CITY OF GRAHAM PEDESTRIAN TRANSPORTATION PLAN

DECEMBER 2006

PREPARED FOR
CITY OF GRAHAM, NC

PREPARED BY
GREENWAYS INC.

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Sidewalk surrounded by crape myrtles in front of Graham Middle School.

ACKNOWLEDGMENTS

This Pedestrian Transportation Plan study was made possible by the joint efforts of the City of Graham's Planning Department, Parks and Recreation Department, Public Works Department, Police Department, City Council, and the efforts of local citizens. This public-private partnership represents the broad commitment by individual members of the Graham community to work together to improve the pedestrian-friendliness of the area.

City of Graham Steering Committee

- Chip Turner: Chairmen and Recreation and Parks
- Mickey Cheek: City Council and Recreation and Parks
- Bryan Shoffner: Planning and Zoning Board
- Delbert Bean: Recreation and Parks
- Bob Jones: Recreation and Parks
- Donna Ramsey: Historic District Commission
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Members of the Steering Committee consider pedestrian options for Graham.

Downtown Graham

INTRODUCTION

Chapter 1

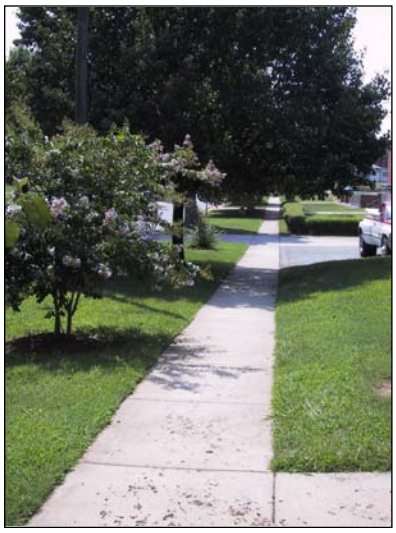
1.1 Scope and Purpose

In March of 2005, the City of Graham contracted with Greenways Incorporated (GWI) to create a Pedestrian Transportation Plan. The project was started and funded through the bicycle and pedestrian planning grant initiative of the North Carolina Department of Transportation (NCDOT). The project area is the entire Graham Municipal Boundary, encompassing over 9 square miles. The City of Graham is split by I-40/85 with the Downtown to the north and increasing development to the south and east of the interstate.

Because Graham continues to grow and attract more residents annually, a pedestrian friendly environment becomes essential to the City's livability. The Pedestrian Transportation Plan offers an improved alternative transportation network that addresses specific pedestrian safety concerns while recommending key pedestrian routes and connections. The Plan recommends both new pedestrian facilities and enhancements to older facilities in order to best connect pedestrians to their key destinations.

While walking is the least expensive and for some, the only transportation mode, implementing, building, and maintaining a high quality pedestrian system requires comprehensive planning and long term funding. The Pedestrian Transportation Plan will be a key resource for the City in securing grants from a growing supply of funds dedicated to pedestrian safety and livable communities.

The planning process took 12 months to complete and included regular input from a local steering committee made up of representatives from the City Planning Department, the Recreation and Parks Department, the NCDOT, and local citizens. Together, the committee brought focused feedback throughout the course of the planning process. Additionally, the City of Graham worked closely with GWI to ensure significant levels of public input, including two public open house workshops, a survey, and a public comment form to gauge the residents' interests, uses, and concerns.



Beautiful sidewalk along Elm St.

This document presents the findings of the public input process along with an assessment of the existing pedestrian facilities in Graham. From these findings, a set of phased recommendations was developed for a pedestrian system that meets the future needs of the area's residents. The recommendations include both physical changes and policy changes, along with suggestions for programs and funding sources to facilitate the Plan's implementation.

1.2 Benefits of Walking

Communities across the United States have been implementing strategies to improve their walking environments and serve the needs of pedestrians. This is done not only to promote public safety, health and welfare, but also because of the growing awareness of the multiple benefits of walking. These benefits include alternative transportation options, increased health and fitness, lower levels of traffic congestion, environmental benefits, economic benefits, and an increased sense of community among residents.

1.2.1 Transportation Benefits

In 1995, the National Personal Transportation Survey found that roughly 40% of all trips taken are less than 2 miles. By making these short trips on foot, rather than a car, citizens can have a substantial impact on local traffic and congestion. Additionally, many people do not have access to a vehicle or license and are not able to drive. In an auto-dependant environment, this situation leaves the elderly, the young, and the underprivileged without a means to get around for even basic daily trips. An improved pedestrian network provides greater and safer mobility for all residents, and allows for a more productive community overall.

1.2.2 Personal Health

It is well documented that an active community is a healthy community. There are numerous studies affirming that sedentary lives and prolonged periods of inactivity are major deterrents to health, sometimes doubling the risk of morbidity and mortality from coronary heart disease and stroke[1]. Obesity and diabetes, particularly in children, have risen dramatically in recent years with the majority of U.S. states having obesity prevalence rates of 20% or greater[2]. The U.S. Department of Health now recommends 60 minutes of physical activity every day to maintain body weight. Improving the connections between schools and neighborhoods in the City of Graham can positively influence children's health by providing opportunities to further incorporate exercise into their daily lives.

Overall, the rise in the occurrence of obesity, cardiovascular disease, hypertension, diabetes, osteoporosis and some cancers affecting all ages are clearly linked to lack of physical activity. A safe, walkable community provides a means and facility to pursue exercise and improve health for all.

1.2.3 Environmental Improvements

When people choose to get out of their cars and make trips by foot, they make a positive environmental impact. They reduce their use and dependence on gasoline and reduce the volume of air pollutants. According to the EPA, there is strong evidence that reducing air pollution from automobile use can protect children's health[3]. For example, during the 1996 Atlanta Olympic Games, when driving was reduced and ambient ozone levels fell by 27.9 percent, emergency room visits for asthma dropped by 41.6 percent. These results suggest that while pedestrians are improving their own health through physical activity, they are also improving the health of those around them by not contributing to air pollution with their automobile trips. Other im-

pacts can be a reduction in overall neighborhood noise levels and improvements in local water quality as fewer automobile-related discharges wind up in the local rivers, streams, and lakes.

1.2.4 Economic Benefits

A pedestrian friendly city can help both the individual and the community economically. Walking is a free means of transportation. The cost of owning and operating a car with surging gas prices is a significant percentage of our incomes. Walking is a necessity for some and a financial gain for all. A walkable community is also a sign of high quality of life, attracting new residents and businesses, and spurring economic development.

1.2.5 Quality of Life

Many factors go into determining the quality of life for the citizens of a community. The local education system, prevalence of quality employment opportunities, and affordability of housing are all items that are commonly cited. Increasingly though, citizens claim that access to alternative means of transportation and access to quality recreational opportunities such as parks, trails, greenways, and bicycle routes, are important factors for them in determining their overall pleasure with their community. Happy, active citizens radiate a high degree of livability within a community, and this livability factor can, as mentioned above, attract new businesses, new residents, and new opportunities - all important components of maintaining a high quality of life in the community.

Pedestrian-friendly pocket park (Sesquicentennial Park) in City square. This park opened in 2001, celebrating the City's 150th anniversary.

1.2.6 Summary and Additional Resources

Many private and public organizations have completed studies and surveys that show the many benefits of walking. The ideas presented above are only a small sample of the information that is available. If you would like to learn more about the benefits of walking, the Internet can be a great source of information. An excellent starting-point for resources is the Pedestrian and Bicycle Information Center's website (www.walkinginfo.org/pp/benefits), based out of Chapel Hill, NC. Another excellent resource is Active Living by Design, (www.activelivingbydesign.org), a program of the Robert Wood Johnson Foundation and part of the UNC School of Public Health, also in Chapel Hill, NC.

1.3 History

While this is Graham's first Pedestrian Plan, it is part of an ongoing, historic effort and desire to provide safe and enjoyable walking opportunities for its residents and visitors. Previous efforts and new policies have established walkable environments throughout portions of City including the older Downtown area and new developments. Today, there is a need to connect and improve these existing facilities.

Funding assistance to create this plan has come from the State of North Carolina's Department of Transportation (NCDOT) as part of its 2004 Bicycle and Pedestrian Planning Grant Initiative. The City of Graham was awarded one of the grants in the first year of this Initiative. This Initiative is part of a growing movement statewide and within the NCDOT to promote the idea that all citizens should have access to safe, convenient walking and bicycling options that get them to their destinations. The NCDOT's Division of Bicycle and Pedestrian Transportation was established in 1974 and has developed laws and policies and increased access to information, funding, and other forms of assistance.

A series of existing local, county, and state transportation, recreation, and growth management plans (outlined in Section 2.3) recommend and support pedestrian improvements and enhancements. These plans, along with the groundwork laid by previous efforts, provide a foundation for the City of Graham Pedestrian Transportation Plan.

1.4 Vision and Goals

The following pedestrian planning goals and objectives were generated for the City of Graham in 2005 as a result of Steering Committee Meetings and Open House Public Workshops:

- Promote safe walking in Graham for all types of residents and visitors and promote the safe interaction of motorists and pedestrians
- Provide sidewalks and improved crosswalks in school and commercial areas
- Aid in revitalizing Downtown through safety and aesthetic improvements, while connecting pedestrian corridors into Downtown
- Improve the existing sidewalks and connect the gaps between them
- Develop off-road greenway trails that protect the environment, provide unique recreational opportunities, and connect into the on-road sidewalk system
- Improve accessibility for children, elderly, and the handicapped
- Reduce traffic congestion
- Increase awareness and promotion of the City's pedestrian needs

Taken together, these goals and objectives form a vision of what the City of Graham aims to achieve:

Create a pedestrian-friendly environment with a system of pedestrian facilities that links together existing resources and destinations (especially schools and Downtown), allows for safe interaction between pedestrians and motorists, supports alternatives to automobile travel, increases recreation opportunities, advances the community's mobility, quality of life, and development, and encourages and rewards the choice to walk.

Citizens convey their goals for the City of Graham.

(Footnotes)

[1] Fox, Dr. Kenneth R. *The Influence of physical activity on Mental Well-Being.*

[2] Centers for Disease Control and Prevention, Department of Health and Human Services

[3] U.S. Environmental Protection Agency (EPA). (2003). *Travel and Environmental Implications of School Siting.*

Cinema in Downtown Graham

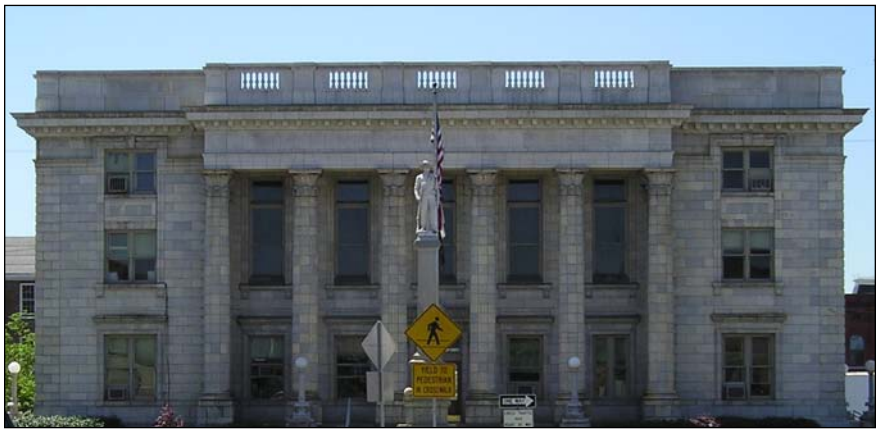
EXISTING CONDITIONS Chapter 2

2.1 General Overview

The City of Graham is the Alamance County Seat, located within the Piedmont Triad section of North Carolina. About halfway between Durham and Greensboro, Graham sits along Interstate 40/85. Then a Town, Graham was incorporated in 1851 after Orange County was split in two, creating Alamance County, and thus the need for a County Seat.

Graham is the 56th largest municipality in North Carolina and is generally contained within a north-south rectangle, split by Interstate 40/85, with patchy annexation patterns to its south and east. It is bounded by the City of Burlington to the west and northwest, the Town of Haw River on the northeast, and the Town of Swepsonville on the southeast. It is also bordered by Boyd's Creek to the West, Great Alamance Creek to the South, and the Haw River to the East.

Graham's strategic location in the growing Piedmont region and small city charm have allowed for steady growth over the last 50 years. In 2003, the population was 13,619, up from 10,426 in 1990. As of 1990, there was a fairly uniform distribution of ages in Graham, indicating a variety of families, young professionals, and retirees. The majority of Graham residents work in either Graham or Burlington, the neighboring city to the West.



Alamance County Courthouse, in the center of Graham.

Graham's geography and population characteristics have an overarching impact on the pedestrian planning process. They significantly affect transportation, the environment, local ordinances, and everyday decisions by motorists and pedestrians. Because of the even distribution of ages, increasing growth, and adjacency to other municipalities and major stream corridors, this Pedestrian Plan will recommend facilities that cater to these needs and take advantage of existing resources. The following sections summarize the existing conditions, current pedestrian usage, community concerns, and existing plans and ordinances.

2.2. Inventory of Existing Pedestrian Conditions

Pedestrian conditions vary across the City on spatial and temporal scales. Most major roads through Graham carry a significant amount of traffic, including heavy vehicles, and often lack adequate pedestrian facilities. During rush hour, traffic increases dramatically, including heavy vehicles in the City's downtown core. Traffic remains fairly consistent throughout the day at Graham's three I-40/85 exit ramps, with many vehicles entering the City to use gas stations and fast food restaurants. Residential roads have relatively minimal traffic and low speed limits, providing safe walking for most residents. There is no mass transit option in Graham.

Citizens in Graham who walk are typically children, adults who do not always have access to a vehicle, and those who walk for recreation or exercise. This is based largely on observation and Steering Committee input.

To understand the City's pedestrian condition, it is important to consider a number of specific factors that affect the overall character of the community. The findings are presented below.

2.2.1 Trip Attractors

People currently walk to a variety of destinations across Graham for various purposes. These destination points are referred to in this document as trip attractors. The most common categories of pedestrian trip attractors in Graham include:

- Downtown
- Schools (North Graham Elementary, South Graham Elementary, Graham Middle School, Graham High School, Alamance Christian School, River Mill Academy)
- Shopping locations (grocery stores, shopping centers, restaurants, Downtown)
- Parks (Bill Cooke Park, South Graham Park, playgrounds)
- Community and recreation centers (Graham Recreation Center, Maple Street Recreation Center, Skate Park)
- Historic and other points of interest (Graham Public Library, Graham Historical Museum, Lynwood Cemetery, Providence Cemetery)
- Places of employment (business areas, industrial parks, City offices, Courthouse)

Pedestrian at Bill Cooke Park, a Graham trip attractor.

Each of these categories of pedestrian trip attractors were considered when determining locations for the physical pedestrian improvements recommended in Chapter 3 - Pedestrian Network

Plan. They represent important starting and ending points for pedestrian travel and provide a good basis for planning ideal walking routes. Some of the most important trip attractors that were identified are shown on ***Map 1 - Existing Conditions***.

2.2.2 Land Use Characteristics

Graham has a variety of land use types radiating out from its urban Downtown center. The Downtown area itself is diverse with civic, industrial, commercial, and residential uses in the immediate vicinity. Overall, residential is the dominant land use type of Graham, surrounding Downtown and in other developments south of Interstate 40/85. Commercial land uses are found in the Downtown, along the major road corridors of Main St./Highway 87, Highway 54/Harden St., and near the Interstate access points with gas stations and restaurants. City offices are centered Downtown with all schools east of Main St. Industrial sites are scattered with concentrations in the north and some along the interstate. There is a small percentage of recreational land use although the few existing area parks are fairly large.

The heaviest concentration of urban land uses is found north of Interstate 40/85 surrounding the Downtown. Open, rural land is still commonplace south of the interstate with scattered residential areas and some commercial activity along S. Main Street.


Elm St. streetscape in Downtown.

2.2.3 Existing Pedestrian Facilities

The majority of existing pedestrian facilities are located in the Downtown area, and also within several new subdivisions (See **Map 1 – Existing Conditions**). These facilities are in place because of previous Downtown development ordinances and newer subdivision regulations. While these existing facilities offer a good starting point, many pedestrian connections to and from the Downtown area are needed, as are connections across Interstate 40/85, to make the City truly pedestrian friendly. Worn footpaths are common where these connections are needed (near schools, in gaps within the sidewalk system, and below the interstate bridges). Finally, where sidewalks do exist, some improvements are necessary such as the addition of curb ramps, striped crosswalks, signal countdowns, and raised medians. The current environment for pedestrians is generally unsafe, handicap inaccessible, and in need of improvement.

While most facilities are lacking or inadequate, several fair examples exist including sections of Elm St. and N. Main St. where sidewalks are on both sides, and a grass buffer separates the road from the sidewalk. The Downtown streetscape around the Courthouse also offers a pleasant environment for pedestrians. Still, crosswalk improvements and curb ramps would go a long way to improving conditions along these routes.

Currently, there are no official greenways within the City of Graham. Linear, undeveloped open spaces, stretches of sewer easement, and existing canoe accesses can be found along the area's waterways offering an opportunity for greenway development.

All sidewalks in Graham were mapped as part of this process by the Consultant using GPS (Global Positioning Systems) technology.

2.2.4 Connectivity

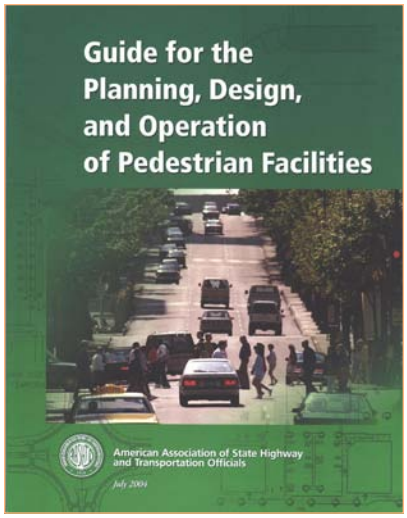
Achieving overall pedestrian connectivity is a major goal for this Plan. As previously mentioned, there is a lack of connectivity between pedestrian facilities and trip attractors. Some of the connections will be fairly easy to implement, such as filling minor gaps within the existing sidewalk system. Other pedestrian connections will be more difficult and expensive to implement, such as the provision of sidewalks and crosswalks around most of Graham's schools and commercial areas.

These latter improvements, however, are highly valuable to the community, particularly in the realm of child safety. Specifically, North Graham Elementary, South Graham Elementary, and Graham High School, all sustain significant child pedestrian traffic, but have no sidewalks whatsoever. Improvements to these areas could potentially save lives, and at the very least, they could provide children with a safer route to school.

Children walking in the auto-oriented road environment near Graham High School.

2.3 Existing Plans and Ordinances

Pedestrian planning in Graham is shaped by planning and project development at many levels. The Federal Government produces standards and guidelines that are then customized at the state, regional, and local levels. The State produces long-range policy, project, and funding documents that are based on local-level needs and state-level interests and capacities. Alamance County and the City of Graham have also produced growth management, parks and recreation, and transportation plans that all incorporate some level of attention to pedestrian issues and provide recommendations. All of these documents represent important efforts, provide valuable insight and background, and have influenced the development of this Plan.



Of all the plans, guidelines, and strategies, the most important documents for guiding this process are: The American

Association of State Highway and Transportation Officials (AASHTO) Guide for the Planning, Design, and Operation of Pedestrian Facilities, the NCDOT's Long-Range Statewide Transportation Plan (updated in 2004), the Burlington Graham Urban Area Metropolitan Planning Organization's Transportation Plan Update (2005-2030), the City of Graham Recreation and Parks Plan, the City of Graham Growth Management Plan (2000-2020), and the City of Graham Development Ordinances. These key works are summarized below. Information about more specific policies and programs are described in Chapter 4. For further information, please consult the reviewed document in its entirety.

AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004)
This guide, published by the American Association of State Highway and Transportation Officials, provides guidance on the planning, design, and operation of pedestrian facilities along streets and highways. It focuses on identifying measures that accommodate pedestrians on public rights-of-way. It includes information on pedestrian characteristics, planning strategies, site development, roadway/sidewalk design, intersection design, signals, signing, and maintenance.

NCDOT Long-Range Statewide Transportation Plan (2004)
The latest version of this document calls for connectivity improvements between different modes of transportation as well as the development of new opportunities for multimodal transportation. To achieve this, the plan asks for a larger financial investment in pedestrian facilities than has historically been available. It also promotes the idea of strengthening the importance of community-level goals in transportation planning and "mainstreaming" the development of pedestrian facilities, i.e. ensuring that pedestrian facility planning is considered early on in the project planning and is a regular part of everyday transportation across the state, rather than a secondary consideration or overlooked component.
Website: http://www.ncdot.org/doh/preconstruct/tpb/statewideplan

NCDOT Long-Range Transportation Plan: Bicycling and Walking in North Carolina (1996)
This Plan defines and promotes the vision of the Division of Bicycle and Pedestrian Transportation. This vision affirms the idea that "All citizens of North Carolina and visitors to the state will be able to walk and bicycle safely and conveniently to their desired destinations". Goals of this Plan include providing bicycle and pedestrian facilities, providing strategies of education, enforcement, and encouragement, and promoting new ways to advance pedestrian safety.
Website: http://www.ncdot.org/transit/bicycle/about/Longrangeplan2.pdf

NCDOT Pedestrian Policy Guidelines, Bridge Policy, and Greenway Policy and Guidelines
The NCDOT provides numerous guidelines for pedestrian facilities, bridges, and greenways. These are guides for implementing policies and pedestrian improvements. This includes requirements for communities to request incorporating pedestrian facilities as part of the TIP (Transportation Improvement Program). It also includes the incorporation of local greenways into the highway planning process. These may be found at the website below.
Website: http://www.ncdot.org/transit/bicycle/laws/laws_intro.html

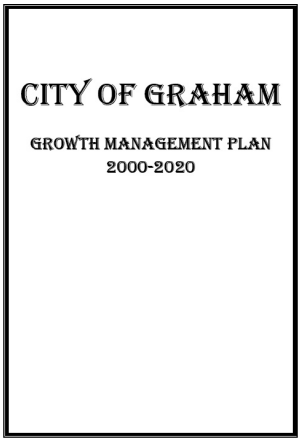
Burlington Graham Urban Area Metropolitan Planning Organization's Transportation Plan Update (2005-2030)

One of the listed goals of this Transportation Plan is the identification and improvement of pedestrian transportation network facilities to better accommodate pedestrian access. Public survey data supports the idea that building sidewalks, crosswalks, and greenways is very important in the MPO area. Specific goals include enhancements, connectivity, and integration of pedestrian facilities along with pursuing pedestrian project funding. Specific roadway/ sidewalk improvements are listed in the appendix and include Graham-Hopedale Road as it heads north into Burlington.

Website: http://www.mpo.burlington.nc.us/datanreports/main.htm

City of Graham Growth Management Plan 2000-2020

This Plan addresses city growth and how to plan for future development and revitalize older portions of the City. The City's goals are to retain a small town atmosphere that is Downtown-centered with a focus to revitalize the core area, creating a more pedestrian friendly environment with sidewalks, trails, and aesthetic improvements. The Plan encourages alternative forms of transportation, making neighborhoods connected to multiple uses by sidewalks, and promoting a greenway system that links the City's recreational resources. It also calls for a Sidewalk Plan that would outline and propose new sidewalks, while requiring new development to include sidewalks. More specific recommendations include developing a greenway system along rivers and creeks, including the Haw River, and improving the Downtown area by making it more pedestrian oriented through streetscape and storefront enhancements. This plan was particularly useful in determining current and future trip attractors, such as 'village centers', 'neighborhood centers', and traditional neighborhood developments.



Website: http://www.cityofgraham.com/growth%20mgnt%20plan.htm

City of Graham Comprehensive Recreation and Parks Master Plan (1998)

This Plan was developed by the City of Graham as a guide for future decision-making regarding parks and recreation services. Recommendations include an environmental park and nature trail at South Graham Park connected to trails leading to the Haw River, a mountain bike trail at Bill Cooke Park, a perimeter fitness trail at Greenway Park, the development of canoe/hiking/ biking trails along the Haw River, and hiking/biking trails along the Little Alamance and Great Alamance Creeks. The recommended greenways would provide excellent recreation opportunities as part of the future Mountains-to-Sea Trail (MST), taking advantage of the river's and creek's hydrologic features. To make this all possible, this Plan suggests seeking funding resources, land donations, easement options, and various partnerships with the State, the County, neighboring cities, private organizations, and non-profit groups.

City of Graham Development Ordinances (Last updated 2006)

This collection of ordinances is generally focused on promoting the health, safety, and welfare

of the City of Graham and its ETJ. Specific ordinances include addressing sidewalk construction during development, setting aside open space during development, and other regulations such as not allowing parking on sidewalks. These specific ordinances are described in Chapter 4 and policy recommendations/action steps are listed to further guide the City of Graham in developing and updating City ordinances to improve future pedestrian conditions.

2.4 Community Concerns, Needs, and Opportunities

Numerous forms of public input (open house public workshops, public comment forms, and Steering Committee Meetings), provided first hand accounts of the existing pedestrian conditions in the City of Graham. The community's concerns, needs, and opportunities regarding these conditions emerged from these inputs. The results are summarized below and have been incorporated into the Pedestrian Network Plan presented in the following chapter. More detailed results are found in Appendix A.

2.4.1 Open House Public Workshops

Two sets of public workshops occurred, in the Fall of 2005 and in the Spring of 2006. The first open house public workshop was held to gather public input early in the planning process and receive visions, goals, and specific recommendations. The meeting consisted of two presentations regarding the scope, goals, and principles of the plan. As a means of public input, workshop facilitators were available to personally engage in dialogue about the concerns, needs, and opportunities that workshop participants expressed regarding the plan and process. Additionally, workshop participants provided direct input by drawing and writing on input maps, allowing each participant to highlight areas and routes of particular concern. The main concerns that emerged from the public workshops revolved around safe routes to schools and recreation centers, access in and around the Downtown Area, and sidewalk improvements along Maple St. and the northwest portion of Main Street. Additionally, the public workshop participants highlighted routes south of I-40/85 that could serve as primary pedestrian corridors.

The second public workshop was held to receive feedback on the preliminary network (sidewalk and greenway) recommendations, intersection improvement sites, and prioritization of both. Overall, citizens were pleased with the network and felt like it addressed the most important areas. Specific intersection improvement sites were recommended as high priorities. There was also emphasis on the need to improve the condition of deteriorated and/or narrow existing sidewalk on Main St. north of Downtown.

2.4.2 Pedestrian Surveys

The City of Graham promoted a survey and public comment form to gauge the community's concerns about the City's existing and future pedestrian conditions. Both were distributed at the public meetings and the public comment form was distributed in the City October newsletter. The survey asked specific questions about walking frequency, factors determining the decision to walk, ranking of important pedestrian issues, and funding options. The public comment form asked participants to describe specific conditions along a walking route of choice.

Generally, citizens who filled out comment forms recommended sidewalks in various locations along with crossing improvements. The most common concern was a lack of a connected sidewalk network. Other comments included a need for more sidewalks around schools, improved crosswalks (especially along Main St.), reduced speed limits for automobile traffic, heavy automobile traffic, and narrow sidewalks.

Members of the Steering Committee discuss potential pedestrian corridors.

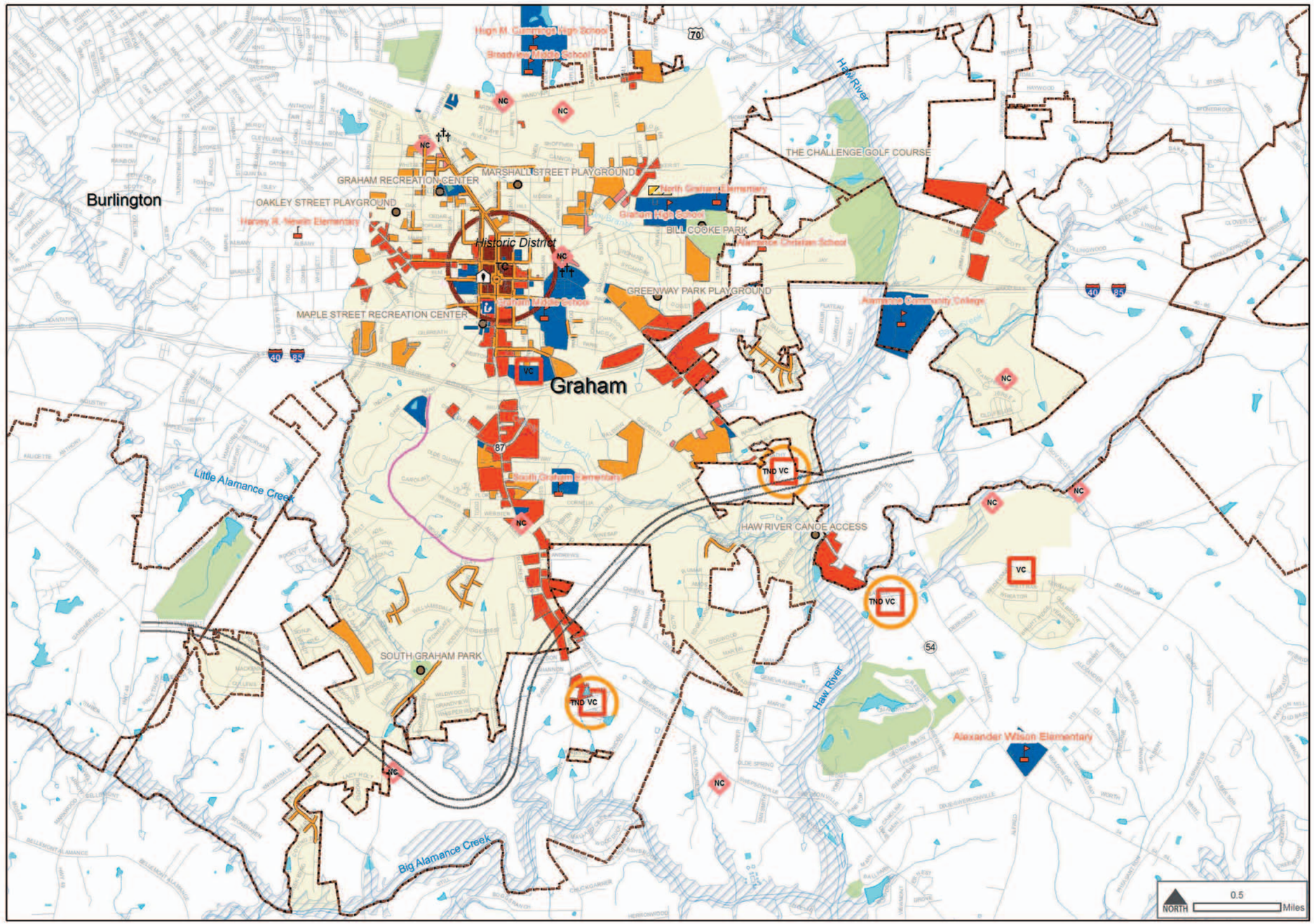
2.4.3 Steering Committee Recommendations

The Steering Committee provided valuable feedback and recommendations to this Plan on a regular basis. Aside from contributing to the Plan's main goals and objectives (Section 1.4 – Vision and Goals), the Committee also provided comments on specific routes and made suggestions for long-term pedestrian corridor extensions to serve future development. Finally, the members of the Committee facilitated public feedback through assistance during the public workshops and by administering the pedestrian survey.

