

# Chowan County & Edenton Greenways and Open Space Plan



Edenton, NC



Chowan County

**GREENWAYS**  
INCORPORATED

Landscape Architecture  
Multi-Objective Trail Planning  
Open Space Planning

2003

The preparation of this plan was financed in part through a grant provided by the North Carolina Coastal Management Program through funds provided by the Coastal Zone Management Act of 1972 as amended which is administered by the Office of Ocean and Coastal Research Management of the National Oceanic and Atmosphere Administration.

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# Executive Summary

During the Winter of 2002 and Spring of 2003, the governments of Chowan County and the Town of Edenton partnered together to create this Greenways and Open Space Plan as a guide for developing a system of trails and protected areas in their community. The three-step process that was undertaken to complete the plan included initial data collection, a series of public meetings and workshops, and finally, the development of a final document containing maps of the proposed system and recommendations for its implementation.

A set of goals for the system was established by combining the input of local government staff with the feedback received from several public meetings and workshops. Existing planning documents were also reviewed and incorporated into the process. The goals that were developed served as guiding principles for the design of the corridors and the location of open space search areas. The complete set of goals is listed in the introductory chapter, but includes:

- promoting connectivity, recreational opportunities, and alternative transportation options
- balancing growth management with natural resource protection, and

- supporting local tourism and economic development activities

## Document Layout

Five chapters form the essence of the document - Introduction, Existing Facilities and Natural Features Review, System Description, Implementation, and Funding. These chapters are followed by a set of appendices that offer additional tools and supplementary information about design standards, public input, electronic map data, system management, and a detailed review of an initial pilot project.



## Key Recommendations

Many recommendations for action and implementation can be found throughout the document. Chapter 3, which describes the layout and design of the proposed system, and Chapter 4, which presents a detailed action strategy for implementing the system contain the greatest concentrations of recommendations. From these, nine key recommendations can be extracted:

- 1) Immediately begin work on the Downtown Edenton Pilot Project.
- 2) Protect Pembroke Creek and Queen Anne Creek by creating a loop greenway around Edenton.
- 3) Develop a primary connector between Downtown Edenton and the communities near Indian Creek.
- 4) Develop a detailed greenway plan for the Rockyhock Creek corridor that includes land-based and water-based uses.
- 5) Make clear delineations of where farmland and agricultural operations should be protected within the community.
- 6) Expand existing parks program to complete neighborhood level parks near all established communities in the County.
- 7) Create a large regional park to serve the entire County and support tourism.
- 8) Manage the entire greenway and open space system as an extension of the existing park system.
- 9) Establish a dedicated, local revenue source to support the development, operation, and management of the system.

Completion of this system of greenways and protected open spaces will take many years and will require the persistent work and dedication of elected officials, local government staff, private businesses and the community at large. The benefits, however, are many and the return on the investment could be significant.



# Introduction

The 2003 Chowan County & Edenton Greenways and Open Space Plan seeks to empower local decision-makers by providing background information, data analysis and innovative strategies that support the development of a local Greenways and Open Space system. The individual chapters present summary information about the community's resources, descriptions of the proposed greenways and open space network, and an action strategy for implementing the vision. In the appendices, additional information can be found regarding design standards and management practices, as well as technical information on the new Geographic Information System (GIS) map layers that have been created through this planning process.

## Project Overview

This planning process represents a partnership between the Chowan County government and the Town of Edenton. Conservation planning techniques were used to identify potential greenways and open spaces that should be protected because of their potential for recreation, economic development, community connectivity, and natural resource management. These protection themes provide the foundation for the plan and are reflected in the list of goals and objectives



found later in this chapter, as well as in the system design and the implementation recommendations.

Prior to the creation of this plan, Chowan County and the Town of Edenton had completed two other adopted documents that incorporated elements of planning for the community's green infrastructure - a trade term for the network of forested and agricultural areas, waterways, parks, and trails that characterize a community's sense of place and provide essential natural functions and support for our lifestyles.

The *1993 Edenton-Chowan County-Wide Comprehensive Master Plan for Parks and Recreation* noted the need for hundreds of acres of recreation areas and miles of trails for walking, biking, and other uses. It made the case for a system of greenways that would help meet those goals.

The *1998 Land Use Plan Update for the County of Chowan and the Town of Edenton* contained descriptions of how greenspace protection fits into growth management strategies, and made a case for additional bike paths, recreational areas and a limited greenbelt system around Edenton.

The new 2003 Chowan County and Edenton Greenways and Open Space Plan brings together the concepts that had been introduced in those documents and adds additional analysis, based on Geographic Information System data layers and the concepts of regional landscape planning. It then offers a recommendations for the prioritization of specific trail segments and lays out an action plan and next steps so that it is clear how the community can move forward to implementation of this plan.

Consultations with Town and County staff and feedback from public events was important to the development of this plan. The interests expressed at those meetings were blended with the sets of goals found in the existing planning documents. Together, the ideas, goals, and the on-the-ground realities of the Chowan-Edenton community drive the character of the greenways and open space system and the recommendations for its implementation.

As a framework document, the Chowan County and Edenton Greenways and Open Space Plan details the general alignment and characteristics of potential corridors. It also uses analysis of Geographic Information System (GIS) data layers to approximate several search areas in the County where open space protection plans can be implemented so that the community's recreation, farmland protection, growth management, and water quality protection efforts can be best coordinated.

## Character of Chowan and Edenton

Known as "The South's Prettiest Town" Edenton is North Carolina's first and oldest permanent settlement. Originally incorporated in 1715 as the Town on Queen Anne's Creek, the community has long been influenced by its natural surroundings. Edenton Bay, at the head of the Albemarle Sound, served as a harbor for vessels travelling up and down the Atlantic Coast and as a dropping off point

for goods that were needed throughout Northeastern NC and Southeastern Virginia.

Today, the natural harbor continues to be an important part of life in Edenton. Developed as a primary attraction and link to the heart of Edenton, the Downtown Harbor is a standard stop for the Historic



Edenton Trolley Tour and for tourists who come to the area to enjoy its charm and beauty.

Edenton is the county

seat of Chowan County and the only incorporated town. Other communities though, include Valhalla, Yeopim, and Center Hill. Predominately rural, Chowan's history, like that of Edenton, is tied up with its natural landscape. When settlers learned they could ditch and drain the naturally occurring wetland landscape, fertile farmland sprung up from what initially appeared as wasteland. Today, farming continues across much of the County and large stands of planted pine are prevalent as well.

Where the water meets the land in this part of the world, extraordinary ecosystems occur. Full of nature's bounty, the near shore areas have long supported Chowan's fisheries industry. Crabs and oysters, Stripers and Red Drum, can still be pulled from the regions rivers and bays, but over the years, the farming and timbering operations (along with land development of housing and roads) have had a big impact on the health of the regions waters, necessitating the establishment of more strict water quality protection measures.

Just over a third of the County's 14,382 residents live in Edenton, making it the heart of Chowan County both demographically and economically.



Maintaining linkages, however, between Edenton and the rest of the communities in the County has become increasingly important. This Greenways and Open Space Plan provides a framework for maintaining that connectivity and for achieving many other Chowan and Edenton goals.

## Goals and Objectives

The following list of Chowan-Edenton Open Space and Greenway system goals and objectives is based on input from the local government staff, the comments of participants at the public meetings, and a review of the existing Chowan-Edenton planning documents. Presented together here, they represent a vision for the community that enhances overall quality of life for all the residents.

### 1. Greater Connectivity

One of the primary goals of this planning process is to enhance connectivity between destinations in Chowan County. This includes connecting the Town of Edenton with other communities and connecting interesting destinations within the Town as well.

- Objective A: Develop trails and bikeways between the Town of Edenton and the rest of the County.
- Objective B: Extend existing sidewalks and bicycle routes to create a link between all the open spaces in Edenton.
- Objective C: Provide interesting routes for walking through Edenton that link to shopping, historic, and waterfront resources.

### 2. Increased Opportunities for Recreation

The proposed greenways and open space system is viewed as an extension of the existing park system, providing residents opportunities to walk, run, bike, picnic, and enjoy nature

- Objective A: Develop greenways between existing parks so that additional value and functionality is added.
- Objective B: Create new parks in communities that are growing.
- Objective C: Improve water access by developing new water-based trails and public access points.

### 3. Alternative Transportation Options

Given the option, some residents would choose to bike or walk to common destinations like work, school, or shopping centers.

- Objective A: Facilitate walking by adding additional sidewalks.
- Objective B: Design new greenways in a manner that accommodates pedestrian and wheeled traffic.
- Objective C: Establish safe cross-county bicycle routes by installing appropriate signage.

### 4. Flood and Soil Erosion Control

Along waterways, efforts to buffer the resource from its nearby land resources can reduce the damage from floods, keep sediment out of the waterways, and maintain healthy streamside ecosystems.

- Objective A: Maximize rivers' natural capabilities in hazard mitigation by permanently protecting floodplain areas.
- Objective B: Maintain permanent vegetated buffers immediately adjacent to waterways.
- Objective C: Define conservation or active and passive recreation as the preferable use along waterways.

## **5. Economic Development**

Integrating the community's living history into the alignment and design of the open space and greenways system can facilitate increased tourism and can enhance the experience of visitors.

- Objective A: Increase the time tourists spend in the community by creating additional sightseeing and vacationing opportunities.
- Objective B: Improve the community's ability to recruit new businesses by maximizing the quality of life in the area.
- Objective C: Support the growth of local business by creating new ways for residents to enjoy their community.

## **6. Growth Management**

As Chowan County and Edenton develop, new construction should be directed to areas where it is most appropriate - balancing growth needs with the needs to maintain a desirable community character and a healthy environment.

- Objective A: Create a greenbelt around the Town of Edenton.
- Objective B: Ensure that sufficient recreational facilities are within a reasonable distance of all population centers.
- Objective C: Protect the natural environment by strategically acquiring public open spaces.



# Existing Facilities and Natural Features Review

When considering where future greenways and other open space areas should be in Chowan County and in the Town of Edenton, it is necessary

to do some assessment of the existing conditions of the area.

This chapter presents an overview of the Chowan-Edenton water

resources, land use, infrastructure, land cover, open space, and natural areas.



Finally, all of the source materials for the maps in this chapter have been made available digitally to Chowan County and the Town of Edenton as part of this planning process. Delivered in Geographic Information System (GIS) format, the data will be useful to the community in future planning endeavors.



Each of these components of the regions on-the-ground identity were taken into consideration during the design of the greenways and open space system. Additionally, factors such as potential growth pressure and the relationship of natural features within the larger multi-county area were also considered.

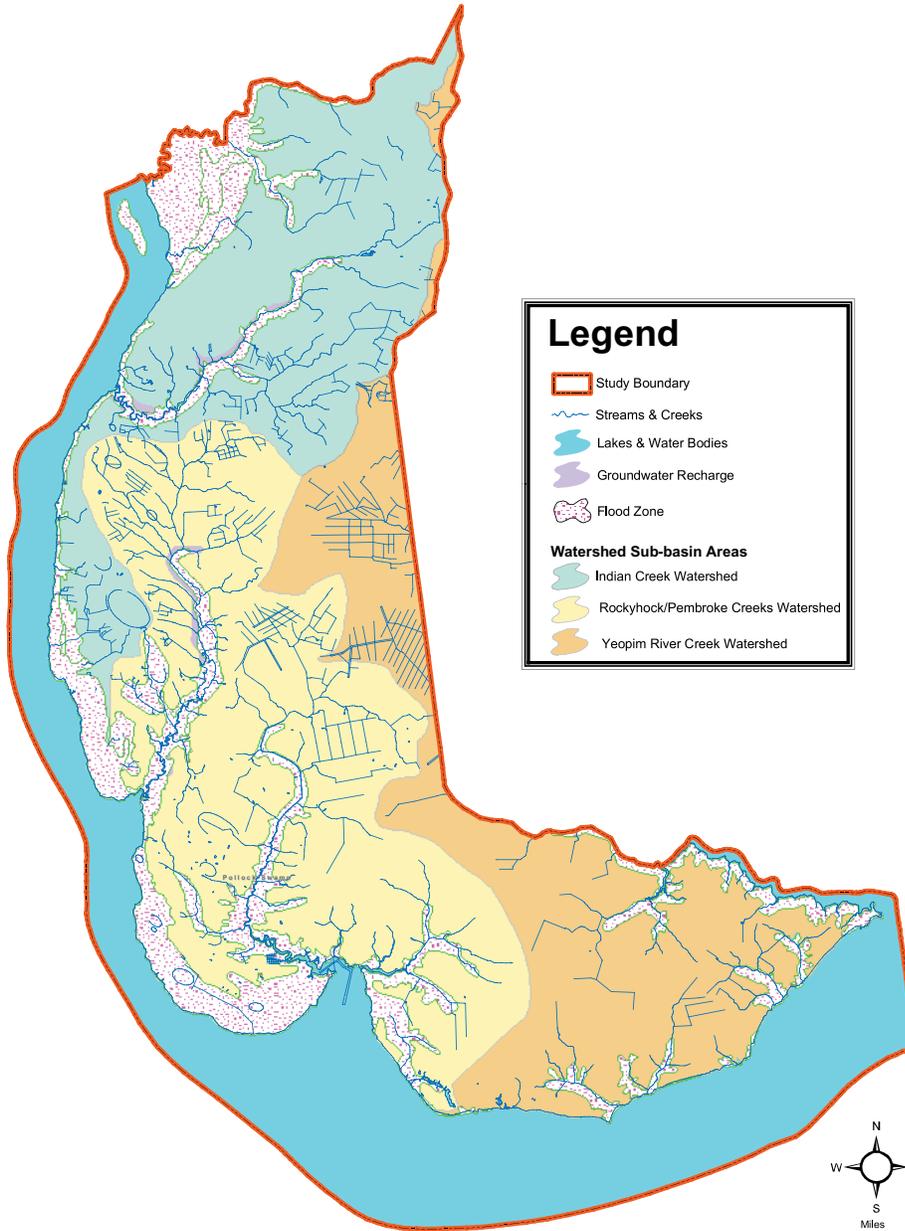


## Water Resources

Chowan County is located in the northeastern corner of North Carolina on the coastal plain, which is mostly flat and slightly above sea level. The County's proximity to water is a defining characteristic of life in the community. Two major river basins divide the County -The Chowan and the Pasquotank. These basins can then

be divided further into subbasins. Shown here are the Indian Creek Watershed, the Yeopim Creek Watershed, and the Rockyhock/Pembroke Creeks Watershed. The Indian Creek and Rockyhock/Pembroke watersheds are part of the Chowan Basin. The Yeopim watershed area is part of the Pasquotank Basin. Also shown on the map are floodplains, groundwater recharge areas, and other surface water features.

## WATER RESOURCES MAP



This plan targets much of the greenways development along the major creek corridors of the area. By following these corridors, greenways can help protect valuable habitat, aid in hazard mitigation planning, provide additional shore access points, and can be completed in a way that minimizes impact on the future buildability of private lands.

The Chowan River is the major defining feature along the Western border of the County. It is fed by a number of Chowan County creeks and rivers and eventually feeds into the Pamlico Sound along the southern border of the County. The Yeopim River separates Chowan County from Perquimans County to the east. The waterfront of the Town of Edenton is defined by Edenton Bay - a sizeable natural harbor.



## Land Use

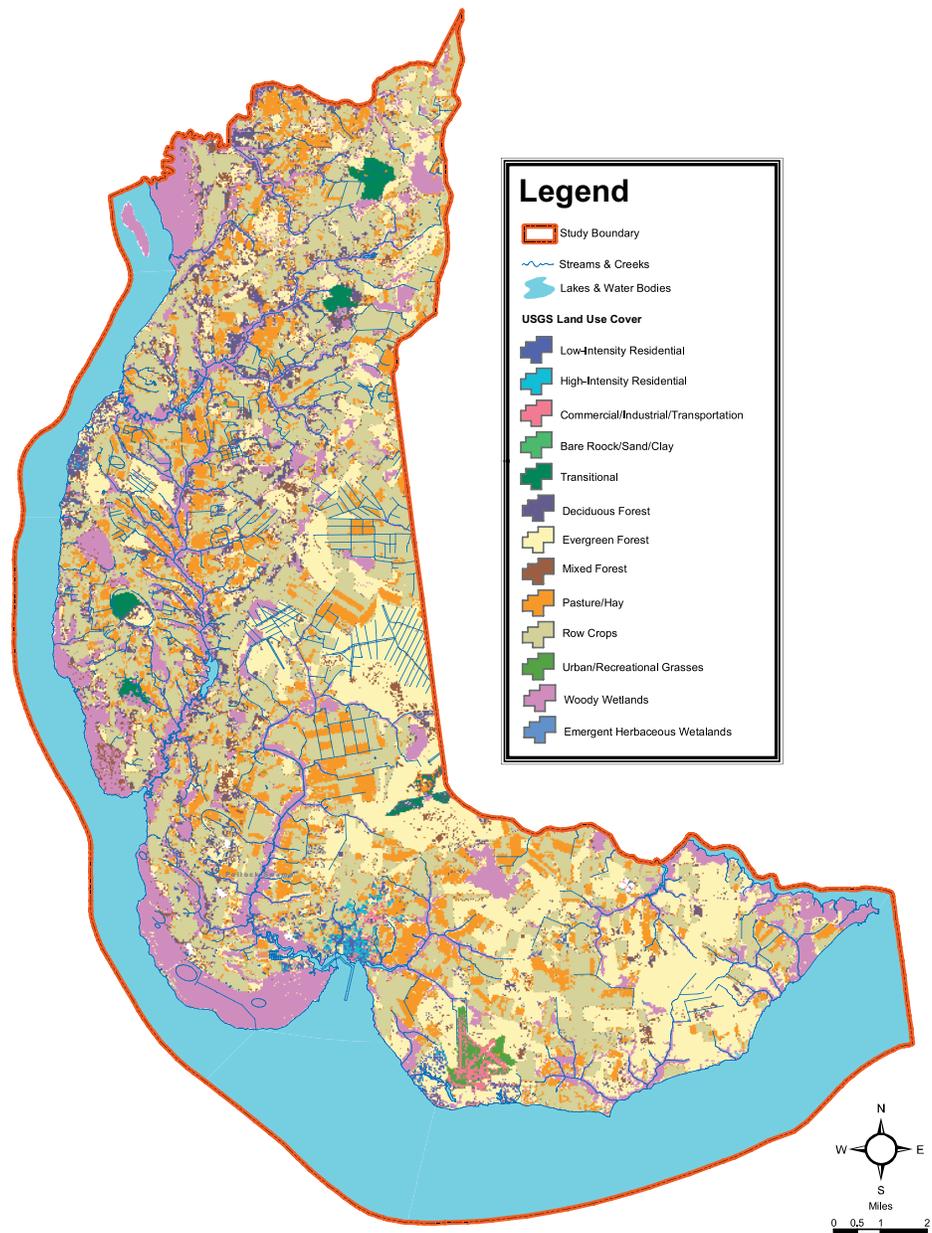
A good deal of the landscape outside the Town of Edenton is low density housing mixed with broad, flat, commercial farm and forest land. Cotton fields cover much of the landscape as do a good number of other row crops. Much of the land used for agriculture and silviculture is wetland that has been ditched and drained to facilitate the runoff of extra water, leaving fertile farmland soil behind.

Examining the current use of the land helps determine both opportunities and constraints for potential greenways and open space systems. In the case with Chowan-Edenton, connectivity between existing commercial, residential, and recreational areas was important and helped define the character of the system. Pockets of forest close to both agricultural lands and smaller rural communities were generally included in the open space component of this plan for potential protection.

In some cases, an effort to avoid conflicts that can come up between land uses - such as a proposed greenway through a commercial or industrial area, can affect the alignment of corridors.

As the community continues to grow and develop, some adjustments to the alignment of these proposed greenway and open space facilities may need to be made to avoid land use conflicts.

## LAND USE MAP



**Infrastructure**

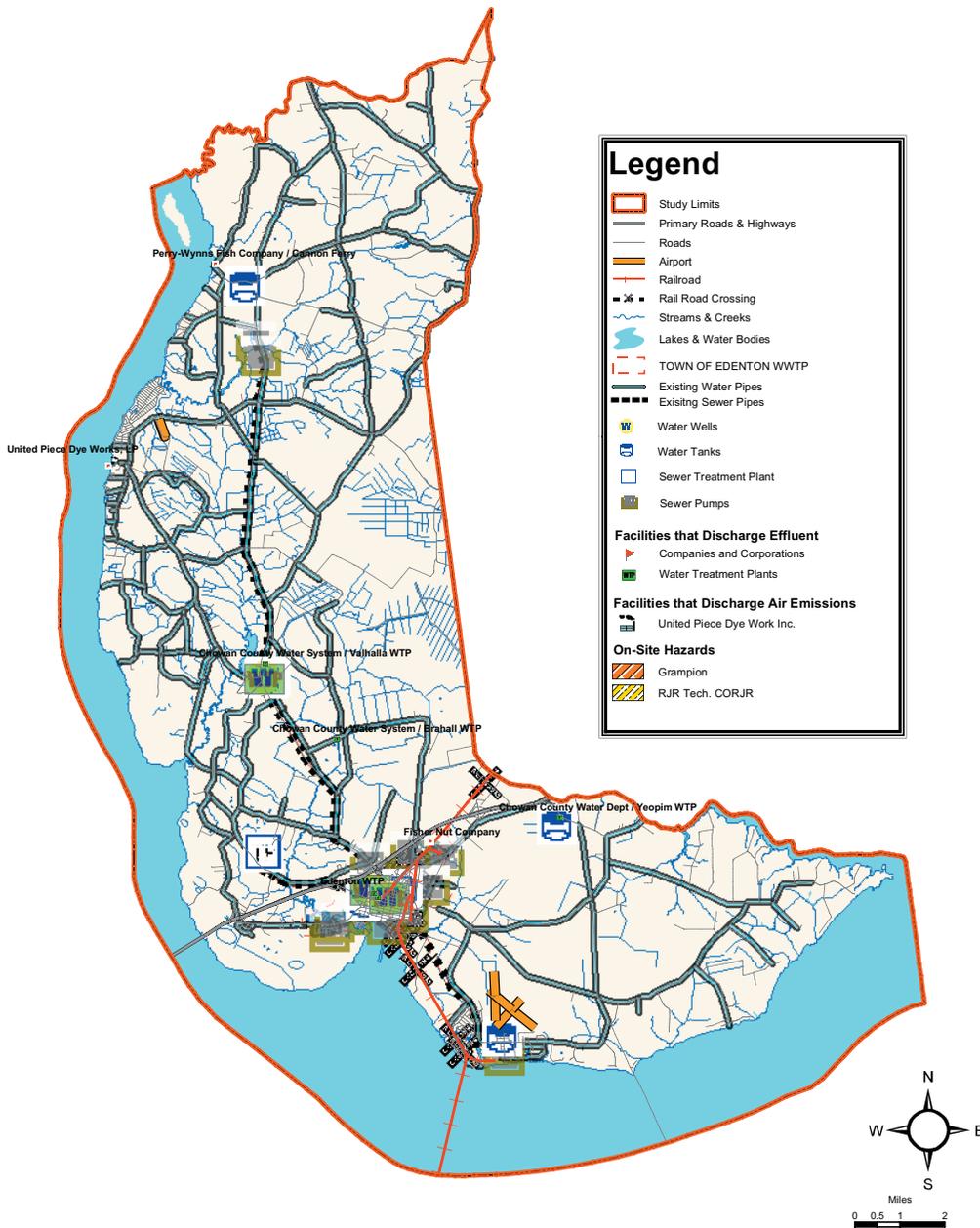
Chowan County is served by one primary north-south road corridor and one primary east-west road corridor. A fabric of smaller connector roads servicing those main routes is overlaid on top of this primary axis. Crossroads across the County are often the sites of small community centers including shopping opportunities and perhaps a community church. These areas can be good nodes or hubs for the larger system.

The development of a community's green infrastructure should be completed in concert with its grey infrastructure of roads, sewage and water lines, and rail roads. Often right-of-ways or easements can be great locations for new bicycle routes or walking trails. The expansion of sewer and water lines into an area also helps suggest how likely it is to be developed in the future. These growth patterns can affect greenway and open space system design.

