



P E D E S T R I A N



P L A N



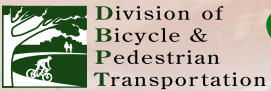
City of Hendersonville

FINAL REPORT

February 2007



State of North Carolina  
Department of Transportation



Kimley-Horn  
and Associates, Inc.



# Table of Contents

## Chapter 1 – Introduction

Hendersonville History .....	1-1
Scope and Purpose of Plan .....	1-1
Background .....	1-2
NCDOT Efforts .....	1-4
Pedestrian Initiatives Already Underway.....	1-5
Vision Statement / Goals and Objectives.....	1-5

## Chapter 2 – Evaluating Existing Conditions

Existing Pedestrian Facilities .....	2-1
--------------------------------------	-----

## Chapter 3 – Current Plans, Programs, Policies, and Guidelines

Introduction .....	3-1
Current Plans .....	3-1
Current Programs.....	3-6
Current Pedestrian Policy .....	3-12
Existing Pedestrian Facility Design Guidelines.....	3-14



**Chapter 4 – Recommended Projects, Guidelines, and Programs**

Introduction ..... 4-1

Recommended Projects..... 4-1

Recommended Guidelines ..... 4-15

Ancillary Programs ..... 4-28

**Chapter 5 – Implementing the Plan**

Introduction ..... 5-1

Funding Opportunities..... 5-5

Action Plan ..... 5-9



# Figures

## Chapter 1

Figure 1.1 – Study Area ..... 1-3

## Chapter 2

Figure 2.1 – Existing Pedestrian Facilities and Planned Greenways ..... 2-3  
 Figure 2.2 – Hendersonville Pedestrian Crashes on Public ROW ..... 2-4  
 Figure 2.3 – Pedestrian Crash Locations by Injury Severity ..... 2-5  
 Figure 2.4 – Vehicle Ownership ..... 2-10  
 Figure 2.5 – Hendersonville Destinations ..... 2-11  
 Figure 2.6 – *Walk Wise, Drive Smart* Hendersonville Neighborhoods ..... 2-12  
 Figure 2.7 – Selected Facilities Status ..... 2-15  
 Figure 2.8 – Slope Intensity ..... 2-17  
 Figure 2.9 – Environmental Features ..... 2-18

## Chapter 3

Figure 3.1 – Apple Country Greenways..... 3-2  
 Figure 3.2 – Existing Greenways ..... 3-3





**Chapter 4**

Figure 4.1 – Recommended Short-Term Projects ..... 4-6  
Figure 4.2 – Recommended Long-Term Projects ..... 4-13  
Figure 4.3 – Sample Sidewalk Both Sides Cross-Section ..... 4-25  
Figure 4.4 – Sample Multi-Use Path Cross-Section..... 4-26

**Chapter 5**

Figure 5.1 – Recommended Pedestrian Network ..... 5-9





# Tables

## Chapter 1

## Chapter 2

Table 2.1 – Annual Pedestrian Crashes by Injury Type.....	2-4
Table 2.2 – Potential Crash Contributing Factors .....	2-6

## Chapter 3

## Chapter 4

Table 4.1 – General Cost Estimates, Short-Term Projects.....	4-7
Table 4.2 – General Cost Estimates, Long-Term Projects .....	4-14
Table 4.3 – Ideal and Minimum Required Sidewalk and Buffer Widths .....	4-18
Table 4.4 – Ideal and Minimum Requirements for Sidewalks and Buffers near Schools .....	4-21

## Chapter 5

Table 5.1 – Pedestrian Action Plan Matrix .....	5-10
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## Chapter 1 — Introduction

### Hendersonville History

Hendersonville is situated in the southeastern edge of the North Carolina Blue Ridge Mountains in the vicinity of one of the broadest valleys in Western North Carolina. Approximately 7 square miles in area, Hendersonville is currently home to approximately 12,000 people.

In 1840, Hendersonville was established as the county seat for Henderson County because of its proximity to the Buncombe Turnpike, an important carriageway that connected Greenville, South Carolina with Asheville. Rows of trees were planted along Main Street to encourage property sales, and early zoning laws were established requiring Main Street to be 100 feet wide so that “a carriage and four horses could turn around without backing.”

The Spartanburg and Asheville Railroad established Hendersonville as a regional tourist destination as a growing number of visitors traveled to the mountains from Florida and Georgia in the late 1800s. Following the economic constraints of the depression era and wartime limitations on travel in the early 1900s, Hendersonville regained some of its lost tourist trade, spurred by an influx of retirees. The permanent and seasonal relocation of retirees created a real estate boom, and caused rapid growth in Hendersonville leading up to the 1970s.