While numerous ideas, concerns, and recommendations were received from the Committee, their chief goals for the Graham pedestrian environment were:

1) Prioritizing areas with children, such as schools
2) Meeting ADA guidelines, such as curb ramps
3) Increasing connectivity and filling sidewalk gaps
4) Connecting sidewalks and trails
5) Traffic slowing
6) Improving existing narrow and/or deteriorating sidewalk
7) Improving access and connectivity to Downtown

Existing Conditions



Legend

- School Locations
- GRAHAM HISTORICAL MUSEUM
- GRAHAM PUBLIC LIBRARY
- Parks/Playgrounds
- Historic Cemetaries
- Existing Sidewalks
- Bicycle Shoulder
- Future Southern Loop
- Roads
- Hydrology
- Lakes/Ponds
- Recreation/Parks
- Future Skate Park
- Historic District

Growth Mgt. Overlay

- Town Center
- Village Center
- Neighborhood Center
- Trad. Neighborhood Dev.

Zoning

- Central Business
- General Business
- Neighborhood Business
- Office-Institutional
- Multi Family Residential
- City Limits
- Graham ETJ

GREENWAYS INCORPORATED
Landscape Architecture
Multi-Objective Trail Planning
Open Space Planning

Data Sources: City of Graham

PEDESTRIAN NETWORK PLAN Chapter 3

3.1 Overview

A new pedestrian network plan for the City of Graham has been developed based on an examination of the existing conditions (Chapter 2) and an understanding of the community's vision and goals for an improved pedestrian network (Chapter 1). A review of the methodology and prioritization process used to create the Pedestrian Network Plan is provided below, followed by descriptions of the individual network components: Pedestrian corridors, sidewalk improvements, intersection improvements, and greenways.

3.2 Pedestrian Network Methodology

A variety of information sources were consulted during the development of the Pedestrian Network, including previous plans and studies, the consultants' fieldwork, public input, and noted pedestrian trip attractors. See Figure 3.1 below for a complete list of information inputs.

Figure 3.1 - List of Information Inputs for the Graham Pedestrian Network

- Locations of existing facilities, gaps in those facilities, and/or ROW
- Locations of the existing arterial roads into Graham
- Locations of important trip attractors (schools, parks, shopping areas, Downtown, etc)
- Locations of major street intersections and crossings
- Locations of safety concern (high pedestrian and auto traffic and inadequate facilities)
- Opportunities for greenway development including open space, available land, and easements
- Public comments made during community workshops and surveys
- Recommendations from representatives of the Steering Committee
- Field observations made in Spring - Fall 2005
- Projects and recommendations from Transportation Plan Update, Growth Management Plan, and Recreation and Parks Plan
- Recreational and transportation routing

Several concepts were developed as guides for the network development process. These concepts represented the interests expressed by the client, the steering committee, and the public. They also help achieve the goals articulated in other local planning documents. Some of the concepts that guided the development of the network included:

1) Residents and visitors, of all different capabilities, should be able to walk safely in Graham.

2) There should be adequate pedestrian access and connectivity to Downtown, schools, shopping areas, surrounding areas, and across I-40/85.

3) Pedestrian facilities should be developed along arterial streets where no sidewalk exists or where sidewalk gaps exist.

4) Crossings should be designed or retrofitted to improve the safety of pedestrians.

5) Off-road trails, or greenways, should be proposed and developed to take advantage of open space and hydrological resources, creating a nature recreation experience for pedestrians, and connected into the sidewalk pedestrian environment.

3.2.1 Prioritization Process

Using the information inputs and guiding concepts, a draft pedestrian network map was developed. All recommended sidewalks were then prioritized based on the pedestrian potential factors listed in Figure 3.2[1]. Intersections and greenways are prioritized by different means described later. The fifteen factors used for this Pedestrian Master Plan were customized for the City of Graham by selecting and weighting the factors according to public input, steering committee input, and the guiding concepts noted above.

Figure 3.2 - Pedestrian Potential Factors

- Elementary School Proximity -1/2 mile radius
- Middle School Proximity -1/2 mile radius
- High School Proximity –1/2 mile radius
- Direct Access to or from a School.
- Parks, Recreation Centers, and Playgrounds Proximity -1/2 mile radius
- Direct Access to/from Programmed Greenways – Based on the City of Graham Comprehensive Recreation and Parks Master Plan
- Direct Access to/from Proposed Greenways – Based on the City of Graham Comprehensive Recreation and Parks Master Plan
- Direct Access to/from High Density Residential – Based on the City of Graham Zoning for Multifamily Residential (R-MF)
- Direct Access to/from Future Development – Based on the City of Graham Growth Management Plan's Traditional Neighborhood Development (TND) and Village Center (VC) areas
- Direct Access to/from Central Business - Based on the City of Graham Zoning (B-1)
- Direct Access to/from General Business - Based on the City of Graham Zoning (B-2)
- Direct Access to/from Neighborhood Business - Based on the City of Graham Zoning (B-3)
- Commercial Corridor – Main (Hwy 87), Elm, and Harden (Hwy 54)
- Point of Interest Proximity (1/2 mile radius) – Includes Graham Historical Museum and Graham Public Library
- Regional and Citywide Connections - Includes links in and out of Graham & across 40/85
- Connections to/from Downtown - Based on the City of Graham Growth Management Plan's Town Center (TC) and Neighborhood Center (NC) areas
- Connectivity to Existing Sidewalks – Based on sidewalk GIS layers created by Greenways Incorporated

See Appendix B: Prioritization Index for the list of proposed projects and their priority ranking.

3.3 The Network

The Pedestrian Network consists of sidewalks, intersections, and greenways that should be improved or developed to create a system of safe and convenient pedestrian facilities throughout the City. The network includes on-road pedestrian facilities (sidewalks, intersection and crosswalk improvements) and off-road facilities (greenways). The newly proposed network includes **40** miles of pedestrian sidewalks, **1.2** miles of sidewalk improvements, **25** intersection improvements, and **24** miles of greenways, all shown in Map 2. It is anticipated that the network will be completed in phases congruent with the project priority index noted above. However, the network segments should be developed when there is opportunity, regardless of the order. Successful development of the City of Graham's Pedestrian Network will require a long-term, cooperative effort between the City of Graham, the North Carolina Department of Transportation, Alamance County, Burlington-Graham MPO, and other local and state agencies. Regional connectivity should also be considered during future development of the sidewalk and greenway network, especially with the City of Burlington and the MST (Mountains-to-Sea Trail).

All pedestrian corridor projects undertaken by the City of Graham should aim to meet the highest standards possible. At a minimum, the corridors should possess curb cuts with ramps at all driveways and intersections. Within each identified corridor, intersections should have marked crosswalks, and major intersections should have pedestrian crossing signals. Sidewalks should be constructed on both sides of the street along thoroughfares and residential collectors. Wider sidewalks, with curb cuts and improved surface conditions will correct sidewalks that currently do not satisfy the guidelines set forth by the Americans With Disabilities Act of 1991. Traffic calming measures, such as curb extensions, traffic circles, medians, and pedestrian islands should be used to create a more hospitable environment for pedestrians in neighborhoods and in dense pedestrian districts. Finally, opportunities should be taken to incorporate pedestrian facilities into all municipal and State roadway construction and widening projects, even if the route is not designated as a pedestrian corridor within this plan.

The four main types of pedestrian projects mentioned above have been identified for the City of Graham and are outlined below. They include Sidewalks, Sidewalk Improvements, Intersection Improvement Projects, and Greenway Corridors. Design guidelines in Chapter 6 provide detailed information regarding proper placement and facility treatments. Appendix D provides lengths and cost estimates for each segment.

3.3.1 Sidewalks

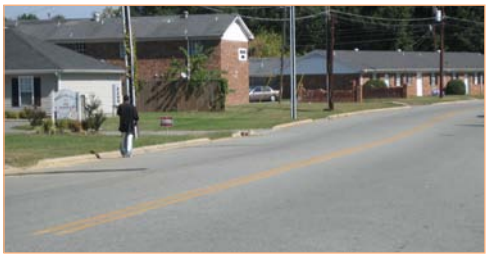
Sidewalk projects are proposed road segments requiring sidewalk to provide adequate pedestrian connections across the City of Graham. The pedestrian sidewalk network connects trip attractors, especially Downtown, schools, future development areas, commercial areas, and allows a pedestrian to access all areas of the City. The aforementioned Priority Index (Appendix B) distinguishes short-term, medium-term, and long-term pedestrian corridor projects. The top priority/short-term pedestrian sidewalk projects are summarized in Figure 3.3. It should be noted that each recommended corridor has its obstacles. For example, Main Street stretches

under an I-40/85 bridge. Providing safe pedestrian facilities across on-off ramps will require cooperation and work with the NCDOT to provide a design solution.

Figure 3.3 – Top Priority / Short-Term Projects

Primary Pedestrian Corridors	From	To
Elm	Flanigan	Parker
Town Branch	Elm	Teer
Main	Rogers	Robin
Melville	Robin	Harden
Trollinger	Elm	Town Branch
Elm	Oneida	Boone
Main	Robin	Pine
Pine	Home	Maple
Marshall	Parker	Harden
Market	Main	Marshall
Harden (Hwy 54)	Pine	Melville
Pine	Goley	State Road 54
Main	Thompson	Rogers
Gilbreath	Ivey	Ray
Robin	Main	Apple
Harden (Hwy 54)	Ivey	Pine
Parker	Melville	Dead End
Goley	Johnson	Pine
Ray	Gilbreath	Cul-de-sac
Maple	Gant	Ward
Ward	Maple	Banks
Harden (Hwy 54)	Cooper	Ivey
Ivey	Main	Gilbreath
Rogers	Thompson	Main
Poplar	North	Elm

Town Branch Rd., a top priority project.



Pedestrian on Parker St., a top priority project.

3.3.2 Sidewalk Improvement Projects

While it is important to add to the current network with the pedestrian corridors above, some existing sidewalks within Graham need improvements because of deteriorating conditions and/or narrow width. A maintenance program, described in Chapter 5, will be critical to keeping all existing and future sidewalks in good, safe condition. The two significant sidewalk improvement projects are: 1) N. Main St. from Providence to Albright and 2) Maple from N. Main to Ward. Sidewalks along both these stretches are older and have seen deterioration and in many locations, are too narrow.

N. Main St. has a sidewalk buffer but sidewalks are narrow and deteriorating in places.

3.3.3 Intersection Improvement Projects

Numerous problematic intersections have been identified in the City of Graham. Intersection Improvement Projects range from repainting crosswalks to modifying underpasses along I-40/85. Correcting dangerous crossings of all magnitudes will encourage pedestrian travel and connect isolated areas safely. Twenty-five intersections have been identified as significant problem spots through field research, steering committee suggestions and public input. This list of intersections does not include all of the many necessary crosswalk improvements along the proposed corridors cited above. At a minimum, painted crosswalks and curb ramps should be provided at all intersections when sidewalks are present. The intersections listed below require more than this minimum provision at each intersection leg (unless otherwise stated) to become safe, accessible, and convenient for pedestrians. Recommended improvements are provided for each:

Immediate Downtown:

- ***N. Main and Court Square***
  Landscaped pedestrian refuge island
  Re-stripe crosswalks to continental design

- ***E. Elm and Court Square***
  Landscaped pedestrian refuge island
  Re-stripe crosswalks to continental design

- ***S. Main and Court Square***
  Landscaped pedestrian refuge island
  Re-stripe crosswalks to continental design

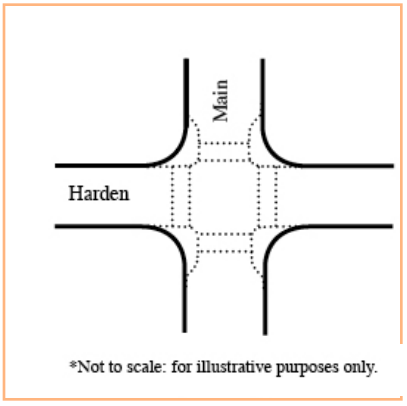
- ***W. Elm and Court Square***
  Landscaped pedestrian refuge island
  Re-stripe crosswalks to continental design

- ***Harden and Maple***
  Pedestrian signal
  Re-stripe crosswalks to continental design

- ***Main and Harden***
  Re-stripe crosswalks to continental design
  Pedestrian countdown signal
  Curb bulb-outs on Main (see diagram)

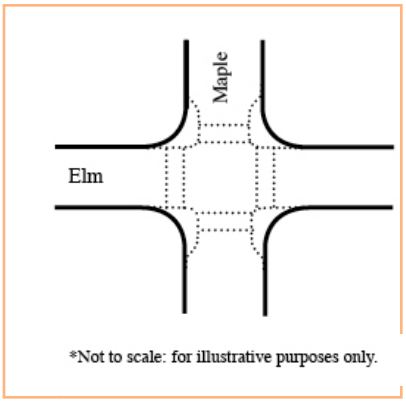
- ***Marshall and Harden***
  Re-stripe crosswalks to continental design

Figure 3.4 – Improvements to Main & Harden



- ***Elm and Maple***
  Re-stripe crosswalks to continental design
  Pedestrian countdown signal
  Pedestrian refuge island on west side of intersection
  Curb bulb-outs on Maple and east side of Elm (see diagram)

Figure 3.5 – Improvements to Elm & Maple



- ***Elm and Marshall***
  Re-stripe crosswalks to continental design
  Curb Ramps (underway as of Summer 2006)
  Relocate signs and utilities from corner

- ***Pine and Maple***
  Crosswalks and crosswalk re-stripe to continental design
  Pedestrian signal
  Curb ramps (some existing)

- ***Main and Pine***
  Crosswalk re-stripe to continental design
  Pedestrian countdown signal
  Curb ramps on eastern corners (underway as of summer 2006)
  Curb ramps on western corners (should be modified to one per crosswalk, rather than one per corner, as is currently provided)

- ***Pine and Marshall***
  Re-stripe crosswalks to continental design
  Curb Ramps (underway as of Summer 2006)

Potential School Route:

- ***Elm and Trollinger***
  Crosswalks
  Pedestrian countdown signal
  School Zone/Pedestrian X-ing signs on Elm

- ***Elm and Albright*** (Uncontrolled Intersection)
  Crosswalks
  Advanced warning signage
  School Zone/Pedestrian X-ing signs on Elm

- ***Elm and Town Branch*** (Uncontrolled Intersection)
  Crosswalks
  Advanced warning signage
  School Zone/Pedestrian X-ing signs on Elm
  Pedestrian refuge island on Town Branch side of intersection (landscaping potential)

'Yield to Pedestrian in Crosswalk' sign on Town Branch side of intersection

- ***Elm and Harden***
  Crosswalks and crosswalk re-stripe to continental design
  Curb ramps (only one is existing)
  Pedestrian countdown signal
  Pedestrian refuge island on east side of intersection (landscaping potential)
  'Yield to Pedestrian in Crosswalk' signage on north and east side of intersection
  Advance stop line on north side of intersection

- ***Pine and 54 (Harden)***
  Crosswalks
  Pedestrian countdown signal
  School Zone/Pedestrian X-ing signs on 54 (Harden)
  Pedestrian refuge island on northeast side of intersection (landscaping potential)

- ***Main and Ivey***
  Crosswalks and crosswalk re-stripe to continental design
  Pedestrian countdown signal

Pine & Harden, an intersection improvement project. This area sees pedestrian traffic from Graham Middle School.

Citywide:

- ***Main and Crescent***
  Crosswalks
  Pedestrian countdown signal

- ***Main and I-40/85***
  Needs further study, see Section 5.5

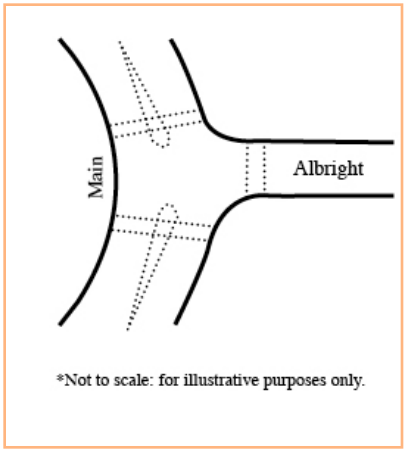
- ***Maple and I-40/85***
  Provide space for 5' pedestrian walkway when bridge is replaced

- ***Main and Gilbreath***
  Re-stripe crosswalks to continental design
  Pedestrian countdown signals

Main and I-40, another intersection improvement project. This area sees a heavy amount of pedestrian traffic through commercial areas as indicated by the

- ***Main and Albright***
  Crosswalks
  Curb ramps
  Pedestrian refuge islands on Main (see diagram)
  Pedestrian X-ing signs on Main
  'Yield to Pedestrian in Crosswalk' signs on refuge island median

Figure 3.6 – Improvements to Main & Albright



- ***Main and Hill/Maple/Guthrie***
  Crosswalks
  Curb ramps at Guthrie and Main
  Pedestrian signals across Main

- ***Main and Parker***
  Crosswalks
  Curb ramps
  Pedestrian signal across Main

- ***Washington and Providence***
  Crosswalks
  Curb ramps
  Pedestrian signal
  Pedestrian refuge island on east side of intersection
  'Yield to Pedestrian in Crosswalk' on east side of intersection
  Relocate commercial signs on corners

3.3.4 Greenway Corridors

Greenway corridor projects include off-road pedestrian facilities, typically taking advantage of linear stream corridors, easements, and other tracts of open space. Greenways can provide excellent alternative transportation and recreation options through a more natural setting and also serve an environmental purpose, to protect forests and enhance water quality. The focus of these corridors will be to provide access and connectivity between residential and recreational pedestrian environments. These corridors were chosen because they were recommended in the Recreation and Parks Service's Comprehensive Plan and due to the availability of linear, undeveloped open space. Negotiations with landowners will be necessary to acquire greenway right-of-way along some portions of the Haw River, Big Alamance Creek, and Little Alamance Creek. Otherwise, the City of Graham can capitalize on sewer easements and open space along portions of these waterways.

It has been recently decided that the Haw River Greenway will become part of the MST (Mountains-to-Sea Trail). The City and Recreation and Parks Department should maintain close involvement with the MST effort to ensure that the Haw River Greenway indeed becomes a viable portion of this cross-state greenway system. Involvement with that project ensures

access to important information such as acquisition strategies, signage, marketing, and potential funding sources. A toolbox of acquisition strategies is detailed in Chapter 5.

The greenways listed in Figure 7 are in order of priority based on a combination of need and opportunity.

Figure 3.7 – Greenway Corridors

- The Haw River Greenway (MST Trail)
- Bill Cooke Park Perimeter Trail
- N. Graham Elementary and Graham High School connection to Bill Cooke Park (Mountain Bike Trail)
- The Little Alamance Creek Greenway
- Corridor from Main St. to Ray St. (Board of Education site and future Village Center) (Follows easement of County Home Branch, sewer, and I-40)
- The Big Alamance Creek Greenway

3.3.5 Further Recommendations

Building on the network description provided above, Chapter 4 describes program and policy recommendations that support this Plan. Implementation steps are summarized in Chapter 5. Chapter 6 encompasses pedestrian facility treatments and design guidelines. Together, these chapters provide a complete picture of the nature and design of the new pedestrian network.

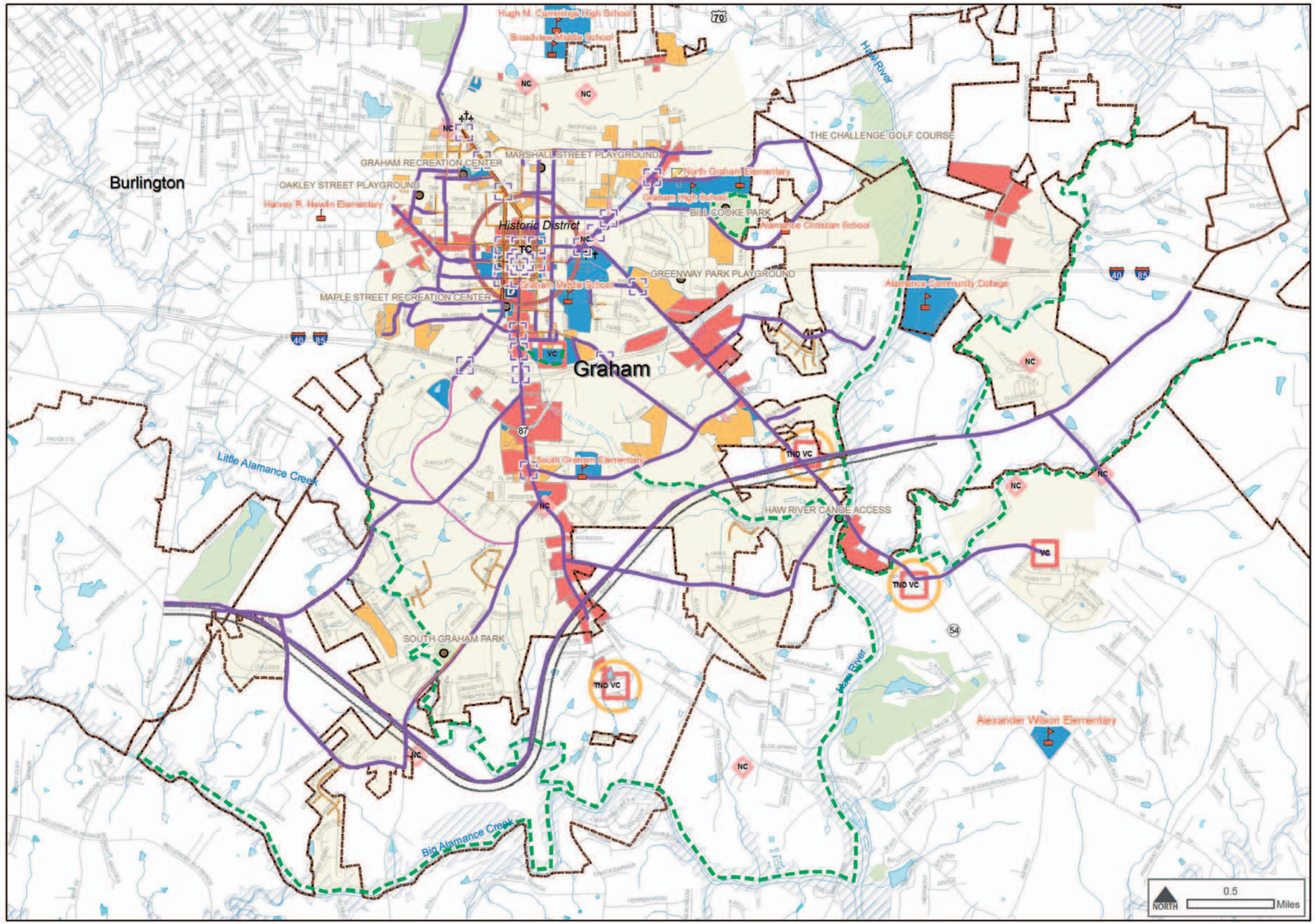
(Footnotes)

[1] Similar factors are used for exemplary alternative transportation plans across the country, such as the Portland Pedestrian Master Plan and the Multimodal Corridor Assessment for the Boulder Transportation Master Plan.

Downtown Graham

Map 2

Recommended Network Plan



Legend

- Intersection Improvements
- Pedestrian Corridors
- Sidewalk Improvements
- Proposed Greenways
- School Locations
- GRAHAM HISTORICAL MUSEUM
- GRAHAM PUBLIC LIBRARY
- Parks/Playgrounds
- Historic Cemetaries
- Existing Sidewalks
- Bicycle Shoulder
- Future Southern Loop
- Roads
- Hydrology
- Lakes/Ponds
- Recreation/Parks
- Future Skate Park
- Historic District

Growth Mgt. Overlay

- Town Center
- Village Center
- Neighborhood Center
- Trad. Neighborhood Dev.

Zoning

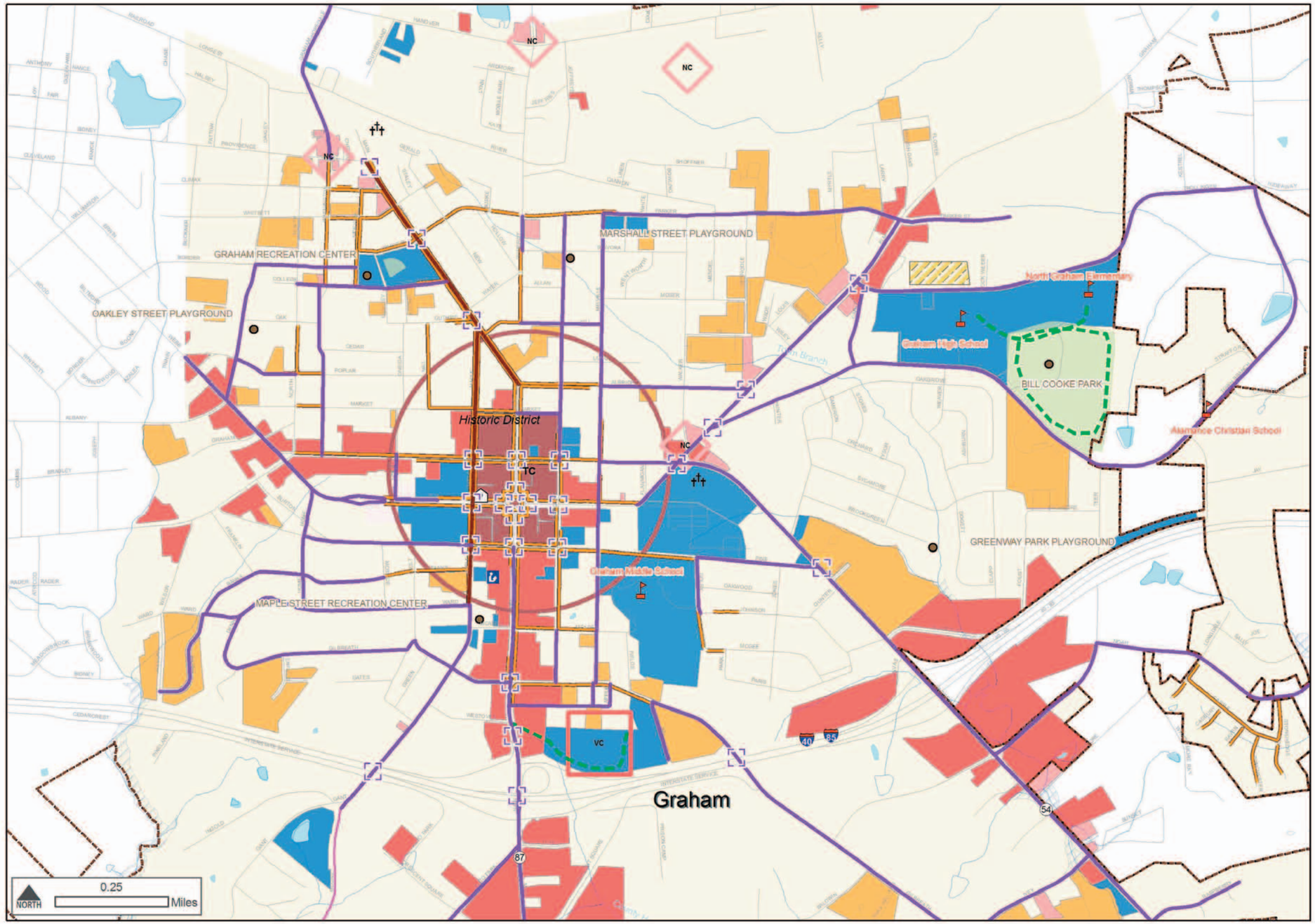
- Central Business
- General Business
- Neighborhood Business
- Office-Institutional
- Multi Family Residential
- City Limits
- Graham ETJ

GREENWAYS INCORPORATED
Landscape Architecture
Multi-Objective Trail Planning
Open Space Planning

Data Sources: City of Graham

Recommended Network Plan

Downtown



Legend

- Intersection Improvements
- Pedestrian Corridors
- Sidewalk Improvements
- Proposed Greenways
- School Locations
- GRAHAM HISTORICAL MUSEUM
- GRAHAM PUBLIC LIBRARY
- Parks/Playgrounds
- Historic Cemetaries
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- Lakes/Ponds
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- Future Skate Park
- Historic District

Growth Mgt. Overlay

- Town Center
- Village Center
- Neighborhood Center
- Trad. Neighborhood Dev.