**INFRASTRUCTURE MAP**

The airport in the southern portion of the County is another example of infrastructure that can influence system design. The presence of the airport is a major constraint on the type of development that can occur in that area and that has impacts on the types of greenways and open space that may be needed there.

When considering how a greenways and open space system can protect natural resources, it is important to know where sources of pollutants are located. The map on this page shows several points of effluent or discharge that should be taken into consideration.



## Land Cover

The land cover map displays the current vegetative ground cover across the County. It is useful as an indicator of the character of the landscape as well as an index of the area's soil and ground water conditions and its general ecosystem characteristics.

Much of Chowan County remains undeveloped and forested in evergreen forests or mixed hardwood and evergreen forests. Patches of wetland areas run along the creek corridors and at the edge of the County where it meets the rivers and sound.

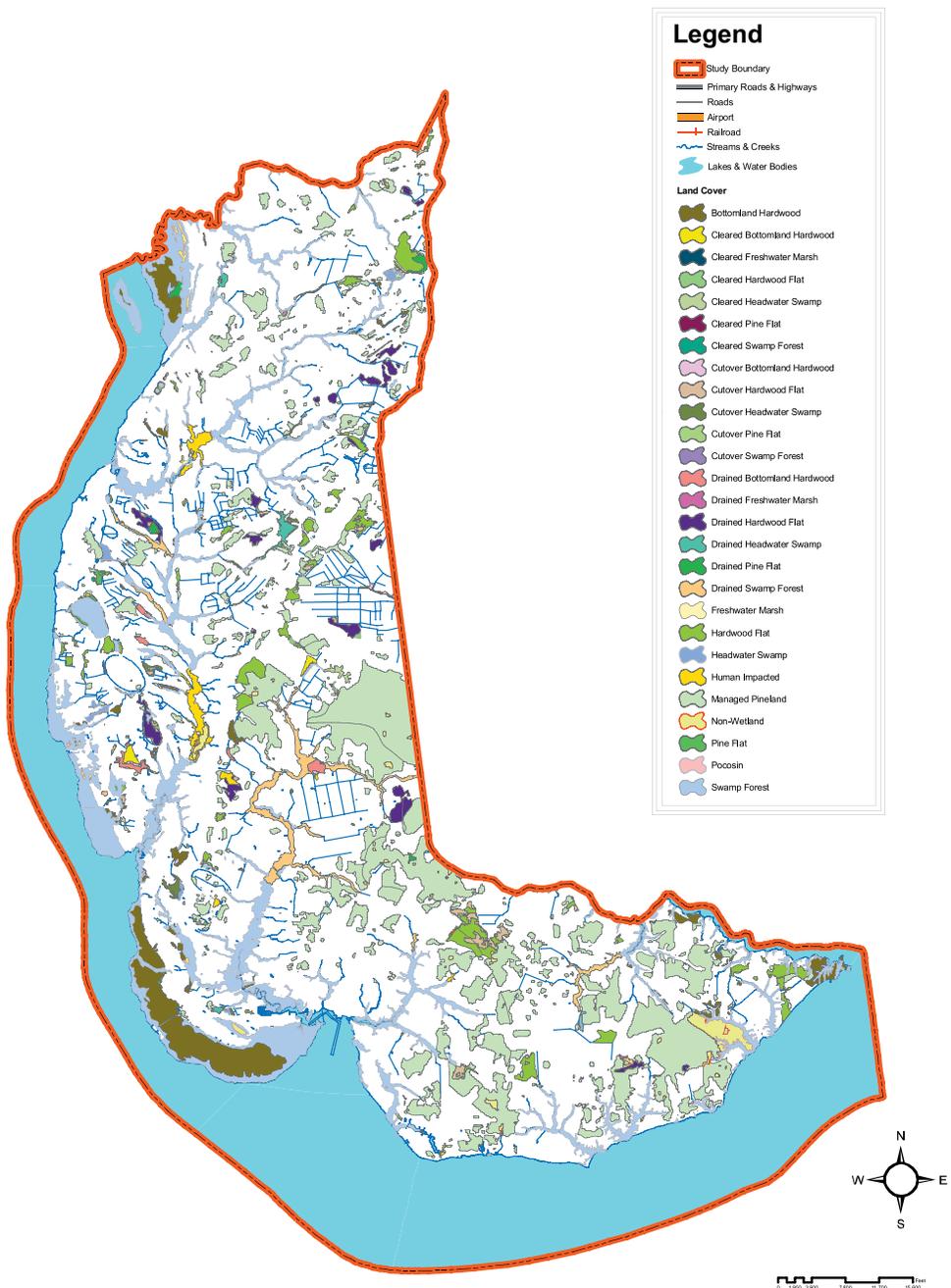
A very large forested area lies near the center of the County along the border with Perquimans County. Mill ponds of various size and functionality dot the generally damp landscape, and Carolina Bays are sprinkled throughout the southwestern portion of the County.

The types of vegetative cover can be indicative of the potential health and wealth of natural community diversity or species habitat and can signal areas that could be part of a system of greenways and open spaces.

Unique vegetative areas or areas with fairly broad expanses of forest, away from the threat of

development, often offer good opportunities for potential open space protection. Some of the areas that are part of the proposed open space search areas were identified in part because of the information shown on this land cover map.

## LAND COVER MAP



**Open Space and Natural Areas**

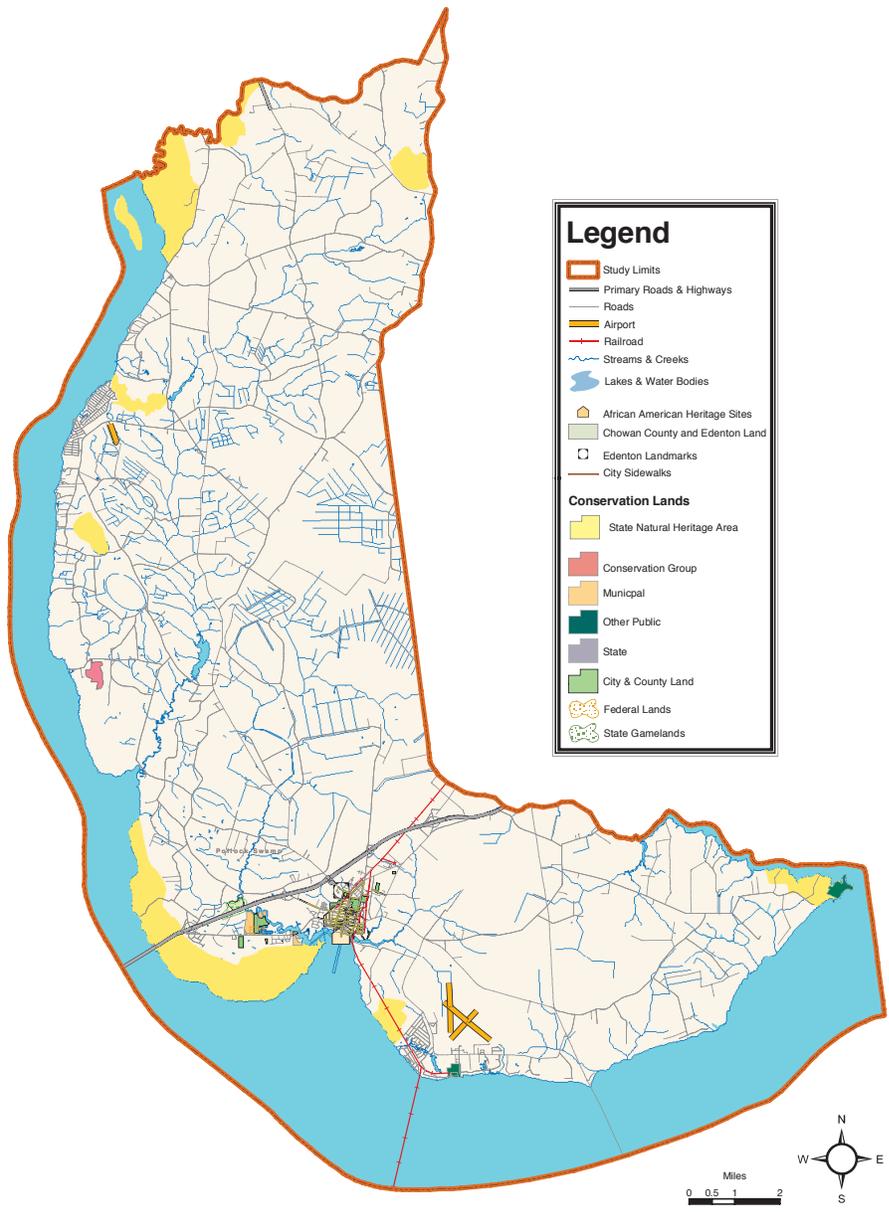
One of the fundamental design considerations in the creation of a greenways and open space system for Chowan County and the Town of Edenton is linking and enhancing existing open space resources. Another is to protect significant areas where current protection is not in place. This map shows the County-wide layout of existing protected areas such as parks and natural area preserves. Most of

the County's parks are located in and around Edenton - where much of the population lives. The greenways system is designed to provide additional linkage between these hubs. Sometimes these linkages are shorter, urban connections, and at other times they stretch long distances between recreational destinations in the central and northern parts of the County.

The most significant natural communities found in Chowan County are generally marshy flood plain areas immediately adjacent to the sound, rivers, and creeks.

The NC Natural Heritage Program has identified nine Coastal Complex Natural Areas that provide important habitat to native plant and animal communities. These areas have generally been included as part of the open space protection search areas.

**OPEN SPACE AND NATURAL AREAS MAP**



# Greenways and Open Space System

## Introduction

This chapter defines the complete network of greenways and open spaces that have been developed for Chowan County and the Town of Edenton. Framed around the existing parks and protected open spaces of the region and its major waterways and roads, the completed system will go a long way in helping the community achieve its connectivity, natural resource protection, alternative transportation, and economic development goals.

The maps and text descriptions on the following pages offer details about the specific greenway corridors that have been defined and the set of open space search areas that are being suggested as part of the network. Together, these selected areas form a complete green infrastructure design for the community that follows a fundamental model of nodes, corridors, connectors, and loops. The system includes unique and interesting destinations and enjoyable and safe routes between them.

## Design Methodology

Both remote research and direct observation were used to analyze the existing conditions in the community. The remote research consisted of gathering background data from the existing land use, parks and recreation, and transportation thoroughfare plans as well as the best available maps and data sets

regarding current land uses, demographics, natural systems status, and capital facilities.

In addition to the remote research conducted, the consultant completed field research to verify our collected data and to become personally familiar with the on-the-ground realities and distinct character of the community. The field visits included observation of surface water characteristics, identification of constraints and opportunities, examination of existing infrastructure and residential and commercial development patterns, estimations of ecological health, and photo documentation.

In addition to this data collection and individual assessment, we listened closely to County and Town staff recommendations and desires, and held a number of information sharing events with the public.

At the beginning of this document, a set of goals and objectives were presented for this plan. From that comprehensive list, four statements were extracted that represent the essence of the Chowan-Edenton Greenways and Open Space system. These are:

- Increased connectivity within Edenton and between Edenton and other parts of the County

- Protection of key natural features and communities
- Improved access to the rivers and creeks
- Increased opportunities for recreation and for alternative transportation

It is these condensed goal statements that are at the heart of the system design.

As part of the creation of this system, Greenways Incorporated developed a set of Geographic Information System data layers using information from the NC Center for Geographic Information and Analysis and from the US EPA, Region 4. The data layers included the schools, hospitals, important cultural sites, natural areas, cultivated areas, floodplains, areas most at risk from potential development, land use, land cover, and many others (The maps in Chapter 2 represent much of this data). Through the overlap of the different data layers and personal visits to much of the Town and County, we systematically constructed the network to meet the proposed community goals and work within the realities on the ground.

Input from elected officials, Town and County staff, and the general public were also included as primary inputs. More information about the public input process is available in Appendix C.

## System Recommendations

This proposed system of greenways and open space is a long term proposal and is expected to take many years to complete. As a master plan for the system, some fluidity has been incorporated in the design so that alterations can easily be made as community needs and interests change over time.

The first portion of the system that is recommended for completion is a segment in the highly visible, Downtown Edenton. Completion of this pilot project will help bring positive attention to the larger task of implementing the entire Greenways and Open

Space system and will serve as a mechanism for cultivating continued community support for the completion of future segments.

This chapter puts forward seven recommendations for developing the Chowan-Edenton Greenways and Open Space system:

**Recommendation 1:** Immediately begin the more detailed planning process for the completion of a pilot project that will link prime locations in Downtown Edenton.

**Recommendation 2:** Achieve protection for and access to Pembroke Creek and Queen Anne Creek through the development of a loop greenway following these corridors and circling around the Town of Edenton

**Recommendation 3:** As a first step in linking to the rest of Chowan County, develop a primary connector between Downtown Edenton and the communities near Indian Creek.

**Recommendation 4:** Develop a detailed greenway plan along the Rockyhock Creek corridor for land and water based activity.

**Recommendation 5:** Make clear delineations of where farmland and agricultural operations should be protected within the community and manage growth to achieve those goals.

**Recommendation 6:** Develop an expansion strategy for the Chowan-Edenton Parks program to complete neighborhood level parks near all of the established communities in the County.

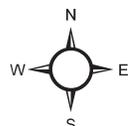
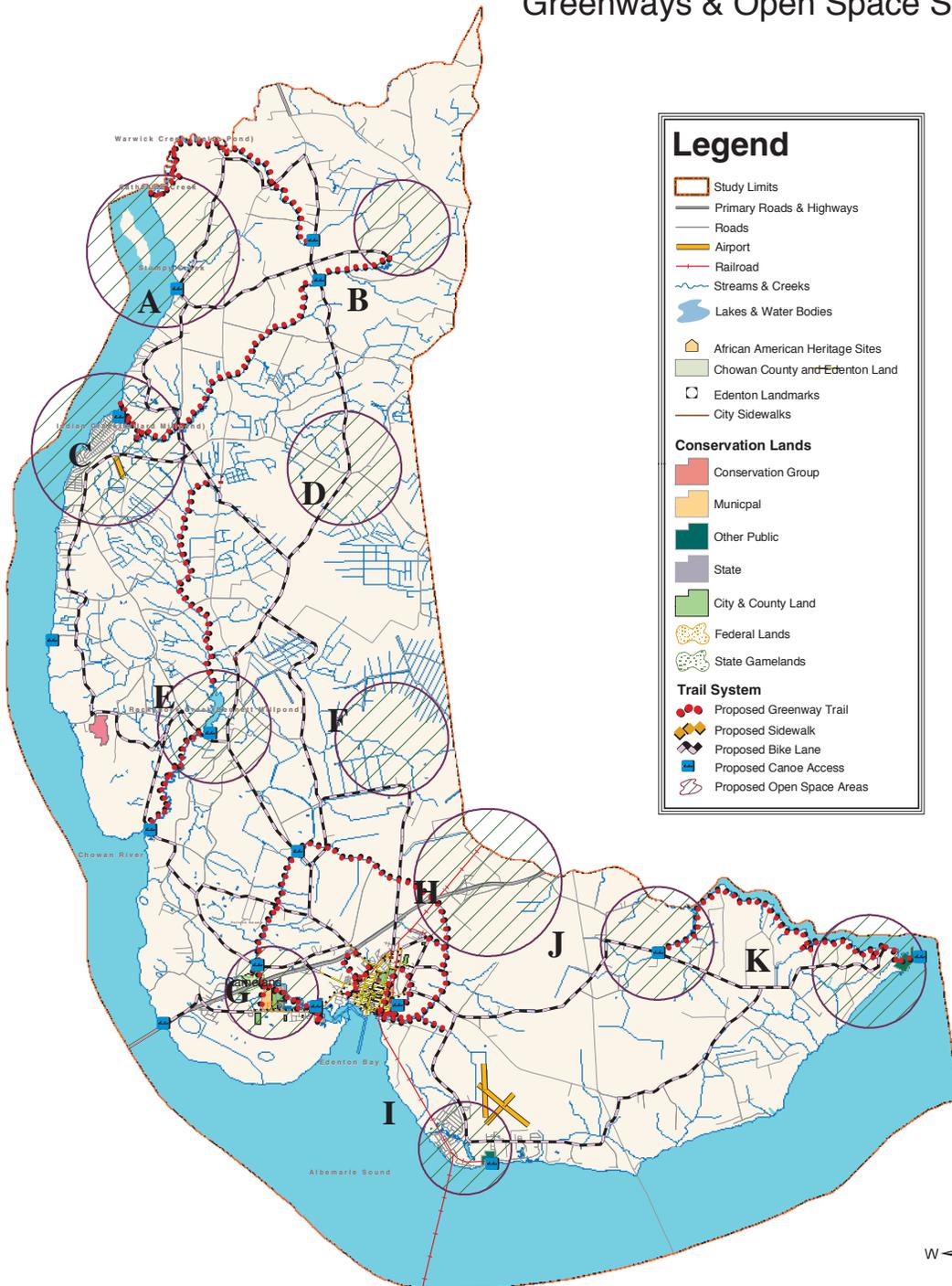
**Recommendation 7:** Create a large, regional park that is located and designed in a manner that serves entire County and supports tourism development interests.

Additional recommendations can be found in the following implementation chapter as well as an action strategy for moving forward with these recommendations and meeting the goals and objectives listed in the introductory chapter.

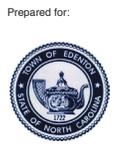


# Chowan County & Edenton North Carolina

## Greenways & Open Space System



Prepared by:  
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Data Sources:  
 NC Center for Geographic Information and Analysis  
 NC Department of Transportation (GIS Mapping Unit)  
 Edenton-Chowan, Planning and Inspections Department  
 Edenton-Chowan Parks & Recreation Department  
 The Town of Edenton and Chowan County, NC  
 (Requests for additional information regarding the data presented on this map should be directed to one of the entities above.)  
 The preparation of this map was financed in part through a grant by the North Carolina Coastal Management Program, through funds provided by the Coastal Management Zone Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resources Management, National Oceanic and Atmospheric Administration.



## System Description

The rest of this chapter is dedicated to more completely describing the details of the system. Starting first with a description of the proposed open space search areas, followed by the Greenways portion of the system.

### OPEN SPACE SYSTEM

Open Space protection is a broad term that generally encompasses several types of protection activities. For the purposes of this plan, the open space protection search areas are designed to support the creation of traditional parks and wildlife preserves and to protect agricultural areas, silvicultural areas, and scenic landscapes. The individual search areas that have been designated are areas where it might be useful for the County to initiate additional protection efforts to achieve some of the communities conservative and recreation goals. Some of the GIS layers used to select these areas were: Natural Heritage Areas, road density, potential threat from urban growth, existing parks and schools, and active agricultural and silvicultural operations.

These search areas are presented as a suggestion of areas where a number of goals might be met through the protection of a number of adjoining or proximal tracts.

Each of the main goals that drove the selection process are described more fully below and suggestions are made for the specific areas that might support these interests.



#### Natural Areas Protection:

From an ecological perspective, the most important areas in the County are several patches of forest and/or swamp that run along the Chowan River, Edenton Bay and the Yeopim River. There is one other area near Snow Hill in the northeastern part of the County. Search areas A,B,C,I and K have been designed in part to provide potential protection to some of these areas. In these

search areas, it may be appropriate to develop a nature center or interactive park that focuses on passive recreation and habitat protection.

#### Neighborhood and Community Parks:

As Chowan County and Edenton continue to grow and develop, more parks will be necessary. These can be areas where residents can play sports, walk pets, exercise, and get together with family or friends. There will be a need for increased opportunities for both passive and active recreation. All of the search areas that were identified have this consideration built into their selection. Three types of park needs were considered:

- 1) Local or Neighborhood parks - These are smaller sections of green within or near a particular community designed to accommodate everyday, local use. Search Areas C,D,G, and I represent this sort of situation.
- 2) Continuation of Existing Facilities - There are several popular destinations that already support community-wide recreational use. Chowan-Edenton might choose to expand these facilities in the future. In other cases, land has been recently protected or regulations (such as near the airport) restrict many development options. In all cases, this category is meant to be a building upon existing conditions. Search areas A,E,G,I, and K have incorporated these considerations.
- 3) Regional parks - Several opportunities exist to develop a much larger regional park that will be designed to serve the entire County and perhaps neighboring counties as well. These areas might support equestrian use or maybe off-road bicycles or vehicles. They could also be designed to support camping and longer hiking trails. Search areas F,H, and J have been designed with this consideration in mind.



### Working Landscapes:

There is a great deal of farmland across the County today, but threats from growth have regularly threatened the viability of agricultural and silvicultural operations across the country. Should the County determine that it would like to embrace more formal land protection efforts based on the needs of working landscapes, several search areas have been designed with this in mind. Areas A,B,D,F,H, and J each contain viable agricultural lands that could be threatened by other uses in the future.



**Scenic Areas:** In every community, there are landscapes that define the personality and uniqueness of the area. In Chowan County, these landscapes tend to be either

wide-open agricultural lands, areas of living history, or water-based landscapes. Each of the open space search areas that have been drawn capture some of the scenic elements of Chowan and Edenton and any open space protection efforts in these areas should be cognizant of the opportunity to protect these views when the opportunities arise.

### GREENWAYS SYSTEM

The second part of the green infrastructure concept outlined in this planning process is the Greenways component. These are the linear portions of the system - the unpaved trails, the buffered areas along the rivers and creeks, and the paved routes for biking, rollerblading, and jogging. They serve as the framework for connectivity and resource protection. They are the connectors and corridors between the nodes of the system. Greenways Incorporated has developed this greenways system in a manner that supports several different levels of corridors, based on

the degree to which facilities are developed on the individual corridors. It is expected that greenways corridors of each of these types will be developed as part of this system.

#### Level 1: No Facility Development

This designation applies to corridors containing environmentally sensitive areas, steep slopes, wetlands or other constraints that make greenway facility development undesirable or impossible. The corridor would remain primarily in a natural state, as human access would be extremely limited. Other functions for these corridors can include floodplain management, water quality protection, and conservation of important habitat for wildlife and plants. The restoration of streambanks and re-vegetation of natural areas may be necessary along these corridors to facilitate a multi-objective corridor. These activities could also take place along those greenways containing trails and other facilities, in order to maximize the water quality, wildlife habitat, and other functions of level 2 through level 4 greenway corridors.

#### Level 2: Limited development/low-impact uses

This designation applies to corridors containing environmentally sensitive areas that limit the extent of greenway facility development. The corridor would remain primarily in a natural state, with gravel or dirt trails (4 to 6 feet wide) for use by one or two low impact user groups, such as hikers and/or equestrians. Trail Head facilities and other amenities (such as signage and picnic tables) would be limited.

#### Level 3: Multi-use unpaved trail development

This designation applies to greenway corridors where the adjacent natural areas, rural landscapes or historic sites dictate a more natural facility development objective, corridors located outside of areas which experience frequent flooding, or greenways where use is anticipated to be lower than in other areas and primarily recreational. The unpaved trails could be surfaced with gravel or

crushed stone (10 to 12 feet wide) for use by several user groups, such as bicyclists, joggers, and equestrians. Wheelchair users and persons with strollers can use unpaved trails if they are designed to ADA standards and surfaced with compacted crushed stone. Trail Head facilities and other amenities (such as benches, signage and picnic tables) would be developed as needed where appropriate.

**Level 4: Multi-use paved trail development**

This designation applies to corridors where high use is anticipated; greenways that do not contain environmentally sensitive areas; corridors which will most likely be used as transportation routes; greenways located within frequently flooded areas; or those located in urban settings. Several user groups, such as bicyclists, joggers, wheelchair users, and rollerbladers, need a surface paved with asphalt or concrete (10 to 12 feet wide). Although asphalt is the most common paved surface used for greenway trails, concrete is best for areas experiencing frequent flooding. Trail Head facilities and other amenities (such as lights, benches, and signage) would be developed.

**Level 5: On-road (sidewalks and bikeways)**

This designation applies to corridors in urban areas where an off-road option is not possible, or corridors which function as connections between off-road trails and major origins and destinations. On-road greenways would consist of sidewalks for pedestrian use and bikeways for cyclists. Bikeways can vary from 6-foot wide bicycle lanes (complete with pavement striping and signage) to 4-foot wide paved roadway shoulders to a 14-foot wide curb lane (to be shared by cyclists and motorists). Pedestrian-scale lighting, street trees, benches and other amenities could be developed to encourage sidewalk use.

