

Sidewalk, Bikeway, Greenway, and Trail Master Plan

*A Plan for a More Livable Community
through the Development of Pedestrian
and Bicycle Facilities, Greenways, and Trails*

**Hickory Regional Planning Commission
Hickory Recreation Commission**

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Preface

On January 16, 1996, the Hickory City Council unanimously adopted a statement of Goals and Objectives that included, among other things, instructions to the Council Sidewalk Committee, "to make recommendations for a sidewalk master plan and funding for same."

The Sidewalk Committee, made up of representatives from City Council and the Recreation and Planning Commissions, began meeting in February 1996 and adopted the following statement to guide its activities:

"The goal of the Task Force is to develop a cost effective sidewalk and bikeway plan to provide a more attractive environment for walking and cycling that encourages people to walk and cycle for both transportation and recreation, that beautifies the City and enhances property values, that links the City together by reaching into the neighborhoods, that connects walkers and cyclists to other modes of transportation, and that recommends priorities and funding mechanisms for implementation."

The Sidewalk Task Force met six times, and heard reports from the Planning, Engineering and Public Services Departments and the Western Piedmont Council of Governments on the current status of pedestrian and bicycle facilities and planning in the Hickory area. They reviewed data on bicycle and pedestrian travel, studied existing and needed improvements in assigned areas, and suggested numerous improvements and strategies for consideration by the City Council. On February 27, 1997, the Task Force approved the Sidewalk and Bikeway Master Plan for submission to the City Council as its recommendation. Prior to the development of this document, there was no formal plan for the identification and development of desirable pedestrian and bicycle facilities in Hickory and its extraterritorial planning jurisdiction.

Executive Summary

The Hickory Sidewalk, Bikeway, Greenway, and Trail Master Plan was developed as an update to the 1997 Hickory Sidewalk and Bikeway Master Plan. The planning process included involvement from the Sidewalk, Bikeway, Greenway, and Trail Task Force made up of members from Hickory City Council, the Planning and Parks and Recreation Commissions, and City staff.

The plan provides overall guidance for policy and program development for improving access and mobility for pedestrians and bicyclists.

The objectives and goals of the plan are:

- ❑ The provision of bicycle and pedestrian facilities to support the mobility needs of the citizen, to improve the safety of walkers and cyclists, and to enhance the city's quality of life.
- ❑ The provision of a comprehensive program of education and enforcement strategies to improve the safety of cyclists and pedestrians.
- ❑ The integration of bicycle and pedestrian facilities with schools, open space, recreation, transit, and land development planning.
- ❑ The encouragement for bicycling and walking as viable alternative modes of transportation.

Consistent with these goals and objectives, the Master Plan identifies a network of sidewalks (approx. 137 miles), bikeways (approx. 132 miles), greenways (8.8 miles) and trails (0.34 miles), and proposes design guidelines to assist in the implementation of the network. ***The network maps are enclosed in the back of the Plan.*** It also addresses initiatives to develop new sidewalks, bicycle routes, greenways, and trails connecting the city's parks, schools, cultural, and shopping centers and recommends improved pedestrian and bicycle access to these destinations. Finally, the Plan proposes initiatives in the areas of facility maintenance, bicycle encouragement, enforcement, and education.

Implementing the plan could have a profoundly positive impact on the City of Hickory by enhancing resident's transportation and recreational options, improving the city's air quality, alleviating the city's congestion and, in general, transforming Hickory into a more welcoming and enjoyable place in which to live, work, and visit.

Introduction

Supporting the needs of pedestrians and bicyclists is a central component to Hickory's movement toward a multi-modal transportation system. Since the passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21), momentum has grown in the state for developing pedestrian and bicycle facilities, which offer the city an opportunity to develop a comprehensive program and policy for supporting pedestrian and bicycle travel modes.

The Sidewalk, Bicycle, Greenway, and Trail Master Plan is intended to create a continuous, safety-oriented system of sidewalks, bikeways, greenways, and trails in and around the City. Generally, its goal is to provide convenient access to schools, activity centers, transit routes, parks, and other recreation areas, thereby increasing citizens' mobility choices while reducing reliance on Single Occupancy Vehicles (SOV's).

To accomplish this goal, the Master Plan set forth policies relating to the planning, design, implementation, and maintenance of pedestrian and bicycle facilities.

The plan also identifies and prioritizes pedestrian projects for future implementation. Priority is given to projects that improve system connectivity, complete missing links between existing facilities, and address safety issues and access to activity centers and transit routes

Why the 1997 Master Plan was updated

Since February 1997, approximately three of the recommendations have been implemented and new priorities for sidewalk construction and the greenway and trail components were added. The greenway and trail components are an integral part of the Master Plan update. As the region's population continues to grow, providing facilities that create a safe and efficient environment for pedestrians and bicycles will become increasingly important. The pedestrian and bicycle components should respond to and support both the development and function of transit services and the land use/transportation concepts of the Hickory by Choice Study. Combined with investments in public transportation, support for non-motorized modes could support long-term congestion relief and community livability benefits.

Investments in pedestrian facilities, bicycle paths and lanes, and encouraging pedestrian and bicycle friendly development need to be accompanied by changes in local zoning codes, site planning requirements, and street design standards. Within this context, a fresh perspective needs to be taken for integrating walking and bicycling needs into new methods of transportation planning.

The pedestrian and bicycle component of the Master Plan is being developed in close coordination with the Task Force. The city's Planning, Engineering, and Parks and Recreation Departments provide technical support to the Task Force and are part of a broader public involvement process.

Background Information

(summarized from *Bicycling and Walking in North Carolina: A Long-Range Transportation Plan*)

Walking and bicycling have become more fully recognized as basic forms of transportation that contributes many benefits to North Carolina. Not only do these forms of transportation offer improved health and fitness, they also promote a cleaner environment and present affordable transportation options to all ages and segments of our society. Virtually every trip, regardless of its mode, has a walking component, and walking and cycling form a much higher percentage of trips taken in dense urban areas, in downtowns, around schools and colleges, and in areas where public transit is an important mode of transportation.

With the passage of the ISTEA, urban areas, such as Hickory, are required to have fully integrated transportation plans, which include thoroughfares, transit, and bicycle and pedestrian components. The ISTEA is a major departure from previous federal highway building programs because it incorporates key concepts that are important to bicyclists and pedestrians. It encourages improvements that make walking, bicycling, and transit more accessible. Federal funds can now more easily be invested in projects that include bicycling and pedestrian facilities that primarily meet state and local transportation, rather than recreational needs. Examples of such projects are: wide paved shoulders, bicycle

paths, bicycle route mapping or signs, bicycle racks, pedestrian paths, sidewalks, pedestrian bridges, pedestrian streetscape improvements, and purchase of abandoned rail corridors for conversion to bicycle trails.

Every state must now have a coordinator responsible for bicycle and pedestrian issues, a long-range 20-year bicycle and pedestrian plan and a newly created Transportation Enhancements category of funding containing bicycle and pedestrian improvements among the eligible categories.

In 1992, in response to the ISTEA, the North Carolina Department of Transportation (NCDOT) Bicycle Program that was created in 1973 became the North Carolina Office of Bicycle and Pedestrian Transportation (NCOBPT). This office promotes bicycling and walking through the construction of facilities and the development of public educational and safety programs.

The TEA-21 builds on the initiatives established in the ISTEA (the last major authorizing legislation for surface transportation). This new Act combines the continuation and improvements of programs authorized under the ISTEA with new initiatives to meet the challenges of improving safety as traffic continues to increase at record levels.

The Hickory-Newton-Conover Metropolitan Planning Organization (MPO), which coordinates surface transportation planning in the Hickory-Newton-Conover Urban Area, has developed a new plan for the year 2020, which links the bicycle and pedestrian planning efforts of all eleven of its local governments. It provides the basis for the regional efforts. It should be noted that many types of bicycle and pedestrian facilities, which may now be considered for inclusion in new highway construction projects as part of an urban area's surface transportation plan, would affect project selection. Other factors affecting project selection include: total project cost, availability of right-of-way (ROW), existing or proposed facilities nearby, conformance with state and federal design standards, and local maintenance of completed projects.

Overview

Pedestrian facilities are a vital part of a city's transportation system. Sidewalks provide access to transit routes and business centers, offering residents alternative choices for commuting to work and non-work related trips. Pedestrian facilities also provide links to schools, activity centers, and other recreational areas. These facilities provide access to city parks and enable people to travel on foot from one park to another. An integrated and well-maintained system of sidewalks and off-street trails makes walking an attractive option for people of all ages, whether they are going to work, school, or seeking exercise or recreation.

The existing off-street bikeway in Northwest Hickory links Geitner and Hickory City Parks for recreational uses. Planned routes for bicyclists provide access to transit routes and neighborhood shopping areas, making this an attractive alternative for commuters. Building and maintaining bicycle facilities along planned routes is a key strategy of this plan.

Sidewalk and Bicycle Project Maps at the end of the Plan show locations of proposed projects and identify each project by facility type. All sidewalk projects listed in the plan are prioritized. Short-Range projects address safety issues, provide access to activity centers, create links to transit or schools, or complete connections between planned pedestrian or bicycle facilities. System connectivity is an additional consideration. These projects should be completed within 1-12 years. Medium-Range projects, on the other hand, are in the category that will be constructed in the 12-20-year time frame and Long-Range projects in 20 years and beyond. Opportunity and the availability of funds are determining factors in the implementation of these projects.

Chapter 1 Visions, Objectives and Goals

- A. *The City of Hickory should provide bicycle and pedestrian facilities to support the mobility needs of its citizens, to promote walking and bicycling as alternative modes of travel, to improve the safety of walkers and cyclists, and to enhance the City's quality of life.*
- ❑ Pursue inclusion of bicycle and pedestrian improvements when state and local thoroughfares are planned and constructed.
 - ❑ Complete a network of bikeways that serve bicycle needs, especially for travel to employment and commercial centers, transit stops, institutions, and recreational destinations.
 - ❑ Link parks, schools, transit stops, shopping, and employment areas with a network of bicycle and pedestrian facilities.
 - ❑ Map all bicycle routes.
 - ❑ Clearly mark and sign all pedestrian crossings and bikeways.
- B. *The City of Hickory should provide a comprehensive program of education and enforcement strategies to improve the safety of pedestrians and bicyclist.*
- ❑ Develop and implement school-based bicycle and pedestrian safety education programs through the Hickory Police Department (HPD) and the North Carolina Office of Bicycle and Pedestrian Transportation (NCOBPT).
 - ❑ Encourage bicycle helmet usage through promotion and education.
- C. *The City of Hickory should integrate pedestrian and bicycle-planning facilities with school, open space, recreation, transit, and land development planning.*
- ❑ Amend ordinances to require construction of planned sidewalks and bikeways or wider road lanes when land develops.
 - ❑ Develop and prioritize a bicycle and pedestrian facility capital improvement plan with dedicated funding.
 - ❑ Coordinate local sidewalks and bikeways with regional plans for pedestrian and bikeway improvements.
 - ❑ Provide sidewalks to all Piedmont Wagon Transit System (PWTS) bus stops.
- D. *The City of Hickory should encourage walking and bicycling as viable modes of transportation.*
- ❑ Sponsor promotions, events, and activities that encourage bicycling and walking.

- Develop inter-modal links and facilities to encourage pedestrians and cyclists to use transit.
- Provide or encourage the placement of bike racks at parks, schools, shopping areas, employment centers, and government facilities.

Sidewalks and bikeways have generally not been considered as important components of the city's transportation system in the past years. These are the facilities with the greatest air quality impact per mile. The kinds of improvements to the transportation system needed to accommodate and encourage mode shifts to walking or bicycling will tend to be very local and widely distributed. Centers where people live, work, go to school, shop, or play will be candidates for walking and bicycling facilities, and should be considered as part of a regional strategy to expand the use of pedestrian and bicycle modes.

Chapter 2 Current Conditions

Laws

The City Code contains numerous laws that apply to the use of the City's sidewalks and bikeways. Several sections of the code prohibit certain types of travel on these facilities. For example, Section 5-2 of the City Code forbids cyclists riders from using a roadway if there is an adjacent bike path. Section 5-7 prohibits from riding a bicycle on a sidewalk in a business district and prohibits anyone over the age of 10 from riding on any sidewalk. Section 29-19 prohibits roller-skating and skateboarding on sidewalks. Section 18-10 prohibits skating and skateboarding on city streets, except at cross walks. In short, the Code prohibits skating and skateboarding on both sidewalks and roadways, except perhaps on such special facilities as the bikeway at City Park. The code does not require the use of any safety equipment, such as helmets, but does require bicycles to have horns or bells.

The City does require the construction of new planned sidewalks as development occurs. The City's Subdivision Regulations allow developers to choose between constructing sidewalks, making payments to a parks and open space fund, contributing land for future parks, or furnishing private recreational facilities. Sidewalks can be negotiated when Planned Development plans are submitted for Council approval. However, generally sidewalks are only required where they are proposed in the 1997 Sidewalk and Bikeway Master Plan. Also, as a matter of practice, sidewalks are generally only constructed when curbed and guttered streets are developed. City standards now require that all new street Right of Ways (ROW's) be graded for their full width to accommodate future sidewalk development.

Other Plans

Parks and Recreation Master Plan – The Parks and Recreation Commission held four public hearings on the Parks and Recreation *Master Plan*. At each meeting, citizens expressed the need to develop sidewalks to link and provide access to the City's park. The Park and Recreation *Master Plan* that was submitted to Council in February 1997 recommended the installation or upgrading of walking tracts at the Westmont Recreation Center, Brown-Penn/Ridgeview Recreation Center, the future Sandy Pines Park, Stanford Park, Neill Clark Park, Geitner/Optimist Park, and Kiwanis Park. In addition, the Plan recommended the development of hiking trails at the Cloninger Mills property. It stated, "In terms of outdoor recreation, better access to Lake Hickory is needed, as are more walking tracks and picnic facilities. New greenway links should be sought out."¹ According to the plan, "There are few opportunities to link other parks into a greenway system, however, efforts should continue to extend the bikeway-greenway program, and especially in the area of Neill Clark Park."²

Thoroughfare Plan – Section 5 of the 1997 Hickory-Newton-Conover Urban Area Transportation Plan³ addressed both pedestrian and sidewalk and bicycle planning issues.

¹ Parks and Recreation Master Plan, 1997. Page 1.

² Parks and Recreation Master Plan, 1997. Page 7.

³ Hickory-Newton-Conover Urban Area Transportation Plan, 1997, p. V-29-V-38

However, it recommended bike lanes for streets with "sufficient bicycle travel" and suggests that all streets be developed with sufficient rights of way (ROW) to accommodate sidewalks with a buffer strip between the sidewalk and curb. The plan recommends that utility poles be at least six feet behind the curb. The Transportation Plan focuses almost exclusively on roadway development and does not indicate where pedestrian or bicycle facilities should be constructed or developed along existing or proposed roadway. The Hickory-Newton-Conover Urban Area Transportation Plan is due for another update in 2003.

Level-of-use Data

There are no data on the number of people who walk or ride their bicycles to neighborhood stores in Hickory, However, for pedestrian activity, there is composite data from the Nationwide Personal Transportation Study, conducted by the University of North Carolina Highway Safety Research Center. This study provides some information on walking trips, including the following:

- Over 90 percent of all walking trips are less than one mile.
- Walking trips that are one mile or less account for 27 percent of the distance people travel by walking.

Chapter 3 Sidewalk and Bicycle Planning in Hickory

3.1 Concerns, Needs and Benefits

3.1.1 Community Concerns

The Task Force identified several concerns during its discussion of pedestrian and bicycle needs in Hickory.

Community Concerns:

- ❑ The foremost concern is for safety. There are areas of the City without adequate sidewalks and many roads are uncomfortably narrow for bicycling. Drivers, cyclists, and pedestrians are often not well informed about the laws and practices that are necessary to safely share the public ROW.
- ❑ The absence of a continuous network of sidewalks and bicycling routes linking the City's neighborhoods, schools, shopping areas, parks, and employment centers does not facilitate the use of alternative modes of travel, nor does it encourage a healthy lifestyle or interaction among our citizens.
- ❑ Every trip on the City's Piedmont Wagon Transit System (PWTS') buses begins or ends with a pedestrian trip; however, not all bus stops are served with sidewalks.

3.1.2 Needs and Opportunities

To assist with the development of this plan, a Sidewalk, Greenway, Bikeway, and Trail Task Force was established. Through a series of discussions, the Task Force raised key issues that need to be addressed through future bicycle and pedestrian policy and program development. These include the need to:

- ❑ Develop a comprehensive approach to addressing pedestrian and bicycling mobility and access.
- ❑ Institute a bicycle and pedestrian program to include: on-road facilities (paved shoulders, bicycle lanes, striping, signs, and traffic calming), off-road facilities (multi-use paths and bicycle parking), pedestrian facilities (sidewalks, crosswalks, and paths), and facility maintenance.
- ❑ Improve and expand the educational programs and institute promotional activities (to better inform the public about the existence of bicycle and pedestrian facilities) for bicycle and pedestrian safety.
- ❑ Endorse and encourage walking and bicycling as legitimate transportation modes.
- ❑ Develop a coordinated region-wide system for bicycle travel by linking regional bicycle and pedestrian planning.

3.1.3 Benefits of Walking and Bicycling

Surveys conducted in 1990 estimated that 73 percent of adults in the US walked outdoors, especially for exercise (Harris Poll), and that walking was one of the fastest growing participant sports in the country (National Sporting Goods Association). National surveys also suggest that there is a latent demand for bicycling and walking and that more people would walk or bicycle if conditions were better.

Health Benefits

The benefits of regular exercise on human health have been well established. Exercise contributes to prevention and management of heart disease, hypertension, obesity and diabetes, osteoporosis, and depression. Walking and bicycling are excellent forms of exercise, which can contribute to these physiological benefits.

Social Benefits

There are also social benefits derived from walking and bicycling, as these forms of recreation and transportation offer opportunities for personal interaction, which are less available when traveling by motor vehicle. Social interaction allows for people to communicate with one another and helps to build a sense of community. Attractive, safe, and accessible places to walk or bicycle can help to improve the character of a community for recreation, culture, quality of life, and community pride.

Aesthetic Attributes

The Task Force recognizes that the City's streets and sidewalks are important public places that are a reflection of the values of the community. Therefore, the appearance and maintenance of the City's sidewalks and bikeways should reflect the environmental qualities inherent to our area and should be treated as opportunities for public landscaping and beautification. It is therefore the opinion of the Task Force that knitting the community together with a network of sidewalks and bikeways will provide Hickory with a powerful attraction for high quality economic development.

Environmental Benefits

A variety of environmental benefits are derived from increasing bicycling, walking, and reducing automobile use. Unlike most other transportation modes, bicycling and walking are non-polluting and consume proportionally small quantities of petroleum products. The Federal Highway Administration (FHWA) has reported that in 1991, bicycling and walking in the US were estimated to have saved 370 to 1,340 million gallons of gasoline and 4.4 to 16.3 million metric tons of air emission pollutants (FHWA, 1994). Efforts to increase bicycling and walking in Hickory will help maintain compliance with federal clean air standards – National Ambient Air Quality Standards (NAAQS).

Transportation Benefits

In terms of transportation benefits, on and off-road transportation improvements to accommodate bicyclists and pedestrians can help enhance safety for motorists and non-

motorists alike. A 1991 study determined that the addition of a four-foot wide shoulder improvement on two-lane roads could reduce motor vehicle crashes by 29 percent (FHWA, 1994). Similarly, traffic calming devices can both reduce vehicular speed and enhance pedestrian and bicycle safety. We can reduce congestion and decrease the number of conflicts between users by increasing the number of trips made on foot and on bicycle, and accommodating those users by implementing new and improved facilities.

Strategies to improve pedestrian and bicycle mobility and accessibility within the transportation system can also lead to overall improvements in land use patterns. Urban designs that include sidewalks, traffic calming devices and pedestrian crosswalks can reduce the need for automobile travel by offering safe and convenient access to businesses, schools, and employment centers. A network of bicycle and sidewalk facilities can link community facilities and reduce the need for automobile dependency, thereby supporting neighborhood centers.

Improved accommodation for bicycles and pedestrians can eventually help lead Hickory toward a multi-modal transportation system in which residents and visitors can travel throughout the community by foot, bicycle, or transit, with greatly reduced dependence on cars.

3.2 Population and Transportation Projections

The Office of State Planning estimates Hickory's population to be 36,057(as of September 2000). Catawba County's population is now projected to increase to 134,287 in 2000, 146,488 in 2010, and to approximately 157,650 in 2020, according to the Western Piedmont Council of Governments' forecast. The highest growth areas will be in Census Tracts 102,103, and 104 in Northeast and Northwest Hickory where population densities per square mile will approach those of larger cities like Charlotte.

Implications for Walking and Bicycling.

As Vehicle Miles Traveled (VMT) increases in the region, the increased traffic on the roads could act as a deterrent to walking and bicycling and there will be a competition for road space among surface modes (auto, truck, public transit, bicycle, and pedestrian). Conversely, increases in VMT may result in increased congestion, which could prompt modal shifts if attractive alternatives are available.

The transportation implications of an aging population must not be overlooked. Many of today's adults will live longer and will face mobility restrictions if their needs as pedestrians are not addressed. The largest component of the population increase in the next 20 years in Hickory will be the elderly. With an abundance of leisure time, these aging citizens will be demanding safe and convenient pedestrian facilities.