Zoning

- Central Business
- General Business
- Neighborhood Business
- Office-Institutional
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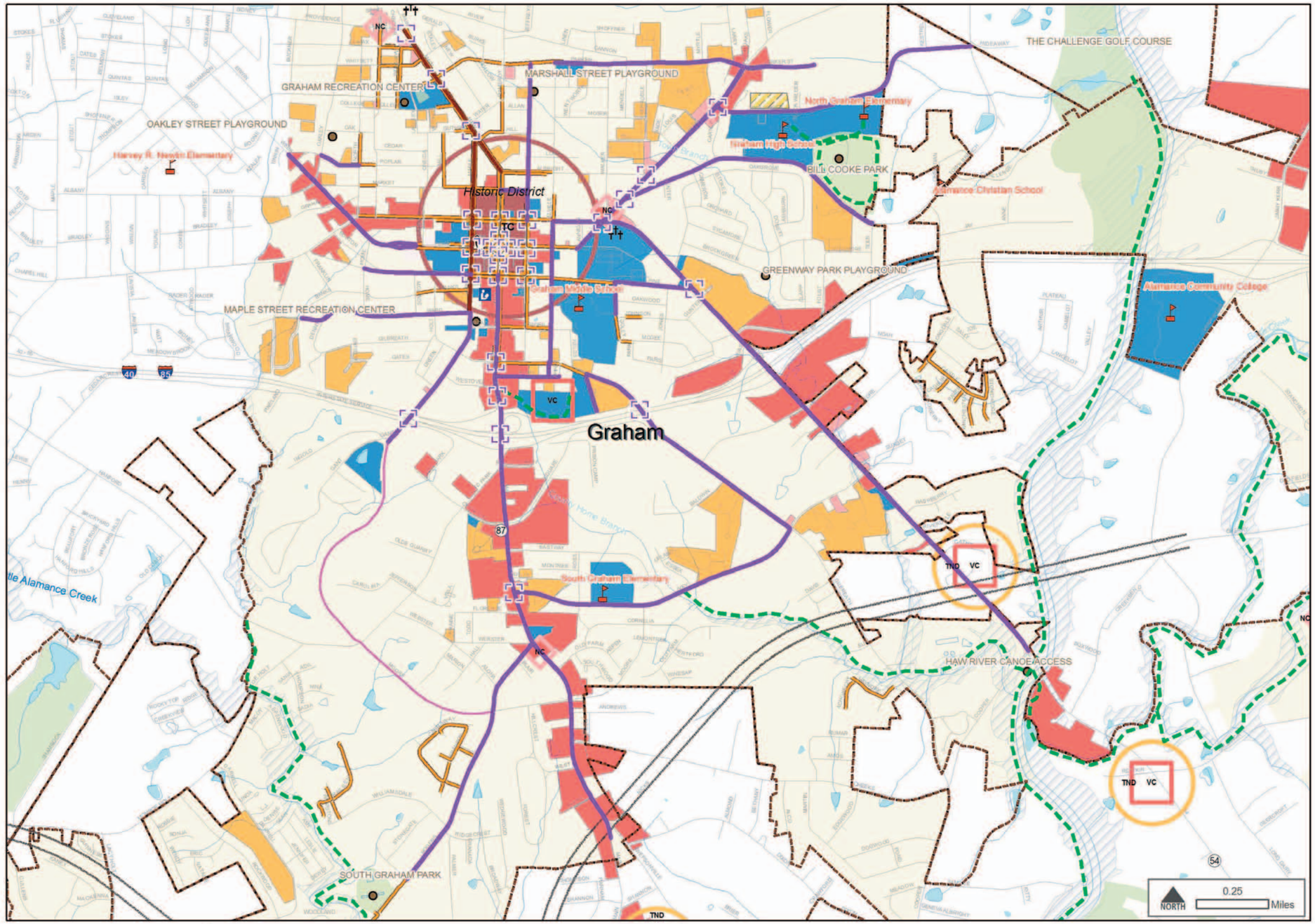
- City Limits
- Graham ETJ

GREENWAYS INCORPORATED
Landscape Architecture
Multi-Objective Trail Planning
Open Space Planning

Data Sources: City of Graham



Recommended Network Plan

Top Priority Corridors

Legend

- Top Priority Corridors
- Intersection Improvements
- Sidewalk Improvements
- Proposed Greenways
- School Locations
- GRAHAM HISTORICAL MUSEUM
- GRAHAM PUBLIC LIBRARY
- Parks/Playgrounds
- Historic Cemetaries
- Existing Sidewalks
- Bicycle Shoulder
- Future Southern Loop
- Roads
- Hydrology
- Lakes/Ponds
- Recreation/Parks
- Future Skate Park
- Historic District

Growth Mgt. Overlay

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- Village Center
- Neighborhood Center
- Trad. Neighborhood Dev.

Zoning

- Central Business
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- Neighborhood Business
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- Graham ETJ

GREENWAYS INCORPORATED
Landscape Architecture
Multi-Objective Trail Planning
Open Space Planning

Data Sources: City of Graham

PROGRAMS AND POLICIES Chapter 4

4.1 Overview

This chapter presents local measures to increase walking and to promote pedestrian safety. It provides a vision and policy framework for pedestrian travel, clarifying the City of Graham's role in addressing pedestrian issues and meeting pedestrians' needs. Actions and policy recommendations are listed for better integrating pedestrian travel into the transportation system. Education, encouragement, and enforcement strategies are also discussed to address the users of Graham's pedestrian network.

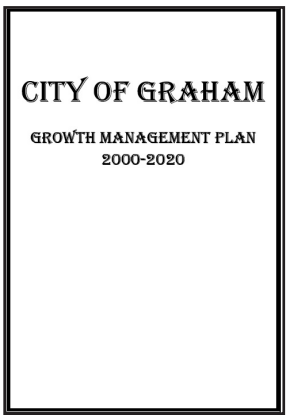
An emphasis on pedestrian considerations parallels new policies within the region and state. The North Carolina Department of Transportation's (NCDOT)'s *Board of Transportation Resolution* (2000) explains that "bicycling and walking accommodations shall be a routine part of the North Carolina Department of Transportation's planning, design, construction, and operations activities" and that "bicycling and walking [is] a critical part of the state's transportation activities."[1]

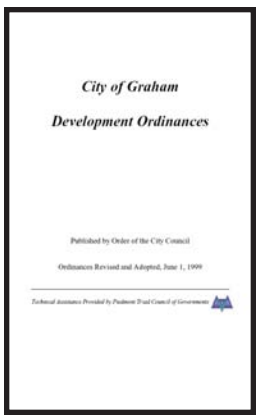
Previous local planning efforts have outlined pedestrian goals and needs for Graham. The following programs, policies, and action items, described in sections 4.2 - 4.4, were prepared in consultation with the following plans and documentation: *The City of Graham Growth Management Plan 2000-2020, The City of Graham Development Ordinances, The Comprehensive Master Plan – Recreation and Parks Services,* and the *Burlington Graham Urban Area Metropolitan Planning Organization (BGMPO) Transportation Plan Update 2005-2030*. Documents that are available online are listed below with their weblinks. The Pedestrian Steering Committee also contributed with their visions and ideas, which included education/encouragement/enforcement programs, connectivity, safety, and community strengthening. Policies relating to implementation are listed in Chapter 5 – Implementation.

City of Graham Growth Management Plan 2000-2020
http://www.cityofgraham.com/growth%20mgnt%20plan.htm

City of Graham Development Ordinances
http://cityofgraham.com/Development_Ordinance.pdf

Burlington Graham Urban Area Metropolitan Planning Organization (BGMPO) Transportation Plan Update 2005-2030
http://www.mpo.burlington.nc.us/datanreports/main.htm





4.2 Policy Recommendations

Policy recommendations were derived from local plans and ordinances (described briefly in Section 4.1), Pedestrian Steering Committee input, other City Pedestrian Plans, and community need. Several policy action items were derived or taken directly from the **Oakland, CA Pedestrian Master Plan.**

4.2.1 Access and Connectivity (AC)

Develop a connected network of pedestrian corridors, both on-road and off-road, prioritizing routes to schools, Downtown, and other trip attractors, that enables pedestrians to travel safely and freely.

General Plan Policies (from local plans and ordinances)

"The developer shall install sidewalks on one side of a new street at the back of the right-of-way with a grass planting between the curb and the sidewalk. Installation of sidewalks is not required for existing streets." *(City of Graham Development Ordinances, Section 10.343)*

"Promote a greenway system that links together the City's recreational resources." (*The City of Graham Growth Management Plan 2000-2020*, p. 36)

"The subdivider shall provide a 50 foot natural, undisturbed buffer along both sides of all perennial and intermittent streams shown on USGS maps. The City shall enforce protection of these buffers in an undisturbed state. Public greenway trails with limited disturbance along perennial and intermittent streams may be accepted with the approval by the City Council." (*City of Graham Development Ordinances, Section 10.341*).

"Open space is an essential component of any well designed planned unit development. Open spaces provide areas for active and passive recreation immediately adjacent to dwelling units.....Each residential planned unit development (or residential portion of a mixed use planned unit development) shall provide common open space as a percentage of the entire parcel....." (*City of Graham Development Ordinances, Section 10.168).*

"Expand the greenway system along rivers, creeks, and tributaries to encourage open space preservation, floodplain protection, and offer residents additional areas for recreational activities." (*The City of Graham Growth Management Plan 2000-2020* p. 53)

"Greenways – Areas designed to provide public access along waterways and scenic corridors. These areas offer recreational opportunities as well as environmental. The development of natural greenways along waterways help to provide a riparian buffer that will reduce urban runoff into creeks, streams and rivers. Greenways are usually found along waterways within the floodplain, where no development is allowed to occur. The key design issue is to preserve as much of the natural environment as possible." (*The City of Graham Growth Management Plan 2000-2020* p. 47)

"The currently undeveloped area of South Graham Park is completely bordered by the Little Alamance Creek….this natural area of the park can become the termination point for a network of greenway trails leading over from the Haw River and the Mountains-to-the-Sea Trail." (*The Comprehensive Master Plan – Recreation and Parks Services*, p. 25-26)

"Because of the river, creeks, and tributaries previously mentioned, the City has an opportunity to create a series of greenway trails that eventually can be linked together to form a network of trails. The recommendation in this plan for a section of the Haw River is to create a canoe trail on the river itself and a hiking trail along the banks of the river. This trail would be multi-purpose in that it would provide opportunities for mountain biking, nature walks, and hiking. This portion of the Haw River trail would coincide with the Mountains-to-the Sea Trail and be consistent with the efforts of several groups to establish a linear park along the full length of the Haw River from Forsyth County to the Jordan Lake." (*The Comprehensive Master Plan – Recreation and Parks Services*, p. 35)

"There currently exists a sewer easement owned by the City of Burlington along the Little Alamance Creek and Great Alamance Creek that can be easily used for the development of a greenway trail.…it is proposed that the City pursue the creation of a trail along this corridor, with access points into neighborhoods along the way. The South Graham Park would serve as a termination point for this potential greenway trail which would be approximately seven miles from the park to the proposed access point at Highway 54." (*The Comprehensive Master Plan – Recreation and Parks Services*, p. 38)

"Other local governments and institutions such as the Town of Haw River and Alamance Community College, in addition to the City of Burlington and Alamance County are potential partners in developing a canoe/hiking trail along the Haw River." (*The Comprehensive Master Plan – Recreation and Parks Services*, p. 21)

"As the City continues to grow it should implement a land dedication ordinance that requires land developers to dedicate a portion of a new subdivision, or a cash contribution in lieu of, to the City as park land…the Town of Cary is an example of a community who has been extremely successful in developing its parks and greenway system through the land dedication ordinance." (*The Comprehensive Master Plan – Recreation and Parks Services*, p. 22)

"Goal – Promote development of an integrated bicycle and pedestrian network." (*Burlington Graham Urban Area Metropolitan Planning Organization (BGMPO) Transportation Plan Update 2005-2030,* p. 8)

"Objective – Pursue funding for a coordinated and comprehensive network of sidewalk and bicycle routes throughout the Urban Area." (*Burlington Graham Urban Area Metropolitan Planning Organization (BGMPO) Transportation Plan Update 2005-2030*, p. 8)

"Objective – Improve the transportation system with accommodations to bicycle and pedestrian access." (*Burlington Graham Urban Area Metropolitan Planning Organization (BGMPO) Transportation Plan Update 2005-2030*, p. 8)

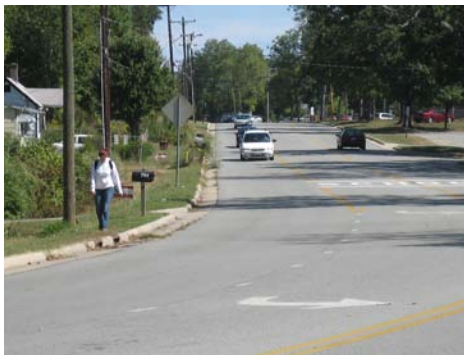
"Independent Projects: Updating the Bicycle and Pedestrian Facilities Inventory… Creating an Urban Area map of pedestrian facilities" (*Burlington Graham Urban Area Metropolitan Planning Organization (BGMPO) Transportation Plan Update 2005-2030*, p. 19)

Policy Recommendations and Action Items

Route Network

Create and maintain a pedestrian route network that provides direct connections between Downtown, trip attractors, and residential/commercial areas.

Action AC 1. Building on local ordinances, sidewalks should be provided on both sides of thoroughfares, collectors, and sub-collector streets. Residential streets can be examined on a case-by-case basis depending on local traffic and proximity to schools.
Action AC 2. Design pedestrian underpasses and improve existing pedestrian tunnels, overpasses, and underpasses to enhance connectivity.
Action AC 3. Develop a system of signage for pedestrian facilities and greenways.
Action AC 4. Create trails, identified in *The Comprehensive Master Plan – Recreation and Parks Services* that follow creeks, extend connectivity, and help promote the restoration of those creeks.
Action AC 5. Conduct a study to identify streets with underused travel lanes for potential traffic calming projects including restriping, lane reduction, and sidewalk widening.
Action AC 6. Maintain the existing walkways to ensure that they are safe and free of debris and vegetation.
Action AC 7. To the maximum extent possible, make walkways accessible to people with physical disabilities.
Action AC 8. In order to achieve north-south connectivity, pedestrian-safe grade-separated interstate crossings and signage should be considered.



Policies to provide sidewalks near schools will make for a safer environment. Graham High School is pictured above.

Action AC 9. Coordinate efforts with surrounding municipalities and Alamance County to ensure regional pedestrian and trail connectivity. An important example is the MST (Mountains-to-Sea Trail) that will utilize the Haw River Greenway corridor.
Action AC 10. Require developers to provide alternative transportation connections between developments to provide connectivity.
Action AC 11. Ensure that as development occurs to the South and East, that greenways, sidewalks, and crosswalks are developed to provide safe connectivity to Downtown.

Safe Routes to School
Develop projects and programs to improve pedestrian connectivity to and safety around schools.

Action AC 12. All roads surrounding schools should have sidewalks on both sides of the road with safe crosswalks.
Action AC 13. Using the Pedestrian Route Network as a base, work with schools to designate, improve, and publicize safe routes to school.
Action AC 14. Implement a seamless school safety program that coordinates adult crossing guards, student safety patrols, and parent volunteers to ensure that all schools have adequate traffic safety programs.
Action AC 15. Prioritize crossing and sidewalk improvements around schools. Incorporate crossing signals near schools.
Action AC 16. Work with schools having inadequate pick-up and drop-off facilities to develop compensatory programs.
Action AC 17. All new schools in Graham should consider vehicle pick-up and drop-off areas to accommodate child pedestrian safety.

4.2.2 Safety (S)

Create a street environment that strives to provide safe conditions for pedestrians.

General Plan Policies (from local plans and ordinances)

"The developer shall install sidewalks on one side of a new street at the back of the right-of-way with a grass planting between the curb and the sidewalk. Installation of sidewalks is not required for existing streets." *(City of Graham Development Ordinances, Section 10.343)*

"Improve the walkability of the City…Adopt Sidewalk Plan to showcase where additional pedestrian walkways should be built in the future…Require new development to include sidewalks that are part of the adopted Sidewalk Plan…Promote development that utilizes pedestrian walkways to connect with adjacent land uses." (*The City of Graham Growth Management Plan 2000-2020*, p. 32-33)

"The purpose and intent of a planned unit development is to promote innovative design that is accessible to pedestrians and encourages the use of alternative modes of transportation." (*City of Graham Development Ordinances, Section 10.126*)

Policy Recommendations and Action Items

Sidewalk Safety
Strive to maintain a complete sidewalk network free of broken or missing sidewalks, curb cuts, or curb ramps.

Action S 1. Provide minimum five foot sidewalk width when possible, especially around

schools, Downtown, commercial centers, senior centers, and other areas of high pedestrian activity. Where possible, wider sidewalks are desirable.
Action S 2. Conduct future surveys or updates of areas lacking sidewalks and estimate the cost and feasibility of filling sidewalk gaps in areas with pedestrian traffic.
Action S 3. Create a program to enforce the responsibility of adjacent property owners for the addition of sidewalks to close gaps and accompany new development.
Action S 4. Continue to budget funds for new construction and sidewalk improvements especially where sidewalk gaps exist.
Action S 5. Implement pedestrian scale lighting at regular intervals in areas of high pedestrian activity to promote pedestrian safety and discourage criminal activity.
Action S 6. Identify pedestrian facilities that are not ADA-compliant including missing, damaged, or non-compliant curb ramps, stairs, or sidewalk segments of inadequate width and create a plan for improving them.
Action S 7. Develop and expand the City's maintenance program of on-demand sidewalk repairs, debris removal, and trimming of encroaching vegetation.

Crossing Safety
Improve pedestrian crossings in areas of high pedestrian activity where safety is an issue.

Action S 8 Install marked crosswalks at all intersections.
Action S 9. Consider the full range of design elements – including bulbouts and refuge islands – to improve pedestrian safety.
Action S 10. Update crossing treatment policy guidelines for all types of crossings based on current federal research (FHWA 2002a, FHWA 2002b).
Action S 11. Use residential and business densities to establish lower speed limits in areas with a high level of pedestrian activity or a history of pedestrian/motor vehicle collisions.
Action S 12. Ensure that crosswalks are properly lit at night.
Action S 13. Analyze pedestrian/motor vehicle collisions to reduce the incidences of pedestrian/motor vehicle conflict.
Action S 14. Install detectable warning surfaces at sidewalk and street boundaries.
Action S 15. Enforce automobile speed limits and intersection behaviors.

Traffic Signals
Use traffic signals and their associated features to improve pedestrian safety at dangerous intersections.

Action S 16. Install pedestrian crossing signals at all major intersections.
Action S 17. Seek additional funds to pay for the retrofitting of traffic signals with pedestrian signal heads and the maintenance costs that such additions may incur.
Action S 18. Review the signal-timing program to ensure that it incorporates the needs of pedestrians by providing adequate crossing times.
Action S 19. Seek funds to address the backlog of traffic signals with special attention to signals in front of schools, senior centers, and other high-pedestrian activity centers.
Action S 20. Consider installing audible pedestrian signals at all new and retrofitted traffic

signals, especially in Downtown area and near senior centers.
Action S 21. Consider using crossing enhancement technologies like countdown pedestrian signals at the highest pedestrian volume locations, especially in the Downtown area.

4.2.3 Community Strengthening (CS)

Provide pedestrian amenities, promote land uses to enhance these public spaces, and promote these features to make Graham a more desirable place to live and a stronger community.

General Plan Policies (from local plans and ordinances)

"Increase regional awareness of downtown as a potential shopping and tourist destination… Develop 'Historic Walk Guide' to be available throughout the City." (*The City of Graham Growth Management Plan 2000-2020* p. 32)

"Coordinate a historical element into the planned greenway and trail development along the Haw River." (*The Comprehensive Master Plan – Recreation and Parks Services*, p. 40)

"Town Center…Design characteristics for future development should focus on the traditional, pedestrian oriented downtowns of the early 1900's. Some specific attributes to be considered are sidewalks, street trees, storefronts, and complementary building styles." (*The City of Graham Growth Management Plan 2000-2020*, p. 39)

"Village Center…The development should be designed with both the pedestrian and automobile in mind." (*The City of Graham Growth Management Plan 2000-2020* p. 40)

"Neighborhood Center…Automobile and pedestrian connections should be provided to surrounding developments." (*The City of Graham Growth Management Plan 2000-2020* p. 40)

"Regional Commercial Center should be designed with the pedestrian in mind and structures should be built to an appropriate scale…Connectivity to adjacent land uses should be encouraged for both pedestrian and automobile traffic." (*The City of Graham Growth Management Plan 2000-2020* p. 41)

"Regional Employment Center…The development usually includes amenities for workers including trails, picnic areas and open space." (*The City of Graham Growth Management Plan 2000-2020* p. 42)

"Neighborhood Residential…Design of these developments should emphasize smaller lots, building placement close to the street, interconnectivity between neighborhoods, sidewalks, and street trees. The goal of this district is to create a 'sense of place' and a pedestrian friendly atmosphere at a higher density." (*The City of Graham Growth Management Plan 2000-2020* p. 43)

"Suburban Residential…Future developments should look to provide sidewalks and connectivity between adjacent properties." (*The City of Graham Growth Management Plan 2000-2020* p. 43)

"Traditional Neighborhood Development (TND)…A key attribute of the TND is the focus on pedestrians and creating a community that accommodates the automobile as well as the pedestrian." (*The City of Graham Growth Management Plan 2000-2020* p. 45)

Town Center, Village Center, Neighborhood Center, Highway Commercial, Regional Commercial Center, Regional Employment Center, Regional Industrial Center, Neighborhood Residential, Suburban Residential, Conservation Residential and Traditional Neighborhood Development are all required to contain sidewalks. (*The City of Graham Growth Management Plan 2000-2020* Chapter 7)

Town Center, Village Center, Neighborhood Center, Neighborhood Residential, Suburban Residential and Traditional Neighborhood Development are all required to be pedestrian oriented, while Highway Commercial, Regional Commercial Center, and Conservation Residential are left as optional. (*The City of Graham Growth Management Plan 2000-2020* Chapter 7)

"The developer shall install sidewalks.....with a grass planting between the curb and the sidewalk." (City of Graham Development Ordinances, p. 8-8).

"Parked vehicles shall not block pedestrian walkways." (2006 newly adopted *Driveways* section of *City of Graham Development Ordinances*).

<u>Policy Recommendations and Action Items</u>

Streetscaping and "Trailscaping"
Encourage the inclusion of art, historic, and nature elements along with street furniture, landscaping, and lighting in pedestrian improvement projects.

Action CS 1. Identify pedestrian routes in neighborhood commercial districts and in the downtown to prioritize streetscaping improvements.
Action CS 2. Require street trees and planting buffers between the sidewalk and the street along all new roadways and sidewalk construction. Keep all vegetation trimmed.
Action CS 3. Prioritize the replacement of dead or missing trees.
Action CS 4. Include pedestrian-scale lighting in streetscaping projects.
Action CS 5. Consider incorporating local artwork into the Pedestrian Route Network, especially along greenways.
Action CS 6. Consider incorporating history signage and nature signage associated with landmarks such as local cemetraries, Downtown, and natural areas into the Pedestrian Route Network, along greenways and sidewalks.
Action CS 7. Place attractive trash receptacles at strategic locations to discourage litter and

maintain a clean appearance.
Action CS 8. Encourage and/or require private owners (of residences and businesses) to keep their area in and around the sidewalk free of debris and litter.
Action CS 9. Continue and expand ongoing Downtown Streetscape Project with specific Downtown design improvements.

The downtown area is the center point of Graham with many historic buildings. Pedestrian policies can help strengthen the Downtown as a City asset.

Land Use/Development
Promote land uses and site designs that make walking convenient and enjoyable.

Action CS 10. Use building and zoning codes to encourage a mix of uses, connect entrances and exits to sidewalks, and eliminate "blank walls" to promote street level activity.
Action CS 11. Promote parking and development policies that encourage multiple destinations within an area to be connected by pedestrian trips. Specifically, promote the connectivity of parking lots between businesses for increased safety and avoidance of roadway traffic.
Action CS 12. Consider implementing "pedestrian only" areas in locations with the largest pedestrian volumes.
Action CS 13. Require contractors to provide safe, convenient, and accessible pedestrian rights-of-way along construction sites that require sidewalk closure.
Action CS 14. Encourage programs to clean up trash and blighted buildings at the street level and expand the use of business associations in this regard.
Action CS 15. Encourage the inclusion of public walkways or trails in large, private developments.
Action CS 16. Assure safe pedestrian access through large parking lots.
Action CS 17. Encourage the development of pocket parks and plazas that are along the Pedestrian Route Network.
Action CS 18. Discourage motor vehicle parking facilities that create blank walls, unscreened edges along sidewalks, and/or gaps between sidewalks and building entrances.

Action CS 19. Develop Downtown Walking Trail program and map.
Action CS 20. Consider mass transit in the future and if implemented locally or regionally, create a safe pedestrian/mass transit interface that includes sidewalk connections to transit stops and adequate shelters.

4.3 Other Policy Recommendations

4.3.1 Future Pedestrian Facility Development
To ensure that the pedestrian facilities recommended in this document are constructed, the elected leaders should allocate sufficient resources on an annual basis to regularly expand the pedestrian network and maintain the facilities as they are completed. Currently, Graham sets aside $100,000 a year for sidewalk improvements and maintenance over the next ten years. This is an excellent start and the commitment should be improved and continued in the future. There must be commitment to a phased timeline of roadway modification and facility construction must be adopted and followed.

Pedestrian facilities should be developed as prioritized in this Plan but consideration should be given to citizens who make specific complaints or requests. Currently citizens may make requests directly to the City. It should be the policy of the City to seriously consider these requests and also monitor changes and new development that may cause other future pedestrian issues not faced at the time of this Plan.

The City can claim right-of-way (ROW) for sidewalk development in front of properties throughout a good portion of the city. Older parts of the city may not have ROW for sidewalks. The City should form a list of roadways with ROW and without ROW and develop a strategy for obtaining ROW where sidewalk segments need to be constructed.

Graham should also take advantage of roadway reconstruction and widening along with bridge reconstruction projects and railroad crossings. These projects offer excellent opportunities to incorporate facility improvements for pedestrians including the addition of sidewalks, crossing improvements, and pedestrian underpasses. This is further described in Chapter 5 - Implementation.

Regarding potential future pedestrian facilities on state roads, it will be important to understand how NCDOT and the Burlington-Graham MPO are involved in the approval process for construction, reconstruction, repaving, and bridge projects on different roads in the Graham area. If NCDOT has the authority to deny a recommendation from the pedestrian plan, it will be important to discuss controversial issues with them during the planning process. The issues could potentially include:

- Bridge culverts/underpasses
- I-40/85 underpass and on/off ramps
- Shoulder regrading and drainage
- Adequate easement acquisition for new road pedestrian facilities

Regarding residential development sidewalk construction, sidewalks should be constructed during the infrastructure development of the subdivision (roads, curbs/ gutter, etc). This is less expensive because of the ability to conduct the infrastructure development at one time. If the sidewalk is damaged during home construction though, the sidewalk should be repaired at the contractor's cost (This should be addressed in development regulations). On a case-by-case basis, the City could allow sidewalks to be constructed after home construction is complete as long as grading has been planned out and done correctly to allow for sidewalk construction. While it is recommended that sidewalks be constructed with the rest of subdivision infrastructure to reduce costs, the City could negotiate on a case-by-case basis with the developer.

Sidewalk should be extended across driveway cuts to maintain the continuity of the sidewalk and reinforce to the driver that he/she should yield to pedestrians (which is required by law). Also, driveway aprons should not extend through the sidewalk area of the driveway, which must also be constructed at a maximum 2% cross slope.

Finally, a provision should be included in local ordinances requiring that non-motorized facilities built as part of a subdivision project be extended beyond the limits of the subdivision boundaries to connect to trip attractors and adjacent developments.

4.3.2 Maintenance

Once the proposed network has been adopted by the City and efforts to implement the network are underway, focus should be directed towards the maintenance and enhancement of the system. Well maintained and managed facilities are critical elements to the long-term success and accessibility of Graham's pedestrian network. Regular maintenance of the community's pedestrian facilities will be essential to maintain the safety of the facilities and their overall usability. To facilitate the practice of regular maintenance, the City of Graham should allot adequate funding for maintenance out of its yearly budget described in Section 4.3.1 and develop a schedule of maintenance activities for the pedestrian network along with the existing maintenance projects of the NCDOT and the Graham Public Works Department.

The Public Works Department should also have a process in place to attend to specific maintenance issues. The Department should quickly respond to citizen reports of damaged surfaces. There are incidences when surfaces need improvement. Repair work by the City or a local firm should be considered as a less expensive alternative to completely replacing the sidewalk. Care should be taken to prevent vegetation from encroaching into walkways as well. Clearances and sight distances should be maintained at driveways and intersections. A regular pruning and maintenance program is advised to remove vegetation litter.

Types of maintenance required include:

- Repair of surface
- Repair of trails
- Restriping of crosswalks/pavement markings
- Replacement or repair of route signs due to damage caused by vandalism or general wear
- Removal of any collected debris (including sand, gravel, trash and vegetation)
- Pruning to keep sight distances and clearances adequate

Many of these maintenance projects are already regularly scheduled along the area's roadways. They now must simply be expanded to include the pedestrian facilities as well. Off-road pedestrian routes may require the attention of separate agencies. Local civic groups could contribute by "adopting-a-trail" and regularly maintain trail segments. The City should develop a standard pedestrian maintenance schedule for incorporation into the activities of all the appropriate City agencies. Many of the basic roadway maintenance tasks, such as debris removal, can be combined to reduce the number of hours needed to complete tasks and maximize the use of City resources.

Finally, it should be the responsibility of the owner or occupant of private property to keep their property and adjacent sidewalk free of litter and debris. Basic cleanliness should be maintained by local residences and businesses. Properly-placed signage and garbage cans can help encourage clean sidewalks.

4.3.3 Annexation

For areas eligible for annexation under North Carolina's statutes, plans are developed to provide all required municipal services and an estimate for providing such services[2]. If pedestrian facilities are to be included in annexed areas, they should be addressed in the annexation study and should be included in an update of any City plan that addresses such facilities, such as the Graham Pedestrian Plan.

Services that will require no extensive capital outlay, such as crosswalk striping, could be provided within a short time. With respect to services involving capital outlays, such as greenway trail development or bike/pedestrian bridges, it should be remembered that: (1) extension of improvements should be commensurated with other parts of the City and should be related to the needs of present settlement and future growth, and (2) extensions should be based on previously approved policies and standards. Therefore, if the City of Graham is to ensure consistent pedestrian facilities in annexed areas, the first step will be adopting the Graham Pedestrian Plan. Furthermore, residents in the annexed area do not expect to be taxed without benefits, but they should also not expect a disproportionate balance of improvements at the expense of the other residents. Therefore, an annexation ordinance that addresses improvements, such as pedestrian facilities, should take this

balance into account when defining the services to be provided.

In some cities, such as Fayetteville, NC, facilities (such as sidewalks for example) are not something the City provides as a base service for annexed areas[3]. However, they have addressed such improvements through other means: they adopted a plan for sidewalk development based on pedestrian traffic and safety, so as the area becomes part of the City, it is eligible for the same improvements based on need. Additionally, the City has subdivision regulations in place that require developers to construct sidewalks on one side of the street in new developments. These are examples of ways in which Graham can put policies in place that apply to the City as a whole, which would immediately include new areas once they are annexed.

4.3.4 Local Ordinances

Local ordinances are another means to develop and encourage safer pedestrian activity across Graham which in turn could lead to larger numbers of people walking. There should be an effort to seek out ordinances that may need updating and/or to develop new ordinances that would relate to the new pedestrian network.

The City should also be aware of North Carolina laws relating to walking in *The Guide to North Carolina Bicycle and Pedestrian Laws.* A portion of this booklet discusses local ordinances and the issues sometimes addressed by these ordinances. If issues arise in the City of Graham, the City can consider developing ordinances that would be enforced by local police. Common issues are bicycling on sidewalks, greenway uses and hours of operation, etc.

4.4 Program Recommendations

Education, encouragement, and enforcement programs should be in place to teach and encourage safety and to ensure the success and integrity of Graham's future pedestrian network.

4.4.1 Education, Encouragement, Enforcement

The recommended pedestrian facilities identified in Chapter 4 will most successfully serve the City of Graham with continued support for walking, built through programs that focus on education, encouragement, and enforcement. Many of the following programs were suggested by members of the steering committee. Additional resources can be found on the NCDOT Division of Bicycle and Pedestrian Transportation website (http://www.ncdot.org/transit/bicycle/).

Education: Long term educational strategies should be developed to teach and promote safety. A good education program provides instruction in lawful behavior for pedestrians and motorists. This education should be available to children and adults alike. This will require coordinated efforts through the City, citizens, and local groups.