With the growth and expansion of the City, however, Main Street began experiencing hardships as well, complicated by an increase in building vacancies and an environment that was unwelcoming to pedestrians. The City opted to reduce Main Street from four lanes to two, creating a quick lateral shift at mid-block to slow traffic. Crosswalks were painted at each intersection. Brick planters were installed along the length of the street and filled with flower displays that to this day change throughout the year. Street trees were planted 25 years ago and today have grown tall enough to provide a sidewalk canopy and shade for pedestrians.

These pedestrian improvements have helped downtown Hendersonville regain economic success. In 1985, Hendersonville was named a “Main Street City” by the National Trust for Historic Preservation.

*(Source: Hendersonville Historic Preservation Commission)*

### Scope and Purpose of Plan

In 2005, the City of Hendersonville received a grant from the North Carolina Department of Transportation (NCDOT) to develop a comprehensive pedestrian plan. The purpose of this plan is to identify and develop safe amenities that encourage a pedestrian-friendly Hendersonville. In large part, this includes the





Downtown Hendersonville.

identification of new sidewalks along existing roads, as well as future connections to pedestrian attractions and greenways. **Figure 1.1** depicts the pedestrian plan study area.

Pedestrian-friendly cities are known to have a logical system of interconnected facilities that allow for safe travel between origins and destinations. Typically, these facilities do not occur by accident, but are the result of careful planning. For this reason, the Hendersonville planning process included not only the mapping of planned pedestrian facilities, but also an assessment of institutional policies and procedures that relate to “walkability.”

This plan is intended to improve pedestrian access and transportation options by looking at transportation priorities, safety considerations, barriers to walking, and special population needs. Both long- and short-range project and program priorities are identified, along with how the recommendations can be integrated with other state, regional, and local planning initiatives, policies, and guidelines. It also identifies ways to capitalize on high-priority North Carolina Department of Transportation Transportation Improvement Program (TIP) projects and the means to enhance the interface with other transportation modes.

The document is organized in five chapters; the first being an introduction and discussion of current initiatives and the vision for this plan. Chapter 2 evaluates existing conditions based on field review, data inventory, crash statistics and public input. Chapter 3 inventories current plans, programs, policies, and guidelines. The fourth Chapter recommends projects, guidelines, and programs. Chapter 5 recommends policies and implementation strategies and includes an action plan that identifies tasks and involves state, regional, and local agencies, elected officials, advocacy groups, and public/private partnerships.

