

Mecklenburg County Greenway Master Plan

(1999 - 2009)

Adopted by the
Board of County Commissioners
May 18, 1999



Prepared for:

Mecklenburg County Park and Recreation Department
Mecklenburg County Park and Recreation Commission
Mecklenburg County Greenway and Trails Advisory Council
Mecklenburg County Greenway Steering Committee
Mecklenburg County Board of County Commissioners

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GREENWAYS
INCORPORATED

Bicycle and Pedestrian Planning
Environmental Design
Landscape Architecture

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Acknowledgments

The Greenway Master Plan Steering Committee was formed to provide focused input and critical feedback in development of the Mecklenburg County Greenway Master Plan from a broad range of community interests. Members of the Steering Committee represent many agencies, councils, committees, and departments including the Park and Recreation Commission, Greenway and Trails Advisory Council, Mecklenburg County Park and Recreation Department, Mecklenburg County Department of Environmental Protection, Charlotte-Mecklenburg County Storm Water Services, Charlotte-Mecklenburg Utility Department, and the Surface Water Improvement and Management (SWIM) initiative. Mecklenburg County Park and Recreation Department, Haden•Stanziale, and Greenways Incorporated wish to express their thanks and appreciation to the Committee members, each one of whom is dedicated to maintaining and improving the quality of life in their community.

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Haden • Stanziale is a land planning and landscape architecture firm based in North Carolina with offices in Charlotte, Durham, and Wilmington. As partners in the firm, Jim Haden and George Stanziale bring more than 40 years of experience gained while principals in the widely recognized firm, Edward D. Stone, Jr. and Associates (E D S A).

Mr. Haden and Mr. Stanziale have been based in North Carolina since 1980. Their full service staff provides master planning and design services for numerous projects throughout the Mid-Atlantic region, including campus, corporate, medical and educational, waterfront, urban, recreational, residential, and commercial facilities.

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Greenways Incorporated is a multi-disciplinary environmental planning and landscape architectural firm that specializes in providing consulting services to government agencies, for-profit corporations, and nonprofit organizations. The company has provided planning, design, construction administration and management services to clients in more than 100 communities and 27 states, Canada and Japan.

Benefits of Greenways

A multi-objective greenway system for Mecklenburg County can address and resolve many community issues that affect the future environmental and economic health of the County. Greenways have been implemented by other communities to control flooding, improve water quality, protect wetlands, conserve habitat for wildlife, and buffer adjacent land uses. Greenways typically incorporate varying types and intensity of human use, including trails for recreation and alternative transportation, and passive and active park facilities, including open play fields. Greenways have also been shown to increase the value of adjacent private properties as an amenity to residential and commercial developments.

Flood Control Benefits

Greenways preserve wooded open spaces along creeks and streams which absorb flood waters and filter pollutants from storm water. Flooding has historically been a significant problem in many parts of Mecklenburg County. In some areas, buildings and land uses have encroached into flood prone areas. By designating floodplains as greenways, the encroachments can be better managed, and in some cases, replaced with linear open spaces that serve as an amenity to local residents and businesses as well as providing important flood water storage capacity.

As a flood control measure, greenway corridors serve as a primary storage zone during periods of heavy rainfall. The protected floodplain can also be used during non-flood periods for other activities, including recreation and alternative transportation. In conjunction with existing Charlotte-Mecklenburg floodplain management policies, recommendations, and programs, greenway lands can be established as development occurs.

The expense associated with the establishment of the greenway system can be offset by the savings realized in reduced flood damage claims. Additionally, for those residents who are required to purchase flood insurance, implementation of a community-wide greenway system in Mecklenburg County is likely to result in reduced flood insurance rates.

Water Quality Benefits

Greenway corridors also serve to improve the surface water quality of local rivers and creeks. The floodplain forests and wetlands contained within greenway corridors filter pollutants from storm water. These pollutants are not removed if storm water is collected

Figure 1: Protecting stream side vegetation is one of the goals of Greenways.



Figure 2: Flooding has caused significant property damage throughout Mecklenburg County. In this photo, a CSX railroad engine is pulled from Little Sugar Creek after floodwaters washed out the railroad bridge supports.



in pipes and discharged directly into local streams. Improving surface water quality in streams and creeks not only benefits local residents, but also numerous forms of wildlife that depend on creeks for their habitat.

The Surface Water Improvement and Management (SWIM) initiative was established by the Mecklenburg County Department of Environmental Protection in November 1996. The program's objective is to improve the surface waters in Mecklenburg County and to restore the usability of the creeks. Growth is occurring at a high rate in the southern watersheds of the County, which has led to the degradation of water quality in local creeks. Similar growth is also occurring in the north and west watersheds of Mecklenburg County, which discharge into the County's primary drinking water supply, Mountain Island Lake. Greenways and the SWIM initiative will help to improve water quality within these watersheds of Mecklenburg County by protecting and promoting stream side buffers that will filter pollutants from overland runoff.

Transportation Benefits

In past years, most American communities have grown in a sprawling, suburban form as a result of dependence on the automobile as the sole means of transportation. Americans have abandoned some traditional forms of transportation (such as passenger train service) and have been slow to improve other forms of transportation (bicycle and pedestrian

networks, bus systems, and local train service). In order to provide relief from congested streets and highways in Mecklenburg County, future transportation planning and development should be concentrated on providing a choice in mode of travel to local residents. These mode choices should offer the same benefits and appeal currently offered by the automobile: efficiency, safety, comfort, reliability and flexibility.

Greenway corridors throughout Mecklenburg County can serve as extensions of the roadway network, offering realistic and viable connections between origins and destinations such as work, schools, libraries, parks, shopping areas, and tourist attractions. Greenway-based bikeways and walkways are

most effective for short travel distances. National surveys by the Federal Highway Administration have shown that Americans are willing to walk as far as two miles to a destination and bike as far as five miles. It is conceivable that destinations can be linked to multiple origins throughout the County with a combination of off-road trails and on-road bicycle and pedestrian facilities. As stated in the 2015 Plan for Mecklenburg County, "the overall transportation goal for Charlotte-Mecklenburg is to develop an efficient, effective, safe, and interrelated transportation system that includes roads, mass transit, aviation, rail, bicycle, and pedestrian ways and related facilities needed for mobility in a rapidly growing urban

Figure 3: Greenways linked with on-road bicycle facilities, sidewalks and transit facilities can be a valuable component of the County's transportation network.



Little Sugar Creek Greenway

region.” The greenway system will be linked to improvements that will be made to bicycling, sidewalk and transit systems.

Air Quality Benefits

Greenways as alternative transportation corridors can serve to reduce traffic congestion, helping to improve local air quality. Offering viable alternative transportation choices through greenways will encourage people to bicycle and walk more often, especially on short trips, thereby reducing traffic congestion and automobile emissions.

The 1970 Clean Air Act calls for federal, state and local governments to reduce ozone levels to what is believed to be a safe level. The level has been lowered to 0.08 parts-per-million (ppm) averaged over an eight hour period. Currently, Mecklenburg County is not a non-attainment area and meets the requirements of the Clean Air Act. However, air quality monitoring shows that levels of air pollutants, such as ozone, are increasing.

Cars and trucks are the key contributors of ozone pollution in Mecklenburg County, producing 68% of the ozone. Factories and power plants only contribute approximately 4% of the ozone pollution. The number of ozone “alert” days in 1998 exceeded the number of ozone “alert” days in 1997 by 800 percent.

Plant and Animal Habitat Benefits

Greenway corridors serve as habitat for many species of plants and wildlife. These corridors provide essential food sources and access to water. Greenway corridors in Mecklenburg County function as primary migratory corridors for aquatic, avian and terrestrial wildlife, serving to help maintain the integrity of plant and animal gene pools. Some wildlife biologists have extolled greenways as future “gene-ways” and determined that migration routes are essential to maintaining healthy wildlife populations. Greenways can also serve as “gene-ways” for plant species which migrate with changes in climate and habitat. These “gene-ways” often follow river and stream corridors that have long served as transportation routes for animals and humans. Greenways in Mecklenburg County can be targeted as a primary habitat and breeding ground for many species of plants and animals. Programs can be established to not only protect the valuable existing forested and wetland areas of the County, but also to reclaim and restore streams to support higher quality habitat.

Figure 4: Air quality in Mecklenburg County continues to degrade as the population increases and more land development takes place. Greenways can help cleanse the air by providing areas for reforestation of native species.



Little Sugar Creek Greenway



Figure 5: Greenways provide a valuable refuge for urban wildlife.



Figure 6: Greenways, like Little Sugar Creek Greenway, promote economic activity, increase the value of adjacent property and can be a primary destination for tourists.

Economic Benefits

Greenways offer numerous economic benefits to Mecklenburg County, including higher real property values, increased tourism and recreation related revenues, and cost savings for public services. Greenways have been shown to increase the value of adjacent properties by as much as 5 to 20 percent. For example, within a new development in Apex, North Carolina, new lots situated on greenways were priced \$5,000 higher than comparable lots off the greenway.

In Charlotte, national builders typically charge premiums ranging from \$1000 to \$5000 for \$120,000-\$200,000 homes bordering open space and greenways.

Many home buyers and corporations are looking for real estate that provides direct access to public and private greenway systems. Greenways are viewed as amenities by residential, commercial and office park developers who, in turn, are realizing higher rental values and profits. American LIVES, a Real Estate Research Firm, completed a national study of the top reasons that people choose their new home. Walking and biking paths are viewed as extremely important to 74% of buyers nationally. The Crosland Land Company, Charlotte, NC, surveyed 800 new and older Charlotte area homebuyers in 1993 and found that walking/biking paths that meander was the second most important amenity to buyers across all price points and buyer types. Additionally, greenways in Mecklenburg County can also save local tax dollars by utilizing strategies for managing community storm water and placing into productive use landscapes that would not normally be developed for community uses.

Figure 7: Greenways offer County residents close to home access to outdoor resources, promoting opportunities for health and fitness activities.



The 2015 Plan for Mecklenburg County states that Mecklenburg County has a strong record of economic vitality and new jobs. Greenways will enhance the quality of life in Mecklenburg County and ensure long term economic viability. Tourism is currently ranked as the number one economic force in the world. In several states, regional areas, and localities throughout the nation, greenways have been specifically created to capture the tourism potential of a regional landscape or cultural destination. The State of Missouri, for example, spent \$6 million to create the 200-mile KATY Trail, which, in its first full year of operation, generated travel and tourism expenditures of more than \$6 million. Orange County, Florida spent \$2 million to create the 16-mile West Orange Greenway and expects to realize a complete return on its investment in the first year of operation through the economic revitalization of the small towns that lie along the trail's route.

Health and Recreation Benefits

Greenways encourage more people to walk or bike to nearby destinations. Studies have shown that as little as 30 minutes a day of moderate-intensity exercise (such as bicycling, walking, or in-line skating) can significantly improve a person's mental and physical health and prevent certain diseases. Providing opportunities for participation in these outdoor activities close to where people live and work is an important component of promoting healthy lifestyles for Mecklenburg County residents.

In 1987, the President's Commission on Americans Outdoors released a report that profiled the modern pursuit of leisure and defined the current quality of life for many Americans. Limited access to outdoor resources was cited as a growing problem throughout the nation. The Commission recommended that a national system of greenways would provide all Americans with access to linear open space resources.

The proposed greenway system for Mecklenburg County can be developed to complement the community's existing parks and open space system. Trail systems will be developed not only for alternative transportation, but also to serve as primary recreation and fitness resources.

Cultural Benefits

Greenways can enhance local culture and protect many of the historic resources in Mecklenburg County. Successful greenway projects across the United States have served as new "main streets" where neighbors meet, children play, and community groups gather to celebrate. For cities and towns large and small, greenways have become a cultural asset and focal point for community activities. Some communities sponsor "greenway days" to celebrate the outdoors and local traditions. Various walking and running events are also held on greenways to support charity or to extend traditional sporting events. Many civic groups adopt segments of greenways for clean-up, litter removal and environmental awareness programs. Some greenways, like San Antonio's Riverwalk, are the focal point not only for community activities but also for economic development.

The richness and diversity of Mecklenburg County's historic resources are represented by numerous National Register of Historic Places and locally significant sites and historic districts. The interpretation of historic and archeological sites along greenways can serve to increase the awareness and appreciation of Mecklenburg County's rich history. Greenways can also be a vehicle to provide controlled public access to important cultural sites in a manner that promotes preservation and enhances interpretive opportunities.

Figure 8: Greenways promote social interaction and have become America's new "Main Street."



Little Sugar Creek Greenway, Freedom Park

Safety Benefits

Little Sugar Creek



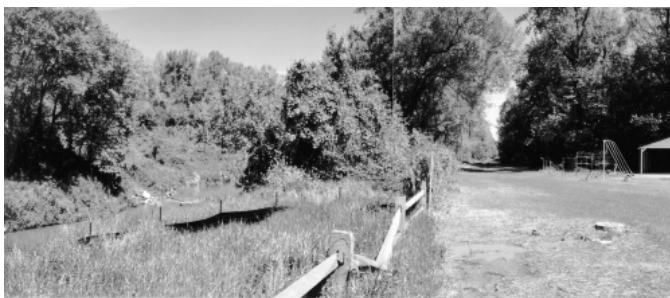
Figure 9: Greenways have been shown to be one of the safest landscapes in America. They are places where children can play safely in an outdoor setting that encourages interaction.

Many Americans are concerned with crime. Some of the most successful deterrents to criminal activity have involved increased neighborhood awareness by citizens and participation in community watch programs. Greenways have proven to be an effective tool to encourage local residents to participate in neighborhood watch programs. Some greenways have even been developed as part of efforts to deter criminal activity in a neighborhood.

As a recreation resource, alternative transportation corridor, or area where fitness activities can take place, most greenways provide a much safer and more user-friendly resource than other linear corridors, such as local roads. Greenways typically attract local residents who use the facility frequently and create

an environment that is virtually self-policing. Crime statistics and reports from law enforcement officials have shown that parks and greenways are typically land uses with the lowest incident of reported criminal activity. According to national crime statistics, on average, a person is more likely to be raped, robbed or assaulted on a street, in a parking lot, or inside their home than in a park (Statistical Abstract of the United States 1988-1992) Additionally, out of 372 trails included in a recent study by the Rails-to-Trails Conservancy, only 3 percent of the trails reported experiencing any type of major crime (in 1995 and 1996).

Figure 10: The natural beauty of greenways makes them one of the most valuable assets of a community.



Little Sugar Creek

A December 1997 Crime Risk study was completed by a UNC-Charlotte graduate student, Shane Nixon, that researched crime risks along the Mallard Creek Greenway and adjacent properties. Using information supplied by the district police department, the study showed that Mallard Creek Greenway and adjacent properties had a total of eight crimes in three years. When compared on a square mile basis per year, the Mallard Creek Greenway and adjacent properties had a crime rate of 13.0 offenses per square mile whereas the local police district area had approximately 24.7 offenses per square mile. Compared to

Mecklenburg County, which had a crime rate of 95.7 offenses per square mile, the Mallard Creek Greenway and adjacent properties have a very low crime rate. This study concluded that people that lived along the greenway were at less risk for crime.

Greenways also improve the safety of their users by providing off-road facilities for bicyclists and pedestrians that are much safer than the roadways. Nationally, over 5,000 pedestrians are killed every year on streets. Sixteen percent of those fatalities are children. **A 1998 study by the Surface Transportation Policy Project identified Charlotte, NC as the 10th most dangerous place in America for pedestrians. Recently, a South Mecklenburg High School cross country runner was hit and killed by an automobile while training and a jogger was critically injured in Dilworth by a hit and run driver. These tragic events can be avoided in the future by supporting greenway development to provide connections between existing greenways and schools, parks, businesses, and neighborhoods.**

Background of Current System

Prior Greenway Planning Efforts

Prior to this Greenway Master Plan, Mecklenburg County's greenway efforts were guided by the 1980 greenway master plan. This document was an in-depth report prepared by a graduate student at the University of North Carolina at Charlotte, for the Mecklenburg County Park and Recreation Commission. In it, the specific greenway recommendations of the Greenway Site Selection Committee were described. Approximately 73.7 miles of greenways were recommended for development along 22 creeks throughout Mecklenburg County to serve the following objectives:

- Provide both passive and active recreation
- Supplement the developing park system and provide linkages between land uses
- Preserve habitats for native vegetation and wildlife
- Reduce the reliance on the automobile for transportation
- Reduce flood damage
- Help remove pollutants from the air and water

In 1991, an Update to the 1980 Plan was completed but never approved. Between 1980 and 1991, the County focused on land acquisition and developed greenways along Campbell, Mallard, McAlpine, and McMullen Creeks. The 1991 Update recommended new greenway corridors, including creeks, conversion of abandoned rail corridors, and use of roadway connections to expand the original proposed system. Priority corridors for greenway acquisition and development, and implementation strategies, are also included in the Update. The top five priority projects identified were:

1. Little Sugar Creek
2. Briar Creek
3. Mallard Creek
4. McMullen Creek
5. Campbell Creek

A segment of the top priority project identified in the 1991 Update was designed and constructed three years later. This section of Little Sugar Creek is adjacent to the Carolinas Medical Center Campus from East Morehead Street to East Boulevard.

Figure 11: McMullen Creek Greenway was one of the top priority corridors in the 1991 Plan update.





Figure 12: The Mallard Creek Greenway was one of the County's original corridors. Here a segment of the greenway trail winds behind a residential home.

In 1988, the Mecklenburg County Board of Commissioners approved the Mallard Creek Greenway Master Plan. This plan proposes approximately ten miles of greenway trail linking a growing residential population in Northeast Mecklenburg to schools, offices and retail establishments. The Mallard Creek Greenway Master Plan Update was completed and adopted in 1997. It recommends adding over 20 miles of greenway trail, extending the system along the upper reaches of Mallard, Clarks, Doby and Toby Creeks.

Current System

<i>Greenway Name</i>	<i>Mileage</i>	<i>Status</i>
Upper Little Sugar Creek	1.1	Existing
Lower Little Sugar Creek	1.3	Existing
Mallard/Clark's Creek	3.7	Existing
McAlpine Creek	4.1	Existing
McMullen Creek	1.3	Existing
McAlpine Nature Trail	1.7	Existing
McAlpine Cross Country	3.1	Existing
SUBTOTAL EXISTING	16.3	
Mallard/Clark's Creek III	3.0	Planned
Torrence Creek	2.3	Planned
Irwin Creek	3.75	Planned
Lower McAlpine Creek	3.2	Planned
Lower McMullen Creek	1.3	Planned
SUBTOTAL PLANNED	13.55	
TOTAL MILEAGE	29.85	

A map and information about the completed greenway segments is available from the Mecklenburg County Park and Recreation Department's Greenways Program.

