail systems in place prior to making an application for funding.

CHAPTER OUTLINE:

C.0 OVERVIEW

C.1 HIGH PRIORITY FUNDING OPTIONS

C.2 STATE FUNDING SOURCES

C.3 FEDERAL FUNDING SOURCES

C.4 LOCAL FUNDING SOURCES

For the past two decades, a variety of funding has been used throughout North Carolina to support the planning, design and construction of urban and rural pedestrian and greenway projects. The largest single source of funding for these projects has come from the Surface Transportation Act, first the Intermodal Surface Transportation Efficiency Act (ISTEA) in the early to mid 1990's; then its successor, Transportation Equity Act for the Twenty-First Century (TEA-21) through the early part of 2002; and now the Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The North Carolina Department of Transportation manages and distributes the majority of federal funds that are derived from the Act to support the development of bicycle/pedestrian/trail development.

The majority of federal funding is distributed to states in the form of block grants and is then distributed throughout a given state for specific projects. State funding programs in North Carolina also support the creation of greenways. North Carolina has developed a broad array of funding sources that address land acquisition, green infrastructure development, and trail facility development.

Additionally, there are many things that the Town of Biscoe can do to establish their own funding for sidewalk and greenway initiatives. For the most part, it takes money to get money. For Biscoe, it will be necessary to create a local funding program through one of the methods that is defined within this report. Financing will be needed to administer the continued planning and implementation process, acquire parcels or easements, and manage and maintain facilities.

This appendix is organized by first addressing the overall high priority options and state sources of funding, then addresses separate federal and local government funding sources. It is by no means an exhaustive list as there are hundreds of additional funding sources available that should be researched and pursued as well.

The Town of Biscoe should pursue a variety of funding options and establish pedestrian recommendations from this Plan as a priority in its Capital Improvement Program (CIP). This appendix identifies a list of some of the pedestrian and greenway funding opportunities that have typically been pursued by other communities. Creative planning and consistent monitoring of funding options will likely turn up new opportunities not listed here.

C.1 HIGH PRIORITY FUNDING OPTIONS

While there are a number of funding sources provided in the following pages, these sources should be the highest priority in order to achieve successful implementation. It is critical for local government to step up given the competitiveness and changing, finite availabilities of most funding sources. Details about the following sources are found later in this appendix.

- Local Capital Improvements Program (CIP)
- Local Bond
- Local Fees
- State Transportation Improvement Program (TIP)
- State Powell Bill Funds
- State Safe Routes to School Program
- State Parks and Recreation Trust Fund (PARTF)
- State Health and Wellness Trust Fund (HWTF)
- Private Sources

C.2 STATE FUNDING SOURCES

The most direct source of public-sector funding for the Town of Biscoe will come from state agencies in North Carolina. Generally, these funds are made available to local governments based on grant-in-aid formulas. The single most important key to obtaining state grant funding is for local governments to have adopted plans for greenway, open space, bicycle, pedestrian or trail systems in place prior to making an application for funding. Unfortunately, there is no direct correlation between any of the programs listed and a constant stream of funding for greenway or trail projects and all projects are funded on the basis of grant applications. There is no specific set aside amount that is allocated for greenway and trail development within a given program. Funding is based solely on need and the need has to be expressed and submitted in the form of a grant application. Finally, all of these programs are geared to address needs across the entire state, so all of the programs are competitive and must allocate funding with the needs of the entire state in mind.

The Powell Bill Program is an annual state allocation to municipalities for use in street system maintenance and construction activities. There is considerable local control over Powell Bill Funds (It is not a grant application process). In the past, the State allocated a considerable portion of these revenues for construction purposes. However, budgetary constraints since 2001 have led to a shift of new Powell Bill funds to cover maintenance and operations activities.

Both the Powell Bill reserves and the 2000 Transportation Bond funds are limited funding sources that will eventually be depleted. Further, federal highway funds can be expected to provide only a portion of the future resource needs of the sidewalk construction program. For this reason, the development of future state transportation bond initiatives will be critical for continuing implementation of the sidewalk construction program in the future.

In North Carolina, the Department of Transportation, Division of Bicycle and Pedestrian Transportation (DBPT) has been the single largest source of funding for bicycle, pedestrian and greenway projects, including non-construction projects such as brochures, maps, and public safety information for more than a decade. DBPT offers several programs in support of bicycle and pedestrian facility development. The following information is from NCDOT's interactive web site (www.ncdot.org). Contact the NCDOT, Division of Bicycle and Pedestrian Transportation at (919) 707-2600 for more information.

North Carolina Department of Transportation
Bicycle and Pedestrian Independent Projects Funded Through the Transportation Improvement Program (TIP):

In North Carolina, the Department of Transportation, Division of Bicycle and Pedestrian Transportation (DBPT) manages the Transportation Improvement Program (TIP) selection process for bicycle and pedestrian projects.

Projects programmed into the TIP are independent projects – those which are not related to a scheduled highway project. Incidental projects – those related to a scheduled highway project – are handled through other funding sources described in this section.

A total of \$6 million is annually set aside for the construction of bicycle improvements that are independent of scheduled highway projects in communities throughout the state. Eighty percent of these funds are from STP-Enhancement funds, while the State Highway Trust provides the remaining 20 percent of the funding.

Each year, the DBPT regularly sets aside a total of \$200,000 of TIP funding for the department to fund projects such as training workshops, pedestrian safety and research projects, and other pedestrian needs statewide. Those interested in learning about training workshops, research and other opportunities should contact the DBPT for information.

The division has an annual budget of \$6 million. Prospective applicants are encouraged to contact the DBPT regarding funding assistance for bicycle and pedestrian projects. For a detailed description of the TIP project selection process, visit: <http://www.ncdot.gov/bikeped/funding/>.

Another \$500,000 of the Division's funding is available for miscellaneous projects.