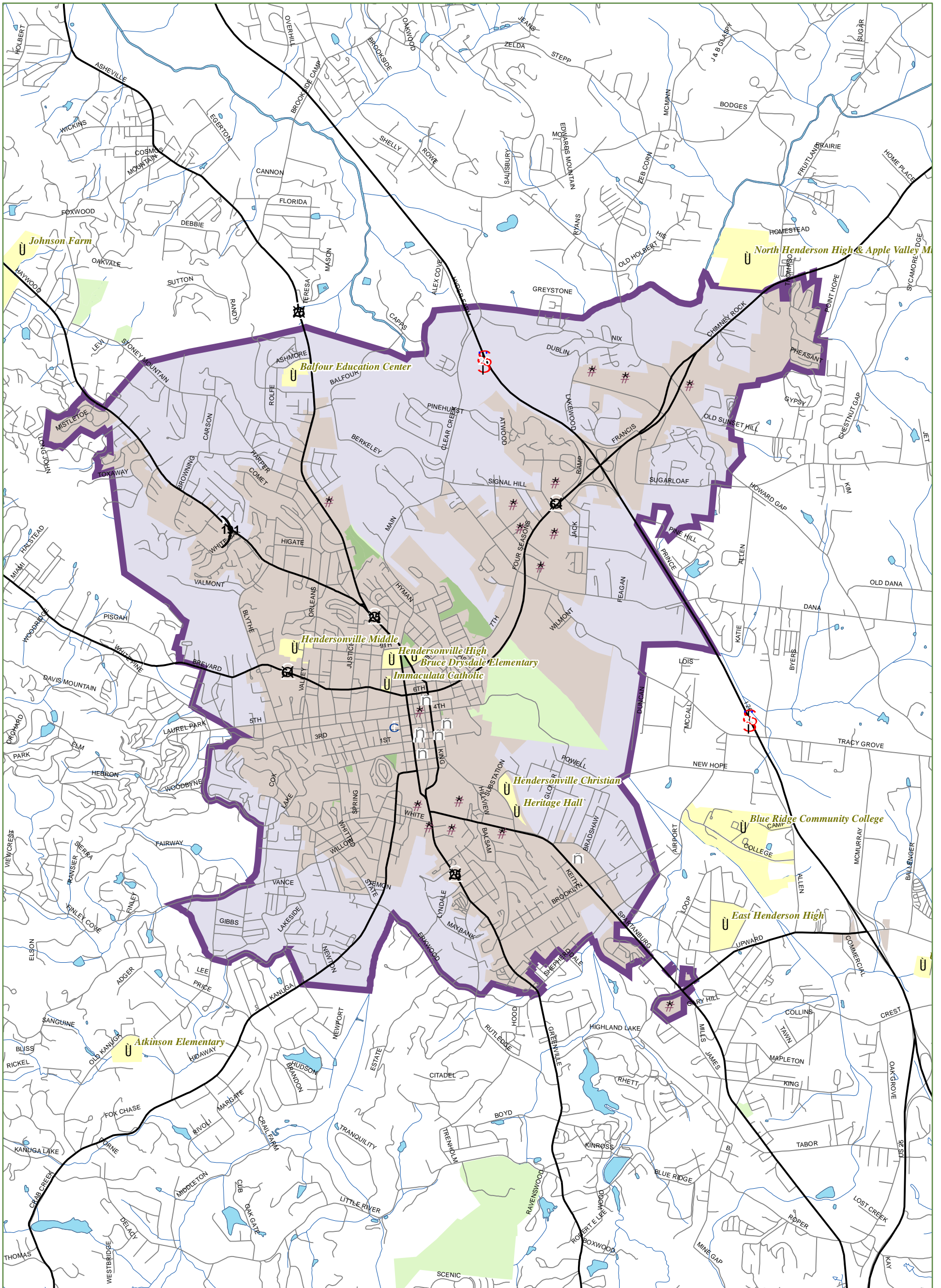
## Background

Walking has always been a transportation option. Whether for a daily commute, exercise, or short trips, walking can be a popular means of avoiding the complications associated with automobile travel. Although most of the transportation mode split percentage belongs to cars and trucks in the United States, walking is still the first (and sometimes the only) choice for some people.

Walking is recognized as an appealing alternative to automobile travel because of benefits such as:

**It is environmentally-friendly.** Simply put, walking doesn’t use fossil fuels or release polluting emissions into the air. Because walking doesn’t involve motorized engine power, both air and noise qualities are improved.





Hendersonville Comprehensive Pedestrian Plan  
Figure 1.1 - Study Area Map

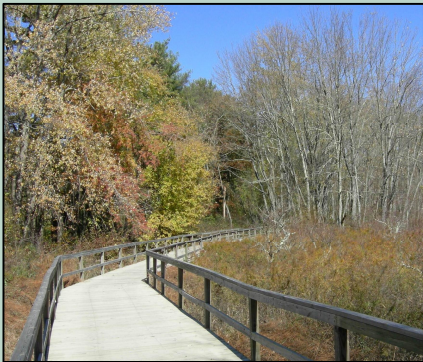


- Study Area
- Extra-Territorial Jurisdiction
- City Limits
- Lakes
- County Parks
- City Parks
- Schools
- Schools
- Library
- Government Buildings
- Shopping Centers

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0 0.125 0.25 0.5 Miles





Hendersonville existing areas of walkability

**Walking promotes good health practices.** The United States Surgeon General advises Americans to get 30-60 minutes of exercise 4 to 6 times each week. Walking is a low-impact way to exercise and can improve a person's health by lowering blood pressure, strengthening muscles, lowering stress levels, increasing the size, strength, and efficiency of the heart and cardiovascular system, burning fat, and increasing metabolism.

**It promotes the "livability" of a place.** Being able to reach a destination through walking gives people another alternative when they are choosing a travel mode. It combines the functionality of actually getting there with the benefits of exercise and recreation. In places where residents are regularly seen outside walking or bicycling, visitors feel a sense of community and safety. A city with great "livability" constantly attracts new residents and businesses.

**The economics of walking make sense.** According to a study by the Boston Foundation, typical American households in 2003 spent an average of \$7,125 on transportation costs, including insurance, repair, maintenance, fuel costs, taxes, and other fees — a significant annual investment. Choosing to walk rather than hop in the car to a nearby destination could save a person significant dollars in a single year.

**It's so easy.** According to a 1995 National Personal Transportation Survey, analysts found that approximately 40 percent of all trips made are less than 2 miles from origin to destination. This relatively short distance can be traveled by a pedestrian in about an hour.

### **NCDOT Efforts**

Given the benefits identified above, it is not surprising that some North Carolina communities have begun to focus on providing facilities for walking as well as bicycling. Many communities in the state have included pedestrian and bicycle modes in their future transportation planning documents as a way of addressing the desires of their citizens to have more transportation choices.

The North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation (NCDOT DBPT) and the Transportation Planning Branch (TPB) responded to this trend by establishing a grant program to fund plan development. Since 2004, 48 municipal plans have been selected and funded to develop pedestrian and bicycle plans, including the *Hendersonville Pedestrian Plan*.