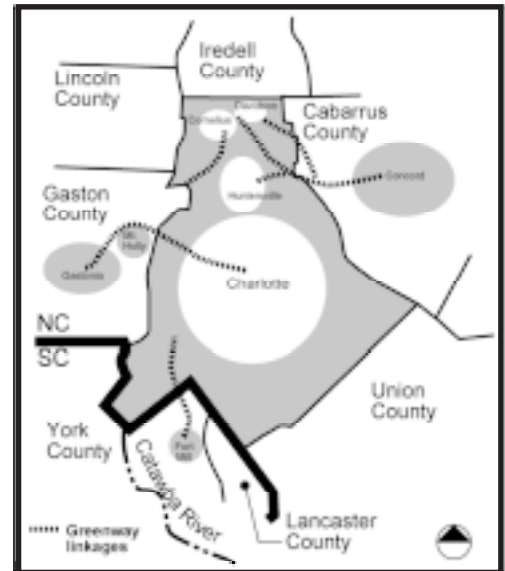
Regional Greenways

There are many opportunities for greenways within Mecklenburg County to connect to existing and future greenways in surrounding counties and the towns. Cabarrus County has future plans for greenways along Clarke Creek that will eventually link to greenways in Davidson, Cornelius, and Mecklenburg County. In Fort Mill, South Carolina, the Anne Springs Close Greenway could be connected to the Steele Creek Greenway corridor in Mecklenburg County. This would provide Southwest Park District users an opportunity to link with an excellent greenway and park resource. Gaston

County has researched many greenway opportunities which include a future greenway along the old Piedmont and Northern Railroad right-of-way that could link downtown Gastonia to Mt. Holly and into Mecklenburg County near the Catawba River. In North Mecklenburg County, the Towns of Huntersville and Cornelius have proposed greenway corridors along McDowell Creek, South Prong of the Rocky River, and the North and South Prongs of Clarke Creek.

Related Planning Efforts

A variety of other comprehensive planning studies have been recently completed or are currently underway in Mecklenburg County which directly influence and complement the recommendations of this Greenway Master Plan. The following is a brief description of each of these related planning efforts and how they support the goals and objectives of the Mecklenburg County Greenway Program.



Regional Connections

Charlotte-Mecklenburg 2015 Plan

The 2015 Plan for Charlotte-Mecklenburg County, approved in 1996, refers directly and indirectly to a greenway system and the current Greenway Master Planning effort. One of the goals under Parks and Recreation is to significantly increase the availability of greenways throughout the County. The other goal is to update the Parks Master Plan to provide planning, prioritization and funding for greenways. Greenways are also a component of the transportation recommendations of the 2015 Plan as off-road bicycle facilities to “better accommodate the needs of bicycle transportation”.

Charlotte-Mecklenburg Park Master Plan

The 1989 Charlotte-Mecklenburg Park Master Plan focused on six categories of park types including State Parks, Nature Preserves, Community Parks, District Parks, Neighborhood Parks, and Special Facilities. This plan also addressed greenways as being an important element of the park system. The adopted 1980 Greenway Master Plan was the most current greenway plan at the time of the Park Master Plan study. Greenways were considered an important factor in linking parks, schools, and other facilities with neighborhoods and employment areas.

Charlotte-Mecklenburg Bicycle Transportation Study

The Charlotte-Mecklenburg Bicycle Transportation Study is currently underway. Wilbur Smith and Associates (WSA), The FWA Group, and B.I.K.E.S. are developing the plan. The multi-dimensional plan focuses on bicycle facilities, design standards, policies and regulations, and education and encouragement. Bicycling to parks and greenways for

recreation is the most popular bicycling activity identified for Charlotte and Mecklenburg County. The Study addresses opportunities to connect the greenway system to nearby but not immediately adjacent residential areas via bike lanes on connectors or minor arterials and by signing local residential streets. The final plan will identify desirable connection points between the on-road system of bicycle facilities and proposed greenways. The Charlotte-Mecklenburg Bicycle Transportation Study complements and reinforces the findings of the Mecklenburg County Greenway Master Plan. The Bicycle Transportation Study is scheduled to be completed in Spring 1999.

Bicycle Suitability Map

The Bicycle Suitability Map, produced by NCDOT in February 1998, lists bicycle suitability ratings for some of the major arterials throughout Mecklenburg County. The ratings are based upon levels of difficulty among the roads surveyed. The levels of difficulty are moderate, advanced, and extreme caution. Some roads that were surveyed are not recommended and some are prohibited. This map is available from Charlotte DOT.

2025 Integrated Transit/Land Use Plan for Charlotte-Mecklenburg

The 2025 Integrated Transit/Land Use Plan for Charlotte-Mecklenburg is also currently underway. A draft summary report was completed in July 1998. The consulting firm of Parsons Brinckerhoff is preparing the plan in coordination with the Charlotte Department of Transportation. The key tasks involved with the plan are investigating transit options, identifying potential routes within each corridor, identifying the costs and benefits of each transit option, identifying near-term, mid-term and long term transit improvements, and involving the public in the decision-making process. The Transit Plan focuses on rapid transit corridor facilities. However, the plan also addresses improved transit service to all citizens of Mecklenburg County. The improved transit service may include extended service hours, new transit hubs, increased cross-town service linking the corridors and the new transit hubs, and new local service in each of the towns. The plan also emphasizes that a successful transportation system gives citizens a variety of ways to get around the region including expanded transit with bicycle and pedestrian connections. Greenways are included in this plan and provide linkage between residential neighborhoods and planned transit hubs.

Floodplain Planning

Charlotte-Mecklenburg Storm Water Services is concerned with floodplain planning and management which can incorporate the use of greenways as facilities to reduce the impacts of flooding. Storm Water Services has produced a floodplain management guidance document and policy research paper on detention which will be incorporated into the Greenway

Master Plan. This agency has also begun experimenting with alternative designs for stabilizing creek banks (which are common locations for greenways). These designs incorporate bioengineering, a technique employing natural materials to improve aquatic habitat and stabilize soil by combining engineering principles with plant science. Experimental bioengineering efforts currently underway include projects along Dairy Branch, Toby Creek and Little Sugar Creek.

Surface Water Improvement and Management Initiative

The Mecklenburg County Department of Environmental Protection (MCDEP) has been working with citizens since November of 1995 to identify ways to restore the water quality in creeks through the Surface Water Improvement and Management (SWIM) Program. Essentially, SWIM seeks to produce measurably cleaner surface waters in the County and restore the usability of streams through:

- Increasing public awareness of surface water quality conditions;
- Engaging the public's direct involvement in efforts to restore streams;
- Promoting intergovernmental coordination to resolve surface water problems;
- Developing basin plans designed to restore water quality; and
- Implementing activities identified in these basin plans.

Phase I of the SWIM project involves the stabilization of creek water quality county-wide through establishing buffers, controlling erosion, modeling, watershed planning, bacteria elimination and public awareness. This phase is currently in progress.

Additionally, draft basin plans have been completed by the Department of Environmental Protection for Sugar, Little Sugar, Taggart, Briar, Irwin, Stewart, Coffey, Gar, McDowell, Clear, Stevens and McMullen Creeks and Kings Branch. In some cases, these creeks have been adopted by the Adopt-A-Stream group of volunteers that is administered by the Department of Environmental Protection, Water Quality Section. In 1998, a total of 37 groups signed up to adopt streams. These included businesses, churches, youth groups, schools, agencies, university organizations, and concerned citizens who together adopted approximately 85.4 miles of streams. These citizen groups clean up the creeks, stencil hundreds of storm drains to discourage dumping, and report pollution problems by signing up to be "Water Watchers". Outside of SWIM efforts, Mecklenburg County Storm Water Services has helped to increase awareness of creeks in Mecklenburg County by installing signs at major creek crossings advising motorists of each creek's name and if a greenway follows the creek.

All of these efforts toward water quality improvement are directly linked to greenways as vegetated buffers that improve water quality and, through trail development, provide public access and awareness of riparian corridors.

Description of Study Area

Natural Systems

Mecklenburg County lies in the Piedmont region of North Carolina and is characterized by low-lying rounded hills and gentle rolling slopes. Steeper slopes are located near and along drainageways. The highest point of the County is Cornelius, in the most northern part of the County, at more than 830 feet above sea level.

The County is divided by two major river basins, the Catawba and Yadkin. Streams located in the western two thirds of the County flow into the Catawba River. Streams located in the eastern part of the County flow into the Yadkin River. The Catawba River forms the western boundary of Mecklenburg County. The divide of the two river basins is a broad ridge that extends from Davidson to Mint Hill.

Irwin, Little Sugar, and Briar Creeks are the largest creeks in Mecklenburg County and drain most of the urban area of the City of Charlotte. These creeks flow southward and converge into Sugar Creek before finally entering the Catawba River in Lancaster County, South Carolina. The topography of Mecklenburg County offers both opportunities and constraints. In some areas, it may be difficult to develop trails to ADA (Americans with Disabilities Act) standards while in other areas the gently rolling slope may work well with greenway development.

The soils within Mecklenburg County are generally well drained, with clayey subsoils on the broad ridges and side slopes of gentle hills. Poorly drained soils with loamy subsoils can be generally found only in the floodplain areas of the rivers and creeks. According to the Mecklenburg County Soil Survey by the Soil Conservation Service prior to 1978, the Monacan soils (MS) that are generally located along the creeks and rivers need on-site investigation to determine the usage and planning of the type of development that may occur.

Canopy trees, understory trees, shrubs, and groundcovers are critically important vegetation features of the natural landscape. Vegetation filters pollutants from the air and surface waters, provides habitat for wildlife, provides shade for aquatic species, and provides stabilization for streambanks. Most of the vegetation that is common along the stream banks of creeks within Mecklenburg County can be categorized as southern floodplain forest and southern mixed hardwood forest. The southern mixed hardwood forest exists along tops of slopes and near coves and more protected areas. The southern floodplain forest is the



Figure 13: Clark's Creek contains some of the better water quality found in developed sections of the County.

more dominant type of vegetation for most of the creek corridors . This type of forest exists along the stream banks and nearby slopes. The dominants and associates within the type of forest will vary depending on the amount of moisture that the floodplain receives during the year.



Figure 14: Connecting County residents to Mecklenburg's vast system of park and recreation facilities is one of the primary goals of the Greenway system.

Human-Made Systems

For the purposes of this report, the Mecklenburg County study area has been divided into six Park Districts and one Park Region in order to better understand the existing human-made infrastructure. These six districts include north, northwest, northeast, east, south, and southwest. The Central Park Region includes Central Park Districts I, II, and III. Mecklenburg County Park and Recreation Department recognizes these divisions along river and major interstate and roadway boundaries. Each of these districts is described below. This information is intended to serve as a guide to the existing opportunities and constraints to greenway development in Mecklenburg County. Destinations within one-mile of the corridors are listed in each Park District description. (Typically, pedestrians will travel up to 2 miles and bicyclists will travel up to 5 miles from their origin for any given trip.)

North Park District

North Mecklenburg County includes land within the northern boundary of the County, east of Lake Norman, and west of the eastern boundary of the County. The southern limit of the North Park District continues at the Catawba River from Allison Ferry Road to McDowell Creek and ends at Interstate 77. At Interstate 77, the southern limit of the North district continues at Alexandriana Road and follows Eastfield Road to the Cabarrus County line. This district includes the Towns of Davidson, Cornelius, and Huntersville. The character of this district can be described as rural on the east side of Interstate 77, and rapidly suburbanizing on the west side of Interstate 77. The northern boundary of the North Park District includes the Towns of Davidson and Cornelius. The center of the district is the Town of Huntersville, which is characterized by the newer residential communities that have been developed in a once rural area of the County. In the North Park District, the Torrence Creek Greenway is under design and soon to be constructed. Additionally, the designated State Bike Route 6, Piedmont Spur Route of the "North Carolina Bicycling Highway System", follows State Highway 73 to Gilead Road and Huntersville-Concord Road through the North Park District.

Important destinations in the North Park District:

Lake Norman	
Davidson College	
Torrence House and Store	Ramsey Creek Park
General Davidson Memorial	Historic Davidson Plantation

Blythe Landing	David B. Waymer Recreation Center
North Mecklenburg Park	Holbrooks Road District Park
The Energy Explorium	Jetton Road Park on Lake Norman

Davidson Library	
Davidson Middle School	Davidson Elementary School
Cornelius Elementary School	Lake Norman YMCA
North County Regional Library	CPCC North Campus
John M. Holbrook Memorial Park	Huntersville Elementary School
David B. Waymer Complex	Alexander J. McKnitt Middle School
North Mecklenburg High School	

Origins in the district include the following lakeside communities:

- The Peninsula
- Shearwater Point
- Norman Shores
- Residential communities within the Towns of Davidson, Cornelius, and Huntersville

Two Park and Ride lots for the city transportation system are located in the North district including one at NorthCross Shopping Center and another at Huntersville Square Shopping Center.

In the North Park District, many low speed, low traffic residential streets are safe for non-motorized travel. However, the major north-south corridors of Catawba Road and Statesville Road are not. There are many scenic routes that are popular routes for recreational cyclists such as Beatties Ford Road, Gilead Road, Davidson-Concord Road, and Grey Road.

In northern Mecklenburg County, crowding will be an issue on roads and rapid transit in the form of rail and bus transit will be proposed in the near future as a result of the new rapid-transit plan for Mecklenburg County. The plan proposes bus only lanes along the shoulders of I-77 and train service adjacent to Old Statesville Road. In the near future, the towns of Huntersville, Cornelius, and Davidson will begin building passenger rail and bus stations that will serve the bus routes in the near future and train later. Pedestrian and bicycle access will be an important part of this plan, and greenway linkages should be provided to these transit stations.

Opportunities for greenway trail development in North Mecklenburg County include:

McDowell Creek	Torrence Creek
Torrence Creek Tributary #1	Clarke Creek
Clarke Creek South Prong	Rocky River West Branch North Prong
Rocky River West Branch South Prong	Ramah Creek

McDowell Creek flows south from Cornelius through residential communities and rural farmland. The southern portion of the creek flows into the Rural Hill Nature Preserve, which is listed on the National Register of Historic Places. Torrence Creek flows west into McDowell Creek through the backyards of many residential neighborhoods and farms. Torrence Creek Greenway is currently under design for construction documentation. This 2.3 mile future greenway will be the first greenway in the North Park District. Clarke Creek, both the North Prong and South Prong, flow into the Rocky River in Cabarrus County. The West Branch and the South Prong of the Rocky River are located in the northeast side of the North District. The South Prong of the Rocky River begins near the Main Street in Davidson and flows beside Davidson Elementary School, rural areas, and one major residential development, River Run. Ramah Creek flows through rural lands and terminates at Clarke Creek.

Northwest Park District

Northwest Mecklenburg County consists of lands bounded by McDowell Creek to the north, the Catawba River to the west, Statesville Road to the east, and Interstate 85 to the south. The planned Interstate 485 Outer Belt Loop divides this district into two characteristically different areas. The area located south of the planned Interstate 485 includes sprawling suburban neighborhoods and commercial strip development within the Charlotte City Limits. The area located north and northwest of the planned Interstate 485 includes some suburban development; however, the land also consists of nature preserves, historic sites, and a wildlife refuge. The primary north-south roadway is Interstate 77. The future Interstate 485 will be the major east-west connector. Brookshire Boulevard (Route 16) and Mount Holly-Huntersville Road are two major east-west arterials that radiate out from Interstate 85 to the Catawba River and further to Mount Holly. Beatties Ford Road is a major arterial that connects to Lake Norman.

Potential greenway trail corridors in Northwest Mecklenburg County include:

Long Creek	McIntyre Creek
Catawba River	

The Catawba River flows south along the outer west boundary of the district into Mountain Island Lake and continues south where it crosses under Interstate 85. Gar Creek flows into Mountain Island Lake through Latta Plantation Nature Preserve. McIntyre Creek begins at the intersection of Interstate 77 and Sunset Road and flows through several residential neighborhoods and Hornets Nest Park until it meets Long Creek. Long Creek flows through many residential neighborhoods and commercial developments and follows the planned Interstate 485 for most of the district. Long Creek flows into the Catawba River at the proposed Catawba Riverfront Park. The Catawba Riverfront Park is a planned park along the Catawba River that will include over three miles of pedestrian

trails, eight miles of mountain bike trails, and 3.5 miles of equestrian trails. One trail within this park will be a historical path over the Tuckaseegee Ford, which used to be a major wagon route in the 1700's. Currently, the existing park location is a popular mountain biking destination. The prospects for a trail along the former P & N Railroad line, which is now owned by the North Carolina Department of Transportation, should be explored. A trail along this route could-via the greenway in the Wesley Heights/Seversville area-connect uptown Charlotte to Gastonia and Lincolnton, where abandoned sections along this line are being studied for conversion to trails.

Major Origins and Destinations within Northwest Mecklenburg County include: Mountain Island Lake Sites (mentioned above)

Hornets Nest Park	Hornets Nest Elementary School
Coulwood Park	Coulwood Middle School
Coulwood Library	Paw Creek Elementary School
Firestone Park	Fred Alexander Park
Pawtuckett Elementary School	Oakdale Elementary School
Tuckaseegee Park	Hoskins Park
Allenbrook Elementary School	Thomasboro Elementary School
West Mecklenburg High School	Wilson Middle School
Tuckaseegee Elementary School	Cowan's Ford Wildlife Refuge
Stephen's Road Nature Preserve	Davidson Cemetery
Rural Hill Nature Preserve	Latta Plantation Nature Preserve
Auten Nature Preserve	Carolina Raptor Center
Historic Latta Place	Davidson Plantation Site

One Park and Ride Lot is located in the northwest district at Tuckaseegee Road and Sloan Drive.

Figure 15: County residents derive many benefits from Greenways. Pets enjoy them too.

Northeast Park District

Northeast Mecklenburg County consists of land bounded by Eastfield Road to the north, Statesville Road to the west, the Mecklenburg County limits to the east, and Interstate 85 to Sugar Creek Road to The Plaza to the south. The planned Interstate 485 Outer Belt Loop is located close to the Mecklenburg County limits in this district. There are three primary north-south roadways through this district -- Interstate 85, Highway 29, and Highway 49. Northeast Mecklenburg County is characterized by automobile-oriented sprawling residential development and commercial strip development. Residential developments are located off of major arterials such as Sugar Creek Road, Mallard Creek Road, Mallard Creek Church Road and The Plaza that radiate from Interstate 85. W. T. Harris Boulevard is a major arterial that serves as an east-west connector that links Interstate 77 to Independence Boulevard through this district. The University of North Carolina at



Charlotte (UNCC) is located between Highways 29 and 49 along W. T. Harris Boulevard. The future site of the Central Piedmont Community College (CPCC) Northeast Campus is located off of W. T. Harris Boulevard and Grier Road. Industrial and commercial strip development along W. T. Harris Boulevard has made bicycling and walking extremely difficult for students.

Potential greenway trail corridors in Northeast Mecklenburg County include:

Clark's Creek	Mallard Creek
Toby Creek	Doby Creek
Back Creek	Long Creek
Irwin Creek	Reedy Creek
Little Sugar Creek	

Clark's Creek begins in the northern area of the district and flows south through residential neighborhoods and into Mallard Creek. An existing greenway is located along Clark's Creek and Mallard Creek that links the neighborhoods of Mallard Trace, Sweet Water, Radbourne, Harris Pointe, and Mallard Ridge to one another. The existing greenway ends after the Mallard Creek Road underpass. Mallard Creek Greenway extensions are planned and will link the existing greenway portion to the Mallard Creek Recreation Area. NCDOT has constructed a section of boardwalk and wetland area as the mitigation project for the construction of Interstate 485. At present, the boardwalk extends into the wetland area, but in the future it will link to the Mallard Creek Greenway. Mallard Creek links UNCC to the University Research Park and residential neighborhoods. Toby Creek flows north from residential neighborhoods to UNCC connecting to Mallard Creek. Back Creek flows northwest from The Plaza east through both residential development and rural areas into Cabarrus County. Dixon Branch is located in the northwest area of this district and

Figure 16: Neighborhood entry points provide convenient access for County residents.



flows into the Twin Lakes Business Park. Long Creek is also located in the northwest area of this district and flows into several business parks including NorthWoods, Long Creek, and Metrolina Expo Center. Irwin Creek begins at Nevin Community Park and flows south through residential development and commercial development and under Interstate 85. Little Sugar Creek begins in the southwest corner of this district in the residential neighborhood of Hidden Valley and flows south to Cordelia Park, which is located in the Central District. Reedy Creek is located in the southern area of this district flowing through Reedy Creek Nature Preserve and Park and into the East District.