**Level 6: Water Based Trails**

This designation applies to those rivers and streams that can successfully accommodate

and/or which are designated to support canoeing, kayaking and boating. Water based trails can be designed with features and facilities that make this activity more enjoyable for residents, including signage systems, improved rapids, safety systems, etc.

**Corridor Descriptions**

The remainder of this chapter is a set of maps and corridor descriptions for the five primary corridors where initial greenway projects are being recommended. The rest of the system should be completed as the opportunity to do so arises. The first project - Corridor A (on the opposite page) - is the Downtown Edenton Pilot Project. The other four are: Pembroke Creek, Queen Anne Creek, Rockyhock Creek, and the Edenton-Indian Creek Corridor.

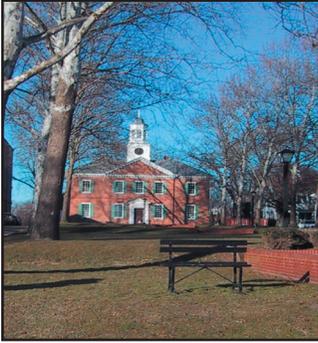
The entire proposed system, shown on the map on page 3-3, covers an area much greater than the five projects described on the next several pages. The chart below shows the mileage of the entire system and how it is broken down into basic corridor types.

**MILES OF PROPOSED SYSTEM**

	Bike Lanes	Greenway Trails	Sidewalks
Town (Edenton)	3.60	5.84	4.42
County	92.11	45.53	0.69
<b>Total</b>	<b>95.71</b>	<b>51.37</b>	<b>5.11</b>
Total miles of proposed system:		152.19	

The proposed open space search areas should be evaluated in a parallel process to the development of the greenways. Together the open space components and the greenway components of the system work together to provide recreational and tourism opportunities, natural resource protection, and tools for managing community growth.





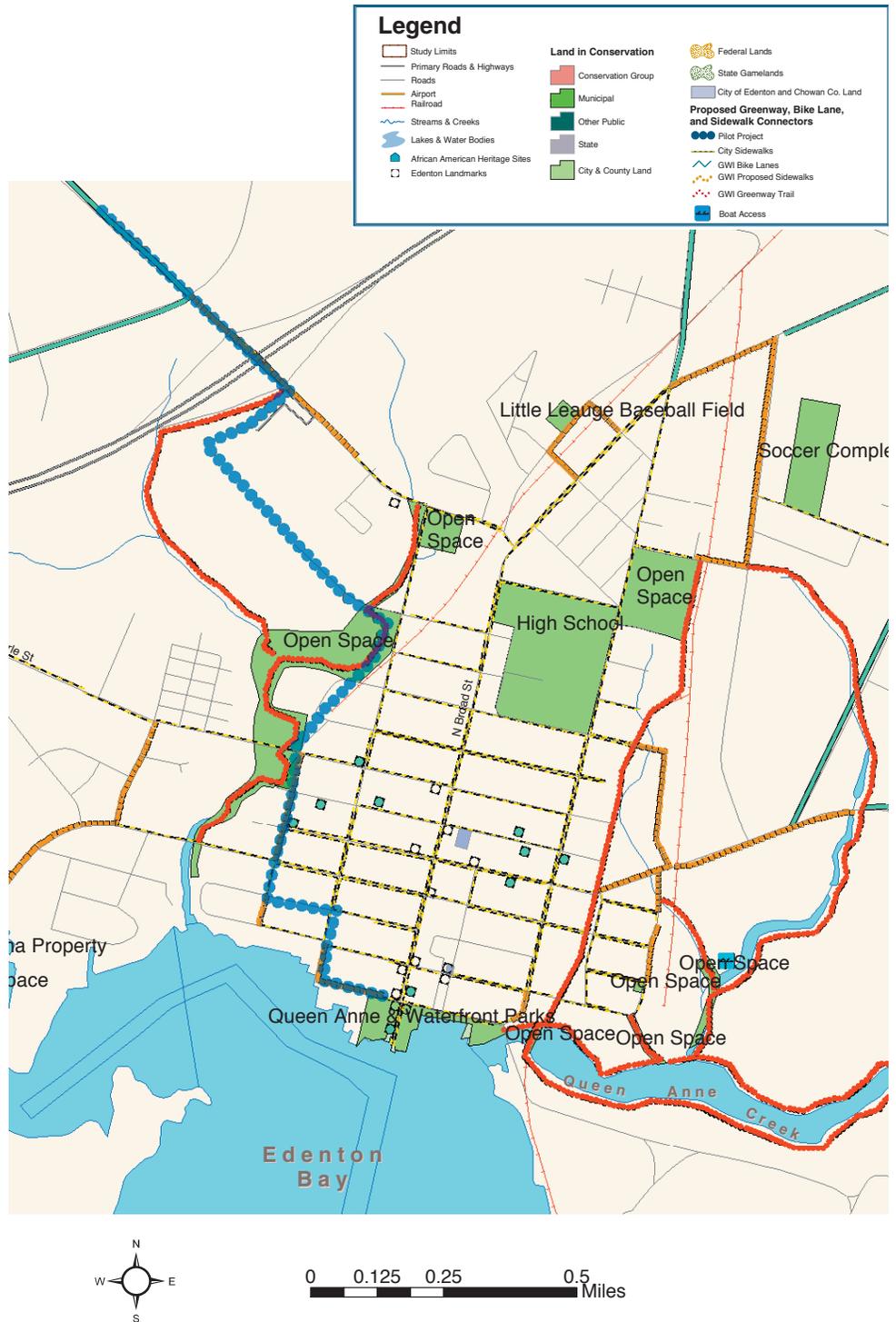
## A. Downtown Corridor

### Description:

This pilot project links the hotels and restaurants near the intersection of Hwy 17 Bypass and Hwy 32 with the African American Cemetary and the downtown waterfront area. Running south from Hwy 32, the route follows Claire Road to W. Hicks St, then continues SE to Granville St. Along Granville Street and into the cemetary, the route follows new sidewalks and eventually connects with the abandoned rail corridor in the cemetary, terminating at Moseley St. The corridor then winds along W. Eden, Granville and W. Water Street to its endpoint.

### Objective:

This corridor is a pilot project and should be used to jumpstart additional interest and investment in the larger greenway and open space system. It would serve immediately as an alternative travel route between popular tourist destinations and would allow the community to highlight some of its cultural resources. Additionally, by connecting to many existing open spaces and to the hospital area, it serves as a potentially popular bike and walking route for the town residents. Additional information about this corridor is available in Appendix E.





## B. Pembroke Creek

### Description:

Commencing in Pollock Swamp to the north and west of Edenton, Pembroke Creek becomes one of the most major surface water features in the county as it winds south and east under the US 17 Bypass and under the West Queen St. Bridge where it supports a small marina and then feeds into Edenton Bay.

### Objective:

This waterway provides a canoeable route that reaches several miles upstream from Edenton Bay. Through the construction of several canoe access points, the area is set to be a prime destination

for water-based recreation. A permanently protected buffer along the creek corridor into Pollock Swamp allows for the protection of the water quality, the species habitat, and with appropriate facility development, provides the first stage of a major loop trail around the Edenton area.





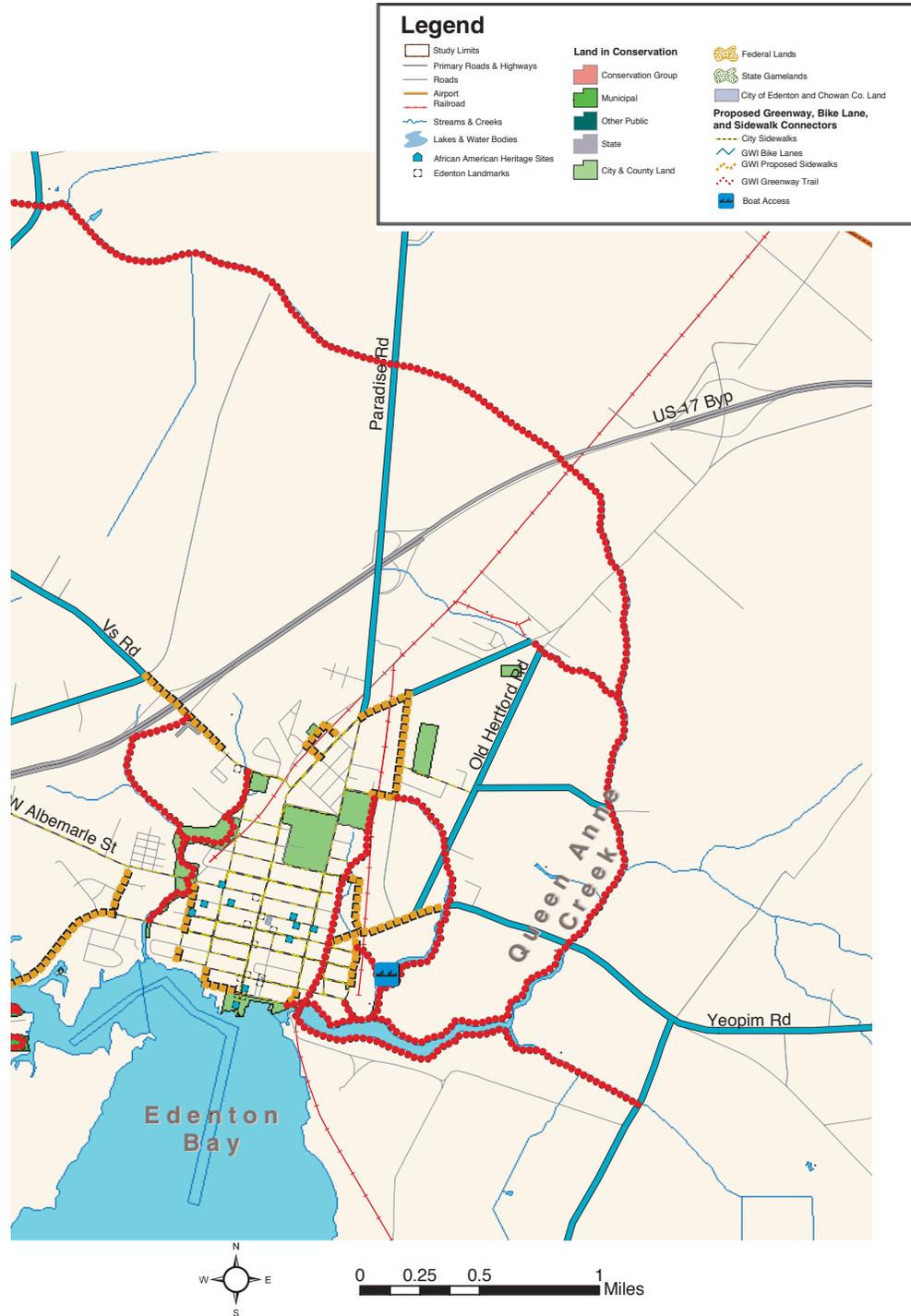
## C. Queen Anne Creek

### Description:

Queen Anne Creek is the major watercourse that flows in from the east of Edenton along the beginnings of the Downtown waterfront area and into Edenton Bay near the Town Square. Its canoeable route ends near the intersection of east-bound Hwy 32, but continues as a more minor creek for several miles northward.

### Objective:

This corridor provides a scenic setting for homes and businesses located just east of the downtown waterfront. Placement of a canoe access point would allow another water-sport option for local residents and tourists. Completion of a designated greenway along the corridor would provide an excellent recreational and transit opportunity for the residents living in communities just east of downtown, and perhaps more importantly, when followed north all along its corridor, provides a prime opportunity to link across the farmland to the north of town with the Pembroke Creek/Pollock Swamp Corridor.



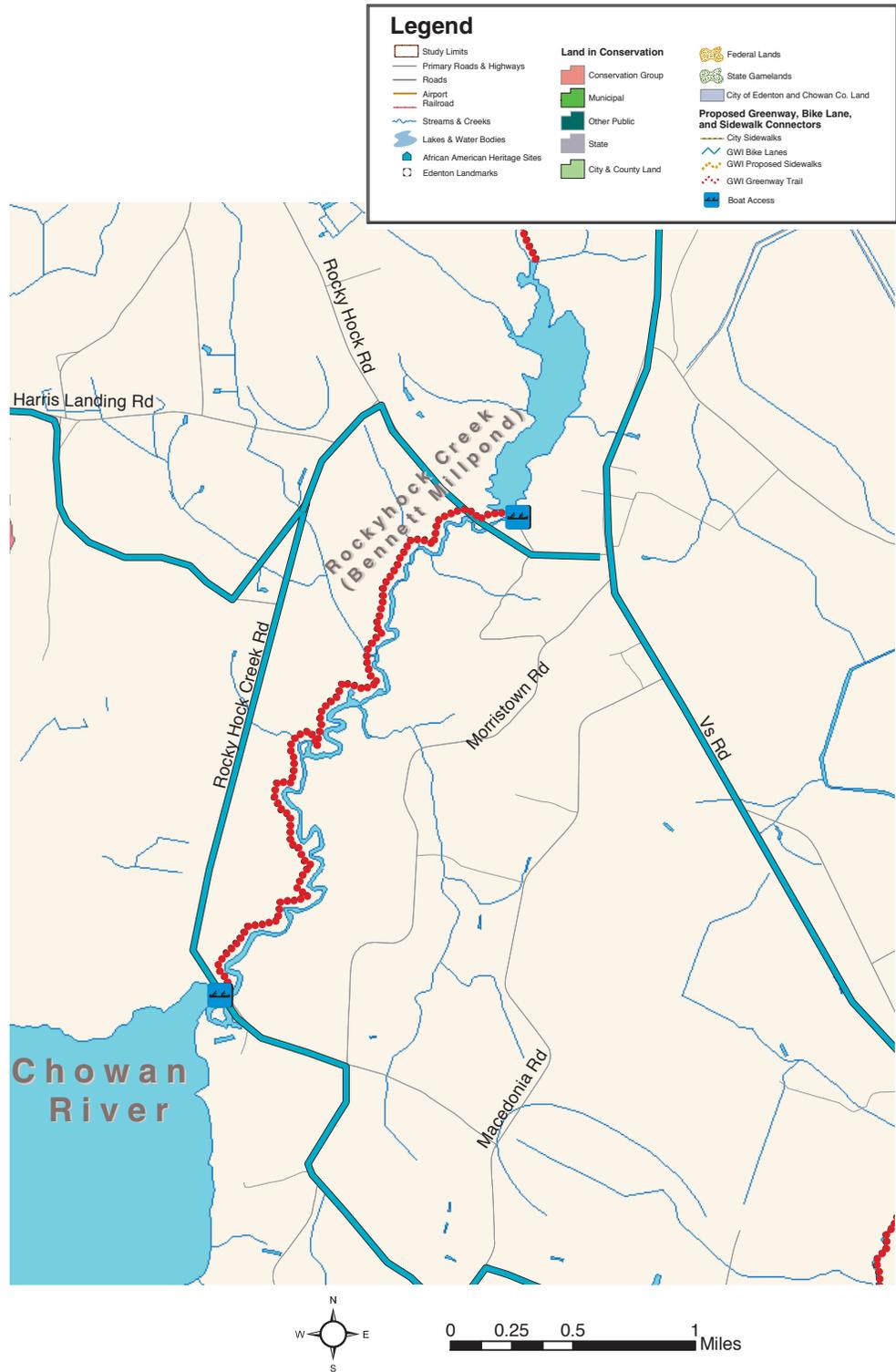
## D. Rockyhock Creek

### Description:

A land and water corridor stretching from Chowan Middle School near Virginia Road and Dillard’s Mill Road to the incredibly scenic Bennet Millpond and then following the creek to its confluence with the Edenton River.

### Objective:

Completion of this corridor serves to link several major education and recreation destinations. Through the placement of several canoe access points, this corridor adds to the growing number of water-based trails available to the boating public. The protection of a vegetative buffer along the stream corridor will help ensure high quality wildlife habitat and will serve to protect water quality in the Edenton River, Edenton Bay, and the Albemarle Sound.



## E. Edenton-Indian Creek Corridor

### Description:

Primarily follows existing roads using an on-road bikeway or sidewalk, the route would begin at the Hwy 32 and Hwy 17 bypass intersection and head north and east along Mexico Road, Chamber's Ferry Road, Morristown Road, Cowpen Neck Road. Eventually linking to Harris Landing Road, and heading North along SR 1214 and River Road into the Indian Creek communities.

### Objective:

Provides a primary corridor between Edenton and Indian Creek with potential links to Bennet Millpond and a canoe access point on the Chowan River. With improvements for safer pedestrian and bicycle travel, the Indian Creek Corridor provides an excellent alternative transit route for residents and a scenic tour for tourists.





# Implementation

## Overview and First Steps

Implementation of this plan begins with securing support for it among the local elected bodies and their advisory boards. Official support should come in the form of adoption of this document as the official Greenways and Open Space Plan for Chowan County and the Town of Edenton. Following its adoption, the plan can be used in conjunction with other existing planning documents as the basis for future land use, recreation, resource management, and transportation decisions.

Historically, communities across the country have overlooked the importance of this first step of adopting a new plan. Without official adoption, the document, “lacks teeth”, and can easily lose its influence.

The next step is to begin work on the pilot project - a downtown greenway that links some of the hotels and restaurants near the intersection of Hwy 17 Bypass and Hwy 32 with open spaces on the way to downtown, the African American cemetery, and the Downtown Edenton Waterfront. The completion of this project, and eventually each of the projects listed in the plan, will require the persistence of local government staff, the passion of the public and elected officials, and the commitment of the community as a whole to negotiate access and



acquisition agreements, establish continuous revenue streams, build facilities, and manage the new greenways in perpetuity.

As each of the projects is completed, it should be adopted as an additional unit of the Chowan-Edenton Parks and Recreation Department and should be managed in accordance with their standard practices for facilities management. The development of each project should also be overseen by the Parks and recreation department with the advice of a local greenways and open space advisory board appointed by the Town and County elected officials.

Greenways Incorporated recommends that each of the proposed greenway corridors be treated as additions to the Town-County Park system and be managed as an additional park unit.

## Action Plan

Following adoption of the plan, energies should be focused on completing the Downtown Corridor Pilot Project. To give guidance on how to get started and how to complete the pilot project, the following action plan details the major steps to be taken and individual actions to be completed within each step. General timelines are also provided for each of the steps. The timelines and order of actions are proposed as basic guidelines

but should be seen as flexible. They can be altered and adjusted to meet the community's needs as it moves ahead with the project.

### **Step 1: Strategy Development (July '03 - September '03)**

Following the budget rush in May and June, many local government elected boards quiet down in July and August. This is a good opportunity to establish an agreed upon strategy for moving forward.

- Action A: Establish a new Town-County Greenways and Open Space Advisory Board, appointed by the local elected boards.
- Action B: The advisory board develops an agreed upon timeline and strategy for completing the pilot project. Final decisions should be made about the route selection, type of trail, and intended funding sources
- Action C: Initiate individual communications with landowners that may be affected by proposed pilot project plans.

### **Step 2: Public Support (September '03 - December '03)**

Once a draft concept paper has been established and individual landowners have been briefed, it's time to take the show on the road. This should be done in two parts: continuation of private land owner communications and a public campaign.

- Action A: Continue dialog with landowners to counter fears and build understanding of the economic benefits of the project.
- Action B: Establish a public awareness/education campaign including a series of presentations to local civic groups, guest editorials in the local paper, and distribution of a flyer with basic information.

### **Step 3: Funding (September '03 - February '04)**

With the public support phase still ongoing, the County and Town staff, along with the advisory board should start to implement the funding strategy ideas developed in Step 1, Action B.

- Action A: Ensure that local cash and in-kind contributions are arranged, by working with local elected officials, private businesses, and potential individual donors.
- Action B: Research and apply for grants (many may have January, February or March Deadlines)
- Action C: Start laying the groundwork for a permanent revenue stream for greenway and open space projects. This may involve establishing a local trust fund, researching bond options, or getting public feedback about willingness to create an additional, dedicated fee to support greenways and open space. Contacting a consultant to help with a public financing strategy may be necessary here.

### **Step 4: Acquisition of Access Privileges (December '03 - June '04)**

Now that the public is on-board and funding is lined up, it is time to start securing access to the properties that may be needed for the project. This can be a very slow process and should be approached thoughtfully. It may take several rounds of funding.

- Action A: For public land holders, finalize long-term public access agreements.
- Action B: Building on private land owner communications, finalize arrangements for the donation and/or sale of easements and fee simple purchases.
- Action C: Finalize improvement plans for sidewalks or street alterations.



### **Step 5: Development (July '04 - December '04)**

This step is the one that all the others have built up to - actual construction of the new facility.

- Action A: Bring together volunteers and donations arranged for in Step 2 and Step 3 to start clearing trees and brush and grading
- Action B: Oversee contracts for additional trail work such as grading, surfacing, and building construction.
- Action C: Finalize improvements to any roads that were scheduled for amendments to allow additional pedestrian and wheeled traffic.
- Action D: Hold opening ceremonies and dedication ceremonies with appropriate acknowledgments for all who contributed time and money to the effort.

### **Step 6: Move on to the Next Project (December '04 - )**

While work is ongoing with the pilot project, the groundwork needs to begin for the next project, including: determining where and how it will proceed, initial land owner communications, and funding considerations. Starting the first steps in the background while completing the pilot project will allow the community to build on the energy and relationships established during the pilot project and will allow a smoother flow from one project to the next.

### **Conclusion**

Following this action plan and implementing the recommendations in the previous chapter will move the community through the completion of the pilot project and will lay the groundwork necessary to move on to additional projects within the system once the pilot project has been completed.

Much of the work in initially creating a community Open Space and Greenway system is

in establishing the necessary administrative capacity and developing the financial support system. Once a community has completed its first project, subsequent efforts can simply build upon the new, enhanced administrative capacity.

Implementation of this greenways and open space plan will take many years. It is expected that the pilot project alone may take two years to complete, subsequent projects that involve more acquisition of land rights and which cover larger areas may take anywhere from three to ten years.



# Funding Recommendations

Implementing the recommendations of this plan will require a combination of funding sources that include local, state, federal, and private money. Fortunately, the benefits of protected greenways and other open spaces are many and varied. This allows Chowan-Edenton programs 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 open space projects.

It is important that Chowan-Edenton fully evaluate its available options and develop a funding strategy that can meet community needs, maximize local resources, and leverage outside funding. Financing will be needed to administer the continued planning and implementation process, acquire parcels or easements, and manage and maintain facilities in the Greenways and Open Space System.

Greenways Incorporated advises the local governments of Chowan County and the Town of Edenton to research and pursue a variety of funding options. Below is a list of some of the greenways and open space 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.

## ***Federal Government Funding Sources***

### **The Transportation Equity Act for the 21st Century (TEA-21)**

This is the primary authorizing legislation for surface transportation projects in the US. The enhancement programs under this act are popular sources of money for greenway and trail projects and for scenic area protection projects. Historic preservation and mitigation projects for highway water runoff are also potentially useful projects that can be funded under this act. Tea-21 was enacted in 1998 and is being reviewed for re-authorization in 2003. This means that the current TEA-21 programs listed below may change in the very near future. For the most up-to-date information, visit [www.tea3.org](http://www.tea3.org). Some of the most pertinent programs under this act are:

### **Recreational Trails Program**

Originally titled, the Symms National Recreational Trails Fund Act, this funding source assists with the development of non-motorized and motorized trails. States receive the funds and can then grant them to other private or public organizations. Under this program, grant recipients must provide a 20 percent match and the projects must be consistent with the Statewide Comprehensive Outdoor Recreation Plan (SCORP) - updated every 5 years by the NC Division of State Parks.

### **Office of Bicycle and Pedestrian Transportation**

Under this program, a state may spend a portion of its federally allocated surface transportation funds on bicycle and pedestrian facilities or on non-construction projects such as brochures, public service announcements and route maps related to bicycle safety. Rails-Trails projects can also be funded under this program. All projects must be part of a long-range transportation plan. Contact the NCDOT, Division of Bicycle and Pedestrian Transportation at (919) 733-2804 for more information.

### **National Scenic Byways Program**

Allows federally allocated surface transportation funds to be spent on protecting and developing Federal and State scenic byways, including acquisition of scenic areas and development of bicycle lanes along the route. This money is available only along dedicated scenic routes. More information about dedicating a stretch of roadway as a NC Scenic Byway can be obtained from the NCDOT.