Incidental Projects – Bicycle and pedestrian accommodations such as bike lanes, widened paved shoulders, sidewalks and bicycle-safe bridge design are frequently included as incidental features of highway projects. In addition, bicycle-safe drainage grates are a standard feature of all highway construction. Most bicycle and pedestrian safety accommodations built by NCDOT are included as part of scheduled highway improvement projects funded with a combination of National Highway System funds and State Highway Trust Funds.

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.

Governor's Highway Safety Program (GHSP) – The mission of the GHSP is to promote highway safety awareness and reduce the number of traffic crashes in the state of North Carolina through the planning and execution of safety programs. GHSP funding is provided through an annual program, upon approval of specific project requests. Amounts of GHSP funds vary from year to year, according to the specific amounts requested. Communities may apply for a GHSP grant to be used as seed money to start a program to enhance highway safety. Once a grant is awarded, funding is provided on a reimbursement basis. Evidence of reductions in crashes, injuries, and fatalities is required. For information on applying for GHSP funding, visit: www.ncdot.org/programs/ghsp/.

Funding Available Through North Carolina Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs)

MPOs in North Carolina which are located in air quality nonattainment or maintenance areas have the authority to program Congestion Mitigation Air Quality (CMAQ) funds. CMAQ funding is intended for projects that reduce transportation related emissions. Some NC MPOs have chosen to use the CMAQ funding for bicycle and pedestrian projects. Local governments in air quality nonattainment or maintenance areas should contact their MPO for information on CMAQ funding opportunities for bicycle and pedestrian facilities.

Bicycle and Pedestrian Planning Grant Initiative, (managed by NCDOT, DBPT)

To encourage the development of comprehensive local bicycle plans and pedestrian plans, the NCDOT Division of Bicycle and Pedestrian Transportation (DBPT) and the Transportation Planning Branch (TPB) have created a matching grant program to fund plan development. This program was initiated through a special allocation of funding approved by the North Carolina General Assembly in 2003 along with federal funds earmarked specifically for bicycle and pedestrian planning by the TPB. The planning grant program was launched in January 2004, and it is currently administered through NCDOT-DBPT and the Institute for Transportation Research and Education (ITRE) at NC State University. Over the past three grant cycles, 48 municipal plans have been selected and funded from 123 applicants. A total of \$2.3 million has been allocated. Additional annual allocations will be sought for subsequent years. The Town of Biscoe should apply for bicycle planning grant funding. For more information, visit <http://www.ncdot.gov/bikeped/planning/>

Safe Routes to School Program
(managed by NCDOT, DBPT)

The NCDOT Safe Routes to School Program is a federally funded program that was initiated by the passing of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005, which establishes a national SRTS program to distribute funding and institutional support to implement SRTS programs in states and communities across the country. SRTS programs facilitate 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 Division of Bicycle and Pedestrian Transportation at NC-DOT is charged with disseminating SRTS funding.

The state of North Carolina has been allocated \$15 million in Safe Routes to School funding for fiscal years 2005 through 2009 for infrastructure or non-infrastructure projects. In 2009, more than \$3.6 million went to 22 municipalities and local agencies for infrastructure and non-infrastructure projects. All proposed projects must relate to increasing walking or biking to and from an elementary or middle school. An example of a non-infrastructure project is an education or encouragement program to improve rates of walking and biking to school. An example of an infrastructure project is construction of sidewalks around a school. Infrastructure improvements under this program must be made within 2 miles of an elementary or middle school. The state requires the completion of a competitive application to apply for funding. For more information, visit www.ncdot.org/programs/safeRoutes/ or 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

Recreational Trails Program (RTP)

The Recreational Trails Program (RTP) is a grant program funded by Congress with money from the federal gas taxes paid on fuel used by off-highway vehicles. This program's intent is to meet the trail and trail-related recreational needs identified by the Statewide Comprehensive Outdoor Recreation Plan. Grant applicants must be able contribute 20% of the project cost with cash or in-kind contributions. The program is managed by the State Trails Program, which is a section of the N.C. Division of Parks and Recreation.

The grant application is available and instruction handbook is available through the State Trails Program website at <http://ils.unc.edu/parkproject/trails/home.html>. Applications are due during the month of February. For more information, call (919) 715-8699.

Powell Bill Program

Annually, State street-aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by statute. This program is a state grant to municipalities for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways. Funding for this program is collected from fuel taxes. Amount of funds are based on population and mileage of town-maintained streets. For more information, visit www.ncdot.org/financial/fiscal/ExtAuditBranch/Powell_Bill/powellbill.html.

North Carolina's Clean Water Management Trust Fund (CWMTF)

This fund was established in 1996 and has become one of the largest sources of money in North Carolina for land and water protection. At the end of each fiscal year, 6.5 percent of the unreserved credit balance in North Carolina's General Fund, or a minimum of \$30 million, is placed in the CWMTF. The revenue of this fund is allocated as grants to local governments, state agencies and conservation non-profits to help finance projects that specifically address water pollution problems. CWMTF funds may be used to establish a network of riparian buffers and greenways for environmental, educational, and recreational benefits. The fund has provided funding for land acquisition of numerous greenway projects featuring trails, both paved and unpaved. For a history of awarded grants in North Carolina and more information about this fund and applications, visit www.cwmtf.net/.

North Carolina Parks and Recreation Trust Fund (PARTF)

The fund was established in 1994 by the North Carolina General Assembly and is administered by the Parks and Recreation Authority. Through this program, several million dollars each year are available to local governments to fund the acquisition, development and renovation of recreational areas. Applicable projects require a 50/50 match from the local government. Grants for a maximum of \$500,000 are awarded yearly to county governments or incorporated municipalities. The fund is fueled by money from the state's portion of the real estate deed transfer tax for property sold in North Carolina.

The trust fund is allocated three ways:

- 65 percent to the state parks through the N.C. Division of Parks and Recreation.
- 30 percent as dollar-for-dollar matching grants to local governments for park and recreation purposes.
- 5 percent for the Coastal and Estuarine Water Access Program.