Children are the current and future users of Graham's pedestrian network. Teaching children about the benefits of walking and pedestrian safety can foster lifelong habits. Local schools should be used to teach children about pedestrian safety *and* the benefits of walking. Crossing guards are an excellent means to provide safety and education. Instruction programs and events for children should also be available in Graham through the Recreation and Parks Department. The National Safe Routes to School program also offers a national course that would be very beneficial to Graham. Pedestrian instruction for teenagers can be taught in driver's education courses. Families should also be given tools to help them understand how walking can improve their health. Many resources for children's education on pedestrian safety can be found through the Pedestrian and Bicycle Information Center's website, www.walkinginfo.org. Listed below are some of the resources provided by the Center related to children's education:

- *Walking School Bus*
  A walking school bus is an encouragement program that provides an alternative way to transport children to school. A parent can be responsible for accompanying a group of children to school by utilizing the pedestrian system in Graham.
  http://www.walkingschoolbus.org/

- *Walk to School Day*
  The web site offers a history of Walk to School Day, child pedestrian information, resources for planning events and online registration.
  http://www.walktoschool.org

- *Preventing Pedestrian Crashes: Preschool/Elementary School Children*
  Provides information to parents on pedestrian risks for preschool and elementary school children. Safe and Sober Campaign. Taken from the NHTSA website.
  http://www.nhtsa.dot.gov/people/outreach/safesobr/15qp/web/sbprevent.html

- *Kidswalk-to-School:*
  This guide is a resource to help communities develop and implement a year-long walk-to-school initiative. Centers for Disease Control and Prevention.
  http://www.cdc.gov/nccdphp/dnpa/kidswalk/kidswalk_guide.htm

- *Pedestrian Injury:*
  Pedestrian injury remains the third leading cause of unintentional injury-related death among children ages 5 to 14. SafeKids.
  http://www.safekids.org/

- *Pedestrian Fatalities Related to School Travel:*
  This is a fact sheet pertaining to school age children. NHTSA.

http://www.nhtsa.dot.gov/people/injury/pedbimot/ped/Getting_to_School/pedestrian.html

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

- *Streets in America are unsafe and unforgiving for kids:*
  Article by the Pedestrian Safety Roadshow. U.S. Department of Transportation. Federal Highway Administration.
  http://www.tfhrc.gov/safety/pedbike/articles/unsafe.htm

- *Focusing on the Child Pedestian:*
  Pedestrian Information from the FHWA.
  http://safety.fhwa.dot.gov/roaduser/pdf/PedFacts.pdf

Events sponsored by the Graham Recreation and Parks Department may provide opportunities for adult education. For example, the City could hold a Pedestrian Day in the spring for children and adults and offer training classes all summer. A great resource for older adult education on pedestrian safety, called *Stepping Out* can be found through the National Highway Traffic Safety Administration's website, *www.nhtsa.dot.gov/people/injury/olddrive/SteppingOut/index.html* *Stepping Out* tells older adults how to maintain their safety while walking - whether walking for exercise or to run errands. The *Stepping Out Webpage* provides the following:

- A quick refresher on the health benefits of walking.
- Resources for getting started and planning what level of activity is best for you.
- Ideas for incorporating walking into your everyday schedule and staying motivated to continue walking.
- Tips for staying safe at intersections, in parking lots, in non-sidewalk areas, and in bad weather.
- Suggestions for making your community a safer place to walk.

Having such information available to the public and older populations in the form of a news article, flyer, a City website link, or a combination of these, would help to increase education and awareness for adults.

Education may also be provided through various print and electronic media. Safety tips for pedestrians and motorists could be featured on a local cable television channel. A pedestrian brochure could include educational items about proper skills, road crossings, and habits. Also, the City of Graham website could provide educational materials. According to the Pedestrian

and Bicycle Information Center, the following items cover the basics to be included in pedestrian educational materials:

Things to remember as a driver:

- You can encounter pedestrians anytime and anywhere - even in places where they are not supposed to be found.
- Pedestrians can be very hard to see - especially in bad weather or at night. You must keep a lookout and slow down if you can't see clearly.
- Stop for pedestrians who are in a crosswalk, even if it is not marked. When you stop for a pedestrian in a crosswalk, stop well back so that drivers in the other lanes can also see the pedestrian in time to stop.
- Cars stopped in the street may be stopped to allow a pedestrian to cross. Do not pass if there is any doubt!
- Don't assume that pedestrians see you or that they will act predictably. They may be physically or mentally impaired - or drunk!
- When you are turning, you often will have to wait for a "gap" in traffic. Beware that while you are watching for that "gap", pedestrians may have moved into your intended path. Don't run someone down.
- Be especially attentive around schools and in neighborhoods where children are active. Drive there like you would like people to drive in front of your own home!

Things to remember as a pedestrian:

- Be predictable. Stay off freeways and restricted zones. Use sidewalks where provided. Cross or enter streets where it is legal to do so.
- Where no sidewalks are provided, it is usually safer to walk facing road traffic (This is also the law).
- Make it easy for drivers to see you - dress in light colors and wear reflective material. It might be wise to carry a flashlight in very dark areas.
- Buy "workout" clothes that incorporate reflective materials and that are highly visible.
- Be wary. Most drivers are nice people, but don't count on them paying attention. Watch out - make eye contact to be sure they see you!
- Alcohol and drugs can impair your ability to walk safely, just like they do a person's ability to drive.
- Use extra caution when crossing multiple lane, higher speed streets.

(Source: Pedestrian and Bicycle Information Center, www.walkinginfo.org.)

Encouragement: Encouragement programs should be initiated to help build a larger pedestrian community. Financial incentives and/or public praise can be provided to local businesses that support walking through their actions. Awards can be created to celebrate advances in the community's pedestrian facilities, pedestrian use, and overall pedestrian friendliness.

There are a variety of means to promote walking. Pedestrian booths could distribute information at local events and festivals such as *Thursdays After Seven*. Local businesses and tourist information centers could distribute pedestrian maps and information. Inserts into local newsletters can detail the health benefits of walking. Mileage clubs could be established and awards given to those who reach their goals. Walking school buses could be established where adults take turns leading groups of children to school. Specific day programs such as Walking Wednesdays could be designated for walking to school and work. An annual Pedestrian Day could be sponsored by the Graham Recreation and Parks Department with promotions, contests, and education programs. National Trails Day, celebrated nationwide annually in June, could become an annual event along one of Graham's greenways.

A new local program in the City of Graham, the *Graham Walks Project*, offers great opportunities for pedestrian encouragement. The *Fit Community Grant*, which will fund the project, came out of a partnership between the City of Graham, Healthy Alamance and Alamance County Health Department. As the lead agency, the City of Graham Recreation and Parks Department will develop a Downtown Walking Trail and kick-off a new walking program that will run for six weeks in the fall and spring, starting on September 28, 2006. Additionally, the project will include construction of a perimeter trail for Cooke Park, providing opportunities for walking, jogging, and biking.

Graham could also tap into many of the existing national encouragement programs:

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

- *Safe Routes to School* is a national program with $612 million dedicated from Congress from 2005 to 2009. Local Safe Routes to School programs are sustained by parents, community leaders, and citizens to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school. The

Safe Routes to School activity in Durham, NC

website is *http://www.saferoutesinfo.org/.* As of 2006, the North Carolina Safe Routes to School program has $15 million over five years for infrastructure improvements within two miles of schools. It also offers programs and workshops held at schools that request guidance. There is an application process and schools that hold workshops and programs will be likely candidates for the capital improvement money.

- *Safe Communities*, is a project of the National Highway Traffic Safety Administration (NHTSA). Nine agencies within the U.S. Department of Transportation are working together to promote and implement a safer national transportation system by combining the best injury prevention practices into the Safe Communities approach to serve as a model throughout the nation. To get them involved in the City of Graham, start by visiting their website, *http://www.nhtsa.dot.gov/safecommunities/*

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

- *America Walks* is a national coalition of local advocacy groups dedicated to promoting walkable communities. Their mission is to foster the development of community-based pedestrian advocacy groups, to educate the public about the benefits of walking, and, when appropriate, to act as a collective voice for walking advocates. They provide a support network for local pedestrian advocacy groups. To get started visit their website, *http://americawalks.org*.

Enforcement: Enforcement is critical to ensure that proper actions are being taken by both pedestrians and motorists and that the rights of each are recognized. A local law enforcement program for a shared transportation system should be developed for Graham. Appropriate and updated pedestrian traffic laws are an important first step in developing an adequate enforcement program. The most effective pedestrian ordinances distinguish between motorized vehicles and pedestrians and clarify the manner in which each shall lawfully share the roadways. Existing state traffic laws should be reviewed to ensure that appropriate rules and regulations are applied to Graham's pedestrian network. This will result in a meaningful policy of which to enforce.

Enforcement truly requires the action of everyone including parents, teachers, and police officers. Officers should take an active role in

enforcement, teaching safety, evaluating traffic concerns, providing a presence, and giving warnings or tickets to those who disobey the law. Law enforcement officers can also set reasonable enforcement targets, with enforcement actions being a verbal warning or a citation:

Reasonable Enforcement Targets Regarding Pedestrians:

- Pedestrians who push through a crowd of people waiting for a "walk" light and cross illegally.
- Pedestrians who enter a stream of traffic and disrupt the flow.
- Pedestrians who "dash out" into the path of oncoming cars.
- Pedestrians who are drunk (take to a place of safety).

Reasonable Enforcement Targets Regarding Drivers:

- Drivers speeding near schools or in neighborhoods where children live.
- Drivers not complying with crosswalk right-of-way laws.
- Drivers who overtake and pass a car stopped at a pedestrian crosswalk. Officers who observe this violation should issue a citation.

Simply sharing this list of enforcement targets with the City of Graham Police Department could kick-off a change in the way pedestrian safety is enforced. Additionally, local law enforcement should refer to and be competent with the NCDOT's *A Guide to North Carolina Bicycle and Pedestrian Laws.* This is available online at: http://www.ncdot.org/transit/bicycle/laws/resources/BikePedLawsGuidebook-Full.pdf. For an online resource guide on laws related to pedestrian and bicycle safety (provided by the National Highway Traffic Safety Administration), visit www.nhtsa.dot.gov/people/injury/pedbimot/bike/resourceguide/index.html

(Footnotes)

[1]NCDOT's Bicycling & Walking in North Carolina, a Critical Part of the Transportation System (adopted by the Board of Transportation on September 8, 2000). *http://www.ncdot.org/transit/bicycle/laws/laws_resolution.html*
[2] Charlotte-Mecklenburg Planning Commission. Annexation - Frequently Asked Questions. Retrieved on 11/30/05 from www.charmeck.org/Departments/Planning/Annexation/Annexation+FAQ.htm
[3] Town of Fayetteville. Often Asked Smart Growth Questions and Corresponding Answers. Retrieved on 11/30/05 from http://www.townoffayetteville.org/sgn/faq.htm

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Pedestrian and Bicycle Information Center. *www.walkinginfo.org*

IMPLEMENTATION Chapter 5

5.1 Overview

The text in this chapter describes how the City of Graham can turn the vision of a connected network of safe pedestrian routes into a reality. The strategy for doing so involves the physical changes discussed in Chapter 3, as well as new policy and program considerations covered in Chapter 4. This chapter deals with opportunities and strategies, key implementation steps (implementation policies), phasing of the pedestrian network, necessary staffing, and methods for developing facilities. These chapters all fit together to form the implementation program.

5.2 Opportunities and Strategies

Among the opportunities to promote the Plan recommendations available to the City of Graham is the opportunity to build upon an already committed and active base of citizens, pedestrians, Downtown leaders and enthusiasts in the area. Through their organizations, institutions, publications, and networks, the City can get the word out about improved or new pedestrian facilities and programs.

Second among the opportunities, is the availability of the existing pedestrian facilities (Downtown sidewalks and streetscapes, etc). Though some changes are being suggested in the short-term and a much expanded network is suggested for the long-term, the presence of an existing network provides a strong foundation from which to build. Residents are already accustomed to seeing pedestrians on sidewalks and trails and should become used to seeing pedestrian walkway and trail signs. Building on their existing awareness is much easier than building on no awareness.

The third opportunity is building upon the existing patchwork of destination points. Schools, parks, residential neighborhoods, commercial areas, and the Downtown core are all places pedestrians currently travel to or would like to travel to. Short connectors between destinations connect with other connectors to the next destination. In the end, long corridors are created from this distribution of linked destination points. The addition of crosswalks and signage will make these destinations safer and more attractive to pedestrians.

The final opportunity is taking advantage of the region's substantial growth. Where development and roadway reconstruction occurs, pedestrian facilities should be incorporated to reduce the overall cost of the system. Having policies in place to require sidewalks and greenways can help expand the pedestrian network as development occurs.

From these opportunities comes the framework for an initial implementation strategy:

1) Use the base of pedestrians to expand the awareness of the benefits of a walkable community

2) Expand and modify the existing pedestrian route network to a comprehensive, connected, safe system so that it better meets the needs of the community, provides access to all, and enhances the current transportation infrastructure

3) Start making the critical connections between destination points that will allow for continuous growth of and improvement in the pedestrian transportation network.

4) Take advantage of future development and roadway reconstruction to expand the pedestrian network.

5) The final, most important strategy is keeping the Steering Committee of officials and citizens that helped direct the development of this Plan intact. This Committee should oversee the implementation of this plan, develop programs, seek funding sources, be a place for information and idea exchange, evaluate progress, and maintain momentum for carrying out this Plan's recommendations. Committee members would be the pedestrian "eyes" and "ears" of the community and report to each other twice annually to discuss issues and consider future strategies.

These strategies represent the core of a solid implementation strategy. As the individual policy recommendations and physical recommendations are addressed, they should each fit with one of these primary strategies.

5.3 Adopting this Plan

Before any other action takes place, the local government of the City of Graham should focus on adopting this plan. This should be considered the first step in implementation. Through adoption of this document and its accompanying maps as the area's official pedestrian plan, the community is able to shape larger regional decisions so that they fit with the goals of this plan. The City also gives itself greater authority in shaping local land use decisions so that they achieve the goals and vision of this plan.

5.4 Action Steps

After the plan is adopted, implementation of specific recommendations can begin. Many of these will occur simultaneously and include policy and facility improvement changes. The key steps are:

- Create the necessary governance capability, administration (staffing) capability, and organization to support and oversee the implementation of this plan and the proper maintenance of the facilities that are developed.

- Form the Committee described in Section 5.2 to oversee the implementation of the pedestrian network.

- Secure the funding necessary to undertake the short-term projects and develop a funding strategy that will allow the community to incrementally complete each of the suggested pedestrian facility improvements over a 10-20 year period.

- Ensure that pedestrian planning is integrated with other transportation planning efforts at the state and local level, as well as with long-range and current land use, economic development, parks and recreation, environmental, and community planning.

- Add signs to the recommended network routes as they are completed so that functional, safe, and updated pedestrian routes and greenways are immediately available to the community.

- Develop and implement education and awareness programs discussed in Chapter 4 such as public events, which can be used to announce new pedestrian routes and some of the upcoming projects.

- Implement pedestrian policy recommendations and action items described in Chapter 4 related to creating an accessible, connected, safe, and desirable community.

- Begin working on the proposed short-term phasing facilities listed in Chapter 3 and Appendix A.

- Coordinate pedestrian improvement projects with scheduled street re-paving, streetscaping, and other utility work.

5.5 Pedestrian Network Phasing

Because the entire pedestrian network cannot be built simultaneously, an effort was made to phase the recommended pedestrian network over time. From the overall pedestrian network described in Chapter 3, pedestrian corridor facilities were phased into short-term (0-3 years), mid-term (4-7 years), and long-term (8-15 years). As discussed in Chapter 3, pedestrian corridors were prioritized and phased based on the facility segment's ability to serve key destinations (including schools and Downtown), address safety concerns, and expand connectivity. The Top Priority pedestrian corridor segments, intersection improvement sites, and greenways are listed in Chapter 3. The methodology, scoring, and phasing table are described in more detail in both Chapter 3 and Appendix A.

5.6 Staffing

In order to implement, construct, promote, and maintain a pedestrian network, City departments and staff should be given the responsibilities described below.

Implementation: Planning Department
Facility Development and Maintenance: Public Works Department
Community Programs: Planning Department, Recreation and Parks Department
Enforcement: City Police Department
Public Information Distribution: Public Information Office/City of Graham staff

Adapted from other successful pedestrian communities, recommended staffing for each department is shown below:

Planning Department: A member of the Planning Department, assigned by the City Planning Director, should be appointed to take on the responsibilities of "Pedestrian Coordinator." These duties would include the overall commitment to carrying out recommendations from this Plan, applying for funding, and overseeing the entire pedestrian program. Overseeing the program requires an evaluation and monitoring process to measure successes and failures of the Plan's implementation. This includes updating and improving portions of the Plan and pedestrian facility development methods over time if necessary. Site plans should be reviewed, particularly for large residential and commercial development, to ensure that pedestrian safety is addressed appropriately.

Members of the Planning staff should also conduct tasks such as updating and publishing new local pedestrian maps, creating and updating GIS layers of all pedestrian facilities, proposing future alternative routes, and working with adjacent communities and regional organizations to coordinate pedestrian linkages.

Public Works Department: The Public Works Director should oversee the construction and maintenance of all pedestrian facilities. The Public Works section responsible for Streets should also be responsible for future sidewalk construction and maintenance. One member of the Public Works Department should handle pedestrian facility development and construction among his/her other responsibilities.

Maintenance responsibilities, as described in Section 4.3.2, include repair of sidewalk and trail surfaces, repainting/restriping of crosswalks and pavement markings, debris removal, vegetation pruning, and repair/replacement of signage.

Recreation and Parks Department: The Recreation and Parks Director and/or staff should play a role in education and encouragement programs. Recreation centers and other trail, park, and school areas can be the location of events such as educational courses. This department should also play a role in managing off-road pedestrian facility development, including the Haw

River Greenway. Coordination with the Haw River group - Trail Committee and the MST (Mountains-to-Sea) Trail effort should continue through the Recreation and Parks Department as well.

Police Department: All local police officers should be educated about North Carolina bicycle and pedestrian laws and interactions between bicyclists, pedestrians, and motorists. *The Guide to North Carolina Bicycle and Pedestrian Laws*, written by the NCDOT Division of Bicycle and Pedestrian Transportation, should be distributed to local law enforcement officers. Police officers should become more proactive in educating the public and enforcing laws when they are broken.

Public Information Office: City of Graham employees responsible for providing public information and promoting the implementation of this Plan should ensure that updated information is available on the web, at the Alamance County Area Chamber of Commerce, City of Graham public facilities, and also promoted through local media. To promote the pedestrian network and build momentum, officials should present pedestrian improvements and achievements by means of local newsletters, newspapers, the City website, and local cable television. Ribbon-cutting ceremonies could be held for accomplishments such as greenways. Programs and events, such as those described in Section 4.4 (Program Recommendations), are another means to involve the public.

Volunteers: Services from volunteers, student labor, and seniors, or donations of material and equipment may be provided in-kind to offset construction and maintenance costs. Formalized maintenance agreements, such as adopt-a-trail or adopt-a-highway can be used to provide a regulated service agreement with volunteers. Other efforts and projects can be coordinated as needed with senior class projects, scout projects, interested organizations or clubs or a neighborhood's community service to provide for the basic needs of the pedestrian network. Advantages of utilizing volunteers include reduced or donated planning and construction costs, community pride and connection to the City's pedestrian network, and increased awareness about pedestrian safety issues.

5.7 Pedestrian Access Improvement Study for the I-40 & Main Street Intersection

The City of Graham Pedestrian Transportation Plan recognizes the intersection of I-40 and Main Street as a major setback to the overall pedestrian connectivity of the City. Since the Main Street corridor connects north and south Graham, with direct access to downtown, it serves as a critical area for pedestrians. Currently, the intersection provides no safety measures for pedestrians, and lacks even basic facilities, such as sidewalks and crosswalks. Pedestrian use, however, is still high, as evident in the worn footpaths along both sides of Main Street. Because of these and other factors, the Main Street corridor emerged as a top priority for pedestrian facilities during an analysis of the entire proposed pedestrian network (See section on Prioritization).

An in-depth pedestrian access improvement study is recommended to determine the specific improvements necessary to facilitate pedestrian safety and flow through the intersection. Using guidance from this Plan's section on facility design, the study could be conducted by a combination of City of Graham staff (ideally from both planning and engineering backgrounds) with further guidance from the Burlington Graham Metropolitan Planning Organization (BGMPO) and the NCDOT. At a very minimum, policy changes should be made to ensure that when future improvements are made to the I-40 bridge, pedestrian facilities are incorporated into the project. It is recommended that the study be initiated immediately by the Pedestrian Coordinator, and conducted as soon as possible.

5.8 Establishing Performance Measures (Evaluation and Monitoring)

The Committee should work to establish performance measures to benchmark progress towards achieving the goals of this Plan. These performance measures should be stated in an official report within one to two years after the Plan is adopted. This report should discuss opportunities that are created through performance measures, such as the ability to track trends in pedestrian use and safety over time, present accurate information on pedestrian facility use to policy makers, cite accurate inventories of the quantity and quality of facilities during planning and analysis tasks, and understand the characteristics and needs of pedestrians in the community. The report should also discuss challenges, such as the cost of data collection and reporting, accuracy of data, and how to establish realistic performance targets for pedestrian improvements.

Baseline data should be collected as soon as the performance measures are established. The performance measures can address the following aspects of pedestrian transportation and recreation in the Graham area:

- Safety. Measures of pedestrian crashes or injuries.
- Usage. Measures of how many people are walking on on-road and off-road facilities.
- Facilities. Measures of how many pedestrian facilities are available and the quality of these facilities.
- Education/Enforcement. Measures of the number of people educated or number of people ticketed as a part of a pedestrian safety campaign.
- Institutionalization. Measures of the total budget spent on pedestrian projects and programs or the number of municipal employees receiving pedestrian facility design training.
- Cost. Measures of the total cost of pedestrian facilities per mile or per user.

When establishing performance measures, the City of Graham should consider utilizing data that can be collected cost-effectively and be reported at regular intervals, such as in a performance measures report that is published every two to three years. As the process of collecting and reporting pedestrian data is repeated over time, it will become more efficient.

It will also be a responsibility of the Committee (see Section 5.2) to evaluate and monitor the existing and recommended network over the next 10 years. The Committee should review process and progress and evolve and adapt as needed. New opportunities or input from an

on-going monitoring and evaluation process may emerge, leading to the need to adapt and update the recommendations of this Plan. Land use, transportation, development, and the overall landscape will continue to change as Graham grows, resulting in a dynamic Urban Area. For example, the region and City of Graham may consider mass transit in the future. A level of preparedness and consideration should be given then to the pedestrian-transit interface to assure safe pedestrian access to transit stops, adequate shelters, etc.

5.9 Methods for Developing Facilities

This section describes types of transportation facility construction and maintenance projects that can be used to create new pedestrian facilities. Note that roadway construction and reconstruction projects offer excellent opportunities to incorporate facility improvements for pedestrians. It is much more cost-effective to provide a pedestrian facility along with these other projects than to initiate the improvement later as a "retrofit."

To take advantage of upcoming opportunities and to incorporate pedestrian facilities into routine transportation and utility projects, the "Pedestrian Coordinator" should keep track of the City's projects (through the Public Works Department) and any other local and state transportation improvements. While doing this, he/she should be aware of the different procedures for state and local roads and interstates.

Finally, it is imperative throughout the development of facilities to have coordination with NCDOT. Short term projects can be discussed with the NCDOT Division 7 office. Scoping and requesting TIP (Transportation Improvement Program) projects should continue by coordinating with the BGMPO (Burlington-Graham Metropolitan Planning Organization) and contacting the PDEA (Project Development and Environmental Analysis) Branch of the NCDOT. More information about the TIP can be found in Appendix C. Finally, long-term needs can be discussed with the NCDOT Transportation Planning Branch.

5.9.1 Roadway Construction and Reconstruction

Pedestrians should be accommodated any time a new road is constructed or an existing road is reconstructed. All new roads with moderate to heavy motor vehicle traffic should have sidewalks and safe intersection attributes. The City of Graham should take advantage of any upcoming construction projects, including roadway projects outlined in the BGMPO 2030 Transportation Plan. Also, case law surrounding the ADA has found that roadway resurfacing constitutes an alteration, which requires the addition of curb ramps at intersections where they do not exist.

5.9.2 Residential and Commercial Development

As detailed in Chapter 4, the construction of sidewalks and safe crosswalks should be required during development. Construction begins on a blank slate and the development of pedestrian facilities that corresponds with site construction is more cost-effective than retro-fitting. This ensures the future growth of the pedestrian network and the development of safe communities. A specific example is providing safe pedestrian access through large parking

lots.

5.9.3 Retrofit Roadways with New Pedestrian Facilities
There may be critical locations in the proposed Pedestrian Network that have pedestrian safety issues or are essential links to destinations. In these locations, it may be justified to add new pedestrian facilities before a roadway is scheduled to be reconstructed or utility/sewer work is scheduled.

In some places, such as Main Street, it may be relatively easy to add sidewalk segments to fill gaps, but other segments may require removing trees, relocating landscaping or fences, regrading ditches or cut and fill sections.

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

It is NCDOT bridge policy that sidewalks shall be included on new bridges with curb and gutter approach roadways with no controlled access. Sidewalks should not be included on controlled access facilities. A determination on whether to provide sidewalks on one or both sides of new bridges will be made during the planning process according to the NCDOT Pedestrian Policy Guidelines. When a sidewalk is justified, it should be a minimum of five to six feet wide with a minimum handrail height of 42." For more information, visit: http://www.ncdot.org/doh/construction/altern/value/manuals/RDM2001/part1/chapter6/pt1ch6.pdf

5.9.5 Signage and Wayfinding Projects
Signage along specific routes or throughout an entire community can be updated to make it easier for people to find destinations. Pedestrian route and greenway signs are one example of these wayfinding signs, and they can be installed along routes independently of other signage projects or as a part of a more comprehensive wayfinding improvement project.

5.9.6 Greenway Acquisition
Because the majority of greenways exist in an off-road environment, the acquisition of land or easements becomes a critical part of the implementation process. The recommended alignment of greenways in this Plan follows publicly-owned land where possible, but in many cases, an acquisition strategy will have to be implemented in areas of privately-owned land.

There are several resources and strategies that can aid in the implementation and acquisition process. First, greenways should be considered as "infrastructure" and an important facility

in the City of Graham, providing ecological and recreational services. They can and should be complementary elements of the overall drainage and floodplain infrastructure and be a part of the City's water quality and flood management programs.

Second, the City of Graham adopted a new ordinance, as of 2006, providing fifty feet of stream buffer along both sides of perennial and intermittent streams where public greenways may be approved by the City Council. Also, planned unit development requires a percentage of open space, which could be utilized as greenways. Therefore new development presents new opportunity for greenway development.

Third, the City of Graham should pursue partnerships with land trust and land managers to make more effective use of its land acquisition funds and strategies. Enlisting the support of a local land trust could help broker land protection arrangements between private landowners and the City of Graham. The City should also take advantage of its existing, City-owned utility easements where acquisition is not necessary.

Finally, providing educational material to local landowners and developers about the benefits of greenways and land/easement donations is also an excellent means to stimulate greenway acquisition.

The following list of tools describe various methods of acquisition that can be used by landowners, land conservation organizations, and the City of Graham to acquire greenway lands.

Land Management

Management is a method of conserving the resources of a specific greenway parcel by an established set of policies called management plans for city-owned greenway land or through easements with private property owners. Property owners who grant easements retain all rights to the property except those which have been described in the terms of the easement. The property owner is responsible for all taxes associated with the property, less the value of the easement granted. Easements are generally restricted to certain portions of the property, although in certain cases an easement can be applied to an entire parcel of land. Easements are transferable through title transactions, thus the easement remains in effect perpetually.

Management Plans: The purpose of a management plan is to establish legally binding contracts which define the specific use, treatment, and protection for city-owned greenway lands. Management plans should identify valuable resources; determine compatible uses for the parcel; determine administrative needs of the parcel, such as maintenance, security, and funding requirements; and recommend short-term and long-term action plans for the treatment and protection of greenway lands.

Conservation Easement: This type of easement generally establishes permanent limits on the use and development of land to protect the natural resources of that land. When public access to the easement is desired, a clause defining the conditions of public access can be added to the terms of the easement. Dedicated conservation easements can qualify for both federal income

tax deductions and state tax credits. Tax deductions are allowed by the Federal government for donations of certain conservation easements. The donation may reduce the donor's taxable income.

Preservation Easement: This type of easement is intended to protect the historical integrity of a structure or important elements in the landscape by sound management practices. When public access to the easement is desired, a clause defining the conditions of public access can be added to the terms of the easement. Preservation easements may qualify for the same federal income tax deductions and state tax credits as conservation easements.

Public Access Easements: This type of easement grants public access to a specific parcel of property when a conservation or preservation easement is not necessary. The conditions of use are defined in the terms of the public access easement. Often times, these easements already exist, owned by the City, and are linear, following utility lines. A City *utility easement* or *recreation easement* are two options to be considered in Graham. If an easement has already been cleared and set aside for utilities such as sewer or for recreation, a greenway can be an easy addition.

Government Regulation

Regulation is defined as the government's ability to control the use and development of land through legislative powers. The following types of development ordinances are regulatory tools that can meet the challenges of projected suburban growth and development as well as conserve and protect greenway resources. Existing open space requirements for development can be found in Graham's Development Ordinances (www.cityofgraham.com/Development_Ordinance.pdf)

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

Negotiated Dedications: This type of mechanism allows the City to negotiate with landowners for certain parcels of land that are deemed beneficial to the protection and preservation of specific stream corridors. This type of mechanism can also be exercised through dedication of greenway lands when a parcel is subdivided. Such dedications would be proportionate to the relationship between the impact of the subdivision on community services and the percentage of land required for dedication-as defined by the US Supreme Court in Dolan v Tigard.

Fee-in-Lieu: To complement negotiated dedications, a fee-in-lieu program may be necessary

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

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

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

Overlay Zones: An overlay zone and its regulations are established in addition to the zoning classification and regulations already in place. Currently Graham Planned Unit Developments require certain percentages of open space, which could include greenways.

Subdivision Exactions: An exaction is a condition of development approval that requires development to provide or contribute to the financing of public facilities at their own expense. For example, a developer may be required to build a greenway on-site as a condition of developing a certain number of units because the development will create the need for new parks or will harm existing parks due to overuse. This mechanism can be used to protect or preserve greenway lands, which are then donated to either the City or County. Consideration should be given to include greenway development in future extraction programs.

Acquisition
Acquisition requires land to be donated or purchased by a government body, public agency, greenway manager, or qualified conservation organization. It should be noted that in land acquisition for which a greenway may be built with federal funds, the landowner must be offered payment of fair market value and documentation of the offer must be recorded.