3.3 Policy Direction for Pedestrians and Bicycles

Encouraged by the Hickory by Choice Study that was adopted in 1999, the FY 1999-2000 budget provided \$195,000.00 for sidewalk facilities. Under the 2000 Transportation Enhancement Program application submitted in June 2000, the city requested \$364,930.00 to fund a system of bicycle facilities that would improve access to transit, recreation, schools, and commercial destinations. This level of investments underscores the importance of pedestrian and bicycle facilities to support the city's transit system and increase travel options for residents. It also strongly supports the integration of land use/transportation planning that has a more pedestrian and bicycle friendly orientation. Other policies contained in the Study that support pedestrian and bicycle facilities are:

- ❑ Develop a citywide coordinated network of facilities for pedestrian and bicycles.
- ❑ Promote transportation projects that ensure the most efficiency out of existing roads.
- ❑ Promote programs encouraging use of transit and ridesharing options that modify travel behavior.
- ❑ Promote programs that shift travel demand to less congested times of the day or reduced demand.
- ❑ Provide for higher density in single-family and multi-family residential areas within walking distance of either jobs or transit service.
- ❑ Promote community urban design plans to guide new development to be compatible with existing development and supportive of transit, pedestrian, and bicycle access.

While the policies listed below are consistent with the original vision of the Task Force, they provide more specific direction with regard to pedestrian and bicycle facility development and emphasis.

- ❑ Concentrate growth into compact, well-defined places that are connected by an efficient, transit-oriented, multi-modal transportation system and provide (through a continuous network of sidewalks in both residential and commercial areas) the opportunity for residents to live near jobs and urban activities.
- ❑ Promote design that preserves community character and livability and people-oriented areas, and supports transit, pedestrian, and bicycle access.
- ❑ Promote land use and transportation solutions that reduce air pollution.
- ❑ Emphasize transportation investments that provide alternatives to SOV's, such as transit, bikeways and pedestrian paths, and Transportation Demand Management (TDM).

Chapter 4 Sidewalk and Bicycle Facilities and Programs

4.1 Introduction

The Task Force has identified approximately 137 miles of sidewalks⁴ and 132 miles of bikeways plus 4.6 miles of existing bikeway⁵ in Hickory. In addition, there are five miles of walking tracks and unpaved trails in City parks. Existing sidewalks are concentrated in older sections of the City, especially in areas radiating out from the City's historic center.

The Task Force has also identified some areas for improvement in these facilities. Sidewalks are often discontinuous, and even where they are continuous, they shift from one side of the street to the other requiring pedestrians to cross the street in order to remain on the sidewalk. Some older sidewalks are not handicap accessible at intersections or driveway cuts. Due to limited ROW, sidewalks are sometimes built around telephone and power poles, which can create obstructions. Not all sidewalks are well maintained, and adjacent property owners occasionally allow bushes and shrubs to partially obstruct sidewalks. Many sidewalks are constructed immediately behind curbs without an intervening utility strip, which places pedestrian uncomfortably close to traffic on several major streets. Some major corridors have no sidewalks (for example, US 70 SE and SW or US 321 North). Some PWTS bus stops are located in areas without sidewalks, which necessitates that some riders wait on unimproved rights-of-way and to walk to and from the bus stop across unimproved rights-of-way or in the street.

Most bicycling now occurs, and will continue to occur, on the same network of local roads used by motor vehicles. The use of roads and road shoulders by bicyclists and pedestrians is not surprising because these highways generally provide the most direct, and in some instances, the only route to neighborhood destinations. Unfortunately, some roads have not historically been designed with bicycles and pedestrians in mind. This has created a number of functional, funding, and structural issues that need to be addressed.

4.2 Design Guidelines

Design standards are a critical component in the sidewalk and bikeway network implementation process. They help to ensure a consistent, safe level of service for users and protect city governmental agencies from liability issues in the event of injury. The City of Hickory Engineering Department follows design standards contained in the Manual of Practice and all other appropriate documents.

⁴ See Appendix B, p. 55.

⁵ See Appendix C, p. 56.

The design guidelines are a compilation of national guidelines. The city's local design guidelines have been based in whole or in part on national and state standards. The following is a list of the National standards.⁴

1. Guide to the Development of New Bicycle Facilities, the American Association of State Highway and Transportation Officials (AASHTO). Released in 1981, and updated in 1991, the AASHTO Guide has become the basic reference for facility designers across the country.

2. North Carolina Bicycle Facilities Planning And Design Guidelines.

This manual draws heavily upon several publications of the AASHTO.

3. Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Administration.

Released in 1935, and updated in 1988, the MUTCD is the national manual for streets and highways. Conformance with the manual's standards is required in nearly every state by statute.

4. Guidelines for Greenways, The Greenway Collaborative.

This document provides detailed advice on the planning, design and maintenance of multi-use paths and trails.

5. Design and Maintenance Manual for Multi-use Trails, Rail-to-Trails Conservancy.

This document provides information similar to that found in Guidelines for Greenways, but with an emphasis on abandoned rail corridors and canal towpaths.

6. Guidelines for Establishing In-Line Skate Trails in Park and Recreation Areas,

International In-Line Skating Association.

The **City of Hickory Manual of Practice** establishes a width of 5 feet as the standard for sidewalks and contains design standards for wheel chair ramps and crosswalks.

Generally, sidewalks are not constructed unless the street has been curbed. Recently, in Hickory's draft **Landscape Master Plan**, the FWA Consultant Group recommended that the City eliminate the grass utility strip often located between the sidewalk and curb in favor of establishing wider sidewalks with concrete poured to the back of the curb.

Opinion is divided as to relative merits of either design. The aesthetics of locating the planting strip toward the street or toward the adjacent property and issues of maintenance, safety, ease of adding traffic signs, light poles, utility meters, and other fixtures, must often be weighed against the availability of rights-of-way, topography, development of adjacent property, relative costs of construction, intended use, amount of traffic flow on the street, wishes of adjoining property owners, and other factors in a case by case assessment.

4.2.1 Types of Bikeways

The following descriptions of facility types are based on the AASHTO 1991 Guide for the Development of Bicycle Facilities. Which type of bikeway is appropriate for a particular segment of the bikeway network will depend primarily on the volume, speed, and make-up of the motor vehicle traffic on the segment.

Bike Lane. – A designated division of the roadway for the preferential or sole use of bicyclists designated through the use of pavement markings, striping, and special signing.

It is recommended that the typical width of a bicycle lane should extend out at least 5 feet (or 4 feet from the gutter) for the bicyclist to feel comfortable, and it should be marked with a 4” to 8” wide stripe delineating the lane. Bike lanes are especially appropriate for areas that experience average daily traffic of more than 10,000 vehicles and where vehicles travel at more than 30 MPH and the traffic volume exceeds 10,000 AADT.

Separate Bicycle Path. – A bikeway physically separated from motorized vehicles by an open space or barrier, which is open to all forms of non-motorized traffic.

These facilities can be located within an exclusive ROW as in the case of rails to trail conversion, or may be constructed adjacent to a street or highway with adequate safeguards that motorized vehicles will not attempt to enter the path. To be successful, bicycle paths should be designed to avoid conflict points with streets. If there is enough ROW, bicycle paths should be at least 10 feet wide and optimally up to 12 feet in width if a great deal of pedestrian use is expected. In general, bike paths should be considered where average motor vehicle speeds (85th percentile) exceeds 40 mph and the traffic volume is in excess of 18,000 AADT.

Shared Lane. – These bikeways provide no designated separate area for bicycle traffic and require bicyclists to travel within a standard width travel lane, which can often cause motorist to change lanes or enter an opposing lane when overtaking a bicyclist.

Posted signs or symbols may mark routes. “Shared the Road” signs help to promote motorist awareness of bicyclists in shared lanes. It is recommended that the “Share the Road” signs be installed sparingly because motorists will tend to disregard them if they are overuse.

Shared lanes of at least 14 feet in width are appropriate for all riders in areas with low speeds and volumes.

Bicycle Route. – A portion of a system of bikeways designated under the authority of the appropriate jurisdiction.

Bicycle routes can be designated to provide a continuous route between designated facilities or can identify a long touring route, and will be based upon whether bicycling is safe and convenient along a particular street. Special attention should be taken to divert bicyclists away from streets not capable of supporting safe bicycle travel. Directional signing is recommended.

Bikeways in Existing Pavement Width.

Many streets in parts of Hickory already have sufficient width to accommodate bikeways on existing pavement. Streets and roads with relatively low motor vehicle volumes generally function well on shared roadways, and even for those roads for which on-street bike lanes are warranted, it is possible in many cases to find the width for bike lanes without widening the street. One option is the narrowing of traffic lanes. This may lower motor vehicle speeds, which makes the street safer not only for bicyclists and pedestrians, but motorists as well.

Bikeways on New and Reconstructed Roads.

Every new road construction or road reconstruction project should include provisions for use of the road by bicyclists. The appropriate design treatment, for example, bike lane or shared roadway, will depend on the anticipated motor vehicle traffic volumes and speeds.

Bicycle Parking

It is important that bicyclists have secure places to park their bikes at or near each of their destinations. For those destinations at which the bicycle will be parked a relatively short time, a simple bike rack is sufficient. On the other hand, individuals who commute by bicycle may wish to have protection for their bicycles by using lockers.

- ❑ *Public Parking* – Whenever public parking is provided for automobiles it should also be provided for bicycles. This could apply to the public parking lots in downtown Hickory and the on street parking that serves the retail and commercial establishments. As a general rule, bicycle racks will be installed as needed. However, at other more frequented traffic destinations such as schools, libraries, and parks they should be provided at a higher ratio than at the downtown locations.
- ❑ *Private Parking* – Many commercial and business establishments in Hickory provide parking facilities for the use of their employees and customers. These facilities should include provisions for secure bicycle parking.

Business and commercial owners should be encouraged, as a matter of civic responsibility, to convert some automobile parking to secure bicycle parking. For new developments with a capacity of 50 or more automobiles, the provision for a bicycle parking facility should be considered.

Incentives for Employee Use of Alternative Transportation

The free parking provided by many employers represents a substantial subsidy to the use of automobiles by their employees. Instead of automatically providing free parking to all employees, employers should be encouraged to offer employees the choice of a parking permit or a direct payment to subsidize their use of alternative modes of transportation.

4.2.2 Sidewalks

Specific guidance is offered by the AASHTO for determining where sidewalks should be used. Sidewalks can be placed in urban collectors and local streets for "...pedestrian access to schools, parks, shopping areas, and transit stops and placed along all streets in commercial areas on both sides of the street. In residential areas, sidewalks are desirable on both sides of the streets but need to be provided on at least one side of all local or collector streets."⁶ The City of Hickory Land Development Code requires sidewalks along both sides of all proposed roadways (public and private) except for cul-de-sac that will carry less than 200 cars per day or less, in which case it is are required only on one side of the street.⁷

4.3 Network Development

4.3.1 Sidewalks

Appendix A outlines the sidewalk projects to be funded. These projects are conceptual and the Engineering Department will develop the details of design as the projects proceed further along in the implementation process.

Table 1 illustrates the most complete guidance, developed as part of the FHWA requirements, regarding when and where to install sidewalks. It is based on the type of area, type of roadway, and the number of dwelling units per acre.

⁶ A sidewalk may be omitted on one side of any new street when that side clearly cannot be developed and when there are no uses or planned uses for that side that would encourage people to walk there.

⁷ City of Hickory Land Development Code (Draft 9/11/00), p 168.

Table 1: Guidance for installing sidewalks based on area type, roadway type, and number of dwelling units per acre

Type of Area (Land-use, roadway functional classifications, or number of dwelling units)	Sidewalk Placement Recommendations On. ...	
	...new urban and suburban streets?	...existing urban and suburban streets?
Commercial and industrial streets.	On both sides of these streets.	On both sides of these streets—make every effort to add them and to complete missing links.
Residential—major arterials	On both sides of these streets	On both sides of these streets
Residential –collectors	On both sides of these streets	For multi-family dwelling—on both sides of these streets. For single-family dwellings—on at least one side of these streets.
Residential ⁸ —local streets with more than 4 units per acre.	On both sides of these streets	Preferred on both sides, but required for at least one side
Residential—local streets with less than 1 unit per acre.	Required on one side, but preferred on both sides	Preferred on at least one side. At least 1.2 m (4ft) shoulder required on both sides
Residential—local streets with less than 1 unit per acre.	On one side of these streets preferred, but shoulder on both sides required.	Preferred on at least one side. At least 1.2 m (4ft) shoulder required on both sides

Source: Planning and Designing: Local Pedestrian Facilities, NCDOT Office of Bicycle and Pedestrian Transportation, 1997

4.3.2 Bikeways

The primary consideration in identifying segments of a proposed bikeway network is the extent to which the bikeways contribute to meeting the stated goals of the Task Force. A considerable amount of commercial, employment and residential destinations are

⁸ According to the Hickory By Choice Comprehensive Land Use and Transportation Plan, Primary and Secondary Residential developments have an average density of housing of approximately six and four units per acre respectively. Comprehensive Land Use and Transportation Plan, Hickory By Choice, 1998 p. 44.

located on arterial and collector streets and roads (e.g. Hwy 70 and Center Street). This is where the bikeways should be placed in order for them to provide convenient access. These streets and roads generally provide the safest routes for bicyclists, since they tend to minimize the number of street crossings at uncontrolled intersections. Bike lanes should always be considered when any arterial or collector street is reconstructed. The bikeway routes identified in this plan as part of the designated bikeway network are those routes on which there is a high density of traffic destinations, especially traffic destinations likely to attract bicyclists, and routes which provide continuity and access to these high density segments.

As of the summer of 2000, approximately 1.6 miles of bike path already exists at Hickory City Park. There is a total of 132 miles of bikeway proposed in this Master Plan. This includes a 17.1-mile bikeway, based on the 2000 Transportation Enhancement Program funding application submitted in May 2000. If the project is funded, it will facilitate the implementation of approximately 13 percent of the total bikeway network. The number of new bikeway miles to be added to the network over the 20-year implementation period is illustrated below.

Table 2: A Benchmark (Cumulative over time)

By 5 Years	By 10 Years	By 20 Years
40 % Complete Approximately 52.8 miles	60% Complete Approximately 79.2 miles	100% Complete Approximately 132 miles

Action Items

- ❑ Implement bikeway facilities as part of all transportation improvements, including road construction, reconstruction, and other transportation projects (e.g.traffic calming improvements, intersection improvements, etc).
- ❑ Coordinate with North Carolina Department of Transportation NCDOT and NCOBPT, for Catawba, Caldwell, Alexander, and Burke Counties to ensure appropriate bicycle connections.
- ❑ Coordinate with Lenoir Rhyne College, Catawba Valley Community College, and the City of Hickory Public and private schools as well as employers with over 100 employees on improvements.

Table 3: Recommended Bikeway Network Implementation Costs.

Facility	Estimated Number of Miles	Estimated Costs
Bicycle Lanes (Existing curbed streets)	To be determined	N/A
Bicycle Lanes (Shoulder widening)	To be determined	N/A
Bicycle Paths	N/A	N/A

Table 4: Cost (Cumulative over time).

0-12 Years	12-20 Years	20 Years and Beyond
N/A Miles	N/A Miles	N/A Miles
N/A Dollars	N/A Dollars	N/A Dollars
ENGINEERING DEPT.		

4.4 Complying with Federal Standards

Since 1981, bicycle facility construction has been guided by the AASHTO “Guidelines for Development of New Bicycle Facilities” (1981). No comparable document exists for pedestrian facilities. The AASHTO’s guidelines covers some elements of the planning process and general design characteristics of roadway improvements for bicycles (drain grates, railroad crossings, pavement, traffic control devices, shoulders, wide curb lanes, bicycle routes, and bicycle lanes) and bicycle paths (width and clearance, design speed, horizontal alignment and super-elevation, grade, sight-distance, intersections, signing and marking, pavement structures, structures, drainage, lighting, restriction of motor vehicle traffic, and multi-use). The guide was updated in 1991, but still provides only an overview of the issues.

The design standards outlined in the AASHTO apply to most projects using federal or state funds. When federal funds are used, the local jurisdiction is required to use federal design standards. However, when local funds are used exclusively, each jurisdiction is able to tailor the federal guidelines to its own purposes, which often leads to inconsistencies in pedestrian facilities across jurisdictions.

Americans with Disabilities Act (ADA)

The requirement to comply with the ADA must be considered when determining sidewalk design and location.⁹ Proposed rules implementing the act will affect both transportation facilities and building sites. This Act requires that public and private developments provide access to all people. For example, public facilities such as hotels, parks, and hospitals will be required to remove barriers gradually, beginning with those that can be handled quickly and economically. These improvements tend to benefit the broader pedestrian community beyond the physically challenged people targeted by the ADA. In accordance with the North Carolina General Statutes 136-44.14, all street curbs in North Carolina that are being constructed or reconstructed for maintenance procedures, traffic operations, repairs, correction of utilities, or altered for any reason after September 1, 1973, should provide wheel chair ramps for the physically handicapped at all intersections where curb and gutter is provided and at other major points of pedestrian flow. Wheel chair ramps and depressed curbs shall be constructed in accordance with

⁹ Americans with Disabilities Act Handbook, U.S. Equal Employment Opportunity Commission and the U.S. Department of Justice, Washington, DC, October 1992.

details contained in the Department of Transportation, Division of Highways' publication entitled, *Guidelines, Curb Cuts, and Ramps for Handicapped Persons*.¹⁰

4.5 Bicycle and Pedestrian Safety Education Program

According to the North Carolina Bicycle Facilities Planning and Design Guidelines, "it is the policy of the North Carolina Board of Transportation (NCBOT) that education of both motorists and bicyclists, regarding the rights and responsibilities of bicycle riders, shall be an integral part of the Board's Bicycle Program". School systems are encouraged to institute bicycle safety education programs as part of and in addition to driver's education program and in conjunction with the Governor's Highway Safety Program. The Division of Motor Vehicles (DMV) is also urged to include bicycle safety and user information in its motor vehicle safety publications.¹¹

Education and awareness are key ingredients to safely accommodate bicyclists and pedestrians and encourage the use of bicycles as a mode of transportation. Not all motorists are aware that bicyclists enjoy the same rights to the road as do operators of motor vehicles and many bicyclists are either unaware of or choose to ignore their responsibilities as road users. Moreover, safe bicycling techniques sometimes run counter to intuition, even for adults. Therefore, it is important that attempts to promote bicycle transportation be accompanied by programs to educate bicyclists and motorists alike about their rights and responsibilities as road users and about proper techniques for cycling and driving in mixed traffic.

4.5.1 Safety Education

Unsafe bicycling practices are an all too common sight as the number of automobiles on the road increases annually. Bicyclists can be seen riding against traffic, running red lights, and ignoring stop signs. Young bicyclists riding on sidewalks often ride full-tilt across intersecting streets, without so much as a glance to check for turning automobiles. Unsafe practices like these can have dire consequences. The National Highway Traffic Administration reports that for 65 percent of the 841 cyclists killed in accidents nationwide with motor vehicles in 1991, police reported one or more errors on the part of the cyclists. The most common error was "failure to yield ROW," followed by "improper crossing of roadway or intersection," and "failure to obey traffic signs and traffic control devices."

While the development of bicycle facilities is one way to enhance bicyclist's safety, clearly there are bicycle accidents that can only be counter-measured through education and enforcement programs. Thus, a comprehensive bicycle plan must include components covering bicyclists' education and enforcement of rules of the road for both bicyclists and motor vehicle drivers.

¹⁰ NCDOT Minimum Construction Standards (Subdivision Roads) provides specific information on the design and construction of pedestrian facilities.

¹¹ North Carolina Bicycle Facilities Planning and Design Guidelines, NCDOT, 1994.

Targets

Primary audiences for education and awareness efforts about bicycles and pedestrian safety are described below.

Children – The ideal program to educate children about bicycle safety is one that is integrated through the school system and is supported by parents. The City and the five Hickory Elementary Schools are working to promote a comprehensive bicycle safety curriculum targeted at all fourth grade students. Research indicates that a school-based curriculum often shows results in terms of a positive change in children’s knowledge and behavior, such as obeying traffic laws and wearing protective helmets. For better results it is imperative that the school curriculum is supplemented with parents’ follow-up messages to children.

Adults – Adult bicyclists typically do understand the basics of the traffic system. In many cases, however, they do not understand how (or are unwilling) to operate a bicycle within that system. Within this category there are also distinctions that should be made between advanced and beginner adult bicyclists, as well as different needs of commuter versus recreational bicyclists.

Motorists – Motorists sometimes harbor a variety of misconceptions regarding bicycling and walking. In addition, many drivers frequently fail to see or acknowledge the presence of bicyclists or pedestrians. Many also believe that bicyclists have no right to use the highway, or consider them a nuisance whenever they are encountered.

Hickory Safety Education Program

Bicycling and walking are the only independent means of transportation available to children. The vulnerability of this group is reflected in the accident statistics illustrated in Table 5.

Table 5: Reported cases of bicycle accidents involving children and adults.¹²

Year	Catawba Mem. Hospital	Catawba Mem. Hospital	Total
	Inpatient	Outpatient	
1995	1	143	144
1996	4	135	139
1997	1	133	134
1998	5	146	151
1999	3	129	132
Total	14	686	700¹³

¹² Frye Regional Medical Center did not provide any data.

¹³ It is estimated that 96.3 percent of the reported bicycle accidents were related to Emergency Room visits.

The City's Safety Education Program will address traffic safety issues in the city's schools, both inside the classrooms and in a simulated traffic environment on school grounds. The program will coordinate traffic safety events with the HPD, speakers from NCDOT-NCOBPT, and local bicycle experts to educate fourth and fifth grade students about pedestrian and bicycle safety. The projects will be a cooperative effort between HPD, City of Hickory Board of Education, and the Department of Planning and Development, which will act as facilitator. An important first step in this process is a safety program presented in schools by members of the HPD's Community Policing Bicycle Patrol Program. It will focus on teaching children how to safely cross streets, ride bicycles, and will provide them with hands-on, interactive safety training. In addition, this education program will involve sponsoring public service announcements about safe bicycling on the radio.

These programs are important because it not only teaches safe bicycling to future automobile drivers, but also because it teaches the rules of the road as well as respect for all forms of transportation.