## VISION STATEMENT

*Hendersonville will develop and maintain a pedestrian network that includes sidewalks, pedestrian crossings, and greenways that:*

- *Offer safety and connectivity to citizens and visitors*
- *Motivates and rewards the choice to walk and use transit*
- *Improves access for those with disabilities*
- *Integrates and balances pedestrians with other modes of transportation*
- *Adds to the quality of life and unique character of the City of Hendersonville*

## Pedestrian Initiatives Already Underway

### “Walk Wise, Drive Smart”

In 2005, Hendersonville was selected by The University of North Carolina Highway Safety Research Center to develop a model program that promotes safer and more inviting walking environments for older adults. *Walk Wise, Drive Smart* is funded by the National Highway Traffic Safety Administration and is receiving in-kind support from several state and local organizations. This program is one of the first in the country to be associated with a small to mid-size community. It is expected to establish a friendly walking environment for senior adults and others. It is hoped that the processes used to achieve change can be used by communities across the nation.

Under the guidance of this partnership, a research team examined the needs and expectations of Hendersonville residents to identify an older adult pedestrian safety program that is responsive to the community's needs. Similar to this plan, extensive stakeholder and resident input was sought to develop an action plan which addressed the needs of older pedestrians. An action plan has been completed and a variety of environmental, education, enforcement, and encouragement program elements are underway.

## Vision Statement/Goals and Objectives

The interest in learning more about walking in Hendersonville has led to the development of the *Hendersonville Pedestrian Plan*. Focused on the community of Hendersonville, this plan aims to serve all residents.

To help make this project successful, the City requested the help of Bi-



Peds, a committee of local volunteers that advocates for bicycling and walking as a means for improved community mobility and a healthy way of living. In addition, a 20 member Pedestrian Plan Steering Committee representing a cross-section of community interests was created to work with the project team. With the help of the steering committee and Bi-Peds, as well as other interested citizens, the project team developed a vision for walkability and a strategy for implementation.

At the first meeting, the steering committee adopted the *Hendersonville Pedestrian Plan* vision statement which specifies the goals and objectives for this plan:

*Hendersonville will develop and maintain a pedestrian network that includes sidewalks, pedestrian crossings, and greenways that:*



- *Offer safety and connectivity to citizens and visitors*
- *Motivates and rewards the choice to walk and use transit*
- *Improves access for those with disabilities*
- *Integrates and balances pedestrians with other modes of transportation*

- *Adds to the quality of life and unique character of the City of Hendersonville*

This vision statement has guided the development of this plan, serving as a starting place for goals and objectives. The recommendations presented in Chapter 5 were developed within the context of this vision.



## Chapter 2 — Evaluating Existing Conditions

### Existing Pedestrian Facilities

Effectively planning for Hendersonville’s future pedestrian network requires a thorough understanding of current conditions. In 2005, the volunteer group Bi-Peds worked with the City to inventory sidewalks throughout the community. Individuals performed a walking survey of each street within the City to determine the location and condition of existing sidewalks and greenways. City staff has since used this data to create an “existing conditions” map that served as a foundation for the *Hendersonville Pedestrian Plan*. **Figure 2.1** shows the existing sidewalks, on one and both sides of the street, as well as existing and proposed greenways. The first-hand experience of Bi-Peds, along with the input of other community members, helped determine the needs and priorities for improving walking in Hendersonville.

### Community Concerns, Needs, and Priorities

A critical component of any successful plan is engaging members of the public who live, work, and travel within the study area. Plan participants improve our understanding of the needs and short-comings of the existing pedestrian network. They also have a vested interest in the process and can hold policy makers accountable for the

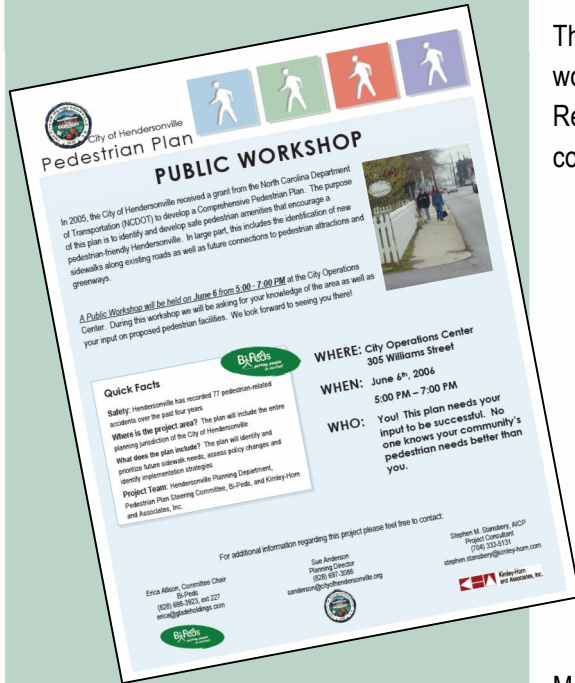
implementation of the community vision. Two public workshops were held, open to the general public and designed to engage citizens in a meaningful discussion about pedestrian issues in Hendersonville.