For information on how to apply, visit: www.partf.net/learn.html

Land and Water Conservation Fund – North Carolina (LWCF)

The Land and Water Conservation Fund (LWCF) program is a reimbursable, 50/50 matching grants program to states for conservation and recreation purposes, and through the states to local governments to address “close to home” outdoor recreation needs. LWCF grants can be used by communities to build a trail within one park site, if the local government has fee-simple title to the park site. Grants for a maximum of \$250,000 in LWCF assistance are awarded yearly to county governments, incorporated municipalities, public authorities and federally recognized Indian tribes. The local match may be provided with in-kind services or cash. The program’s funding comes primarily from offshore oil and gas drilling receipts, with an authorized expenditure of \$900 million each year. However, Congress generally appropriates only a small fraction of this amount. The allotted money for the year 2007 is \$632,846.

The Land and Water Conservation Fund (LWCF) has historically been a primary funding source of the US Department of the Interior for outdoor recreation development and land acquisition by local governments and state agencies. In North Carolina, the program is administered by the Department of Environment and Natural Resources. Since 1965, the LWCF program has built a permanent park legacy for present and future generations. In North Carolina alone, the LWCF program has provided more than \$63 million in matching grants to protect land and support more than 800 state and local park projects. More than 37,000 acres have been acquired with LWCF assistance to establish a park legacy in our state. For more information, visit: <http://ils.unc.edu/parkproject/lwcf/home1.html>

North Carolina Farmland Preservation Trust Fund

Established in 1986, the Farmland Preservation Trust Fund was funded by appropriations from the General Assembly. Managed by the N.C. Department of Agriculture and Consumer Services and contracted to the Conservation Trust for N.C. (CTNC). The General Assembly has appropriated \$2.65 M since 1998. The 2002 General Assembly appropriated \$200K; 2003 General Assembly, \$0. NCDACS has awarded grants to help local land trusts and counties with farmland protection programs work with farm families to arrange permanent conservation easements on over 4270 acres and large parts of 30 farms. These grants have leveraged over \$20 M from other private and public funding sources and donations of development rights from farm owners. Contact CTNC at 919-828-4199. E-mail: info@ctnc.org or Web site: <http://www.ctnc.org>

Any county that has established by ordinance a farmland preservation program or a qualified, private, non-profit land conservation organization, is eligible to apply for a grant. Grants may be submitted for reimbursement of up to 70% of real costs for transactional expenses in acquiring agricultural conservation easements through donation or purchase, including—but not limited to—documented costs for environmental audits, legal fees, appraisals, surveys, purchase options, personnel expenses for project preparation, and long-term easement monitoring and enforcement costs. Grant requests cannot exceed a maximum of \$25,000 per project.

Contact: Conservation Trust for North Carolina, 1028 Washington St, Raleigh, NC 27605. 919-828-4199. Web site: www.ctnc.org. E-mail: info@ctncc.org.

Agriculture Cost Share Program

Established in 1984, this program assists farmers with the cost of installing best management practices (BMPs) that benefit water quality. The program covers as much as 75 percent of the costs to implement BMPs. The NC Division of Soil and Water Conservation within the NC Department of Environment and Natural Resources administers this program through local Soil and Water Conservation Districts (SWCD). For more information, visit www.enr.state.nc.us/DSWC/pages/agcostshareprogram.html or call 919-733-2302.

North Carolina Natural Heritage Trust Fund

This trust fund, managed by the NC Natural Heritage Program, has contributed millions of dollars to support the conservation of North Carolina's most significant natural areas and cultural heritage sites. The NHTF is used to acquire and protect land that

has significant habitat value. Some large wetland areas may also qualify, depending on their biological integrity and characteristics. Only certain state agencies are eligible to apply for this fund, including the Department of Environment and Natural Resources, the Wildlife Resources Commission, the Department of Cultural Resources and the Department of Agriculture and Consumer Services. As such, municipalities must work with State level partners to access this fund. Additional information is available from the NC Natural Heritage Program. For more information and grant application information, visit www.ncnhtf.org/.

North Carolina Adopt-a-Trail Grants

Operated by the Trails Section of the NC Division of State Parks, annual grants are available to local governments for trail and facility construction. Grants are generally capped at about \$5,000 per project and do not require a match. The Adopt-A-Trail grant program awards \$135,000 annually to local governments, nonprofit organizations and private trail groups for trails projects. The funds can be used for trail building, trail signage and facilities, trail maintenance, trail brochures and maps, and other related uses. Applications for funding may be obtained by contacting a regional trails specialist or the State Trails Program at (919) 715-8699. Applications are due for the each year's funding cycle at the end of February.

Contact: Darrell McBane, State Trails Coordinator, 12700 Bayleaf Church Road, Raleigh, NC 27614 (919) 846-9991. Web site: <http://ils.unc.edu/parkproject/trails/grant.html>. E-mail: darrell.mcbane@ncmail.net.

North Carolina Division of Water Quality - 319 Program Grants
By amendment to the Clean Water Act Section in 1987, the Section 319 Grant program was established to provide funding for efforts to curb non-point source (NPS) pollution, including that which occurs through stormwater runoff. The U.S. Environmental Protection Agency provides funds to state and tribal agencies, which are then allocated via a competitive grant process to organizations to address current or potential NPS concerns. Funds may be used to demonstrate best management practices (BMPs), establish Total Maximum Daily Load (TMDL) for a watershed, or to restore impaired streams or other water resources. In North Carolina, the 319 Grant Program is administered by the Division of Water Quality of the Department of Environment and Natural Resources. Each fiscal year North Carolina is awarded nearly \$5 million dollars to address non-point source pollution through its 319 Grant program. Thirty percent of the funding supports ongoing state

non-point source programs. The remaining seventy percent is made available through a competitive grants process. At the beginning of each year (normally by mid-February), the NC 319 Program issues a request for proposals with an open response period of three months. Approximately \$880,000 will be available statewide for distribution to grant recipients.