### **Land and Water Conservation Fund (LWCF)**

This federal funding source was established in 1965 to provide “close-to-home” park and recreation opportunities to residents throughout the United States. LWCF grants can be used by communities to build a variety of park and recreation facilities, including trails and greenways. In NC, the federally granted money is allocated through

the State Division of Parks and Recreation. 50 percent of the local project costs must be met through in-kind services or cash provided by the recipient.

### **Wetlands Reserve Program**

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.

## ***State Funding Sources***

### **North Carolina Parks and Recreation Trust Fund**

Generally several million dollars a year are available to local governments across NC through this program. Applicable projects require a 50/50 match from the local government and no more than \$250,000 can be requested. The money can be used for the acquisition, development and renovation of recreational areas. The NC Division of State Parks manages the program along with the Recreational Resources Service.

### **Clean Water Management Trust Fund**

This fund was established in 1996 and has become one of the largest sources of money in NC for land and water protection. Local governments may apply for grants to acquire easement or fee-simple interest in properties that (1) enhance or restore degraded waters, (2) protect unpolluted waters, and/or (3) contribute toward a network of riparian buffers and greenways for environmental, educational, and recreational benefits.



## Farmland Protection Trust Fund

Ranging from only a couple hundred thousand dollars to millions of dollars over the last several years, this program is funded through an allocation by the NC General Assembly to the NC Department of Agriculture and Consumer Services. It is a voluntary program designed to protect farmland from development by either acquiring property outright or acquiring conservation easements on the property. The program is administered by the Conservation Trust for North Carolina (CTNC). Questions about available funding should be directed to CTNC.

## Natural Heritage Trust Fund

Money from this fund may only be allocated to State agencies, so Chowan and Edenton must work with State level partners to access this fund. The NHTF is used to acquire and protect land that has significant habitat value. Most of the land that would qualify in Chowan County tends to be along the northern, western, and southern boundaries of the County as it meets the major surface waters. Some large wetland areas may also qualify, depending on their biological integrity and characteristics. Additional information is available from the NC Natural Heritage Program

## 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 in Chowan County and Edenton can be found at [www.h2o.enr.state.nc.us/wrp](http://www.h2o.enr.state.nc.us/wrp)

## Albemarle/Pamlico National Estuary Program (APNEP)

Funded and sponsored by the US EPA, but housed in the NC Department of Environment and Natural Resources, this program focuses on supporting activities that have a positive impact on the health of the Albemarle and Pamlico Estuaries, which includes the Chowan, Pasquotank, Roanoke, Tar-Pamlico and Neuse river basins. Grants are made for a number of projects including the construction of model projects that protect water quality and estuarine habitat. Additional information is available at their website: <http://h2o.enr.state.nc.us/nep>

## Small Cities Community Development Block Grants

Although Chowan County and Edenton do not meet the population density requirements necessary to access Federal level CDBG funds, state level funds are allocated through the NC Department of Commerce, Division of Community Assistance. These funds can 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.

## Ecosystem Enhancement Program

This is a brand new program in 2003. Developed as a new mechanism to facilitate improved mitigation projects for NC highways, this program will have money available for both restoration projects and protection projects that serve to enhance water qual-

ity and wildlife habitat in NC. Additional information is available by contacting the Natural Heritage Program in the NC Department of Environment and Natural Resources (NCDENR).

### **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). Contact the Chowan County SWCD for more information.

### **Conservation Reserve Enhancement Program (CREP)**

A joint effort between the NC Division of Soil and Water Conservation, the North Carolina Clean Water Management Trust Fund, the North Carolina Wetlands Restoration Program, and the United States Department of Agriculture to address water quality programs of specific river basins and watershed areas. This is a voluntary program to protect riparian lands that are currently in agricultural production. The program is managed by the NC Division of Soil and Water Conservation.

### **North Carolina Conservation Tax Credit Program**

An incentive program for landowners that donate their land or easements on the land for conservation purposes. Participants receive a state tax credit for the value of their donation. For more information see: <http://ncctc.enr.state.nc.us>.

### **NC Adopt-A-Trail Grant Program**

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. Applications are due in the fall. For more information, visit <http://ils.unc.edu/parkproject/trails/grant.html>

### **Public Beach and Coastal Waterfront Access Program**

Administered by the NC Division of Coastal Management, this program can provide funds for land acquisition and for construction projects that provide public access to beaches, estuaries, public trust waters and urban waterfronts. This could be a significant funding source for the development of canoe access points along many of the greenways or for development of waterfront parks that can serve as hubs for the system.

### **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. For more information, contact the NC Division of Forest Resources.

### **Water Resources Development Grant Program**

The NC Division of Water Resources offers cost-sharing grants to local governments on projects related to water resources. Stream Restoration and Land Acquisition and Facility Development for Water-Based Recreation Projects are two of the categories of projects that are generally funded. For more information, see: [http://www.ncwater.org/Financial\\_Assistance](http://www.ncwater.org/Financial_Assistance)



## ***Local Funding Sources***

A number of local funding options have been grouped here under the primary banners of taxes, fees, loans, bonds, and other resources. Because Chowan-Edenton is a fairly small community, a number of these options may not be feasible. However, they are listed here so that a full perspective of the options may be had.

### **Taxes**

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 a county's or municipality's 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.

#### **FEES**

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

#### **Stormwater Utility Fees**

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

#### **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”). Open space 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.

If Chowan-Edenton is interested in pursuing open space impact fees, it 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 open space 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.

### **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 Edenton-Chowan decides to pursue a bond issue, consideration should be given to combining the needs of the Thoroughfare

Plan, Parks and Recreation Plan, and the Open Space and Greenways Plan 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**

Cities, counties, and service districts 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 im-



provements 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).

## **Other Local Options**

### **Local Capital Improvements Program**

In communities that can afford it, a yearly appropriation for greenway and trail development in the capital improvements program is another option. 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 Parks and Recreation Department.

### **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 work days. 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 two examples of private funding opportunities available in North Carolina.

#### **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](http://www.conservationfund.org)

#### **Z. Smith Reynolds Foundation**

This Greensboro-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 Chowan-Edenton in other areas of open space and greenways development. More information is available at [www.zsr.org](http://www.zsr.org).



# Appendix A: Safety and Security

Safety is a duty and obligation of all public facility managers, therefore, as the construction documents for the Chowan-Edenton greenways are completed over time, appropriate local, state, and federal agencies should review these plans and specifications to ensure that they meet all existing regulations.

In order to provide reasonable and ordinary safety measures, Chowan County and Edenton should maintain their collaborative relationship as a Safety and Security Program is developed. This program should consist of well-defined safety and security policies; the identification of trail management, law enforcement, emergency and fire protection policies; and a system that offers timely response to the public for issues or problems related to safety and security. It has been recommended in the main part of the document that the Chowan-Edenton Parks and Recreation Department administer new greenway and open space projects as an extension to the existing recreation system. The Safety and Security component should also be administered in that Department, building on their existing coalitions between Police, Fire, Public Works, and Legal Departments. Procedures and policies should be established for external coordination between local alliances, local neighborhood watch associations, and “Adopt-a-Greenway” organizations. Important components of the Safety and Security Program should include:

- 1) Establishment of a Safety Committee or Coordinator;
- 2) Preparation of a Trail Safety Manual for employees and agencies;
- 3) Establishment of user rules and regulations;
- 4) Development of greenway emergency procedures;
- 5) Preparation of a safety checklist for the trail;
- 6) Preparation of a trail user response form;
- 7) A system for accident reporting and analysis;
- 8) Regular maintenance and inspection program;
- 9) Site and facility development and review;
- 10) Public information program;
- 11) Employee training program for safety and emergency response; and
- 12) Ongoing research and evaluation of program objectives.

The program should discourage the general public from using any segment of the system that is under construction. Trail segments should not be considered officially opened for public use until a formal dedication ceremony has been completed. Individuals who use greenway segments that are under construction, without written permission from an authorized agent, should be deemed in violation of the Chowan and Edenton Greenway Hours of Operation policy.

## Hours of Operation

The consultant recommends that the Chowan and Edenton greenways be operated like all other non-lighted local government park and recreation facilities open for public use from dawn to dusk, 365 days a year, except as specifically designated by the local Parks and Recreation Department. The consultant recommends that individuals who are found using these facilities after dusk and before dawn, be deemed in violation of these hours of operation and subject to fines and/or prosecution.

## Trail User Rules and Regulations

One of the emerging safety issues in greenway trail planning, design, and development is multi-user conflict. Typically, these conflicts are caused by overuse of a trail. However, other factors may lead to user conflicts and problems including poorly designed and engineered trail alignments, inappropriate user behavior, or inadequate facility capacity. The most effective trail use management plan is a well-conceived safety program that provides the individual user with a Code of Conduct for the trail, sometimes called a Trail Ordinance. Several multi-use trail systems across the United States have adopted progressive ordinances for public use. The consultant recommends that the following Rules and Regulations be implemented for the Chowan and Edenton system. These rules should be displayed in both brochures and on information signs throughout the Trail. The consultant recommends that these rules and regulations be reviewed by the appropriate authorities and legally adopted by Chowan County and Edenton.

1) **Be Courteous:** All Trail users, including bicyclists, joggers, walkers, wheelchairs, skateboarders and skaters, should be respectful of other users regardless of their mode of travel, speed, or level of skill. Never spook animals; this can be dangerous for you and other users. Respect the privacy of adjacent landowners.

2) **Keep Right:** Always stay to the right as

you use the trail, or stay in the lane that has been designated for your user group. The exception to this rule occurs when you need to pass another user.

3) **Pass on the Left:** Pass others going in your direction on their left. Look ahead and behind to make sure that your lane is clear before you pull out and around the other user. Pass with ample separation. Do not move back to the right until you have safely gained distance and speed on the other user. Faster traffic should always yield to slower and on-coming traffic.

4) **Give Audible Signal When Passing:** All users should give a clear warning signal before passing. This signal may be produced by voice, bell, or soft horn. Voice signals might include "Passing on the Left!" or "Cyclist on the left!" Always be courteous when providing the audible signal - profanity is unwarranted and unappreciated.

5) **Be Predictable:** Travel in a consistent and predictable manner. Always look behind before changing position on the trail, regardless of your mode of travel.

6) **Control Your Bicycle:** Inattention, even for a second can cause disaster —always stay alert! Maintain a safe and legal speed at all times.

7) **Don't Block the Trail:** When in a group, including your pets, use no more than half the trailway, so as not to block the flow of other users. If users approach your group from both directions, form a single line, or stop and move to the far right edge of the trail to allow safe passage by these users.

8) **Yield when entering or crossing trails:** When entering or crossing a trail at uncontrolled intersections, yield to traffic already using the other trail.

9) **The Use of Lights:** When using a trail during periods of low visibility each cyclist should be equipped with proper lights. Cyclists should have a white light that is visible



from five hundred feet to the front, and a red or amber light that is visible from five hundred feet to the rear. Other trail users should use white lights (bright flashlights) visible two hundred fifty feet to the front, and wear light or reflective clothing.

10) Don't Use this Trail Under the Influence of Alcohol or Drugs: It is illegal to use this trail if you have consumed alcohol in excess of the statutory limits, or if you have consumed illegal drugs. Persons who use a prescribed medication should check with their doctor or pharmacist to ensure that it will not impair their ability to safely operate a bicycle or other wheeled vehicle.

11) Cleanup Your Litter: Please keep this trail clean and neat for other users to enjoy. Do not leave glass, paper, cans, or other debris on or near the trail. Pack out what you bring in—and remember to always recycle your trash.

12) Keep Pets on Leashes: All pets must be kept on a secure and tethered leash. Failure to do so will result in fines and possible detention of the pet.

13) Clean Up After Your Pets: Please remove any pet droppings and dispose of properly. Failure to do so will result in fines.

14) Use the Buddy System: Always use the trail system with a friend!

15) Trail Subject to Flash Flooding: Please be aware that the parts of the system are officially closed during times when floodwaters overflow creek banks and covers trail surfaces. For your personal safety, please be prepared to leave the trail immediately during periods of heavy rainfall.

16) Swimming Prohibited: Swimming is prohibited in creeks and tributary streams.

17) Vegetation Removal: It is illegal to remove vegetation of any type, size, or species from the greenway. Please contact the Parks and Recreation Department should you

have concerns about noxious weeds, poisonous vegetation, dying or dead vegetation, or other concerns about vegetation growth in the greenway.

Share the Trail! Always exercise due care and caution when using the trail!

## Police/Park Ranger Patrol and Emergency Response System

In order to provide effective patrol and emergency response to the needs of trail users and adjacent property owners, the consultant recommends that the Police and Sheriff Departments and the Parks and Recreation Department work together, to develop a specific patrol and emergency response plan for the Chowan and Edenton system. This plan should define a cooperative law enforcement strategy for the trail based on the capabilities of different agencies and services typically required for the facility. Site designs for individual segments of the system should illustrate: points of access to the trails; approved design details for making these access points safe, secure, and accessible to law enforcement officials; and potential locations for a system of cellular-type emergency phones. The appropriate officials should be consulted to locate other mechanisms or project elements that will aid local agencies in managing the trail in a safe and secure manner.

The Police, Sheriff's, and Parks and Recreation Departments should also define an emergency response system in conjunction with appropriate local fire stations and paramedical units that defines which agencies should respond to 911 calls, and provides easy-to-understand routing plans and access points for emergency vehicles. Local hospitals should be notified of these routes so that they may also be familiar with the size and scope of the project.

At all public entrances to the Chowan and Edenton system, appropriate signage should be installed to notify users of the potential for flash flooding and the need to quickly exit

the Greenway during periods of heavy rainfall.

## Risk Management and Liability

The design, development, management, and operation of the Chowan and Edenton system must be carefully and accurately executed in order to provide a resource that protects the health, welfare, and safety of the public.

Liability most often occurs when a facility has been under-designed for the intended volume of use; when management of the facility is poor; or when unexpected accidents occur because the trail manager failed to recognize the possibilities of a potentially hazardous situation. To reduce the exposure to liability, the town and county should have in place the following measures prior to opening the first phase of the system:

- 1) A complete maintenance program that provides the appropriate duty or level of care to greenway users;
- 2) A risk management plan that appropriately covers all aspects of the trail
- 3) A comprehensive working knowledge of public use laws and recent case history applicable in North Carolina

Public use of the Chowan and Edenton system should be covered under existing policies for the use of parkland and public spaces. The town and county should exercise reasonable care in the construction of all greenway facilities to reduce hazardous, public nuisance and life threatening situations. The Chowan and Edenton system is available for public use as defined by the Hours of Operation Policy; therefore, any individual found using the trail outside the normal hours of operation would not be covered by the municipal insurance policies for public use.

## Maintenance and Management

The consultant recommends that the town and county adopt a clear and concise maintenance and management program for the Chowan and Edenton system. The primary

objective of this maintenance and management plan is to assure that the public's health and safety are protected during normal use of the greenway and open space system. The system should be classified as an extension of the existing park system, and formally maintained in a clean, safe, and usable condition like all other parks within the town and county. Greenway lands should be maintained in a natural condition to the largest extent possible, so that they may fulfill multiple functions including passive recreation, alternative transportation, storm water management, environmental and historical interpretation, and plant and wildlife habitat protection.

Maintenance should include the removal of debris, trash, litter, obnoxious, and unsafe man-made structures, and other foreign matter to make the greenway corridor safe for public use. Vegetation should be removed with discretion. The objective in controlling the growth of existing vegetation should be to maintain clear and open sightlines along the edge of trails, and eliminate potential hazards that could occur due to natural growth, severe weather, or other unacceptable conditions.

A majority of understory trees, shrubs, and other weedy vegetation should be clear-cut a minimum distance of three (3) feet from each edge of the trail. To the greatest extent possible, large trees should be avoided by field adjusting the final trail alignment. Selective clearing of vegetation should be conducted within a zone that is defined as being between three (3) to ten (10) feet from each edge of the trail.

The desired clear unobstructed view along the centerline of the trail is 300-feet in front of and behind the trail user. The exception to this policy will be where terrain or curves in the trail serve as the limiting factor. The town will be responsible for the cutting and removal of vegetation. Future removal of vegetation by individuals other than those persons employed by the town should be deemed unlawful and subject to fines and/or



prosecution.

All trail surfaces should be maintained in a safe and usable manner at all times. Rough edges, severe bumps, or depressions, cracked, or uneven pavement, and vegetation occurring in the tread of the trail should be removed and replaced in such a manner that the trail surface is maintained as a continuous, even, and clean surface. The Parks and Recreation Department should strive to minimize the number of areas where ponding water occurs; however, the town/county should not be held liable for public use through areas of casual or ponded water.



# Appendix B: Design Guidelines

The design development guidelines featured in this Appendix have been tailored to meet the specific facility development needs of the Chowan County and Edenton Greenways and Open Space System. The purpose of these guidelines is to assist the County, the Town, and their partnering organizations in developing open space and greenway facilities.

These guidelines provide a variety of trail facility and ecological system restoration concepts and ideas. These guidelines are not a substitute for a more thorough examination and detailed landscape architectural and engineering evaluation of each project segment. These guidelines serve as minimum standards for greenway facility development. The Town disclaims any liability for the use, appropriateness and accuracy of these guidelines as they apply to a specific project.

The following resource materials have been used in the preparation of these guidelines:

- Adherence to national design standards for off-road trails and greenway facilities, as defined by the American Association of State Highway Transportation Officials (AASHTO), the Americans with Disabilities Act, Designing Sidewalks and Trails for Access: Part 2 and the Manual on Uniform Traffic Control Devices.

For more in-depth information and design development standards, the following publications should be consulted:

Greenways: A Guide to Planning, Design and Development

Published by Island Press, 1993

Authors: Charles A. Flink and Robert Searns

For more information visit [www.greenways.com](http://www.greenways.com)

Trails for the Twenty-First Century

Published by Island Press, 2001

Authors: Charles A. Flink, Robert Searns and Kristine Olka

For more information visit [www.greenways.com](http://www.greenways.com)

## Description

## Resources

## Additional Resources

### Guide to the Development of Bicycle Facilities

Updated in 2000 by the American Association of State Highway Transportation Officials (AASHTO). Available from FHWA or AASHTO. [www.aashto.org/bookstore/abs.html](http://www.aashto.org/bookstore/abs.html)

### Manual on Uniform Traffic Control Devices (MUTCD)

Published by the U. S. Department of Transportation, Washington, DC, 2001

### Universal Access to Outdoor Recreation: A Design Guide

Published by PLAE, Inc., Berkeley, CA, 1993

### Designing Sidewalks and Trails for Access: Part Two - Best Practices Design Guide

Published by U.S. Department of Transportation, Washington, DC, 2001

In all cases, the recommended guidelines in this report meet or exceed national standards. Should these national standards be revised in the future and result in discrepancies with this chapter, the national standards should prevail for all design decisions.

Other useful web sites for information include:

Rails-to-Trails Conservancy - [www.railtrails.org](http://www.railtrails.org)

National Park Service - [www.nps.org](http://www.nps.org)

U.S. Department of Transportation - [www.walkinginfo.org](http://www.walkinginfo.org) and  
[www.bicyclinginfo.org](http://www.bicyclinginfo.org)

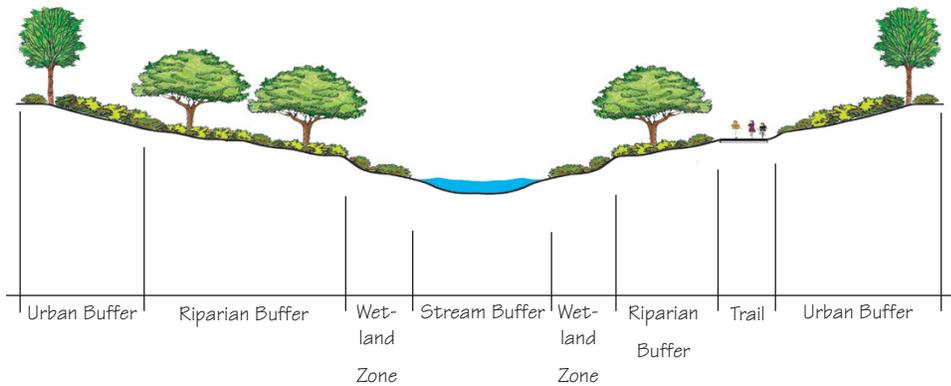
Trails and Greenways Clearinghouse -  
[www.trailsandgreenways.org](http://www.trailsandgreenways.org)

National Bicycle and Pedestrian Clearinghouse -  
[www.bikefed.org/clear.htm](http://www.bikefed.org/clear.htm)

Greenways Incorporated - [www.greenways.com](http://www.greenways.com)



## Stream Corridor Buffer



Riparian buffers serve many functions. They filter stormwater pollutants, help moderate stream flow, stabilize streambanks, moderate stream temperature, and provide aquatic and terrestrial habitat. The minimum recommendations should require that new developments maintain an existing 50-foot vegetated buffer on both sides of all intermittent and perennial streams, lakes and ponds within the County. For the purpose of the recommendations, a waterbody exists if the feature is present on either the most recent version of the soil map or 7.5 minute quadrangle topographic map prepared by USGS. The recommended required buffers consist of two zones: a 30-foot undisturbed zone adjacent to each side of the waterbody, and a vegetated zone that extends from the outer edge of the 30 foot zone for a distance of at least 20-feet.

Buffers are required in water supply watersheds throughout the state as part of the Water Supply Watershed Management Program. The Division of Water Quality manages the program through oversight of local ordinances and monitoring of land use activities. Local water supply watershed programs must be approved by the NC Environmental Management Commission (EMC). The program requires local governments to adopt land use controls that include buffer protection. For low-density development, 30-foot buffers are required along perennial streams, and 100-foot buffers are required for high-density development.

Stream buffers within Chowan County and Edenton should be established to protect water quality and animal habitat. For the purpose of greenway facility development, a minimum of 50-foot wide buffer (150-foot preferred) as measured from the top of streambank is required in order to mitigate the damaging effects of flooding from storms, filter pollutants from overland flow and develop appropriately sized greenway trail facilities.

Many counties throughout the state have applied the 50-foot buffer. Some of the municipalities have placed additional buffers up to 100-feet on their streams, according to their stream order.

Instead of using this conventional method of prescriptive buffers, stream buffers should be a varied width according to ecological features of the watershed. Each buffer width will be site specific, depending on the following characteristics of the stream, riparian buffer and watershed:

- Slope
- Soil
- Hydrology
- Vegetation
- Water Quality
- Impervious Surface

The appropriate width for a variety of characteristic combinations for each corridor will be researched as stream and creek corridors are indentified in the future.

## Corridor Planting

Some basic guides for planting in corridors is as follows:

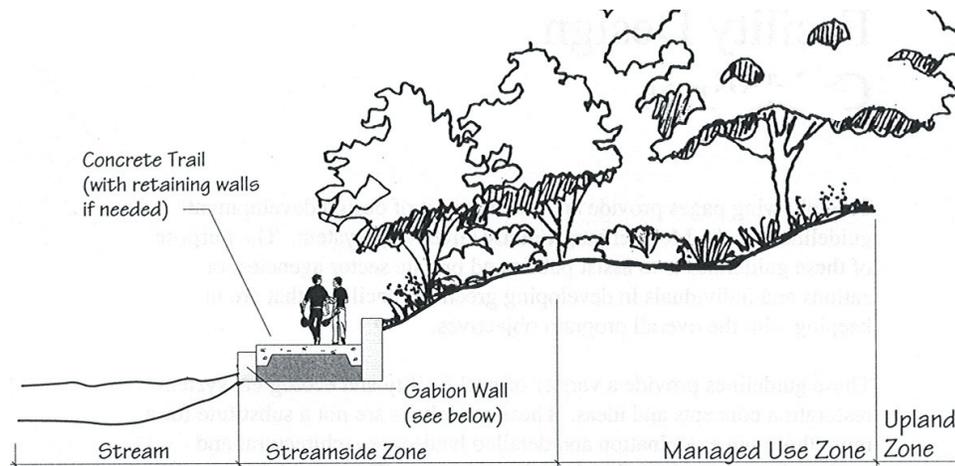
- ◆ Efforts should be made to eliminate non-native invasive species, such as privet (*Ligustrum sinense*) from corridors.
- ◆ Native overstory and understory trees/shrubs should be replanted where vegetation is removed or harmed due to construction of parks, trails, etc. in greenway corridors or open space.
- ◆ Fallen trees should not be removed unless they obstruct trails or present danger. Otherwise, they should be left to decay naturally. Evergreens, conifers (pines) and deciduous trees should all be used proportionally.
- ◆ Mast producing trees and shrubs with berries should be utilized for wildlife food whenever possible.
- ◆ Flowering trees and shrubs can be used to draw attention to important intersections and entrances.
- ◆ Evergreen shade trees are needed near seating areas and picnic tables.
- ◆ Evergreen shrubs, such as wax myrtle, can help separate public areas from private residences.