There are many creeks that exist in this district and connect to several important destinations for bicyclists and pedestrians, making them potential greenway corridors. These destinations include:

Mallard Creek Community Park	Nevin Community Park
University Research Park	UNCC
Reedy Creek Nature Preserve and Park	Mallard Creek Recreation Center
Metrolina Expo	University City Regional Library
RibbonWalk	David Cox Road Elementary School
Alexandriana Historic Site	School
Winding Springs Elementary School	Ranson Middle School
Mallard Creek Elementary School	Statesville Road Elementary School
Learning Academy North	School
Countryside Montessori School	Allen Hills Park
Derita Elementary School	Northside Christian Academy
Nathaniel Alexander Elementary	Zebulon B. Vance High School
Jim Martin Middle School	University City YMCA
University Meadows Elementary School	Blockbuster Pavilion
CPCC Northeast Campus	Newell Elementary School
Reedy Creek Elementary School	Viewmont Park
Briarwood Park	Northridge Middle School
Mayfield Elementary School	Hidden Valley Elementary School

A tributary of Mallard Creek links major destinations such as Mallard Point Shopping Center, Shoppes at University Place, a Park and Ride Lot, The Village at University Place, and several other residential communities to Mallard Creek. Additional origins include the residential neighborhood developments of:

Devonshire	Clearbrook
Rolling Oaks	Brynmoor
Wellington	Audubon Park
Chancellor Park	Highland Creek
Forest Pond	Governors Village
Wyndom Place	

Central Park District I

Central Park District I is located western side of central Mecklenburg County. This Park District is bounded by Interstate 85 in the northwest, Interstate 77 and Tryon Street to the east and south and Billy Graham Parkway to the west. This area includes residential, commercial, industrial and corporate business parks. The Charlotte Douglas International Airport is located just west of this Park District. Potential greenway trail corridors in the Central Park District I Region include:

Stewart Creek	Irwin Creek
Duke Power corridor	

(which is owned in fee-simple by the County)

The creeks provide opportunities for greenways. Additionally, underutilized railroad corridors, which someday could be abandoned, and city property in the Central Park District I might also support greenway facility development. Stewart Creek begins in the northern part of this park district and flows south into Irwin Creek through many neighborhoods, such as Wesley Heights, and parks, including Martin Luther King Park. Irwin Creek flows south from Interstate 85 through residential and commercial strip development. In many areas, Irwin Creek is culverted, especially as it meanders under Interstate 77 and through the interstate 277 interchange. The Duke Power corridor runs parallel to an existing CSX rail line and is adjacent to Litaker Avenue in Wesley Heights, a suburb that developed around a streetcar corridor. The CSX rail line once connected textile mills in Mecklenburg and Gaston Counties. The Wesley Heights Neighborhood Plan has proposed a greenway along the Duke Power corridor to link schools, parks, residential neighborhoods, recreation centers, and Ericsson Stadium to one another.

There are many origin and destination points that could be served by greenway trail corridors including:

- | | |
|-----------------------------------|---|
| LC Coleman Park | Bruns Avenue Elementary School |
| Waddell Street Park | Bryant Park |
| Martin Luther King Park | Clanton Park |
| Amay James Park | Barringer Elementary School |
| Revolution Park | Abbott Park |
| Marie G. Davis Middle School | Southside Park |
| Wilmore Park | Johnson C. Smith University |
| Frazier Park | Oaklawn Elementary School |
| Biddleville Park | West Charlotte Park and Recreation Center |
| Lincoln Heights Elementary School | |

Figure 17: Central city parks and Greenways offer a respite from urban landscapes, as found here in Frazier Park.



Central Park District II

This District is located in the northeastern part of Central Mecklenburg County. The boundaries of this district include Interstate 85 in the north, Interstate 77 and 277 and Tryon Road in the southwest, Central Avenue in the south, and Eastway Drive and Sugar Creek Road in the east. This area includes a large mix of residential, industrial, and commercial land uses. Potential greenway trail corridors in the Central Park District II Region include:

- Irwin Creek
- Little Sugar Creek

Irwin Creek begins north of Interstate 85 and flows into this Park District, continuing south through commercial and industrial lands. Little Sugar Creek begins within the Hidden Valley residential neighborhood and flows southwest into Uptown Charlotte. Little Sugar Creek continues south into Central Park District III. Briar Creek begins north near the Norfolk Southern Railroad Line and Highway 29 and flows south into industrial, commercial, and residential development. This creek is culverted in many areas due to the amount of major roadways it crosses as it flows southwest. The creek continues to flow into Central Park District III, where it winds through residential and commercial areas.

There are many origin and destination points that could be served by greenway trail corridors including:

- | | |
|-----------------------------------|--------------------------------|
| Double Oaks Park | Irwin Avenue Elementary School |
| Cordelia Park | Sixteenth Street Park |
| Alexander Street Park | Hawthorne Middle School |
| Village Heights Elementary School | Little Peoples Park |
| Shamrock Park | |

Central Park District III

This district is located in southwest Central Mecklenburg County and includes much of the Uptown Charlotte area. The boundaries of this district include Central Avenue to the north, Eastway Drive, Wendover Road, Runnymede Lane, Woodlawn Road, and Billy Graham Parkway to the east and south, and Tryon Street to the west. This district includes a variety of land uses including residential, commercial, industrial, and institutional development. Potential greenway trail corridors in the Central Park District III Region include:

- | | |
|-----------------|--------------------|
| Briar Creek | Little Sugar Creek |
| Edward's Branch | |

Little Sugar Creek is culverted near the Interstate 277 and Highway 74 interchange; however, the creek remains as an open channel further south as it meanders through parks, residential neighborhoods, and commercial development. An existing greenway is located along Little Sugar Creek at the Carolinas Medical Center for a 0.8 miles stretch. Briar Creek continues from wind through many neighborhoods and commercial areas until its confluence with Little Sugar Creek at Fairview Road. Edward's Branch begins outside of Central Park District III, near Central Avenue and Sharon Amity Road and flows southwest into commercial and residential areas. This creek reaches a confluence with Briar Creek near Chantilly Elementary School.

Much of the Uptown Charlotte area is characterized by pedestrian-friendly development that includes sidewalks, street lamps,

Figure 18: The newly constructed paved trails in Wesley Heights will eventually connect to Uptown Charlotte.

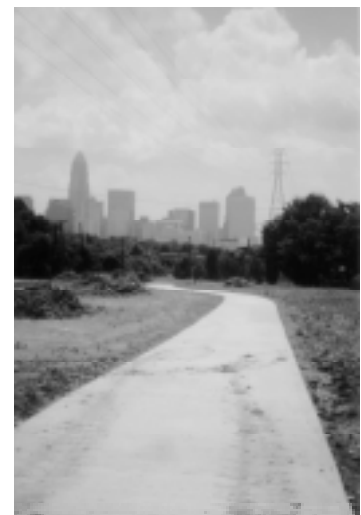


Figure 19: Greenways are a safe place to go for a walk.



benches, street trees, on-street parking, and store-fronts which are placed directly adjacent to the sidewalks. Commercial and corporate establishments dominate Uptown Charlotte; however, there has been recent development, including new urban housing and retail that has diversified its image.

Uptown Charlotte and the surrounding neighborhood communities in the Central Park District III have many origin and destination points that could be served by greenway trail corridors including:

- | | |
|--------------------------------------|---|
| First Ward Park | Randolph Road Park |
| Marshall Park | Fourth Ward Park |
| Independence Arena | |
| Ericsson Stadium | Museum of the New South |
| Memorial Stadium | Discovery Place |
| Uptown YMCA | Convention Center |
| Blumenthal Performing Arts Center | Great Aunt Stella Center |
| Midtown Square | Park Road Shopping Center |
| Aquatic Center | Metro Center |
| Wesley Uptown Alternative School | Spirit Square |
| Charlotte Main Library | Central Piedmont Community College |
| Central YMCA | Historic Rosedale |
| First Ward Elementary School | Mint Museum of Art |
| Queens College | Ovens Auditorium |
| Merchandise Mart | Chantilly Shopping Center |
| Chantilly Park | Myers Park High School |
| Chantilly Elementary School | The Nature Museum |
| Freedom Park | Independence Park |
| Kings College | Elizabeth Traditional Elementary School |
| Memorial Stadium | Ascension Lutheran |
| Selwyn Elementary School | Carolinas Medical Center |
| Latta Park | Alexander Graham Middle School |
| Pearl Street Park | |
| St. Ann's Catholic Church and School | |
| Park Road Elementary School | |
| Dilworth Gardens Shopping Center | |

There are also many hotels, restaurants, retail shops, and corporate businesses that are origin and destination points.

Additional origins and destinations in Central Mecklenburg County include many schools, libraries, parks, businesses, retail shops, restaurants, golf courses, and residential neighborhoods.

East Park District

East Mecklenburg County comprises the largest area of all the districts. The boundaries of this park district include the Mecklenburg County line to the east and south, Monroe Road to the west, and Eastway Drive and The Plaza Road to the north. This park district includes the town of Mint Hill. The major east-west roadways consist of Highways 24 and 51. Major north-south roadways are Lawyers Road, Idlewild Road, Independence Boulevard, and Monroe Road. This is one of the most rapidly growing districts in Mecklenburg County. Highway 51, one of Mecklenburg County's busiest roads, is four to six lanes and is lined with commercial and residential areas. Many of the roads within this park district have been given "advanced", "extreme caution", and "not recommended" bicycle suitability ratings. It will be important to set aside greenway trail corridors to provide citizens an alternative to motorized transportation as a way to get around East Mecklenburg County. Potential greenway trail corridors include:

- | | |
|----------------|----------------|
| Reedy Creek | Campbell Creek |
| McAlpine Creek | Irvin Creek |

Reedy Creek is located in the northeastern area of this district and flows north into Cabarrus County towards the Yadkin River. Campbell Creek flows south through residential neighborhoods and into McAlpine Creek. A two-mile stretch of greenway exists along Campbell Creek in McAlpine Park. McAlpine Creek begins near the intersection of Albemarle Road and Wilson Grove Road and flows west through many neighborhoods and into McAlpine Park and Greenway and James Boyce Park. A three-mile stretch of greenway exists along McAlpine Creek within the McAlpine Park connection to James Boyce Park. Irvins Creek begins as McEwen Lake flowing southwest through the Towns of Mint Hill and Matthews and into McAlpine Creek.

Origins and destinations within East Mecklenburg County include:

- | | |
|---------------------------------|-------------------------------------|
| Kilborne Park | Harrisburg Road Park |
| Campbell Creek Park | Methodist Home Park |
| Mint Hill Doctors Museum | and Recreation Center |
| Hezekiah Alexander House | Charlotte Museum of History |
| Methodist Home | Cedarwood Park |
| Idlewild Road Park | Albemarle Road Park |
| McAlpine Park and Greenway | James Boyce Park |
| Mint Hill Municipal Park | Independence Square Shopping Center |
| Piney Grove Elementary School | Eastland Mall |
| Greenway Park Elementary School | Windsor Square Shopping Center |

South Park District

South Mecklenburg County consists of the Towns of Matthews and Pineville and its boundaries include Wendover Road and Runnymede Lane to the north, Monroe Road to the east, the Mecklenburg County line

to the south, and Little Sugar Creek to the west. Like the East Park District, South Mecklenburg County is characterized by its suburban sprawl including new residential and commercial strip development. Potential greenway trail corridors include:

McAlpine Creek	McMullen Creek
Little Sugar Creek	Four-Mile Creek

Little Sugar Creek is a major creek corridor that flows south through residential neighborhoods, such as Parkdale and Huntingtowne Farms, parks, schools, and commercial developments and continues into Union County, South Carolina. McMullen Creek begins near Monroe Road and flows southwest near many residential communities. As McMullen Creek reaches Highway 51, the land use surrounding the creek is mostly commercial and industrial development. McAlpine Creek is located centrally in this district and flows southwest to Union County. Residential communities such as Shadowlake, Carmel, and Olde Colony are located along McAlpine Creek. Four-Mile Creek flows west across the southern portion of this district, beginning in Matthews and flowing into McAlpine Creek. This creek flows in the back yards of many residential communities, a golf course, and parks.

Major Origins and destinations in South Mecklenburg County include:

James K. Polk Memorial	Cedar Spring Hospital
Huntingtowne Farms Park	Park Road Park
Marion Diehl Park & Recreation Center	McClintock Middle School
Sardis Road Park and Ride	Shalom Park
The Leon and Sandra Levine	South Park Mall
Jewish Community Center	Morrison Library
Phillips Place	James Boyce Park
William R. Davie Park	Carolina Place Mall
Squirrel Lake Park	Colonel Francis J. Beatty Park
Charlotte Country Day	Huntingtowne Elementary
Carmel Library	School
Olde Providence Swim and Racquet Club	

Southwest Park District

Southwest Mecklenburg County includes the area bounded by the Catawba River and Lake Wylie to the west, the Mecklenburg County line to the south, Interstate 85 in the north, and Billy Graham Parkway and Little Sugar Creek to the east. This park district is characterized by corporate, industrial, and commercial growth. Many business and industrial parks have developed south of the Charlotte Douglas International Airport. In the west area of this district towards Lake Wylie, the commercial growth begins to decrease and established residential communities are evident. Many of the business and industrial parks in this district are isolated from nearby open space. Greenway corridors in this district will create a

place for employees of the business and industrial parks to recreate, relax, and participate in sports activities. Potential greenway corridors in this park district include:

Steele Creek	Walker Branch
Coffey Creek	Sugar Creek
Kings Creek	

Figure 20: Mecklenburg County Park and Recreation always advocates using local Greenways with a friend.

Steele Creek begins at the intersection of Shopton Road and Steele Creek Road and flows south through a residential neighborhood, Arrowood Southern Industrial Park, and by Paramounts Carowinds Theme Park. Steele Creek flows south into Fort Mill, South Carolina, to the popular Anne Springs Close Greenway. Walker Branch flows southeast into Steele Creek and flows through many residential neighborhoods such as Tealbriar and Southbridge Forest. Coffey Creek flows south from the Charlotte Douglas International Airport through residential communities, business parks, and interstate interchanges. This creek flows into Sugar Creek at the Governor James Martin Freeway. Irwin Creek changes names to Sugar Creek at the Billy Graham Parkway and flows through and near Renaissance Park Golf Course, residential communities, and business parks. Kings Creek begins near Tyvola Road and flows south through the backyards of neighborhoods and commercial development until meeting Sugar Creek near Westinghouse Boulevard.



Major Origins and destinations include:

Lake Wylie	McDowell Nature Preserve
Copperhead Island Park	Jack Hughes Park
Arrowood Southern Industrial Park	Paramount's Carowinds Theme Park
Coffey Creek Business Park	Renaissance Park
Arrowood Southern Executive Park	Tyvola Place Shopping Center
Ramblewood Park	South Square Park
Archdale Park	Charlotte Coliseum
South Oak Shopping Center	Thomas McAllister Winget Park
Charlotte Douglas International Airport	
Anne Springs Close Greenway (Fort Mill, South Carolina)	

Existing Trail, Bicycle, and Pedestrian Facilities

Mecklenburg County is abundant with natural resources such as Lake Norman, the Catawba River, Lake Wylie, Mountain Island Lake, and many creeks. Many nature preserves, district parks, community parks, and special lake and river access facilities are located in close proximity to these natural resources. Some of these parks, such as Jetton Park, Freedom Park, and McAlpine Park include nature trails and greenways. Most Mecklenburg County residents and visitors must travel by automobile to reach trail and bicycle and pedestrian facilities. The current

greenway system consists of a few, scattered, short segments of trails located within the County which could serve as anchors for a future greenway system.

Recently, Charlotte has passed new City and County ordinances for incorporating sidewalks on both and/or one side of new roadways depending upon the width of road right-of-way. Also, developers are responsible for installation of sidewalks along their project frontage on existing thoroughfares at the time of development. Other specific improvements may be required to the thoroughfare to meet specific traffic demands. Actions such as these will help address the needs of pedestrians in the City of Charlotte and Mecklenburg County. Areas in need of sidewalk linkages could be addressed through greenway development and appropriate greenway connections.

Nature Preserves , Open Space, and Wildlife Refuge

These popular destination areas in Mecklenburg County provide environmental centers, open space, nature trails and observation decks, and picnic areas. There are three major open space areas in Mecklenburg County which include the Mountain Island Lake Sites, McDowell Nature Preserve, and Reedy Creek Park and Nature Preserve. The Mountain Island Lake Sites consist of Latta Plantation Nature Preserve, Auten Nature Preserve, Rural Hill Nature Preserve, Cowan's Ford Wildlife Refuge, and Stephen's Road Nature Preserve.

The Mountain Island Lake Sites are located within the Mountain Island Lake Watershed. These sites are under public ownership to protect the water quality of Mountain Island Lake, the primary drinking water supply for the City of Charlotte , Mecklenburg County, Gastonia, Mt. Holly, and several other towns within Gaston County, as well as Clover, South Carolina.

Latta Plantation Nature Preserve, located on the shore of Mountain Island Lake, provides boat rentals, canoe access, concessions, boat docks, equestrian center, an historic home (Latta Place), visitor center, picnic shelters, the Carolina Raptor Center, horseback and nature trails.

The Auten Nature Preserve includes the Paw Paw Site and the Duke Power boat access site. The Rural Hill Nature Preserve includes the Rural Hill Plantation and the Crescent Peninsula sites. Stephen's Road Nature Preserve consists of 208 acres of designated natural area that forms a buffer zone.

Cowan's Ford Wildlife Refuge is located at the end of Neck Road on Mountain Island Lake. A total of 18 acres has been designated to include observation platform and parking and to allow for educational and interpretive development. The remainder of Cowan's Ford, 650 acres, is designated as protected natural area. The nature preserves and the

wildlife refuge are accessible only by automobile or bike, with exception to boat and canoe access for Latta Plantation and McDowell Nature Preserves.

McDowell Nature Preserve is located on the shore of Lake Wylie, north of York Road and east of the Catawba River and west of Shopton Road. In the developed area of this preserve camping, picnicking, trails, nature center, and water related activities are available.

Reedy Creek Park and Nature Preserve is located in the Northeast Park District north of The Plaza Road. This site includes the Environmental Center, Robinson Rock House homestead, the Frazier House, a mill stone, a drylaid rock wall, hiking trails, and a spring which is located along the South Fork branch. Interpretive/environmental education programs are available at each nature center and throughout the nature preserve system.



Figure 21: Reedy Creek Park and Nature Preserve has many miles of hiking trails and an environmental center that is used by many.

Vision, Goals & Objectives

The Mecklenburg County Greenway Steering Committee and the Greenway & Trails Advisory Council worked with the consultant to define a vision for the Mecklenburg County Greenway System. The purpose of this vision is to provide guidance for the expanded role that greenway development can play in protecting resources throughout the County while providing access for local residents to natural features and landscapes.

Greenway Vision Statement

The preservation, protection, and appropriate recreational use of floodplains in Charlotte-Mecklenburg through a greenway and greenway trail program will create a more livable and sustainable community for all residents and businesses.