Grants are divided into two categories: Base and Incremental. Base Projects concern research-oriented, demonstrative, or educational purposes for identifying and preventing potential NPS areas in the state, where waters may be at risk of becoming impaired. Incremental projects seek to restore streams or other portions of watersheds that are already impaired and not presently satisfying their intended uses. State and local governments, interstate and intrastate agencies, public and private nonprofit organizations, and educational institutions are eligible to apply for Section 319 monies. An interagency workgroup reviews the proposals and selects those of merit to be funded.

Contact: North Carolina DWQ, 512 N. Salisbury St. Raleigh, NC 27604. (919) 733-7015 Web site: www.h2o.enr.state.nc.us/nps/Section_319_Grant_Program.htm. E-mail: kimberly.nimmer@ncmail.net.

Small Cities Community Development Block Grants

State level funds are allocated through the NC Department of Commerce, Division of Community Assistance to be used to promote economic development and to serve low-income and moderate-income neighborhoods. Greenways that are part of a community's economic development plans may qualify for assistance under this program. Recreational areas that serve to improve the quality of life in lower income areas may also qualify. Approximately \$50 million is available statewide to fund a variety of projects. For more information, visit www.hud.gov/offices/cpd/communitydevelopment/programs/stateadmin/ or call 919-733-2853.

North Carolina Ecosystem Enhancement Program

Developed in 2003 as a new mechanism to facilitate improved mitigation projects for NC highways, this program offers funding for restoration projects and for protection projects that serve to enhance water quality and wildlife habitat in NC. Information on the program is available by contacting the Natural Heritage Program in the NC Department of Environment and Natural Resources (NCDENR). For more information, visit www.nceep.net/pages/partners.html or call 919-715-0476.

North Carolina Wetlands Restoration Program (NCWRP)

This is a non-regulatory program established by the NC General Assembly in 1996. The goals of the NCWRP are to:

- Protect and improve water quality by restoring wetland, stream and riparian area functions and values lost through historic, current and future impacts.
- Achieve a net increase in wetland acreage, functions and values in all of North Carolina's major river basins.
- Promote a comprehensive approach for the protection of natural resources.
- Provide a consistent approach to address compensatory mitigation requirements associated with wetland, stream, and buffer regulations, and to increase the ecological effectiveness of compensatory mitigation projects.

Additional information about the program and potential funding assistance with the restoration or creation of wetlands can be found at www.h2o.enr.state.nc.us/wrp

Contact: Tad Boggs, Ecosystem Enhancement Program Coordinator, NC Wetlands Restoration Program, 1619 Mail Service Center, Raleigh, NC 27699-1619. (919) 715-2227. E-mail: tad.boggs@ncmail.net.

Conservation Reserve Enhancement Program (CREP)

This program is a joint effort of the North Carolina Division of Soil and Water Conservation, the NC Clean Water Management Trust Fund, the Ecosystem Enhancement Program (EEP), and the Farm Service Agency - United States Department of Agriculture (USDA) to address water quality problems of the Neuse, Tar-Pamlico and Chowan river basins as well as the Jordan Lake watershed area.

CREP is a voluntary program that seeks to protect land along watercourses that is currently in agricultural production. The objectives of the program include: installing 100,000 acres of forested riparian buffers, grassed filter strips and wetlands; reducing the impacts of sediment and nutrients within the targeted area; and providing substantial ecological benefits for many wildlife species that are declining in part as a result of habitat loss. Program funding will combine the Federal Conservation Reserve Program (CRP) funding with State funding from the Clean Water Management Trust Fund, Agriculture Cost Share Program, and North Carolina Wetlands Restoration Program.

The program is managed by the NC Division of Soil and Water Conservation. For more information, visit www.enr.state.nc.us.

nc.us/dswc/pages/crep.html

Urban and Community Forestry Assistance Program

The program operates as a cooperative partnership between the NC Division of Forest Resources and the USDA Forest Service, Southern Region. It offers small grants that can be used to plant urban trees, establish a community arboretum, or other programs that promote tree canopy in urban areas. To qualify for this program, a community must pledge to develop a street-tree inventory, a municipal tree ordinance, a tree commission, and an urban forestry-management plan. All of these can be funded through the program.

Greenways are a specific category within the program "Naturalization Projects or Greenway Development." These types of projects can be combined with tree planting, where native species are used and environmental benefits to the community are emphasized. Planning and development, assessments and studies, maps and drawings, promotional and educational materials may be eligible for funding when matched with a solid volunteer and in-kind staffing match. Forest buffers, connecting corridors between fragmented wooded areas, riparian buffers/protection, or reduction of mowing maintenance in municipal parks through edge naturalization, are some naturalization projects that will be considered for grants. Approximately \$200,000 is available each year for grant recipients.

For more information and a grant application, contact the NC Division of Forest Resources and/or visit http://www.dfr.state.nc.us/urban/urban_grantprogram.htm.

Water Resources Development Grant Program

The NC Division of Water Resources offers cost-sharing grants to local governments on projects related to water resources. Of the seven project application categories available, the category which relates to the establishment of greenways is "Land Acquisition and Facility Development for Water-Based Recreation Projects." Applicants may apply for funding for a greenway as long as the greenway is in close proximity to a water body. For more information, see: www.ncwater.org/Financial_Assistance or call 919-733-4064.

North Carolina Health and Wellness Trust Fund (HWTF)

The NC Health and Wellness Trust Fund was created by the General Assembly as one of 3 entities to invest North Carolina's portion of the Tobacco Master Settlement Agreement. HWTF receives one-fourth of the state's tobacco settlement funds, which are paid in annual installments over a 25-year period.