In addition to the general public outreach, a steering committee of local staff and citizens was formed. This committee identified City needs and represented community interests during the plan’s development at regular meetings. The committee contributed technical knowledge, institutional understanding, and community familiarity, and was heavily relied upon as the future pedestrian networks and policy issues were discussed.

The goal of this public involvement process was to gain valuable knowledge and input from the community, as well as build awareness and support for the pedestrian plan. It is a desired result of this effort that the *Hendersonville Pedestrian Plan* will be supported and promoted by the public as a result of the input from knowledgeable members of the community.

Members of the steering committee completed a survey during their first meeting to determine the existing community concerns, needs, and priorities. They were asked to identify where they would allocate funds to improve pedestrian mobility. The responses focused mainly on connecting areas of interest — such as libraries, schools, parks, and greenways — as well as providing crossing amenities, connecting existing corridors,

## Hendersonville, North Carolina Pedestrian Plan

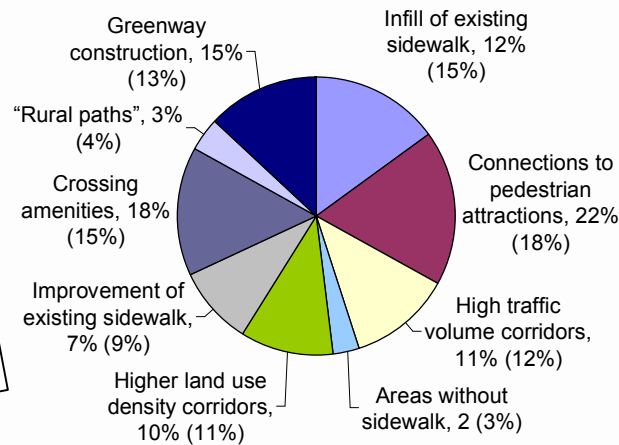


constructing greenways, and repairing the existing pedestrian infrastructure.

The same survey was distributed at the first public workshop to citizens, staff, and local business owners.

Results are shown in the chart below, with steering committee results shown in parentheses.