Hickory Police Department Community Policing Bicycle Patrol

The Basics of Bicycling Grant – In December 1999, the Hickory City Public Schools, in concert with the City of Hickory, was awarded a \$5,000 grant, (of which the City of Hickory contributed an additional \$1,000 and the Public Services Department contributed \$800 of In-kind services), funded by the NCDOT/NCOBPT. This seven (7)- unit “Basics of Bicycling” curriculum is being administered for the first time during the 2000-2001 academic year. It will become a permanent part of the elementary schools curriculum.

With the exception of this grant, no other funding is specifically identified for bicycle safety education. However, as the Hickory Pedestrian and Bicycle Safety Education and the Basics of Bicycling Programs develop, and are integrated, designated funding will be sought.

Bicycle Helmets - The NCDOT-NCOBPT offers many programs that promote pedestrian and bicycle travel including helmet promotion, basics of bicycling programs, commuter incentives, share the road signs, bikeway mapping, bikeway construction programs, and design guidelines for bicycle facilities. The use of helmets should be encouraged by everybody as they have been proven to reduce the severity of injuries. It is estimated that more children are involved in collision as an increasing number of them now use bicycle for both transportation and recreational purposes.

The bicycle safety education program should encourage all bicyclists, young and old, to wear bicycle helmets for protection. Requiring the use of helmets and imposing financial penalty for non-use is not recommended.

4.5.2 Adult Programs

As interest in bicycling by baby-boomers increase, the need to educate this population about safe bicycling becomes more important. The HPD, as part of its community outreach program, and other interested groups should be encouraged to develop programs aimed at adults as well and deliver them to the public through the sponsorship of neighborhood associations, civic organizations, employers, and colleges.

Law Enforcement

A major disincentive to cycling is the number of cars and trucks on Hickory streets, sometimes driven above the posted speed limit. Thus, another element of a safe traveling environment is enforcement. It is essential for police officers to enforce the laws on bicycle use. Improper behavior in traffic creates hazardous situations for all road users, regardless of facility design. A combination of education and enforcement is important for young bicyclists, as they do not have the experience of dealing with traffic that motor vehicle operators have acquired. Although police statistics show the number of bicycle and pedestrian accidents have decreased since 1996 (see Appendix E), continued enforcement of motor vehicle regulations, especially motor vehicle speeds, is needed to continue the downward trend.

Enforcement of regulations is also needed to improve bicycle-pedestrian conflict. Young cyclists may be considered a menace to pedestrians when they ride their bicycles on the sidewalks. Often, they do this to compensate for the lack of bicycle lanes and paths.

The HPD's Community Policing Bicycle Patrol Program enhances patrol capacity by increasing accessibility of the beat areas. There are currently 20 Police Officers involved in this program that are outfitted with at least 20 bicycles and equipment.

Funding for the program is derived from public sources. A continuing effort should be made to encourage private funding from sources such as area businesses or civic organizations. The program is an example of the unique efficiency and mobility afforded

by the bicycle. Initial assessment reveals that the program increases visibility, provides positive interaction with citizens, improves beat officers' ability to respond to calls for service, and improves beat officer's mobility and image in the community.

4.5.3 Public Awareness Campaign

Federal and state funding should be sought for a public awareness campaign. This campaign becomes relevant as we begin to promote alternative means of transportation as a solution to the air quality problem in the region. The bicycle safety component of this program would be directed to adult and child bicyclist as well as motorist.

Recommendations

- ❑ A public awareness campaign should be implemented with the cooperation of local media-radio, television and newspaper (assuming that funding can be obtained) to promote bicycling and walking as a means of local transportation.
- ❑ The City declares a Bike-to-Work Week during National Bicycle Month in May of each year.

4.6 Bicycle to Transit

In the process of providing alternative modes of transportation, the city will seek to integrate bicycling with public transit by implementing the following:

- ❑ Bicycle accessibility on all PWTS buses and passenger rail cars.
- ❑ PWTS buses fitted with front and rear mounted bicycle racks to carry two bicycles each.
- ❑ Bicycle racks at the Multi-modal Transportation Center in downtown Hickory and at park-and-ride facilities.
- ❑ Bicycles being allowed on passenger rail cars.
- ❑ Bicyclists will be encouraged to watch a short instructional video, and demonstrate that they can use the bicycle racks.
- ❑ An aggressive bicycle-on-transit marketing strategy.

A network of bikeways complemented by secure bicycle parking at appropriate commercial, employment, school, cultural destinations, and bus stops/shelters are the key to attracting bicycle commuters and recreational users to transit. According to the Draft Hickory-Newton-Conover Urban/Rural Area Public Transit Master Plan, it is projected that 25 additional buses and a passenger rail system will be in operation over the next 25 years.

Encouraging bicycle-transit trips will improve the use of the bicycle as a mode of transportation as well as the PWTS ridership. However, the PWTS should also consider operational efficiency and safety as high priorities. Given the number of buses¹⁴ and passenger rail cars anticipated to be in operation over the next 25 years and considering the time delays of increased bicycle on transit usage, the PWTS anticipates being able to handle an increase in the number of bicycles on its buses.

Costs

The cost of implementing bicycle-transit trips will include providing bicycle racks on all buses and promoting the program. As most of these costs will be borne by the PWTS, no cost estimates have been made here in this plan.¹⁵

4.7 Bicycle Facility Maintenance Request Program

What may appear to be an adequate roadway surface for automobiles can be treacherous for bicyclists. Small rocks, minor ridges in the pavement, potholes, wet leaves, etc., can create hazards. Thus, it is important to properly maintain the surfaces. Bikeways will always be subject to debris accumulation and surface deterioration. The city's departmental maintenance strategy is basically to protect the investment of public funds in the bikeways so they can continue to be used safely. They understand that poorly maintained facilities will become unusable and they may become a legal liability. The maintenance plan should focus on preventing injury.

The city should implement a Bicycle Facility Maintenance Request Program. If implemented, this program will respond to requests for small-scale, low-cost improvements, such as sweeping, repairing surface problems, and replacing unsafe grating. Bicyclists could make a request in three ways:

1. By sending in a request card¹⁶. Cards would be available at area bicycle shops and through the bicycle interest groups in the Hickory-Newton-Conover area (such as the Crossroad Cycling Club).
2. By calling the City's Action Center at 323-7508 or Department of Planning and Development at 323-7422.
3. Sending e-mail request to Chuck Wiles: cwiles@ci.hickory.nc.us or Eric Ben-Davies: ebendav@ci.hickory.nc.us

The Planning and Development staff could catalog all requests and route them to the Public Services Department for appropriate action. Requests that are outside the scope of the program would be considered for the Capital Improvements Program (CIP) or other

¹⁴ The Hickory-Newton-Conover Urban Area Transit Master Plan projects five buses every five years.

¹⁵ See Hickory-Newton-Conover Urban Area Draft Master Plan for more information

¹⁶ See sample card in Appendix G.

funding sources. The person making the request would be contacted by letter or telephone once action has been taken.

Routine Maintenance

Sweeping – The Public Services Department current practice is to sweep arterial streets and bridges eight to ten times per year, residential streets six times per year, and the central business district six times per year. Each year the Planning Department should provide a list of high priority streets to Public Services, Street Division. This list would be used in planning resource allocations for street cleaning and routine maintenance.

Surface Repairs – A smooth surface, free of potholes and other obstructions, should be provided and maintained. Requests for surface improvements could be made through the Facility Maintenance Request Program.

Pavement Overlays. – Pavement overlay projects offer ideal opportunities to greatly ++++improve conditions for bicyclists. These projects offer a chance to widen the roadway for greater bicycle space, or to re-stripe the roadway with bike lanes.

Vegetation. – Vegetation encroachment into the bikeway is a nuisance and a safety hazard. Property owners in Hickory should be responsible for ensuring their trees and shrubs do not cause safety problems.

Sign, Stripes and Legends. – The program should ensure that bikeway signs and striping are kept in a readable condition through regular inspections.

Drainage Improvements. – Drainage facilities do change grades over time. A bicycle-safe drainage grate at the appropriate height should be used to improve bicycle safety. Unsafe grates should be replaced on a request basis and whenever bikeway improvements are made, for example, during installation of new bike lanes.

Chapter 5 Planning and Recommendations

5.1 Major Pedestrian and Bicycle Planning Issues

The Sidewalk, Bikeway, Greenway, and Trail Master Plan reflects the mobility and access needs of the city and is placed in a wider context than the simple movement of people and goods. Issues such as land use, the environment livability, and the quality of life are important factors.

5.1.1 Land Use

The ease of walking and bicycling is often determined by land use patterns. Prior to the acceptance of the integration of land use/transportation planning as a viable planning strategy, much of the built environment fostered a situation where the automobile was the dominant mode of transportation and required for most trips:

- ❑ Segregated land use increases the distance between origin and destination points.
- ❑ Commercial developments are designed to be readily accessible by automobile and buildings are set back and separated from the roadway with parking.
- ❑ The transportation system discourages walking and bicycling due to high traffic volumes and speeds.
- ❑ Land use patterns conducive to walking and bicycling include:
 - ❑ Greater housing densities allow more residents to live closer to neighborhood destinations such as stores and schools.
 - ❑ Mixed-use zoning allows services, residents, and businesses to share the same structure, reducing travel demands.
 - ❑ Locating buildings close to the street allows easy access by pedestrians.
 - ❑ The preservation of open spaces between communities creates a greenbelt, or a natural buffer that helps prevent urban sprawl.
 - ❑ Resolving conflicts with neighborhood traffic management (e.g., traffic calming) makes streets more inviting to walkers and bicyclists.
 - ❑ Integrating land use and transportation planning allows new developments to implement these strategies thereby making walking, bicycling, and public transit attractive options from the onset.

5.1.2 Pedestrian and Bicycle Access

Facilities such as US 321, US 70 or NC 127 could offer direct connections to major employment and commercial centers. However, the issue of pedestrian and bicycle access to these corridors is compounded by the general perception that they are undesirable and dangerous for non-motorized travel because of high traffic volumes and speed.

Therefore, bicycle and pedestrian use should be encouraged on alternate parallel streets where possible. Pedestrian-activated signals at grade level crossings should be considered. As well as grade separated pedestrian crossing for US 70, US 321, and McDonald Parkway crossings.

5.1.3 Public Transit

Transit trips begin and end with a walk or bike ride. Sidewalk and bicycle facilities in transit corridors will make the PWTS more effective. Therefore, high priority should be given to providing sidewalks and bikeways on transit routes and on local streets feeding these routes from the neighborhoods of Ridgeview, Kenworth, Green Park, Oakwood and Claremont. Transit users need to cross the road safely at stops. Bus stops should provide a pleasant environment for waiting passengers, with shelters, landscaping, adequate buffering from the road, and lighting. Their design should minimize disruptions with other non-motorized users, such as pedestrians walking past passengers waiting to board a bus or bicyclists on bike lanes.

Bus stops should be placed in locations that are readily accessible by pedestrians, or that can be made accessible by changing the configuration of adjacent land use. This can be done by:

- ❑ Orienting building entrances to the transit stop.
- ❑ Clustering buildings around transit stops.
- ❑ Locating transit stops close to business and commercial centers.

5.1.4 Transportation Demand Management (TDM)

The TDM includes transportation actions that reduce peak period SOV travel, spread of traffic volumes away from peak periods, or improve traffic flow. It is intended to ease demand on the transportation system by using low-cost strategies that encourage a more efficient use of existing facilities. Some commonly used strategies include: carpooling, vanpools, walking, bicycling, trip reduction ordinances, compressed or staggered work schedules, flex time, and telecommuting.

These strategies tend to be most successful where there are:

- ❑ Congested commuter corridors.
- ❑ Clearly identifiable work trip travel patterns.
- ❑ Clearly identifiable trip origin travel and destinations,
- ❑ Large employer work site or clusters of small employer work sites.
- ❑ Community commitment to improving air quality.
- ❑ Constrained parking at employer work sites.

- Available transportation alternatives.

The TDM is most effective where strategies are linked and users are offered a combination of viable transportation choices and incentives.

The relationship between TDM and walking and bicycling is two-fold:

1. Encouraging more employers to commute on foot and by bicycle can be part of a package of incentives.
2. Successful TDM strategies can reduce the volume of traffic on roadways at peak hours, with the following consequences for pedestrians and bicyclists:
 - A. Reduced traffic volumes may render the road less intimidating to pedestrians and bicyclists.
 - B. Reduced traffic volumes may decrease the need for additional capacity and free up funds and ROW's for pedestrian and bicycle facilities.

Consistency in pedestrian and bicycle facility planning among local jurisdictions

Among other things, the size and the available resources of the various local jurisdictions in the urbanized area will affect the level of effort that is placed on pedestrian and bicycle facility planning in Hickory. These differences create issues where a pedestrian or bicycle facility crosses jurisdictional boundaries.

Establishing priorities for funding

Local criteria for setting funding priorities need to be determined. For example, should facilities that serve the largest number of pedestrian or bicyclists regardless of type of use (recreation or short errands to neighborhood stores) be placed high on the priority list, or should extra weight be given to facilities that provide alternatives to single occupancy vehicle use or access to public transportation?

Public involvement and coordination processes.

Federal regulations are very explicit about the role of the public involvement process in the development of plans. The Task Force feels there is a need to bringing critical target populations into the process.

5.1.5 Project Prioritization

Needs assessments should result in a prioritization of projects with a corresponding balancing of immediate needs with available funding. Generally, the highest priority should be given to projects that create new opportunities for walking and bicycling. However, prioritization should not be too strict. In the case of unforeseen opportunities, such as grants or construction activities, some projects of lower priority may be completed before others of higher priority. This is especially true in regards to road construction. Also, some lower priority projects may be completed simply because they are inexpensive and easy to fund.

The Task Force has identified the primary sidewalks and bicycle routes within the City and evaluated the needed improvements based on the following prioritization:

- Short-Range Projects (1-12 Years)
 1. Addressing safety issues.
 2. Providing access to trip generators such as schools, employment centers, neighborhood shopping centers, transit and recreational facilities, and multi-family housing.
 3. Completing connections between planned pedestrian facilities.
 4. Connecting existing sidewalks sections to improve continuity and create loops.
 5. Adding continuity to existing but incomplete facilities.
- Medium-Range Projects (12-20 Years)
 1. Extending network of sidewalks into areas that have been recently annexed and those that will be annexed in the future.
 2. Creating additional loops and links additional neighborhoods commercial growth areas.
- Long-Range Projects (20 and above)
 1. These projects need coordination with the NCDOT Transportation Improvement Program (TIP) to provide sidewalks and bikeways on future thoroughfare routes.
 2. Providing sidewalks on both sides of heavily traveled, multi-lane streets

The Task Force has examined the City's bicycle and pedestrian system and policies and recommends the adoption of the following plan of action for initiating the implementation of its goals.¹⁷

5.2 Recommendations

- Implement the existing North Carolina Persons with Disabilities Protection Act (NCPDPA) to ensure compliance with requirements of ADA Title 11 regulation Sec. 35.130.
- Allocate a minimum annual expenditure as determined by Council to retrofit curbs until the City complies with the ADA.
- Coordinate utility and sidewalk projects in the street ROW.
- Develop a map to include sidewalks, bikeways, greenways and trails.

¹⁷ The implementation of sidewalk projects listed under this category began in FY 1997-1998.

- ❑ Provide bicycle access through installing bike racks on PWTS buses and allowing bicycles on passenger rail cars.
- ❑ Promote bicycle commuting through employer participation.
- ❑ Develop a public awareness campaign through the local media on the merits of bicycling.
- ❑ Maintain communication with bicycling communities throughout the region.
- ❑ The City should build a constituency for the protection and maintenance of the greenways through environmental education, private organizations and community involvement.
- ❑ The HPD's Community Policing Bicycle Patrol Program should provide security to all area on a regular basis.
- ❑ Implement (officially designate, sign, and stripe) and maintain a network of on-street bike lanes, potentially reaching 132 miles in length by 2020, making the bicycle a viable transportation option for more residents.
- ❑ Implement the proposed 8.8-mile greenway system and a .34 trail as part of the transportation network in Hickory.
- ❑ Provide bicycle parking and support facilities in public places and encourage the same in commercial and employment centers.

Chapter 6 Implementation

6.1 Opportunities and Challenges in implementing bicycle and pedestrian strategies

Planning for bicyclists and pedestrians needs to become an integral part of the city's transportation planning effort. It has become increasingly clear that the promotion of walking and bicycling as alternative modes of transportation can play an important role in developing possible solutions to the air pollution problems facing the city.

At the national level, the passage of the ISTEA in 1991 and the TEA-21 in 1998 have set forth a new level of planning and funding opportunities for implementing bicycle and pedestrian facility improvements. Given these modes, the regional vision will likely be a composite of much more geographically dispersed public perceptions of needs and desires relating to walking and bicycling. This creates a challenge for this type of planning process--- the development of a regional transportation plan for what is essentially the most local of transportation modes. On the one hand, there is the perception that since the Western Piedmont Council of Governments (WPCOG) is required to develop a regional plan, it should include only projects of regional (not local) significance. On the other hand, only programs included in the MPO's Transportation Plan will be eligible for federal funds. In other words, federal funds will be available only where local pedestrian and bicycle projects are of regional significance.

Federal regulations allow for the grouping of "minor projects" in both the Long-Range Transportation Plan and the TIP. This provides important opportunities for pedestrian and bicycle projects and has significant implications. For instance, this approach would support an evaluation of the potential air quality impacts of pedestrian and bicycle projects and programs on the basis of combined project implementation.

This type of analysis is critical to the inclusion of pedestrian and bicycle improvements as Transportation Control Measures (TCMs) in the State Improvement Program (SIP) for air quality attainment. If the WPCOG cannot establish that pedestrian and bicycle TCM investments will produce quantifiable air quality gains, the region will get no credit toward attainment of air quality goals. Hence, there would be no justification, from a SIP standpoint, for investment in pedestrian and bicycle projects. Similarly, guidance documents issued by the FHWA and Federal Transit Administration (FTA) make clear that MPOs must establish measurable air quality gains for projects proposed for funding using Congestion Mitigation and Air Quality (CMAQ) resources (See description under Funding Sources for Sidewalk, Bikeway, Greenway and Trails).

The investment in pedestrian and bicycle facilities will clearly advance implementation of the Hickory-Newton-Conover Urban/Rural Area Public Transit Master Plan since increasing the amount and share of pedestrian and bicycle facilities is an important part of the broader regional vision. Pedestrian and bicycle facilities support the land use and transportation concept of the Hickory by Choice Study by helping provide an environment where people can work, shop, attend school, and participate in recreational

activities without the use of a private vehicle. Any modal shift from a motorized to a non-motorized mode of travel also benefits the region's air quality.

6.2 Methods of Implementation

□ General Road Improvement

Wherever a road or street is constructed, reconstructed, or relocated, sidewalks and bikeways should be provided, unless the cost is too high, safety is compromised, or there is an absence of need. This may create temporarily incomplete sidewalk and bikeway segments, but as road improvements continue, these segments will become linked.

- The word “cost” is used as a relative term. Thus, if costs \$1.00 per square foot to construct a sidewalk that is located in an area where there are no pedestrian traffic, then the cost is too high. Similarly, if the cost of the sidewalk exceeds the cost of the road (because of ROW acquisition costs), then the cost is too high.
- The safety of the pedestrian is compromised when the speed and volume of traffic and obstructions, such as utility poles, are not conducive to pedestrian safety.
- There is an absence of need where the land use on a specific corridor or section of road does not anticipate pedestrian traffic

□ Stand-Alone Sidewalk or Bikeway Projects

Missing links in sidewalk and bikeway networks should be constructed to complete a corridor or to link up existing sidewalks and bikeways. Improvements range from simple sidewalk paving to major road-widening or bike striping/restriping projects. These projects may present opportunities to implement access management techniques, improve road alignment, repave the road surface, etc. This may increase costs, but will provide overall benefits to the corridor.

□ Maintenance Preservation Overlays

Though pavement overlay projects are designed to preserve the existing roadway surface, some low-cost improvements can be incorporated to provide benefits to pedestrians and bicyclists.

In areas where widening is not possible because of existing curbs and sidewalks, the most effective way to provide bike lanes is by reconfiguring lanes after paving. This saves the expense and inconvenience of removing existing strips. Coordination with local stakeholders ensures that all interested parties agree especially when on-street parking removal is required.

Low-cost pedestrian improvements that can be made during paving projects include completing segments of missing sidewalk and adding accessible curb ramps.

□ Minor Improvement Projects

Many inexpensive improvements can be made to enhance the walking and bicycling environment:

For bicyclists:

- Raising drainage grates flush with the road surface.
- Removing curbs, pavement markers and other obstructions
- Improving sight distance at curves by regrading or removing vegetation.
- Fixing surface irregularities in bike lanes or shoulders

For pedestrians:

- Replacing sidewalks in disrepair.
- Filling in sections of missing sidewalks.
- Improving crossing opportunities such as curb extensions

Private Development

The city's Subdivision Regulations that are included in the proposed Land Development Code require sidewalks along property frontage on all Transportation Plan roadways. Some road improvements are made by developers, such as widening the roads immediately adjacent to their property, providing new accesses, reconstructing existing roadways and intersections, and constructing new roads within subdivision. Alternately, a developer may choose to pay to the city an amount that is equivalent to the city's cost to construct the sidewalk.¹⁸

When roads are dedicated to the city, they become a public ROW. Therefore, they should be built to the same standard as public roads. They can become a financial burden and a liability if they must be retrofitted later at the public's expense.

6.3 Funding Sources for Sidewalks, Bikeways, Greenways

There are many different sources of funds for the acquisition, development, and management of sidewalks, bikeways, greenways and trail facilities. Clearly, the most successful method of funding greenways is to combine private sector funds with funds from local, state, and federal sources. Communities involved with greenway implementation could leverage local money with outside funding sources to increase resources available for greenway acquisition and development.