Fit Together, a partnership of the NC Health and Wellness Trust Fund (HWTF) and Blue Cross and Blue Shield of North Carolina (BCBSNC) announces the establishment of Fit Community, a designation and grant program that recognizes and rewards North Carolina communities' efforts to support physical activity and healthy eating initiatives, as well as tobacco-free school environments. Fit Community is one component of the jointly sponsored Fit Together initiative, a statewide prevention campaign designed to raise awareness about obesity and to equip individuals, families and communities with the tools they need to address this important issue.

All North Carolina municipalities and counties are eligible to apply for a Fit Community designation, which is awarded to those that have excelled in supporting the following:

- physical activity in the community, schools, and workplaces
- healthy eating in the community, schools, and workplaces
- tobacco use prevention efforts in schools

Designations will be valid for two years, and designated communities may have the opportunity to reapply for subsequent two-year extensions. The benefits of being a Fit Community include:

- heightened statewide attention that can help bolster local community development and/or
- economic investment initiatives (highway signage and a plaque for the Mayor's or County Commission Chair's office will be provided)
- reinvigoration of a community's sense of civic pride (each Fit Community will serve as a model for other communities that are trying to achieve similar goals)
- use of the Fit Community designation logo for promotional and communication purposes.

The application for Fit Community designation is available on the Fit Together Web site:
www.FitTogetherNC.org/FitCommunity.aspx.

Fit Community grants are designed to support innovative strategies that help a community meet its goal to becoming a Fit Community. Eight to nine, two-year grants of up to \$30,000 annually will be awarded to applicants that have a demon-

strated need, proven capacity, and opportunity for positive change in addressing physical activity and/or healthy eating.

The North Carolina Conservation Tax Credit (managed by NCDENR)

This program, 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. The goal of this program is to manage stormwater, protect water supply watersheds, retain working farms and forests, and set-aside greenways for ecological communities, public trails, and wildlife corridors. For more information, visit: www.enr.state.nc.us/conservationtaxcredit/.

C.3 FEDERAL FUNDING SOURCES

Most federal programs provide block grants directly to states through funding formulas. For example, if a North Carolina community wants funding to support a transportation initiative, they would contact the North Carolina Department of Transportation and not the US Department of Transportation to obtain a grant. Despite the fact that it is rare for a local community to obtain a funding grant directly from a federal agency, it is relevant to list some additional federal programs below.

Community Block Development Grant Program (HUD-CBDG)

The U.S. Department of Housing and Urban Development (HUD) offers financial grants to communities for neighborhood revitalization, economic development, and improvements to community facilities and services, especially in low and moderate-income areas. Several communities have used HUD funds to develop greenways, including the Boulding Branch Greenway in High Point, North Carolina. Grants from this program range from \$50,000 to \$200,000 and are either made to municipalities or non-profits. There is no formal application process. For more information, visit: www.hud.gov/offices/cpd/communitydevelopment/programs/.

Wetlands Reserve Program

This federal funding source is a voluntary program offering technical and financial assistance to landowners who want to restore and protect wetland areas for water quality and wildlife habitat. The US Department of Agriculture's Natural Resource Conservation Service (USDA-NRCS) administers the program and provides direct payments to private landowners who agree to place sensitive wetlands under permanent easements. This program can be used to fund the protection of

open space and greenways within riparian corridors. For more information on all SAFETEA-LU programs, visit <http://www.fhwa.dot.gov/safetealu/>.

The National Endowment of the Arts

Many organizations seek ways to incorporate more of their community into their pedestrian, and greenway planning. One way to do this is to celebrate the cultural and historic uniqueness of communities. There are some funding opportunities for these types of projects. The National Endowment of the Arts funds arts-related programs through the Design Arts Program Assistance, and provides many links to other federal departments and agencies that offer funding opportunities for arts and cultural programs.

USDA Rural Business Enterprise Grants

Public and private nonprofit groups in communities with populations under 50,000 are eligible to apply for grant assistance to help their local small business environment. \$1 million is available for North Carolina on an annual basis and may be used for sidewalk and other community facilities. For more information from the local USDA Service Center, visit: <http://www.rurdev.usda.gov/rbs/buspr/beg.htm>

Rivers Trails and Conservation Assistance Program (RTCA)

The Rivers, Trails, and Conservation Assistance Program, also known as the Rivers & Trails Program or RTCA, is the community assistance arm of the National Park Service. RTCA staff provide technical assistance to community groups and local, State, and federal government agencies so they can conserve rivers, preserve open space, and develop trails and greenways. The RTCA program implements the natural resource conservation and outdoor recreation mission of the National Park Service in communities across America

Although the program does not provide funding for projects, it does provide valuable on-the-ground technical assistance, from strategic consultation and partnership development to serving as liaison with other government agencies. Communities must apply for assistance. For more information, visit: www.nps.gov/ncrc/programs/rtca/ or call Chris Abbett, Program Leader, at 404-562-3175 ext. 522.

Public Lands Highways Discretionary Fund

The Federal Highway Administration administers discretionary funding for projects that will reduce congestion and improve air quality. The FHWA issues a call for projects to disseminate this funding. The FHWA estimates that the PLHD funding for

the 2007 call will be \$85 million. In the past, Congress has earmarked a portion of the total available funding for projects. For information on how to apply, visit: <http://www.fhwa.dot.gov/discretionary/>

C.4 LOCAL FUNDING SOURCES

The Town of Biscoe will need to create independent, local funding sources to be used to match federal and state grants for pedestrian facility and greenway development. Local support and funding is the most integral component of successful pedestrian facility implementation. This section provides a list of funding options that each of the local governments should consider for future greenway development, sidewalk development, and open space protection.

Municipalities often plan for the funding of pedestrian facilities or improvements through development of Capital Improvement Programs (CIP). In Raleigh, for example, the greenways system has been developed over many years through a dedicated source of annual funding that has ranged from \$100,000 to \$500,000, administered through the Recreation and Parks Department. CIPs should include all types of capital improvements (water, sewer, buildings, streets, etc.) versus programs for single purposes. This allows municipal decision-makers to balance all capital needs. Typical capital funding mechanisms include the following: capital reserve fund, capital protection ordinances, municipal service district, tax increment financing, taxes, fees, and bonds. Each of these categories are described below.