### Survey Results:

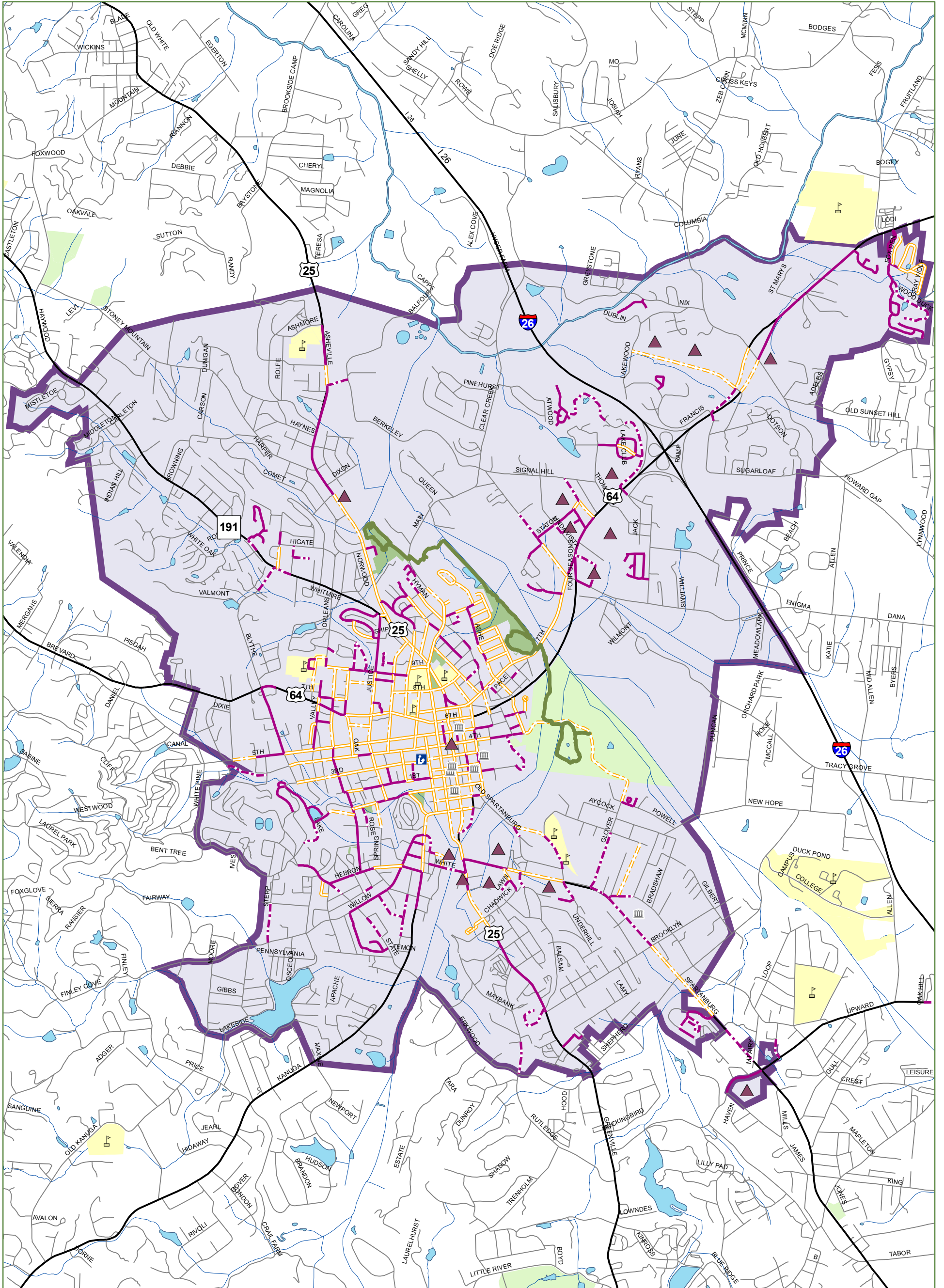


Members of the community also identified problems facing local walkers. The following locations and issues were named as needing improvement to adequately accommodate pedestrians in Hendersonville:

- Sidewalks in downtown need to be completed — from Blythe Street to Grove and 6<sup>th</sup> Avenue West to Spartanburg Highway (US 176)
- Pedestrian crossings should be timed with signals to ensure there is adequate time to cross

- A safe route for pedestrians to cross Haywood Road (NC 191) and Asheville Highway (US 25) from schools, subdivisions, and transit stops must be provided
- Developers should be required to build sidewalks and pedestrian trails in all new or expanded development projects
- NCDOT should paint all crosswalks between Haywood Road (NC 191) and the southern end of 5 Points (approximately 15 crosswalks)
- More sidewalks and pedestrian crossing areas need to be added to Spartanburg Highway (US 176)
- Sidewalk regulations should be enforced, shrubs adjacent to sidewalks should be trimmed, and uneven facilities should be repaired
- Sidewalks need to be added along Haywood Road (NC 191)
- Sidewalks should be added to and widened along Blythe Street from Brevard Road (US 64) to Haywood Road (NC 191) and Brevard Road (US 64) through Oakland Cemetery

Several citizens voiced a significant concern for pedestrian safety. As a result, this pedestrian plan places emphasis on these priorities identified by the steering committee and general community.



Hendersonville Comprehensive Pedestrian Plan  
 Figure 2.1 - Existing Pedestrian Facilities



- |                                |              |                      |                          |  |
|--------------------------------|--------------|----------------------|--------------------------|--|
| Study Area                     | County Parks | Schools              | <b>Existing Sidewalk</b> | Both Sides Partial                       |
| Extra-Territorial Jurisdiction | City Parks   | Library              | One Side Partial         | Both Sides Continuous                    |
| Lakes                          | Schools      | Government Buildings | One Side Continuous      | One Side Continuous and One Side Partial |
|                                |              | Shopping Centers     | Existing Greenways       |  |

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0 0.125 0.25 0.5 Miles



**TYPES OF INJURIES  
RESULTING FROM CRASHES  
INVOLVING PEDESTRIAN**

- *Type A injuries are disabling*
- *Type B injuries are those which are evident, but not disabling*
- *Type C injuries are possible injuries, perhaps not reported at the time of the accident*

**Safety Concerns**

Concern for pedestrian safety was expressed by the steering committee and the general public during the public involvement process. Several participants articulated a fear of walking in some areas because of the lack of sidewalks and crosswalks, stating they would walk more if they had a safer environment.

As part of the planning process, pedestrian crashes were analyzed. It should be noted, however, that pedestrian safety also includes appropriate walking surfaces, adequate pedestrian scale lighting, and adequate facilities, among other features.

Table 2.1 shows the summary of crashes involving pedestrians for Hendersonville from 2001 to 2005. The City's pedestrian crashes included 2 fatalities, 14 Type A injuries (disabling), 26 Type B injuries (evident), 38 Type C injuries (possible), and 4 collisions resulting only in property damage, for a total of 84 reported collisions in a 5-year period.