To implement greenways in Hickory, local advocates and city staff could pursue a variety of funding sources. The funding sources listed in this Chapter represent some of the greenway funding opportunities that have been pursued by other communities.

¹⁸ Land Development Code, Article 8, Section 8.7, Subsection 1, p. 167.

6.3.1 Federal and State

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

□ **TEA-21**

The TEA-21, and its predecessor, the ISTEA, is the single largest source of federal funding for greenways and other bicycle and pedestrian projects in the United States. It is administered through the United States Department of Transportation (USDOT) and provides up to 80 percent of the cost of developing and constructing facilities such as greenways, sidewalks, and bikeways.

There are many sections of the TEA-21 that support the development of bicycle and pedestrian transportation corridors. The NCDOT can utilize funding from any of these subsets of the TEA-21. Those sections that apply to the creation of sidewalks, greenways, and bikeways include:

□ **Surface Transportation Program (STP) funds**

Section 1007 of the ISTEA stipulates ten percent of each state's annual STP funds must be set aside for Transportation Enhancement Activity (TEA) 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. As with all the ISTEA funds, these projects are to be used principally for transportation, not recreation. The funding split is 80 percent Federal and 20 Local. The projects must be related to pedestrian and bicycle transportation and must be part of the Long-Range Transportation Plan. The funds are programmed by the local MPO in the TIP.

□ **Transportation Enhancement Program**

For FY 2000, the NCDOT has \$22 million available for enhancement awards for projects such as sidewalks, greenways, bikeways, trails, signage and safety education. Transportation enhancement funding is a cost reimbursement program and not a grant. The applicant may receive reimbursement for eligible costs as the work is completed. Work performed and cost incurred prior to project award and agreement execution are not eligible for reimbursement. There is a 20 percent local match required. Projects that are funded under this program, must comply with various federal laws (example: the American with Disabilities Act) and other applicable regulations to receive these funds. There is a cap of 2 percent of total construction cost on enhancement funding. The local government must agree to maintain sidewalks constructed under this program and secure any additional ROW if needed.

□ **The Congestion Mitigation and Air Quality Improvement Program (CMAQ)**

The CMAQ program provides federal transportation funds to support state and local development and implementation of projects that reduce transportation-related air

pollution. It was established by Section 1008 of the ISTEA to fund projects that initiate or expand transportation related infrastructures and services that have air quality benefits. It provides about \$1 billion per year for six years. The money is divided among the states based upon a legislative formula. Each state is guaranteed 0.5 percent, and the rest is given to states with areas where ozone and carbon monoxide levels do not meet air quality standards (non-attainment areas). It is anticipated our area will officially be declared in non-attainment at the end of this or the first part of next year. The formula takes into account the severity of the air pollution, as well as the population of the non-attainment areas within the state. Among the projects that are eligible for CMAQ funds are such facilities as bike racks, bike lockers, and showers.

□ **National Recreational Trails Fund Act (NRTFA or Symms Act)**

A component of the TEA-21, the NRTFA is a funding source to assist with the development of non-motorized trails. The Act 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.

Through state agencies, “Symms Act” Grants are available to private and public sector organizations. The NRTFA are 80 percent federally funded and 20 percent local match. Federal agency project sponsors or other Federal programs may provide additional Federal shares up to 95 percent. Local matches can be in the form of donations of service, materials, or land.

□ **Chapter 224 of the Sessions Laws of North Carolina**

The City has authority by virtue of Chapter 225 of the Session Laws of North Carolina to construct certain public improvements and assess their cost against abutting properties without a petition when Council finds improvements necessary for safety reasons. This process requires hearings and findings. Assessments may be paid in five to ten annual installments at 6 percent annual interest.

□ **Community Development Block Grant (CDBG) Program**

The United States 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, for example, High Point, NC (Boulding Branch Greenway) have used HUD funds to develop greenways.

The city may also continue to use its CDBG to finance the construction of sidewalks in low, and moderate, income areas or to pay sidewalk assessments for low, and moderate, income property owners. Historically, the city has utilized these funds in the past for this purpose.

- (1) The TEA-21 provides federal funding for transportation enhancement projects that build a better America by improving safety, protecting the environment and public health, and creating an opportunity for all Americans to improve their quality of life through Transportation Enhancements. The City must be willing to provide, at least a 20 percent cash match.
- (2) Other federal money is often available when greenway construction is included as part of highway or mass-transit projects.

6.3.2 Local sources

- According to the City Council's Goals and objectives for the FY 2000-2001, \$150,000.00 was allocated to fund greenways and landscaped streets connected to the downtown.¹⁹ This is a City Center project.
- The Sidewalk, Greenway, Bikeway, and Trail Task Force have established a sidewalk priority list. The City has appropriated between \$46,500 and \$120,000 each year since 1993 to finance the construction of these identified priorities. Funding in the FY1999-2000 budget for sidewalks was increased to \$195,000 (actual FY 2000 is \$121,485). The FY2001 Budget allocation is \$110,000.
- Property owners may petition for sidewalk improvements, which are assessed at the rate approved by City Council (approximately half the cost of construction). Assessment may be paid in five annual installments at an interest rate determined by statute.

How do Grants affect the Priorities outlined in the Master Plan

The implementation of sidewalks, bicycle lanes, greenways, and trails is not exclusively dependent on the availability of federal or state grants. Local funds are available to implement projects that have been prioritized by the Task Force. Funds secured through grants are project specific. In other words, projects implemented with grant funding will allow other projects to move up on the priority list. It should be noted that prioritization of projects is a continuous process. The availability of grant funding will enhance the overall implementation of the Master Plan.

¹⁹ City Council's Goals and objectives, 2000-2001 p. 201.

**City of Hickory
Sidewalk Master Plan
1997**



Prepared by the City of Hickory, NC 1-22-07

Chapter 7 Greenways & Urban Trails Plan

The City seeks to provide greenways to meet Hickory's conservation, recreation, and alternative transportation needs. This desire has led to the development of the Sidewalk, Bikeway, Greenway, and Trail Master Plan, which will be complemented by related bicycle and pedestrian planning efforts.

7.1 The Visions, Goals and Objectives

The City of Hickory's greenways will be multi-modal transportation corridors for cyclists, hikers, and other non-motorized users. Our goal is to connect the existing and planned trails and greenways that are locally owned and managed to form a continuous and safe network of green routes which can be easily identified by the public through signage, maps, and user guides. The long-term goal is to develop a network of greenways and bicycle pedestrian facilities that will connect parks, schools, and cultural centers. This will enable not only residents to travel short distances from their homes to local points of interest but also tourists to visit the vast store of history and culture within Hickory. The routes will be made up of pedestrian oriented transportation corridors utilizing floodplains, sidewalks, park paths, etc. This network within Hickory will link with other greenways and trails that may be developed in the surrounding area to form a true greenway network in the Greater Hickory Metro area.

Making Hickory a more bicycle and pedestrian-friendly city will necessarily generate a strong public interest in the creation of greenways and trails to form a connected network. The Sidewalk Bikeway Greenway and Trail Task Force will provide the vision to make these linkages and the coordination to see that it happens. A network of greenways and trails will contribute, both actually and symbolically, to advancing a number of agendas: increasing transportation options, improving air quality, reducing roadway congestion, encouraging eco-tourism and adventure travel, local economic development, improving mental and physical health via recreation and exercise, helping to connect people and communities, decreasing the ozone level and air pollution, and helping to create new public space.

What are Greenways and Urban Trails?

There are many types of greenways, and therefore many definitions. The defining characteristic of a greenway is its linear, connecting nature. Typically, greenways are continuous system of open spaces such as parks and privately owned natural areas, which are connected in some way. They can link people to their environment. They are also ribbons of open space that typically include paths for pedestrians and cyclists. When they contain pathways, greenways can furnish alternate modes of transportation. Greenways can also include historic areas, art walks, waterfront promenades, urban walkways, environmental demonstration trails, heritage walks, bikeways, rails to trails projects, and natural trails. They can also be ribbons of open space along rivers, streams, wildlife corridors, power lines ROW, ridges, marshes, or other "green" areas that do not contain paths, but are protected for environmental reasons.

A greenway can serve a variety of purposes: preservation of historically or culturally significant areas, protection of natural resources, including wildlife, wildlife habitat, wetlands, water quality, public recreation and education, or simply conservation of a natural area.

Particular geographies within the City have characteristics, which would be prohibitive to the implementation of greenways. Areas, such as the more established neighborhoods in and surrounding the downtown area have developed in a dense pattern and open unoccupied space to accommodate greenways is all but absent. In instances where such limitations occur the use of urban trails as segments of larger greenway projects are viable options. Urban trails can utilize existing sidewalk facilities or operate parallel to streets to provide linkages where traditional greenways would not be possible. Such trails should be so designed to provide users with clear and standardized markers to direct those users along the trails and connect with other segments of the facilities.

Design characteristics associated with the development of urban trails would involve the inclusion of planted or preserved landscaping between the pedestrian facility and the vehicular roadway. Additional design parameters would include surface markings, appropriate signage, and other user oriented amenities.

Greenways and urban trails may also be developed to include components involving the recognition of historical sites and events, cultural opportunities, such as public art, and educational opportunities for the general public.

Greenway and Urban Trail Concept

In April 2003, Hickory City Council officially recognized and authorized the Greenway/Trail Task Force to update the 2000 Greenway/Trail recommendations contained with the 2000 Sidewalk, Bikeway, Greenway, and Trail Master Plan. The Task Force recommends the implementation of greenway/trail projects as an effort to weave natural corridors through the City to community resources such as parks, cultural centers, schools, shopping centers, and areas of employment. Greenways are founded on three principles. First, where possible, the greenways follow natural corridors such as floodplains or existing ROW's, thus reducing conflict with private land holdings. Second, the greenways are conceived as interconnected loops. Finally, the greenways are conceptually designed to connect those areas and resources which are of value to a city and which distinguish that city as a special place in which to live. These areas include the natural landscape of the city, its neighborhoods, schools, parks, cultural facilities, and places of work and commerce.

Greenways give the public a way to walk through more of the natural settings instead of just asphalt and concrete without having to drive outside the city. Opportunities for greenways include utility easements, existing and abandoned railroad ROW, and environmentally sensitive areas such as wetlands and floodplains.

7.2 Benefits of Greenways and Urban Trails

Recreation – The growing popularity of outdoor recreation activities, such as roller blading and mountain biking, combined with the rapid loss of community open spaces, has increased the need for quality recreational facilities, such as greenways. Greenways can not only serve as stand-alone facilities, complete with parking areas and amenities such as benches and informational signage, they can also enhance the existing recreational resources in an area by linking parks, schools, and recreational centers.

Transportation – Two-thirds of all the trips we make are for a distance of five miles or less. Trails that are part of a network of pathways offer transportation alternatives by connecting homes, workplaces, schools, parks, shopping centers, and cultural attractions. Using trails to bicycle or walk for short distances trips reduces ozone levels and air pollution and increases the mobility of those who cannot drive.

Health – According to the Surgeon General, moderate exercise, such as walking and bicycling, performed on a regular basis can yield substantial health benefits for individuals. Greenway trails provide safe and convenient places for these activities, which have been proven to reduce stress, burn excess fat, and reduce a person's risk of developing cardiovascular problems, diabetes, cancer, and arthritis.

Economic – Greenways have been proven to attract and retain tourists and expand tourism revenues in many communities. Bicyclists spend money in places such as hotels, restaurants, retail stores, bicycle shops, and bed and breakfasts facilities.

Each year in September, bicyclists gather in Hickory to participate in the Bridge-to-Bridge Incredible Century Race. It is sponsored by Caldwell County to promote the county. Hundreds of bicyclists from around the country participate in this event. Also, in August, bicyclists from North Carolina, South Carolina, Virginia, Georgia, and Maryland gather at the Catawba Valley Community College for the annual Hickory Criterium. About 200 bicyclists participate.

Greenways are also economic assets that increase the real estate value of adjacent properties. A recent study from the real estate industry revealed that “walking and biking paths” ranked 3rd among 39 features identified by homebuyers as crucial factors in their home-purchasing decisions (1994 American Lives Study).

Economic impact analyses and general observation from greenway and pedestrian trail facilities throughout the United States are demonstrating the economic implications associated with the use of such facilities. A report by the National Park Service notes the economic impact of San Antonio's Riverwalk. The National Park Service report indicated that San Antonio's Riverwalk accounted for \$1.2 billion in annual spending. Although, the facility located in San Antonio is much larger in scale than those being recommended as part of this plan, the information provided should demonstrate the economic benefits associated with greenway and pedestrian trails.

The New River Trail and Foster Falls State Parks had 1,044,000 visitors last year, generating \$17.5 million in the local economy. The New River Trail State Park is a 57-mile greenway that follows an abandoned railroad right-of-way. It is Virginia's premier mountain bike and equestrian trail and was selected as a National Millennium Trail, one of 50 in the United States.

In West Virginia, the 78-mile-long Greenbrier River Trail, following an old railroad bed along the Greenbrier River from North Caldwell to Cass, has spawned a tourist industry in a rural area long on scenery but short on jobs since the state lost over half of its coal-mining jobs and 30 percent of its manufacturing jobs between 1980 and 1991. Greenbrier Trail users brought more than \$82,000 into the local economy during a 17-day period, reports a survey conducted by Dr. Raymond Busbee of Marshall University in Huntington.

A USDA Forest Services survey of users of the Virginia Creeper Trail demonstrated that nonlocal users of the trail spent on average \$330.00 per group visit to the area and that locals spend on average \$180.00 per year on outings related to the use of the Virginia Creeper Trail. The same study indicated that tourists travel an average of 250 miles to visit the Virginia Creeper Trail.

Education – The interpretation of natural, historic and cultural resources along a greenway serves to educate young and old alike. Examples of communities that have incorporated educational themes in the development of greenways include: Swift Creek Recycled Greenway in Cary, NC, where the use of recycled waste by-products is the featured element of the trail; the Stones River Greenway in Murfreesboro, TN, which emphasizes Civil War history; and the Boulder Greenway System in Boulder, CO, where “outdoor classrooms” help children learn about surrounding natural systems.

Environmental – In addition serving as components in the City’s transportation network and providing recreational opportunities, greenways also serve as important ecological tools for the protection and enhancement of the natural environment. They improve water quality by establishing buffers along creeks and streams and providing habitat for a diversity of plants and animal species. These buffers serve as natural filters, trapping pollutants from urban runoff, eroding areas, and agricultural lands. Additionally, greenways improve air quality by encouraging non-polluting forms of transportation.

Floodplain Management – In the 1990s, flooding caused more damage to communities across the nation than all other types of natural disasters combined. Today, communities are beginning to realize the benefits of protecting flood-prone areas through greenway development strategies, which reduces the impacts of flooding.

Quality of Life – Communities are always looking for ways to improve quality of life, which not only includes a strong economy and low taxes, but also a clean environment, good education system, access to outdoor resources, and neighborhoods that are friendly and free of crime. Greenways are an inexpensive way for cities and towns to improve their quality of life by providing all of these benefits. An improved quality of life attracts

individuals and corporations wishing to relocate and invest in the community, thereby improving the local economy as well.

7.3 Recommended Greenway and Urban Trail Projects

The Greenway/Trail Task Force has identified and is recommending the designation of the following Greenways and Urban Trails as components of the City’s pedestrian transportation network (Please see Appendix C for graphic depiction):

LF = Linear Feet, M = Mile

Project	Name	Description	Length
A	Henry Fork River Greenway	A linear greenway/trail along the Henry Fork River spanning from the westernmost planning area to the City of Hickory southeastward to the southernmost planning area of the City of Hickory. The proposed facility follows along the banks of the Henry Fork River. The facility uses the riverbank as its focal point as it meanders across Catawba County. A loop greenway/trail originating at the Henry Fork Park moving southwestward along the Henry Fork River and westward along a minor creek to link with Old Shelby Road and converting to an urban trail and moving northward to connect with Sweet Bay Lane and continue eastward and connect back to Henry Fork Park. A loop greenway/trail originating at the Henry Fork Park moving southwestward along the Henry Fork River and westward along a minor creek to link with Old Shelby Road and converting to an urban trail and moving northward to connect with Sweet Bay Lane and continue eastward and connect back to Henry Fork Park. The project also includes the following smaller loops and connectors : 1) a loop greenway/trail originating at the Henry Fork Park moving southwestward along the Henry Fork River and westward along a minor creek to link with Old Shelby Road and converting to an urban trail and moving northward to connect with Sweet Bay Lane. A linear greenway/trail linking the proposed greenway/trail along Moss Farm Road to the east and the Henry Fork River in the west. A linear greenway/trail linking the Henry Fork River in the south to Sweet Bay Lane in the north. A linear greenway linking with the Henry Fork River in the north and moving southeastward intersecting with Moss Farm Road.	13.42M
B	Geitner Creek Greenway	A linear greenway/trail beginning along the Henry Fork River and moving northward along Geitner Creek and under Interstate 40 and continuing northward to connect with 10 th Avenue SW.	1.86M
C	Southside Park Urban Trail Connector	An urban trail originating at Southside Park moving northeastward along 2nd Street SE and connecting with Project K at 10 th Avenue SE.	0.75M
D	6 th St SE / River Road Greenway	A linear greenway/trail originating at the southern limit 6 th Street SE in the north and moving southward crossing the Henry Fork River; connecting to Ponderosa Lane and moving westward to connect with River Road.	1.47M
E	Clark Creek Greenway	A linear greenway/trail originating at the westernmost extent of Amity Lane, moving westward to junction with Clark Creek and continue southward to the southernmost boundary of the City’s planning jurisdiction and also continuing northward to Us 70 to connect with the Ridgecrest Park Greenway (Project F)	1.63M
F	Ridgecrest Park Greenway	A linear greenway/trail originating at Ridgecrest Park traveling northward connecting to Tate Boulevard and eastward to connect to the 6 th Street SE. The linear greenway continues southward and connects and follows a creek under I-40 and continues further southward to US 70 where it connects with the Clark Creek Greenway (Project E)	2.08M

Project	Name	Description	Length
G	Lyle Creek Greenway	A linear greenway/trail originating at St. Stephens Elementary moving eastward along Lyle Creek located at the southern boundary of the school property and continuing to the easternmost extent of the City of Hickory's ETJ.	1.34M
H	East Lake Hickory Greenway Connector	A linear greenway/trail originating at the city owned property near 19 th Avenue NE and moving northward along Snow Creek and connecting with Clyde Campbell Elementary School and St. Stephens Park before terminating to the north at Lake Hickory. The East Lake Hickory Greenway Connector includes a linear greenway/trail traveling westward along and under an overhead powerline near 22 nd Avenue NE and connecting the Falling Creek Greenway (Project T).	5.3M
I	Cliff Teague Park Urban Trail & Greenway	A loop greenway/trail originating at Cliff Teague Park and traveling southward along a small creek to D Avenue SE, then converting to an urban trail and traveling northwestward to intersect with C Avenue SE, and traveling eastward back to Cliff Teague Park.	0.66M
J	7 th Avenue SW/ West Hickory Park Urban Trail & Greenway Connector	An urban trail originating at the intersection of South Center Street and 7 th Avenue NW traveling westward along 7 th Avenue SW along the northern boundary of Brown Penn Park to its intersection with 7 th Street SW where a spur travels to the north to connect with Optimist Park. At the intersection of 7 th Avenue SW and 7 th Street SW the urban trail continues westward turning to the south following 8 th Street SW then turning to the west paralleling US 70 then turning to the north following 9 th Street SW then turning to the west following 7 th Avenue SW crossing US 321 at the existing pedestrian bridge continuing westward to the intersection with 17 th Street SW where the urban trail continues to the north to connect with West Hickory Park. The urban trail also travel southward at the intersection of 7 th Avenue Se and 17 th Street SW turning to the west following 11 th Avenue SW connecting with the Geitner Creek Greenway (Project B)	2.7M
K	Kiwanis Park / Downtown Urban Trail Connector	A linear greenway/trail originating at the Kiwanis Park on 6 th Street NE moving southwestward then northwestward then changing to an urban trail following 10 th Avenue SE and turning to the north following South Center Street and terminating at Union Square.	1.52M
L	Downtown / YMCA Urban Trail & Greenway Connector	A linear urban trail originating at Union Square traveling northward along North Center Street and shifting over to 1 st Street NW and connect with the greenway/trail at the YMCA.	0.98M
M	YMCA / Hilton Park Greenway Connector	An urban trail originating near the YMCA on 4 th Street Drive NW moving northwestward along 7 th Avenue NW and northward along 6 th Street NW where it converts to a linear greenway and follows westward along following Cripple Creek then continuing to junction with Horseford Creek and continuing northward to terminate at Hilton Park. Once at Hilton Park the greenway/trail will loop around the existing park and connect in the southeast with 16 th Avenue Lane NW.	3.63M
N	Lakeland Park Greenway connector	A linear greenway/trail originating at Hilton Park traveling westward to the westernmost extent of the existing greenway/trail along Horseford Creek and continuing westward to connect with 16 th Avenue NW.	0.18M
O	Jaycee Park Greenway Loop	A linear greenway/trail originating near the intersection of 15 th Avenue NW and Old Lenoir Road and traveling northeastward around the VFW Post and Jaycee Park to connect with the existing greenway/trail	0.41M