Capital Reserve Fund

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

Capital Project Ordinances

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

Municipal Service District

Municipalities have statutory authority to establish municipal service districts, to levy a property tax in the district additional to the citywide property tax, and to use the proceeds to provide services in the district. Downtown revitalization projects are one of the eligible uses of service districts.

Bonds/Loans

Bonds have been a very popular way for communities across the country to finance their open space and greenway projects. A number of bond options are listed below. If local government decides to pursue a bond issue, consideration should be given to combining the needs of Biscoe into a single bond proposal. Contracting with a private consultant to assist with this program may be advisable. Since bonds rely on the support of the voting population, an education and awareness program should be implemented prior to any vote.

Revenue Bonds

Revenue bonds are bonds that are secured by a pledge of the revenues from a certain local government activity. The entity issuing bonds, pledges to generate sufficient revenue annually to cover the program's operating costs, plus meet the annual debt service requirements (principal and interest payment). Revenue bonds are not constrained by the debt ceilings of general obligation bonds, but they are generally more expensive than general obligation bonds.

General Obligation Bonds

Local governments generally are able to issue general obligation (G.O.) bonds that are secured by the full faith and credit of the entity. In this case, the local government issuing the bonds pledges to raise its property taxes, or use any other sources of revenue, to generate sufficient revenues to make the debt service payments on the bonds. A general obligation pledge is stronger than a revenue pledge, and thus may carry a lower interest rate than a revenue bond. Frequently, when local governments issue G.O. bonds for public enterprise improvements, the public enterprise will make the debt service payments on the G.O. bonds with revenues generated through the public entity's rates and charges. However, if those rate revenues are insufficient to make the debt payment, the local government is obligated to raise taxes or use other sources of revenue to make the payments. G.O. bonds distribute the costs of open space acquisition and make funds available for immediate purchases. Voter approval is required.

Special Assessment Bonds

Special assessment bonds are secured by a lien on the property that benefits by the improvements funded with the special assessment bond proceeds. Debt service payments on these bonds are funded through annual assessments to the property owners in the assessment area.

State Revolving Fund (SRF) Loans

Initially funded with federal and state money, and continued by funds generated by repayment of earlier loans, State Revolving Funds (SRFs) provide low-interest loans for local governments to fund water pollution control and water supply related projects including many watershed management activities. These loans typically require a revenue pledge, like a revenue bond, but carry a below market interest rate and limited term for debt repayment (20 years).

Taxes

Many communities have raised money through self-imposed increases in taxes and bonds. For example, Pinellas County residents in Florida voted to adopt a one-cent sales tax increase, which provided an additional \$5 million for the development of the overwhelmingly popular Pinellas Trail. Sales taxes have also been used in Allegheny County, Pennsylvania, and in Boulder, Colorado to fund open space projects. A gas tax is another method used by some municipalities to fund public improvements. A number of taxes provide direct or indirect funding for the operations of local governments. Some of them are:

Sales Tax

In North Carolina, the state has authorized a sales tax at the state and county levels. Local governments that choose to exercise the local option sales tax (all counties currently do), use the tax revenues to provide funding for a wide variety of projects and activities. Any increase in the sales tax, even if applying to a single county, must gain approval of the state legislature. In 1998, Mecklenburg County was granted authority to institute a one-half cent sales tax increase for mass transit.

Property Tax

Property taxes generally support a significant portion of local government activities. However, the revenues from property taxes can also be used to pay debt service on general obligation bonds issued to finance open space system acquisitions. Because of limits imposed on tax rates, use of property taxes to fund open space could limit the county's or a municipality's ability to raise funds for other activities.

Property taxes can provide a steady stream of financing while broadly distributing the tax burden. In other parts of the country, this mechanism has been popular with voters as long as the increase is restricted to parks and open space. Note, other public agencies compete vigorously for these funds, and taxpayers are generally concerned about high property tax rates.

Excise Taxes

Excise taxes are taxes on specific goods and services. These taxes require special legislation and the use of the funds generated through the tax are limited to specific uses. Examples include lodging, food, and beverage taxes that generate funds for promotion of tourism, and the gas tax that generates revenues for transportation related activities.

Occupancy Tax

The NC General Assembly may grant towns the authority to levy occupancy tax on hotel and motel rooms. The act granting the taxing authority limits the use of the proceeds, usually for tourism-promotion purposes.

Fees and Service Charges

Several fee options that have been used by other local governments are listed here:

Impact Fees

Impact fees, which are also known as capital contributions, facilities fees, or system development charges, are typically collected from developers or property owners at the time of building permit issuance to pay for capital improvements that provide capacity to serve new growth. The intent of these fees is to avoid burdening existing customers with the costs of providing capacity to serve new growth ("growth pays its own way"). Park and greenway impact fees are designed to reflect the costs incurred to provide sufficient capacity in the system to meet the additional open space needs of a growing community. These charges are set in a fee schedule applied uniformly to all new development. Communities that institute impact fees must develop a sound financial model that enables policy makers to justify fee levels for different user groups, and to ensure that revenues generated meet (but do not exceed) the needs of development. Factors used to determine an appropriate impact fee amount can include: lot size, number of occupants, and types of subdivision improvements.

Pursuing park and greenway impact fees will require enabling legislation to authorize the collection of the fees.

In-Lieu-Of Fees

As an alternative to requiring developers to dedicate on-site open space that would serve their development, some communities provide a choice of paying a front-end charge for off-site open space protection. Payment is generally a condition of development approval and recovers the cost of the off-site greenway or open space land acquisition or the development's proportionate share of the cost of a regional parcel serving a larger area. Some communities prefer in-lieu-of fees. This alternative allows community staff to purchase land worthy of protection rather than accept marginal land that meets the quantitative requirements of a developer dedication but falls a bit short of qualitative interests.