To further this end, the Charlotte-Mecklenburg Greenway System should;

- Preserve and reclaim natural floodplains for the purposes of improving water quality protection, protecting wildlife habitat and open space, and providing recreational, educational, and alternative transportation opportunities.*
- Create a primary infrastructure of multi-use trails along suitable floodplain corridors that are connected to adjacent parks and nature preserves and provide a system of contiguous and substantial trail mileage for rigorous pedestrian and bicycle use.*
- Include partnerships between civic, corporate, and governmental entities to ensure that overland linkage beyond the County's floodplain greenway trail system is provided to offer access to destinations such as schools, neighborhoods, businesses, and shopping.*

Greenway Vision Context

Mecklenburg County's Greenway System will be the creekside corridors. By protecting the stream network, the community will achieve enormous environmental benefits in addition to the opportunity to establish a trail system that offers both alternative transportation and recreational benefits.

Mecklenburg County's streams arise within our own borders, providing the opportunity to develop networks of greenway through capitalizing on the following attributes:

- major streams converge near the southern or eastern county boundaries;
- major streams fall into the following groupings;
 - a. The Rocky River
 - b. Mountain Island Lake

- c. Lake Wylie
- d. Lower Catawba River
- e. Yadkin River

-drainage basins may be linked to one another through relatively short over-ridge “links” in the upper reaches of the greenway/ stream network.

The Greenway Master Plan will identify the major stream corridors, suggest links that are critical for creating connectivity, and propose that additional “overland connectors” to other community features be encouraged. The proposed primary corridors provide linkages to nature preserves and parks. Overland connectors will provide connections to other significant features such as libraries, shopping or work centers, schools, and other destinations from the primary corridors. These connections will be added to the greenway network as rapidly as practical through the activity of local advocates. These advocates may elicit cooperation of businesses, institutions, landowners, governmental entities, and others in developing individualized trails/sidewalks/bikeways.

Other trail elements will be recognized and should be welcomed into the system. Examples would include rail corridors, whether “abandoned” (e.g. the P & N line from the Catawba River to Ericsson Stadium) or newly-created (e.g., trolley or transit), bikeways, and an overland route tying together the various nature preserves in the Mountain Island Lake area.

Water Management Goal

One of the primary goals of the greenway system is to preserve, protect and restore floodplain lands as vital areas for the absorption of flood waters. This goal will help to reduce economic losses caused by flooding and involve the greenway program as part of a county-wide clean water program that ensures streams, rivers and lakes will support biological diversity and human contact recreation.

Objectives

To accomplish this goal, the following objectives should be achieved:

- Adopt policies and implement county-wide programs that serve to maintain floodplains as open, undeveloped landscapes.
- Develop watershed-based strategies for controlling flooding and utilizing greenways as a mitigating landscape feature.
- Decrease non-point source pollution loads on streams, rivers and lakes in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) permit.
- Develop a community-wide strategy for protecting undeveloped natural stream corridors and a mitigation program for stream corridors that have been adversely effected by land use development.
- Require the establishment of stream-side buffers in accordance with SWIM initiatives.

- Develop strategies to restore and reclaim urban streams that have been degraded by poor land use practices.
- Increase public awareness of water quality issues and concerns.
- Develop and effectively implement proactive efforts to improve water quality involving private citizens through existing Adopt-A-Stream and storm drain stenciling programs.

Recreation Goal

The greenway program will create a diversity of universally accessible landscapes that offer County residents an opportunity to maintain a fit and healthy lifestyle. Through the development of a recreation-based trails system, greenways can also supplement other elements of the County's multi-modal transportation program and encourage bicycle and pedestrian connections to transit and rail travel throughout the County.

Objectives

To accomplish this goal, the following objectives should be achieved:

- Make as one of the primary goals of the Mecklenburg County Park and Recreation Department, the expansion of the greenway trails system throughout the County, as shown on the officially adopted greenway master plan map. This will ensure that residents have access to a system of trails that can best serve their recreational needs.
- Ensure that greenway landscapes are accessible to all persons, regardless of their ability. Utilize the most current federal and national guidelines on outdoor accessibility to define the variety of trail environments and experiences that are available to residents.
- Integrate corporate health care programs into physical development strategies of the greenway system.
- Make greenways a destination for health and fitness activities.
- Develop a reference map, for use by local agencies and organizations, that show a system of secondary trails that reflect important neighborhood-level connections. This map will be used by local agencies in discussions with other local agencies, such as the Charlotte-Mecklenburg School Board, to provide the location of specific connections. It is also anticipated that this reference map can be used to define important connections between the primary greenway trail system, as adopted by Mecklenburg County, and important secondary trails to be developed by others.
- Provide overland connections as development occurs. The Mecklenburg County Park and Recreation Department staff should continue to work with developers and local land development review agencies to ensure that important neighborhood-level connections are successfully negotiated as part of the land development program.
- Develop greenways as part of a multi-modal transportation system in Charlotte-Mecklenburg County, with an emphasis on connections to existing and future transit systems and to maximize alternative transportation opportunities by providing connections to bicycle facilities.

- Mecklenburg County Park and Recreation Department should expand its Challenge Grants program to make money available to bonafide community groups, private sector organizations and other agencies that are interested in developing neighborhood connections to the County's primary greenway trail system.
- Mecklenburg County Park and Recreation staff should work with the GTAC to develop a list of ten to twenty priority neighborhood-level connections. This list should then be shared with the Charlotte Department of Transportation for inclusion in priority transportation improvements and sidewalk plans. The list should also be shared with potential partners. (i.e. Charlotte-Mecklenburg School Board) to generate additional support for immediate development of the connections.

Economic Goal

Greenways can offer numerous economic benefits to county residents. The Mecklenburg County Park and Recreation Department staff should continue to identify specific economic strategies that will enable the greenway program to return financial benefits to the community.

Objectives

To accomplish this goal, the following objectives should be achieved:

- Determine the range of benefits that can be reasonably defined by proximity to greenways. Publish these through a variety of media outlets so that county residents can have access to this information.
- Identify partnership opportunities with the public sector (State and towns) that can serve to reduce the cost of implementing and managing greenways.
- Identify partnership opportunities with the private sector (businesses, civic organizations, associations and individuals) that can serve to reduce the cost of implementing and managing greenways.
- Identify other potential short and long-term cost savings associated with greenway implementation, such as the type of materials that are used to build greenway facilities.

Environmental Education Goal

The greenway program should be used to promote the long-term involvement and participation of County residents in the planning, design, implementation and management of the county-wide greenway program. Educators should be encouraged to utilize the County's streams, rivers and other corridors of land to foster opportunities for environmental education.

Objectives

To accomplish this goal, the following objectives should be achieved:

- Encourage the establishment of outdoor classrooms to promote environmental education opportunities within greenways.
- Expand education curriculums of primary and secondary schools to include urban geography, social studies, and sciences related to environmental management.
- Develop a program of continuing education for elected officials, agency staff, developers and land designers/engineers to define technologies for managing urban and non-urban stream corridors.
- Celebrate Mecklenburg's unique environmental and cultural resources through the development of a county-wide greenway program.
- Broaden the existing "adopt-a-greenway" program to include participation among local business and industry in addition to residential and civic organizations.
- Develop an on-going communication with print, radio and television media. Establish a greenways publication to keep county residents informed of progress. Expand the existing Park and Recreation Web site to include updated information on the greenway program.

Habitat Conservation Goal

Greenways should be used to preserve and encourage biodiversity through the protection of important and distinctive habitat throughout the County.

Objectives

To accomplish this goal, the following objectives should be achieved:

- Protect and restore aquatic habitat as a primary component of the greenways program.
- Establish stream side vegetative buffers to promote diverse habitat for aquatic and terrestrial species.
- Protect, restore and create wetlands in key riparian corridors to promote breeding grounds for wildlife.

Operations and Management Goal

The County should develop an implementation strategy for greenways that is based on public/private partnerships and encourages community participation.

Objectives

To accomplish this goal, the following objectives should be achieved:

- Develop a public-private partnership effort that will further the efforts of the Park and Recreation Department's greenway development and maintenance goals for a future greenway system.
- Assign responsibilities for facility and land management to appropriate public and private sector organizations and agencies.

- Adopt a management philosophy that encourages natural resource stewardship.
- Establish a dedicated source of funding for operation and management activities.
- Establish a dedicated maintenance crew for greenway trails.

The Greenway System

Background

In the 1980 Master Plan for Mecklenburg County's Greenway System, the network of corridors was described as a "green necklace" along creeks and streams of the County. This 1998 Plan Update (refer to Map 1) proposes expansion of the original "green necklace" as well as an expansion of how the greenway program is operated.

New Approach

First, this Plan Update recommends that the Greenway System be expanded to include floodplain management and water quality buffer objectives. Under this scenario, greenways will be thought of as linear landscapes that are used to protect stream corridors and their floodplains from degradation due to land use development and poor land management practices. It is hoped that through the adoption of this philosophy, the amount of public and private property that is currently subject to damage and loss from flooding will be gradually reduced. In addition, under this philosophy, creeks and streams will undergo restoration and reclamation so that the water quality supports aquatic organisms and a variety of human uses.

This plan recommends that all streams with drainage areas (subwatersheds) equal to or greater than 100 acres be used as the basis for this stream-oriented greenway system. The County-wide greenway system is defined as the Water Quality Corridor System (refer to Map 2) and will be consistent with the adopted Surface Water Improvement and Management (SWIM) initiative's buffer requirements. SWIM's buffer requirements go beyond the limits of FEMA regulated floodplains to provide protection of water quality, storage for floodwaters, allow channels to meander naturally, and provide suitable habitats for wildlife. As a part of SWIM's buffer requirements, the County will, in the future, map all streams with greater than 100 acres of drainage using Geographic Information System (GIS) technology. This mapping clarifies, for the public, those lands that are subject to buffer requirements. For the purposes of this master plan only, the Water Quality Corridor System map illustrates "blue-line streams" as identified by USGS, as the basis for the stream-oriented greenway system until the 100-acre subwatershed mapping is completed.

Second, this Plan Update recommends that the network of trails along stream corridors be considered as a separate component of the Water Quality Corridor System. The primary purpose of the trail system will be to offer close-to-home and close-to-work recreation opportunities, offer

local residents a choice in transportation and to offer schools a destination for outdoor classroom activities. The trails system will be expanded from the original network that was defined in the 1980 Master Plan.

Trails developed under this system will be subject to the design guidelines defined by this Master Plan. The majority of this trail system will be paved because it will be constructed in floodprone landscapes. Under this recommended scenario, the future greenway system in Mecklenburg County becomes more multi-objective and begins to fulfill the goals that were originally defined in the 1980 Plan and reinforced by this Plan update.



Figure 22: Mecklenburg County citizens discuss the goals and objectives of the future greenway system.

Community Involvement

Many of the recommendations featured in this Master Plan Update are derived from public input. The consultant team conducted fourteen (14) public workshops throughout the County during the master planning process. Additional meetings were held with business and civic groups, elected officials and community organizations. Greenway planning sessions were also conducted with the Greenway Steering

Committee, Greenway and Trails Advisory Council, Bicycle Transportation Plan Steering Committee, Creek Coordination Committee, and SWIM Buffer Committee. The comments and recommendations received during these meetings served as the foundation for the development of the Recommended Greenway System. In essence, the Recommended System reflects what the citizens of the County requested, and constitutes an expansion of the greenway system from the original system established by the 1980 master plan.

The Recommended System

Linkage and connectivity was identified through the community involvement process as an important element of this Master Plan Update. It has always been a goal of the County's greenway system to link residents with popular destinations through the development and operation of a multi-purpose trails system. As with other public infrastructure systems, including water, sewer and roads, the County has a responsibility to develop and operate a primary system of trails that can serve the needs of residents in a cost effective manner. Therefore, the recommended system of greenway trails is divided into two major categories, primary trails and secondary trails. This is not meant to differentiate among the quality to which these trails should be developed. These terms are only used in this master plan update to define the County's responsibilities for acquisition, development and operation of an integrated greenway trails system.

The primary greenway trails system is illustrated on the Greenway Trail Facilities Map (refer to Map 1) located in this chapter of the Master Plan. The primary trails system is comprised of FEMA regulated floodplains

within stream corridors and overland connectors. This constitutes the system that Mecklenburg County is responsible for developing and operating. The primary trail system contains recommended trails from the 1980 Adopted Greenway System. Overland connectors are shown on the primary trails system map and are included as a way of linking a specific greenway corridor to either an existing or proposed county district park, community park, nature preserve or another primary greenway corridor within a one-mile radius. It is envisioned that overland connectors consist of a bicycle facility, such as a bike lane, bike route or wide outside lane, and a system of existing or proposed sidewalks for pedestrian travel.

There are numerous popular destinations through the County that should be connected to the primary greenway trails system. It is beyond the reasonable purview of the County to connect all of these popular destinations to the primary greenway trails system. However, the County is interested in working in partnership with other agencies and private sector organizations to establish these connections. To accomplish this, it is necessary to define a system of secondary greenway trails. The secondary greenway trails system is comprised of neighborhood-level trail connectors that can be located on either publicly-owned or privately-owned land. Secondary trails can be developed as trails along streams, within power line, sewer line or natural gas transmission easements, within abandoned railroad rights-of way, or within community open space lands; as sidewalks along roadways; or as bikeways. Secondary trails are already in existence throughout the County, and have been traditionally developed by other groups and organizations. For example, the Radbourne neighborhood in northeastern Mecklenburg County has developed a private trails system that connects to the County-operated Clark's and Mallard Creek Greenways, which is a part of the primary greenway trails system. The Twin Lakes Office Park in northcentral Mecklenburg County also has a well-established trail system for use by the tenants of the park, and is an example of how private sector businesses can develop trails to serve the needs of their clients. It is anticipated that the majority of the secondary trails system will continue to be developed in this manner.

Additionally, the towns of Matthews, Pineville, Mint Hill, Huntersville, Cornelius, and Davidson, will need to begin the process of developing portions of the primary and secondary trail system within their respective jurisdictions. The County may elect to participate in the development of the greenway system within the communities by providing technical and financial assistance on a project-by-project basis.

The secondary system of trails has been mapped, but is not an official element of this master plan. A reference map for the secondary trails system was compiled from a variety of public workshops that were facilitated by the Greenway Plan consultants (May 1998 and September 1998). This map represents a "wish list" of potential neighborhood-level

Proposed Primary Greenway Corridors

Proposed Corridor Name	Miles	Begin Point	End Point	1980 Plan Miles	Town/City/County limits	Park District
Back Creek	5.6	Cabarrus County Line	Reedy Creek Park/NP		County/City	NE
Lower Briar Creek	1.3	Colony Road	Little Sugar Creek	4.3	City	S/C III
Upper Briar Creek	4.0	Sharon Road Country Club Drive	Grenadier Court Methodist Home Park		City	C II/C III
Campbell Creek	3.4	Campbell Creek I	Albemarle Road	3.8	City	E
Clark's Creek/Tributary	2.6	Silvermere Way	Victoria Ave.		City/County	NE
South Prong Clarke Creek	4.9	Cabarrus County Line	Hill St./Huntersville		City/Huntersville	N
Coffey Creek	1.2	Shopton Rd.	Sugar Creek	1.2	County/City	SW
Edward's Branch	2.3	Briar Creek	Winterfield Place		City	C III/E
Four Mile Creek	8.6	Squirrel Lake Park	McAlpine Creek	9.5	Matthews	S
Gum Branch	2.0	Long Creek	Bellhaven Rd.	1.5	City	NW
Irvin Creek	5.4	Sunset Rd./Mint Hill	McAlpine Creek	3.3	City/Mint Hill	E
Lower Irwin Creek	5.2	Billy Graham Parkway	Irwin Creek Greenway I	2.8	City	C I
Upper Irwin Creek	4.9	Irwin Open Element	Nevin Community Park		City	C I/CII
Little Sugar Creek	18.0	Lancaster, SC Cty. Line East Morehead St.	Princeton Ave. Cordelia Park	13.6	City	CII/C III/S
Long Creek	15.2	Victoria Ave./Begin	Catawba River	3.5	City/Huntersville	NW
Mallard Creek	5.2	Cabarrus County Line	Univer. Research Trail	1.6	City	NE
Mallard Creek Tributary	2.1	W.T. Harris Blvd.	W. Sugar Creek Road		City	NE
McAlpine Creek	6.4	Sardis Road	Pineville-Matthews Rd.	2.1	City	S
McDowell Creek	9.3	W. Catawba Ave.	Mountain Island Lake	4.2	County/Cornelius	N/NW
McIntyre Creek	3.6	Long Creek	Hornets Nest Park		City	NW
McMullen Creek	10.3	Pineville-Matthews Rd.	Independence Blvd.		City	E/S
Paw Creek	6.3	Piedmont and North. RR	Catawba River	5.2	County/City	NW/SW
Ramah Creek	4.9	SP Clarke Creek	Caldwell Station area		County	N
Reedy Creek	3.5	Cabarrus County Line	Reedy Creek Park/NP	4.3	County	NE/E
South Prong Rocky River	5.9	Cabarrus County Line	Main Street/Davidson		County/Davidson	N
West Branch Rocky River	3.6	Iredell County Line	Cabarrus County Line		County	N
Toby Creek	2.6	Mallard Creek	W. Rocky River Rd.	2.7	City	NE
Torrence Creek	1.8	McCoy Road	Huntersville Bus. Park	3.8	City/Huntersville	N
Torrence Creek Tributary	2.9	Torrence Creek	Cambridge Rd./ Huntersville		Huntersville	N
Six Mile Creek	9.6	Col. Francis Beatty Park	Union, SC Cty. Line		County	S
Steele Creek	4.4	Brown-Grifer Rd.	York, SC County Line		City/County	SW
Stewart Creek	3.6	I-85	Irwin Creek		City	C I
Sugar Creek	12.1	Billy Graham Parkway	Lancaster, SC Cty. Line	6.3	City	SW
Walker Branch	2.2	York Road	York, SC County Line		County	SW
Proposed Greenway Total Mileage	184.9			73.7		

Proposed Primary Overland Connectors

Proposed Primary Overland Connectors	Connector Roads	Mileage
Mecklenburg Park to S.P. Clarke Creek Greenway	- Old Statesville Rd. - Stumptown Rd. - Statesville Rd. - Gilead Rd. - Huntersville/Concord Rd. - Hill St. - Old Vermillion Dr.	3.5
McDowell Creek Greenway to Latta Plantation Park/Nature Preserve	- Beatties Ford Rd. - Sample Rd.	3.0
Long Creek Greenway to Latta Plantation Park/Nature Preserve	- Beatties Ford Rd. - Sample Rd.	1.0
Jetton Park to McDowell Creek Greenway	- Jetton Rd. - Catawba Ave. - Magnolia Estates Dr.	1.0
Ramsey Creek Park to McDowell Creek Greenway	- Nantz Rd. - Catawba Ave. - Magnolia Estates Dr.	.6
Mallard Creek Community Park/ Rec. Center to Clark's Creek Greenway	- Polk and White Rd. - Katelyn Dr. - Saxonbury Way	1.5
Nevin Community Park to Clark's Creek Tributary Greenway	- Perkins Rd. - Gibbon Rd. - Christenbury Rd. - W. Sugar Creek Rd.	2.1
Clark's Creek Trib. Greenway to RibbonWalk	- Greenlefe Village Rd. - Eargle Rd. - E. Allen Rd. - Lake Rd.	1.5
Clark's Creek Greenway to Long Creek Greenway	- Old Statesville Rd. - Victoria Ave.	1.2
Toby Creek Greenway to Back Creek Greenway	- W. Rocky River Rd. - Rocky River Rd.	1.0
Back Creek Greenway to Newell Park	- Rocky River Rd. - Old Concord Rd. - Newell Baptist Church Rd.	.6
Back Creek Greenway to Reedy Creek Greenway	- greenway spur to Reedy Creek Park and Nature Preserve	.3
Reedy Creek Park/Nature Preserve to Campbell Creek Greenway	- Robinson Church Rd. - Market St. - Hickory Grove Rd.	1.7
William R. Davie Park to Four Mile Creek Greenway	- Pineville Matthews Rd. - Rea Rd.	1.5
Six Mile Creek Greenway to Col. Francis Beatty Park	- McKee Rd. - E. Providence Dr. - Allenwood Rd.	1.5
Briar Creek Greenway around Myers Park Country Club	- Chilton Rd. - Queens Rd. - E. Roswell Ave. - Colony Rd. - Selwyn Ave. - Michael Baker Pl. - Runnymede Ln. - Sharon Rd.	3.7
Briar Creek Greenway around Charlotte Country Club	- Dunlavin Way - Fountain Sq. Apts. Dr. - Arnold Dr. - Harbinger Ct.	1.2
Walker Branch Greenway to McDowell Park/Nature Preserve	- Steele Creek Rd. - York Rd. - Shopton Rd. - W.	1.5
University Regional Library to Toby Creek	- Spur trail from Toby Creek to Library	.3
Total Proposed Overland Connectors		29.7

connectors and other trails. This reference map is only the beginning to a more extensive and fluid system.