Project	Name	Description	Length
		network located near Geitner Park.	
P	Winkler Park Greenway	A linear greenway/trail originating at Winkler Park traveling northward along a small creek and turning eastward and terminating near U.S. 321.	1.62M
Q	Salt Block / Lenoir Rhyne College Urban Trail Connector	A linear urban trail originating at the SALT Block traveling northward along 3 rd Street NE turning to the northeast along 5 th Avenue Place NE and then traveling northeastward along Stasavich Place NE crossing 8 th Avenue NE and following 9 th Avenue NE and 5 th Street NE to junction with the Stanford Park Urban Trail & Greenway Loop (Project S).	1.04M
R	Lenoir Rhyne College / Stanford Park Greenway Connector	A linear greenway/trail originating at Lenoir Rhyne College near 10 th Avenue NE and traveling northward along a small creek crossing 11 Avenue NE and 12 th Avenue NE and terminating at Stanford Park.	0.27M
S	Stanford Park Urban Trail & Greenway Loop	A loop greenway/trail originating at Stanford Park traveling northward along the eastern boundary of the adjacent golf course to 21 st Avenue NE then turning westward along 21 st Avenue NE turning southward following 5 th Street NE turning eastward and following 12 th Avenue NE and intersecting with the Lenoir Rhyne College / Stanford Park Greenway Connector (Project R).	1.87M
T	Falling Creek Greenway	A linear greenway/trail originating on City owned property at Lake Hickory traveling southward along Falling Creek across Cloninger Mill Road and Falling Creek Road to link with Jenkins Elementary School and continuing southward to link with North View Middle School and terminating at the convergence of two small creeks near 26 th Avenue NE.	3.83M
U	Neil Clark Park Greenway and Urban Trail	A linear greenway/trail originating on 25 th Street Drive NW traveling around the eastern boundary of Neill Clark Park to intersect with 29 th Avenue Drive NW. At its intersection with 29 th Avenue Drive NW the greenway converts to an urban trail and travels southeastward along 29 th Avenue Drive NW crossing NC 127 connecting with 28 th Avenue NE and terminating at North View Middle School and connecting with the Falling Creek Greenway (Project T).	1.83M

LF = Linear Feet

M = Mile

Note: All distances are approximate

7.4 Additional Recommendations

In addition to the recommendations contained within Section 7.3, the Greenway/Trail Task Force also recommends the implementation and/or exploration of the following policies:

- The consideration of regional connectivity to other greenway/trail systems within the region.
 - The possible westward expansion of the proposed greenway/trail along the Henry Fork River to connect with existing and/or proposed greenway/trail facilities within Burke County, and specifically the City of Morganton.
 - The possible northward expansion of the proposed greenway/trail originating at Winkler Park to connect with existing and/or proposed greenway/trail facilities within Caldwell County. A possible route for such a facility could utilize the existing short-line rail bed if the rail line were to ever cease to operate.
 - The possible southern expansion of the proposed greenway/trail along Clark Creek to connect with existing and/or proposed greenway/trail facilities within southern Catawba County.
 - The possible southward expansion of the proposed greenway/trail along the Henry Fork River or the proposed greenway/trail loop accessing the Henry Fork Park to connect with the Catawba County maintained park at Baker's Mountain.
- The exploration of providing pedestrian and cyclist access along utility easements and rights-of-way owned and/or maintained by private utilities.
- The consideration of the implementation of a system designed to mark proposed greenway/trail facilities outlined within Section 7.3.
- The consideration of the implementation of a program designed to produce maps of the City's greenway/trail network available to those interested in utilizing such facilities.
- The inclusion of education components to each recommended project. Such components could include markers which point out items of interest to those using the proposed facilities. Items of interest could include environmental and ecological aspects of greenway segments and historical and cultural depictions along urban trail segments.
- The consideration of greenway/trail designs that work to minimize any negative environmental impacts on the surrounding natural environment. In instances

where greenway/trail facilities do not utilize sidewalks or similar facilities the design of any pedestrian access ways should be designed as to not increase environmental degradation. Alternative surfacing materials and/or ground cover should be considered to minimize surface water runoff and nonpoint source pollution.

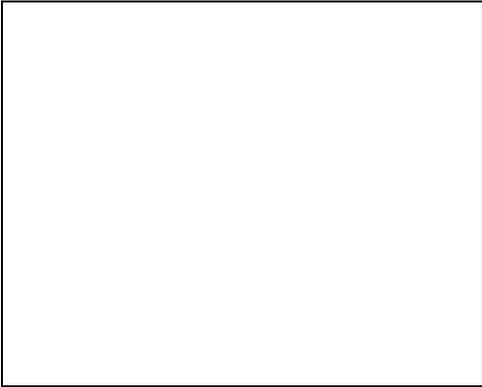
- The consideration of design parameters that promote safe access and use of proposed greenway/trail facilities. Such design parameters should include, where, feasible the following features:
 - When travel paths are provided, they be designed as to facilitate safe two way passage of pedestrians and cyclists;



- The provision of trail head markers which indicate the respective difficulty, location, and length of the particular greenway/trail segments;



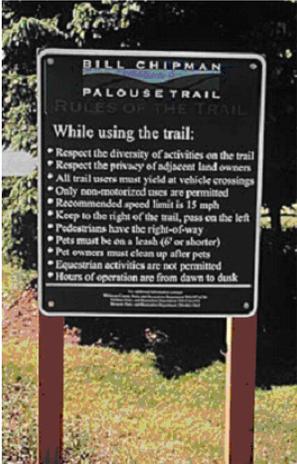
- The provision of proper lighting;



- The prospective installation of waste receptacles, benches, and other similar amenities;



- The establishment and posting of rules and operation/use hours of each greenway/trail facility;



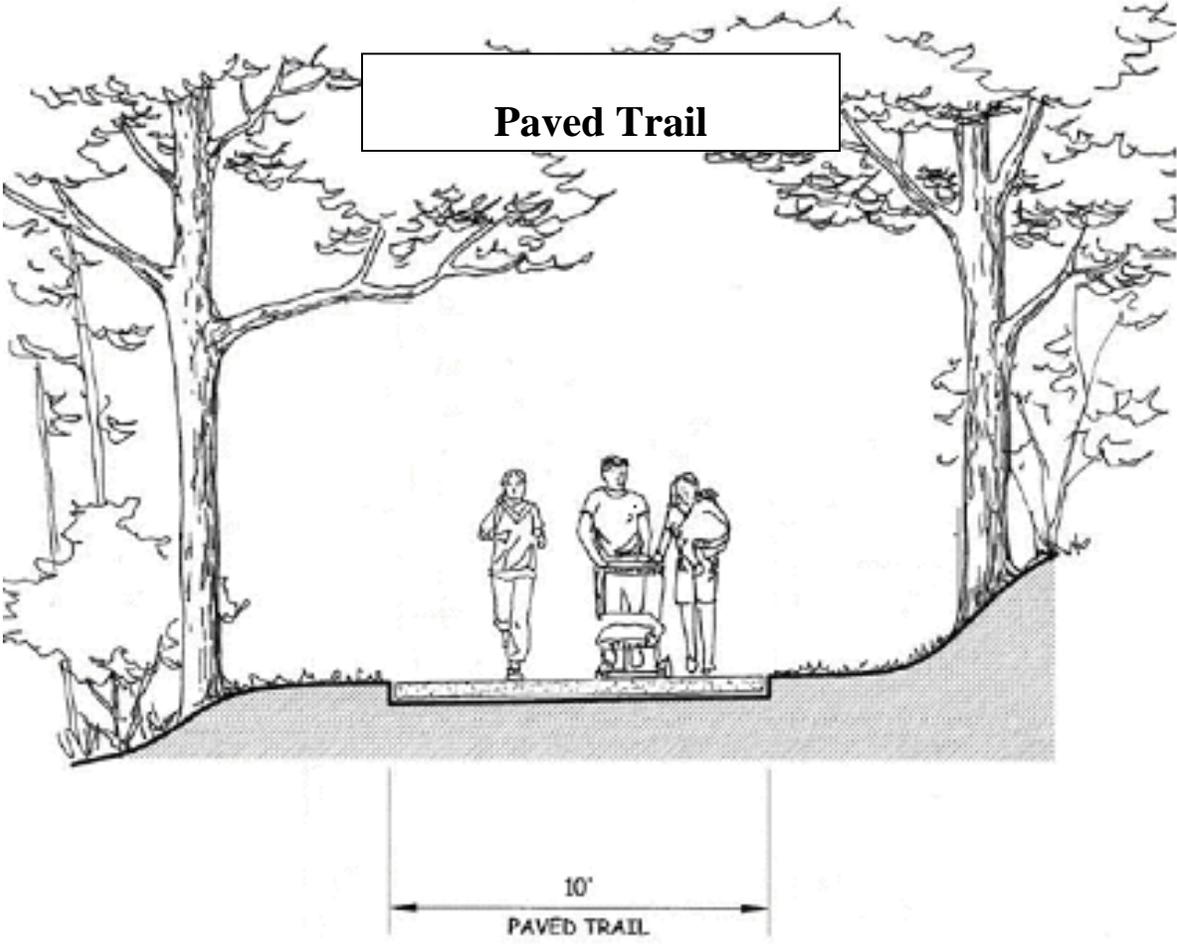
- Where feasible, the development of access areas for persons with disabilities;

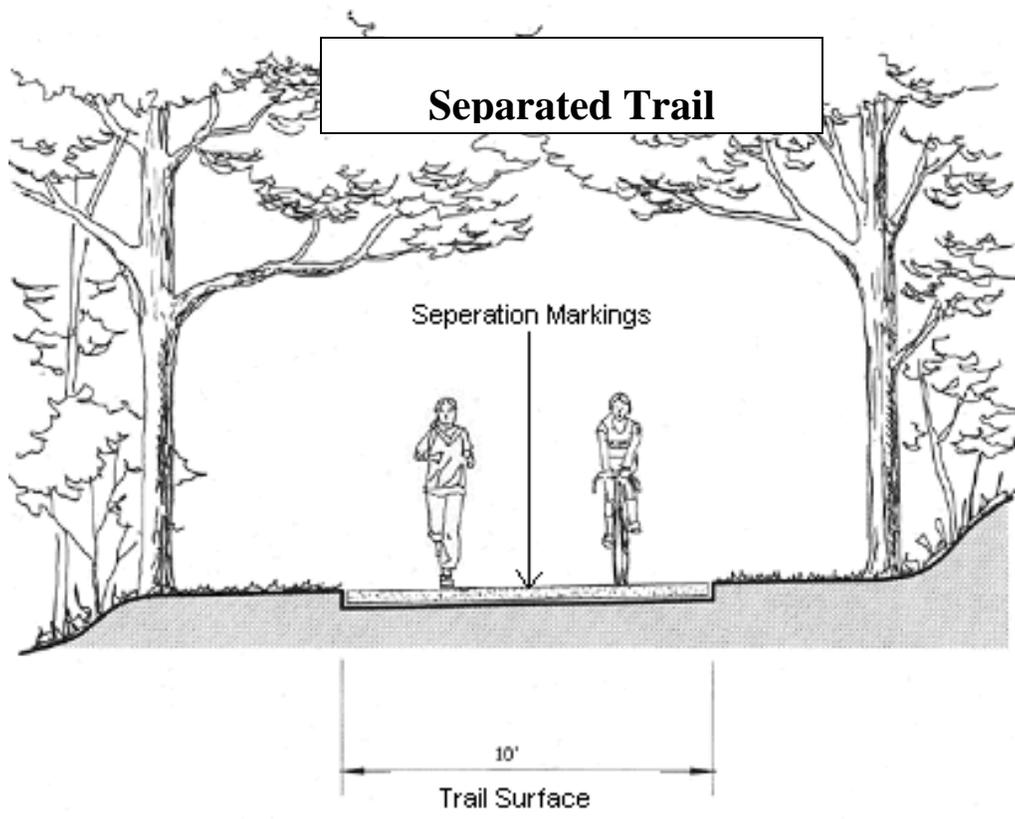
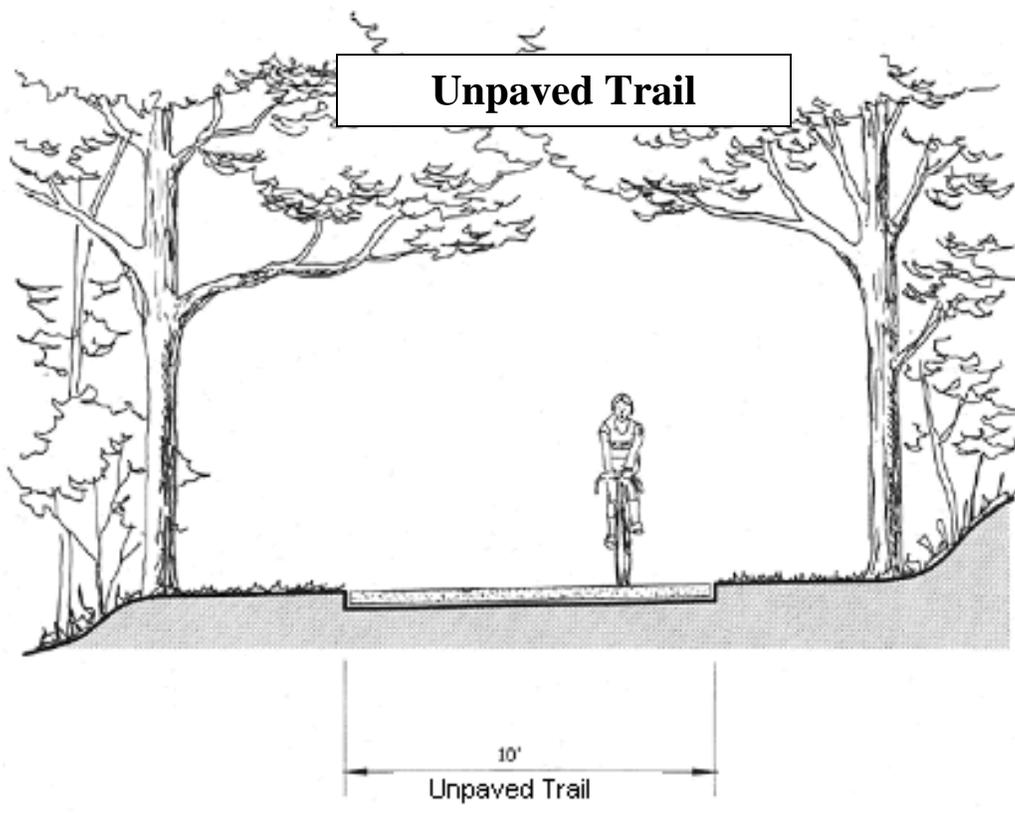


- Where greenway/trail facilities link to Lake Hickory, consider the designation of canoe/kayak input and outtake points that may be utilized to access recreational opportunities afforded by Lake Hickory.

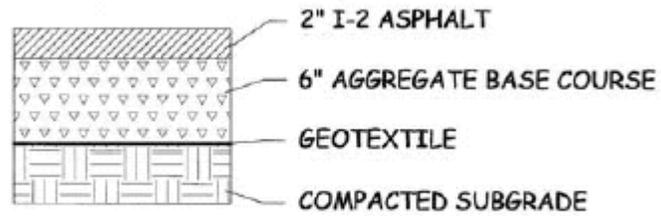


□ Greenway Trail Typical Cross Sections:

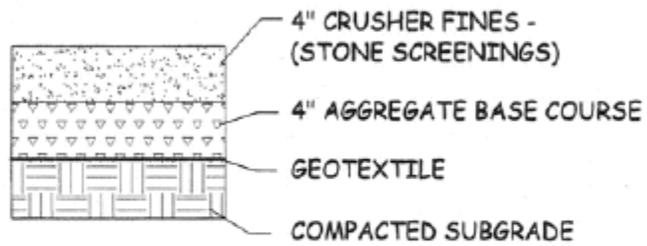




- Greenway Trail Subsurface Typical Cross Sections:



ASPHALT PAVING SECTION



STONE SCREENINGS SECTION

- Urban Trail Cross Sections



Urban trail cross section within non-residential areas.



Urban trail cross section delineating separation buffer from vehicular traffic.



Urban trail cross section within residential areas

7.5 Preliminary Cost Estimates

Cost estimates for the various greenway projects proposed within this plan can vary greatly dependent upon site-specific situations. Changes in slope, soil and subsurface composition, crossing of water features, and countless other factors can greatly impact the costs of specific projects.

Generally greenway construction is currently averaging fifty dollars (\$50.00) per linear foot. From this average greenway construction would cost approximately \$264,000 per mile. This generalization does not account for pedestrian bridges, which on average cost between \$500 and \$1,000 per linear foot. In addition to construction of the greenway trails, many of the proposed facilities will include the provision of signage, benches, waste receptacles, and other related amenities.

Although these generalizations offer a ballpark idea of the costs associated with the construction of greenway facilities, site-specific situations will be the driving factor in ultimate project costs. Projects with gentle slopes, accommodating subsurface soils, and similar features have the ability to cost substantially less than projects in areas where the terrain is rugged and uninviting.

7.6 Prioritization of Greenway and Urban Trail Projects

As outlined in Section 7.3 project were assigned an implementation priority. The priority thus assigned to each specified recommendation was offered as to guide the ultimate realization of the greenway/trail component of the larger master plan.

In considering a process to prioritize greenway/trail recommendations the following variables were considered.

1. **Location**: In an effort to provide equity to the various areas of the City an attempt was made to distributing projects, in regards to priority, throughout the City. The basis for the geographical distribution of project priority was developed utilizing the four recognized City quadrants. An effort was made to prioritize projects in a manner in which each quadrant would receive projects in varying degrees of priority.
2. **Length**: The lengths associated with the various project recommendations vary greatly from location to location. Efforts were made to break larger projects into smaller segments and intermingle them throughout the prioritization process.
3. **Properties Impacted (Crossed)**: By and large the property required to implement any of the projects recommended by the Task Force will need to either be purchased, which would increase cost estimates, or have easement agreements with owner of such properties. Project recommendations that cross fewer properties, from the aspect of ownership, may be easier to implement.
4. **Project Costs**: Project costs will inevitably have an impact upon the actual implementation of recommended projects. By breaking projects into smaller segments much of the cost can be spread over multiple spending periods, thus increasing the probability of project implementation. Typically, projects with lower cost will be easier to implement and such must be taken into consideration during project prioritization.

5. **Transportation:** Each component of the larger greenway and trail network was observed as being an element of the City's transportation network as well as serving recreational purposes. In an effort to create a functional transportation network utilizing greenways and trails, connectivity and location must be taken into consideration during prioritization. Historically downtown areas and densely urbanized areas are typically much more conducive to pedestrian oriented transportation facilities. In addition, commerce centers, entertainment venues, and governmental institution locate many of their primary facilities within downtown areas.

Given the prominence of more pedestrian facilities within the downtown area and its likelihood of supporting important economic, cultural, and governmental attributes; dispersing greenway and trail facilities outward from the center of the City of Hickory would create a pedestrian oriented transportation network which links the outlying communities to a common point promoting economic and cultural activities and interactions.

7.7 Project Feasibility and Limitations to Implementation

Project prioritization was undertaken in an effort to develop a strategy to implement each of the projects identified within Section 7.3. Although each of the identified projects possesses the perceived ability to work as elements of the larger greenway and urban trail network, it has been recognized that extenuating circumstances may arise which in effect bars the completion of particular projects or segments thereof.

In the instance where factors bar the implementation of any of the identified and prioritized projects, subsequent projects will be elevated in rank as to move the implementation process along. At which time each subsequent project have been implemented the implementation process will once again revisit the skipped projects to ascertain if conditions have changed which will now lend feasibility to their implementation.