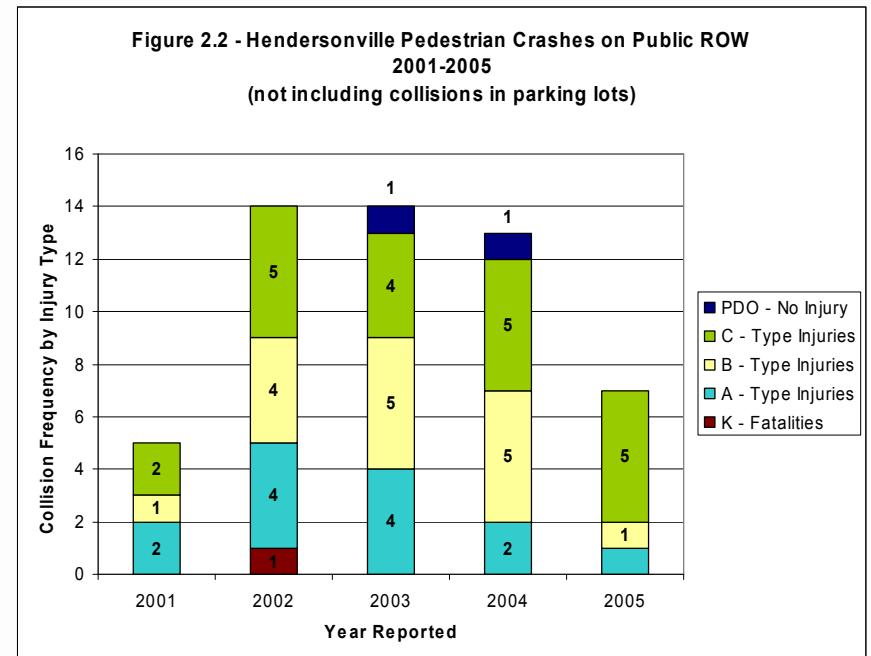
A closer analysis of the data shows that 31 of the 84 collisions (37%) occurred in parking lots, which reduces the number of collisions on public right-of-way to 53. The

distribution of remaining crashes by injury type is shown in Figure 2.2. Figure 2.3 shows the spatial location of all pedestrian collisions on public right-of-way and in parking lots by injury severity for the 5-year period.

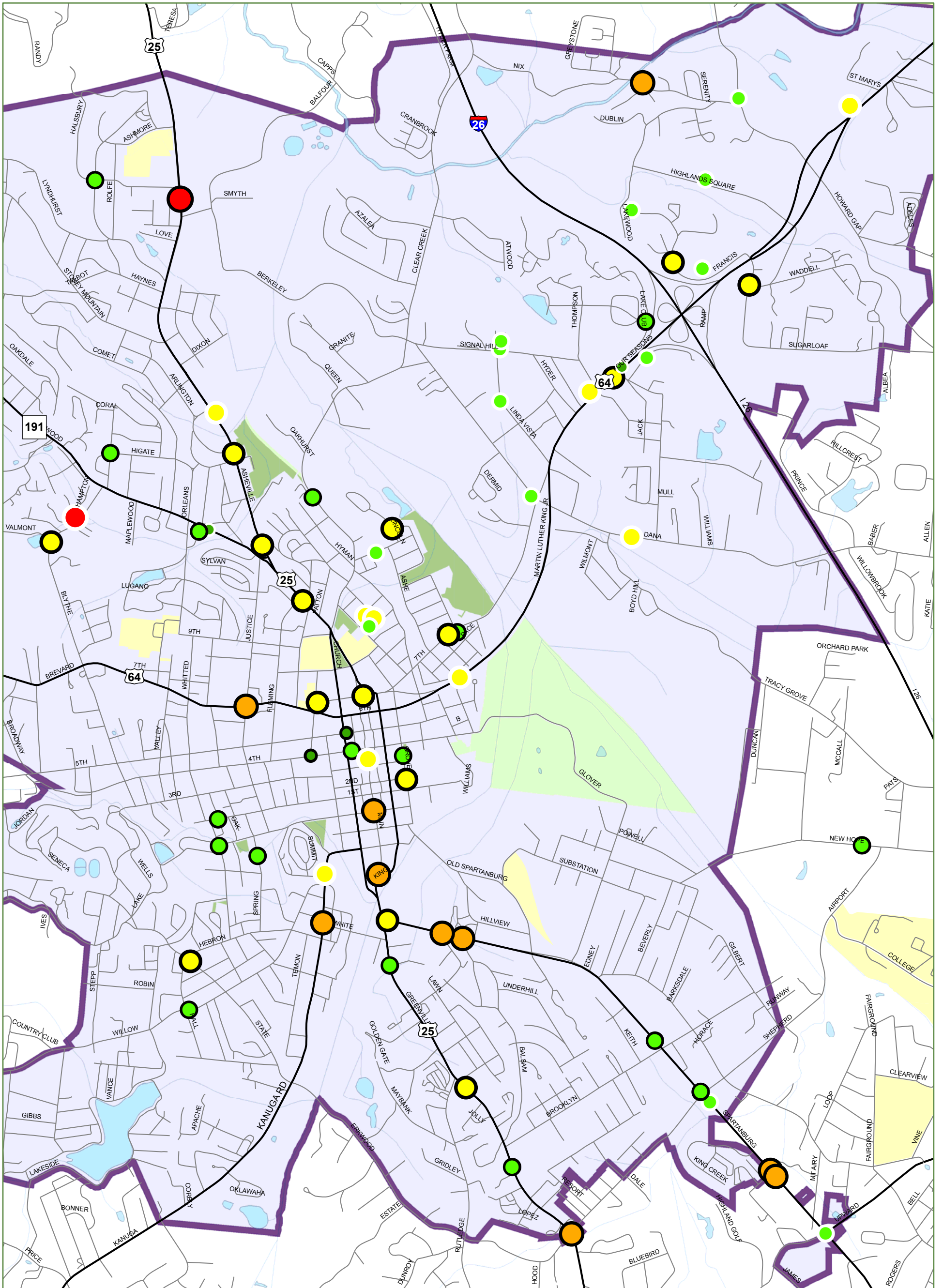
Table 2.1 — Annual Pedestrian Crashes by Injury Type