In addition to the recommendations in this plan for greenway trail facilities, a new bikeway network has emerged for Charlotte-Mecklenburg County. Sponsored by the Charlotte Department of Transportation, the Charlotte-Mecklenburg Bicycle Transportation Plan proposes a comprehensive system of bikeways throughout the City and County along existing roadways and abandoned railroad rights-of-way. The proposed bikeway system is comprised of five facility types: bike lanes, striped shoulders, wide outside lanes, widened outside lanes, and bike routes. It is important to understand that the bikeway plan does not accommodate pedestrian travel. The Bikeway Plan and this Greenway Plan have been coordinated to optimize connections between the two systems.

Facility Development and Use

In addition to making recommended changes to the number and length of greenway trail corridors throughout the County, the consultant team has included in this Plan facility development terminology that will help to define the future use of greenway corridors. This terminology is currently being adopted for use by other communities throughout the nation and helps to clarify the different uses and purposes that greenways can have in a community. Under this philosophy, the level of facility development and use for a greenway corridor will vary significantly, and is defined according to different types of use. Differing types of facility development and use, as categorized below, shall be assigned to specific corridors based on more detailed studies of each corridor and further community involvement. In many cases, it may be appropriate for one corridor to contain more than one type of use. The designation of "type" should in no way be construed to establish priority or hierarchy.

Type 1: No facility development

This designation applies to corridors containing environmentally sensitive areas, steep slopes, wetlands or other constraints that make greenway facilities undesirable or impossible. The corridor will remain primarily in a natural state as human access would be extremely limited. Other functions for these corridors will include floodplain management, water quality protection and conservation of important habitat for wildlife and plants. This will include all stream corridors between 100 - 640 acre drainage area and reflects the implementation of the SWIM Buffer System for Mecklenburg County. An example of a Type 1 facility is the Gar Creek corridor.

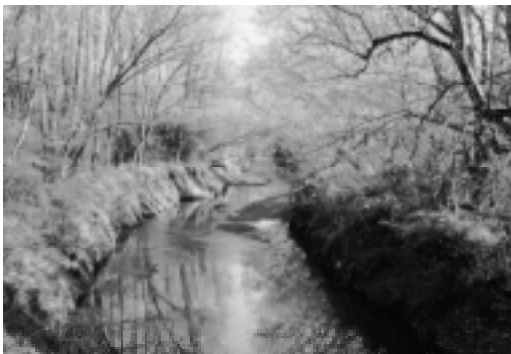


Figure 23: Example of a no-facility development greenway -- a natural stream channel.

Type 2: Limited development, low impact uses

This designation applies to corridors containing environmentally sensitive features that limit the extent of greenway facility development. The corridor will remain primarily in a natural state, with gravel, or dirt trails (4 to 6 feet wide) for use by low impact user groups such as hikers or joggers. Trail head facilities and other amenities (such as signage and picnic tables) will be limited. Boardwalks may be necessary to cross wetlands in these areas.



Figure 24: Example of a limited development greenway, the McMullen Creek Boardwalk.

Type 3: Multi-use unpaved trail development

This designation applies to greenway corridors located outside of areas which experience frequent flooding. Aggregate surface trails (4 to 8 feet wide) are appropriate for corridors outside the floodplain where anticipated use or adjacent landscape dictates a more natural trail. These trails are restricted to pedestrian and wheelchair activity. 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) will be developed as needed where appropriate.



Figure 25: Example of an unpaved greenway trail, the Clark's Creek Trail. A future paved trail tread is planned for Clark's Creek Greenway.

This type of facility is **not** proposed for the primary trail system recommended in this plan. Most all of the land that has been acquired and will be acquired for the greenway system is within the FEMA regulated floodplain. In these areas, a paved trail type will be necessary to ensure that the trail stays intact during flood events. In the future, if an abandoned rail or utility right-of-way is available for trail development and this land is outside of the FEMA regulated floodplain, this type of trail can be an alternative depending on the type and amount of users.



Figure 26: Example of a paved greenway trail that supports multiple uses.

Type 4: Multi-use paved trail development

This designation applies to corridors where high use is anticipated, that do not contain environmentally sensitive areas, which will most likely be used as transportation routes, and are located within frequently flooded areas. The paved trails can be surfaced with asphalt or concrete (10 foot minimum) for use by several user groups, including bicyclists, joggers, wheelchair users and rollerbladers. Although asphalt is the most common paved surface used for greenway trails, concrete is best for areas experienc-

ing frequent flooding. Trail head facilities and other amenities (such as lights, benches, and signage) will be developed as needed and where appropriate. Campbell Creek Greenway and Mallard Creek Greenway are two examples of this type of trail development in Mecklenburg County. This type of facility is recommended for the majority of greenway trail development throughout Mecklenburg County.



Figure 27: Example of an on-road greenway/bikeway facility.

Type 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 will 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). Refer to the adopted standards from the Bicycle Transportation Plan for bicycle facility design guidelines. Pedestrian-scale lighting, street trees, benches and other amenities can be developed to encourage sidewalk use.

Type 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, and safety systems. The Master Plan for the Catawba Riverfront Park identifies proposed trails that lead to canoe put-ins at various locations to accommodate kayakers and canoeists. The proposed Catawba River Trail can provide canoeists and kayakers with recreation opportunities.

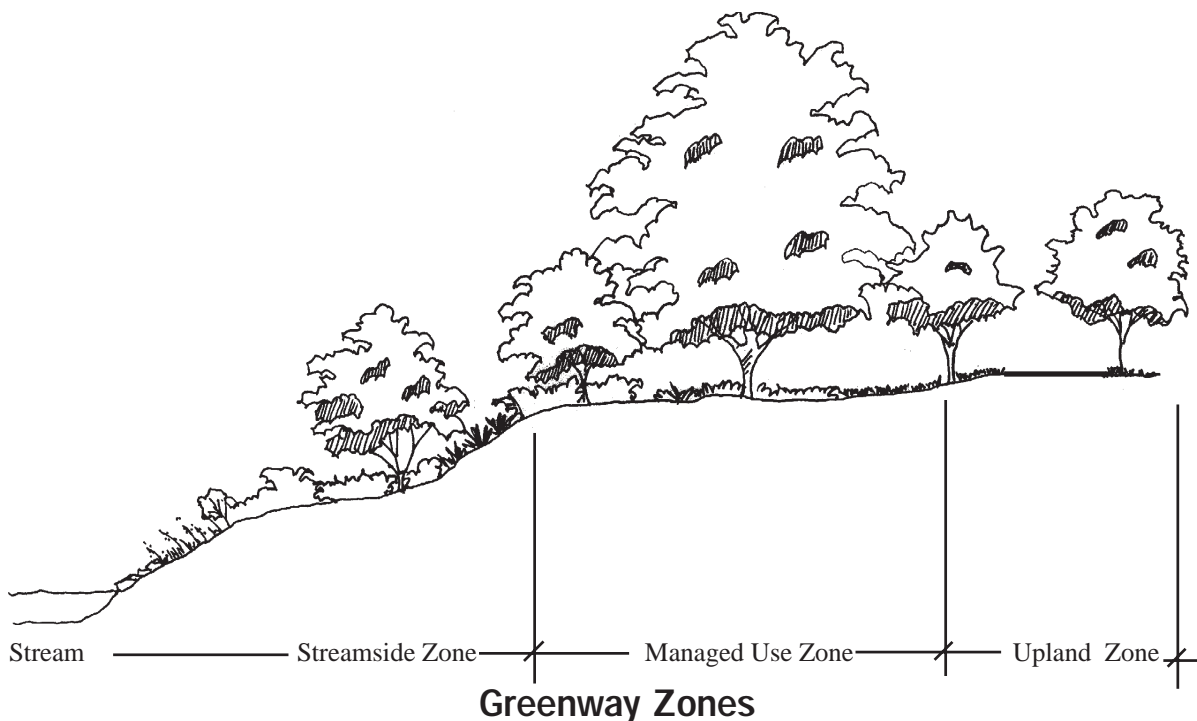


Figure 28: Example of a water-based trail.

Greenway Zones

Trail facility development Type 2, 3 and 4 will also be governed by the following criteria which has been established by SWIM staff in draft format:

A minimum corridor width of up to 100 feet (each side of streambank) or 100 year regulated floodplain (whichever is greater) should be established for all Type 2, 3 and 4 greenways located in FEMA regulated floodplains. Greenway lands that provide less width will require more careful planning, design, construction and maintenance. This 100 foot width will be divided into three distinctive zones: *streamside zone*, *managed use zone*, and *upland zone*.



Greenway recommendations regarding trail facility development in the greenway zones are consistent with the SWIM Buffer Plan. Each zone has a specific function, type of vegetation, and use. The SWIM Buffer Plan should be referenced when recommending greenway facility development in a particular zone.

Streamside Zone

The Streamside Zone protects the physical integrity of the ecosystems that are present. Native vegetation should be preserved and existing forest canopy should remain undisturbed. This zone is very restrictive to development. Permitted uses in the zone may include flood control and bank stabilization. Other land uses that disturb the existing native vegetation and ecosystems are prohibited except for specified secondary uses when no practical alternative exists. Other mitigation efforts should be undertaken to restore the native ecology of this zone. If appropriate, unpaved and unimproved foot trails and/or boardwalk trails (Type 2) can be constructed in this zone.

In some urban settings, it may be necessary to develop a hard surfaced trail because of limited public right-of-way. Such development should only occur in conjunction with ecosystem improvements, such as water quality features, soil bioengineering, and Best Management Practices. Development of this type of trail may also occur in conjunction with new utility installation and repair and upgrades of utilities to limit the amount of disturbance that can occur in this zone. Trail alignment occurs at the toe of the bank in this type of situation. This type of trail development is limited to the urban areas of the County.

Managed Use Zone

The Managed Use Zone provides some distance between upland development and the streamside zone. The vegetation within the managed use zone should consist of a managed forest, with some clearing allowed. The land use within this zone should be limited to some types of recreational activities, storm water best management practices (BMP's), multi-use greenways, and all secondary uses. Within the Managed Use Zone, the majority of greenway facility development should occur, including asphalt and concrete surfaced trails for walking, bicycling, rollerblading and education activities. Other greenway facilities can also be located in this zone, such as signage, bench seating and safety systems.

Upland Zone

The final Upland Zone prevents encroachment and filters backyard and adjacent property runoff. A forest canopy is encouraged within the Upland Zone, but at the very least a grass cover should be provided within this zone. The land use for this zone is restricted to lawns, gardens, BMP's, minimal impervious cover, and storage buildings. Commercial buildings and occupied structures are not permitted in this zone.

The Plan of Action

The Mecklenburg County Greenway Master Plan Update identifies a system of greenway corridors throughout the County which fulfill multiple objectives. To realize the vision laid forth in this plan, the following steps will need to be completed for each greenway corridor.

Step One - Land Acquisition: Before detailed master planning of an individual corridor occurs, it is necessary for the County to have an ownership interest in the land that is included in this greenway system. A variety of land acquisition techniques are included in this master plan to guide both public and private interests. It is essential that an interest in land ownership take place prior to beginning a detailed master plan for an individual greenway corridor. Criteria for prioritizing land acquisition is contained within the next page.

Step Two - Corridor Master Planning: Site specific master planning for individual greenway corridors will determine the feasibility and the appropriate level of use for a segment of corridor and, where appropriate, trail routing. Each master plan for a greenway corridor or segment of a corridor should involve residents from surrounding neighborhoods, as well as adjacent property owners and businesses.

Step Three - Design Development, Construction Documents, and Engineering: After master planning has been completed and a specific corridor plan has been defined, detailed construction documents will then be produced for the project as well as a detailed cost estimation and assignment of responsibilities and costs.

Step Four - Construction and Facility Development: Depending on the level of use that is appropriate for a greenway corridor, actual construction of the greenway facilities, such as trails, habitat restoration, and stream-bank restoration will take place. Construction and development operations can be phased as necessary to meet budget and time constraints. Criteria for prioritizing trail development is contained within the next page.

Step Five - Maintenance and Management: Once the greenway facilities have been completed, maintenance and management should begin immediately. The Mecklenburg County Park and Recreation Department and its divisions shall be the lead management agency and should work in partnership with other county agencies, the City of Charlotte, and municipalities throughout the County, as well as private sector groups, to effectively manage and maintain the greenway system.



Figure 29: Campbell Creek Greenway, has been recently paved. Most greenways in Mecklenburg County will be paved in the near future.

Criteria for Prioritizing Land Acquisition

The following criteria are provided in this master plan update to guide the County in prioritizing parcels of land to be acquired for the greenway system. Criteria are not provided in order of significance. The criteria are listed in alphabetical order; the ordering does not represent either priority or hierarchy.

Cost of Acquisition - a determination that it is financially feasible to acquire the property.

Cultural Significance - the property contains a unique artifact of history, or is a historically significant parcel of land.

Environmental Significance - the property is an important parcel of land and contains a significant environmental feature(s) that makes it worthy of acquisition (i.e. water quality, plant or animal habitat, floodplain management).

Geographical Equity - the property is located in an area of the County that if acquired will provide a balance to future trails system development.

Maintenance of Property - it has been determined that the property can be maintained in a manner that is consistent with Mecklenburg County Park and Recreation Department policies.

Opportunity for Donation - a donor has come forward and has agreed to give the land to the County.

Opportunity for Trail Development - the property is ideally suited for trail development. Issues of accessibility have been addressed and satisfied.

Population Served - the parcel of property is located in an area of the County that is densely populated.

Source of Funding - funds have been identified and are available to purchase the property.

Type of Trail Development - the property can accommodate an appropriate level of trail facility development.

Threat of Loss - the parcel of land is in demand and may not be available for public ownership unless quick action is taken.

Criteria for Prioritizing Trail Development

The following criteria are provided in this master plan update to guide the County in determining greenway trail development. The criteria are listed in alphabetical order; the ordering does not represent either priority or hierarchy.

Cost of Trail Facility Development - an estimate for the project has been completed and it has been determined that it is financially feasible to build the greenway trail facility.

Cost of Trail Facility Maintenance - an evaluation of the project has been completed and it has been determined that the corridor can be maintained in accordance with Mecklenburg County Park and Recreation Department policies. Additionally, adopt-a-greenway groups have been identified and have been enlisted to support the future operation of the greenway trail.

Expansion of Existing System - the proposed greenway trail facility is an extension of an existing trail.

Geographical Equity - construction of the trail ensures that there is an equitable balance in trail facility development throughout the County.

Need for a Trail Segment - residents of an area are presently underserved and require the development of the greenway facility. Additionally, the trail segment has been identified as an element of other adopted plans (i.e. Small Area Plan).

Ownership of Land - the County has title or rights of public access and use on the property.

Opportunity: Origin and Destination - the trail segment has a logical point of beginning and end.

Population Served - trail development will serve a significant population within a one-mile radius.

Public Support - the surrounding neighborhoods and communities support development of the trail.

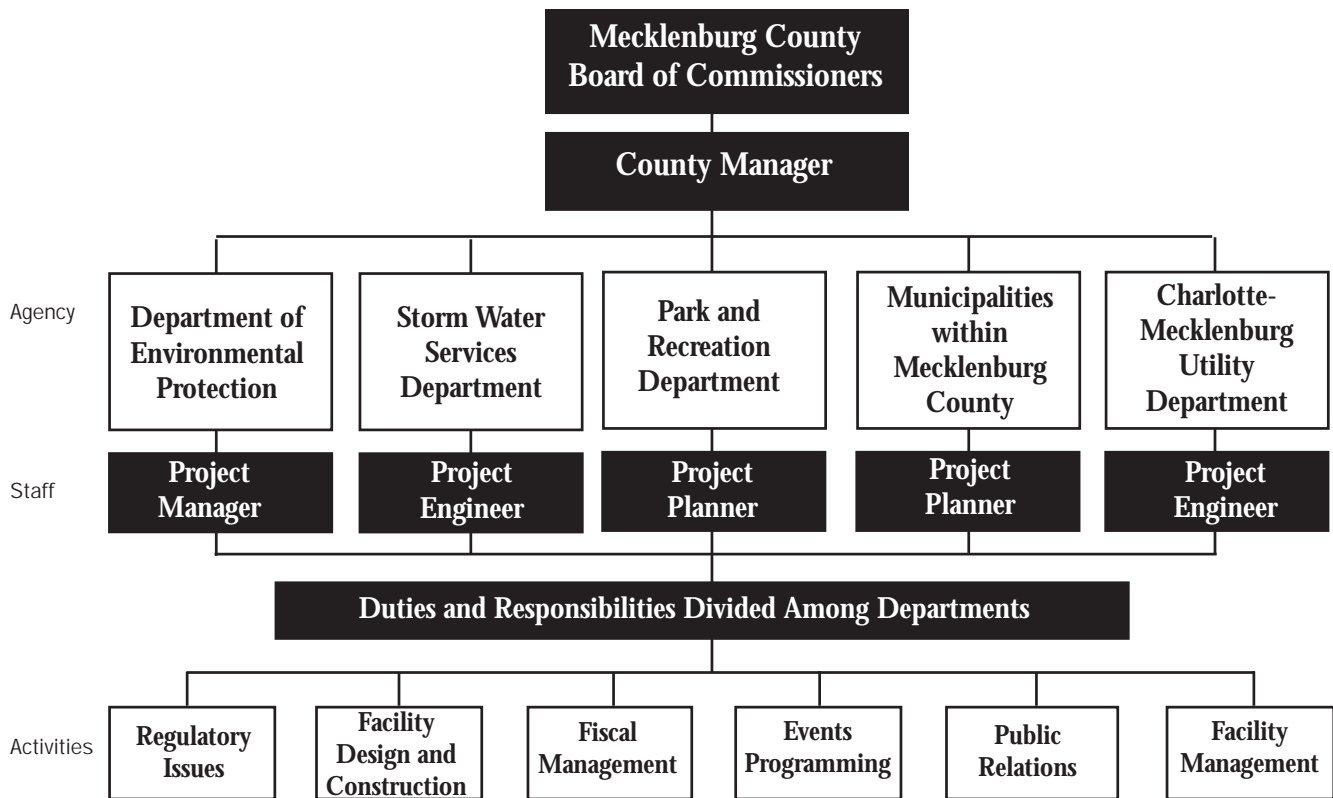
Source of Funding - funds have been committed to the project, other agencies or private sector groups have committed funds in support of the project (i.e. partnerships have been established).