## Types of Trail Treads

### Creekside Trail Tread

Creekside trails are located only in urban areas, where right-of-way constraints and channelized streams restrict trail development to the floodway. Creekside trails are designed to accommodate walkers, bicyclists, rollerbladers, and joggers. These multi-use trails are typically positioned directly adjacent to the stream channel and are therefore subject to frequent flooding. These trails require hard-paved surfaces of concrete to withstand high-velocity stream flows. Retaining walls or other structural elements may also be required for stable construction and to protect the trail from erosion and flood damage.



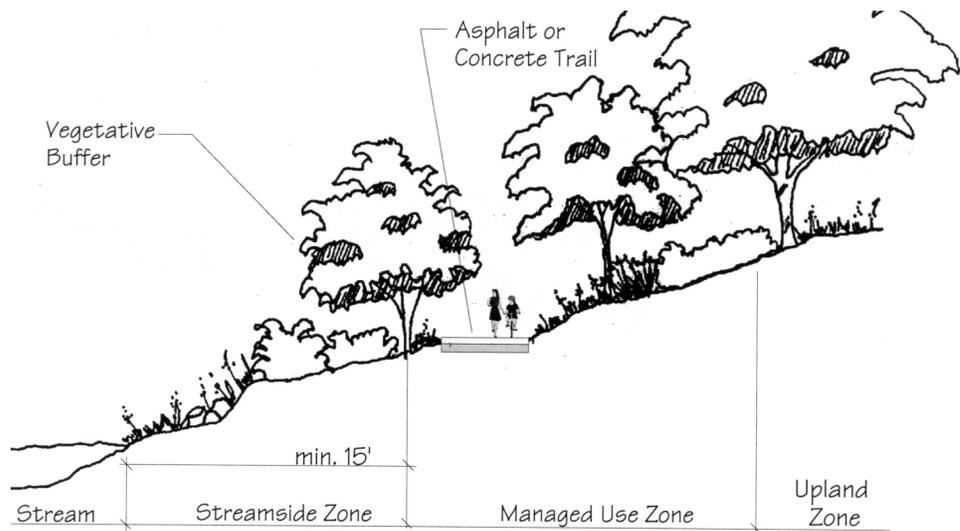
#### Typical Multi-Use Creekside Trail Cross Section

Creekside trails should be a minimum of 10'-wide for multi-use trails. The installation of railings, benches, signage, and trash receptacles that could obstruct flow during storm events, should be carefully considered. Creekside trails must be designed and installed in a manner that minimizes their effect on flood waters and protects the amenities from flood damage. The use of retaining walls as seat walls is one way in which non-obtrusive amenities can be included on this type of trail facility. Special consideration should be paid to mitigating the impacts of trail construction on the natural environment.

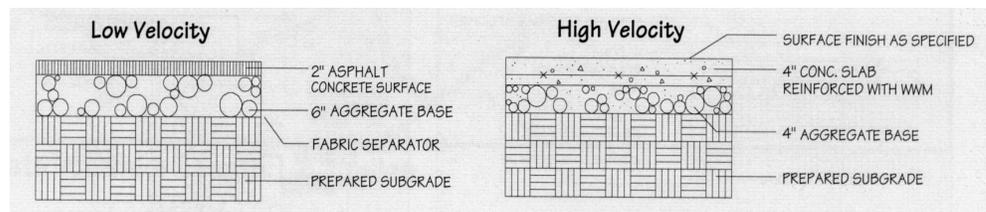
## Floodway Trail Tread

Multi-use trails within the floodway are designed to accommodate a variety of users including walkers, joggers, cyclists, and rollerbladers. These multi-use trails are typically positioned within the floodway but not directly adjacent to streams. Some vegetative buffer between the stream and trail should be left intact. Like the streamside trails, trails within the floodway are subject to periodic flooding, however, not as frequently. These trails require paved surfaces of either asphalt or concrete depending on frequency of flooding and expected velocity of flow. A proper trail foundation is important and will increase the longevity of the trail. No soft shoulder should be constructed due to flood considerations. Special consideration should be given to the mitigation of negative impacts from trail development on the natural stream environment.

Multi-use trails within the floodway should be built with a minimum width of 10 feet. All elements of the trail including the trail tread, railings, benches, and trash receptacles will be periodically flooded. The design and materials for these trails should be carefully selected accordingly.



Typical Multi-Use Trail Cross Section  
(Within the Floodway)



Asphalt Paving on Aggregate Base

Gravel Paving on Aggregate Base

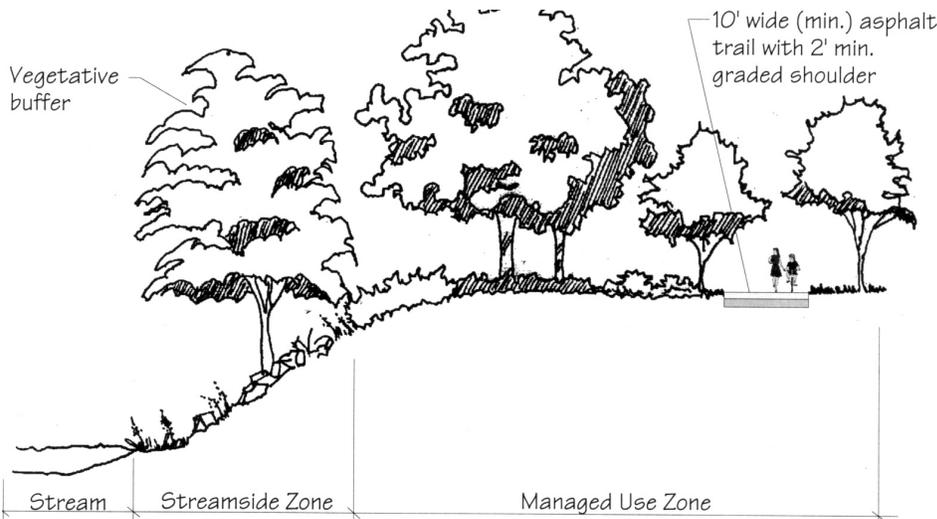
## Paving Cross Section



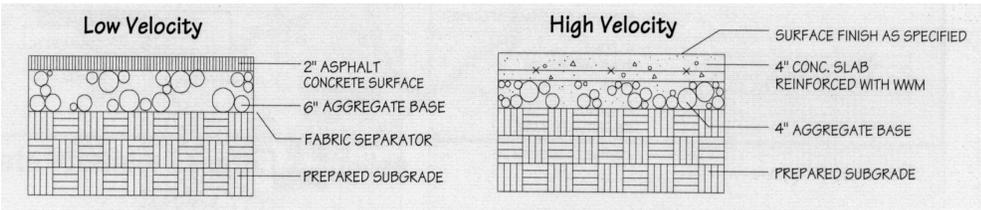
# Floodplain Trail Tread

Multi-use trails within the floodplain are designed to accommodate a variety of users including walkers, joggers, cyclists, and in-line skaters. These multi-use trails are typically positioned outside the floodway but within the floodplain. Significant vegetative buffers between the stream and trail should be left in tact. Multi-use trails within the floodplain are subject to occasional flooding during large storm events. It is recommended that these trails be built with paved asphalt, however an aggregate stone surface may be adequate in some locations.

Multi-use trails within the floodplain should be built to a minimum width of 10', although 12' to 14' is preferred. The graphics below illustrate two suitable pavement cross sections that can be used to build multi-use trails within the floodplain.



Typical Multi-Use Trail Cross Section  
(Within the Floodplain)



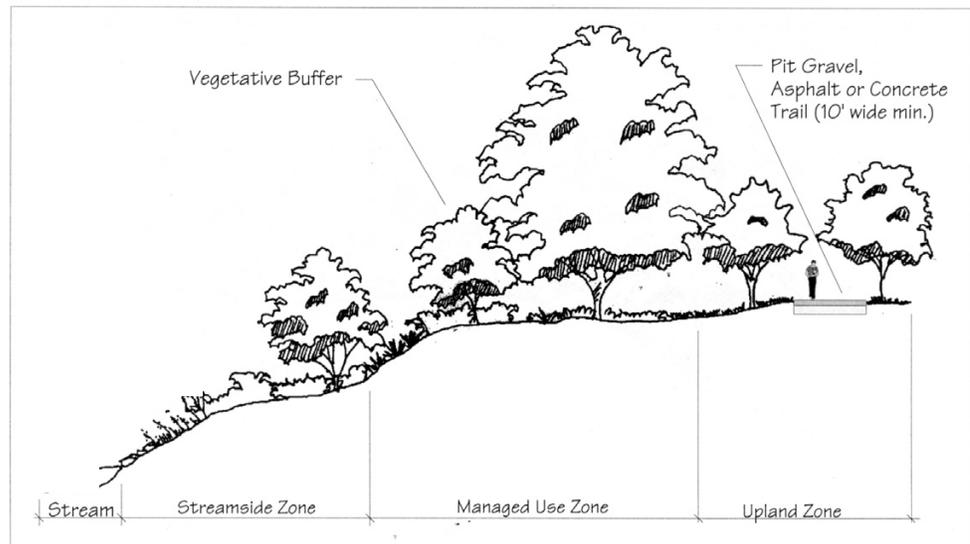
Asphalt Paving on Aggregate Base

Gravel Paving on Aggregate Base

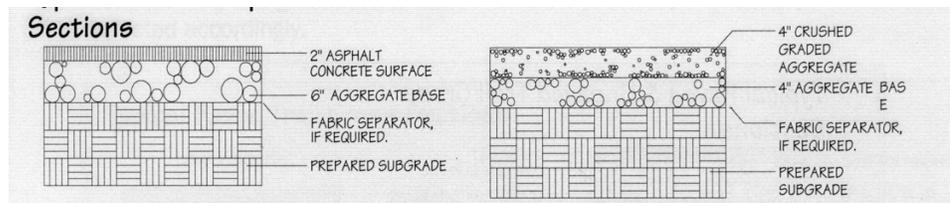
Paving Cross Section

# Upland Trail Tread

Upland multi-use trails are designed to accommodate a variety of users including walkers, joggers, cyclists and in-line skaters. These upland multi-use trails are typically positioned completely outside designated floodplains. Significant vegetative buffer between any streams and the trail should be left in tact. It is recommended that these trails be built with paved asphalt or aggregate stone, depending on the preference of local user groups. Upland multi-use trails should be built to a minimum width of 10', though 12' is preferred.



Upland Trail Cross Section



Asphalt Paving on Aggregate Base

Gravel Paving on Aggregate Base

Paving Cross Section



## Footpath/Hiking Trail

Footpaths or hiking trails are designed to accommodate pedestrians and are not intended for cyclists or other wheeled users. These natural surface trails typically make use of dirt, rock, soil, forest litter, pine mulch and other native materials for the trail surface. Preparation varies from machine-worked surfaces to those worn only by usage. This is the most appropriate surface for ecologically sensitive areas.

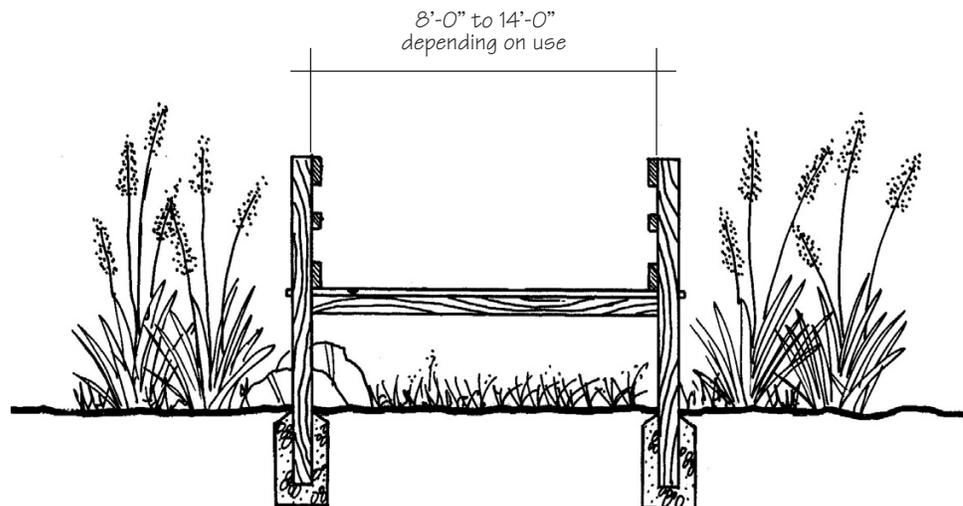


### Footpath Cross Section

These pathways, often very narrow, sometimes follow strenuous routes and may limit access to all but skilled users. Construction of these trails mainly consists of providing positive drainage for the trail tread and should not involve extensive removal of existing vegetation. Timbers may be used for steps along steep slopes. These trails vary in width from 3 feet to 6 feet and vertical clearance should be maintained at 9 feet. These trails are most commonly found within the streamside zone.

## Boardwalk Trail Tread

Boardwalks, or wood surface trails, are typically required when crossing wetlands or poorly-drained areas. While boardwalks can be considered multi-use trails, the surface tends to be slippery when wet and not best suited for wheeled users. Boardwalks intended for use by bikes, pedestrians, in-line skaters and others should be a minimum of 14 feet wide. However, boardwalk trails limited to pedestrian use can be as narrow as 8 feet. If maintenance vehicles use the boardwalk for maintenance access, it should be a minimum of 14 feet.



Boardwalk Cross Section

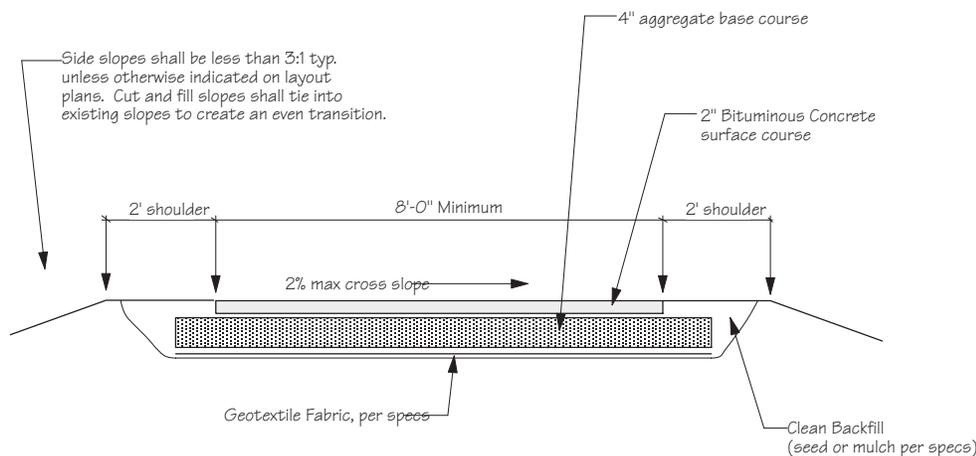
Wood surfaced trails are usually composed of sawn wooden planks or lumber that forms the top layer of a bridge, boardwalk or deck. The most commonly used woods for trail surfacing are exposure- and decay- resistant species such as pine, redwood, fir, larch, cedar, hemlock and spruce. Wood is a preferred surface type for special applications because of its strength and comparative weight, its aesthetic appeal and its versatility. Synthetic wood, manufactured from recycled plastics, is now available for use as a substitute in conventional outdoor wood construction. While these products are more expensive than wood lumber, recycled plastic lumber lasts much longer, does not splinter or warp and will not discolor.



## Paved Multi-Use Trail

Typical pavement design for paved, off-road, multi-use trails should be based upon the specific loading and soil conditions for each project. These trails, typically composed of asphalt or concrete, should be designed to withstand the loading requirements of occasional maintenance and emergency vehicles. In areas prone to frequent flooding, it is recommended that concrete be used because of its excellent durability.

One important concern for asphalt, multi-use 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 2'-wide graded shoulder to prevent trail edges from crumbling.



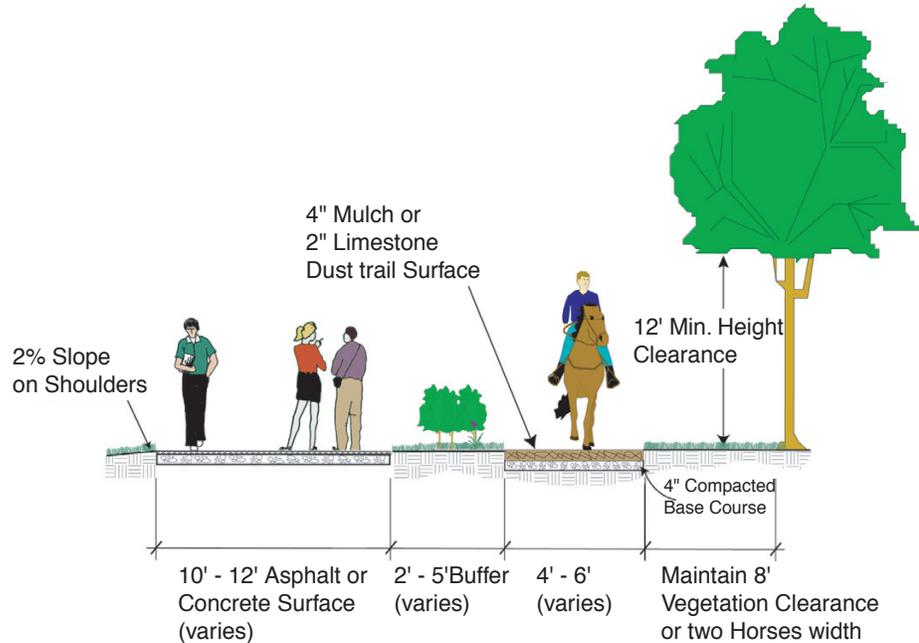
### Multi-Use Trail Cross Section

The minimum width for two-directional trails is 10', however 12'-14' widths are preferred where heavy traffic is expected. Centerline stripes should be considered for paths that generate substantial amounts of pedestrian traffic. Possible conflicts between user groups must be considered during the design phase, as cyclists often travel at a faster speed than other users. Radii minimums should also be considered depending on the different user groups.

Asphalt is a hard surface material that is popular for a variety of rural, suburban and urban trails. It is composed of asphalt cement and graded aggregate stone. It is a flexible pavement and can be installed on virtually any slope.

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.

## Dual Trail Tread



Typical Equestrian and Pedestrian Trail Cross Section

Dual tread trails are suggested on multi-use trail systems where different users travel at different speeds, such as equestrians and walkers. If hard surfacing is being used on the multi-use trail, a softer, 5-foot-wide tread for horses should be considered. Mulch, dirt, stabilized dirt or limestone dust can be used. Hard surfaces, such as concrete and asphalt are undesirable for equestrians because they can injure horses' hooves. Granular stone may also present problems because it can get stuck in horse hooves.

Vertical clearance for equestrians should be at least 10 feet, with a horizontal clearance of at least 5 feet. Low-hanging tree limbs should be cut flush with the trunk. Leaves, branches and other protrusions that could injure the horse, rider or gear should be removed. Within the tread, stumps, large rocks and other debris should be cleared. Sight distances for equestrians, who usually travel between 4 and 6 miles per hour, should be at least 100'.

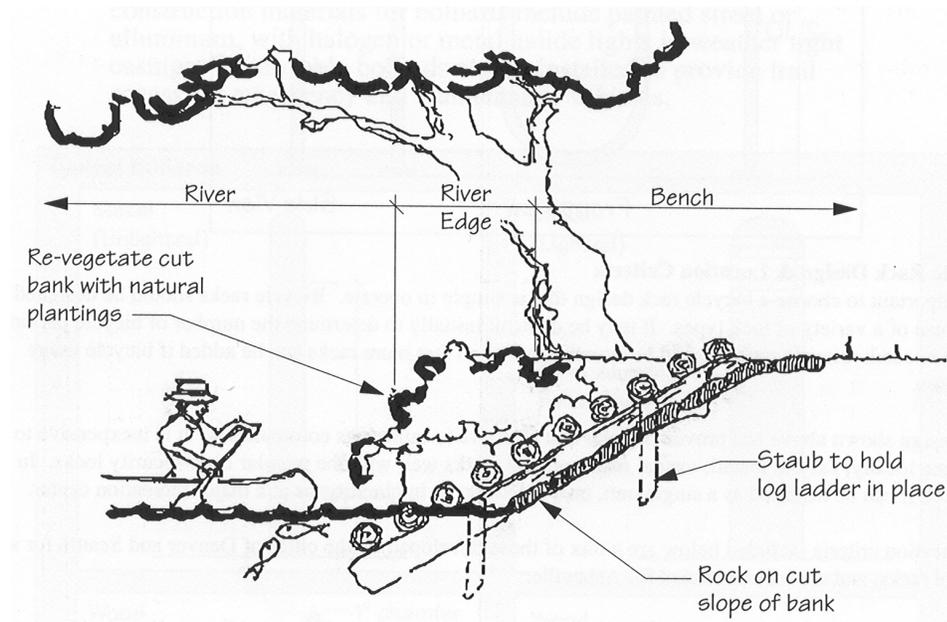
Dual treads may also be required for mountain biking trails.

## Water Based Trail

This designation applies to those rivers and streams that can successfully accommodate and/or which are designated to support canoeing, kayaking and boating. Water based trails can be designated with features and facilities that make this activity more enjoyable for residents, including signage systems, improved rapids, safety systems, and access points. Rental outfits could be established at put in/take out points.



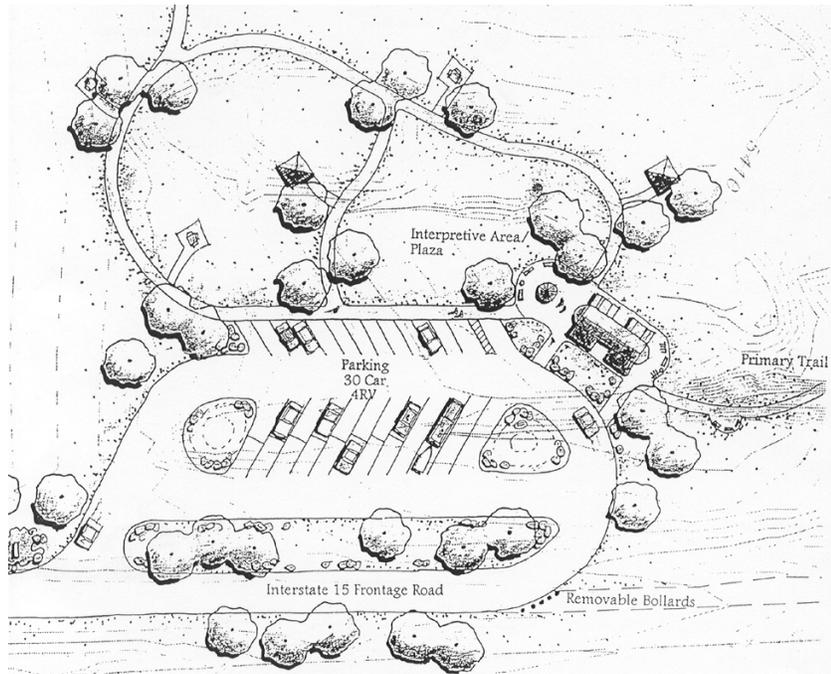
Example of a Water Based Trail in Use



Small Boat Access

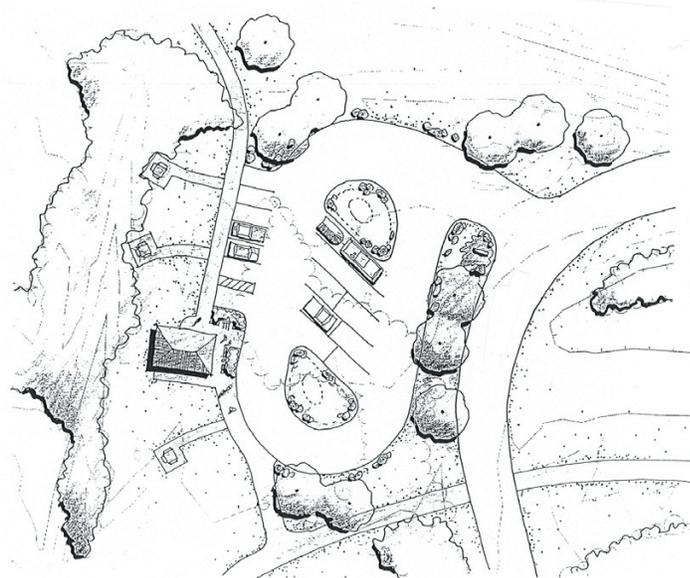
# Trailheads

## Major and Minor Trailheads



Typical Major Trailhead Plan View

Trail heads should be installed throughout the greenway system to give the public access. A “trail head” is a point of formal public entry into the greenway system that may provide certain related public facilities such as parking, restrooms, drinking fountains, trail signage, etc. Major trail heads and minor trail heads are suggested. Major trail heads should be located in significant areas. An exhibition building or an interpretive exhibit may be incorporated, along with restrooms, water fountains, picnic tables, parking, signage, etc. Minor trail heads can be used to connect a smaller number of people to surrounding trails, open space, parks, etc.