7.8 Prioritized Greenway and Urban Trail Projects

From the recommended projects identified within Section 7.3, the Greenway/Trail Task Force has recommending the projects be implemented in accordance with the matrix located below (Please see Appendix C for graphic depiction):

PROJECT	PRIORITY	DESCRIPTION	LENGTH
R	1	A linear greenway/ urban trail originating at Lenoir Rhyne College near 10 th Avenue NE and traveling northward along a small creek crossing 11 Avenue NE and 12 th Avenue NE and terminating at Stanford Park.	0.27M
L	2	A linear urban trail originating at Union Square traveling northward along North Center Street and shifting over to 1 st Street NW and connect with the greenway/trail at the YMCA.	0.98M
Q	3	A linear urban trail originating at the SALT Block traveling northward along 3 rd Street NE turning to the northeast along 5 th Avenue Place NE and then traveling northeastward along Stasavich Place NE crossing 8 th Avenue NE and following 9th Avenue NE and 5 th Street NE to junction with the Stanford Park Urban Trail & Greenway Loop (Project S).	1.04M
K	4	A linear greenway/trial originating at the Kiwanis Park on 6 th Street SE moving southwestward then northwestward then changing to an urban trail following 10 th Avenue SE and turning to the north following South Center Street and terminating at Union Square.	1.52M
S	5	A loop greenway/urban trail originating at Stanford Park traveling northward along the eastern boundary of the adjacent golf course to 21 st Avenue NE then turning westward along 21 st Avenue NE turning southward following 5 th Street NE turning eastward and following 12 th Avenue NE and intersecting with the Lenoir Rhyne College / Standford Park Greenway Connector (Project R).	1.87M
J-1	6	An urban trail originating at South Center Street and traveling westward along 7 th Avenue SW then turning northward to follow 7 th Street SW and terminating as a greenway at the Hickory Optimist Park	1.01M
T-1	7	A linear greenway originating on 21 st Avenue NE traveling northward along Falling Creek then turning westward and converting to an urban trail following 28 th Avenue NE and terminating at North View Middle School	1.13M
U	8	A linear greenway/trail originating on 25 th Street Drive NW traveling around the eastern boundary of Neill Clark Park to intersect with 29 th Avenue Drive NW. At its intersection with 29 th Avenue Drive NW the greenway converts to an urban trail and travels southeastward along 29 th Avenue Drive NW crossing NC 127 connecting with 28 th Avenue NE and terminating at North View Middle School and connecting with the Falling Creek Greenway (Project T).	1.83M

PROJECT	PRIORITY	DESCRIPTION	LENGTH
J-2	9	A linear urban trail/greenway originating at the intersection of 7 th Avenue SW and 7 th Street SW traveling westward along 7 th Avenue SW then turning southward along 8 th Street SW then turning westward adjacent to U.S. 70 then turning northward following 9 th Street SW again turning westward following 7 th Avenue SW crossing U.S. 321 at the existing pedestrian bridge then turning northward along 17 th Street SW and connecting to the West Hickory Park. The urban trail/greenway also turns southward along 17 th Street SW crossing U.S. 70 then following westward along 10 th Avenue SW to connect the Geitner Creek Greenway (Project B)	1.69M
M-1	10	A linear urban trail/greenway originating near the YMCA property on 4 th traveling northwestward along 7 th Avenue NW junctioning with and then following Cripple Creek near 7 th Street NW and continuing northwestward to junction with 12 th Avenue NW	1.74M
B	11	A linear greenway/trail beginning along the Henry Fork River and moving northward along Geitner Creek and under Interstate 40 and continuing northward to connect with 10 th Avenue SW.	1.86M
A-1	12	A linear greenway originating ant the convergence of Geitner Creek and the Henry River traveling westward along the northern bank of the Henry river to the westernmost point of the Henry Fork Park	1.2M
T-2	13	A linear greenway originating near 28 th Avenue NE traveling northward along Falling Creek connecting to WM Jenkins Elementary School	1.09M
M-2	14	A linear greenway originating near 12 th Avenue NW following Horseford Creek northward to Hilton Park ten once on the Hilton Park property converting to an urban trail circling the park and connecting with 16 th Avenue Lane NW	1.89M
T-3	15	A linear greenway originating near WM Jenkins Elementary School traveling northward following Falling Creek crossing Falling Creek Road NE and Cloninger Mill Road NE crossing onto the City owned property and connecting to Lake Hickory then turning eastward to connect to 9 th Street NE.	1.61M
O	16	A linear greenway/trail originating near the intersection of 15 th Avenue NW and Old Lenoir Road and traveling northeastward around the VFW Post and Jaycee Park to connect with the existing greenway/trail network located near Geitner Park.	0.41M
N	17	A linear greenway/trail originating at Hilton Park traveling westward to the westernmost extent of the existing greenway/trail along Horseford Creek and continuing westward to connect with 16 th Avenue NW.	0.18M
C	18	An urban trail originating at Southside Park moving northeastward along 2nd Street SE and connecting with Project K at 10 th Avenue SE.	0.75M

PROJECT	PRIORITY	DESCRIPTION	LENGTH
A-2	19	A loop greenway/urban trail originating at the southwestern corner of the Henry Fork Park traveling westward along the northern bank of the Henry River turning northward following a small creek to connect to Sweet Bay Lane converting to an urban trail traveling eastward along Sweet Bay Lane turning southward near the northwest corner of the Henry Fork Park and converting to a greenway traveling westward to junction with the Henry River,	1.39M
H-1	20	A linear greenway originating on City owned property near 21 st Street NE moving northward to connect with an existing Duke Power overhead transmission line turning eastward following the transmission line easement to connect to the Falling Creek Greenway (Project T)	1.64M
H-2	21	A linear greenway originating near the Transmission line easement near 21 st Street NE traveling northward following Snow Creek connecting to Kool Park Road NE	1.31M
A-3	22	A greenway/urban trail originating on Sweet Bay Lane traveling southwestward following Old Shelby Road turning northeastward near Sunrise Drive following a small creek and connecting to the Henry River.	0.86M
H-3	23	A linear greenway originating on Kool Park Road NE moving northward following Snow Creek and connecting to St. Stephens Park	0.69M
A-4	24	A loop greenway/urban trail originating at the convergence of the Henry River and a small creek moving southwestward along the northern bank of the Henry River turning eastward a bridging the Henry River near Sunrise Drive continuing eastward to connect to Moss Farm Road then turning northward again crossing the Henry River.	1.63M
H-4	25	A linear greenway originating at St. Stephens Park traveling northward along Snow Creek and connecting to Lake Hickory	1.66M
A-5	26	A linear greenway originating at the convergence of the Henry River and Geitner Creek traveling eastward along the northern bank of the Henry River crossing beneath U.S. 321 and connecting with N.C. 127.	1.66M
P	27	A linear greenway/trail originating at Winkler Park traveling northward along a small creek and turning westward to connect to Lake Hickory and traveling eastward and terminating near U.S. 321	1.62M
A-6	28	A linear greenway originating near N.C. 127 traveling southeastward along the northern bank of the Henry River connecting to the future 6 th Street SE extension.	2.27M
D	29	A linear greenway/trail originating at the southern limit 6 th Street SE in the north and moving southward crossing the Henry Fork River; connecting to Ponderosa Lane and moving westward to connect with River Road.	1.47M

PROJECT	PRIORITY	DESCRIPTION	LENGTH
A-7	30	A linear greenway originating near Sunrise Drive traveling southwestward along the northern bank of the Henry River and terminating at the westernmost boundary of the City's ETJ.	2.8M
A-8	31	A linear greenway originating at the future 6 th Street SE extension traveling southeastward along the northern bank of the Henry River to connect with the City's Henry River Wastewater Treatment Facility	1.61M
F	32	A linear greenway/trail originating at Ridgecrest Park traveling northward connecting to Tate Boulevard and eastward to connect to the 6 th Street SE. The linear greenway continues southward and connects to and follows a creek under I-40 and continues further southward to U.S. 70 where it connects with the Clark Creek Greenway (Project E)	2.08M
G	33	A linear greenway/trail originating at St. Stephens Elementary moving eastward along Lyle Creek located at the southern boundary of the school property and continuing to the easternmost extent of the City of Hickory's ETJ.	1.34M
E	34	A linear greenway/trail originating at the westernmost extent of Amity Lane, moving westward to junction with Clark Creek and continue southward to the southernmost boundary of the City's planning jurisdiction and also continuing northward to US 70 to connect with the Ridgecrest Park Greenway (Project F)	1.63M

LF = Linear Feet, M = Mile, Note: All distances are approximate

7.9 Funding Sources

Funding for greenway/trail projects can be obtained from a variety of sources. Such sources can include federal and state programs, locally supported initiatives, and to some degree from private corporations, foundations, and organizations. The following list of identified funding sources has been compiled to demonstrate and guide the City's activities towards obtaining the funding necessary for completion of greenway/trail projects. Although extensive, the following list should not be construed to be all-inclusive.

□ Federal Funding Sources

□ Community Development Block Grant Program

The U.S. Department of Housing and Urban Development offers financial grants to communities for neighborhood revitalization, economic development, and improvements to community facilities and services, especially in low and moderate-income areas.

□ Land and Water Conservation Fund (LWCF) Grants

LWCF funds are used by federal agencies to acquire additions to National Parks, Forests, and Wildlife Refuges. In the past Congress has appropriated such funds for "state-side" projects to acquire and build park and recreation facilities. The LWCF requires a 50% local match, which can consist of in-kind services or cash.

□ Watershed Protection and Flood Prevention Grants

The USDA National Resources Conservation Service (NRCS) provides funding for the maintenance and operation of watershed improvements consisting of areas less than 250,000 acres. Eligible projects include those designed to improve watershed protection, flood prevention, sedimentation control, public water-based fish and wildlife enhancements, and recreation planning. The NRCS requires a 50% local match for public recreation and fish and wildlife projects.

□ Transportation and Community and System Preservation Pilot Program

The Transportation and Community and System Preservation Pilot Program is a comprehensive initiative of research and grants to investigate the relationships between transportation and community and system preservation and private sector-based initiatives. States, local governments, and metropolitan planning organizations are eligible for discretionary grants to plan and implement strategies that improve the efficiency of the transportation system; reduce environmental impacts of transportation; reduce the need for costly future public infrastructure investments; ensure efficient access to jobs, services, and centers of trade; and examine private sector development patterns and investments that

support these goals. A total of \$120 million is authorized for this program in FY's 1999-2003.

□ Federal Transportation Programs

TEA 21, which expired in 2003, but has been since been temporarily extended, has provided state and local governments with federal dollars eligible for use on pedestrian oriented projects. At this time the U.S. Congress and the President are currently negotiating the final format of the new Federal Transportation Bill and until which time it is finalized the true scope of Federal funding opportunities will remain unknown. However, initial congressional reports have indicated that funding priorities within the draft legislation are similar to TEA-21, which provided funding for greenway/trail type projects.

□ State Funding Sources

□ North Carolina Parks and Recreation Trust Fund (PARTF)

The PARTF program provides dollar-for-dollar grants to local governments. Recipients use the grants to acquire land and/or to develop parks and recreational projects that serve the general public. The trust fund provides funding for local governments for parks and recreation purposes. PARTF funds allocated to local governments require 50% matching funds.

□ Cleanwater Management Trust Fund (CWMTF)

The 1996 General Assembly of North Carolina established the Clean Water Management Trust Fund (CWMTF) to help local governments, state agencies and conservation non-profit groups finance projects to protect and restore surface water quality. It is recommended that projects funded by the CWMTF be accompanied by 20% matching funds.

□ North Carolina Department of Transportation Enhancement Program

The Federal Highway Administration (FHWA) is responsible for administering the Enhancement provisions of federal law. This is accomplished through the FHWA Office of Human Environment and in the FHWA field offices in each state (the FHWA field office for North Carolina is located in Raleigh). Enhancement funds are made available annually to North Carolina and are administered by the North Carolina Department of Transportation.

□ Local Funding Sources

□ Local Capital Improvements Program

The City may opt to appropriate for greenway/trail facilities within its annual Capital Improvement Program.

□ Required Recreation and Open Space Areas

The City's current Land Development Code requires developers constructing new residential developments to provide recreation and/or open space for use by the residents of such communities. The provision also permits developers to submit a monetary payment in lieu of providing such facilities.

Recreation and/or recreational area provided as part of residential development may be designed as to provided linear greenway/trail facilities, which in time or immediately connect to the City's regional greenway/trail network. Where funds are received in lieu of providing such facilities these funds may provide for the implementation greenway/trail facilities that may be utilized by the residents of the community.

□ Preservation of Riparian Buffers and Flood Prone Areas

The City's Current Land Development Code requires development activities within watershed areas to preserve riparian buffers along stream banks. The Land Development Code also steers development away from areas prone to flooding.

In instances either of the above situations, the City should attempt to acquire such areas through purchase or dedication, or attempt to acquire easements along and through such areas that may be utilized for the designation or greenway/trail facilities.

□ Private Funding Sources

□ Local Businesses

Support for greenway/trail projects from the local business community may be pledged and obtained through:

- Cash donations for specific projects;
- Donations of services to reduce implementation costs;
- Reduction in the costs of materials purchased from local businesses which support implementation.

□ Private Foundations and Non-Profits

Many private foundations and non-profit groups providing financial and professional support services to greenway/trail projects are available to local governments. Some of these organizations are as follows:

- Local, regional, and national land conservancy organizations, such as the Conservation Fund, the DuPont Corporation, the Land Trust Alliance and the Foothills Conservancy of North Carolina;
- Trail Sponsors
Organizations such as the civic and business groups can be utilized to provide amenities to greenway/trail facilities to promote themselves as sponsors of such facilities.

Such sponsorships may include trash receptacles with accompanying placards, recognition placards at or near greenway/trail access points, picnic areas with accompanying recognition placards, and an assortment of other similar features.

- Volunteers

Community volunteers may help with greenway/trail construction and/or maintenance, as well as fund raising. Potential sources for such volunteer pool include local Boy and Girl Scout troops, civic and fraternal organizations, historical societies, cyclist clubs, school groups, conservation groups, neighborhood associations, church groups, and countless others.

Chapter 8 Trails

Introduction

Trails are an essential element of the parks and recreation system that enhance the quality of life in the Hickory community. The Parks and Recreation Department manage a map of the location of potential trails in the city's open space, along the city's ROW and through city parks.

These trail projects will be built over the next 20 years. They will provide citizens an opportunity to explore the treasures of open space lands by linking parks and neighborhoods. They will also provide commuting options where none existed before and recreational activities for all citizens. They are also natural areas that can be an excellent base for in-depth environmental studies.

8.1 Goals, Benefits and Needs

8.1.1 Goals

- ❑ To create a network of multi-use trails throughout Hickory that will provide connectivity with city parks, cultural and neighborhood centers of activities, and employment destinations.
- ❑ To encourage use and stewardship between neighborhood groups, private organizations, schools, and the business community in trail use and stewardship.

8.1.2 Benefits and Needs

The woodlands within the city are deserving of protection (from residential and commercial expansion). These natural areas are vital to the environmental quality of Hickory. They provide scenic beauty and serve as a refuge for plants and wildlife in an urban environment. They also play a major role in enhancing the city's livability and economic well-being.

There is a distinct shift in recreational focus to less structured recreational activities such as walking, jogging, and the enjoyment of natural areas. The popularity of the existing bikeway in Northwest Hickory clearly demonstrates public interest in trail related activities.

8.2 Proposed Trails

- ❑ **The Boy Scouts of America Trail** – This proposed new trail construction located in Northwest Hickory would provide connectivity between the Boy Scouts of America

scout cabin²⁰ and an existing bikeway. It will be 600 feet in length and traverse a very scenic and heavily wooded area. The existing bikeway provides connectivity between rugged/primitive trails, a greenway and the Hickory City, Hilton, and (3) Geitner Parks. Construction will involve the building of an asphalt trail approximately 8-12 feet wide within the city's open space to include signage, benches, bike racks, a recognition plaque, and a large cleared area around the building. The trail will also provide a view of the Lake Hickory and will comply with the Americans with Disabilities Act (ADA).

8.3 Recommendations

- ❑ The City should create a formal trail system in Hickory. This should be based on a clear understanding of the city's objectives for such a system, which includes connectivity with city parks, bikeways and greenways.
- ❑ The City should, as part of the Sidewalk, Bikeway, Greenway, and Trail Master Plan, investigate potential funding sources relative to transportation related trails, which may be available from state or federal agencies.
- ❑ Implement the existing NCPDPA to ensure compliance with requirements of Americans with Disabilities Act (ADA) Title 11 regulation Sec. 35.130.
- ❑ The City should identify specific trail projects that can be implemented (which the Parks and Recreation Department should pursue through other means such as volunteer activities), capital funding sources, and additional grant programs.
- ❑ Develop a map to include trails.
- ❑ The trail's walking surface should be constructed to include a landscaped seating area with benches.
- ❑ Signage related to better recognition and use of the trail should be installed at appropriate locations.
- ❑ The City should build a constituency for the protection and maintenance of the trails through environmental education, private organizations and community involvement.
- ❑ The HPD's Community Policing Bicycle Patrol Program should provide trail security on a regular basis.
- ❑ Produce a brochure to promote and enlist community support for the development of a trail system.

²⁰ This cabin was built in 1937.

8.4 Funding Sources for Trails

□ North Carolina's Adopt-A-Trail Grant

The Adopt-A-Trail Grant Program was created by the General Assembly in 1987 to provide funding to volunteer groups, non-profit organizations, and governmental agencies involved in trail development and management, such as trail repair and renovation projects or for informational brochures and maps. The State Trails Program within the Division of Parks and Recreation administers the grant. \$135,000 is available through FY2000-2001.

□ National Recreational Trails Fund Act (Symms Act)

A component of TEA-21, the NRTFA is a funding source to assist with the development of non-motorized trails. The Act uses funds paid into the Highway Trust Fund from fees on non-highway recreation fuel that are 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.

Through state agencies, Symms Act Grants are available to private and public sector organizations. NRTFA are 80 percent federally funded, with a 20 percent local match. Federal agency project sponsors or other federal programs may provide an additional federal share of up to 95 percent. Local matches can be in the form of donations of service, materials, or land.

□ Transportation Enhancement Program

For FY 2000, the NCDOT has \$22 million available for enhancement awards for projects such as sidewalks, greenways, bikeways, trails, signage, and safety education. Transportation enhancement funding is a cost reimbursement program, not a grant. The applicant may receive reimbursement for eligible costs as the work is completed. Work performed and cost incurred prior to the project being awarded and agreement execution are not eligible for reimbursement. There is a 20 percent local match required. Projects that are funded under this program must comply with various federal laws (example the ADA) and regulations in order to receive these funds. There is a cap of 2 percent of total construction cost on enhancement funding. The local government must agree to maintain sidewalks constructed under this program and secure any additional ROW if needed.

Chapter 9 Conclusions

The Sidewalk, Bikeway, Greenway and Trail Task Force will present this Master Plan to the Hickory Parks and Recreation Commission. The Task Force, prior to the presentation of the Master Plan to City Council for their review, will consider their recommendations. The Task Force strongly recommends the adoption of the Sidewalk, Bikeway, Greenway and Trail Master Plan and the implementation of its recommendations. As soon as possible, the final plan should be submitted to the Hickory-Newton-Conover MPO for incorporation into the urban area's Surface Transportation Plan. Lobbying should begin for the inclusion of sidewalks, bikeways and greenways in all future state roadway projects under the cost-sharing program adopted by the NCDOT. Clearly, this plan makes many proposals that will require a substantial effort on the part of the city, interested groups and community organizations to implement. Such efforts will include: identifying and taking advantage of opportunities for public-private partnerships; developing innovative and stable funding mechanisms for all projects; maintaining a respect for the natural environment; broadening the primary transportation orientation to include other modes of transportation other than SOV's and developing and integrating inter-modal opportunities in a multi-modal transportation system for the City of Hickory

The Task Force strongly suggests that Council revisit the priorities annually during the budget process so that progress and cost estimates can be evaluated and priorities and funding can be adjusted accordingly. The Task Force believes that this plan should be revisited entirely at three-year intervals to insure that it is implemented and adjusted appropriately for changing needs and priorities.

The Task Force and staff support members will remain as the Task Force and only be replaced as necessary

Appendix A: Preliminary Sidewalk Priorities and Cost Estimates

Appendix B: Sidewalk Map

Appendix C: Greenway Map

Appendix D: Bikeway and Trail Map

Appendix E: Recommendations from Original 1997 Sidewalk and Bikeway Master Plan

Short-Range

- ❑ The Task Force recommends that the city continue to develop a network of bicycle and pedestrian facilities by completing missing links in its sidewalk system, constructing sidewalks in developing areas to develop continuous corridors linking neighborhoods, parks, shopping areas, employment areas, transit stops, and schools. The initial phase of developing this community wide network would lead to the construction of approximately 20 miles of new sidewalks located in all quadrants of the City. The Task Force has made the development of loops linking schools, parks, and neighborhoods a priority in its consideration of needs.
- ❑ The Task Force recommends that the City adopt a goal of having sidewalks on both sides of streets with four or more lanes to reduce the need for pedestrians to cross-busy streets. Along other streets, with lighter traffic flows, sidewalks on one side are sufficient. However, efforts should be made to make such sidewalks continuous to minimize the need to repeatedly cross the street in order to remain on the sidewalk. Wherever sidewalks are constructed, well-marked and signed pedestrian crosswalks should be included. A review of pedestrian and traffic accidents during the last two years indicates clusters of accidents in the vicinity of intersections on several heavily traveled streets, such as U.S. 321 and 2nd Avenue NW, Lenoir Rhyne Boulevard around 3rd and 11th Avenues SE, 8th Street and 7th Avenue NE near Lenoir Rhyne College, along NC 127, and at multiple locations in the Ridgeview Neighborhood. See Appendix F, Hickory Police Department Collision Statistics, 1998-1999.
- ❑ The City Engineering Department will review Hickory's Manual of Practice to develop recommendations for revision that should be made in the standards for sidewalk development. The FWA Group recommended wider sidewalks with no utility strip between the curb and sidewalk and between utility and planting strips located at the outside edge of the sidewalk. Hickory's current standard sidewalk is four and one-half feet in width. The Task Force prefers the appearance and sense of safety provided by a buffer between the pedestrian and the street. Frequently, sidewalks have been constructed around signs and utility poles, which can create obstacles for pedestrians. The Task Force recommends that whenever economically feasible, sidewalks be kept free of such obstructions either by adjusting the location of sidewalk or relocating the utility poles and signs.
- ❑ The Task Force also recommends that the Engineering Department develop design standards for sidewalks along streets that do not have curb and gutter. Where sufficient rights-of-way exist, sidewalks may be placed outside the ditch line, which will separate walkers from traffic. Alternatively, paved shoulders, which could be shared by cyclists and pedestrians, can be developed between the ditch and the existing pavement.

- ❑ The Task Force recommends that the City continue to review its existing sidewalks for handicapped accessibility. In many locations the design of driveways and curbs creates barriers to wheelchair access.
- ❑ The Hickory Policy Department, the North Carolina Office of Bicycle and Pedestrian Transportation (NCOBPT) and the Hickory and Catawba County Public Schools should develop and implement school based pedestrian and bicycle safety programs.
- ❑ The Task Force also recommends that the Parks and Recreation, Planning and Engineering Departments develop bikeway plans for the City's recreation parks, and begin to seek bikeway funding from the NCOBPT and other sources for the facilities identified in the list of needs which it has developed.
- ❑ The City should work with the Hickory-Newton-Conover MPO to develop a regional bike route map for cyclists.
- ❑ Rail corridors in Hickory remain in use and do not appear likely to be abandoned. Nonetheless, the Task Force recommends that Council monitors the status of these corridors and be prepared to request their preservation as bicycle and pedestrian ways if they are ever abandoned.
- ❑ The Task Force also recommends that the City Council consider applying the provisions of Chapter 224 of the Session Laws of 1927 in circumstances where there are heavily traveled streets without sidewalks or paved shoulders in commercial and industrial areas that are being used by pedestrians. Springs Road, Highway 70, and the east side of Lenoir Rhyne College all give evidence of pedestrian usage. In developing business areas, such as along 13th Avenue Drive SE near the Hickory Metro Trade Center, future development may be required to construct sidewalks, as existing development has not petitioned for sidewalks. With a likely increase in foot travel, both by workers and visitors moving between hotels, restaurants, shopping areas, and the Trade Center, sidewalks will be needed for pedestrian safety. Repayments of the assessments under either the petition or the 1927 Act might be directed to a revolving sidewalk fund.
- ❑ In addition, the Task Force recommends that the City pursue the inclusion of its bicycle and pedestrian plans in the Hickory-Newton-Conover Urban Area Transportation Plan and begin to lobby for inclusion of identified bicycle and pedestrian facilities in all future roadway projects funded by the NCDOT. The City should include sidewalks and bike lanes in all transportation improvements that it undertakes in accordance with its future street plan.
- ❑ Although not directly related to sidewalk and bikeway construction, the City should pursue the renaming of the Thoroughfare Plan. The word "Thoroughfare" has become a scornful term implying a disruptive, high volume traffic artery with no accommodation for pedestrians, cyclists, or adjoining residential development. Given the emphasis on alternative means of transportation provided by ISTEAA, the City's beautification goals, and the important role that streets play as public spaces, the Task Force suggests that the Thoroughfare Plan be renamed the Transportation Systems

Plan and that the term "thoroughfare" be replaced by other terms more accurately describing the intended size, appearance and function of the street (i.e. parkway, arterial street, major street, collector streets, etc.)