Exactions

Exactions are similar to impact fees in that they both provide facilities to growing communities. The difference is that through exactions it can be established that it is the responsibility of the developer to build the greenway or pedestrian facility that crosses through the property, or adjacent to the property being developed.

Streetscape Utility Fees

Streetscape Utility Fees could help support streetscape maintenance of the area between the curb and the property line through a flat monthly fee per residential dwelling unit. Discounts would be available for senior and disabled citizens. Non-residential customers would be charged a per foot fee based on the length of frontage on streetscape improvements. This amount could be capped for non-residential customers with extremely large amounts of street frontage. The revenues raised from Streetscape Utility fees would be limited by ordinance to maintenance (or construction and maintenance) activities in support of the streetscape.

Stormwater Utility Fees

Greenway sections may be purchased with stormwater fees, if the property in question is used to mitigate floodwater or filter pollutants.

Stormwater charges are typically based on an estimate of the amount of impervious surface on a user's property. Impervious surfaces (such as rooftops and paved areas) increase both the amount and rate of stormwater runoff compared to natural conditions. Such surfaces cause runoff that directly or indirectly discharge into public storm drainage facilities and creates a need for stormwater management services. Thus, users with more impervious surface are charged more for stormwater service than users

with less impervious surface. The rates, fees, and charges collected for stormwater management services may not exceed the costs incurred to provide these services. The costs that may be recovered through the stormwater rates, fees, and charges includes any costs necessary to assure that all aspects of stormwater quality and quantity are managed in accordance with federal and state laws, regulations and rules.

Installment Purchase Financing

As an alternative to debt financing of capital improvements, communities can execute installment/ lease purchase contracts for improvements. This type of financing is typically used for relatively small projects that the seller or a financial institution is willing to finance or when up-front funds are unavailable. In a lease purchase contract the community leases the property or improvement from the seller or financial institution. The lease is paid in installments that include principal, interest, and associated costs. Upon completion of the lease period, the community owns the property or improvement. While lease purchase contracts are similar to a bond, this arrangement allows the community to acquire the property or improvement without issuing debt. These instruments, however, are more costly than issuing debt.

Tax Increment Financing

Tax increment financing is a tool to use future gains in taxes to finance the current improvements that will create those gains. When a public project, such as the construction of a greenway, is carried out, there is an increase in the value of surrounding real estate. Oftentimes, new investment in the area follows such a project. This increase in value and investment creates more taxable property, which increases tax revenues. These increased revenues can be referred to as the "tax increment." Tax Increment Financing dedicates that increased revenue to finance debt issued to pay for the project. TIF is designed to channel funding toward improvements in distressed or underdeveloped areas where development would not otherwise occur. TIF creates funding for public projects that may otherwise be unaffordable to localities. The large majority of states have enabling legislation for tax increment financing.

Partnerships

Another, often overlooked, method of funding pedestrian systems and greenways is to partner with public agencies and private companies and organizations. Partnerships engender a spirit of cooperation, civic pride and community participa-

tion. The key to the involvement of private partners is to make a compelling argument for their participation.

Major employers and developers should be identified and provided with a “Benefits of Walking”-type handout for themselves and their employees. Very specific routes which make those critical connections to place of business would be targeted for private partners’ monetary support, but only after a successful master planning effort. People rarely fund issues before they understand them and their immediate and direct impact. Potential partners include major employers which are located along or accessible to pedestrian facilities such as multi-use paths or greenways. Name recognition for corporate partnerships would be accomplished through signage trail heads or interpretive signage along greenway systems.

Utilities often make good partners and many trails now share corridors with them. Money raised from providing an easement to utilities can help defray the costs of maintenance. It is important to have a lawyer review the legal agreement and verify ownership of the subsurface, surface or air rights in order to enter into an agreement.

Other Local Options

Local Capital Improvements Program

As discussed in Chapter 5 and the beginning of this appendix, a strong local Capital Improvements Program (CIP) commitment, dedicated to sidewalk and greenway development, is critical for long-term implementation. Project priorities and costs are discussed in Chapters 3 and 5. Currently, \$15,000 is allocated for greenway development each year in Black Mountain, NC. In Raleigh, the greenways system has been developed over many years through a dedicated source of annual funding that has ranged from \$100,000 to \$500,000, administered through the Parks and Recreation Department. In Graham, NC, \$100,000 is allocated towards sidewalk development each year.

Facility Maintenance Districts

Facility Maintenance Districts (FMDs) can be created to pay for the costs of on-going maintenance of public facilities and landscaping within the areas of a town where improvements have been concentrated and where their benefits most directly benefit business and institutional property owners. An FMD is needed in order to assure a sustainable maintenance program. Fees may be based upon the length of lot frontage along streets where improvements have been installed, or

upon other factors such as the size of the parcel. The program supported by the FMD should include regular maintenance of streetscape of off road trail improvements. The municipality can initiate public outreach efforts to merchants, the Chamber of Commerce, and property owners. In these meetings, Biscoe staff will discuss the proposed apportionment and allocation methodology and will explore implementation strategies. The municipality can manage maintenance responsibilities either through its own staff or through private contractors.