Type of Trail - the type and surface of the proposed trail can be accommodated within the environmental setting of the greenway corridor. Additionally, the proposed trail surface meets the needs of local user groups and will be accessible under appropriate guidelines established by the Mecklenburg County Park and Recreation Department.

Implementation Strategy

Successful implementation of this master plan will require a concerted effort by Mecklenburg County in partnership with local governments and private sector organizations who have the ability, influence and authority to guide the community toward acceptable multi-objective greenway solutions. Implementation of the greenway program should not be the sole burden of the County. To be truly successful it must become the collective pursuit of the entire community. In prior years, Mecklenburg County's greenways have been implemented and managed almost exclusively by the Park and Recreation Department. This master plan recommends a new strategy for implementing and managing greenways.

The chart below illustrates an implementation and management strategy for a public agency partnership, within Mecklenburg County, that should enable various aspects of the greenway program to be more effectively implemented. On the following pages, the roles of County agencies and other public-sector and private-sector organizations are defined.



Role of Mecklenburg County

Mecklenburg County will be the lead agent, owner, developer, and manager of the primary greenway system throughout the County. It will be necessary for the County to partner with local municipalities throughout the County to build and maintain various segments of the greenway system. Listed below and on the following pages are the key agencies and organizations that will play a role in this implementation.

Role of the County Commission

The Mecklenburg County Commission will be called upon to adopt and implement the recommendations of this Master Plan. The County Commission will need to work with the County Manager to determine the most effective implementation strategy for the County-wide greenway system. This may include engaging in unique public-private partnerships, determining an appropriate financing strategy for greenways, and defining appropriate coordinated capital improvement projects that maximize the use of county resources. The County Commission will also be viewed as the ultimate “Champion” of this master plan and will need to exhibit appropriate leadership of the goals and objectives defined herein.

Role of the County Manager

The Mecklenburg County Manager is vested with management responsibilities for the community's public resources. As such, the primary role of the County Manager, with respect to the greenway system, will be to direct the activities of the various departments of the County as necessary to perform required acquisition, development, stewardship and maintenance activities for the greenway. The County Manager will also be called upon to determine an effective coordinated capital improvements program that enables various County departments to share resources in support of greenway development.

Role of the Park and Recreation Department

The Park and Recreation Department will acquire necessary land and prepare detailed corridor master plans and construction documents for each greenway segment. The Park and Recreation Department will become the primary steward for greenway lands and facilities. However, due to the size and scope of this endeavor, it is strongly encouraged that the Park and Recreation Department's Partners for Parks Foundation expand the existing Adopt-A-Parks Program to include greenway sponsorship. This program will enlist the participation and support of the Greenway and Trails Advisory Council and other public and private sector organizations in managing and maintaining greenway lands and facilities.

Role of the Greenway and Trails Advisory Council (GTAC)

The Greenway and Trails Advisory Council mission statement is to “promote and support implementation of the Mecklenburg County Greenway Master Plan and development of other types of recreational trails through:

1. the education of citizens on the objectives of the master plan and multiple trail needs
2. the coordination with other entities, programs, and departments (including Charlotte-Mecklenburg Planning Commission, Storm Water Services, Environmental Protection, CMUD, and the NC and Charlotte Departments of Transportation) to prioritize greenway development and acquisition through a point-based system
3. the identification and solicitation of resources to accelerate land acquisition and trail construction
4. and, in addition, the development of a regional greenway network by working with surrounding counties to establish linkages to their recreational and natural resources.”

GTAC shall support the implementation and development of trails according to the recommendations of the Mecklenburg County Greenway Master Plan update in accordance with their mission statement. GTAC will establish and utilize a point-based system for prioritizing greenway acquisition and trail development which will be weighed along with staff recommendations when making funding decisions. GTAC will be fully informed on a specific, case-by-case basis of how staff recommendations coincide with GTAC priorities regarding acquisition and trail development.

Role of the Charlotte-Mecklenburg Planning Commission

The Charlotte-Mecklenburg Planning Commission will support the Greenway Master Plan and will help with implementation by showing potential greenways in District Plans, notifying Mecklenburg County Park and Recreation Department of proposed developments in a greenway area, utilizing the rezoning process to encourage dedication of lands, such as sidewalks and bicycle facilities, for the greenway system, and planning transportation improvements in coordination with greenways.

Role of the Storm Water Services Department

The Mecklenburg County Storm Water Services Department shall assist the Park and Recreation Department with the development of specific greenway segments. Storm Water Services can accomplish this through the use of funds obtained from federal and state grants and through a coordinated capital improvement approach to project implementation.

Role of the Charlotte-Mecklenburg Utilities Dept. (CMUD)

Charlotte-Mecklenburg Utilities Department (CMUD) is an important part of the implementation strategy for county-wide greenways. CMUD’s system of sanitary sewers offers enormous potential for shared use with greenway development objectives. For the expansion and development of new sanitary sewer lines, CMUD should use a joint-use easement docu-

ment during right-of-way negotiations to acquire subsurface and surface rights from willing sellers. During facility development, CMUD should partner with County Departments and local municipalities to build trail facilities where feasible. CMUD can function as the greenway developer and Park and Recreation will be the greenway manager.

Role of the Engineering and Building Standards Department

The Mecklenburg County Engineering and Building Standards Department shall assist the Park and Recreation Department with the preparation of detailed corridor master plans for each of the greenway segments defined by this comprehensive master plan.

Role of the Department of Environmental Protection

Mecklenburg County Department of Environmental Protection (MCDEP) should assist the Park and Recreation Department with the implementation of this master plan. MCDEP will maintain an advisory role, assisting with scientific, technical, and policy issues that impact water quality. MCDEP will also insure that plans and projects are consistent with the County's environmental goals and in compliance with local, state, and federal environmental regulations. MCDEP will represent sound environmental stewardship in the development of the greenway system. The Department's SWIM program shares common goals and objectives with the greenway system. SWIM's primary role will be to review greenway

County Park and Recreation Department	Charlotte-Mecklenburg Utilities	Storm Water Services Department	MC Department of Environmental Protection
System-wide Planning Land Acquisition Facility Planning Facility Construction Facility Maintenance Adopt-A-Greenway Community Programs Event Programming Public Relations Fiscal Management	System-wide Planning Land Acquisition Facility Design Facility Construction Facility Maintenance	System-wide Planning Land Acquisition Facility Planning Facility Design Facility Construction	System-wide Planning Land Acquisition Facility Planning Facility Design Facility Construction SWIM Standards Review

plans for potential restoration or mitigation opportunities and coordinate those efforts with greenway implementation. As such, it may prove helpful and necessary to coordinate project development on a case-by-case basis.

Other responsibilities and roles are further defined in the chart below:

Role of Municipalities within Mecklenburg County

The City of Charlotte, and the towns of Cornelius, Davidson, Huntersville, Mint Hill, Pineville, and Matthews have a very important role to play in the implementation of this plan. Each is a partner in the development of the county-wide greenway system. As such, the physical development, maintenance, and land acquisition of the greenway system should be a shared responsibility where ever and whenever possible. The specific level of participation in any given project will be subject to the unique conditions of each project. The municipalities should embed the greenway philosophy in their planning and zoning processes. The City and respective towns have much to gain through their involvement with the greenway program and should take every opportunity to coordinate their activities with those of the County to ensure that the best possible greenway solution is realized. The first step for the municipalities within Mecklenburg County will be to adopt this Plan. Secondly, all municipalities should work to acquire land for the greenway system.

Role of Local Businesses and Corporations

Mecklenburg County businesses and corporations might choose to sponsor a segment of greenway for development or maintenance. Businesses and corporations can work with the Park and Recreation Department to give money, materials, products and labor toward the development of a greenway facility. Businesses can also consider installing facilities, such as bike racks or lockers, benches, and signage that link their operations to the greenway system through the Partners-for-Parks Program.

Role of Civic Organizations

Local civic groups and organizations, including the Junior League, Boy Scouts and Girl Scouts, garden clubs, YMCA, Kiwanis and Rotary Clubs, to name a few, can be participants in the Mecklenburg County Greenway System. These organizations can play a vital role in building sections of greenway trails, maintaining and managing greenway lands and facilities, and co-hosting events that raise money for the greenway system. There are many ways in which civic organizations can participate in the development of the greenway system. The most appropriate involvement can be determined by matching the goals and objectives of each organization to the needs of the greenway program. The involvement of such organizations should be coordinated through the Park and Recreation Department Partners for Parks and Adopt-A-Park program.

Role of Individual Citizens

Local residents who are interested in the development of Mecklenburg County's Greenway System can participate by agreeing to donate their time, labor, and expertise to the Park and Recreation Department. Residents might choose to partner with a friend or form a local neighborhood group that adopts a section of greenway for maintenance and management purposes through the Adopt-A-Greenway Program. Individuals can help patrol trails during daylight hours. This effort should be coordinated with Park Watch. Individuals can volunteer to plant trees, shrubs, and flowers along segments of greenways. All volunteer efforts will be recognized by the Park and Recreation Department through a community-wide program.

Staffing the Greenway Program

This master plan recommends a significant expansion of the greenway system. Much of this expansion can be accomplished within the current operating framework that exists within County government. It will be necessary, however, to add staff resources to the Mecklenburg County Park and Recreation Department to facilitate, coordinate and implement the activities of this plan. Each recommended staff position will need to coordinate with the Bicycle Coordinator position recommended by the Charlotte-Mecklenburg Bicycle Transportation Master Plan.

The greenway program needs two additional staff level positions: Greenway Development Specialist and Greenway Manager. The position of Greenway Planner currently exists. Each position is described below in greater detail.

Greenway Development Specialist

The Greenway Development Specialist will need to work closely with other public and private sector groups to coordinate overall development of the greenway system. There is a significant amount of greenway system that will need to be brought on-line during the first three years of plan implementation and it will be the responsibility of this individual to ensure that these development objectives are accomplished. This person should have a background in landscape architecture or civil engineering and park and recreation development. This person should have experience in project development and construction and will need to work closely with consultants, contractors, and other agency staff to accomplish program objectives.

Greenway Manager

The Greenway Manager shall be primarily responsible for coordinating the management activities of the greenway system. Under the current Park and Recreation Department structure, maintenance and management will be divided among the Park Districts. The Greenway Manager will provide centralized oversight within the County, working with each of the Park Districts in developing and managing trail corridor development. Some maintenance and management may be contracted to private sector companies. It shall be the responsibility of the Greenway Manager to ensure these activities are performed in accordance with the provisions of this master plan.

Appendix A: Operations, Management and Maintenance

Operating, maintaining and managing a system of greenways in Mecklenburg County will require a coordinated effort among Mecklenburg County agencies and private sector organizations and individuals. The following text defines the key aspects of greenway system management, beginning with operational policies and followed by facility management, land management, safety and security, trail user rules and regulations, an emergency response plan, and a risk management plan.

Operations

Over the course of time, Mecklenburg County will encounter a variety of issues that are important to the successful management and operation of the greenway system. The following operational policies are defined to assist the County in responding to typical greenway implementation issues. More specific problems and issues may arise during the long-term development of the system that result in additional policies being considered and adopted.

Land Acquisition Procedures

As defined in previous sections of this Plan, the protection of stream corridors from urban encroachment is essential in order to permit stream channels and their floodplains to perform natural infrastructure functions. Stream corridors are best protected by first delineating the landscape boundaries of the 100-year (regulatory) floodplain and then by encouraging landowners to engage in land stewardship practices that limit encroachment and preserve the native landscape.

This section of the Plan defines land acquisition procedures that can be used to conserve, protect, and preserve the stream corridors of Mecklenburg County. This Plan recommends a **voluntary** land acquisition program for protecting the streams and floodplains of the County. The text in this section offers a menu of tools that landowners, land conservation organizations and local government can use to establish the physical boundaries of the Greenway System. In the event that certain parcels of land within the floodplain are considered vital to the overall efforts of the greenway system, mechanisms defined herein enable the Park and Recreation Department, or another local government agency, to purchase or negotiate for the dedication of certain property rights. Dedication should be negotiated in a manner that is consistent with local, state and Federal laws that permit and govern such action.

Mechanisms for Acquisition of Land through Management

Management is a method of conserving the resources of a specific greenway parcel through either an established set of policies called Management Plans, or through negotiated agreements or easements with private property owners.

Management Plans

Management plans are prepared by the County Park and Recreation Department for government-owned greenway lands. In addition, agencies can work together to establish management plans for lands under their control. Management plans should identify valuable resources; determine compatible uses for the parcel; determine administrative needs of the parcel, such as maintenance, security and funding requirements; and recommend short-term and long-term action plans for the treatment and protection of the resources.

Subdivision Plans

Both the City and County Subdivision Ordinances contain requirements related to public park sites and greenways. Under these provisions, planning staff notifies the Mecklenburg County Park and Recreation Department of the proposed development. The planning staff can require the reservation of the site for a maximum of 18 months to allow the Park and Recreation Department to acquire the site by dedications purchase, or other means. A large amount of existing greenway acreage in Mecklenburg County was dedicated through the subdivision process.

Both the City and County Zoning Ordinances allow the dedication of greenway land to count as the minimum open space requirement for certain developments such as cluster and mixed use development. Planning staff encourages the dedication through the rezoning or subdivision processes.

Easements

Land management agreements in which the County Park and Recreation Department receives less than full interest in a parcel of land in order to protect a valuable resource. The purpose of these agreements is to establish legally binding contracts or a mutual understanding of the specific use, treatment and protection that these greenway lands will receive. Property owners who grant easements retain all rights to the property except those which have been granted by the easement. The property owner is responsible for all taxes associated with the property, less the value of the easement granted. Easements are generally restricted to certain portions of property, although in certain cases an easement can be applied to an entire parcel of land. Easements are transferable through title transactions, thus the easement remains in effect in perpetuity. Three types of greenway easements are:

Conservation Easements

This type of easement generally establishes permanent limits on the use and development of land to protect the natural resources of that land. Dedicated conservation easements can qualify for both federal income tax deductions and state tax credits. Tax deductions are allowed by the Federal government for donations of certain conservation easements. The donations may reduce the donor's taxable income.

Preservation Easements

This type of easement is intended to protect the historical integrity of a structure or important elements of the landscape by sound management practices. Preservation easements may qualify for the same federal income tax deductions and state tax credits as conservation easements.

Public Access Easements

Right of public access easements provide the general public with the right to access and use a specific parcel of property. Both conservation easements and preservation easements may contain clauses for the right of public access and still be eligible for tax incentives.

Mechanisms for Acquisition of Greenways through Regulation

The second method of protecting stream corridor/greenways is through government regulation. Regulation is defined as the government's ability to control the use and development of land through legislative powers. The following types of development ordinances are regulatory tools that can meet the challenges of projected suburban growth and development and, at the same time, conserve and protect greenway resources.

Dedication/Density Transfers

Also known as incentive zoning, this mechanism allows greenways to be dedicated to the County for density transfers on the development of a property. The potential for improving or subdividing part or all of a parcel of real property, as permitted under by the County land use development laws, can be expressed in dwelling unit equivalents or other measures of development density or intensity. Known as density transfers, these dwelling unit equivalents may be relocated to other portions of the same parcel or to contiguous land that is part of a common development plan. Dedicated density transfers can also be conveyed to subsequent holders if properly noted in transfer deeds.

Negotiated Dedications

The County may ask a landowner to enter into negotiations for certain parcels of land that are deemed beneficial to the protection and preservation of specific stream corridors. The County may ask for the dedication of land for greenways when landowners subdivide property (a minimum size would be determined). Such dedications would be proportionate to

the relationship between the impact of the subdivision on community services and the percentage of land required for dedication - as defined by the US Supreme Court in *Dolan v Tigard*.

Fees-in-Lieu

To complement negotiated dedications, a fee-in-lieu program may be necessary to serve as a funding source for other land acquisition pursuits of the Greenway Program. Based on the density of development, this program allows a developer the alternative of paying money for the development/protection of greenways in lieu of dedicating land for greenways. This money is then used to implement greenway management programs or acquire additional greenway lands.

Reservation of Land

A reservation of land does not involve any transfer of property rights but simply constitutes an obligation to keep property free from development for a stated period of time. Reservations are normally subject to a specified period of time, such as 6 or 12 months. At the end of this period, if an agreement has not already been reached to transfer certain property rights, the reservation expires.

Conditional Use Permits

Also known as conditional use rezoning, this mechanism can create public and private greenways through special restrictions placed on the rezoning of a property. Conditional use permits require the owner to perform some act or make site improvements to justify the change in zoning classification. This mechanism allows planning officials to accommodate property owners, to not conflict with the Land Use Plan and to protect greenways within the County.

Buffer/Transition Zones

This mechanism recognizes the problem of reconciling different, potentially incompatible land uses by preserving greenways that function as buffers or transition zones between uses. Care must be taken to ensure that use of this mechanism is reasonable and will not destroy the value of a property.

Overlay Zones

An overlay zone and its regulations are established in addition to the zoning classification and regulations already in place.

Subdivision Exactions

An exaction is a condition of development approval that requires a developer to provide or contribute to the financing of public facilities at his own expense. For example, a developer may be required to build a greenway on-site as a condition of developing a certain number of units because the development will create need for new parks or will harm

existing parks due to overuse. The mechanism can be used to protect or preserve a greenway which is then dedicated to the County.

Mechanisms for Protection of Greenways through Acquisition

The third method of protecting stream corridor/greenways is through the acquisition of property. A variety of methods can be used to acquire property for greenway purposes.

Donation/Tax Incentives

A local government agency agrees to receive full title to a parcel of land at virtually no cost. In most cases, the donor is eligible to receive federal and state deductions on personal income, as previously described under conservation easements. In addition, property owners may be able to avoid inheritance taxes, capital gains taxes and recurring property taxes.

Fee Simple Purchase

This is a common method of acquisition where a local government agency or private greenway manager purchases property outright. Fee simple ownership conveys full title to the land and the entire “bundle” of property rights including the right to possess land, to exclude others, to use land and to alienate or sell land.

Easement Purchase

This mechanism is the fee simple purchase of an easement. Full title to the land is not purchased, only those rights granted in the easement agreement. Therefore the easement purchase price is less than full title value.

Purchase/Lease Back

A local government agency or private greenway organization can purchase a piece of land and then lease it back to the seller for a specified period of time. The lease may contain restrictions regarding the use and development of the property.

Bargain Sale

A property owner can sell property at a price less than the appraised fair market value of the land. Sometimes the seller can derive the same benefits as if the property were donated. Bargain Sale is attractive to sellers when the seller wants cash for the property, the seller paid a low cash price and thus is not liable for high capital gains tax, and/or the seller has a fairly high current income and could benefit from a donation of the property as an income tax deduction.

Option/First Right of Refusal

A local government agency or private organization establishes an agreement with a public agency or private property owner to provide the right of

first refusal on a parcel of land that is scheduled to be sold. This form of agreement can be used in conjunction with other techniques, such as an easement, to protect the land in the short term. An option would provide the agency with sufficient time to obtain capital to purchase the property or successfully negotiate some other means of conserving the greenway resource.

Rezoning Petitions

Petitions for rezoning that are adjacent to or include areas identified as potential park or greenway site are sent to the Park and Recreation Department staff for their comments. Planning staff encourage the dedication of those areas as part of the rezoning process.