Typical Minor Trailhead Plan View

## Restrooms

Public amenities, such as phones, restrooms, etc., shall be located and concentrated at the confluence of vehicular and pedestrian traffic. ADA accessible restrooms should be placed at major trail access points in order to accommodate trail users. Where possible, other uses should be incorporated into the structure, such as storage for maintenance equipment. These structures should be located adjacent to thoroughfares for security, maintenance and access to utility hookups. They should also make use of natural light and ventilation as much as possible.



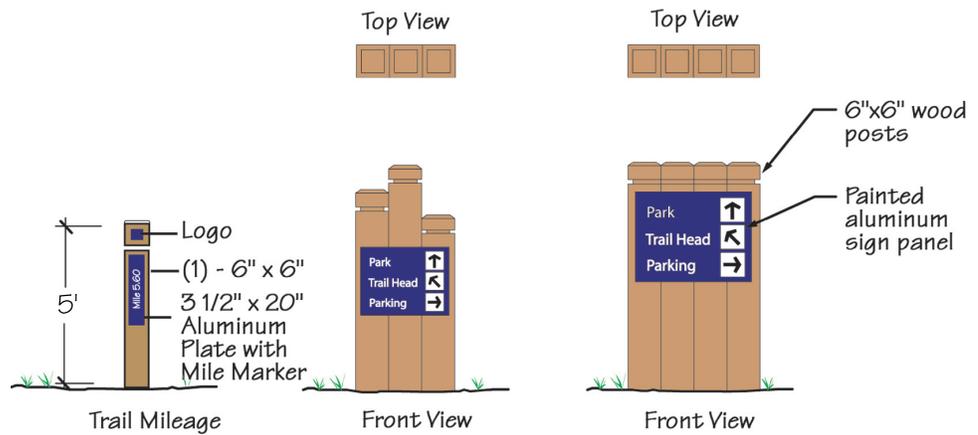
Typical Restrooms



Waterless Restroom Option

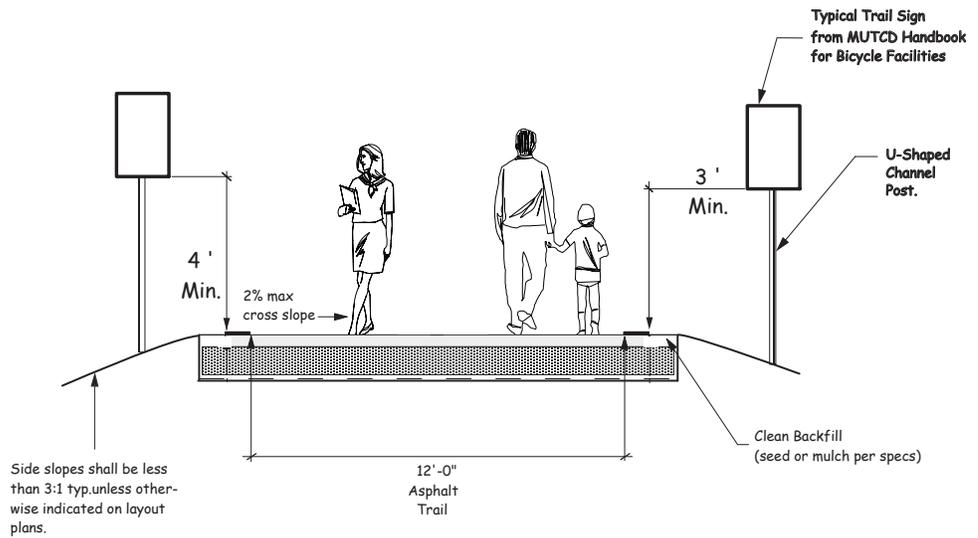
# Signage Details

## Directional Signage



### Signage Examples

## Typical Trail Signage Location



### Typical Signage Location



# DOT Bike Signage

The MUTCD specifies standard signage for bicycle lanes. According to section 9B-8, the R3-16 sign should be used in advance of the beginning of a designated bicycle lane to call attention to the lane and to the possible presence of bicycles. The MUTCD requires that the diamond lane symbol be used with both the R3-16 and R3-17 signs.

According to Section 9B-11 of the MUTCD, the R7-9 R7-9a signs can be used along streets where motorists are likely to park or frequently pull into the bike lane.

**BIKE LANE AHEAD**   **BIKE LANE ENDS**   **RIGHT LANE ONLY**   **BIKE ROUTE**   **BEGIN**   **END**

BIKE LANE signs should be replaced with bike lane stencils, with optional NO PARKING signs where needed.

BIKE ROUTE signs, especially with BEGIN and END riders, should be removed, or replaced with direction signs (OBD11-1) for directional assistance.

**BIKE XING**   **ON SHOULDER**   **NARROW BIKE LANE RIDE SINGLE FILE**

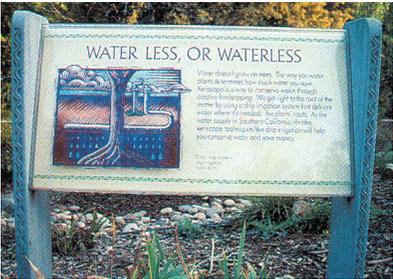
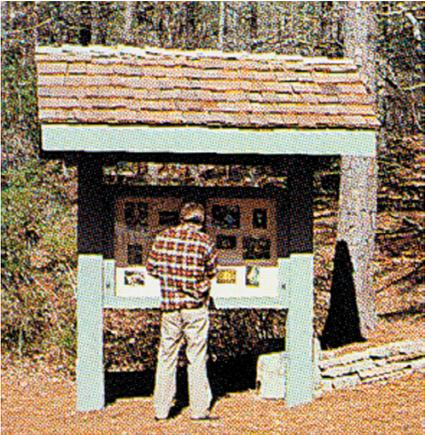
BIKE XING signs are not needed for bike lanes or shoulder bikeways where they approach controlled intersections.

BIKE WARNING sign with ON SHOULDER rider is not needed where shoulder width is adequate for bicycling.

This warning sign is not needed as bicyclists can judge for themselves the width of a lane.

## Signage Examples

# Interpretive Signage

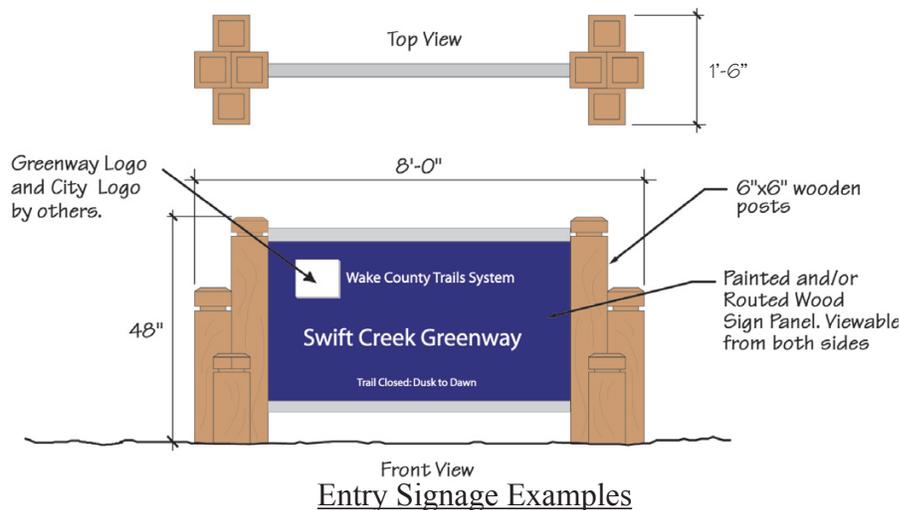
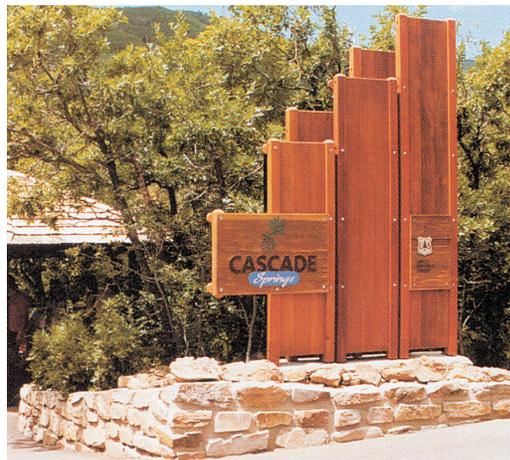
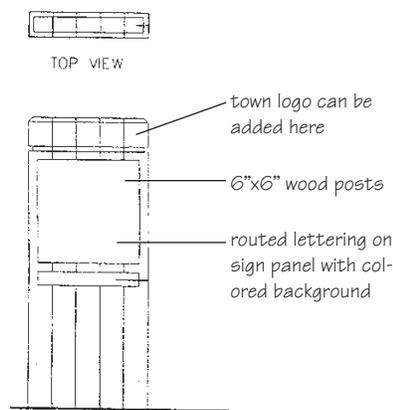


Signage Examples



# Entry Signage

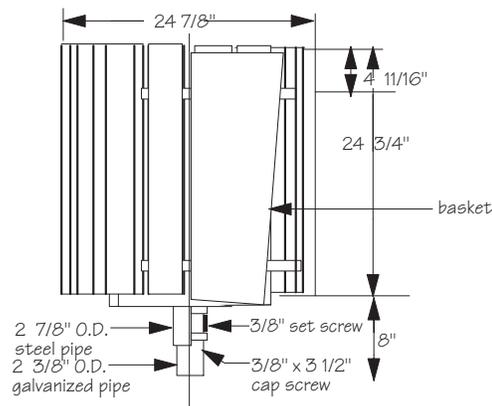
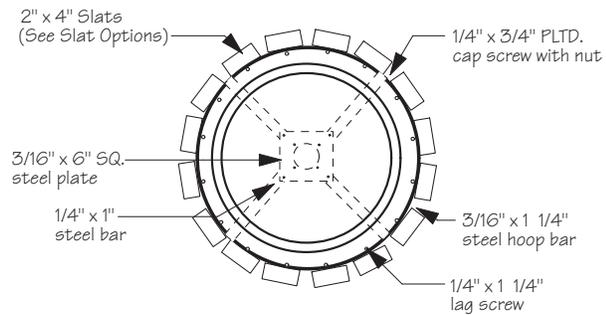
Proper trail identification at trail terminal point and major intersections is important in the development of a comprehensive trail network. A system of signage is important throughout the Chowan-Edenton Greenway System to ensure that information is provided to trail users regarding the safe and appropriate use of all facilities. Greenway entry signage may also include mileage to provide users with a reference as to how far he or she has traveled, and the remaining distance to specific destinations.



# Site

## Trash Receptacles

Trash containers are necessary along all trails. They can be attractive as well as functional and should be selected based on the amount of trash expected, overall maintenance program of the trail, and types of users. Trash cans need to be accessible to both trail users and maintenance personnel. At a minimum, 22-gallon or 32-gallon containers should be located at each entranceway and at each bench seating area. They should be set back three feet from the edge of the trail. The location of additional trash cans will depend upon the location of concessions, facilities adjacent to the trail and areas where trail users tend to congregate.



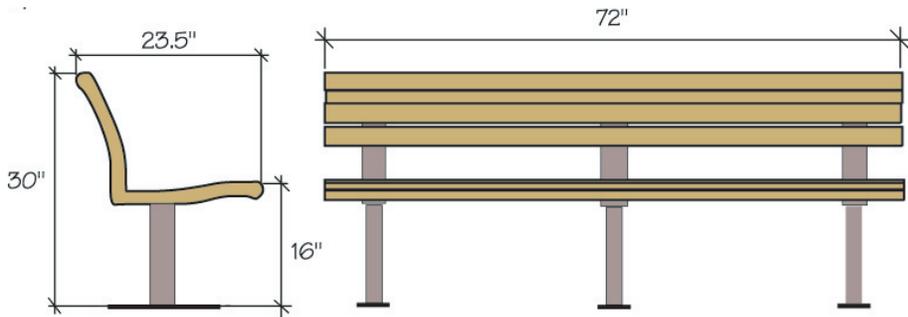
Typical Trash Receptacle Detail



# Benches

Benches along trails allow users to rest, congregate or contemplate. Trail benches should comfortably accommodate the average adult. They should be located at the primary and secondary entrances to the trail and at regular intervals, and should be set back three feet from the trail edge.

The graphics below illustrate a bench that can be manufactured using recycled plastic lumber or conventional treated wood lumber. The prefabricated plastic lumber units cost more initially but last longer and require little or no maintenance.

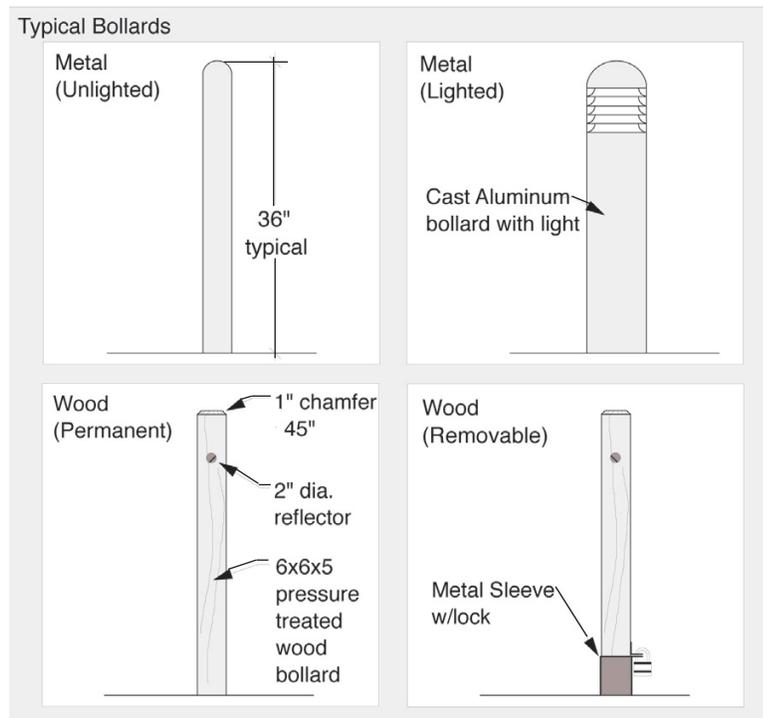


Typical Bench Detail



# Bollards

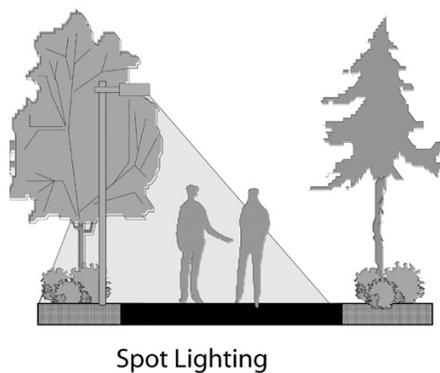
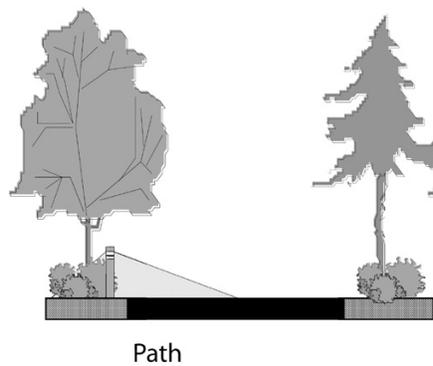
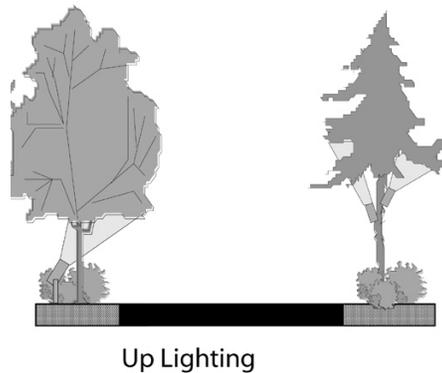
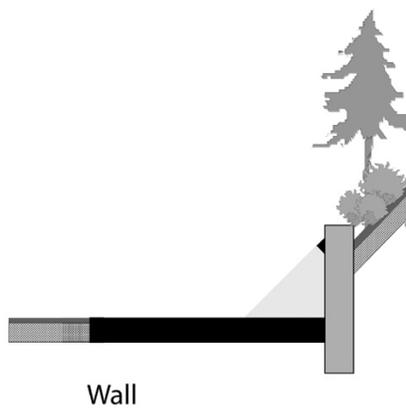
Bollards are intended to provide separation between vehicles and trail users. They are available in a variety of shapes, sizes, and colors and come with a variety of features. Lighted bollards are intended to provide visitors with minimum levels of safety and security along trails which are open after dark. Bollards should be chosen according to the specific needs of the site and should be similar in style to the surrounding elements. Typical construction materials for bollards include painted steel or aluminum, with halogen or metal halide lights in weather tight casings. Removable bollards can be installed to provide trail access for emergency and maintenance vehicles. The graphic below illustrates several typical bollard examples.



Typical Bollard Details

# Trail Lighting

Particularly during winter months when trips to and from work are made in the dark, adequate lighting can make the difference in a person's choice to bicycle or walk. However, due to liability and security concerns, many off-road bicycle paths are closed at night, and therefore unlit. Lighting for multi-use trails should be considered on a case-by-case basis in areas where 24-hour activity is expected, with full consideration of the maintenance commitment lighting requires.

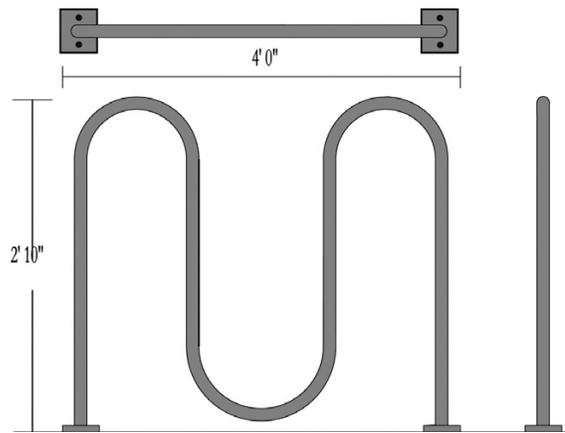


## Various Lighting Types

## Bike Rack

It is important to choose a bicycle rack design that is simple for cyclists to operate. Bicycle racks should be designed to allow use of a variety of lock types. It may be difficult initially to determine the number of bicycle parking spaces needed. Therefore, bike racks should be situated on-site so that more can be added if bicycle usage increases.

The design shown below has proven popular and effective in numerous communities. It is inexpensive to fabricate locally, easy to install, vandal resistant and works well with popular high-security locks. In addition, it can be installed as a single unit, on a sidewalk, or in quantity, at major recreation nodes.



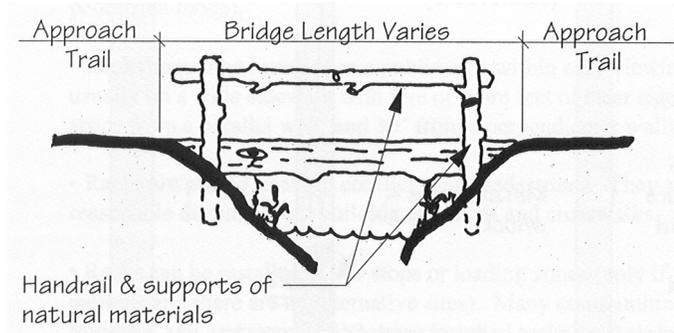
Typical Bike Rack

### Location Criteria:

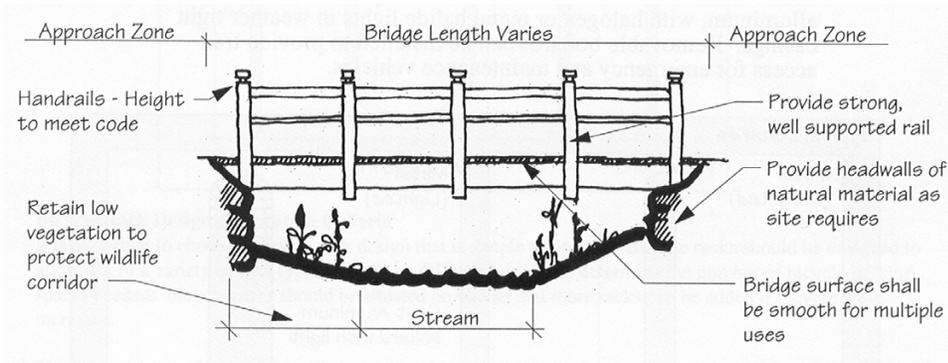
- ◆ Racks should be located within 50' of building entrances (where bicyclists would naturally transition into pedestrian mode).
- ◆ Racks should be installed in a public area within easy viewing distance from a main pedestrian walkway, usually on a wide sidewalk with five or more feet of clear sidewalk space remaining (a minimum of 24" clear space from a parallel wall and 30" from a perpendicular wall).
- ◆ Racks are placed to avoid conflicts with pedestrians. They are usually installed near the curb and at a reasonable distance from the building entrances and crosswalks.
- ◆ Racks can be installed at bus stops or at loading zones (only if they do not interfere with boarding or loading patterns and there are no alternatives). Bike racks on busses also facilitate bike-on-transit travel.

## Bridges

Bridges are an important element of almost any trail project. The type and size of bridges can vary widely depending on the trail type and specific site requirements. Some bridges often used for multi-use trails include suspension bridges, prefabricated span bridges and simple log bridges. When determining a bridge design for multi-use trails, it is important to consider emergency and maintenance vehicle access. Bridges intended for occasional vehicular use must be designed to handle up to 10,000 pound loads safely and at least 14'-wide to allow for vehicle passage.



Foot Bridge



Urban Trail Bridge



Span Bridge

Note: Prefabricated span bridges are ordered directly from the manufacturer. Approximate cost is \$100/foot. For examples and quotes, see [www.steadfastbridge.com](http://www.steadfastbridge.com).