Donation or Tax Incentives: In this type of acquisition, a government body, public agency, or qualified conservation organization agrees to receive the full title or a conservation easement to a parcel of land at no cost or at a "bargain sale" rate. The donor is then eligible to receive a federal tax deduction of up to 30 to 50 percent of their adjusted gross income. Additionally, North Carolina offers a tax credit of up to 25 percent of the property's fair market value (up to $5000). Any portion of the fair market value not used for tax credits may be deducted as a charitable contribution. Also, property owners may be able to avoid any inheritance taxes, capital gains taxes, and recurring property taxes.

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

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

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

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

Option / First Right of Refusal: A local government agency or private organization establishes an agreement with a public agency or private property owner to provide the right of first refusal on a parcel of land that is scheduled to be sold. This form of agreement can be used in conjunction with other techniques, such as an easement to protect the land in the short-term. An option would provide the agency with sufficient time to obtain capital to purchase the property or successfully negotiate some other means of conserving the greenway resource.

Purchase of Development Rights: A voluntary purchase of development rights involves purchasing the development rights from a private property owner at a fair market value. The landowner retains all ownership rights under current use, but exchanges the rights to develop the property for cash payment.

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

Eminent Domain: The right of exercising eminent domain should be done so with caution by the community and only if the following conditions exist: 1) the property is valued by

the community as an environmentally sensitive parcel of land, significant natural resource, or critical parcel of land, and as such has been defined by the community as irreplaceable property; 2) written justification for the community's claim about the property's value has been prepared and offered to the property owner; 3) all efforts to negotiate with the property owner for the management, regulation, and acquisition of the property have been exhausted and that the property owner has been given reasonable and fair offers of compensation and has rejected all offers; and 4) due to the ownership of the property, the timeframe for negotiating the acquisition of the property will be unreasonable, and in the interest of pursuing a cost effective method for acquiring the property, the community has deemed it necessary to exercise eminent domain.

References

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

Pedestrian Master Plan. The City of Oakland. Part of the Land Use and Transportation Element of the City of Oakland's General Plan. November 12, 2002. *http://www.oaklandnet.com/government/Pedestrian/Ch_4.pdf*

DESIGN GUIDELINES Chapter 6

6.1 Overview

These guidelines originate from and adhere to national design standards as defined by the American Association of State Highway Transportation Officials (AASHTO), the Americans with Disabilities Act (ADA), the Federal Highway Administration (FHWA) Pedestrian Facilities Users Guide, the Manual on Uniform Traffic Control Devices (MUTCD), and the NCDOT. Should the national standards be revised in the future and result in discrepancies with this chapter, the national standards should prevail for all design decisions. Likewise, all cost information provided is relevant only at or around the date of this report (September 2006). A qualified engineer or landscape architect should be consulted for the most up to date and accurate cost estimates.

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

6.2 Pedestrian Facility Elements

6.2.1 Sidewalks and Walkways

Sidewalks and walkways are extremely important public right-of-way components often times adjacent to, but separate from automobile traffic. In many ways, they act as the seam between private residences, stores, businesses, and the street. They are spaces where children play, neighbors meet and talk, shoppers meander casually, parents push strollers, and commuters walk to transit stops or directly to work. Because of the social importance of these spaces, great attention should be paid to retrofit and renovate areas with disconnected, dangerous, or otherwise malfunctioning walkways.

Figure 6(a): Well designed residential sidewalk[1].

From a European style promenade to, in the case of a more rural environment, a simple asphalt or crushed stone path next to a secondary road, walkway form and topography

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

Figure 6(b): Sidewalk with a vegetative buffer zone. Notice the sense of enclosure created by the large canopy street trees[1].

Sidewalks are typically built in curb and gutter sections. They need to be kept completely free of obstructions such as utility poles. A four to eight foot buffer zone parallel to the sidewalk or walkway is recommended to separate pedestrian traffic from automobile traffic and to keep the sidewalk free of light pole obstructions. Much like the sidewalk and walkway itself, the form and topography of this buffer will vary greatly. Native street tree plantings have historically proven to work successfully within these buffer zones. They regulate micro-climate, create a desirable sense of enclosure, promote a local ecological identity and connection to place, and can act as a pleasant integration of nature into an urban environment. In the event that vegetation is not possible, a row of parked cars, bike lane, or street furniture can be used to create this buffer.

Guidelines[3+9]:

- Concrete is preferred surface, providing the longest service life and requiring the least maintenance.
- Sidewalks should be built as flat as possible to accommodate all pedestrians; they should have a running grade of five percent or less; with a two percent maximum cross-slope.
- Concrete sidewalks should be built to minimum depth of four inches; six inches at driveways.
- Sidewalks should be a minimum of five feet wide; eight to ten feet wide within Downtown; ten feet can also be considered in other areas of heavy pedestrian traffic. When sidewalk abuts storefronts, an additional two feet of space from walls is recommended.
- Buffer zone of two to four feet in local or collector streets; five to six feet in arterial or major streets and up to eight feet in busy streets and Downtown to provide space for light poles and other street furniture.
- Motor vehicle access points should be kept to minimum.

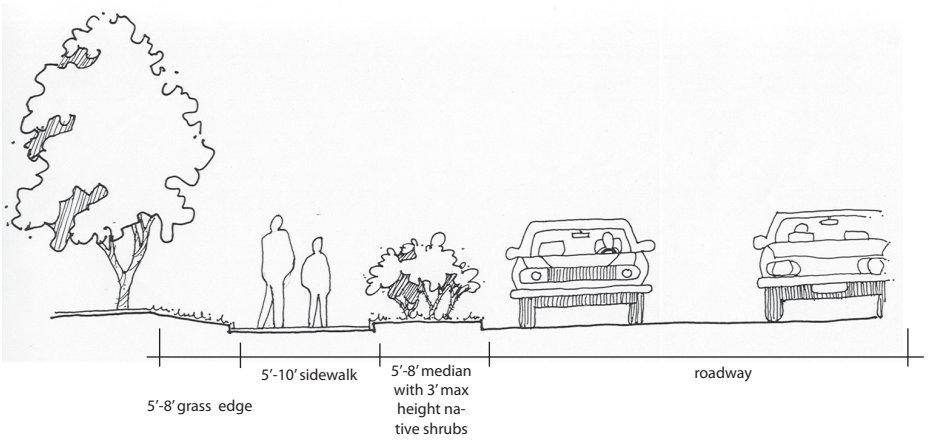


Figure 6(c):
Typical street with adjacent sidewalk

Cost[1] :

Concrete curbing: $10-$15/linear foot

Walkways: $3/square foot

Asphalt walkways are much less expensive in terms of construction cost but more difficult to traverse and more expensive to maintain.

6.2.2 Greenway Trails

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

Multi-use trails are the most common trail type in the nation. These trails vary in width and can accommodate a wide variety of users. The minimum width for two-directional trails is 10', however 12'-14' widths are preferred where heavy traffic is expected.

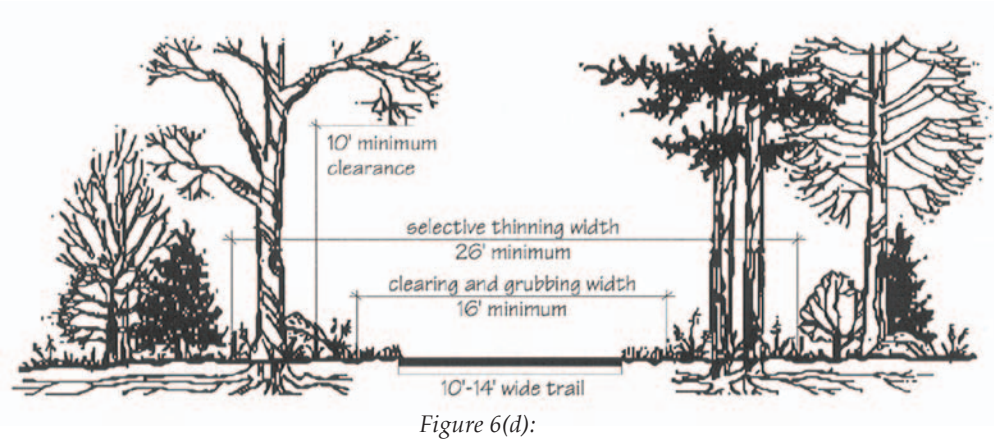


Figure 6(d):
Vegetation clearing guidelines

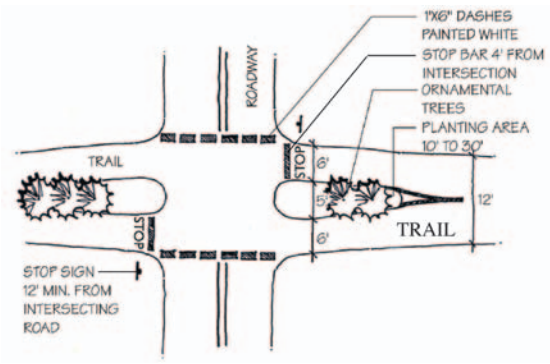


Figure 6(e):
Typical greenway trail approach to a roadway

Centerline stripes should be considered for paths that generate substantial amounts of pedestrian traffic. Possible conflicts between user groups must be considered during the design phase, as cyclists often travel at a faster speed than other users. Radii minimums should also be considered depending on the different user groups.

While the vegetative clearing needed for these trails varies with the width of the trail. The minimum width for clearing and grubbing a 14' wide trail is 18' (two feet on each side). Selective thinning increases sight lines and distances and enhances the safety of the trail user. This practice includes removal of underbrush and limbs to create open pockets within a forest canopy, but does not include the removal of the forest canopy itself.

Typical pavement design for a paved, off-road, multi-use trail should be based upon the specific

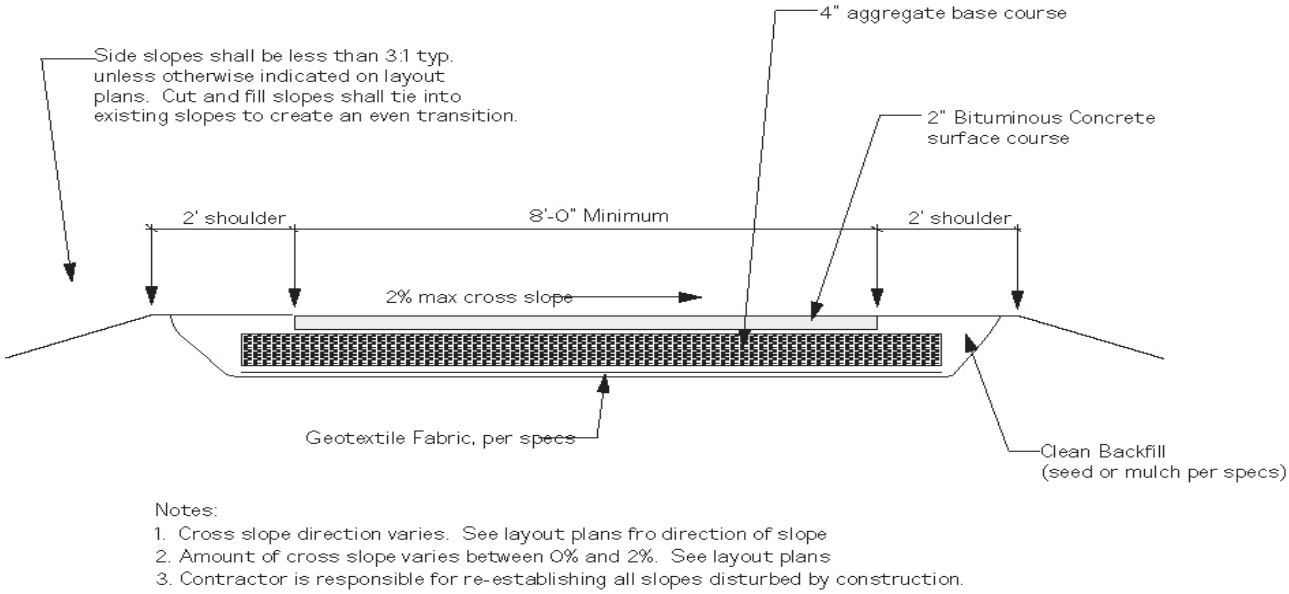


Figure 6(f):
Asphalt pavement construction detail

loading and soil conditions for each project. These asphalt or concrete trails should be designed to withstand the loading requirements of occasional maintenance and emergency vehicles.

Concrete: In areas prone to frequent flooding, it is recommended that concrete be used because of its excellent durability. Concrete surfaces are capable of withstanding the most powerful environmental forces. They hold up well against the erosive action of water, root intrusion and subgrade deficiencies such as soft soils. Most often, concrete is used for intensive urban applications. Of all surface types, it is the strongest and has the lowest maintenance requirement, if it is properly installed.

Asphalt: Asphalt is a flexible pavement and can be installed on virtually any slope. One important concern for asphalt trails is the deterioration of trail edges. Installation of a geotextile fabric beneath a layer of aggregate base course (ABC) can help to maintain the edge of a trail. It is important to provide a 2' wide graded shoulder to prevent trail edges from crumbling.

Trail and Roadway Intersections: The images below present detailed specifications for the layout of intersections between trail corridors and roadways. Signage rules for these sorts of intersections are available in the MUTCD as well. For further trail design, including design for roadway intersections, please see *Trails for the Twenty-First Century: Planning Design, and Management Manual for Multi-use Trails*.

6.2.3 Marked Crosswalks

A marked crosswalk designates a pedestrian right-of-way across a street. It is often installed at controlled intersections or at key locations along the street (a.k.a. mid-block crossings) and in this Plan are prescribed for the Downtown, school areas, and key residential and commercial areas where pedestrian activity is greatest. Although marked crosswalks provide strong visual clues to motorists that pedestrians are present, it is important to consider the use of these elements in conjunction with other traffic calming devices to fully recognize low traffic speeds and enhance pedestrian safety. In general, "marked crosswalks should not be installed in an uncontrolled environment where speeds exceed 40 mph"[3]. Every attempt should be made to install crossings in places where pedestrians are most likely to cross. A well-designed traffic calming location is not effective if pedestrians are using other unmodified and potentially dangerous locations to cross the street.

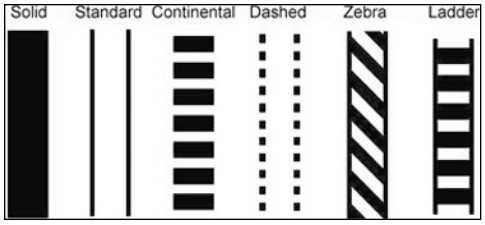


Figure 6(g): Illustration of all the variety of patterns possible in designating a crosswalk[1].

Marked pedestrian crosswalks may be used under the following conditions: 1) At locations with stop signs or traffic signals, 2) At non-signalized street crossing locations in designated school zones, and 3) At non-signalized locations where engineering judgment dictates that the use of specifically designated crosswalks are desirable[9].

There is a variety of form, pattern, and materials to choose from when creating a marked crosswalk. It is important however to provide crosswalks that are not slippery, are free of tripping hazards, or are otherwise difficult to maneuver by any person including those with physical mobility or vision impairments. Although attractive materials such as inlaid stone or certain types of brick may provide character and aesthetic value, the crosswalk can become slippery. Also, as it degrades from use or if it is improperly installed, it may become a hazard for the mobility or vision impaired.

A variety of color or texture may be used to designate crossings. These materials should be smooth, skid-resistant, and visible[3]. Reflective paint is inexpensive but is considered more slippery than other devices such as inlay tape or thermoplastic. A variety of patterns may be employed as detailed in Figure 6(g). In areas with a high volume of pedestrian traffic, particularly at mid-block crossings, a crosswalk can be raised to create both a physical impediment for automobiles and a reinforced visual clue to the motorist.

An engineering study may need to be performed to determine the appropriate width of a crosswalk at a given location, however marked crosswalks should not be less than six feet in width. In downtown areas or other locations of high pedestrian traffic, a width of ten feet or greater should be considered.

Guidelines[3+9]:
- Should not be installed in an uncontrolled environment where speeds exceed 40 mph.
- Crosswalks alone may not be enough and should be used in conjunction with other measures to improve pedestrian crossing safety, particularly on roads with average daily traffic (ADT) above 10,000.
- Width of marked crosswalk should be at least six feet wide; ideally ten feet or wider in Downtown areas.
- Curb ramps and other sloped areas should be fully contained within the markings.
- Crosswalk markings should extend the full length of the crossings.
- Crosswalk markings should be white per MUTCD.
- The 'continental' pattern is recommended for intersection improvements in Graham for aesthetic and visibility purposes; Lines should be one to two feet wide and spaced one to five feet apart.

Cost[1]:

Regular striped:	$100
Ladder crosswalk:	$300
Pattern concrete:	$3,000

Maintenance cost varies according to region and pattern used

6.2.4 Advance Stop Bars

Moving the vehicle stop bar 15–30 feet back from the pedestrian crosswalk at signalized crossings and mid-block crossings increases vehicle and pedestrian visibility. Advance stop bars are 1–2 feet wide and they extend across all approach lanes at intersections. The time and distance created allows a buffer in which the pedestrian and motorist can interpret each other's intentions. Studies have shown that this distance translates directly into increased safety for both motorist and pedestrian. One study in particular claims that by simply adding a "Stop Here for Pedestrians" sign reduced pedestrian motorist conflict by 67%. When this was used in conjunction with advance stop lines, it increased to 90%[1].

Cost[1]:

Signage (if desired): $50 - $150 plus installation

No additional cost if new line is installed in new paving or as part of repaving

6.2.5 Curb Ramps

Curb ramps are critical features that provide access between the sidewalk and roadway for wheelchair users, people using walkers, crutches, or handcarts, people pushing bicycles or strollers, and pedestrians with mobility or other physical impairments. In accordance with the 1973 Federal Rehabilitation Act and to comply with the 1990 Federal ADA requirements, curb ramps must be installed at all intersections and mid-block locations where pedestrian crossings exist[1]. In addition, these federal regulations require that all new constructed or altered roadways include curb ramps. Although the federally prescribed maximum slope for a curb ramp is 1:12 or 8.33% and the side flares of the curb ramp must not exceed a

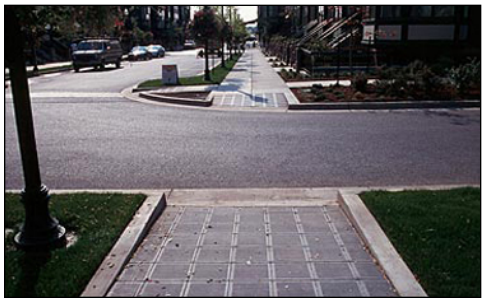


Figure 6(h):
Curb ramps shown have two separate ramps at the intersection[1].

maximum slope of 1:10 or 10.0%, it is recommended that much less steep slopes be used whenever possible.

It is also recommended that two separate curb ramps be provided at each intersection (Figure 6(h)). With only one large curb ramp serving the entire corner, there is not safe connectivity for the pedestrian. Dangerous conditions exist when the single, large curb ramp inadvertently directs a pedestrian into the center of the intersection, or in front of an unsuspecting, turning vehicle.

For additional information on curb ramps see *Accessible Rights-of-Way: A Design Guide*, by the U.S. Access Board and the Federal Highway Administration, and Designing Sidewalks and Trails for Access, Parts I and II, by the Federal Highway Administration. Visit: www.access-board.gov for the Access board's right-of-way report[1].

Guidelines[9]:
- Two separate curb ramps, one for each crosswalk, should be provided at corner of an intersection.
- Curb ramp should have a slope no greater than 1:12 (8.33%). Side flares should not exceed 1:10 (10%).

Cost[1]:
Curb ramp: $800 - $1,500 per ramp (new or retrofit)

6.2.6 Raised or Lowered Medians

Medians are barriers in the center portion of a street or roadway[1]. When used in conjunction with mid-block or intersection crossings, they can be used as a crossing island to provide a place of refuge for pedestrians. They also provide opportunities for landscaping that in turn can help to slow traffic. A center turn lane can be converted into a raised or lowered median thus increasing motorist safety.

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

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

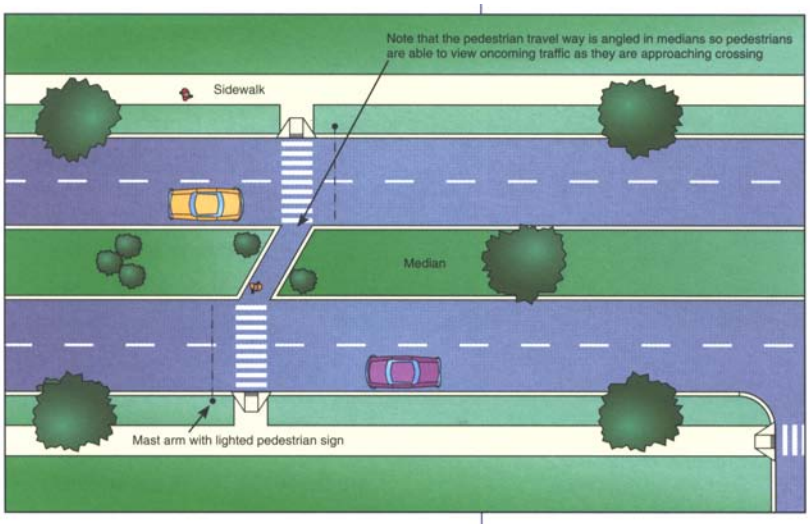


Figure 6i):
A lowered median can be used to filter stormwater and provide a refuge for pedestrians crossing a roadway[3].

Guidelines[3+9]:
- Median pedestrian refuge islands should be provided as a place of refuge for pedestrians crossing busy or wide roadways at either mid-block locations or intersections. They should be utilized on high speed and high volume roadways.
- Medians should incorporate trees and plantings to change the character of the street and reduce motor vehicle speed.
- Landscaping should not obstruct the visibility between motorists and pedestrians.
- Median crossings should provide ramps or cut-throughs for ease of accessibility for all pedestrians
- Median crossings should be at least 6 feet wide in order to accommodate more than one pedestrian, while a width of 8 feet (where feasible) should be provided for bicycles, wheelchairs, and groups of pedestrians
- Median crossings should possess a minimum of a 4 foot square level landing to provide a rest point for wheelchair users.
- Pedestrian pushbuttons should be located in the median of all signalized mid-block crossings, where the roadway width is in excess of 60 feet.

Cost[1]:
Raised or lowered: $15,000 - $30,000 per 100 feet

6.2.7 Bulb-outs

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

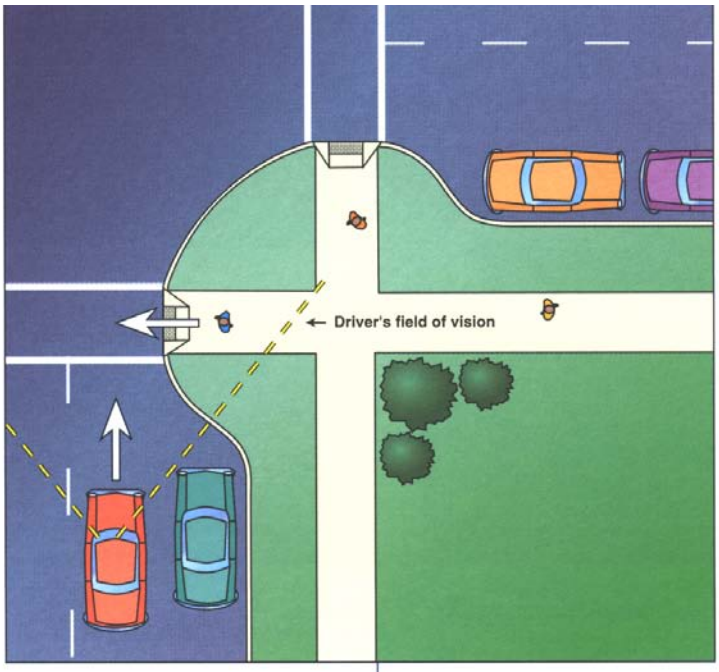


Figure 6(j):
By reducing a pedestrian's crossing distance, less time is spent in the roadway, and pedestrian vehicle conflicts are reduced.[3]

Sightlines and pedestrian visibility are reduced when motor vehicle parking encroaches too close to corners creating a dangerous situation for pedestrians. When placed at an intersection, bulb-outs preclude vehicle parking too close to a crosswalk. Also, bulb-outs at intersections can greatly reduce turning speed, especially if curb radii are set as tight as possible[1]. Finally, bulb-outs also reduce travel speeds when used in mid-block crossings because of the reduced street width.

Bulb-outs should only be used where there is an existing on-street parking lane and should never encroach into travel lanes, bike lanes, or shoulders[1].

Guidelines[10]:
- Bulb-outs should be used on crosswalks in heavy pedestrian areas where parking may limit the driver's view of the pedestrian.
- Where used, sidewalk bulb-outs should extend into the street for the width of a parking lane (a minimum five feet) in order to provide for a shorter crossing width, increased pedestrian visibility, more space for pedestrian queuing, and a place for sidewalk amenities and planting.
- Curb extensions should be used on mid-block crossing where feasible.
- Curb extensions may be inappropriate for use on corners where frequent right turns are made by trucks or buses.

Cost[1]:
Bulb-outs/Curb extensions: $2,000 - $20,000
Cost can increase depending on the amount of infrastructure that may have to be relocated.

6.2.8 Pedestrian Overpass/Underpass

Pedestrian overpasses and underpasses efficiently allow for pedestrian movement across busy thoroughfares[1]. These types of facilities are problematic in many regards and should only be considered under suitable circumstances or where no other solution is possible.

Perhaps the best argument for using them sparingly is that research proves pedestrians will avoid using such a facility if they perceive the ability to cross at grade as taking about the same amount of time[1].

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

Overpasses work best when existing topography allows for smooth transitions. Underpasses as well work best with favorable topography when they are open and accessible, and exhibit a sense of safety[1]. Each should only be considered with rail lines, high volume traffic areas such as freeways, and other high volume arteries[1].

Guidelines[10]:
- Over and underpasses should be considered only for crossing arterials with greater than 20,000 vehicle trips per day and speeds 35 - 40 mph and over.
- Minimum widths for over and underpasses should follow the guidelines for sidewalk width.
- Underpasses should have a daytime illuminace minimum of 10 fc achievable through artificial and/or natural light provided through an open gap to sky between the two sets of highway lanes, and a night time level of 4 foot-candle.
- In underpasses, where vertical clearance allows, the pedestrian walkway should be separated from the roadway by more than a standard curb height.
- Consider acoustics measures within underpasses to reduce noise impacts to pedestrians and bicyclists.

Cost:
Varies greatly from $500,000 to $4,000,000

6.2.9 Roundabouts

A roundabout is a circular intersection that maneuvers traffic around in a counterclockwise direction so that cars make a right-hand turn onto a desired street[1]. Vehicles from approaching streets are generally not required to stop although approaching vehicles are required to yield to motorists in the roundabout. It is believed that this system eliminates certain types of crashes at traditional intersections.

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

Problems also arise with the vision-impaired because there are not proper audible cues

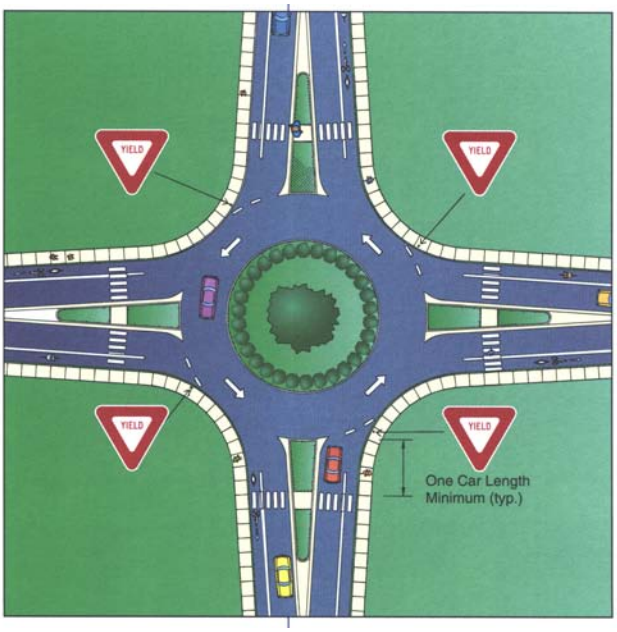


Figure 6(k):
Typical roundabout.[3]

associated with when to cross. Studies are underway to develop and test solutions. Auditory accessible pedestrian signals placed on sidewalks and splitter islands are one solution, but again there is no research to prove their efficacy[1].

In areas where traffic is low, a roundabout presents little in the way of a barrier for bicyclists. However, in multi-lane roundabouts where speeds are higher, and the traffic is heavy, bicyclists are at a distinct and dangerous disadvantage. Adding a bike lane within such a roundabout has not proven to be effective. A possible solution involves creating a bike lane that completely skirts the roundabout allowing the cyclist to use or share the pedestrian route.

Guidelines[11]:

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

Cost[1]:

Neighborhood intersection, landscaped:	$45,000 - $150,000
Arterial, landscaped	$250,000
Lower maintenance cost than traditional signals	

6.2.10 Signalization

6.2.10.1 Traffic Signals

Traffic signals assign the right of way to motorists and pedestrians and produce openings in traffic flow, allowing pedestrians time to cross the street[1 4]. When used in conjunction

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

Engineering, as well as urban design judgment, must be used when determining the location of traffic signals and the accompanying timing intervals. Although warrants for pedestrian signal timing have been produced by the MUTCD, each site must be analyzed for factors including new facility and amenity construction (i.e. a popular new park or museum) to allow for potential future pedestrian traffic volume. In addition, creating better access to existing places may in fact generate a higher pedestrian volume[1].

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

6.2.10.2 Pedestrian Signals

There are a host of possible traffic signal enhancement opportunities that can greatly improve the safety and flow of pedestrian traffic. Some include: international symbols for WALK and DON'T WALK, providing large traffic signals, the positioning of traffic signals so that those waiting at a red-light cannot see the opposing traffic signal and anticipate their own green-light, installing countdown signals to provide pedestrians information on how long they have remaining in the crossing interval, automatic pedestrian sensors, and selecting the proper signal timing intervals[1].

According to the MUTCD, international pedestrian signal indication should be used at traffic signals whenever warranted[1]. As opposed to early signalization that featured "WALK" and "DON'T WALK", international pedestrian symbols should be used on all new traffic signal installations as illustrated in Figure 6(l). Existing "WALK" and "DON'T WALK" signals should be replaced with international symbols when they reach the end of their useful life.

Figure 6(l): International symbols used in a crosswalk to designate WALK and DON'T WALK [1].

Symbols should be of adequate size, clearly visible, and, in some circumstances, accompanied by an audible pulse or other messages to make crossing safe for all pedestrians. Proper placement and location for the signals are shown in Figure 6(m). Consideration should be paid to the noise impact on the surrounding neighborhoods when deciding to use audible signals[1]. For additional information on accessible pedestrian signals, please visit: www.walkinginfo.org/aps.