- Finally, the City should develop a sidewalk and bikeway component in its five-year capital improvement plan to insure the implementation of the projects that Council selects for construction in the priority that Council determines.

A summary of the recommendations of phase one construction, which totals approximately 20 miles:

1. Complete the two remaining projects on the Council priority list in January 1995. These projects are sidewalks between Lenoir Rhyne Boulevard and Kiwanis Park along 7th Avenue SE (2250'; \$18,000) and a sidewalk along Spring Road from St. Stephens Elementary School to 16th Street NE (7000'; \$63,000).
2. Link all quadrants of the City by constructing continuous sidewalks on one side of NC 127 from Cloninger Mill Road to Southside Heights (21,000', \$210,000). Part of this project may be accomplished through NCDOT when 2nd Street SW is improved through Brookford following the completion of US 321.
3. Construct sidewalks north of 16th Avenue NW along 2nd Street NW, 8th Street Drive NW, 9th Street NW, 21st Avenue NW and 25th Avenue NW. This will link these residential areas to existing sidewalks along NC 127 (16,700'; \$184,000). Second Street NW lacks curb and gutter at this time.
4. Construct a sidewalk along one side of the 8th Street Extension project to link neighborhoods to the Lenoir Rhyne College area and the proposed Stanford District Park (6,200'---\$60,000).
5. Construct a sidewalk between 5th Street NE and NC 127 along 17th Avenue NE, 3rd Street Drive NE, 16th Avenue NE, and 14th Avenue NE. This will link neighborhoods to Civitan Park and Hickory High School (6,000'--- \$66,000). The eastern half of this project has curb and gutter; the western half does not.
6. Construct sidewalks in the Kenworth and Eastridge neighborhoods to link residential areas to Kiwanis Park (8,400'-- \$92,400). Portions of these sidewalks may be eligible for CDBG funding.
7. Construct short lengths of sidewalk along 9th Avenue NW, 9th Street NW/SW, 2nd Avenue SW, 3rd Avenue NW, 4th Avenue SE at the new library, 4th Street SW, 2nd Street SE, and 11th Avenue SW. This will complete missing links in the sidewalk system (9000'-- \$99,000). Portions of these sidewalks may be eligible for CDBG funding.
8. Construct a new sidewalk from 12th Avenue NW to 4th Street Drive NW along 10th Street Blvd., 14th Avenue Drive, 14th Avenue, 4th Street, and 13th Avenue NW (9,500; \$109,000).

9. Complete links along the proposed street linking NC 127 to Huffman Cove Road (1700'-- \$15,000).
10. Construction of a sidewalk along 2nd Avenue NW from Long View to 12th Street Drive NW to provide a pedestrian link to the neighborhoods south of the airport (4,000'-- \$44,000).
11. Construct a sidewalk along one side of US 70 between Lenoir Rhyne Boulevard and Sweetwater Road to provide access to employment and shopping centers (8200'-- \$90,000). These improvements might be funded under the 1927 Act.
12. Construct a sidewalk along 13th Avenue Drive SE from Lenoir Rhyne Blvd. to the Trade Center and along 19th Street Drive SE between the Trade Center and Hwy. 70 (5200'--\$57,000). These improvements might be funded under the 1927 Act.
13. Construction of sidewalks at all PWTS bus stops to provide safety places for pedestrian transfers.

Mid-Range

The medium range priorities mainly involve extending the network of sidewalks established by the first five years of this plan into areas recently annexed or to be annexed in the near future. Also included in the mid-range priorities are efforts to ensure that projects in the North Carolina Transportation Improvement Program, such as the Eastside Thoroughfare, are designed with bicycle lanes and sidewalks.

- ❑ The city should lobby for the use of ISTEA Enhancement Funds for Transportation Program Improvement Projects.
- ❑ In addition, bicycle improvements in the city's passive parks should be designed during this period and the City should apply for funding through the North Carolina Office of Bicycle and Pedestrian Transportation. These priorities include approximately 30 miles of sidewalks to be constructed by the city. Sidewalks and bikeways along the Eastside Thoroughfare should be requested, with the NCDOT funding bikeways and the city and also funding 54,000 feet of sidewalks on both sides of streets in residential areas. The estimated cost of these projects is approximately \$1,340,000.
- ❑ The City Council may have to consider assessing curb and gutter costs or obtaining sidewalk easements from adjoining property owners in areas with curb and gutter.

A summary of the recommendations of phase two construction (FY 2002-2006), which totals approximately 30 miles:

1. Completion of loops in northwest Hickory linking Neill Clark Park to NC 127 via Huffman Cove and Icard's Ferry Roads and 39th Avenue NW. These streets do not currently have curb and gutter (15,500'--\$170,500).

2. Completion of a sidewalk linking the Northmoor area to NC127. These streets do not currently have curb and gutter (6,500'--\$72,000).
3. Construction of sidewalks along several collector and arterial streets in northeast Hickory to create loops and link and to neighborhoods. These links include sidewalks along Falling Creek Road, Tricycle Road (9th Street Drive NE), and 16th Street NE. These streets do not currently have curb and gutter (25,300'--\$280,000).
4. Construction of sidewalks along 21st Avenue, 12th Street and 19th Avenue NE to link neighborhoods to sidewalks connecting to Stanford Park (7,700'; \$85,000).
5. Construction of sidewalks along "C" Avenue SE, linking Highland Avenue to C.S. Teague Park (4,800'--\$53,000). These sidewalks may be CDBG eligible.
6. Construction of a sidewalk between 12th Street Drive NW and 6th Street NW along 13th Avenue NW, 11th Street NW, and 12th Avenue NW to link neighborhoods. (7,500'--\$83,000).
7. Construction of a sidewalk along 5th Street NE and 26th Avenue NE to link neighborhoods, shopping areas, and a potential school site (6,200'; \$68,000). Portions of this sidewalk may be constructed as new development occurs.
8. Construction of sidewalks between Glenn Hilton Park and Neill Clark Park along 5th Street Pl., 19th Avenue Drive, 18th Avenue Drive, 19th Avenue, 9th Street Drive, 9th Street, 25th Avenue Drive, 30th Avenue Drive and 30th Avenue NW. This will link neighborhoods to these parks (9,800'--\$110,000).
9. Construction of a sidewalk along Clement Boulevard to link developing business areas to Winkler Park (4,000'--\$44,000). This project might be funded in part by assessments under the 1927 Act.
- 10 Construction of sidewalks along the other side of US 70 between Lenoir Rhyne Boulevard and Sweetwater Road to provide access to employment centers and shopping areas (19,000; \$209,000). This project might be funded under the 1927 Act.
- 11 Sidewalks in residential areas throughout the Eastside Thoroughfare funded at 30% of cost through NCDOT (54,000'-- \$160,000) 80,000 feet of bike lanes funded by NCDOT.

Long-Range

The long-range priorities primarily insure that future local and state street projects are designed with bicycle lanes and sidewalks, provide sidewalks on both sides of heavily traveled multi-lane streets, and extend the City's network of sidewalks into future annexation areas in the northeast and Mountain View. Examples of latter improvements would consist of sidewalk extensions along 16th Street NE, Snow Creek Road, Sulphur Springs Road, Spencer Road, NC 127 South, the Hickory-Lincolnton Road, Robinson

Road, Iron Bridge Road, 6th Street SE, Fairgrove Church Road, Springs Road, and Wandering Lane.

These priorities include approximately 137 miles of sidewalks and 132 miles of bike lanes at an estimated cost of approximately \$15,000,000. Many of these improvements may be accomplished through cost sharing with NCDOT during street improvement projects. By the end of the first ten-year planning period covered by this proposal, Council should reconvene a study committee and develop another set of specific recommendations for the ensuing ten-year period.

Appendix F: North Carolina Department of Transportation Bicycle Policy

General

Pursuant to the Bicycle and Bikeways Act of 1974, the Board of Transportation finds that bicycling is a bonafide highway purpose subject to the same rights and responsibilities and eligible for the same considerations as other highway purposes, as elaborated below.

1. The Board of Transportation endorses the concept that bicycle transportation is an integral part of the comprehensive transportation system in North Carolina.
2. The Board of Transportation endorses the concept of providing bicycle transportation facilities within the rights-of-way of highways deemed appropriate by the Board.
3. The Board of Transportation will adopt Design Guidelines for Bicycle Facilities. These guidelines will include criteria for selecting cost-effective and safety-effective bicycle facility types and a procedure for prioritizing bicycle facility improvements.
4. Bicycle compatibility shall be a goal for state highways, except on fully controlled access highways where bicycles are prohibited, in order to provide reasonably safe bicycle use.
5. All bicycle transportation facilities approved by the Board of Transportation shall conform with the adopted "Design Guidelines for Bicycle Facilities" on state-funded projects, and also to guidelines published by the American Association of State Highway and Transportation Officials (AASHTO) on federal aid projects.

Planning and Design

It is the policy of the Board of Transportation that bicycle facility planning be included in the state thoroughfare and project planning process.

1. The intent to include planning for bicycle facilities within new highway construction and improvement projects is to be noted in the Transportation Improvement Program.
2. During the thoroughfare planning process, bicycle usage shall be presumed to exist along certain corridors (e.g., between residential developments, schools, businesses and recreational areas). Within the project planning process, each project shall have a documented finding with regard to existing or future bicycling needs. In order to use available funds efficiently, each finding shall include measures of cost-effectiveness and safety-effectiveness of any proposed bicycle facility.
3. If bicycle usage is shown likely to be significant, and it is not prohibited, and there are positive cost-effective and safety-effective findings; then, plans for and designs of highway construction projects along new corridors, and for improvement projects along existing highways, shall include provisions for bicycle facilities (e.g., bike routes,

bike lanes, bike paths, paved shoulders, wide outside lanes, bike trails) and secondary bicycle facilities (traffic control, parking, information devices, etc.).

4. Federally funded new bridges, grade-separated interchanges, tunnels, and viaducts, and their improvements shall be designed to provide safe access to bicycles, pursuant to the policies of the Federal Highway Administration.
5. Barriers to existing bicycling shall be avoided in the planning and design of highway projects.
6. Although separate bicycle facilities (e.g., bike paths, bike trails) are useful under some conditions and can have great value for exclusively recreational purposes, incorporation of on road bicycle facilities (e.g., bicycle lanes, paved shoulders) in highway projects are preferred for safety reasons over separate bicycle facilities parallel to major roadways. Secondary complementary bicycle facilities (e.g., traffic control, parking, information devices, etc.) should be designed to be within highway rights-of-way.
7. Technical assistance shall be provided in the planning and design of alternative transportation uses, including bicycling, for abandoned railroad rights-of-way. This assistance would be pursuant to the National Trails Act Amendment of 1983, and the resultant national Rails to Trails program, as will the Railway Revitalization Act of 1975.
8. Wherever appropriate, bicycle facilities shall be integrated into the study, planning, design, and implementation of state funded transportation projects involving air, rail, and marine transportation, and public parking facilities.
9. The development of new and improved bicycle control and information signs is encouraged for the increased safety of all highway users.
10. The development of bicycle demonstration projects, which foster innovations in planning, design, construction, and maintenance, is encouraged.
11. Paved shoulders shall be encouraged as appropriate along highways for the safety of all highway users, and should be designed to accommodate bicycle traffic.
12. Environmental Documents/Planning Studies for transportation projects shall evaluate the potential use of the facility by bicyclists and determine whether special bicycle facility design is appropriate.
13. Local input and advice shall be sought, to the degree practicable, during the planning stage and in advance of the final design of roadway improvements to ensure appropriate consideration of bicycling needs, if significant.
14. On highways where bicycle facilities exist, (bike paths, bike lanes, bike routes, paved shoulders, wide curb lanes, etc.), new highway improvements shall be planned and implemented to maintain the level of existing safety for bicyclists.
15. Any new or improved highway project designed and constructed within a public-use transportation corridor with private funding shall include the same bicycle

facility considerations as if the project had been funded with public funds. In private transportation projects (including parking facilities), where state funding or Department approval is not involved, the same guidelines and standards for providing bicycle facilities should be encouraged.

Construction

It is the policy of the Board of Transportation that all state and federally funded highway projects incorporating bicycle facility improvements shall be constructed in accordance with approved state and federal guidelines and standards.

1. Bicycle facilities shall be constructed, and bicycle compatibility shall be provided for, in accordance with adopted Design Guidelines for Bicycle Facilities and with guidelines of the American Association of State Highway and Transportation Officials.
2. Rumble strips (raised traffic bars), asphalt concrete dikes, reflectors, and other such surface alterations, where installed, shall be placed in a manner as not to present hazards to bicyclists where bicycle use exists or is likely to exist. Rumble strips shall not be extended across shoulder or other areas intended for bicycle travel.
3. During re-striping operations, motor vehicle traffic lanes may be narrowed to allow for wider curb lanes.

Maintenance

It is the policy of the Board of Transportation that the state highway system, including state-funded bicycle facilities, shall be maintained in a manner conducive to bicycle safety.

1. State and federally funded and built bicycle facilities within the state ROW are to be maintained to the same degree as the state highway system.
2. In the maintenance, repair, and resurfacing of highways, bridges, and other transportation facilities, and in the installation of utilities or other structures, nothing shall be done to diminish existing bicycle compatibility.
3. Rough road surfaces, which are acceptable to motor vehicle traffic, may be unsuitable for bicycle traffic, and special consideration may be necessary for highways with significant bicycle usage.
4. For any state-funded bicycle project not constructed on state ROW, a maintenance agreement stating that maintenance shall be the total responsibility of the local government sponsor shall be negotiated between the Department and the local government sponsor.
5. Potholes, edge erosion, debris, etc., are special problems for bicyclists, and their elimination should be a part of each Division's maintenance program. On identified bicycle facilities, the bike lanes and paths should be routinely swept and cleared of grass intrusion, undertaken within the discretion and capabilities of Division forces.

Operations

It is the policy of the Board of Transportation that operations and activities on the state highway system and bicycle facilities shall be conducted in a manner conducive to bicycle safety.

1. A bicyclist has the right to travel at a speed less than that of the normal motor vehicle traffic. In exercising this right, the bicyclist shall also be responsible to drive his/her vehicle safely, with due consideration to the rights of other motor vehicle operators and bicyclists and in compliance with the motor vehicle laws of North Carolina.
2. On a case by case basis, the paved shoulders of those portions of the state's fully controlled access highways may be studied and considered as an exception for usage by bicyclists where adjacent highways do not exist or are more dangerous for bicycling. Pursuant to federal highway policy, usage by bicyclists must receive prior approval by the Board of Transportation for each specific segment for which such usage is deemed appropriate, and those segments shall be appropriately signed for that usage.
3. State, county, and local law enforcement agencies are encouraged to provide specific training for law enforcement personnel with regard to bicycling.
4. The use of approved safety helmets by all bicyclists is encouraged.

Education

It is the policy of the Board of Transportation that education of both motorists and bicyclists, regarding the rights and responsibilities of bicycle riders, shall be an integral part of the Department's Bicycle Program.

School systems are encouraged to conduct bicycle safety education programs as a part of and in addition to the driver's education program, to the maximum extent practicable, and in conjunction with safety efforts through the Governor's Highway Safety Program. The Division of Motor Vehicles is also urged to include bicycle safety and user information in its motor vehicle safety publications.

Parking

It is the policy of the Board of Transportation that secure and adequate bicycle parking facilities shall be provided wherever practicable and warranted in the design and construction of all state-funded buildings, parks, and recreational facilities.

Appendix G: Guidelines for NCDOT to Comply with Administrative Decision to Incorporate Local Greenways into Highway Planning Process

- ❑ Thoroughfare plans will address the existence of greenways planning activity, which has been submitted by local areas. Documentation of mutually agreed upon Interface points between the thoroughfare plan and a greenway plan will be kept, and this information will become a part of project files.
- ❑ Project Planning Reports will address the existence of locally adopted greenways segment plans, which may affect the corridor being planned for a highway improvement. It is, however, the responsibility of the locality to notify the Department of the adopted greenways plans (or changes to Its previous plans) through its current local transportation plan, as well as its implementation programs.
- ❑ Where local greenways plans have not been formally adopted or certain portions of the greenways plans have not been adopted, the Department may note this greenway planning activity but is not required to incorporate this information Into Its planning reports.
- ❑ Where the locality has included adopted greenways plans as a part of its local transportation plan and a segment (or segments) of these greenways fall within the corridor of new highway construction or a highway improvement project, the feasibility study and/or project planning report for this highway improvement will consider the effects of the proposed highway Improvement upon the greenway. In the same manner as it considers other planning characteristics of the project corridor, such as archeological features or land use.
- ❑ Where the locality has justified the transportation versus the leisure use importance of a greenway segment and there is no greenway alternative of equal Importance nearby, the project planning report will suggest Inclusion of the greenway crossing, or appropriate greenway element, as an incidental part of the highway expenditure.
- ❑ Where the locality has not justified the transportation Importance of a greenway segment, the greenway crossing, or appropriate greenway element, may be included as a part of the highway improvement plan if the local government covers the cost.
- ❑ A locality may add any appropriate/acceptable greenway crossing or greenway element at their own expense to any highway Improvement project as long as it meets the design standards of the NCDOT.
- ❑ The NCDOT will consider funding for greenway crossings, and other appropriate greenway elements only if the localities guarantee the construction of and/or connection with other greenway segments.

- This guarantee should be in the form of inclusion in the local capital improvements program or NCDOT/municipal agreement.

If the state pays for the construction of a greenway incidental to a highway improvement and the locality either removes the connecting greenway segments from its adopted greenways plans or decides not to construct its agreed upon greenway segment, the locality will reimburse the state for the cost of the greenway incidental feature. These details will be handled through a municipal agreement.

Localities must accept maintenance responsibilities for state built greenways, or portions thereof. Details will be handled through a municipal agreement.

Appendix H: Administrative Action to Include Local Adopted Greenways Plans in the NCDOT Highway Planning Process January, 1994

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

NCDOT Responsibilities:

The- Department will incorporate locally adopted plans for greenways into the ongoing planning processes within the Statewide Planning (thoroughfare plans) and the Planning and Environmental (project plans) Branches of the Division of Highways. This incorporation of greenway plans will be consistent throughout the department. Consideration will be given to including the greenway access as a part of the highway improvement. Where possible, within the policies of the Department, within the guidelines set forth in ISTEA, and within budget and normal ROW constraints of the individual highway projects, provisions for greenway crossings, or other greenway elements, will be made as a part of the highway project or undertaken as an allowable local expenditure.

Local Responsibilities:

Localities must show the same commitment to building their adopted greenway plans as they are requesting when they ask the state to commit to providing for a certain segment of that plan. It is the responsibility of each locality to notify the Department of greenway planning activity and adopted greenway plans and to update the Department with all adopted additions and changes in existing plans. It Is also the responsibility of each locality to consider the adopted transportation plan In their greenways planning and include its adopted greenways planning activities within their local transportation planning process. Localities should place in priority their greenways construction activities and justify the transportation nature of each greenway segment. When there are several planned greenway crossings of a proposed highway improvement, the locality must provide justification of each and place the list of crossings in priority order. Where crossings are planned, transportation rights of way should be designated or acquired separately to avoid jeopardizing the future transportation Improvements.

Appendix I: Interim Pedestrian Policy Guidelines 3-1-99

EXECUTIVE SUMMARY

These guidelines provide a procedure for implementing the Pedestrian Policy adopted by the Board of Transportation in August 1993. The Pedestrian Policy addresses TIP projects and makes an important distinction between "considering the needs of pedestrians to avoid creating hazards to pedestrian movements" and the concept of "facilitating pedestrian movements for other reasons."

HAZARDS

A hazard in this context is defined as a situation when pedestrian movements are physically blocked in a manner which forces pedestrians to use another mode of transportation or walk in an automobile traffic lane (parallel with the automobile traffic) to pass a barrier. The concept of "not creating a hazard" is intended to allow municipalities to have the flexibility to add pedestrian facilities as part of the project, or in the future after the TIP project is complete. Our current standard cross sections generally do not create barriers for pedestrian movements.

QUANTIFYING THE NEED FOR PEDESTRIAN FACILITIES

Planning studies should evaluate the need for pedestrian facilities based on the degree to which the following criteria are met.

- Local Pedestrian Policy
- Local Government Commitment
- Continuity and Integration
- Location
- Generators
- Safety
- Existing or Projected Pedestrian Traffic

REQUIREMENTS FOR DOT FUNDING

REPLACING EXISTING SIDEWALKS

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

PREVENTING HAZARDS

If there is evidence that a TIP project would create a hazard to existing pedestrian movements, the DOT will take the initiative to not create the hazard. However, if there is not evidence that a TIP project would create a hazard to existing pedestrian movements, the municipality will need to prove there will be pedestrian movements, which will be affected within five years by the hazard created by the TIP project.