Purchase of Development Rights

Purchase of Development Rights (PDR) programs are often used to protect agricultural lands. PDR involves purchasing the development rights from a private property owner at a fair market value. The landowner retains all ownership rights under current use, but exchanges the rights to develop the property for cash payment.

Condemnation

The practice of condemning private land for use as greenways is viewed as a last resort policy. Using condemnation to acquire property or property rights can be avoided if private and public support for the Greenway Program is present. Condemnation is seldom used for the purpose of dealing with an unwilling property owner. In most cases, condemnation for greenway purposes has been exercised when there has been absentee property ownership, when title to the property is not clear, or when it becomes apparent that obtaining the consent for purchase will be difficult because there are numerous heirs located in other parts of the United States, or in different countries. The community must exercise caution in using Eminent Domain.

It is recommended that the right of eminent domain for a specific property be exercised by the community **only** if all of the following conditions exist:

- a) that the property is valued by the community as an environmentally sensitive parcel of land, significant natural resource, or critical parcel of land, and as such has been defined by the community as an irreplaceable property;
- b) that written scientific justification for the community's claim that the property possesses such value should be prepared and offered to the property owner;
- c) that all efforts to negotiate with the property owner for the management, regulation and acquisition of the property have been exhausted and that the property owner has been given reasonable and fair offers for compensation and has rejected all offers;
- d) that due to the ownership of the property, the timeframe for negotiat-

ing the acquisition of the property will be unreasonable, and in the interest of pursuing a cost effective method for acquiring the property, the community has deemed it necessary to exercise the right of eminent domain.

Right of Public Access and Use of Trail Lands

The general public should have free access to and use of those greenway lands that support public use (i.e. trail development), and that are owned by Mecklenburg County or on land that the County has secured the right of public access and use. All access and use is governed by existing County policies and should also be governed by a new Greenway Trail Ordinance (found in this chapter). The use of all trails is limited to non-motorized uses, including hiking, bicycling, running, jogging, wheelchair use, skateboarding, rollerblading, equestrian use (only Latta Plantation), mountain biking, and other uses that are determined to be compatible with the County's greenway trails.

The Park and Recreation Department is working with Charlotte-Mecklenburg Utilities Department (CMUD) to allow public use of sewer easement/Right-of-Way in the future with a joint use agreement of sewer easements.

Naming of Greenways

Greenways are named for the significant natural features that are found within the corridor. For example, the Little Sugar Creek Greenway is so named because it follows Little Sugar Creek. Greenways can also be named after an individual or individuals if these persons are truly distinguished within the community, or if these persons have contributed a gift equal to more than 50% of the value of greenway development within that corridor segment.

Fencing and Vegetative Screening

Mecklenburg County will work with each landowner on an individual basis to determine if fencing and screening is required and appropriate. The County may agree to fund the installation of a fence or vegetative screen; however, it should be the responsibility of the adjacent property owner to maintain the fence or vegetative screen in perpetuity, including the full replacement of such fence or screen in the event of failure or deterioration due to any circumstances.

Adopt-a-Greenway Program

An Adopt-a-Greenway Program has already been established by Mecklenburg County to encourage community groups, families, businesses, school groups, civic clubs and other organizations to join in managing the greenway system. The County should continue and expand this program for every greenway corridor in the system, and work closely with local organizations to ensure that these groups manage and main-

tain trails in a manner that is consistent with County objectives. The County should develop written agreements for each Adopt-a-Greenway entity and keep a current record of this agreement on file. Adopt-a-Greenway entities will be assigned a specific section of the greenway system, defined by location or milepost. The activities of each organization should be monitored by the County or its designee. Agreements for management can be amended or terminated at any time by either party, giving 30 days written notice.

Management Agreements

Management Agreements will be established between Mecklenburg County and specific public or private organizations wishing to assist with the management of designated segments of the greenway system. The objective of these agreements is to define areas of maintenance and management that are compatible with existing land management activities, especially where greenways intersect with public or private properties and/or rights-of-way. Management agreements spell out specific duties, responsibilities and activities of the County and public or private organization that wishes to assist with management activities. They can be amended or terminated at any time by either party, giving 30 days written notice.

Cross Access Agreements

The County can use cross access agreements to permit private landowners that have property on both sides of a greenway corridor access to and use of a greenway corridor to facilitate operation and land use activities.

Cross access agreements are based on case law of the United States and specific experiences from other greenway trail systems throughout the United States. Adjacent landowners generally have the right to use the access at any time. However, access cannot block the right-of-way for trail users, other than for temporary measures such as permitting livestock to cross, or transporting equipment. Adjacent landowners are responsible for acts or omissions which would cause injury to a third party using the trail. If a landowner must move products, materials, livestock or equipment across the trail on a regular basis, appropriate signage should be installed to warn users of the trail to yield for such activities.

Crossing of abandoned or active rail lines, utility corridors and/or roads and highways will require the execution of agreements with companies, local, state or federal agencies and organizations that own the rights-of-way. These crossings must provide clearly controlled, recognized, and defined intersections in which the user will be warned of the location. In accordance with the American Association of State Highway Transportation Officials (AASHTO) and the Manual on Uniform Traffic Control Devices (MUTCD), the crossing will be signed with appropriate regulatory, warning and information signs.

Greenway Facility Management

Greenway facilities shall be maintained in a manner that promotes safe use. All trail facilities should be managed by Mecklenburg County or their designee. Trail maintenance should include the removal of debris, trash, litter, obnoxious and unsafe man-made structures, and other foreign matter so as to be safe for public use. Trail heads, points of public access, rest areas and other activity areas should be maintained in a clean and usable condition at all times. The primary concern regarding maintenance should always be public safety.

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, gullies, rills and washed out treads should be repaired immediately. Volunteer vegetation occurring in the tread of the trail should be removed in such a manner so that the trail surface is maintained as a continuous, even and clean surface.

Land Management

Property owned or used by Mecklenburg County for the greenway system shall be maintained in a condition that promotes safety and security for greenway users and adjacent property owners. To the extent possible, the property shall also be maintained in a manner that enables the corridor to fulfill multiple functions (i.e. passive recreation, alternative transportation, stormwater management and habitat for wildlife). Property that is owned or managed by other entities should be managed and maintained in accordance with the policies of that public body responsible for the affected parcel.

Vegetation within each greenway corridor shall be managed to promote safety, serve as wildlife habitat, buffer public trail use from adjacent private property (where applicable), protect water quality, and preserve the unique aesthetic values of the natural landscape. Removal of native vegetation shall be done with discretion, removal of exotic species should be accomplished in a systematic and thorough manner.

Vegetation adjacent to trails shall be managed as necessary to maintain clear and open lines of sight along the edge of the trail, and eliminate potential hazards that could occur due to natural growth, severe weather or other unacceptable conditions. To promote safe use of any greenway trail, all vegetation should be clear cut to a minimum distance of three (3) feet from each edge of a trail. 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 a trail. At any point along a trail, a user should have a clear, unobstructed view, along the centerline of a trail, 300 feet ahead and behind his/her position. The only exception to this policy should be where terrain or curves in a trail serve as the limiting factor.

Mecklenburg County or their designated agent should be responsible for the cutting and removal of vegetation. Removal of vegetation by an individual or entity other than the County or a County designee shall be deemed unlawful and subject to fines and/or prosecution.

Safety and Security

Safety is a duty and obligation of all public facilities. In order to provide a standard of care that offers reasonable and ordinary safety measures, Mecklenburg County shall cooperatively develop and implement a Safety and Security Program for the greenway system. This program will consist of well defined safety and security policies; the identification of trail management, law enforcement, emergency and fire protection agencies; the proper posting, notification and education of the trail user policies; and a system that offers timely response to the public for issue or problems that are related to safety and security. The safety and security of the greenway system will need to be coordinated with local law enforcement officials, local neighborhood watch associations, and Adopt-a-Greenway organizations.

Important components of the safety and security program include the following. Mecklenburg County should:

- 1) work with law enforcement agencies, primarily Charlotte-Mecklenburg Police Department, to establish a Greenway Safety and Security Committee that can meet periodically to discuss management of the greenway system.
- 2) prepare a Greenway Safety Manual and distribute this to management agencies and post it at all major trail heads.
- 3) post User Rules and Regulations at all public access points to greenway trails.
- 4) work with the management agencies to develop Trail Emergency Procedures.
- 5) prepare a Safety Checklist for the greenway system, and utilize it monthly during field inspection of greenway facilities.
- 6) prepare a Greenway User Response Form for complaints and complements and provide copies at all trail heads.
- 7) work with management agencies to develop a system for accident reporting analysis.
- 8) conduct a regular Maintenance and Inspection Program, and share the results of these investigations with all management agencies.
- 9) coordinate other Public Information Programs that provide information about greenway events and activities that County residents can participate in.
- 10) have an ongoing evaluation of greenway program objectives.

User Rules and Regulations

Trails within greenway corridors shall be operated like all other parks within the County, open for public use from sunrise to sunset, 365 days a year, except as specifically designated. Individuals who are found to be

using unlighted facilities after dusk and before dawn should be deemed in violation of these hours of operation and treated as trespassers. Where trails are lighted for nighttime use, the rules established within the Trail Ordinance (below) should govern permitted uses and activities.

The County shall enforce three types of trespass violations. A Level One violation is a first occurrence in which the violator is provided a written warning. Level Two violation is a second occurrence in which the violator is suspended for 30 days from using the greenway system. Level Three violation is a multiple occurrence in which the violator is suspended for life from using the greenway system.

The County should always discourage the general public from using any segment of a greenway trail that is under construction. Trail segments should not be considered officially opened for public use until such time as a formal dedication ceremony and official opening has been completed. Individuals who use greenway segments that are under construction, without written permission from the County should be deemed in violation of this access and use policy and treated as a trespasser.

Trail Ordinance

Multi-use conflict is a national problem for community and regional greenway systems. Typically, conflicts are caused by overuse of a greenway trail, however, other factors may be problematic including poorly designed and engineered trail alignments, inappropriate user behavior, or inadequate facility capacity. The most effective conflict resolution plan is a well conceived safety program that provides the individual user with a Code of Conduct for the greenway trail, sometimes called a Trail Ordinance. Several communities across the United States have adopted progressive trail ordinances to govern public use and keep trails safe for all users. The following Rules and Regulations are recommended for the Mecklenburg County Greenway Trails System. These rules should be displayed both on brochures and information signs throughout the greenway system.

- 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 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 your left!" or "Cyclist on your 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: Lack of attention, even for a second, can cause disaster - always stay alert! Maintain a safe and legal speed at all times.
 - 7) Do not Block the Trail: When in a group, including your pets, use no more than half the trail, so as not to block the flow of other users. If your group is approached by users 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 the Trail at an uncontrolled intersection, yield to traffic already using the other trail.
 - 9) Do not 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.
 - 10) Clean-up Your Litter: Please keep this Trail clean and neat for other users to enjoy. Do not leave glass, paper, cans or any other debris on or near the Trail. Please clean up after your pets. Pack out what you bring in - and remember to always recycle your trash.
 - 11) Keep Pets on Leashes: All pets must be kept on secure and tethered leashes. Keep pets off of adjacent private property. Failure to do so will result in a fine.
 - 12) Prohibition on Camp Fires: Fires, for any purpose, are prohibited within the Trails System. Any person caught lighting a fire for any purpose will be prosecuted to the fullest extent of the law.

Emergency Response Plan

In order to effectively patrol the greenway system and respond to the potential for fire, floods and other natural or human-caused disasters, Mecklenburg County shall adopt a greenway emergency response plan. This plan defines a cooperative law enforcement strategy for greenways based on services required and those that are typically provided by police, sheriff, fire and EMS agencies. Specifically, all trails should be provided with an address system that denotes specific locations along the length of a trail corridor. A site plan that illustrates points of access

to each trail corridor should be produced and kept on file at the County Park and Recreation Department and provided to each agency. Each trail should be designed to permit access for law enforcement, fire and EMS agencies and vehicles that are not in excess of 6.5 tons gross vehicle weight. Typically, inter-governmental agreements are executed for this. A system of cellular-type emergency phone should be located in remote sections of the system, providing users with access to the area 911 Emergency System. All emergency phones should be placed above the flood elevation to ensure long term usage.

The emergency response plan should also define the agencies that should respond to 911 calls, and provide easy to understand routing plans and access points for emergency vehicles. For long distance trails, access points for emergency and maintenance vehicles should be located at reasonable distances from trail heads (approximately every 2-3 miles). Local hospitals should be notified of these routes so that they may also be familiar with the size and scope of the project. The entire greenway system should be designed and develop to support a minimum gross vehicle weight of 6.5 tons.

Risk Management Plan

The purpose of a Risk Management Plan is to increase safety for the users of the Mecklenburg County Greenway Trails System and reduce the potential for accidents to occur within the system or on lands adjacent to the system. While it is impossible to guarantee that all risk will be eliminated by a Risk Management Plan, implementation of a plan is in fact a critical step to reduce liability and improve safety. A Risk Management Plan establishes a methodology for greenway management that is based on current tort liability and case law in the United States related to the development, operation and management of public use greenway lands and facilities.

The ultimate responsibility for managing the greenway system, as defined within this Plan, rests with Mecklenburg County. The Risk Management Plan has as its major goals:

- 1) Risk Identification: determining where risk (threat to safety or potential loss) exists within the corridor.
- 2) Risk Evaluation: conducting appropriate examination of areas defined as a risk and determining the factors that contribute to risk.
- 3) Risk Treatment: defining and implementing an appropriate solution to the area of risk in accordance with one of the four options:
 - a) risk avoidance: prohibiting use of a risk area.
 - b) risk reduction: limit use of area and repair risk area immediately.
 - c) risk retention: obtain waivers from all potential users of the risk area.
 - d) risk transfer: transfer risk area (property) to an agency better suited to manage the area.

The following sixteen step plan should be implemented by Mecklenburg County to establish a Risk Management Plan for the Mecklenburg County greenway system.

- 1) Develop a policy statement about risk management.
- 2) Conduct a needs assessment for the greenway program.
- 3) Determine goals and objectives for risk management - what are acceptable and not acceptable management levels.
- 4) Develop specifications for site and facility development.
- 5) Establish a clear and concise program for risk management.
- 6) Define supervision and responsibility for risk management.
- 7) Define appropriate rules and regulations that govern the use of the trail system.
- 8) Conduct routine/systematic inspections and investigations of the trail system.
- 9) Develop an accident reporting and analysis system.
- 10) Establish procedures for handling emergencies.
- 11) Develop appropriate releases, waivers and agreements for use and management.
- 12) Identify best methods for insuring against risk.
- 13) Develop a comprehensive in-service training program for employees of the County.
- 14) Implement a public relations program that can effectively describe the risk management program and activities.
- 15) Conduct periodic reviews of the Risk Management Plan by outside agents to ensure that the Plan is up to date.
- 16) Maintain good legal and insurance representation.

Liability

The design, development, management, and operation of the Mecklenburg County Greenway System must be carefully and accurately executed in order to provide a resource that protects the health and welfare of the public. Liability may occur when a facility has been under-designed to handle its 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 possibility and exposure to liability, the County should have in operation the following measures prior to opening the first segment of greenway:

- 1) a thorough 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 greenway system, and as necessary adjacent landowners;
- 3) a comprehensive working knowledge of public use laws and recent case history applicable in North Carolina.

Mecklenburg County's existing self-insurance program may be adequate to protect the County government from financial loss that might occur through the development and operation of the greenway system. Trails are no greater liability to the County than park and recreation resources. The County should review its current policy and check coverages to be certain that all aspects of its policies are up to date.

Mecklenburg County should exercise reasonable care in the design and construction of all greenway facilities to reduce hazardous, public nuisance and life threatening situations. Recreational Use Statutes in North Carolina serve to reduce the exposure that adjacent landowners might expect to realize from the proximity of trails to private property. In fact, it is very difficult to find any case law in the United States where an adjacent property owner has been sued because a trail user strayed onto the adjacent private property and fell victim to an accident that was caused by the adjacent landowner. Some landowners have claimed that their insurance rates will go up because of the presence of a trail abutting their property. Once again, there is no case history among insurance companies to support this claim — provided the landowner has not gone out of their way to create an attractive nuisance and lure trail users onto their property.

It is also important that a fee not be charged to use any portion of the greenway system, because typically this may impact the way in which the recreational use statutes in North Carolina apply to the use of the system. A voluntary donation applied to the greenway system will generally not affect the recreational use statute.

Appendix B: Estimates of Cost and Return

The following defines typical costs for off-road, water-based and on-road greenway facility development and management. These are represented by general costs for facility development (not including land acquisition costs) as well as dollar amounts that communities across the state are spending on their greenway program development and management/maintenance/operations. Cost estimates are followed by examples of how other communities are receiving a return on their investment in greenways in terms of reduced flooding costs, reduced costs of water quality improvement, increased tourism revenue and increased business attraction.

Greenway Facility Development Costs

Costs do not include land acquisition costs. Labor costs are included in facility estimates. Costs for engineering and design development are estimated at 10-15% of construction costs.

Greenways with No Facility Development (Type 1):

Vegetation	Unit Cost
Trees (3" caliper)	\$350 each
Shrubs (3 gallon)	\$25 each

*Costs include plant and installation.

Streambank Stabilization (Bioengineering)

\$25-55/lin. foot
\$40-45/lin. foot ave.

Greenways with Limited Facility Development (Type 2):

Trail Treads

4-foot Bare Earth Hiking/Mtn. Bike Trail	\$10,000 per mile
10-foot Wood Deck/Boardwalk Trail (without rail)	\$75 per foot

*Costs include site preparation, clearing, grading, and mobilization.

Signage

Information Signs	\$200 each
Direction Signs	\$200 each
Warning Signs	\$200 each
Mile Markers	\$50 each

Greenways with Multi-use Unpaved Trail Facility

Development (Type 3):

Trail Treads

10-foot Aggregate/Stone Trail	\$50,000/mile
10-foot Wood Deck/Boardwalk Trail	\$75 per foot

Signage

Information Signs	\$200	each
Direction Signs	\$200	each
Warning Signs	\$200	each
Mile Markers	\$50	each

Furniture/Furnishings

Benches	\$600	each
Trash Receptacles	\$100	each
Security Bollards	\$250	each
Bicycle Racks	\$500	each
Fencing (Board-on-Board)	\$20/	lin. foot
Gates	\$750	each
911 Emergency Phones	\$800	each
Pre-fabricated Steel Bridges	\$1,000/foot	

Greenways with Multi-use Paved Trail Facility

Development (Type 4):

Trail Treads

10-foot Asphalt Multi-Purpose Trail	\$150,000/mile
10-foot Concrete Multi-Purpose Trail	\$300,000/mile
10-foot Wood Deck/Boardwalk Trail	\$75/foot

Signage

Information Signs	\$200	each
Direction Signs	\$200	each
Warning Signs	\$200	each
Mile Markers	\$50	each

Furniture/Furnishings

Benches	\$600	each
Trash Receptacles	\$100	each
Security Bollards	\$250	each
Bicycle Racks	\$500	each
Fencing (Board-on-Board)	\$20/	foot
Gates	\$750	each
911 Emergency Phones	\$800	each
Pre-fabricated Steel Bridges	\$1,000/foot	

Appendix C:

Funding Sources

The most successful method of funding greenways is to combine private sector funds with funds from local, state, and federal sources. Many communities involved with greenway implementation will seek to leverage local money with outside funding sources, to increase resources available for greenway acquisition and development.