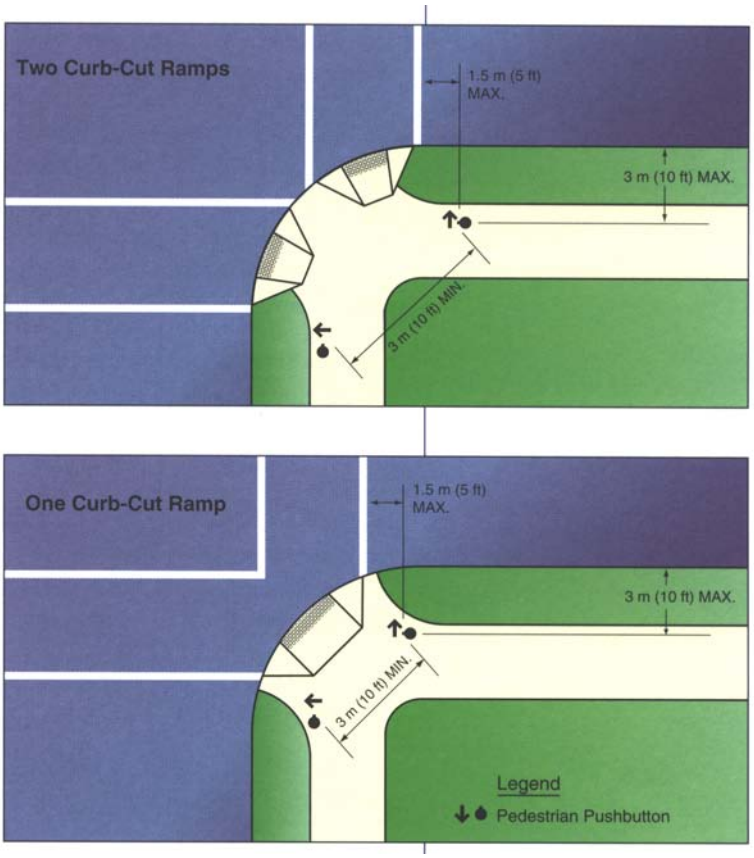


Figure 6(m):
Location of pedestrian push-button.[3]

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

The timing of these or other pedestrian signals needs to be adapted to a given situation. There are three types of signal timing generally used: *concurrent*, *exclusive*, and *leading pedestrian interval* (LPI). The strengths and weaknesses of each will be discussed with an emphasis on when they are best employed.

Concurrent signal timing refers to a situation where motorists running parallel to the crosswalk are allowed to turn into and through the crosswalk, left or right, after yielding to pedestrians. This condition is not considered as safe as some of the latter options, however this type of signal crossings generally allows for more pedestrian crossing opportunities and less wait time. In addition, traffic is allowed to flow a bit more freely. *Concurrent* signal timing is best used where lower volume turning movements exist[1].

Where there are high-volume turning situations that conflict with pedestrian movements, the *exclusive* pedestrian interval is the preferred solution. The *exclusive* pedestrian intervals stop traffic in all directions. In order to keep traffic flowing regularly, there is often a greater pedestrian wait time associated with this system. Although it has been shown that pedestrian crashes have been reduced by 50% in some commercial or downtown areas by using these intervals, the long wait times can encourage some to attempt a cross when there is a perceived lull in traffic[1]. These types of crossings are dangerous and may negate the use of the system. A problem is also created for those with visual impairments when the audible cues of the passing parallel traffic is eliminated. Often an audible signal will have to accompany a WALK signal[1].

A proven enhancement that prevents many of the conflicts addressed under either of the former methods is LPI. An LPI works in conjunction with a *concurrent* signal timing system and simply gives the pedestrian a few seconds head start on the parallel traffic. An advance walk signal is received prior to a green light for motorists. This creates a situation where the pedestrian can better see traffic, and more importantly, the motorists can see and properly yield to pedestrians[1]. Long-term research has shown that this system has worked well in places like New York City (where it has been used for 20 years) at reducing motorist and pedestrian conflict[1]. As with the *exclusive* pedestrian interval, an audible cue will need to accompany the WALK signal for the visually impaired.

The use of infrared or microwave pedestrian detectors has increased in many cities worldwide. Theses devices replace the traditional push-button system. Although still experimental, they appear to be improving pedestrian signal compliance as well as reducing the number of pedestrian and vehicle conflicts[1]. Perhaps the best use of these devices is when they are employed to extend crossing time for slower moving pedestrians. Whether these devices are used or the traditional push-button system is employed, it is best to provide instant feedback to pedestrians regarding the length of their wait. This is thought to increase and improve pedestrian signal compliance.

Guidelines[3+9]:
- Pedestrian signals should be placed in locations that are clearly visible to all pedestrians.
- Larger pedestrian signals should be utilized on wider roadways, to ensure readability.
- Pedestrian signal pushbuttons should be well-signed and visible.
- Pedestrian signal pushbuttons should clearly indicate which crossing direction they control.
- Pedestrian signal pushbuttons should reachable from a flat surface, at a maximum height of 3.5 feet and be located on a level landing to ensure ease of operation by pedestrians in wheelchairs.
- Walk intervals should be provided during every cycle, especially in high pedestrian traffic areas.

Cost[1]:

Traffic signals:	$20,000 - $140,000
Pedestrian signals:	$5,000
Adjusting signal timing requires a few hours of staff time	

6.2.11 Right Turn on Red Restrictions

Introduced in the 1970's as a fuel saving technique, the *Right Turn on Red* (RTOR) law is thought to have had a detrimental effect on pedestrians[1]. The issue is not the law itself but rather the relaxed enforcement of certain caveats within the law such as coming to a complete stop and yielding to pedestrians. Often motorists will either nudge into a crosswalk to check for oncoming traffic without looking for pedestrians or slow, but not stop, for the red-light while making the turn.

Figure 6(n):
A low cost sign that restricts right-hand turns at a red light[1].

There is legitimate concern that eliminating an RTOR will only increase the number of right-turn-on-green conflicts where all of the drivers who would normally have turned on red, now are anxious to turn on green. As discussed in 6.2.10 above, LPI or exclusive pedestrian intervals my help to alleviate this problem. Eliminating RTOR should be considered on a case-by-case basis and only where there are high pedestrian volumes. This can be done by simple sign postings as illustrated in Figure 6(n).

Cost[1]:
Signage, installed: $230 - $350

6.2.12 Landscaping

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

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

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

Figure 6(o):
Landscaping used on the Sea Street in Seattle, Washington shows how stormwater treatment can be tied to aesthetically pleasing plantings[7].

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

particularly with larger tree plantings, are important to avoid cracking sidewalks and other pedestrian obstructions.

Guidelines[3]:
- Buffer zone plantings should be maintained at no higher than three feet to allow sight distance for motorists and pedestrians.
- Trees with large canopies planted between the sidewalk and street should generally be trimmed to keep branches at least seven feet above the sidewalk.
- Plants and trees should be chosen to match character of area.

Cost[1]:
Varies greatly. May be supplemented by funds from community organizations or homeowners associations.

6.2.13 Roadway Lighting Improvements

Proper lighting in terms of quality, placement, and sufficiency can greatly enhance a nighttime urban experience as well as create a safe environment for motorists and pedestrians. Two-thirds of all pedestrian fatalities occur during low-light conditions[3]. Attention should be paid to crossings so that there is sufficient ambience for motorists to see pedestrians. To be most effective, lighting should be consistent, adequately spaced, and distinguished, providing adequate light.

In most cases, roadway street lighting can be designed to illuminate the sidewalk area as well. The visibility needs of both pedestrian and motorist should be considered. In commercial or downtown areas and other areas of high pedestrian volumes, the addition of lower level, pedestrian-scale lighting to streetlights with emphasis on crossings and intersections may be employed to generate a desired ambiance. A variety of lighting choices include mercury vapor, incandescent, or less expensive high-pressure sodium lighting for pedestrian level lighting[1]. Roadway streetlights can range from 20-40 feet in height while pedestrian-scale lighting is typically 10-15 feet.

It is important to note that every effort should be made to address and prevent light pollution. Also known as photo pollution, light pollution is "excess or obtrusive light created by humans"[4]. Whenever urban improvements are made where lighting is addressed, a qualified lighting expert should be consulted early in the process. This individual should not only create a safe and attractive ambiance, but will do so with the minimum of fixtures, an awareness of the importance of minimizing photo pollution, and with a focus on minimizing future energy use. A thoughtful plan of how and where to light will reap benefits not only in potential reduced infrastructure cost, but future energy costs as well.

Guidelines[9]:
- Ensure pedestrian walkways and crossways are sufficiently lit.
- Consider adding pedestrian-level lighting in areas of higher pedestrian volumes, Downtown, and at key intersections.
- Install lighting on both sides of streets in commercial districts.
- Use uniform lighting levels.

Cost[1]:
Varies greatly depending on design, fixture selection, and public utility

6.2.14 Street Furniture and Walking Environment

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

Figure 6(p):
The street furniture shown here is placed in such a manner so as to create a safe, pleasurable, and accessible walking environment[1].

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

Guidelines[3]:
- Ensure proper placement of furniture; do not block pedestrian walkway or curb ramps or create sightline problems.
- Wall mounted Objects = not to protrude more than 4″ from a wall between 27″ and 7′ from the ground
- Single post mounted Objects = not to protrude more than 4″ from each side of the post between 27″ and 7′ from the ground
- Multiple Post Mounted Objects = lowest edge should be no higher than 27″ and no lower than 7′
- Place street furniture at the end of on-street parking spaces rather than in middle to avoid vehicle-exiting conflict.

Cost[1]:
Varies depending on design, furniture selection, material, and level of landscaping

6.2.15 Transit Stop Treatments

Currently the City of Graham is not served by any public transportation. In the event that such an opportunity is made available to the City, it is appropriate to consider some of the basic elements of a well designed, accessible, and functional transit stop.

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

Figure 6(q):
This typical transit stop has all of the key features of shelter, ample seating, bicycle parking, landscaping, and trash bins[1].

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

Cost:
Can vary greatly from $1,000 to $10,000

6.2.16 Pedestrian Signs and Wayfinding

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

MUTCD Pedestrian-Related Signage

Regulatory Signs

R1-5 R1-5a R1-6 R1-6a R5-10b R5-10c R9-1 R9-2

R9-3a R9-4 R9-4a R9-6 R10-4b

School, Warning, and Informational Signs

S1-1 S3-1 W11-2 W15-1 I-4

Sources: Manual on Uniform Traffic Control Devices, 2003
http://www.trafficsign.us/

Sign	MUTCD Code	MUTCD Section	Conventional Road	
Yield here to Peds	R1-5	2B.11	450x450 (18x18)	Regulatory
Yield here to Peds	R1-5a	2B.11	450x600 (18x24)	
In-Street Ped Crossing	R1-6, R1-6a	2B.12	300x900 (12x36)	
Peds and Bikes Prohibited	R5-10b	2B.36	750x450 (30x18)	
Peds Prohibited	R5-10c	2B.36	600x300 (24x12)	
Walk on Left Facing Traffic	R9-1	2B.43	450x600 (18x24)	
Cross only at Crosswalks	R9-2	2B.44	300x450 (12x18)	
No Ped Crossing	R9-3a	2B.44	450x450 (18x18)	
No Hitch Hiking	R9-4	2B.43	450x600 (18x24)	
No Hitch Hiking (symbol)	R9-4a	2B.43	450x450 (18x18)	
Bikes Yield to Peds	R9-6	9B.10	300x450 (12x18)	
Ped Traffic Symbol	R10-4b	2B.45	225x300 (9x12)	
School Advance Warning	S1-1	7B.08	900x900 (36x36)	School, Warning, nformational
School Bus Stop Ahead	S3-1	7B.10	750x750 (30x30)	
Pedestrian Traffic	W11-2	2C.41	750x750 (30x30)	
Playground	W15-1	2C.42	750x750 (30x30)	
Hiking Trail	I-4	--	600x600 (24x24)	

1. Larger signs may be used when appropriate.
2. Dimensions are shown in millimeters followed by inches in parentheses and are shown as width x height.
3. First dimension in millimeters; dimensions in parentheses are in inches.
4. All information in table taken directly from MUTCD.

Wayfinding signage should orient and communicate in a clear, concise and functional manner. It should enhance pedestrian circulation and direct visitors and residents to important destinations. In doing so, the goal is to increase the comfort of visitors and residents while helping to convey a local identity[5].

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

Cost[1]:
Signage: $50 - $150 plus installation

6.3 Bridges

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

It is NCDOT bridge policy that within Urban Area boundaries, sidewalks shall be included on new bridges with curb and gutter approach roadways with no controlled access. Sidewalks should not be included on controlled access facilities. A determination on whether to provide sidewalks on one or both sides of new bridges will be made during the planning process according to the NCDOT Pedestrian Policy Guidelines. When a sidewalk is justified, it should be a minimum of five to six feet wide with a minimum handrail height of 42."

It is also NCDOT bridge policy that bridges within the Federal-aid urban boundaries with rural-type roadway sections (shoulder approaches) may warrant special consideration. To allow for future placement of ADA acceptable sidewalks, sufficient bridge deck width should be considered on new bridges in order to accommodate the placement of sidewalks.

For more information, visit:
http://www.ncdot.org/doh/construction/altern/value/manuals/RDM2001/part1/chapter6/pt1ch6.pdf
&
http://www.ncdot.org/doh/construction/altern/value/manuals/bpe2000.doc

Guidelines:
- Sidewalks should be included on roadway bridges with no controlled access with curb and gutter approach in Urban Areas.
- Sufficient bridge deck width should be considered on new bridges with rural-type shoulder approaches for future placement of sidewalks.
- Sidewalk should be 5' to 6' wide.
- Minimum handrail height should be 42"

Figure 6(r):
One of the many old buildings in the Downtown Graham area.

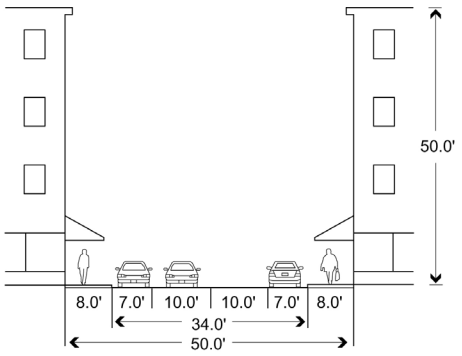
6.4 Building Scale Cross-Sections

Context, dimension, and scale are important considerations when developing new or retrofitting existing pedestrian friendly environments. Context refers generally to the place: is it urban, rural, residential, commercial, industrial or mixed? Dimension relates to the actual size and distance of objects such as buildings. Scale relates to how both context and dimension work together within a given locality. It is often a subjective observation based on the feeling generated while occupying a space. A place that is not scaled properly will most likely feel uncomfortable, while those that are will be more pleasurable. According to the American Planning Association, some important factors within a pedestrian environment are[8]:

- parking configuration
- building use
- degree/type of non-motorist activity
- truck traffic percentage
- ADA requirements
- location within the urban fabric
- transit use

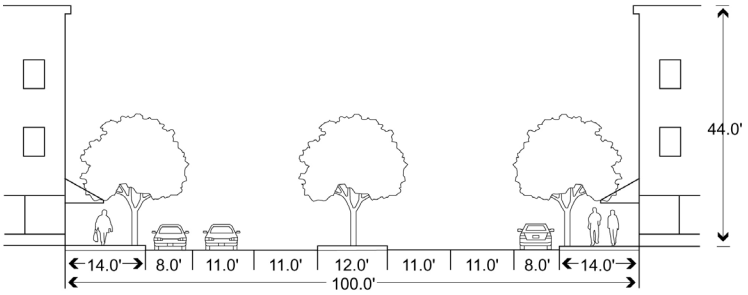
The following typical cross sections on the next four pages illustrate the interaction of these concepts:

Figure 6(s):
With a building ratio of 1:1, where the building heights are the same as the distance between them, a sense of enclosure is established quite easily. Depending on traffic requirements, the space can be used for tree plantings, bike lanes, wider sidewalks, or a combination of those elements[8].



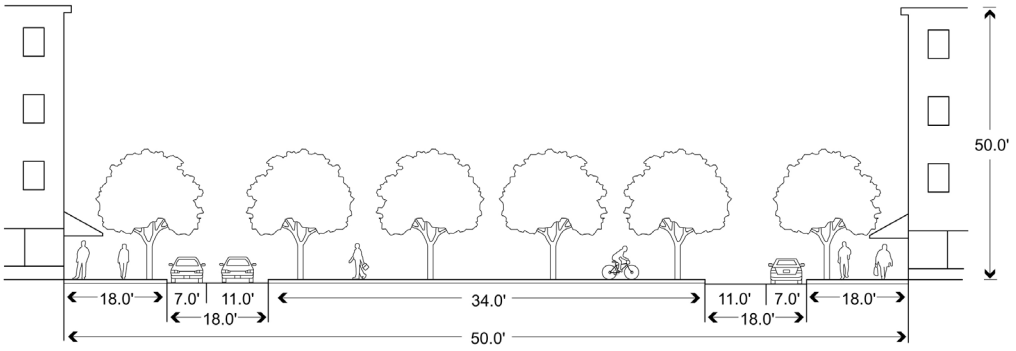
1:1 Ratio

Figure 6(t):
A building ratio of 2:1 where the building heights are half of the distance between them, requires the addition of other elements to help maintain a sense of enclosure and to reinforce the notion of human scale, and pedestrian friendly environments[8].

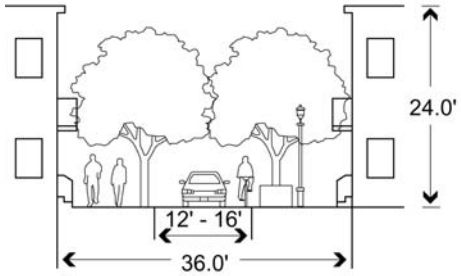


2:1 Ratio

Figure 6(u):
A ratio of 3:1 approaches the maximum distance between buildings before the building edges cease to relate to each other. Any ratio larger than 4:1 starts to lose a perception of enclosure and should be avoided if at all possible[8].

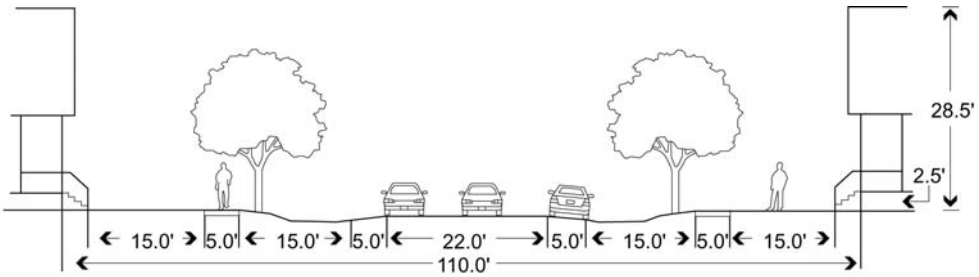


3:1 Ratio



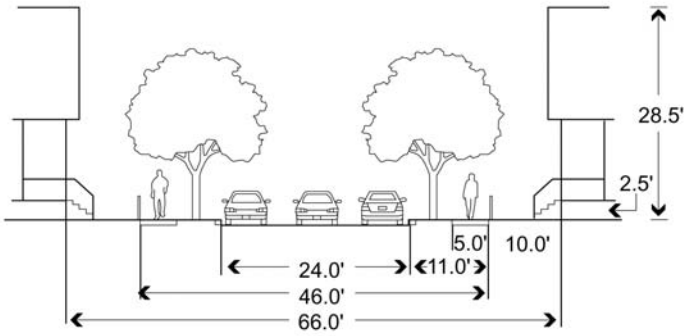
Woonerf

Figure 6(v):
Woonerfs, otherwise know as, Home Zones, are planned communities where the pedestrian is given precedence over the automobile. The streets meander as does the paving material so that the motorist must travel slowly and cautiously. Building proportions are generally at a 1:1.5 max. Residential and mixed use buildings front the often tree lined streets. These neighborhood designs create interesting and innovative opportunities for interactions of public and private space [8].



Low ADT Yield Street

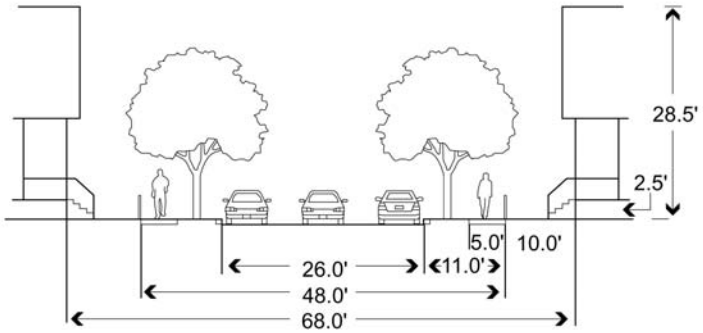
Figure 6(w):
In a more rural area, the Low ADT Yield Street is appropriate given the often immense building ratio of between 4:1 and 5:1. These areas are often defined by low density residential use with open drainage swales and ornamental tree plantings [8].



Edge Yield Street

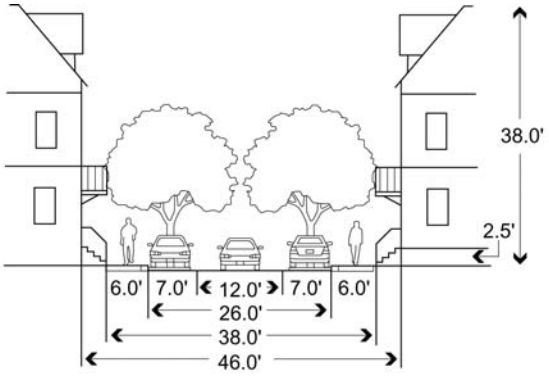
Figure 6(x):
The Edge Yield Street is recommended for the center or edge of neighborhood. The blocks should be short and consist mostly of single family detached housing. The building separation ratio is at a 3:1 or 4:1 max.

Figure 6(y):
The AASHTO Recommended Street is a highly desirable form of a residential neighborhood where the Woonerf is not appropriate. Parking needs must be addressed however alleys may serve as opportunities for vehicle and building access. These neighborhoods feature closed drainage, street trees (preferably native species), and offset sidewalks[8].



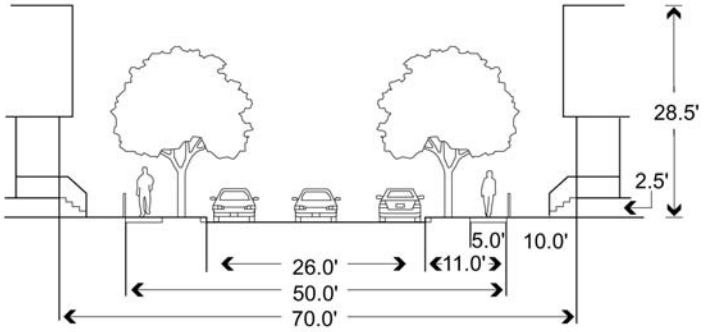
AASHTO Recommended Residential Street

Figure 6(z):
This variation of the AASHTO Recommended Residential Street, recognizes higher density, larger residential buildings and a reduced building ratio. This can be used in areas with slower traffic and lower parking densities.

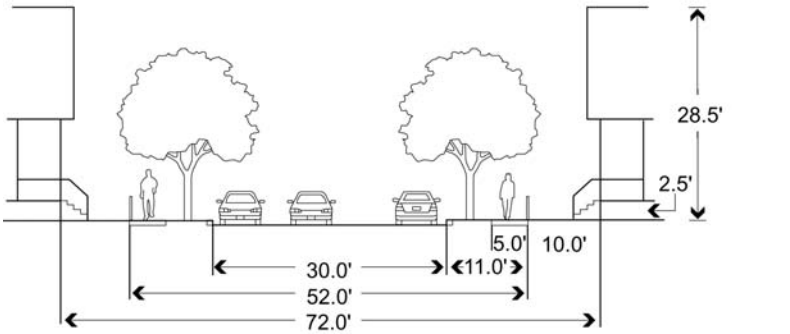


Modified AASHTO Residential Street

Figure 6(aa):
The Yield Street maintains a building ratio of 3:1 while allowing for an opportunity, in lower density environments, to detach the sidewalks. These streets consist of a mix of detached or attached residential and sometimes commercial or live/work buildings. The character, for the most part, remains residential.



Yield Street



Non Yield Street

Figure 6(bb):
This illustration is not entirely indicative of a Yield Street but begins to offer some of what is intended in their use. The travel lanes of a Yield Street are narrower than shown. These are predominantly residential streets of multistory buildings, a mix of land use and truck traffic. It calls for a building ratio of 3:1 and allows for both parallel and diagonal parking.

6.5 Local Pedestrian Facility Improvements - Conceptual Renderings

The following pages contain some examples of conceptual retrofits that may be available to the City of Graham when considering pedestrian enhancements.

Figure 6(cc):
BEFORE, Main St, near I-40.

Figure 6(dd):
AFTER, Main St, near I-40, addition of sidewalk and planting buffers.

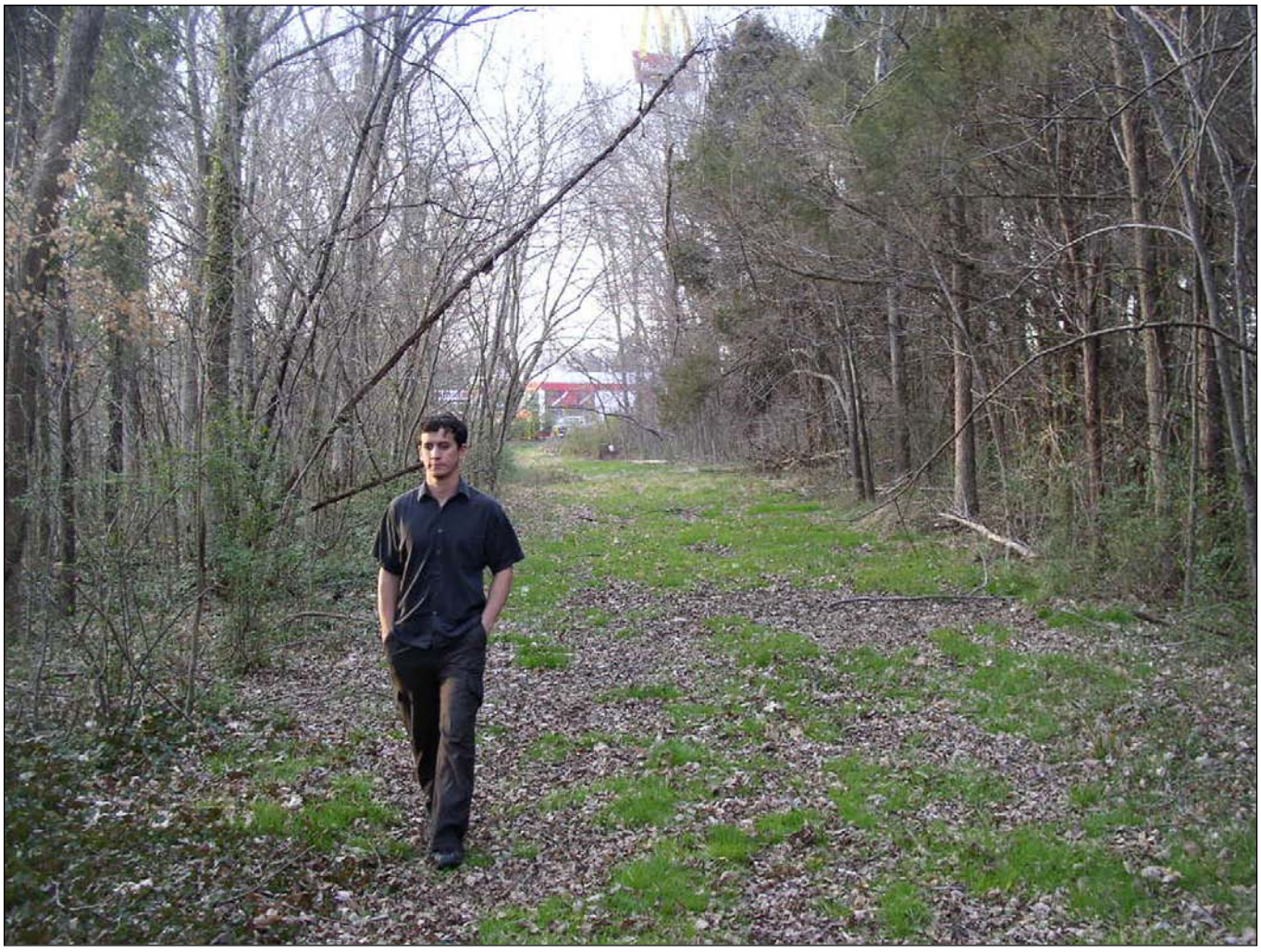


Figure 6(ee):
BEFORE, Recommended greenway corridor east of Main St., near I-40

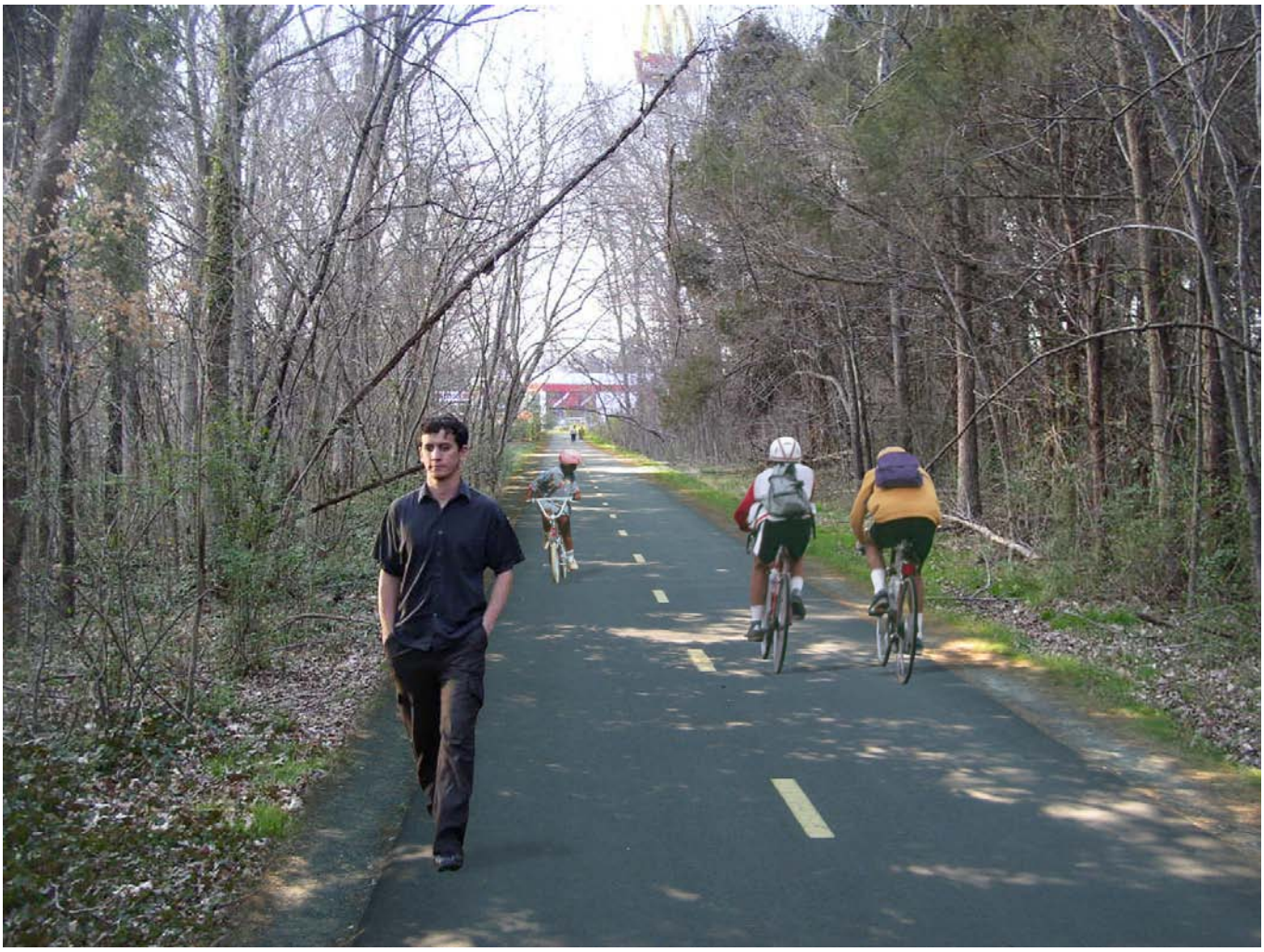


Figure 6(ff):
AFTER, Recommended 10-ft, multi-use greenway corridor east of Main St., near I-40, could provide an excellent recreational and transportation corridor.