## On Road Facilities

### Underpass

Trail underpasses and overpasses can be used to avoid undesirable at-grade intersections of trails and freeways or high volume arterial highways . Neither should be used frequently in suburban, fringe or rural areas. Underpasses typically utilize existing overhead roadway bridges adjacent to a stream or culverts under the roadway that are large enough to accommodate trail users. There are several key issues that must be addressed in the design of the roadway underpass:

1. The vertical clearance of the underpass must be at least 10 feet
2. The width of the underpass must be at least 12 feet
3. Proper drainage must be established to avoid pooling of stormwater inside the underpass
4. It is recommended that underpasses be lighted for safety

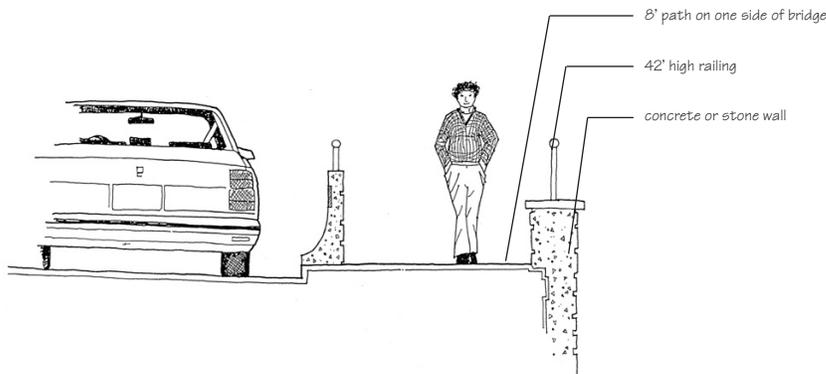


Roadway underpasses that utilize box culverts can sometimes be installed as part of a roadway improvement or construction project at a greatly reduced cost.

# Overpass

Trail overpasses can be used in high traffic volume areas where underpasses are not possible. Overpass options include sidewalks on bridges, freestanding pedestrian/bike bridges or lanes attached to an existing bridge. AASHTO requires that bridges be a minimum of 36 inches, but prefers that they are at least as wide as the trail. Forty-two inch high railing is also required. A fenced cover, as shown below, provides a safer environment over highways and busy streets. The NCDOT should be referenced for height requirements, which vary depending on the type of road. ADA should also be referenced for ramp requirements.

It is important to remember that pedestrians and cyclists will opt not to use an overpass or an underpass if it takes more than twice the time as crossing the street at-grade. For this reason, at-grade fencing should be considered in some instances .



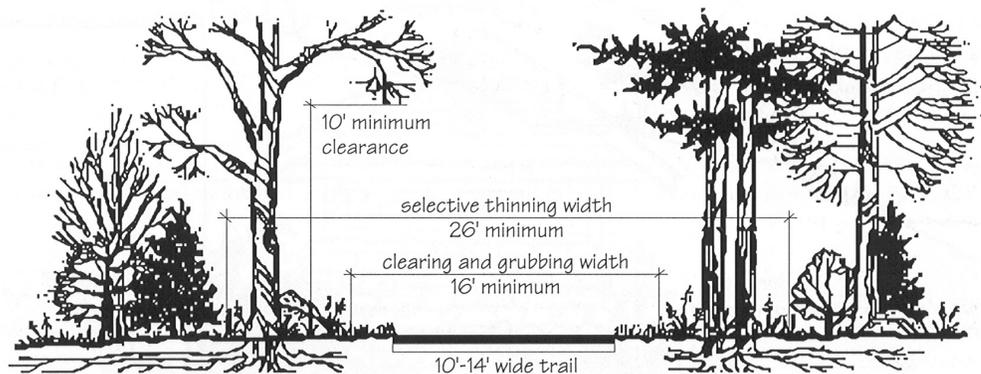
Typical Roadway Bridge with Sidewalk



## Vegetative Clearing

Vegetative clearing refers to the amount of vegetation removal that is required for various levels of trail development. The amount of vegetative clearing required for any one trail will depend on the type of trail being developed. While footpaths or hiking trails require little or no vegetation removal, paved pathways may require significantly more.

Single-tread, multi-use trails are the most common trail type in the nation. These trails vary in width, can accommodate a wide variety of users and are especially popular in urban areas. While the vegetative clearing needed for these trails varies with the width of the trail, the graphic below outlines typical requirements.

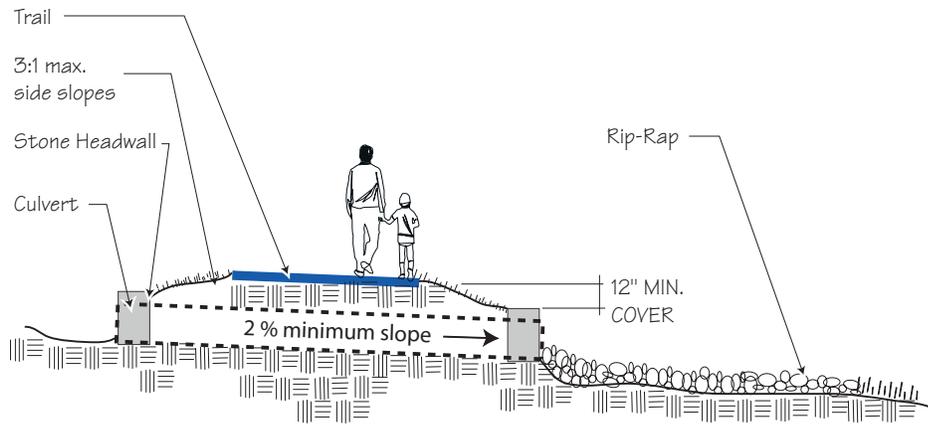


Typical Tree Trimming Distances

Clearing and grubbing consists of tree, shrub and stump removal. The minimum width for clearing and grubbing of a 14'-wide trail is 16 feet (2'-wide shoulders). Selective thinning includes removal of underbrush and limbs to create open pockets within a forest canopy. Selective thinning increases sight lines and distances and enhances the safety of the trail user. Selective thinning does not include the removal of the forest canopy.

# Trail Culvert

Proper installation of trail culverts is important to ensure proper stormwater runoff drainage, trail user safety and longevity of the trail surface. Pipe length, diameter and material specifications will vary depending on specific site needs. Two materials typically used for trail culverts are reinforced concrete pipe (typically required when the trail is within NCDOT Right of Way), and High Density Polyethylene (HDPE) recycled plastic pipe. Plastic pipes are typically less expensive on a per foot basis. Outlet protection varies per site needs and in some cases a flow spreader may be required at the outlet location. Rock check dams can be placed after the outlet to slow and filter drainage. The graphic below outlines proper installation parameters for greenway trail culverts.

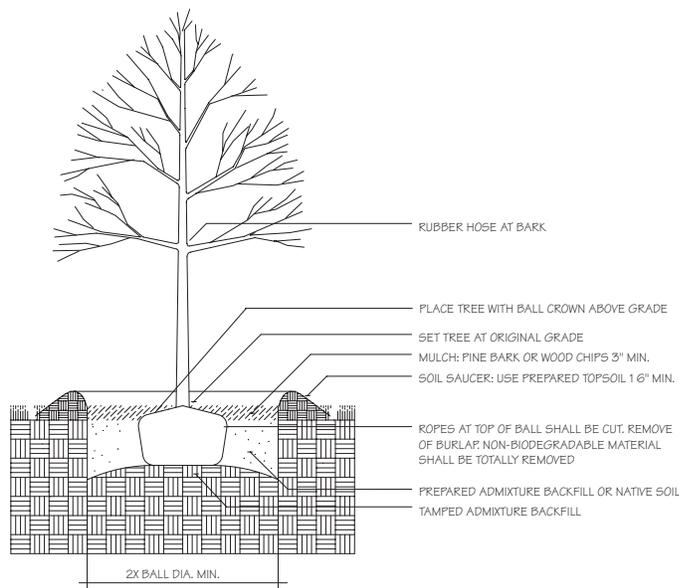


Culvert Placement Cross Section

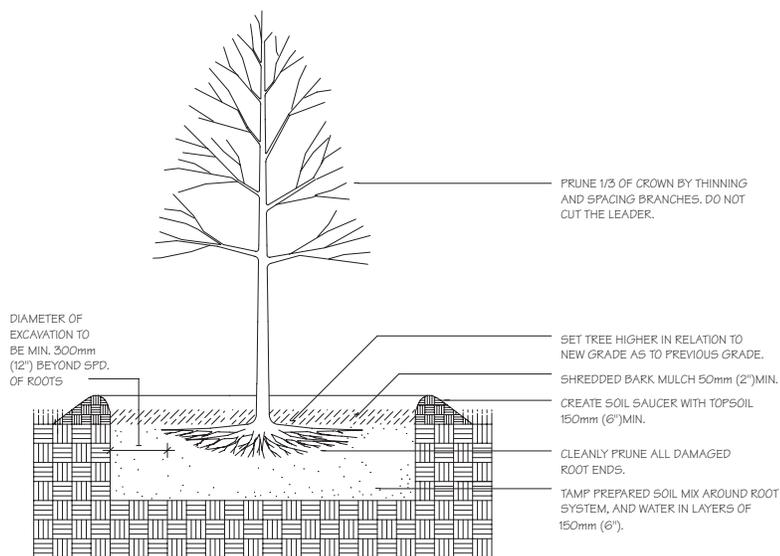
# Planting Details

## Tree Plantings

Trees are important to greenways and trails for both aesthetic and environmental reasons. Not only do they contribute to the appearance of a trail, their shade cools the environment for trail users and provides habitat for birds and wildlife. Trees also help keep streams healthy by providing shade (which regulates the temperature), filtering pollutants in storm runoff and adding leaf litter to feed small insects and fish. When choosing trees and shrubs for greenway corridors, it is recommended that indigenous and well-adapted species be used. This will reduce the need for chemical and water applications as a part of long term maintenance. The following graphics represent common installation practices used for several different types of plant material.



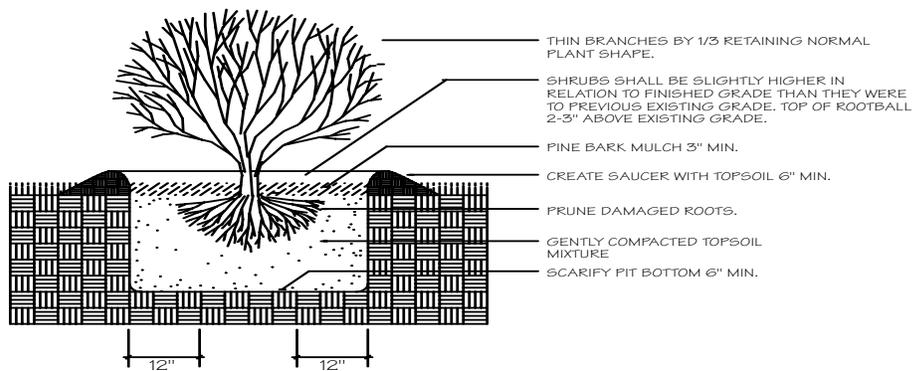
Ball and Burlap Tree Planting Detail



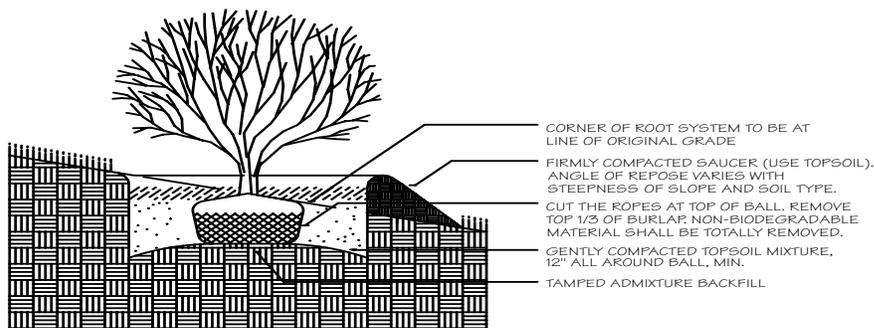
Bare Root Tree Planting Detail

# Shrub Plantings

The amount of planting needed will vary depending on the project. While some projects will require little or no planting, other projects may require it for vegetative screening, habitat restoration, erosion control or aesthetics. The graphics below illustrate planting techniques for two types of shrub material (ball & burlap and bare root) which can be used.



SHRUB PLANTING - BARE ROOT



SHRUB PLANTING ON SLOPE - BALL AND BURLAP

## Ball and Burlap Shrub Planting Detail

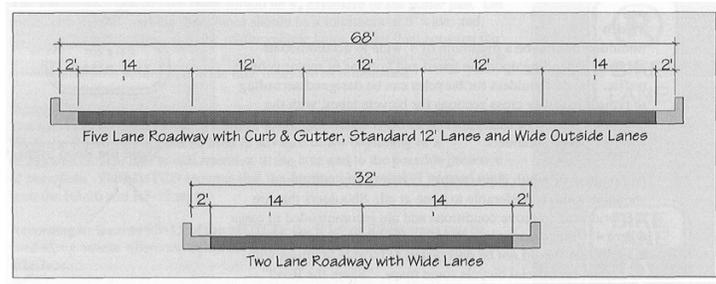
# Bike

## Bike Considerations - Wide Curb Lanes

There are three types of on-road bicycle facilities: wide curb lanes, bike lanes and paved shoulders. Wide curb lanes, or outside lanes, are wider than the standard 12' travel lane and can provide more space for cyclists and easier passing for motorists. Under most conditions, automobiles and bicycles can coexist in a 14' wide curb lane, without the need for the motorist to move into the next adjacent lane.

### Location and Width

Wide curb lanes best accommodate advanced cyclists, as these riders are more comfortable operating directly in traffic. The wide curb lane is always the furthest right-hand lane, and should optimally be 14'-16' wide, not including the gutter pan (curb lanes that are wider than 16' are not recommended). Wide curb lanes are not required to have curb and gutter. In order to achieve the extra space needed for a 14' wide outside lane, the roadway may either be physically widened or restriped to reduce the lane width of inner lanes and increase the width of outer lanes. Re-striping proposals should be reviewed by a transportation engineer to ensure adequate safety for the motorists as well as bicyclists.



### Signage

There is no special “wide curb lane” sign, however on high volume urban arterials, the designer may choose to install “Share the Road” warning signs (standard bicycle warning plate with a subplate stating SHARE THE ROAD).

### Intersection Design

When the curb lanes approach intersections with turning lanes, the 14' wide lane should continue through the intersection as the outside through-lane.

### Design Issues

**Acceptance:** Bicycle programs in numerous communities have found that less experienced bicyclists seldom see a difference when wide curb lanes are provided. Therefore, if the desired outcome is greater numbers of bicyclists or a visible “pro-bicycle” statement, this option will not satisfy the need.

**Traffic:** Wider curb travel lanes may tend to increase motorist speeds. Whether a marginal increase in speeds is important in a particular situation should be a subject for analysis.

## Bike Considerations - Bike Lanes

Bicycle lanes in Chowan County and Edenton should conform to the standards in AASHTO's Guide for the Development of Bicycle Facilities (2000). Bicycle lanes are an on-road type of facility. They should not be separated from other motor vehicle lanes by curbs, parking lanes, or other obstructions. General standards for width, striping, and intersections are provided below.

### Location and Use

Bicycle lanes serve the needs of experienced and inexperienced bicyclists in urban and suburban areas, providing them with their own travel lane. Bicycle lanes are always located on both sides of the road (except when they are constructed on one-way streets). By this design, cyclists are encouraged to follow the rules of the road, which require them to travel in the same direction as adjacent motor vehicle traffic.

### Width

The minimum width of bike lanes should be 4', exclusive of the gutter pan. On roads with parallel parking, bike lanes should be a minimum of 5' wide, and should be installed adjacent to the motor vehicle lanes, rather than between the parking lane and the curb. Along streets in Chowan County and Edenton with higher motor vehicle speeds and traffic volumes, 6' wide bike lanes are recommended.

### Signage

The MUTCD specifies standard signage for bicycle lanes. According to section 9B-8, the R3-16 sign should be used in advance of the beginning of a designated bicycle lane to call attention to the lane and to the possible presence of bicyclists. The MUTCD requires that the diamond lane symbol be used with both the R3-16 and R3-17 signs.

According to Section 9B-11 of the MUTCD, the R7-9 or R7-9a signs can be used along streets where motorists are likely to park or frequently pull into the bike lane.

### Striping

Bicycle lane stripes should be solid, 6"-wide white lines. Care should be taken to use pavement striping that is skid resistant. Bicycle-shaped pavement symbols and directional arrows should be placed in the bicycle lane to clarify its use. Pavement letters that spell "ONLY BIKE" are also highly recommended. Symbols should be installed at regular intervals, immediately after intersections, and at areas where bicycle lanes begin.

Bike lane striping at intersections is challenging. Traffic has a tendency to mix at intersections: motorists who are turning right must cross paths with cyclists who wish to continue straight, and cyclists who wish to turn left must cross into left-hand turn lanes. Several intersection striping patterns are provided by AASHTO's Guide for the Development of Bicycle Facilities (2000) and the MUTCD (2001).

## Bike Route

A bicycle route is a “suggested way” for a cyclist to get from a point of origin to a destination. Bike routes do not necessarily require physical improvements in order to accommodate bicyclists, given that they meet minimum safety criteria in their present condition. Bike routes can be preferable for a number of reasons including directness, scenery, less congestion and lower speed limits.

### Location and Use

Bicycle routes may be used by all types of cyclists. In urban areas bike routes are most often designated on residential streets with low traffic volumes, and are typically used to direct cyclists to a destination within the community, or to provide a through-route for bicyclists. In rural areas, bike routes are most often designated on roadways that are popular touring routes for recreational cyclists, or long-distance commuting routes for advanced cyclists.

### Safety Criteria

A street does not necessary have to be physically widened in order to be designated as a bicycle route. A road with standard 12' wide lanes can be designated as a bike route with the appropriate signage, given that each condition below is met:

- ◆ In its present state (or with planned improvements), the roadway sufficiently accommodates cyclists. The evaluation should take into account roadway width and traffic volumes. Candidate bike routes should have good sight distances and adequate pavement conditions. In addition, traffic should not regularly exceed posted speed limits.
- ◆ All bicycle hazards have been removed from the roadway or otherwise remedied, including unsafe drainage grates and angled railroad crossings.
- ◆ The bicycle route is designated as one segment within an interconnected system of bicycle facilities.

Bicycle route signage should be used according to the standards in the MUTCD, which provides several choices in styles. Bicycle route signs should be placed at all areas where new traffic enters the roadway. The distance between signs should not be greater than two miles. In urban areas, it is helpful to include directional arrows and captions that indicate nearby destinations, particularly at intersections.

# Bike Pavement

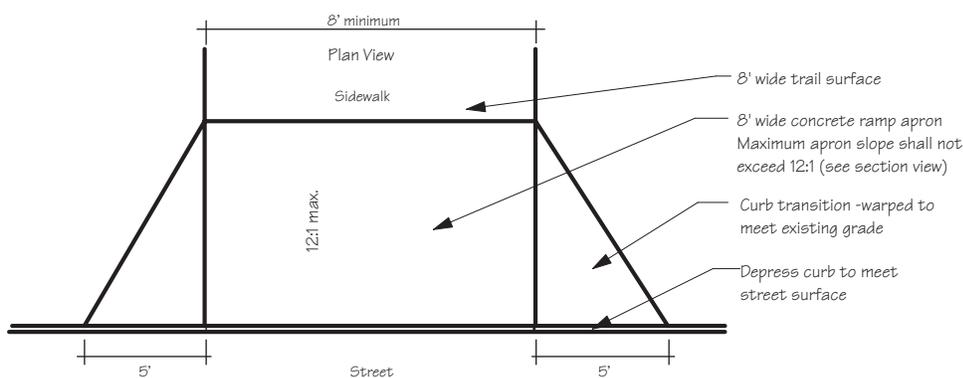
Bike lane pavement and sub-base should always have the same depth and quality as the adjacent roadway. Bike lanes are not required to have a curb and gutter.

Every effort should be made to provide a smooth and even surface for bicycles, particularly for designated bicycle routes and lanes. Bicycles are much more vulnerable to surface irregularities than motor vehicles, because they rely on very narrow, highly pressurized wheel with no suspension. A simple pothole that might cause a slight jarring to the passengers of a car can cause a serious crash for a cyclist.

Potholes aren't the only surface hazard for cyclist. Bumps, corrugations, seams, rumble strips, unraveled pavement and bridge expansion joints can cause bicyclists to lose their balance. In addition, temporary roadway construction zones often include surface hazards such as milled pavements and sudden pavement changes. Temporary signage can be used to warn bicyclist of upcoming irregularities.

When paved shoulders or bicycle lanes are added to the edge of the existing roadway, a resulting seam between the two can be hazardous to bicyclists. One solution is to install 10' wide strips of asphalt, partially overlapping the existing motor vehicles lanes.

Pavement with large aggregates can also put additional stress on the mechanical parts of road bikes, especially for distance riders. Smooth pavement is preferred to avoid accidents due to the loss and/or looseness of bike parts.

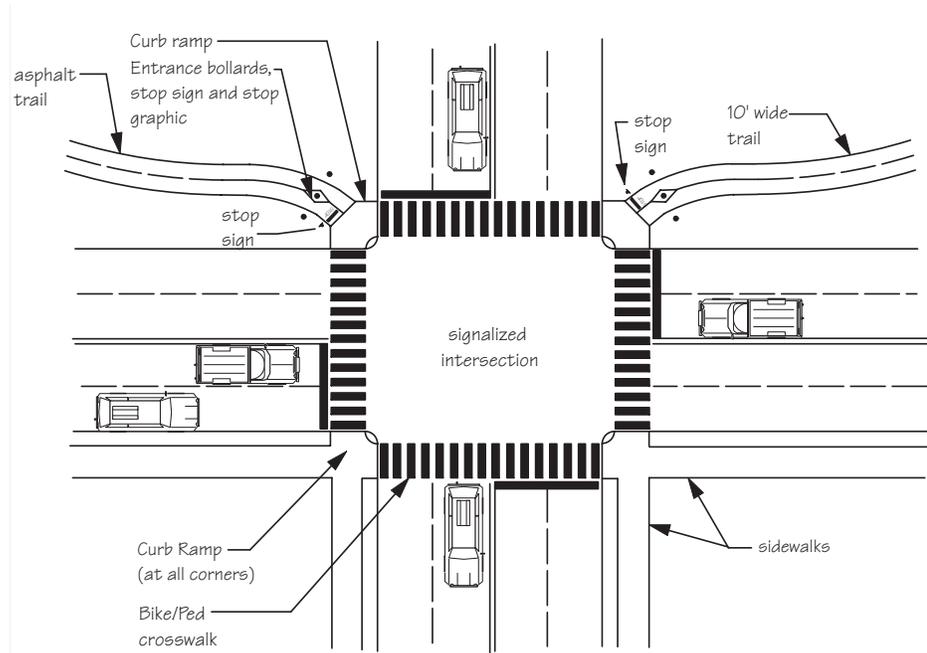


Bike Curb Ramp Plan View

# Bike Intersections

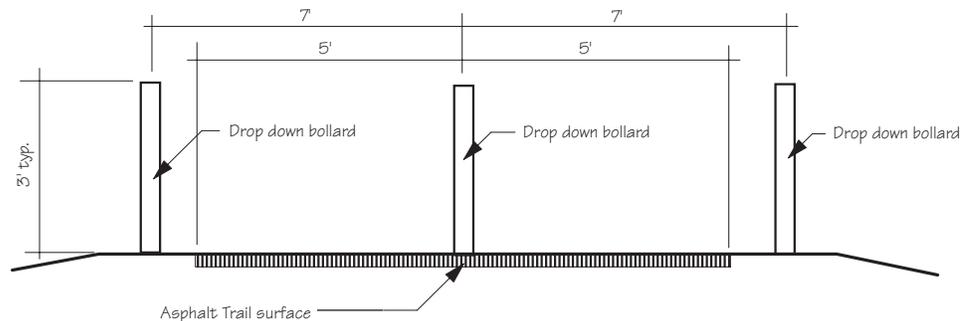
Trail/Roadway intersections can become dangerous conflict areas if not carefully designed. For at-grade intersections, there are usually several design objectives:

1. Site the crossing area at a logical and visible location.
2. Warn motorists of the upcoming crossing.
3. Maintain visibility between trail users and motorists.
4. Inform trail users of the upcoming intersection.