To implement greenways in Mecklenburg County, local advocates and government staff should pursue a variety of funding sources. The funding sources listed in this chapter represent some of the greenway funding opportunities that have typically been pursued by other communities.

Public Funding Sources

Federal

Several federal programs offer financial aid for projects that aim to improve community infrastructure, transportation, housing, and recreation programs. Some of the federal programs that can be used to fund greenways include:

- **Transportation Equity Act for the 21st Century (TEA21)**
The primary source of federal funding for greenways is through the Transportation Equity Act of 1998 (TEA21), formerly the Intermodal Surface Transportation Efficiency Act (ISTEA). ISTEA provided millions of dollars in funding for bicycle and pedestrian transportation projects across the country and will provide millions more as TEA21.

There are many sections of TEA21 that support the development of bicycle and pedestrian transportation corridors. NCDOT can utilize funding from any of these subsets of TEA21. Those sections that apply to the creation of greenways, sidewalks and bikeways include:

- **Surface Transportation Program (STP) funds**
These funds can be used for bicycle and pedestrian facility construction or non-construction projects such as brochures, public service announcements, and route maps. The projects must be related to bicycle and pedestrian transportation and must be part of the Long Range Transportation Plan. These funds are programmed by the Metropolitan Planning Organization (MPO) in the Transportation Improvement Program.
- **Transportation Enhancements Program**
A total of \$3.6 billion is available through TEA21 for Transportation Enhancements. Ten percent of North Carolina's annual STP funds (approximately \$107 million over the next six years) are available for

Enhancements, which include projects such as trails, greenways, side-walks, signage, bikeways, safety education and wildlife undercrossings. There is usually a 20 percent match of local funds required (some states will accept donations of services, materials or land in lieu of cash) and there are several key requirements that projects must meet in order to receive these funds. The North Carolina DOT administers TEA21 funding and should be contacted for further details.

- **Transit Enhancements Program**
Transit Enhancement Activities. This will generate approximately \$30 million annually for these activities, which will then be divided among the 125 largest urban areas in the U. S. Activities eligible for funding include pedestrian access and walkways, bicycle access, bike storage facilities, bike-on-bus racks, and transit connections to parks within the transit service area.
- **Recreational Trails Program**
A component of TEA21, the Recreational Trails Program is a funding source to assist with the development of non-motorized and motorized trails. The Program uses funds paid into the Highway Trust Fund from fees on non-highway recreation fuel used by off-road vehicles and camping equipment. This money can be spent on the acquisition of easements and fee simple title to property, trail development, construction and maintenance. Project amounts vary by state, with most ranging from \$2,000 to \$30,000.

Through state agencies, a total of \$45 million per year is available to private and public sector organizations. Projects are 80 percent federally funded, and grant recipients must provide a 20 percent match. Federal agency project sponsors or other federal programs may provide additional federal share up to 95 percent. Local matches can be in the form of donations of services, materials or land. Projects funded must be consistent with the Statewide Comprehensive Outdoor Recreation Plan. Contact Darrell McBane at (919) 846-9991 for more information.

- **Congestion Mitigation and Air Quality Improvement Program (CMAQ)**
The CMAQ program was created to reduce congestion on local streets and improve air quality. Funds are available to communities designated as “non-attainment” areas for air quality, meaning the air is more polluted than federal standards allow. Funds are also available to “maintenance” areas, former non-attainment areas that are now in compliance. Funds are distributed to states based on population by county and the severity of air quality problems. A 20 percent local match is required.

Community Development Block Grant Program

The U.S. Department of Housing and Urban Development (HUD) offers financial grants to communities for neighborhood revitalization, economic

development, and improvements to community facilities and services, especially in low and moderate-income areas. Several communities have used HUD funds to develop greenways, including the Boulding Branch Greenway in High Point, North Carolina. Contact George Holmes at (336) 547-4005 for more information.

Land and Water Conservation Fund (LWCF) Grants

This federal funding source was established in 1965 to provide park and recreation opportunities to residents throughout the United States. Money for the fund comes from the sale or lease of nonrenewable resources, primarily federal offshore oil and gas leases and surplus federal land sales. LWCF funds are used by federal agencies to acquire additions to National Parks, Forests, and Wildlife Refuges. In the past, Congress has also appropriated LWCF moneys for so-called "state-side" projects. These "state-side" LWCF grants can be used by communities to acquire and build a variety of park and recreation facilities, including trails and greenways.

"State-side" LWCF funds are annually distributed by the National Park Service through the North Carolina Department of Environmental Health and Natural Resources (DEHNR). Communities must match LWCF grants with 50 percent of the local project costs through in-kind services or cash. All projects funded by LWCF grants must be used exclusively for recreation purposes, in perpetuity. Funding for this program has not been available for several years, although funds could be allocated in the future.

Watershed Protection and Flood Prevention (Small Watersheds) Grants

The USDA Natural Resource Conservation Service (NRCS) provides funding to state and local agencies or nonprofit organizations authorized to carry out, maintain and operate watershed improvements involving less than 250,000 acres. The NRCS provides financial and technical assistance to eligible projects to improve watershed protection, flood prevention, sedimentation control, public water-based fish and wildlife enhancements, and recreation planning. The NRCS requires a 50 percent local match for public recreation, and fish and wildlife projects. For more information, contact Matthew Kinane with NRCS at (704) 792-0402.

Conservation Reserve Program

The U. S. Department of Agriculture, through its Agricultural Stabilization and Conservation Service, provides payments to farm owners and operators to place highly erodible or environmentally sensitive landscapes into a 10-15 year conservation contract. The participant, in return for annual payments during this period, agrees to implement a conservation plan approved by the local conservation district for converting these sensitive lands to a less intensive use. Individuals, associations, corporations,

estates, trusts, cities, counties and other entities are eligible for this program. This program can be used to fund the maintenance of open space and non-public use greenways along water bodies and ridge lines. Contact Matthew Kinane with NRCS at (704) 792-0402.

Wetlands Reserve Program

The Department of Agriculture also 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. It is administered by the NRCS in North Carolina. Contact Matthew Kinane with NRCS at (704) 792-0402.

Hazard Mitigation Grant Program

The Federal Emergency Management Agency (FEMA) provides grants to state and local governments for implementing long-term hazard mitigation measures following a major disaster declaration. Eligible projects include the acquisition and relocation of repetitive flood structures. Such lands, once acquired, can be converted into greenways for flood mitigation purposes. A 25 percent local match is required. All applications must be submitted no later than 90 days following FEMA's approval of the State Hazard Mitigation plan. Contact the Mitigation Division of FEMA Region IV for more information at (770) 220-5406.

Flood Mitigation Assistance

This FEMA program provides funds to states and communities to help reduce the long-term risk of flood damage to structures. Eligible projects include acquisition and relocation of insured structures. Grantees must participate in the National Flood Insurance Program and a 25 percent local match is required. The total amount of Flood Mitigation Assistance Grants provided during any 5-year period cannot exceed \$10 million to any state or \$3.3 million to any community. Contact the Mitigation Division of FEMA Region IV for more information at (770) 220-5406.

Conservation Contracts

The USDA Farm Service Agency can forgive debt from Farm Loan Program loans in exchange for conservation contracts on environmentally sensitive portions of a borrower's property. Contracts can be set up for conservation, recreational and wildlife purposes on farm property, including properties adjacent to streams and rivers. Interested individual borrowers should contact their local Farm Service Agency office to apply.

State

North Carolina Parks and Recreation Trust Fund

This relatively new funding source provides more than \$5 million in matching funds annually for local recreation land acquisition, develop-

ment and renovation to communities across the state. The funding source, which comes from a real estate transfer tax, requires a 50-50 match from local government and no more than \$250,000 can be requested. The Recreation Resources Service should be contacted for additional information (919-515-7118).

Clean Water Management Trust Fund

This Fund is another new funding source which provides dollars to build riparian buffers for environmental, recreational and educational benefits. This could be a major funding source for greenways in Mecklenburg County, with \$39 million available every year. Contact David McNaught at (919)954-5497 for more information.

Water Resources Development Project

This funding source provides up to \$1 million per year for acquisition and development of water-based recreation sites, including greenways. A 50-50 match is required. John Sutherland or Jeff Bruton with the Division of Water Resources should be contacted for additional information at (919) 715-5422.

North Carolina Department of Transportation

See TEA21 text above.

Local

Taxes

Greenways can be funded through sales tax revenues. One example of a community that is using sales tax dollars to fund bicycle and pedestrian facilities is Cobb County, Georgia, where citizens voted to implement a one percent local sales tax to provide funding for transportation projects. Over four years, Cobb County DOT will receive \$3.8 million of this sales tax revenue for bicycle improvements alone, to be used as a match for federal dollars. Another example is Oklahoma City, where voters approved a temporary \$0.01 sales tax, which generated millions of dollars for greenway acquisition and development.

Impact Fees

Impact fees are monetary one-time charges levied by a local government on new development. Unlike required dedications, impact fees can be applied to finance greenway facilities located outside the boundary of development. The General Assembly has permitted a "small but growing number of local governments to impose impact fees". These fees can be levied through the subdivision or building permit process to finance greenways in Mecklenburg County.

Bond Referendums

The Charlotte-Mecklenburg County, NC, area has passed four referendums that generated more than \$3 million for greenways. This funding source could be used in the future to continue funding greenways. Since bonds rely on the support of the voting population, an aggressive education and awareness program will need to be implemented prior to any referendum vote.

Local Capital Improvements Program

Some local governments have initiated a yearly appropriation for greenway and trail development in the capital improvements program. In Raleigh, NC, greenways continue to be built and maintained, year after year, due to a dedicated source of annual funding, that has ranged from \$100,000 to \$500,000, administered through the Parks and Recreation Department.

Private Funding Sources

Many communities have solicited greenway funding from a variety of private foundations, corporations, and other conservation-minded benefactors. As a general rule, local foundations and businesses will have a greater interest in and be more likely to fund local projects. These local sources should be approached first, before seeking funds outside the community.

Local Foundations

The following is a listing of foundations that award grants for environmental projects in the Mecklenburg area. Each of these is a potential source of funding for greenways in the County. Contact information is provided.

Foundation for the Carolinas Venture Grants
1043 E. Morehead St., Suite 100
Charlotte, NC 28234-4769
704-376-9541

Ralph N. Jones Foundation
2316 South Boulevard
Charlotte, NC 28203
704-333-8930

The Sing Foundation
1701 South Boulevard
Charlotte, NC 28203

Philip L. Van Every Foundation
c/o Lance Inc.
P.O. Box 32368
Charlotte, NC 28232
704-554-1421

O'H. Rankin Foundation
2611 Richardson Drive
Charlotte, NC 28211
704-364-0070

Provident Benevolent Foundation
c/o Wachovia Charitable Funds
100 North Main Street
Winston-Salem, NC 27150-7131
336-732-6478

Lance Foundation
P.O. Box 32368
Charlotte, NC 28232
704-554-1421

First Union National Bank of North Carolina
CMG 12-1161
Charlotte, NC 28288-0143
704-374-6649

Dowd Foundation
P.O. Box 35430
Charlotte, NC 28235
704-372-5030

The Dickson Foundation
2000 Two First Union Center
Charlotte, NC 28282
704-372-5404

Harry L. Dalton Foundation
736 Wachovia Center
Charlotte, NC 28285
704-332-5380

The Culbertson Foundation
638 Museum Drive
Charlotte, NC 28207
704-375-4060

The Blumenthal Foundation
P.O. Box 34689
Charlotte, NC 28234
704-377-6555

The Belk Foundation
2801 West Tyvola Road
Charlotte, NC 28217-4500
704-357-1000

The Bailey Wildlife Foundation
10223 Bushveld Lane
Raleigh, NC 27612-6149

Mary Reynolds Babcock Foundation
102 Reynolds Village
Winston-Salem, NC 27106-5123

The Kathleen Price Bryan Family Fund
220 S. Eugene St.
Greensboro, NC 27401
336-273-0080

Collins & Aikman Foundation
701 McCullough Drive
Charlotte, NC 28262
704-548-2389

Community Foundation of Western North Carolina, Inc.
14 College Street
Asheville, NC 28802
828-254-4960

Cumberland Community Foundation
P.O. Box 2171
Fayetteville, NC 28302-2171
910-483-4449

CP&L Foundation
P.O. Box 2591
Raleigh, NC 27602-2591
919-546-6309

Duke Energy Foundation
P.O. Box 1244 (PBO3Q)
Charlotte, NC 28201-1244
704-382-7200

A. E. Finley Foundation
P.O. Box 98266
Raleigh, NC 27624

Karl and Anna Ginter Foundation and the
James G. Hanes Memorial Fund
c/o NationsBank, N. A.
One NationsBank Plaza, NC-002-08-12
Charlotte, NC 28255
704-386-8750

D. F. Halton Foundation
P.O. Box 241167
Charlotte, NC 28224
704-523-6761

John and Anna Hanes Foundation
c/o Wachovia Bank of North Carolina, N.A.
P.O. Box 3099, MC-37131
Winston-Salem, NC 27150
336-732-5274

James and Angelia Harris Foundation
P.O. Box 220427
Charlotte, NC 28222
704-364-6046

Hillsdale Fund
P.O. Box 20124
Greensboro, NC 27420
336-274-5471

The Reese Foundation
P.O. Box 69
Hickory, NC 28603
704-322-3431

Z. Smith Reynolds Foundation
101 Reynolda Village
Winston-Salem, NC 27106-5199
336-725-7541

Grace Richardson Fund
c/o Piedmont Financial Co., Inc.
and Grace Jones Richardson Trust
P.O. Box 20124
Greensboro, NC 27420-0124
336-484-2033

Salisbury Community Foundation
P.O. Box 34769
Charlotte, NC 28234-4769
704-376-9541

George Shinn Foundation
One Hive Drive
Charlotte, NC 28217

The Wachovia Foundation
c/o Wachovia Bank of North Carolina, N. A.
P. O. Box 3099
Winston-Salem, NC 27150-7131

The Parker Foundation
926 Elizabeth Avenue
Charlotte, NC 28204
704-339-0125

Local Businesses

Local industries and private businesses may agree to provide support for development of greenways in Mecklenburg County through:

- donations of cash to a specific greenway segment;
- donations of services by corporations to reduce the cost of greenway implementation, including equipment and labor to construct and install elements of a trail;
- reductions in the cost of materials purchased from local businesses which support greenway implementation and can supply essential products for facility development.

This method of raising funds requires a great deal of staff coordination. One example of a successful endeavor of this type is the Swift Creek Recycled Greenway in Cary, NC. A total of \$40,000 in donated construction materials and labor made this trail an award-winning demonstration project. (Some materials used in the "recycled trail" were considered waste materials by local industries!)

Trail Sponsors

A sponsorship program for trail amenities allows for smaller donations to be received both from individuals and businesses. The program must be well planned and organized, with design standards and associated costs established for each amenity. Project elements which may be funded can include wayside exhibits, benches, trash receptacles, entry signage, and picnic areas. Usually, plaques recognizing the individual contributors are placed on the constructed amenities or at a prominent entry point to the trail.

Volunteer Work

Community volunteers may help with trail construction, as well as fund raising. Potential sources of volunteer labor in Mecklenburg County could

include local bicyclists, local historical groups, neighborhood associations, local churches, conservation groups, school groups, and local civic clubs such as Kiwanis, Rotary and Lions Clubs.

A good example of a volunteer greenway program is Cheyenne, Wyoming, which generated an impressive amount of community support and volunteer work. The program has the unusual problem of having to insist that volunteers wait to begin landscaping trails until construction is completed. A manual for greenway volunteers was developed in 1994 to guide and regulate volunteer work. The manual includes a description of appropriate volunteer efforts, request forms, waiver and release forms, and a completion form (volunteers are asked to summarize their accomplishments). Written guidelines are also provided for volunteer work in 100-year floodplains.

Locally, volunteers were used on two different Saturdays to plant trees, shrubs and bulbs at Freedom Park. Park and Recreation staff, landscape architects, and local nursery volunteers led workforce groups consisting of individuals, families, school groups, and others in this planting effort. Local nurseries donated digging equipment, plant materials, fertilizer, and other items to the effort as well.

To better organize volunteer activity, Cheyenne developed an "Adopt-a-Spot" program. Participants who adopt a segment of trail are responsible for periodic trash pick-up, but can also install landscaping, prune trail-side vegetation, develop wildlife enhancement projects, and install site amenities. All improvements must be consistent with the Greenway Development Plan and must be approved by the local Greenway Coordinator. Adopt-a-Spot volunteers are allowed to display their names on a small sign along the adopted section of greenway.

"Buy-a-Foot" Programs

"Buy-a-Foot" programs have been successful in raising funds and awareness for trail and greenway projects across the country. Under local initiatives, citizens are encouraged to purchase one linear foot of the greenway by donating the cost of construction. An excellent example of a successful endeavor is the High Point Greenway "Buy-a-Foot" campaign, in which linear greenway "feet" were sold at a cost of \$25 per foot. Those who donated were given a greenway T-shirt and a certificate. This project provided an estimated \$5,000 in funds.

American Greenways DuPont Awards

The Conservation Fund's American Greenways Program has teamed with the DuPont 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, building trails, and other creative projects. Grants cannot be used for academic research, institutional support, lobbying or political activities. For more information, contact the Conservation Fund at (703) 525-6300.

REI Environmental Grants

REI (Recreational Equipment Incorporated) awards grants to organizations in protecting and enhancing natural resources for outdoor recreation. Grants of up to \$2,000 are available through this program and can be used for:

1. Preservation of wildlands and open space;
2. Advocacy-oriented education for the general public on conservation issues;
3. Building the membership base of a conservation organization;
4. Direct citizen action (lobbying) campaigns for public land and water recreation issues; and
5. projects that serve to organize a trail constituency or enhance the effectiveness of a trail organization's work as an advocate.

Grants cannot be used for trail construction and maintenance. For more information, call REI's Grantline at (253) 395-7100.

Appendix D: Corridors and Facility Design Guidelines

The following pages provide an illustrated set of descriptions for each of the primary greenway corridors including overland connectors featured in this Master Plan. The purpose of these corridor descriptions is to provide the Mecklenburg County Park and Recreation Department staff and general public with additional information that may be valuable in future discussions regarding possible uses for each corridor.

The design development guidelines featured in this Appendix have been tailored to meet the specific facility development needs of the Mecklenburg County Greenway System. The purpose of these guidelines is to assist public and private sector agencies, organizations and individuals in developing greenway facilities that are in keeping with the overall program objectives.

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 Mecklenburg County Park and Recreation Department disclaims any liability for the use, appropriateness and accuracy of these guidelines as they apply to a specific project.

The following criteria 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, and the Manual on Uniform Traffic Control Devices.
- Mecklenburg County Park and Recreation Department design details and technical specifications for trail facility development
- North Carolina Department of Transportation Bicycle and Pedestrian Transportation Facility Guidelines
- Mecklenburg County Storm Water Channel Restoration Techniques

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

Trails for the Twenty-First Century

Published by Island Press, 1993

Edited by Karen-Lee Ryan, Rails-to-Trails Conservancy

Guide to the Development of Bicycle Facilities

Updated in 1991 by the American Association of State Highway Transportation Officials (AASHTO). Available from FHWA or AASHTO.

Manual on Uniform Traffic Control Devices (MUTCD)

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

Mountain Bike Trails: Techniques for Design, Construction and Maintenance

Published by Bike-Centennial, Missoula, MT

Universal Access to Outdoor Recreation: A Design Guide

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

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.