Figure 6(gg):
BEFORE, Intersection at City Square.

Figure 6hh):
AFTER, Intersection improvement with textured crosswalk and raised, planted median at City Square.

Figure 6(ii):
BEFORE, North Graham Elementary, along Trollinger Road. Pedestrian access is severely limited due to a lack of necessary infrastructure.

Figure 6(jj):
AFTER, A sidewalk is added to allow for pedestrian travel. There is a paving material change at the entrance to slow traffic and notify motorists of the possibility of nearby pedestrians. Tree plantings frame the vehicular and pedestrian corridors. Finally, the current grassy swale is planted with native perennials to help filter and slow stormwater.

Figure 6(kk):
BEFORE, Main Street, north of Harden. This section of Main Street contains many interesting and architecturally significant buildings that support a thriving commercial core. However, the street is wide and fast with little room for pedestrians.

Figure 6(ll):
AFTER, A solution was sought that would maximize pedestrian comfort and safety without sacrificing much needed vehicular flow and parking spaces. This collage shows a textured mid-block crossing featuring a landscaped bulb-out. With the addition of a bench and the selection of trees and shrubs that will create a sense of enclosure, a functional and aesthetically pleasing pocket park is created. Sidewalks are widened on both sides. Trees line both sides of the street adding a much needed softening to Main Street.

(Footnotes)

1 Walkinginfo.org. [Internet]. Chapel Hill, NC: Pedestrian and Bicycle Information Center . (cited 2005 May 2). Available from http://www.walkinginfo.org/

2 Georgia Department of Transportation. (2003). *Pedestrian Streetscape and Guide*

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

4 The Free Dictionary. [Internet]. Huntingdon Valley, PA: Farlex, Inc. (cited 2005 May 1). Available from http://encycl opedia.thefreedictionary.com/light%20pollution

5 City of Portland, Office of Transportation. [Internet]. Portland OR : The City of Portland. (cited 2005 May 3). Available from http://www.portlandonline.com/ transportation/?c=eafaa

6 Sefton Council. [Internet]. Sefton, UK: Sefton Council. (cited 2006 May 4) . Available from http:// www.sefton.gov.uk/ images/new%20sign%20proposals.jpg

7 Seattle.gov. [Internet]. Seattle, WA: Seattle Public Utilities. (cited 2006 May 4). Available from http:// www.ci.seattle.wa.us/util/About_SPU/Drainage_&_ Sewer_System/Natural_Drainage_Systems/Street_ Edge_ Alternatives/COS_004467.asp

8 American Planning Association . (2006). *Planning and urban design standards*. Hooken, NJ: John Wiley & Sons, Inc. 719 p.

9 USDOT Federal Highway Administration. (2002). Pedestrian Facilities Users Guide - Providing Safety and Mobility

10 San Diego Regional Planning Agency (SANDAG). (2002) *Planning and Designing for Pedestrians.*

11 USDOT Federal Highway Administration (2000). *Roundabouts: An Informational Guide.*

12 NCDOT Roadway Design Manual & NCDOT Bridge Policy

APPENDIX A: SUMMARY OF PUBLIC INPUT

A.1 Overview

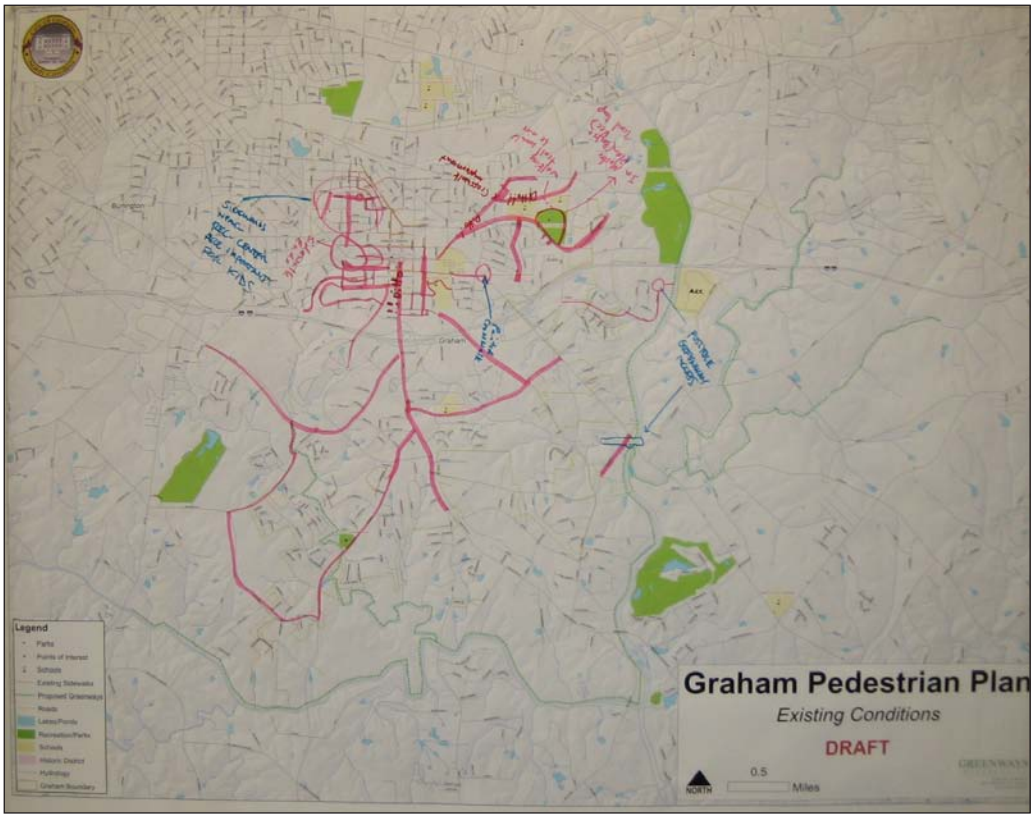
Public input was gathered by different methods throughout the planning process. Public workshops, public comment forms, and steering committee meetings formed the core of the public input strategy. Two public workshops were held, with the first held in October 2005 and the second in April 2006. The initial public workshop informed the public about the pedestrian planning process and was held to gather initial input and recommendations. The second public workshop presented the preliminary pedestrian network to the public in order to receive feedback. Public input was taken in the form of map markups, written comments, and discussion between citizens, City of Graham staff, and Greenways, Incorporated consultants.

Citizens markup maps with City staff during the October 2005 public workshop.

A.2 Map Markup Summary

Citizens drew their recommendations on provided maps for sidewalk improvements, new sidewalk and greenways, and improved intersections. Recommendations heard regularly included providing sidewalks around schools and Downtown, and improving crosswalks around schools and the Downtown area where heavy traffic can be found in Graham. Specific sidewalk recommendations also included improvements along Main St., Elm St.,

Town Branch Rd., Ivey Rd., and Rogers Rd. Improvements to existing sidewalk were recommended along N. Main St. and Maple St. Intersection/crosswalk improvements were recommended along every major corner around the City square. These comments and all other suggestions were taken into account when developing the comprehensive recommended pedestrian network.



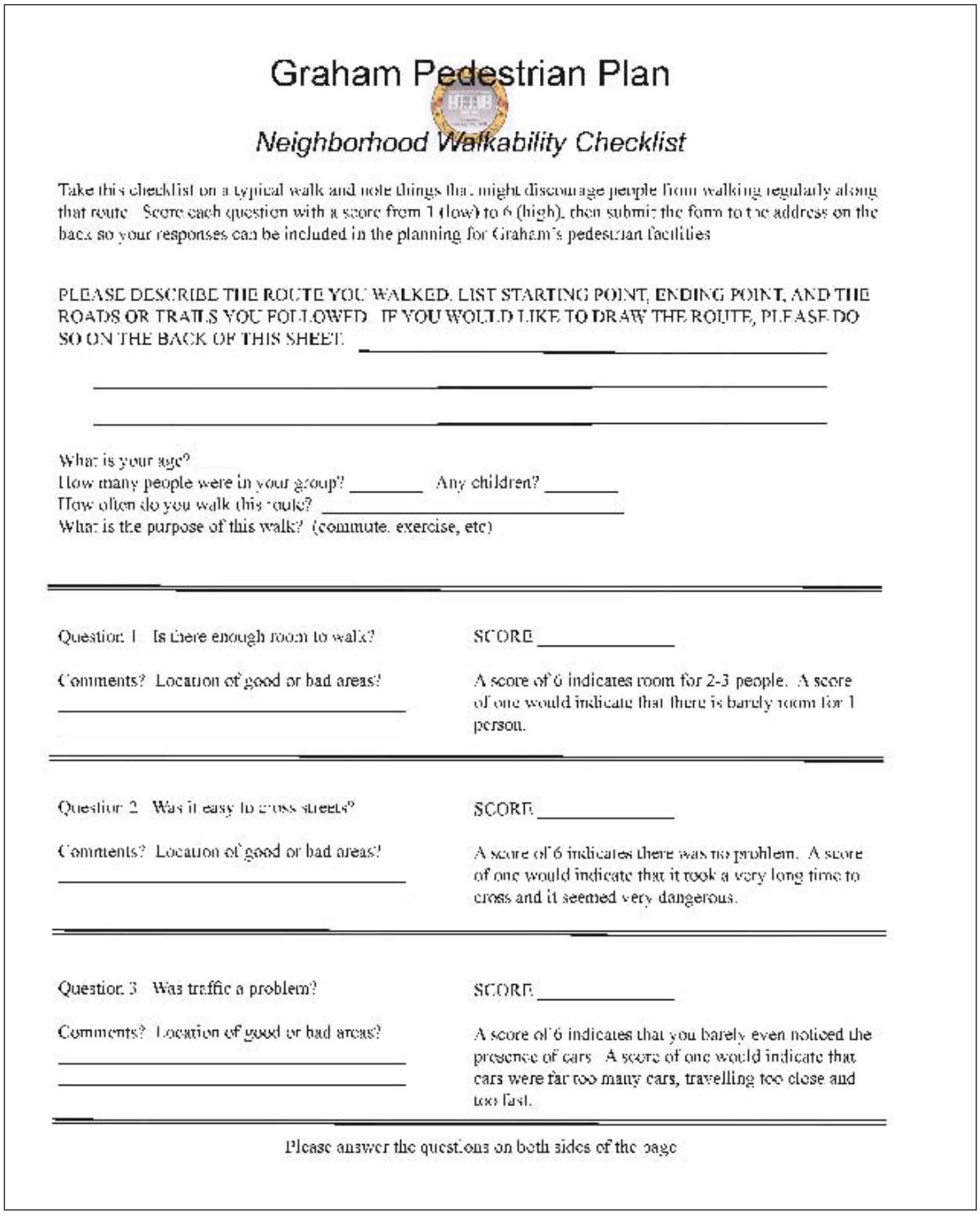
Marked-up map from October 2005 public workshop.

A.3 Public Comment Form Summary

Two types of public comment forms were distributed throughout the planning process. One comment form asked specific questions about walking frequency, factors determining the decision to walk, ranking of important pedestrian issues, and funding options. This was available at the public workshops. The other was a walkability checklist which asked participants to describe specific conditions along a walking route of choice. The walkability checklist was available to public workshop participants and was also sent to citizens of Graham in their water bill/newsletter mailing. A total of 40 comment forms were filled out and provided both general and specific recommendations for the City of Graham.

Generally, citizens who filled out comment forms recommended sidewalks in various locations along with crossing improvements. The most common concern was a lack of a connected sidewalk network. Other comments included a need for more sidewalks

around schools, improved crosswalks (especially along Main St.), reduced speed limits for automobile traffic, and made notice of heavy automobile traffic and narrow sidewalks. Walkability checklists commonly showed that persons walking their normal routes had some positive and negative feelings about their overall walking experience. A connected network, without gaps and with safer crossings, would make their entire walk more safe and comfortable.



Graham Pedestrian Plan

Neighborhood Walkability Checklist

Take this checklist on a typical walk and note things that might discourage people from walking regularly along that route. Score each question with a score from 1 (low) to 6 (high), then submit the form to the address on the back so your responses can be included in the planning for Graham's pedestrian facilities.

PLEASE DESCRIBE THE ROUTE YOU WALKED. LIST STARTING POINT, ENDING POINT, AND THE ROADS OR TRAILS YOU FOLLOWED. IF YOU WOULD LIKE TO DRAW THE ROUTE, PLEASE DO SO ON THE BACK OF THIS SHEET. _____

_____

_____

What is your age?
How many people were in your group? _____ Any children? _____
How often do you walk this route? _____
What is the purpose of this walk? (commute, exercise, etc)

Question 1 Is there enough room to walk? SCORE _____

Comments? Location of good or bad areas? _____

A score of 6 indicates room for 2-3 people. A score of one would indicate that there is barely room for 1 person.

Question 2 Was it easy to cross streets? SCORE _____

Comments? Location of good or bad areas? _____

A score of 6 indicates there was no problem. A score of one would indicate that it took a very long time to cross and it seemed very dangerous.

Question 3 Was traffic a problem? SCORE _____

Comments? Location of good or bad areas? _____ _____

A score of 6 indicates that you barely even noticed the presence of cars. A score of one would indicate that cars were far too many cars, travelling too close and too fast.

Please answer the questions on both sides of the page

Front page of the Walkability Checklist.

Question 4: Did you feel safe?

SCORE

Comments? Location of good or bad areas?

A score of 6 indicates that you would walk here alone at any time. A score of one would indicate that this route is scary, even with other people in daylight.

Question 5: Was it a pleasant place to walk?

SCORE

Comments? Location of good or bad areas?

A score of 6 indicates that it was great and you'd be like to go back again. A score of one would indicate that there really is no reason to be here.

Please return this survey to: Michael Leinwand, City of Graham, Planning Department, P.O. Drawer 357, 201 South Main Street, Graham, NC 27253
If you have questions, please call Michael at: (336)570-6705

If you would like to be contacted about future Graham Pedestrian Plan events, please provide your contact information below. Thanks!

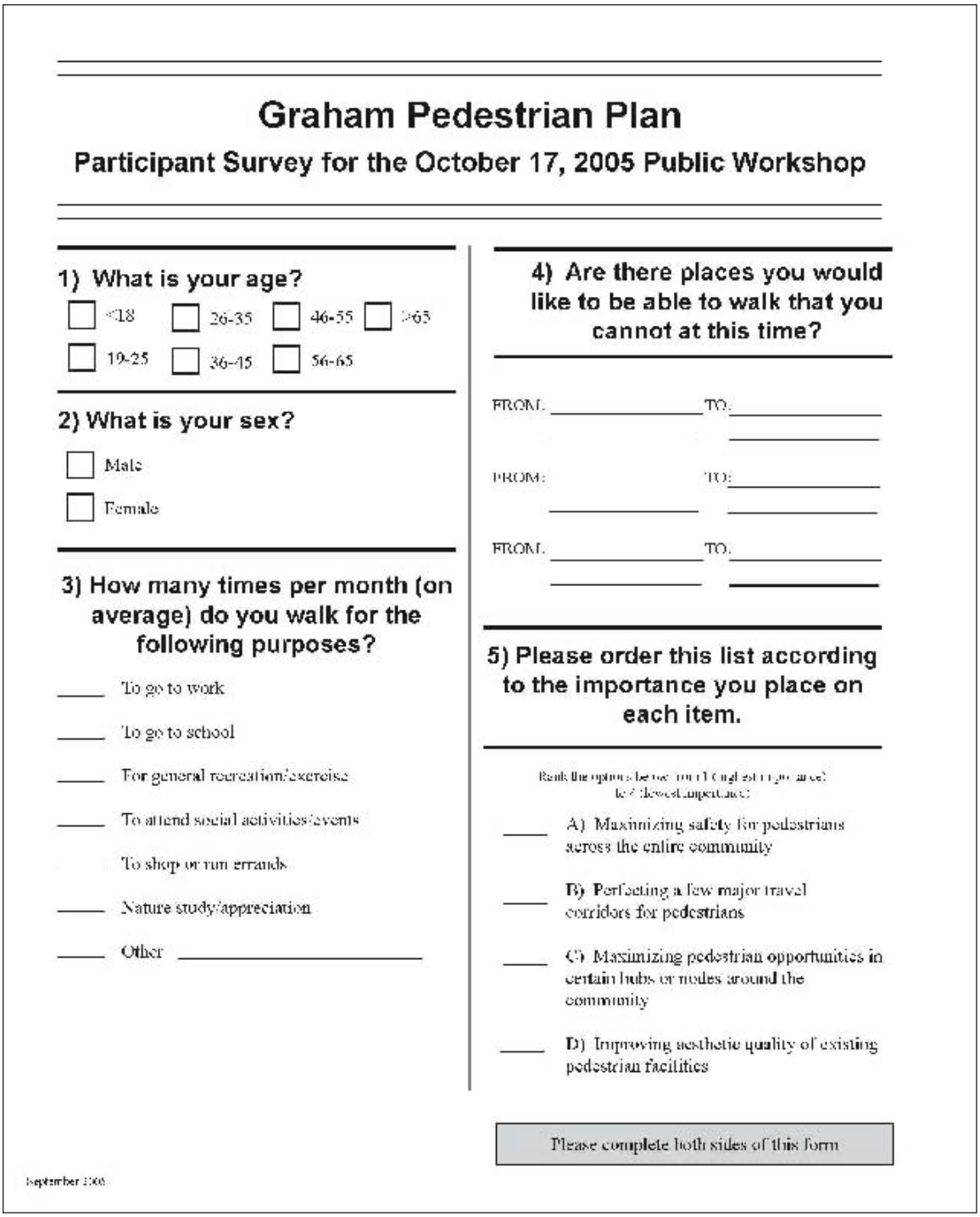
Name

Address

If you'd like to sketch your route, please do so in the box provided here.

This survey sheet was designed specifically for Graham but is based on Mark Fenton's adaptation of the checklist for a walkable america, which is available at www.walkinginfo.org

Back page of the Walkability Checklist.



Graham Pedestrian Plan

Participant Survey for the October 17, 2005 Public Workshop

1) What is your age?

☐ <18 ☐ 26-35 ☐ 46-55 ☐ >65
☐ 19-25 ☐ 36-45 ☐ 56-65

2) What is your sex?

☐ Male
☐ Female

3) How many times per month (on average) do you walk for the following purposes?

_____ To go to work
_____ To go to school
_____ For general recreation/exercise
_____ To attend social activities/events
_____ To shop or run errands
_____ Nature study/appreciation
_____ Other _____

4) Are there places you would like to be able to walk that you cannot at this time?

FROM: _____ TO: _____
_____ _____
FROM: _____ TO: _____
_____ _____
FROM: _____ TO: _____
_____ _____

5) Please order this list according to the importance you place on each item.

Rank the options between 1 (highest importance) to 4 (lowest importance)

_____ A) Maximizing safety for pedestrians across the entire community
_____ B) Perfecting a few major travel corridors for pedestrians
_____ C) Maximizing pedestrian opportunities in certain hubs or nodes around the community
_____ D) Improving aesthetic quality of existing pedestrian facilities

Please complete both sides of this form

September 2006

Front page of public comment form.

7) Which of the following factors play a role in whether or not you walk to a destination?

Check as many as apply

- ☐ Availability of a safe route
- ☐ Availability of an aesthetically pleasing route
- ☐ Costs of other travel modes
- ☐ Availability of other travel options
- ☐ Need for exercise
- ☐ Weather
- ☐ Travel time/length of trip
- ☐ Other _____

8) Should public funds be used to improve pedestrian options and facilities?

- ☐ Yes
- ☐ No

9) If yes, what types of funds should be used? (select one or multiple)

- ☐ Existing local taxes
- ☐ New local taxes
- ☐ State and federal grants
- ☐ Other _____

10) Do you have suggestions about specific programming or pedestrian related policies that you would like to see enacted?

_____

_____

_____

_____

11) Please provide your address below so we can better understand who was represented at tonight's meeting.

Address: _____

_____

_____

Thanks for your input!

Please complete both sides of this form

September 2006

Back page of public comment form.

APPENDIX B: PRIORITIZATION MATRIX

B.1 Overview

The prioritization of the pedestrian network and methodology behind it is described in detail in Chapter 3. Recommended sidewalks were prioritized and divided into phases based on a ranking and scoring system derived by Greenways Incorporated with feedback from the Steering Committee. Short-term projects should be completed within 0-3 years; medium-term within 4-7 years; long-term within 8-15 years. It should be emphasized that all projects (sidewalks, sidewalk improvements, intersection improvements, and greenway corridors) should be implemented and constructed whenever there is opportunity. The ranking of pedestrian corridors simply shows the ideal order based on a measure of many factors.

B.2 Sidewalk Prioritization Matrix

The prioritization matrix is an essential tool that provides the City of Graham with a detailed breakdown of priority scores by roadway segment in the sidewalk portion of the Pedestrian Network. Road segments were broken into logical geographic segments when a specific road segment extended across a significant distance, such as Main St. Seventeen categories, with weighted values ranging from 1-5 points, allowed for the highest possible score of 29. Along with the overall evaluation and monitoring of the Plan's implementation described in Chapter 5, this prioritization matrix should be evaluated every 3-5 years to ensure its proper and most effective usage and results.

B.3 Greenway Prioritization

Greenways were prioritized largely based on opportunity, future need, and goals of the Recreation and Parks Department. The list is in order of priority presented in Chapter 3 and below:

- The Haw River Greenway (MST Trail)
- Bill Cooke Park Perimeter Trail
- N. Graham Elementary and Graham High School connection to Bill Cooke Park (Mountain Bike Trail)
- The Little Alamance Creek Greenway
- Corridor from Main St. to Ray St. (Board of Education site and future Village Center) (Follows easement of County Home Branch, sewer, and I-40)
- The Big Alamance Creek Greenway

B.4 Intersection Facility Prioritization

Recommended intersection improvements were recommended at significant roadway intersections, especially those with close proximity to Downtown, schools, significant residential/ commercial development, and along recommended sidewalk corridors. All intersections are of critical priority for immediate improvements, especially the relatively inexpensive task of painting or restriping of crosswalks. For advanced, more expensive treatments recommended in Chapter 3, the Immediate Downtown and School Route intersections are of the highest priority for improvements within the next 0-3 years.

APPENDIX C: FUNDING

C.1 Overview

Implementing the recommendations of this plan will require a combination of funding sources that include local, state, federal, and private money. This Appendix provides a listing of the most commonly used funds for pedestrian and greenway facility projects in North Carolina. Fortunately, the benefits of protected greenways are many and varied. This allows programs in Graham to access money earmarked for a variety of purposes including water quality, hazard mitigation, recreation, air quality, alternate transportation, wildlife protection, community health, and economic development. Competition is almost always stiff for state and federal funds. It becomes imperative that local governments work together to create multi-jurisdictional partnerships and to develop their own local sources of funding. These sources can then be used to leverage outside assistance. The long term success of this plan will almost certainly depend on the dedication of a local revenue stream for pedestrian and greenway projects.

It is important that Graham fully evaluate its available options and develop a funding strategy that can meet community needs, maximize local resources, and leverage outside funding. Financing will be needed to administer the continued planning and implementation process, acquire parcels or easements, and manage and maintain facilities. Further research into these programs is recommended to determine requirements for specific grants.

Greenways Incorporated advises the City of Graham to pursue a variety of funding options. Below is a list of some of the pedestrian and greenway funding opportunities that have typically been pursued by other communities. Creative planning and consistent monitoring of funding options will likely turn up new opportunities not listed here.

C.2 Federal Government Funding Sources

Safe, Accountable, Flexible and Efficient Transportation Equity Act of 2003 (SAFETEA-LU)

While generally a transportation-based program, the Safe, Accountable, Flexible and Efficient Transportation Equity Act of 2003 (SAFETEA) funds programs to protect the environment. Through increased funding to the Surface Transportation Program (STP) and the National Highway System (NHS), SAFETEA allows for more environmental projects. States may spend up to 20 percent of their STP dollars (used for transportation facility reconstruction, rehabilitation, resurfacing, or restoration projects) for environmental restoration and pollution abatement projects. Additionally, each state sets aside 10 percent of STP funds for transportation enhancement projects, which can include acquisition of conservation and scenic easements, wetland mitigation, and pollution abatement, as well as scenic beautification, pedestrian and bicycle trails, archaeological planning, and historic

preservation. For more information on all SAFETEA-LU programs, visit http://www.fhwa.dot.gov/safetealu/. Some of the most pertinent programs under this act are:

Surface Transportation Program (STP)
This is the largest single program within the legislation from a funding point of view, with $32.5 billion committed over the next five years. Of particular interest to greenway enthusiasts, 10 percent of the funding within this program is set aside for ***Transportation Enhancements*** (TE) activities. Historically, a little more than half of the TE funds have been used nationally to support bicycle/pedestrian/trail projects. So nationally, it is projected that $1.625 billion will be spent on these projects under SAFETEA-LU.
These funds may be used for construction or non-construction projects that benefit bicycles and pedestrians. "Non-construction" projects are items such as maps, brochures, and public service announcements. These funds may be programmed to bring sidewalks and intersections into compliance with ADA regulations.

Congestion Mitigation and Air Quality (CMAQ)
Under SAFETEA-LU, approximately $8.6 billion has been set aside. Historically, about five percent of these funds have been used to support bicycle/pedestrian/trail projects. This would equal about $430 million under SAFETEA-LU. CMAQ Improvement Program funds are similar to STP funds in that they may be used for construction or non-construction projects that benefit bicyclists and pedestrians. These funds have been used for bicycle related projects in many states. An additional potential source of funds relating to outreach and public education is the EPA's Mobile Source Outreach Assistance Competition. This funding source focuses on outreach and public education relating to cleaner air and alternative transportation. These grants have a $100,000 maximum with a 40% required local match.

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

Highway Safety Improvement Program (HSIP)
SAFETEA-LU funds this program at $5 billion over four years. Historically, bicycle and pedestrian projects have accounted for one percent of this program, or about $50 million under SAFETEA-LU. Some of the eligible uses of these funds would include traffic calming, bicycle and pedestrian safety improvements, and installation of crossing signs. This is not a huge source of funding, but one that could be used to fund elements of a project.

Safe Routes to School Program (SR2S)
A new program under SAFETEA-LU is the Safe Routes to School (SR2S) program, with $612

million in funding during the term of the legislation. This is an excellent new program, that within North Carolina will be paired with a variety of health and wellness programs, to increase funding for access to the outdoors for children. Each state will receive no less than $1 million in funding, with 10% to 30% of the funds allocated to non-infrastructure activities. The SR2S Program was established in August 2005 as part of the most recent federal transportation re-authorization legislation--SAFETEA-LU. This law provides multi-year funding for the surface transportation programs that guide spending of federal gas tax revenue. Section 1404 of this legislation provides funding (for the first time) for State Departments of Transportation to create and administer SR2S programs which allow communities to compete for funding for local SR2S projects.
The administration of section 1404 has been assigned to FHWA's Office of Safety, which is working in collaboration with FHWA's Offices of Planning and Environment (Bicycle and Pedestrian Program) and the National Highway Traffic Safety Administration (NHTSA) to establish and guide the program.

High Priority Projects
Under SAFETEA-LU more than 5,091 transportation projects were earmarked by Congress for development, with a total value in excess of $3 billion. An example is the Charlotte metropolitan area with one project receiving funding under the HPP label, the Little Sugar Creek Greenway, which is funded at $3.15 million.

The National Scenic Byways Program
This program provides funds for bikeways and walkways along scenic routes. It recognizes certain roads as National Scenic Byways or All-American Roads based on their archeological, cultural, historic, natural, recreational, and scenic qualities. There are 72 such designated byways in 32 states. Bicycle and pedestrian facilities can be funded as a component of a corridor's management plan. Historically only 2 percent of these funds have been used to support bicycle and pedestrian improvements.

Land and Water Conservation Fund (LWCF)
The Land and Water Conservation Fund is the largest source of federal money for park, wildlife, and open space land acquisition. This federal funding source was established in 1965 to provide "close-to-home" park and recreation opportunities to residents throughout the United States. The program's funding comes primarily from offshore oil and gas drilling receipts, with an authorized expenditure of $900 million each year. However, Congress generally appropriates only a fraction of this amount. LWCF grants can be used by communities to build a variety of park and recreation facilities, including trails and greenways. Fifty percent of the local project costs must be met through in-kind services or cash provided by the recipient. The allotted money varies yearly and unfortunately, the fund has been "zeroed" out for 2006. For more state-based information, see the LWCF description in Section C.3.

Wetlands Reserve Program
This federal funding source is a voluntary program offering technical and financial assistance

to landowners who want to restore and protect wetland areas for water quality and wildlife habitat. The US Department of Agriculture's Natural Resource Conservation Service (USDA-NRCS) administers the program and provides direct payments to private landowners who agree to place sensitive wetlands under permanent easements. This program can be used to fund the protection of open space and greenways within riparian corridors.

National Highway System Funds
These funds can be used for pedestrian and bicycle projects adjacent to any highway on the National Highway System, including Interstate Highways.