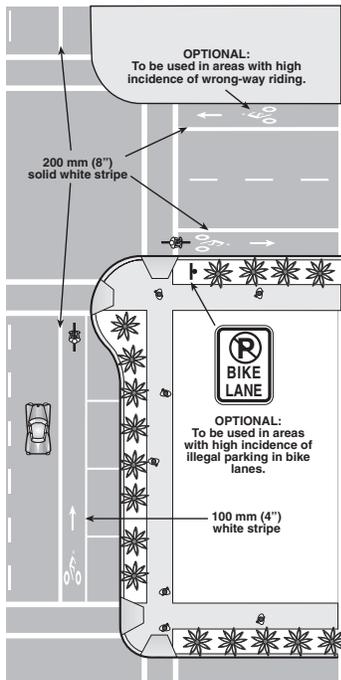
**Typical Signalized Intersection Plan View**

Intersections and approaches should be on relatively flat grades. In particular, the bicyclist should not be required to stop at the bottom of the hill. If the intersection is more than 75 feet from the curb to curb, it is preferable to provide a center median refuge area, per ADA (Americans with Disabilities Act) or ANSI (American National Standards Institute) standards. If crossing traffic is expected to be heavy, it may be necessary to provide a traffic signal that responds to bicycles and/or can be pedestrian activated.

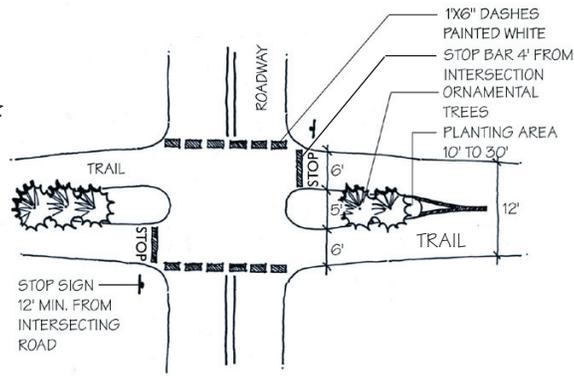


**Typical Bollard Placement**

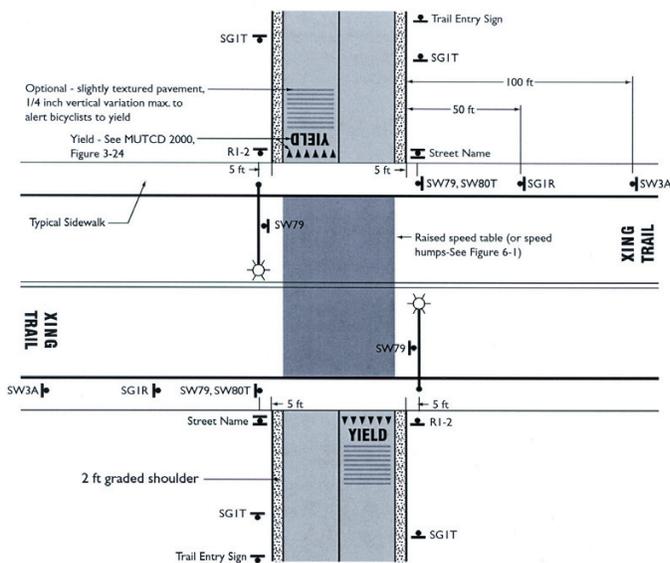
# Bike Intersections



Typical Intersection Signage Layout Plan View



Typical Perpendicular Trail and Road Intersection



Typical Trail Crossing at Local Street  
(from Contra Costa County Trail Design Guidelines)

# Sidewalk

## Sidewalk Considerations

Sidewalks are a critical component of this Greenways and Open Space Plan. They not only encourage walking, but they also improve the safety of pedestrians. An individual's decision to walk is as much a factor of convenience as it is the perceived quality of the experience. Pedestrian facilities should be designed with the following factors in mind:

### Sufficient width

Sidewalks should accommodate anticipated volumes based on adjacent land uses, and should at a minimum allow for two adults to walk abreast (min. 5 feet, prefer 6 feet).

### Protection from traffic

High volume and/or high speed (greater than 35 mph) motor vehicle traffic creates dangerous and uncomfortable conditions for pedestrians. Physical (and perceptual) separation can be achieved through a combination of methods: a grassy planting strip with trees, a raised planter, bicycle lanes, on-street parallel parking, etc.

### Street trees

Street trees are an essential element in a high quality pedestrian environment. Not only do they provide shade, they also give a sense of enclosure to the sidewalk environment which enhances the pedestrian's sense of a protected environment.

### Pedestrian-scaled design

Large highway-scale signage reinforces the general notion that pedestrians are out of place. Signage should be designed to be seen by the pedestrian. Street lighting should likewise be scaled to the level of the pedestrian (14 feet tall), rather than providing light poles that are more appropriate on high-speed freeways.

### Continuity

Pedestrian facilities are often discontinuous, particularly when private developers are not encouraged to link on-site pedestrian facilities to adjacent developments and nearby sidewalks or street corners. New development should be designed to encourage pedestrian access from nearby streets. Existing gaps in the system should be placed on a prioritized list for new sidewalk construction.

### Clearances

Vertical clearance above sidewalks for landscaping, trees, signs and similar obstructions should be at least 10 feet. In commercial areas and the downtown, the vertical clearance for awnings should be 10 feet. The vertical clearance for building overhangs which cover the majority of the sidewalk should be 12 feet.



### Conformance with national standards

Sidewalk design should be consistent with Americans with Disabilities Act requirements and/or ANSI requirements. Specific guidance is provided by the Architectural and Transportation Barriers Compliance Board's American's with Disabilities Act Accessibility Guidelines.

### Sidewalk Obstacles

Street furniture and utility poles create obstacles to pedestrian travel when located directly on the sidewalk. At a minimum, there should be 36 inches of sidewalk width to allow wheelchairs to pass. Where possible, utilities should be relocated so as not to block the sidewalk. Benches should not be sited directly on the sidewalk, but set back at least 3 feet. The design of new intersections or re-design of existing intersections presents an opportunity to improve pedestrian circulation. Street furniture located near intersections can block sight lines. In general, the designer should consider the impact on sight distance for all features located in the vicinity of roadway intersections.

### Sidewalk pavement design

Sidewalks and roadside pathways should be constructed of a solid, debris-free surface. Regardless of the type of surface chosen, it must be designed to withstand adequate load requirements. Pavement depth should reflect site specific soil conditions but never be less than 4.5 inches. Brick and concrete pavers are popular materials for more decorative sidewalks. The use of stylized surfaces is encouraged, however they must be installed properly or they will deteriorate more rapidly.

### Sidewalk width and setback guidelines

It is important to note that there are some areas that warrant wider sidewalks. For example, sidewalks in and around local universities and colleges must accommodate a much higher volume of pedestrians and, therefore, warrant additional width. The recommendations below are based upon standards used by other pedestrian-friendly communities in the U.S. Following the recommendations below ensures that basic needs of pedestrians are addressed in developing areas. In existing residential and commercial areas that lack sidewalks, new sidewalk construction (independent of new development) should occur first in locations that demonstrate the most need.

### Sidewalks on local streets in residential areas

Five-foot wide sidewalks are recommended on at least one side of the street, with a 5 foot wide planting strip. The planting strip may need to be slightly wider to accommodate the roots of street trees, if they are included in the design. Sidewalks are not necessary on cul-de-sacs that are less than 500 feet in length.

### Sidewalks on collector streets in residential and commercial areas

Five-foot wide sidewalks are recommended on both sides of the street. However, one option may be to install a 6 foot wide sidewalk on the side

of the street that generates the most activity. A 7 foot wide planting strip is recommended.

Sidewalks on arterial streets in residential and commercial areas

Six foot sidewalks are recommended on both sides of the street, with an 8’ wide planting strip.

Sidewalks on streets within 2000’ of schools

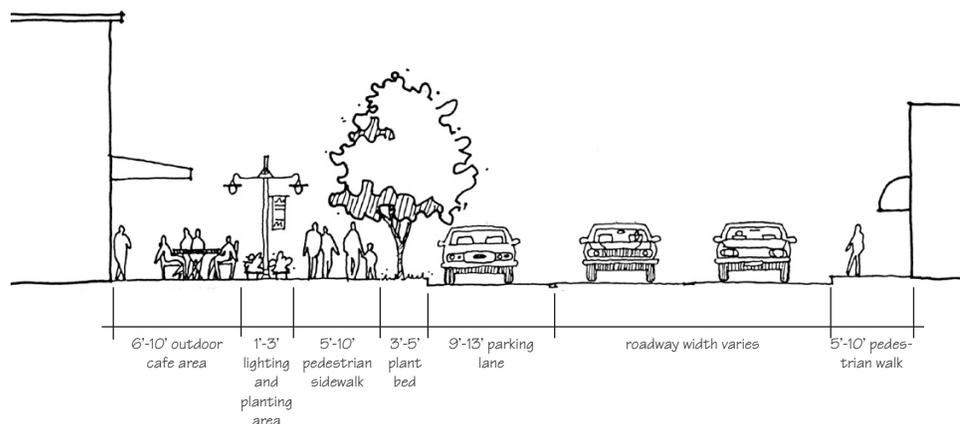
Width and setback should be based on the specific roadway type as described above. For all roadway types, however, sidewalks should be installed on both sides of the road, and should include well-marked crosswalks and school crossing signs.

Sidewalks on streets with no curb and gutter

Sidewalks located immediately adjacent to “ribbon pavement” (pavement with no curb and gutter) are not recommended. However, if no other solution is possible, sidewalks adjacent to ribbon pavement have a much greater setback requirement, depending on roadway conditions. Engineers should consult the AASHTO Policy on Geometric Design of Highways and Streets for more specific guidelines.

Sidewalks in rural areas

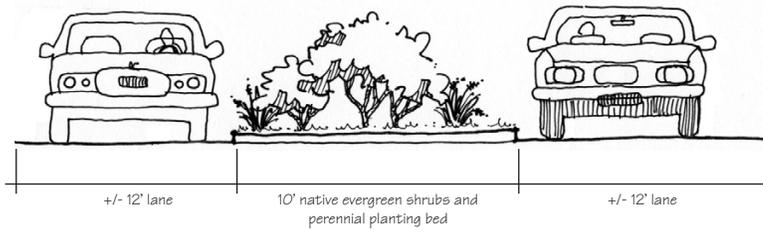
In most rural areas, the low volume of pedestrians does not warrant sidewalk construction. In most cases, 4’-6’ wide paved shoulders can provide an adequate area for pedestrians to walk on rural roadways, while also serving the needs of bicyclists. Exceptions should be made in areas where isolated developments such as schools, ballparks or housing communities create more pedestrian use. For example, motorists might regularly park along a rural road to access a nearby ballpark. A sidewalk may be warranted in this circumstance so that the pedestrians can walk separately from traffic. Sidewalks in rural areas should be provided at a width based on anticipated or real volume of pedestrians, with 5’ being the minimum width.



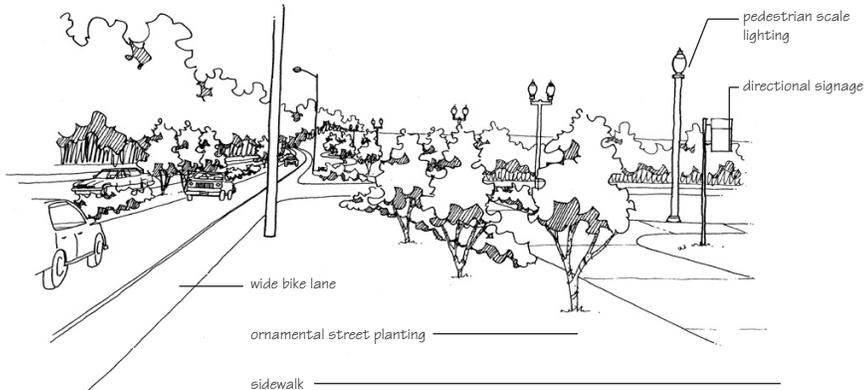
Typical Street Section



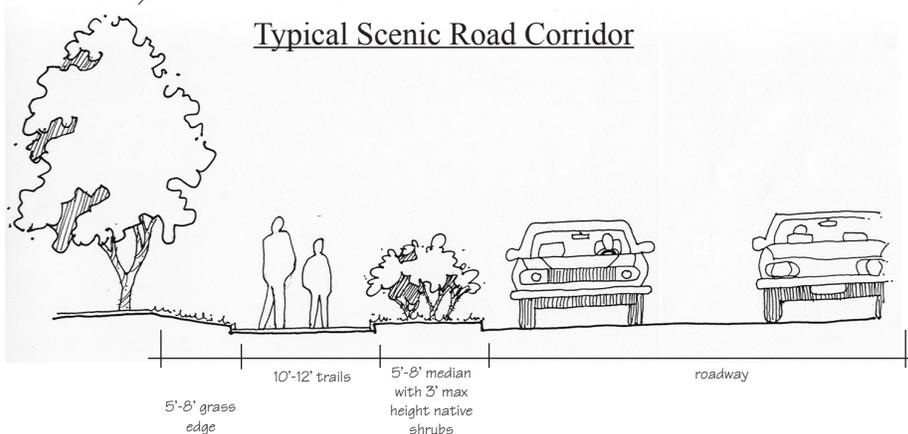
# Roadside Treatments



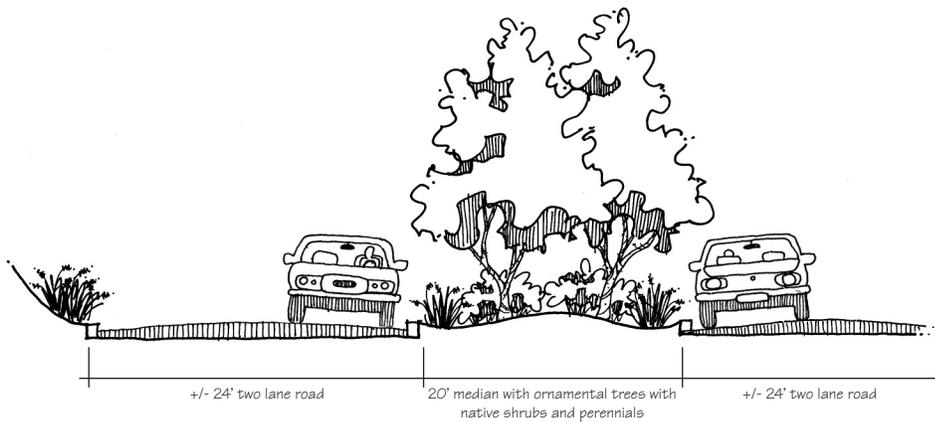
Typical Median Shrub Planting



Typical Scenic Road Corridor



Typical Road with Adjacent Sidewalk



Typical Median Planting

# Roadside Treatments



# Appendix C: Summary of Public Input

An important part of the process used to develop this Greenways and Open Spaces Plan was the public input phase. In order to gather the necessary level of public opinion, the project consultant held three separate public meetings to discuss the planning process, to share draft concepts, and to solicit feedback from the meeting participants.

At each of the meetings, participants were positive about the basic concept of developing a greenway system in the community and about protecting important open spaces. Their feedback regarding the draft versions of proposed trail alignments and draft portions of the document was equally positive.

## The Meetings

The first public meeting was held in the Council Chambers of the Town of Edenton. Approximately 40 participants listened to presentations given by the consultant regarding the overall purpose of the planning process, the expected products, and the initial concepts for the system. Following the presentation, there was a lengthy question and answer session where individuals further developed their understanding of the process and engaged in constructive conversation about



their specific concerns. Several maps of the community's existing landscape were provided for general background and to assist with conversation about proposed greenway corridors and areas for potential open space protection. The meeting was open to the public, and at least half of the participants were local elected officials.

The second meeting was sponsored by the Rotary Club in February 2003. The meeting was designed as an information sharing session for a specific target group - the business community of the Town of Edenton. The meeting began with a presentation given by the consultant regarding potential economic impacts of

greenway development and open space protection. Following the discussion a question and answer session was held.

Finally, a third session was held in March 2003 in Edenton. Like the first meeting, this one was advertised as an opportunity for the general public to hear

about the planning process and for them to share their thoughts on the draft maps and system design concepts. This particular meeting was designed to share draft materials with the public and to get

their feedback on those materials. Maps were presented that represented proposed greenway corridors and the proposed open space search areas. Additionally, presentations were given to explain the use of GIS technology in the planning process and to introduce participants to the concepts of greenways and open space planning.

Throughout the process, the consultant staff was in regular contact with the local government partners from the Town of Edenton and Chowan County. This regular



consultation helped shape the goals and objectives of the planning process and guided the design of the greenways and open space system.

As a way to solicit greater levels of public input, the consultants asked the participants of the final workshop to complete a short survey form. Copies of the form are available on the following pages. The results, while not from a sample size large enough to represent the entire community, serve as a good indicator of general preferences and were consistent with returns from larger nation-wide surveys.

## Summary of Survey Results

- The participants' top preference for new facilities is single and multi-use trails. Their second preference is new or expanded parks, followed by on-road bicycle lanes and natural area corridors with no trail facilities.

- The most popular expected uses for the new system are walking, biking, jogging, learning about wildlife, and learning about natural areas. Less popular, but commonly expected, uses are visiting with family and friends, walking pets, picnicking, and learning about the area's history. The expected uses that received the fewest votes are rollerblading, teaching children to ride bikes, and commuting.
- Among conservation functions, water quality protection and connecting existing green spaces scored highest. Natural habitat protection, new recreational opportunities, alternative transportation, and connectivity within town were listed as second tier concerns. Farmland protection and town-to-town connectivity was listed as least important to the participants.



# **Public Meeting Survey Form**

## **Chowan County and Edenton Greenways and Open Space Plan**

It is important that we understand your needs and interests as we develop the Chowan County and Edenton Greenways and Open Space Plan. Please help us by answering the questions on the front and back of this page:

### **1) Do you support the greenways and open space concept that has been presented?**

Yes \_\_\_\_\_

No \_\_\_\_\_

### **2) What type of facility do you value the most?**

(Please rate each item. 1= Very Important, 2= Important, 3= Less important)

\_\_\_\_\_ Single use walking or hiking corridor

\_\_\_\_\_ Multiple use biking, walking, hiking, rollerblading corridor

\_\_\_\_\_ On-road bicycle lane

\_\_\_\_\_ Natural community corridor (no dedicated trail)

\_\_\_\_\_ New or expanded park

\_\_\_\_\_ Other \_\_\_\_\_

### **3) Please describe how you would use a greenways and open space system**

(1= I would do this often, 2= I would do this sometimes, 3= I probably won't do this )

\_\_\_\_\_ Walk/jog for fun or fitness

\_\_\_\_\_ Ride a bike for fun or fitness

\_\_\_\_\_ Visit with friends and neighbors

\_\_\_\_\_ Rollerblade

\_\_\_\_\_ Teach my children how to ride bikes

\_\_\_\_\_ Walk pets

\_\_\_\_\_ Picnic with friends or family

\_\_\_\_\_ Commute to work or school

\_\_\_\_\_ Observe wildlife

\_\_\_\_\_ Learn about the history of the region

\_\_\_\_\_ Learn about creeks, rivers, and wetlands

\_\_\_\_\_ Play sports (Which sports? \_\_\_\_\_)

\_\_\_\_\_ Other \_\_\_\_\_

4) **How important to you are the following issues?**

(Please rate each item. 1= Very Important, 2= Important, 3= Less important)

- \_\_\_\_\_ Water quality protection
- \_\_\_\_\_ Farmland/Forestland protection
- \_\_\_\_\_ Natural habitat protection
- \_\_\_\_\_ New recreational opportunities
- \_\_\_\_\_ Alternative transportation options
- \_\_\_\_\_ Town-to-town connectivity
- \_\_\_\_\_ Connectivity within town
- \_\_\_\_\_ Connectors between existing green spaces

5) **How important is the development of a Greenways and Open Space network for maximizing the quality of life in Chowan County and Edenton?**

(Please circle one answer below)

Very Important    Important    Somewhat Important    Not Really Important

6) **Do you have suggestions for additional/alternate corridors or open space locations that should be considered? If so, please describe them here:**

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7) **Where is your primary residence?**

- \_\_\_\_\_ Within the Town of Edenton
- \_\_\_\_\_ Just outside Edenton
- \_\_\_\_\_ Another community in Chowan County  
(Which community?) \_\_\_\_\_
- \_\_\_\_\_ Other \_\_\_\_\_

**Any additional comments?**



# Appendix D:

## Catalog of GIS Data Layers

As part of the data collection and information management of the Chowan County and Edenton Greenways and Open Space planning process, a new Geographic Information System (GIS) was created. GIS allows users of data to analyze it spatially - that is, to link information about a point on the ground with a map of the spatial relationship of the data. The system that has been created for Chowan County and Edenton is made up of consolidated available data layers from a number of sources as well as some new layers created by Greenways Incorporated.

A CD-ROM (CD) of all the collected and created layers has been transmitted to the Edenton-Chowan Parks and Recreation Department. The CD is organized into: data received from the NC Department of Transportation (NCDOT), the NC Center for Geographic and Information Analysis (NC CGIA), and data created by Greenways Incorporated.

In addition to these GIS resources, this project was selected as a pilot project for the US EPA, Region 4, GeoBook process. This is a test process that uses collected GIS data for a specified region to help inform local land use and resource conservation decisions. The Chowan-Edenton Geobook CD, has also been transmitted to the Parks and Recreation Department as part of this planning process. The GeoBook CD is a complete Desktop GIS that includes an instructional video, descriptions of the various data layers, and a com-

ponent that allows internet access to information on funding and to additional mapping resources. The EPA GeoBook was used in the process of delineating open space search areas and was used as an information and educational tool at the final public open house.

The following list is a full account of the data layers that are available on the Chowan-Edenton Greenways and Open Space Plan CD. It does not include the additional data layers that are available as image files on the EPA GeoBook CD. Greenways Incorporated used ESRI's software products to create all the maps and data layers. Further questions about these GIS products/data sets should be directed to the Edenton-Chowan Parks and Recreation Department or to the NCDOT, NC-CGIA, or EPA - Region 4 offices. Up-to-date information on State Natural Heritage Areas is available from the Natural Heritage Program in the NC Department of Environment and Natural Resources.

### **NCDOT Layers**

- DOT Primary Roads
- DOT Secondary Roads
- County and Municipal Boundaries

### **NC CGIA Layers**

- Hydrology
  - Streams
  - Lakes
  - Other surface waters

- Public Schools
- Rail roads
- Existing Protected lands
  - Federal properties
  - State properties
  - Local parks
  - Private conservation reserves

#### **Greenways Incorporated Layers**

- African American Heritage Sites
- Proposed Sidewalks
- Proposed Bike Lanes
- Edenton Landmarks
- Existing and Proposed Boat Access Points
- Existing Sidewalks
- Proposed Open Space
- Pilot Project
- County and Town Owned Lands
- Proposed Greenways

#### **Additional Maps and Prepared Products**

- County-wide system - JPEG file
- County-wide system - PDF file
- Town of Edenton system - JPEG file
- Town of Edenton system - PDF file



# Appendix E: Pilot Project

An early action greenway project has been identified by the project consultants for immediate implementation. This “Pilot Project” will serve to link the business and commercial interests on Virginia Avenue and US Highway 17 to the Edenton Waterfront. The goal of this pilot project is to provide residents and visitors with bicycle and pedestrian access into the downtown of Edenton. In accomplishing this project hotels and business that visitors frequent would be linked to the historic and scenic resources of the community.

## The Possibilities

The consultant has prepared a series of before and after photographic renderings to illustrate possible future development of the project corridor. These illustrations are provided on the following pages as examples of future greenway facility development.

This pilot project links hotels, shopping and restaurants near the intersection of Hwy 17 Bypass and Hwy 32 with the, Hospital, African American Cemetery and the downtown waterfront area. Running south from Hwy 32, the route follows Claire Road to W. Hicks St, then continues SE to Granville St. Along Granville Street and into the cemetery, the route follows new sidewalks and eventually connects with the abandoned rail corridor in the cemetery, terminating at

Moseley St. The corridor then winds along W. Eden, Granville and W. Water Street to its endpoint.

The photos below show a before and after representation of bike and pedestrian improvements to Moseley Street.





The photos above offer a before and after representation of improvements that could be made to the old textile mill property, looking north from Moseley Street toward the African American Cemetery.

The existing abandoned rail tracks would be removed and replaced with a 10-foot wide asphalt trail that would support bicycling and walking.

At the African American Cemetery, a new trail would be constructed along the abandoned tracks and could be a place where interpretive/education signage could be installed.

From this location, the trail would proceed north to the constructed wetlands at the hospital. The greenway would wind past the hospital and have its northern endpoint at the US 17 and Virginia Avenue intersection, near the Hampton Inn hotel area,