INCIDENTAL PROJECTS

Due to the technical difficulty of describing justification for pedestrian facilities, a cost sharing approach is used to provide cost containment for the pedestrian facilities. The DOT may share the incremental cost of constructing the pedestrian facilities if the "intent of the criteria" are met. The DOT will pay a matching share of incidental pedestrian facility total construction costs up to a cap of no more than 5% of total project construction cost of improvements that are within the city limits. Only improvements that have a sidewalk adjacent to it will be included in the total project construction cost. Additionally, the cost of bridges will not be included in the total project construction cost since the provision of pedestrian facilities on bridges will be funded entirely by the DOT. This total project construction cost does not include the construction cost of any incidental pedestrian facilities. The matching share is a sliding scale based on population as follows:

MUNICIPAL POPULATION	DOT PARTICIPATION	LOCAL PARTICIPATION
> 100,00	50%	50%
50,000 to 100,000	60%	40%
10,000 to 50,000	70%	30%
< 10,000	80%	20%

FUNDING CAPS

Under normal circumstances, the cumulative funding for preventing hazards and providing incidental pedestrian facilities should not exceed 5% of the total project construction cost.

INDEPENDENT PROJECTS

The DOT will have a separate category of money for all independent pedestrian facility projects in North Carolina. The independent pedestrian facility funds will be administered similar to the Bicycle Program.

RIGHT-OF-WAY

In general, municipalities are responsible for providing any ROW needed to construct pedestrian facilities. However, the 3.0-meter (10 foot) berm the DOT generally provides on urban curb and gutter facilities can accommodate pedestrian facilities.

MAINTENANCE

Local governments will be responsible for maintaining all pedestrian facilities

**INTERIM
PEDESTRIAN POLICY GUIDELINES, PART 2**

3-1-99

INTRODUCTION

These guidelines provide a procedure for implementing the Pedestrian Policy adopted by the Board of Transportation in August 1993. The Pedestrian Policy addresses TIP projects and makes an important distinction between "considering the needs of pedestrians to avoid creating hazards to pedestrian movements" and the concept of "facilitating pedestrian movements for other reasons." Consequently, these guidelines are divided into three main sections:

- 1) Considering the needs of pedestrians to avoid creating hazards.
- 2) Quantifying the need for pedestrian facilities.
- 3) Requirements for DOT funding.

CONSIDERING THE NEEDS OF PEDESTRIANS

TO AVOID CREATING HAZARDS

Section "d" of the Pedestrian policy states: "In the planning, design, and construction of TIP transportation projects, the DOT shall consider the needs of pedestrians and will not create hazards to pedestrian movements." This means that during each phase of a project, a DOT employee should consider how the project could affect pedestrian movements. If the project will create a hazard to pedestrian movement, the DOT should use engineering judgement and find a way to remove the hazard. A hazard in this context is defined as a situation when pedestrian movements are physically blocked in a manner which forces pedestrians to use another mode of transportation, or walk in an automobile traffic lane (parallel with the automobile traffic) to pass a barrier.

This does not mean that the DOT should build pedestrian facilities on all TIP projects. However, it does mean that the DOT should consider how projects will affect pedestrians and how projects can be designed to accommodate vehicular demands without creating barriers to pedestrians. Hazards can be divided into two categories, lateral barriers and perpendicular barriers. Lateral barriers prevent pedestrians from traveling parallel to the roadway. Perpendicular barriers prevent pedestrians from crossing a roadway.

The concept of "not creating a hazard" is intended to allow municipalities to have the flexibility to add pedestrian facilities as part of the project or in the future after the TIP project is complete. Because bridges are so expensive and because they often have useful lives over fifty years, bridges should be given special consideration when pedestrian travel is anticipated.

BRIDGES

Current standard cross sections generally do not create barriers for pedestrian movements. For bridges on streets with shoulder approaches, a minimum shoulder may be sufficient to "not create a hazard for pedestrian movements" over or under the bridge. For bridges on streets with curb and gutter approaches, DOT will fund and construct sidewalks on both sides if the bridge is less than 200 feet in length. If the bridge is greater than 200 feet in length, then a sidewalk on one side will automatically be funded and constructed. The bridge will also be studied to determine the costs and benefits of constructing sidewalks on both sides and if in the judgement of the DOT, sidewalks on both sides are justified, and then they will be funded and constructed. For dual bridges less than 200 feet in length with a curb and gutter approach, sidewalks will be constructed on the outside of each structure. If the dual bridges are greater than 200 feet in length, then a sidewalk on the outside of one bridge will automatically be funded and constructed. The bridges will also be studied to determine the costs and benefits of constructing sidewalks on the outside of both bridges and if in the judgement of the DOT, sidewalks on both bridges are justified, then they will be funded and constructed.

SHOULDER CROSS SECTIONS

Currently, there is no typical cross section for a rural road with a shoulder, and a pedestrian facility, which is outside of the ditch. However, when a rural road with a shoulder section has a pedestrian facility outside of the ditch, the ditch will not be considered a perpendicular barrier. Similarly, as long as there is some space where pedestrians can walk which is not in an automobile travel lane, the ditch will not be considered a lateral barrier either.

WIDENING PROJECTS

If a TIP project widens a road from 2 lanes to 5 lanes, the new 5-lane road is not considered a perpendicular barrier. Similarly, as long as there is some space where pedestrians can walk which is not in an automobile travel lane, the new 5-lane road is not considered a lateral barrier either.

RELOCATING PEDESTRIAN MOVEMENTS

This policy is not intended to require a pedestrian bridge or tunnel at interchanges where sidewalks and crosswalks are not practical. In these cases, the DOT may consider relocating the pedestrian movement to avoid creating unsafe situations or making unpractical design modifications. Typically, relocated pedestrian movements should be no more than 800 meters (0.5 miles) away from the original path of the pedestrians. The 800 meter distance is a one-way distance, not a round trip distance.

CONSTRUCTION PROCESS

During the construction phase of a project, there may be times when it is not possible to maintain all pedestrian movements through the entire construction process. When necessary, there may be temporary barriers to pedestrian movements in the work zone.

EXAMPLE

For example, the "XYZ" Expressway is a new controlled-access freeway through an established urban area. A major thoroughfare with sidewalks, which will have a new interchange with the Expressway, connects a neighborhood on the north side of the Expressway with a hospital on the south side of the Expressway. Because the proposed interchange for the major thoroughfare is a Single-Point-Diamond design with free-flowing ramps in all four quadrants, there is no safe way for a pedestrian to cross the expressway without conflicting with free-flowing traffic. Although there is a nearby railroad bridge over the expressway, pedestrians are prohibited from that bridge because it was not designed to accommodate both trains and pedestrians. Consequently, residents who live in a neighborhood a few blocks from the hospital will now need to drive to the hospital or walk through a free-flowing traffic lane.

In this example, the design engineer should make every reasonable effort to design this interchange to accommodate the automobile traffic, and not create a barrier for pedestrian movements. If the interchange design requires free-flow ramps as this Single-Point-Diamond design does, the engineer should determine if it is possible for pedestrians to cross the free-flow traffic lanes. If the peak hour traffic flow has acceptable gaps to allow pedestrians to cross safely, then the ramps will not be considered a barrier. However, if traffic volumes or pedestrian volumes are too great, an alternative pedestrian facility should be considered. If accommodating pedestrians at the interchange will compromise safety or good engineering judgement, the engineer should consider if shifting the pedestrian movement away from the interchange is a feasible alternative.

QUANTIFYING THE NEED FOR PEDESTRIAN FACILITIES

Section "e" of the Pedestrian Policy states: *"The Department recognizes there are certain situations in which pedestrian facilities provide significant benefits in the movement of pedestrian traffic . . ."* If a municipality would like the DOT to consider a project for "significant benefits," the municipality is responsible for collecting any necessary information and submitting a written request prior to the initiation of a planning study. The DOT will review the request and, if necessary, verify the data from the municipality. If the pedestrian facilities are not incorporated into a project during the planning phase, and if there are significant factors which change during the time between the project planning study and the project design phase, municipalities may resubmit a request for pedestrian facilities prior to or at the post hearing meeting for the Design Public Hearing or Combined Hearing (whichever is applicable). The cost of sidewalks added to a project after the post-hearing meeting for the Design Public Hearing or Combined Hearing will be the responsibility of the municipality. The Manager of the Programming and TIP Branch may allow DOT participation in sidewalk construction cost after the post-hearing meeting if there is sufficient justification.

Planning studies should evaluate the need for pedestrian facilities based on the degree to which the following seven criteria are met. Municipalities should address each of these criteria when submitting requests for pedestrian facilities. Subsequently, the DOT will make the final determination for pedestrian facility eligibility.

1. Local Pedestrian Policy. There is evidence that local policies on urban development are encouraging urban densities and residential developments to occur in a manner to facilitate pedestrian travel by reducing walking distances, and requiring sidewalk construction in development ordinances.

- Is a pedestrian plan included in local thoroughfare plan?
- Do subdivision ordinances require pedestrian facility construction?
- Do local zoning ordinances facilitate pedestrian travel? (For example, do the zoning ordinances encourage mixed-use developments, which are accessible to pedestrians, or do the zoning ordinances encourage highway strip development, which is not accessible to pedestrians?)

2. Local Government or Local Sponsor Commitment. There is a local government/sponsor plan and commitment to provide an integrated system of pedestrian facilities, which will connect with pedestrian facilities provided by the project.

- Does the local Capital Improvement Program include local funds for providing pedestrian facilities, which will connect with pedestrian facilities provided by the NC TIP project?

- ❑ How many pedestrian facilities currently connect with the pedestrian facilities provided by the project?
 - ❑ How many subdivisions have provided pedestrian facilities, which are or will be connected with pedestrian facilities provided by the project?
 - ❑ Has a responsible local government agency agreed in writing to maintain the pedestrian facility?
3. **Continuity and Integration.** The project provides a connection to an existing or a proposed pedestrian network and will provide a critical link in the network.
- ❑ Is the project a critical link in an existing network? (For example, will this project provide a missing link in an existing network where there are pedestrian facilities extending beyond the length of this project?)
 - ❑ Is the project a critical link in a proposed network? (For example, will this project provide any link in a proposed network where there will be pedestrian facilities extending beyond the length of this project?)
4. **Location.** The project is located within a Census defined urban area or growth area where development is anticipated in the immediate future; a majority of the properties within walking distance of the project are developed, or projected to be developed within 5 years at urban type residential densities. This five-year period will begin at the completion of the appropriate environmental document.
- ❑ Is the project located in a Census defined urban area?
 - ❑ Is the project located in a growth area (Urbanized Area Boundary) where development is anticipated in the immediate future, but is not in a Census defined urban area?
 - ❑ Are a majority of the properties within walking distance of the project developed, or projected to be developed within 5 years at urban type residential densities (a minimum of 1 dwelling unit per acre)?
5. **Generators.** The project serves as a primary access from one or more of the following to one another:
- ❑ day care, elementary or secondary school
 - ❑ college or university
 - ❑ community facility (such as library or park)
 - ❑ public transportation
 - ❑ commercial, office, industry, or business centers
 - ❑ residential areas.

- ❑ Will any of these land-uses within two kilometers (1.2 miles) of the project use this project as a primary access?
6. **Safety.** The project provides demonstrable safety benefits for pedestrians.
- ❑ Will the pedestrian facility separate pedestrians from automobile traffic with a posted speed greater than 80 kilometers per hour (50 miles per hour)?
 - ❑ Will the pedestrian facility be used by children (0-14), elderly (65+), handicapped, or low-income people?
 - ❑ Will the pedestrian facility reduce potential pedestrian-vehicle conflicts?
 - ❑ Will the pedestrian facility address the identified safety needs of the area?
6. **Existing or Projected Traffic.** Continued, sustained pedestrian travel can be shown by any of the following:
- ❑ Evidence of existing usage such as well-worn paths.
 - ❑ Projected usage based on previous experience with similar facilities.
 - ❑ Minimum of 150 pedestrians per 24-hour period along a corridor planned for the project.

**Appendix J: Hickory Police Department Reported Collision Statistics
1998-1999.**

Table 7: Reported Statistics of Pedestrian and Bicycle collision with automobiles

1993	23
1994	21
1995	26
1996	25
1997	10
1998	6
1999	4

Source: Hickory Police Department

Appendix K: Recommended Policy for the City of Hickory

The policy is proposed to guide the action of the City of Hickory as they relate the goal of encouraging bicycling as a mode of transportation and form of recreation.

This mission recognizes that increased use of alternative modes of transportation would meet some policy goals of the City and provide benefits to its residents and workers. These benefits include:

- ❑ Improved air quality
- ❑ Improved quality of life
- ❑ Enhanced mobility to locations not now well served by public transportation (PWTS)
- ❑ Enhanced mobility for population groups not well served by automobiles or public transportation
- ❑ Helping Hickory meet federal Clean Air Act mandates
- ❑ Increased transit use
- ❑ Increased pedestrian access
- ❑ Increased tourism
- ❑ Improved personal health

This mission also recognizes that Hickory does not now offer an environment, which satisfactorily supports most alternative modes of transportation, and that public policies and actions are needed to provide bicycling support.

Goals

This policy sets out four goals to be pursued by the City of Hickory as a framework for action. The following sections described these goals, reasons for achieving them, any specific objectives that should be met, and actions, which departments may take to achieve the goals.

Improving facilities

Improving bicycle facilities mean more than putting in place miles of bikeways. It involves providing a safe, on-street bicycling environment and installing storage spaces and other infrastructure supporting bicycling. Improving facilities should help allow city residents and workers to bicycle safely and conveniently to destinations between five- and ten-mile distance for work, school, shopping and recreation. Providing such an environment would do much to attract more people to use bicycles more often.

The Departments of Planning and Development, Engineering, Public Works and Parks and Recreation should support bicycling not just in their functions related to planning and

design, but in their maintenance and construction functions as well. They should make all possible efforts to secure federal and state transportation funding for the installation of bicycle facilities. In addition, Hickory's economic development policies should encourage private commercial property owners to install facilities for bicycling.

Promote awareness

Lack of awareness of the feasibility of bicycling and of the needs of bicyclists is two of the greatest obstacles to increased bicycle use. The riding and non-riding public must be informed of facilities being put in place to encourage bicycling in Hickory. Increasing awareness of bicycling should encourage more of the non-riding public to use bicycles.

Efforts to increase awareness of bicycling should be directed toward city employees. Decades of having the automobile as the favored mode of transportation have embedded institutional arrangements which give greater priority to automobiles than to other modes such as walking, bicycles, car-pools and vanpools. City departments should reverse this situation by treating bicycles and other modes as legitimate modes of transportation.

Integrate bicycles with transit modes

The departments should provide for the convenient use of bicycles to and on public transit: buses and light rail and support the establishment of park-and-ride lots. The integration of bicycles with other modes will encourage bicycling as well as increase PWTS bus ridership.

Improve safety

The fear of injury while bicycling is another of the major obstacles to increasing bicycle use. Contributing to employees' confidence in the safety of this mode could help increase bicycle use.

Appendix M

Requirements for NCDOT Funding Replacing Existing Sidewalks

Section "b" of the Pedestrian Policy states: "When a highway construction project having to do with the widening of an existing street requires that an existing sidewalk be torn up to make room for the widening, it is the policy of the Department of Transportation to replace the sidewalk." This statement says the DOT will pay 100% of the cost to replace an existing sidewalk which is removed to make room for a widening project. There is no monetary cap for this category of funding pedestrian facilities.

PREVENTING HAZARDS

Section "d" of the Pedestrian Policy states: "In the planning, design, and construction of TIP transportation projects, the DOT shall consider the needs of pedestrians and will not create hazards to pedestrian movements." If there is evidence that a TIP project would create a hazard to existing pedestrian movements, the DOT will take the initiative to not create the hazard. However, if there is not evidence that a TIP project would create a hazard to existing pedestrian movements, the municipality will need to prove there will be pedestrian movements, which will be affected within five years by the hazard created by the TIP project. The five-year period will begin at the completion of the appropriate environmental document (Categorical Exclusion, Finding of no Significant Impact, or Environmental Impact Statement).

CERTAIN SITUATIONS

Section "e" of the Pedestrian Policy states: "The Department recognizes there are certain situations in which pedestrian facilities provide significant benefits in the movement of pedestrian traffic. The Department of Transportation may participate in the provision of these facilities on a full or shared-cost basis." This statement says the DOT may participate in funding incidental projects, and independent projects as described below.

INCIDENTAL PROJECTS

Incidental pedestrian projects are defined as TIP projects where pedestrian facilities are included as part of the project. The DOT may share the incremental cost of constructing the pedestrian facilities if the "intent of the criteria" is met, and the request for DOT participation is made prior to or at the post-hearing meeting for the Design Public Hearing. The DOT will pay a matching share of incidental pedestrian facility total construction costs up to a cap of no more than 5% of total project construction cost of improvements that are within the city limits. Only improvements that have a sidewalk adjacent to it will be included in the total project construction cost. Additionally, the cost of bridges will not be included in the total project construction cost since the provision of

pedestrian facilities on bridges will be funded entirely by the DOT. This total project construction cost does not include the construction cost of any incidental pedestrian facilities. The matching share is a sliding scale based on population as follows:

MUNICIPAL POPULATION	DOT POPULATION	LOCAL POPULATION
> 100,00	50%	50%
50,000 to 100,000	60%	40%
10,000 to 50,000	70%	30%
< 10,000	80%	20%

The local government share of the pedestrian facility construction funding may not be Federal or State money for the purposes of these guidelines. In addition, the ROW municipalities provide for pedestrian projects may not be counted toward the required local contribution.

EXAMPLE

A 10-mile project proposes to widen an existing two-lane road to a five-lane curb and gutter roadway. Four miles of the project is within the city limits and there are no existing sidewalks. The city requests that sidewalk be included on one side on 2 miles of the project that falls within the city boundaries. The DOT concurs that the sidewalk is warranted and it is added to the project. The city population is 75,000.

To determine the contribution by the DOT and by the city, the "total project construction cost", for purposes of determining participation, must be calculated. Costs are included only if the construction occurs within municipal boundaries and a requested sidewalk are adjacent to the roadway. Additionally, the cost of bridges is excluded from the cost. Therefore, the "total project construction cost" will be the cost of improvements for 2 miles of the project. DOT estimates that it will cost \$5 million to construct the 2 miles of improvements, not including the cost of the sidewalks or bridges. It is estimated that the sidewalk will cost \$170,000 to construct. 5% of the "total project construction cost" is \$250,000; therefore, the cost of the sidewalk construction does not exceed the 5% cap. DOT's share would be 60% of \$170,000, or \$102,000. The city's share would be \$68,000.

INDEPENDENT PROJECTS

Independent pedestrian projects are defined as projects where pedestrian facilities are the entire project. The DOT will have a separate category of money for all independent pedestrian facility projects in North Carolina. The independent pedestrian facility funds will be administered similar to the Bicycle Program. Municipalities will prioritize their requests under the enhancements section of the local request list, and the DOT will fund, as many projects as funding will allow.

GENERAL INFORMATION

The attached flow chart illustrates the decision process for a project engineer. In addition, the funding caps, ROW and maintenance requirements described below must also be met.

FUNDING CAPS

Under normal circumstances, the cumulative funding for preventing hazards and providing incidental pedestrian facilities should not exceed 5% of the total project construction cost. This "total project construction cost" does not include the construction cost of any incidental pedestrian facilities. The 5% cap is intended as a guide, not as an absolute cap. Consequently, the appropriate Branch Manager can approve pedestrian funds over the 5% cap.

RIGHT-OF-WAY

In general, municipalities are responsible for providing any ROW needed to construct pedestrian facilities. The DOT will allow pedestrian facilities on DOT ROW only if the pedestrian facility will not compromise the safety of vehicles or pedestrians. For preventing hazards, the DOT may buy the necessary ROW. For incidental and independent projects the DOT shall not pay extra ROW cost for pedestrian facilities.

Since the DOT's typical curb and gutter cross-section generally has a 3.0 meter (10 foot) berm, a 1.5 meter (5 foot) pedestrian facility may fit within this standard ROW.

Applicable AASHTO standards for ROW and design must be met. The DOT will not narrow automobile travel lanes to accommodate incidental pedestrian facilities. For example, if a project specifies five 3.6 meter (12 foot) lanes on a section of road, the DOT will not reduce the width of the travel lanes to 3.0 meters (10 feet) to create room for pedestrian facilities. In addition, if right-of way is restricted, and there is insufficient room for pedestrian facilities and a utility strip, the utility strip will take precedence.

Applicable Federal and State regulations must also be met. For example, if ROW for a particular project is restricted by historic property, federal regulations on historic preservation may prohibit the DOT from using additional ROW for pedestrian facilities.

MAINTENANCE

Local governments are responsible for maintaining all pedestrian facilities. The Municipal Agreement will formally specify that the DOT is not responsible for maintaining pedestrian facilities.

Appendix N: Policy Adopted by the NCDOT
.0406 Construction and Maintenance of Sidewalks and other
Pedestrian Facilities

- (a) It is the policy of the Board of Transportation that highway funds are for the purpose of constructing and improving streets and highways for the movement of people and goods. Generally, within municipalities, the construction of a sidewalk on a state highway system street is considered a municipal responsibility.
- (b) When a highway construction project having to do with the widening of an existing street requires that an existing sidewalk be tom up to make room for the widening, it is the policy of the Department of Transportation to replace the sidewalk.
- (c) For construction and widening projects where sidewalks do not already exist, it is the policy of the Department of Transportation that it will not participate in the construction of sidewalks except as in subsections (d) and (e). If adequate ROW is available, the Department of Transportation will grade out a level walking area back of the curb in the utility strip. The municipality may, at its own discretion, construct sidewalks. If the municipality desires sidewalks as a part of the construction project, they will be constructed and the city will reimburse the Department of Transportation for the cost of the sidewalks by appropriate municipal agreement.
- (d) In the planning, design, and construction of TIP transportation projects, the Department of Transportation shall consider the needs of pedestrians and will not create hazards to pedestrian movements.
- (e) The Department recognizes there are certain situations in which pedestrian facilities provide significant benefits in the movement of pedestrian traffic. The Department of Transportation may participate in the provision of these facilities on a full or shared cost basis.