Transportation Enhancement Activities (TEAs)
10 percent of STP funds are earmarked for Transportation Enhancement Activities (TEAs). The list of activities that are eligible under the TEA program, include the following:

- Pedestrian and bicycle facilities
- Pedestrian and bicycle safety and education activities
- Acquisition of scenic easements and historic easements and sites
- Scenic or historic highway programs including tourist and welcome centers
- Landscaping and scenic beautification
- Historic preservation
- Rehabilitation and operation of historic transportation buildings, structures or facilities
- Preservation of abandoned railway corridors
- Control and removal of outdoor advertising
- Archaeological planning and research
- Mitigation of highway runoff and provision of wildlife under crossings
- Establishment of transportation museums

Hazard Elimination and Railway-Highway Crossing Programs
These funds account for 10 percent of a state's STP funds. These funds should be used to inventory and/or address safety concerns of motorists, pedestrians, and bicyclists.

Federal Lands Highway Program Funds
These fund bicycle and pedestrian facilities as a provision of roads, highways, and parkways. This program is under the discretion of the appropriate Federal Land Agency or Tribal government.

Job Access and Reverse Commute Grants
These can fund pedestrian and bicycle-related services intended to transport welfare recipients and eligible low-income individuals to and from employment.

State and Community Highway Safety Grants
These are part of the Section 402 formula grants for which each state is eligible. States must submit a Performance Plan that establishes goals and performance measures for improving

highway safety, including improved bicycle and pedestrian safety.

Environmental Protection Agency
Funding for pedestrian facilities have been available through the EPA's Office of Transportation and Air Quality (OTAQ). One such grant source under OTAQ is "Clean Air Transportation Communities: Innovative Projects to Improve Air Quality and Reduce Greenhouse Gases." These funds assist in the funding of innovative pilot projects to reduce transportation related emissions of criteria pollutants and greenhouse gases by decreasing vehicle miles traveled and increasing use of cleaner technologies. Eligible recipients are state, local, multi-state, and tribal agencies involved with transportation/air quality and/or climate change issues. The use of federal air quality monies was utilized in Billings, Montana for implementation of bike trails using the idea of increased number of bicycles as non-polluting vehicles as justification for obtaining air quality grants.

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

Rivers Trails and Conservation Assistance Program (RTCA)
This is a National Park Service program. Although the program does not provide funding for projects, it does provide valuable on-the-ground technical assistance, from strategic consultation and partnership development to serving as liaison with other government agencies. Communities must apply for assistance.

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

C.3 State Funding Sources

Current public sidewalk construction is financed in a range of ways. City projects have been funded using a mix of transportation bond funds (primarily for sidewalks that have been provided as a part of larger roadway projects) and the use of Powell Bill reserves. The sidewalk portion of state roadway projects is typically funded in part by the State and in part by the local government. Federal highway funds have been used for independent

sidewalk projects as well, but this has not been a major portion of the funding mix to date.

The Powell Bill Program is a state grant to municipalities for use in street system maintenance and construction activities. In the past, the City allocated a considerable portion of these revenues for construction purposes. Over the years reserves built up, and the sidewalk program has drawn off these reserves. However, budgetary constraints since 2001 have led to a shift of new Powell Bill funds to cover maintenance and operations activities. Therefore, future Powell Bill allocations are not expected to yield substantial resources for construction purposes.

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

The most direct source of public-sector funding for local governments will come from state agencies in North Carolina. Generally, these funds are made available to local governments based on grant-in-aid formulas. A large amount of the following programs are funded from different pgorams under SAFETEA-LU mentioned in C.2. The single most important key to obtaining state grant funding is for local governments to have adopted plans for greenway, bicycle, pedestrian or trail systems in place prior to making an application for funding. A good starting website with links to many of the following programs is http://www.enr.state.nc.us/html/tax_credits.html.

In North Carolina, the Department of Transportation, **Division of Bicycle and Pedestrian Transportation (DBPT)** has been the single largest source of funding for bicycle, pedestrian and greenway projects, including non-construction projects such as brochures, maps, and public safety information for more than a decade. DBPT offers several programs in support of bicycle and pedestrian facility development. The following information is from NCDOT's interactive web site (www.ncdot.org). Contact the NCDOT, Division of Bicycle and Pedestrian Transportation at (919) 807-2804 for more information.

Transportation Improvement Program (TIP)
Transportation projects in North Carolina progress through a standard process of planning, design and construction. Improvements for bicycling and walking may be included in the TIP as part of the construction of a highway project or, where no highway project is programmed, as an independent project. Bicycle and pedestrian projects follow essentially the same TIP process as do highway projects. The Division of Bicycle and Pedestrian Transportation (DBPT) works with localities to create a statewide four-year schedule for funding projects using the locality's priority listing of needs along with the adopted project selection criteria. The DBPT compiles candidate bicycle and pedestrian projects to be considered for inclusion in the TIP from the following sources:

• The prioritized Metropolitan Transportation Improvement Program (MTIP) lists produced by the 17 Metropolitan Planning Organizations (MPOs), which have been derived from separate lists produced by communities comprising the MPO.

• Project requests that are made at the biennial TIP meetings or through written requests within 30 days of the meetings from the state's small urban areas, counties, public and private entities, and citizens.

• Internal DBPT assessment of statewide bicycle and pedestrian project needs. All project requests are documented and distinguished as independent or incidental (part of a highway project). Independent project requests are evaluated by DBPT using project selection criteria. A prioritized list of these projects is presented to the North Carolina Bicycle Committee. The Committee reviews the list, makes revisions and recommendations, and adopts a four-year schedule of projects. The adopted schedule is sent to the North Carolina Board of Transportation for approval and inclusion in the state's TIP.

Inclusion of a bicycle or pedestrian project in the TIP does not guarantee that it will be implemented; rather, it means that it will receive further study and will be implemented if feasible. Incidental projects are considered in conjunction with the planning study for the given highway or bridge project and implemented, if feasible.

For independent construction projects, DBPT conducts a detailed feasibility study, including cost estimates. If the project is determined to be feasible, DBPT prepares a more detailed planning study, which is reviewed and approved by the Bicycle and Pedestrian Task Force before being submitted to the Board of Transportation for funding authorization. Once the funding is authorized, project design and development begins.

For more information, visit http://www.ncdot.org/transit/bicycle/funding/funding_TIP.html

Bicycle and Pedestrian Planning Grant Initiative
This program was initiated by NCDOT in 2004, to provide communities with planning grants in support of the completion of community-wide bicycle and pedestrian plans. NCDOT will continue this program through 2006 and beyond. For more information, visit http://www.itre.ncsu.edu/ptg/bikeped/ncdot/index.html

North Carolina Safe Routes to School Program
Recently, the state of North Carolina started the NC Safe Routes to School Program based off of the national program. The state has $15 million over the next 5 years for infrastructure improvements within 2 miles of schools. This funding can also be used towards the development of school related programs to improve safety and walkability initiatives. The state requires the completion of a competitive application to apply for funding, similar to the bicycle/pedestrian planning grants, and a workshop at the school to determine what improvements are needed. After a school has the workshop, it will have a good shot of

getting that funding. For more information, contact Theresa Canales at NCDOT, (919) 733-2520.

Federal Aid Construction Funds
These funds are included in the National Highway System (NHS), Surface Transportation Program (STP), and Congestion Mitigation and Air Quality (CMAQ). The funds provide for the construction of pedestrian and bicycle transportation facilities. The primary source of funding for bicycle and pedestrian projects is STP Enhancement Funding.

State Construction Funds
These funds (not including the Highway Trust Fund for Urban Loops and Interchanges) may be used for the construction of sidewalks and bicycle accommodations that are a part of roadway improvement projects.

The North Carolina Conservation Tax Credit
This program provides an incentive (in the form of an income tax credit) for landowners that donate interests in real property for conservation purposes. Property donations can be fee simple or in the form of conservation easements or bargain sale. The goal of this program is to manage stormwater, protect water supply watersheds, retain working farms and forests, and set-aside greenways for ecological communities, public trails, and wildlife corridors. (For more information see: http://ncctc.enr.state.nc.us/).

The Land and Water Conservation Fund (LWCF)
This is the largest source of federal grant money for states and local governments in regards to park, wildlife, and open space land acquisition. The state-and-local grant portion of the program provides up to 50 percent of the cost of a project, with the balance of the funds paid by states or municipalities. LWCF funds are apportioned by formula to all 50 states, the District of Columbia and territories. In North Carolina, the federally granted money is allocated through the State Division of Parks and Recreation. Cities, counties, state agencies, and school districts are eligible for LWCF fund monies. These funds can be used for outdoor recreation projects, including greenway acquisition, renovation, and greenway development. Projects require a 50 percent match. The allotment can vary from year to year. Between 1995 and 1998, no funds were provided for the state-and-local grant portion of the program. In fiscal year 2000, Congress approved stateside grant funding at $40 million. In FY 2001, $89 million was approved. In the current fiscal year 2006, the allotted money has been "zeroed" out again.

For more information and how to apply for a grant in North Carolina, visit http://ils.unc.edu/parkproject/lwcf/home1.html.

North Carolina Recreational Trails Program
The Recreational Trails Program is a grant program funded by Congress with money from the federal gas taxes paid on fuel used by off-highway vehicles. This program's intent is to meet the trail and trail-related recreational needs identified by the Statewide Comprehensive

Outdoor Recreation Plan. Grant applicants must be able contribute 20% of the project cost with cash or in-kind contributions. Applications for funding may be obtained by contacting your regional trails specialist or the State Trails Program at (919) 715-8699.

North Carolina Parks and Recreation Trust Fund (PARTF)
Generally several million dollars a year are available to local governments across NC through this program. Applicable projects require a 50/50 match from the local government and no more than $250,000 can be requested. The money can be used for the acquisition, development and renovation of recreational areas. The NC Division of State Parks manages the program along with the Recreational Resources Service. Visit http://www.partf.net/ for information on how to apply.

Clean Water Management Trust Fund
This fund was established in 1996 and has become one of the largest sources of money in North Carolina for land and water protection. At the end of each fiscal year, 6.5 percent of the unreserved credit balance in North Carolina's General Fund, or a minimum of $30 million, is placed in the CWMTF. The revenue of this fund is allocated as grants to local governments, state agencies and conservation non-profits to help finance projects that specifically address water pollution problems. Local governments may apply for grants to acquire easement or fee-simple interest in properties that (1) enhance or restore degraded waters, (2) protect unpolluted waters, and/or (3) contribute toward a network of riparian buffers and greenways for environmental, educational, and recreational benefits. For a history of awarded grants in North Carolina and more information about this fund and applications, visit http://www.cwmtf.net/.

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

Natural Heritage Trust Fund
Money from this fund may only be allocated to State agencies, so the City of Graham must work with State level partners to access this fund. The NHTF is used to acquire and protect land that has significant habitat value. Some large wetland areas may also qualify, depending on their biological integrity and characteristics. Additional information is available from the NC Natural Heritage Program. For more information and grant application information, visit http://www.ncnhtf.org/.

North Carolina Wetlands Restoration Program (NCWRP)
This is a non-regulatory program established by the NC General Assembly in 1996. The goals of the NCWRP are to:

• Protect and improve water quality by restoring wetland, stream and riparian area functions and values lost through historic, current and future impacts.

• Achieve a net increase in wetland acreage, functions and values in all of North Carolina's major river basins.

• Promote a comprehensive approach for the protection of natural resources.

• Provide a consistent approach to address compensatory mitigation requirements associated with wetland, stream, and buffer regulations, and to increase the ecological effectiveness of compensatory mitigation projects.

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

Ecosystem Enhancement Program
Developed in 2003 as a new mechanism to facilitate improved mitigation projects for NC highways, this program will have money available for both restoration projects and protection projects that serve to enhance water quality and wildlife habitat in NC. Additional information is available by contacting the Natural Heritage Program in the NC Department of Environment and Natural Resources (NCDENR). For more information, resources, and links, visit http://www.nceep.net/pages/partners.html.

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

Conservation Reserve Enhancement Program (CREP)
A joint effort between the NC Division of Soil and Water Conservation, the North Carolina Clean Water Management Trust Fund, the North Carolina Wetlands Restoration Program, and the United States Department of Agriculture to address water quality programs of specific river basins and watershed areas. This is a voluntary program to protect riparian lands that are currently in agricultural production. The program is managed by the NC Division of Soil and Water Conservation. For more information, visit http://www.enr.state.nc.us/DSWC/pages/crep.html.

North Carolina Conservation Tax Credit Program
An incentive program that encourages landowners to donate land or easements on their land for conservation purposes. Participants receive a state tax credit for the value of their donation. For more information see: http://ncctc.enr.state.nc.us.

NC Adopt-A-Trail Grant Program
Operated by the Trails Section of the NC Division of State Parks, annual grants are available to local governments for trail and facility construction. Grants are generally capped at about $5,000 per project and do not require a match. Applications are due in the fall. For more information, visit http://ils.unc.edu/parkproject/trails/grant.html

Urban and Community Forestry Assistance Program
The program operates as a cooperative partnership between the NC Division of Forest Resources and the USDA Forest Service, Southern Region. It offers small grants that can be used to plant urban trees, establish a community arboretum, or other programs that promote tree canopy in urban areas. To qualify for this program, a community must pledge to develop a street-tree inventory, a municipal tree ordinance, a tree commission, and an urban forestry-management plan. All of these can be funded through the program. For more information and a grant application, contact the NC Division of Forest Resources and/or visit http://www.dfr.state.nc.us/urban/urban_grantprogram.htm.

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

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

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

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

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

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

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

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

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

Fit Community grants are designed to support innovative strategies that help a community meet its goal to becoming a Fit Community. Eight to nine, two-year grants of up to $30,000 annually will be awarded to applicants that have a demonstrated need, proven capacity, and opportunity for positive change in addressing physical activity and/or healthy eating.

Blue Cross Blue Shield Grant

The Blue Cross and Blue Shield of North Carolina Foundation has a grants program called "Fit Together." The purpose of the program is to provide support to rural North Carolina communities to improve community health by implementing innovative and integrated strategies to increase physical activity. Approximately $40,000 each is available for up to five grantees. Eligible applicants include nonprofit organizations in North Carolina with 501 c(3) status. Applicants must utilize the "5Ps approach" in their strategy to increase physical activity: preparation, promotions, programs, policies, and physical projects. Visit web site:

www.bcbsnc.com/foundation/fitogether_grants.html.

C.4 Local Funding Sources

A number of local funding options have been grouped here under the primary banners of taxes, fees, loans, bonds, and other resources.

Taxes

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

A number of taxes provide direct or indirect funding for the operations of local governments. Some of them are:

Sales Tax

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

Property Tax

Property taxes generally support a significant portion of a municipality's activities. However, the revenues from property taxes can also be used to pay debt service on general obligation bonds issued to finance greenway system acquisitions. Because of limits imposed on tax rates, use of property taxes to fund greenways could limit the municipality's ability to raise funds for other activities. Property taxes can provide a steady stream of financing while broadly distributing the tax burden. In other parts of the country, this mechanism has been popular with voters as long as the increase is restricted to parks and open space. Note, other public agencies compete vigorously for these funds, and taxpayers are generally concerned about high property tax rates.

Excise Taxes

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

Fees

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

Stormwater Utility Fees

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

The rates, fees, and charges collected for stormwater management services may not exceed the costs incurred to provide these services. The costs that may be recovered through the stormwater rates, fees, and charges includes any costs necessary to assure that all aspects of stormwater quality and quantity are managed in accordance with federal and state laws, regulations, and rules. Greenway sections may be purchased with stormwater fees, if the property in question is used to mitigate floodwater or filter pollutants.

Impact Fees

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

If Graham is interested in pursuing open space impact fees, it will require enabling legislation to authorize the collection of the fees.

Exactions

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

Installment Purchase Financing

As an alternative to debt financing of capital improvements, communities can execute installment/ lease purchase contracts for improvements. This type of financing is typically

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

Partnerships

Another, often overlooked, method of funding pedestrian systems and greenways is to partner with public agencies and private companies and organizations. Partnerships engender a spirit of cooperation, civic pride and community participation. The key to the involvement of private partners is to make a compelling argument for their participation.

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

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

In-Lieu-Of Fees

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

Bonds and Loans

Bonds have been a very popular way for communities across the country to finance their pedestrian and greenway projects. A number of bond options are listed below. Contracting with a private consultant to assist with this program may be advisable. Since bonds rely on the support of the voting population, an education and awareness program should be implemented

prior to any vote.

Billings, Montana used the issuance of a bond in the amount of $599,000 to provide the matching funds for several of their TEA- 21 enhancement dollars. Austin, Texas has also used bond issues to fund a portion of their bicycle and trail system.

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

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

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

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

C.5 Other Local Options

Local Capital Improvements Program
In communities that can afford it, a yearly appropriation for greenway and trail development in the capital improvements program is another option. In Raleigh, for example, the greenways system has been developed over many years through a dedicated source of annual funding that has ranged from $100,000 to $500,000, administered through the Recreation and Parks Department.

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

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

C.6 Private Foundations and Organizations

Many communities have solicited greenway funding assistance from private foundations and other conservation-minded benefactors. Below are a few examples of private funding opportunities available in North Carolina.

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

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

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

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

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

The Trust for Public Land
Land conservation is central to TPL's mission. Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land for human enjoyment and well being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities. TPL's legal and real estate specialists work with landowners, government agencies, and community groups to:

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

For more information, visit http://www.tpl.org/.

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

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

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

National Trails Fund
American Hiking Society created the National Trails Fund in 1998, the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. 73 million people enjoy foot trails annually, yet many of our favorite trails need major repairs due to a $200 million backlog of badly needed maintenance. National Trails Fund grants help give local organizations the resources they need to secure access, volunteers, tools and materials to protect America's cherished public trails. For 2005, American Hiking distributed over $40,000 in grants thanks to the generous support of Cascade Designs and L.L.Bean, the program's Charter Sponsors. To date, American Hiking has granted more than $240,000 to 56 different trail projects across the U.S. for land acquisition, constituency building campaigns, and traditional trail work projects. Awards range from $500 to $10,000 per project.

What types of projects will American Hiking Society consider? Securing trail lands, including acquisition of trails and trail corridors, and the costs associated with acquiring conservation easements. Building and maintaining trails which will result in visible and substantial ease of access, improved hiker safety, and/or avoidance of environmental damage. Constituency building surrounding specific trail projects - including volunteer recruitment and support. Web site: www.americanhiking.org/alliance/fund.html.

Sesquicentenntial Park in Downtown Graham

APPENDIX D: COST ESTIMATES

The material in section D1, along with the sidewalk cost estimates per square foot, were taken directly from "Recommended Guidelines/Priorities for Sidewalks and Walkways," from PEDSAFE online resource, a project sponsored by the USDOT Federal Highway Administration.

D.1 Sidewalk Cost Considerations[1]

The actual cost of providing sidewalks is different for each region of the country and varies with the season. Actual bid prices are also influenced by how busy contractors are at the time of construction.

The cost of constructing sidewalks alone is relatively low; typical bids run between $20 to $30 a square yard ($2.22 - $3.33 square foot).

Factors to consider when calculating the cost of sidewalks:

1. Presence of curb and gutter: The costs of providing curb and gutter, which presumes the need to also provide a street drainage system, run much higher than the cost of sidewalk alone.

2. Number of driveways: To comply with ADA, many existing driveways must be replaced with ones that provide a level passage at least 0.9 (3 ft) wide. It can also be advantageous to inventory all existing driveways to see if any can be closed, resulting in a cost-savings.

3. Number of intersections: While intersections represent a reduction in the sidewalk, curb ramps are required where sidewalks cross intersections and the cost of providing additional traffic control at each intersection should be considered.

4. Obstacles to be removed: The cost for moving or removing obstacles such as utility poles, signposts, and fire hydrants vary too much to be itemized here; however, they are required to be moved if they obstruct access. These costs must be calculated individually for each project.

5. Structures: While minor sidewalk projects rarely involve new structures such as a bridge, many projects with significant cuts and fills may require retaining walls and/or culvert extensions. The costs of retaining walls must be calculated individually for each project.

6. Right-of-way: While most sidewalk projects can be built within existing rights-

of-way (especially infill projects), some may require some right-of-way easement. An alternative to acquiring right-of-way is to narrow the roadway, which should consider the needs of bicyclists (e.g., through bike lanes or shoulders, at a minimum of 1.5 m (5 ft).

7. Miscellaneous factors: Planters, irrigation, benches, decorative lampposts, and other aesthetic improvements cost money, but they are usually well worth it if the impetus for the project is to create a more pleasant and inviting walking environment.

When project costs appear to be escalating due to one or more of the above-listed items, especially retaining walls or acquiring right-of-way, consideration may be given to narrowing the sidewalk in constrained areas as a last resort. The full sidewalk width should be resumed in non-constrained areas—this is preferable to providing a narrow sidewalk throughout, or dropping the project because of one difficult section.

Tips to Reduce Total Costs:

1. Stand-alone vs. integrated within another project: Sidewalks should always be included in road construction projects. Stand-alone sidewalk projects cost more than the same work performed as part of a larger project. Sidewalks can be piggybacked to projects such as surface preservation, water or sewer lines, or placing utilities underground. Besides the monetary savings, the political fallout is reduced, since the public doesn't perceive an agency as being inefficient (it is very noticeable if an agency works on a road, then comes back to do more work later). The reduced impacts on traffic are a bonus to integration.

2. Combining Projects: A cost-savings can be achieved by combining several small sidewalk projects into one big one. This can occur even if the sidewalks are under different jurisdictions, or even in different localities, if they are close to each other. The basic principle is that bid prices drop as quantities increase.

D2. Cost Estimates

The following table uses an estimate of $3/square foot to provide an estimate per each pedestrian corridor. $3/square foot was chosen to be conservative and is towards the high end of typical costs per square foot. Some pedestrian corridors have sections of existing sidewalk so these sections were subtracted from the overall construction length. Graham policy requires sidewalks on both sides of thoroughfares, collectors, and commercial streets and it is recommended in this Plan to also require sidewalks on both sides of any street near multi-family development, schools, and other trip attractors. Otherwise, residential streets only require one side. This was taken into consideration when developing these cost estimates.

Estimated costs were also calculated for the six major recommended greenways in the Graham area and can be found at the bottom of the Cost Estimates table. The number of

$350,000 per mile of trail assumes a 10-foot wide asphalt surface, with signage, trailheads, and minor bridges. This cost is significantly reduced for natural surface types which will be options for these facilities. These estimates are based on a number of local studies and local research.

As mentioned above, other factors can increase actual costs. These estimates are simply to serve as a rough guide for the City of Graham.

Footnotes

[1] "Recommended Guidelines/Priorities for Sidewalks and Walkways." http://www.walkinginfo.org/pedsafe/moreinfo_sidewalks.cfm#cost. US Department of Transportation, Federal Highway Administration.

Main Street in Downtown Graham

APPENDIX E: GLOSSARY

The material in this glossary is largely taken from the International Pedestrian Lexicon available online at: http://user.itl.net/~wordcraf/lexicon.html#a. Other definitions came from a variety of other sources.

AASHTO – American Association of State Highway and Transportation Officials: it is a nonprofit, nonpartisan association representing highway and transportation departments of all transportation modes in the 50 states, the District of Columbia and Puerto Rico.

ADA – American Disabilities Act of 1991. The Act gives civil rights protections to individuals with disabilities including equal opportunities in public accommodations, employment, transportation, State and local government services, and telecommunications.

Advance stop lines - applies to a stop line placed prior to a crosswalk, to either prevent encroachment, or to improve visibility it plays an important safety role especially in multi-lane roads

Alternative Transportation Network – a connected system for travel using transportation other than private cars, such as walking, bicycling, rollerblading, carpooling and transit

Arterial connections – interconnected corridors designed to accommodate a large volume of through traffic

Bargain sale - sale of a property at less than the fair market value. The difference between a bargain sale price and fair market value often qualifies as a tax-deductible charitable contribution.

BGMPO – Burlington Graham Metropolitan Planning Organization

Blank walls – relatively large walls of empty surface that provide opportunity for vandalism with graffiti. Set backs, special lighting, and aesthetic architectural interruptions are possible blank wall treatments.

Blighted building – a structure whose condition within the town, neighborhood or city is detrimental to the physical, social, and/or economic well-being of that community

Bridge culvert – a sewer or drain crossing used for the transference of surface water from a bridge

Buffer zone - an area of land specifically designed to separate one zoning use from another

Bulb-out - extended pavement to narrow roadway, or pinch through fare, or provide space for bus stop, bench, etc.

Concurrent signal timing - motorists running parallel to a crosswalk are allowed to turn into and through the crosswalk (left or right) after yielding to pedestrians

Condemnation - the taking of private property for public use, with adequate compensation to the owner, under the right of eminent domain

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

Conservation easement - a legally binding agreement not to develop part of a property, but to leave it "natural" permanently or for some designated very long period of time regardless of ownership transfer

Corridor - a spatial link between two or more significant locations

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

Curb cut - a ramp leading smoothly down from a sidewalk to an intersecting street, rather than abruptly ending with a curb

Curb extension - a section of sidewalk at an intersection or midblock crossing that reduces the crossing width for pedestrians and is intended to slow the speed of traffic and increase driver awareness

Curb ramp - interruption in the curb, as for a driveway

Driveway apron – the section of a driveway between the sidewalk and the curb

Eminent domain - interruption in the curb, as for a driveway

EPA – Environmental Protection Agency

Fee simple purchase – an outright purchase of the land by municipality

FHWA – Federal Highway Administration

First right of refusal - the right specified in an agreement to have the first opportunity to purchase or lease a given property before it is offered to others

Fitness Trail - a pathway upon which users jog or walk from station to station to perform various exercise tasks

Greenway - a linear open space; a corridor composed of natural vegetation. Greenways can be used to create connected networks of open space that include traditional parks and natural areas.

High volume artery – an important transportation corridor that is used by large traffic levels

Hydrologic resources – stream and sewer corridors and buffer zones that can be used to facilitate the building of greenways

Incentive zoning - a system by which zoning incentives are provided to developers on the condition that specific physical, social, or cultural benefits are provided to the community

Intersection - an area where two or more pathways or roadways join together

Islands of vegetation - a landscaping feature that is planted with flora chosen for its ability to remove pollution and toxins. These spaces manage stormwater runoff from impervious surfaces; the water is slowed down, preventing erosion and allowing water to be absorbed into the ground.

Leaseback - the process of selling a property and also entering into a lease to continue using that property

Linear stream corridor - generally consists of the stream channel, floodplain, and transitional upland fringe aligned linearly

LPI – Leading pedestrian interval. Pedestrians are given the signal to begin crossing before parallel traffic.

Median - a median is a barrier, constructed of concrete, asphalt, or landscaping, that separates two directions of traffic

Median refuge island - an area within an island or median that is intended for pedestrians to wait safely for an opportunity to continue crossing

MPO – Metropolitan Planning Organization

MST – Mountains-to-Sea Trail

Multi-use path - a designated right-of-way for simultaneous use by walkers, joggers, bike riders, in-line skaters and those using other non-motorized methods of travel

Municipal boundary – the limit of municipal jurisdiction

Nature trail - a marked trail designed to lead people through a natural environment which highlights and protects resources

NCDOT – North Carolina Department of Transportation

Negotiated dedications - a local government may ask a landowner to enter into negotiations for certain parcels of land that are deemed beneficial to the protection and preservation of specific parcel of land

Off-road trail – paths or trails in areas not served by the street system, such as parks and greenbelt corridors. Off-street paths are intended to serve both recreational uses and other trips, and may accommodate other non-motorized travel modes in addition to walking.

On-road pedestrian facility – any sidewalk, curb, or crosswalk designed for pedestrian use

Open space - empty or vacant land which is set aside for public or private use and will not be developed. The space may be used for passive or active recreation, or may be reserved to protect or buffer natural areas.

Overlay zone - a zone or district created by the local legislature for the purpose of conserving natural resources or promoting certain types of development. Overlay zones are imposed over existing zoning districts and contain provisions that are applicable in addition to those contained in the zoning law.

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

Pedestrian corridor – refers to any on-road sidewalks

Planned unit development (PUD) - a project or subdivision that includes common property that is owned and maintained by a homeowners' association for the benefit and use of the individual PUD unit owners

Pocket park - a small area accessible to the general public that is often of primarily environmental, rather than recreational, importance; they can be urban, suburban or rural and often feature as part of urban regeneration plans in inner-city areas to provide areas where wild life can establish a foothold.

Preservation easement – a voluntary legal agreement that protects historic, archaeological, or cultural resources on a property. The easement provides assurance to the property owner that intrinsic values will be preserved through subsequent ownership. In addition, the owner may obtain substantial tax benefits.

Public Access Easement – a voluntary legal agreement which grants a municipality a perpetual right-of-way and easement for public access and public benefit

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

Retrofit - the redesign and reconstruction of an existing facility or subsystem to incorporate new technology, to meet new requirements, or to otherwise provide performance not foreseen in the original design

Right turn cut-off - the channel created in larger intersection by a very long turning radius and the construction of a pedestrian island, to which the pedestrian must cross before being in the formal intersection that is controlled by lights. The right-turn cut-off allows continuous right turns at fairly high speeds without stopping but the drivers who are meant to but at times do not yield to pedestrians.

Roundabout - traffic calming device at which traffic streams circularly around a central island after first yielding to the circulating traffic

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

RTOR – Right turn on red

Shared-use path - A bicycle and pedestrian path separated from motorized vehicular traffic by an open space, barrier or curb. Shared-Use Paths may be within the highway right-of-way (often termed "sidepath") or within an independent right-of-way, such as on an abandoned railroad bed or along a stream valley park. Shared use paths typically accommodate two-way travel and are open to pedestrians, in-line skaters, wheelchair users, joggers and other non-motorized path users

Sidewalk - an improved facility intended to provide for pedestrian movement; usually, but not always, located in the public right-of-way adjacent to a roadway. Typically constructed of concrete, but can be made with asphalt, bricks, stone, wood, and other materials.

Thoroughfare - a public road from one place to another, designed for high traffic volumes and essential connections

TND (traditional neighborhood development) - an area of land developed in a planned fashion for a compatible mixture of residential units for various income levels and nonresidential commercial and workplace uses, with a high priority placed on access to open spaces

Traffic calming - a range of measures that reduce the impact of vehicular traffic on residents, pedestrians and cyclists - most commonly on residential streets, but also now on commercial streets

Trip attractor - a location which, because of what it contains, generates itself as a destination for people

Village center - an area in a community where people naturally congregate

Woonerf - a living street (also known as a home zone, and by the Dutch name woonerf) is a street in which, unlike in most streets, the needs of car drivers are secondary to the needs of users of the street as a whole. It is a space designed to be shared by pedestrians, playing children, bicyclists, and low-speed motor vehicles

Yield street - a narrower 26 to 28' wide street and has one auto yield to another as they pass. Parking is parallel on both sides. This type of roadway is suitable for attached residential and mixed-use, and the 26' wide is more suitable for single family homes generally.