Local Trail Sponsors

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

Volunteer Work

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

Private Foundations and Corporations

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

Foundation for the Carolinas

Established in 1958, the Foundation for the Carolinas is the one of the largest community foundations in the South. Building A Better Future, the foundation's major grantmaking program, awards grants only to organizations located in or serving the greater Charlotte area. The foundation's specialized grants programs include the African American Community Endowment Fund (Charlotte-Mecklenburg and surrounding communities), HIV/AIDS Consortium Grants (13 Charlotte-

area counties), and the Medical Research Grants program (North and South Carolina). The foundation's Web site features information for potential donors; program information, guidelines, and deadlines; listings of senior management and board members; an electronic form for requesting copies of the foundation's publications; and contact information. Web site: <http://www.ffc.org/>

Land for Tomorrow Campaign

Land for Tomorrow is a diverse partnership of businesses, conservationists, farmers, environmental groups, health professionals and community groups committed to securing support from the public and General Assembly for protecting land, water and historic places. The campaign is asking the North Carolina General Assembly to support issuance of a bond for \$200 million a year for five years to preserve and protect its special land and water resources. Land for Tomorrow will enable North Carolina to reach a goal of ensuring that working farms and forests; sanctuaries for wildlife; land bordering streams, parks and greenways; land that helps strengthen communities and promotes job growth; historic downtowns and neighborhoods; and more, will be there to enhance the quality of life for generations to come. Website: <http://www.landfortomorrow.org/>

The Robert Wood Johnson Foundation

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

- To 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 more specific information about what types of projects are funded and how to apply, visit <http://www.rwjf.org/applications/>.

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. Based in Raleigh, North Carolina, 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. Web site: <http://nccommunityfoundation.org/>

Z. Smith Reynolds Foundation

This Winston-Salem-based Foundation has been assisting the environmental projects of local governments and non-profits in North Carolina for many years. They have two grant cycles per year and generally do not fund land acquisition. However, they may be able to support Biscoe in other areas of open space and greenways development. More information is available at www.zsr.org.

Bank of America Charitable Foundation, Inc.

The Bank of America Charitable Foundation is one of the largest in the nation. The primary grants program is called Neighborhood Excellence, which seeks to identify critical issues in local communities. Another program that applies to greenways is the Community Development Programs, and specifically the Program Related Investments. This program targets low and moderate income communities and serves to encourage entrepreneurial business development. Visit the web site for more information: www.bankofamerica.com/foundation.

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 three focus areas: Environment and Energy Efficiency, Economic Development, 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>.

American Greenways Eastman Kodak Awards

The Conservation Fund's American Greenways Program has teamed with the Eastman Kodak Corporation and the National Geographic Society to award small grants (\$250 to \$2,000) to stimulate the planning, design and development of greenways. These grants can be used for activities such as mapping, conducting ecological assessments, surveying land, holding conferences, developing brochures, producing interpretive displays, incorporating land trusts, and building trails. Grants cannot be used for academic research, institutional support, lobbying or political activities. For more information visit The Conservation Fund's website at: www.conservationfund.org.

National Trails Fund

American Hiking Society created the National Trails Fund in 1998, the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. 73 million people enjoy foot trails annually, yet many of our favorite trails need major repairs due to a \$200 million backlog of badly needed maintenance. National Trails Fund grants help give local organizations the resources they need to secure access, volunteers, tools and materials to protect America's cherished public trails. To date, American Hiking has granted more than \$240,000 to 56 different trail projects across the U.S. for land acquisition, constituency building campaigns, and traditional trail work projects. Awards range from \$500 to \$10,000 per project.

Projects the American Hiking Society will consider include:

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

Web site: www.americanhiking.org/alliance/fund.html. The Conservation Alliance

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to

protect wild and natural areas. One hundred percent of its member companies' dues go directly to diverse, local community groups across the nation - groups like Southern Utah Wilderness Alliance, Alliance for the Wild Rockies, The Greater Yellowstone Coalition, the South Yuba River Citizens' League, RESTORE: The North Woods and the Sinkyone Wilderness Council (a Native American-owned/operated wilderness park). For these groups, who seek to protect the last great wild lands and waterways from resource extraction and commercial development, the Alliance's grants are substantial in size (about \$35,000 each), and have often made the difference between success and defeat. Since its inception in 1989, The Conservation Alliance has contributed \$4,775,059 to grassroots environmental groups across the nation, and its member companies are proud of the results: To date the groups funded have saved over 34 million acres of wild lands and 14 dams have been either prevented or removed-all through grassroots community efforts.

The Conservation Alliance is a unique funding source for grassroots environmental groups. It is the only environmental grantmaker whose funds come from a potent yet largely untapped constituency for protection of ecosystems - the non-motorized outdoor recreation industry and its customers. This industry has great incentive to protect the places in which people use the clothing, hiking boots, tents and backpacks it sells. The industry is also uniquely positioned to educate outdoor enthusiasts about threats to wild places, and engage them to take action. Finally, when it comes to decision-makers - especially those in the Forest Service, National Park Service, and Bureau of Land Management, this industry has clout - an important tool that small advocacy groups can wield.

The Conservation Alliance Funding Criteria: The Project should be focused primarily on direct citizen action to protect and enhance our natural resources for recreation. We're not looking for mainstream education or scientific research projects, but rather for active campaigns. All projects should be quantifiable, with specific goals, objectives and action plans and should include a measure for evaluating success. The project should have a good chance for closure or significant measurable results over a fairly short term (one to two years). Funding emphasis may not be on general operating expenses or staff payroll.

Web site: www.conservationalliance.com/index.m. E-mail: john@conservationalliance.com.

National Fish and Wildlife Foundation (NFWF)

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

The Foundation awards matching grants under its Keystone Initiatives to achieve measurable outcomes in the conservation of fish, wildlife, plants and the habitats on which they depend. Awards are made on a competitive basis to eligible grant recipients, including federal, tribal, state, and local governments, educational institutions, and non-profit conservation organizations. Project proposals are received on a year-round, revolving basis with two decision cycles per year. Grants generally range from \$50,000-\$300,000 and typically require a minimum 2:1 non-federal match.

Funding priorities include bird, fish, marine/coastal, and wildlife and habitat conservation. Other projects that are considered include controlling invasive species, enhancing delivery of ecosystem services in agricultural systems, minimizing the impact on wildlife of emerging energy sources, and developing future conservation leaders and professionals. Website: <http://www.nfwf.org/AM/Template.cfm?Section=Grants> where additional grant programs are described.

The Trust for Public Land

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 & 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/>.