	2001	2002	2003	2004	2005	Total
Fatality	1**	1	0	0	0	2
Type A Injury	2	4	5	2	1	14
Type B Injury	1	5	9	6	5	26
Type C Injury	5	8	10	8	7	38
Property Damage Only	1	1	1	1	0	4
unknown	0	0	0	0	0	0
<b>Total</b>	<b>10</b>	<b>19</b>	<b>25</b>	<b>17</b>	<b>13</b>	<b>84</b>

\*\*Parking lot fatality







Hendersonville Comprehensive Pedestrian Plan  
**Figure 2.3 - Pedestrian Crash Locations by Injury Severity**

Study Area	Roadway Crash	Schools	Fatality
Extra-Territorial Jurisdiction	Parking Lot Crash	City Parks	Type - A
Lakes	County Parks	Type - B	Type - C
		PDO	

Type A injuries are disabling  
 Type B injuries are those that are evident, but not disabling  
 Type C injuries are possible injuries, perhaps not reported at the time of the crash  
 PDO is property damage only crashes

0 0.125 0.25 0.5 Miles

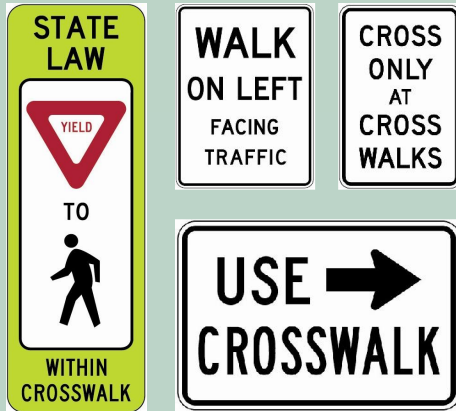


Figure 2.3 shows a significant number of pedestrian collisions occurred in the downtown area, with a concentration of crashes along the Main Street (US 25) corridor. About half of the collisions with Type A (disabling) injuries occurred near downtown Hendersonville. Both fatalities occurred outside of the downtown area in the northwestern quadrant of the City.

Potential contributing factors to the collisions are shown in Table 2.2. The results show that a large percentage of public right-of-way crashes occurred at nighttime (30%) or on wet pavement (18%). About 9% of all crashes occurred on wet pavement and at night. A significant number of crashes (19%) involved pedestrians who were suspected of having consumed alcohol.

Table 2.2 - Potential Crash Contributing Factors

	All Crashes		Public ROW only	
Total Pedestrian Crashes	84	100%	53	100%
Rain/Snow on Pavement	16	19%	9	18%
Nighttime Crashes	22	26%	16	30%
Nighttime AND Wet Pavement	8	10%	5	9%
Alcohol Suspected (Pedestrian)	13	15%	10	19%
Alcohol Suspected (Driver)	1	1%	0	0%

Fortunately, methods exist to lessen the likelihood of the kinds of crashes involving pedestrians in Hendersonville. Typical countermeasures for nighttime collisions include street lighting and better sign retro-reflectivity. Crashes on wet or icy pavement can be prevented by reducing vehicle speeds in areas of heavy pedestrian activity. Generally, drivers should be encouraged to be more cautious under adverse weather conditions, especially in areas of high

pedestrian activity. Education campaigns can help reduce the number of crashes with suspected alcohol or substance abuse. Pedestrians should be commended for choosing not to drive under the influence of alcohol, but they need to be made aware that they will still interact with vehicular traffic.

The large number of pedestrian collisions in private parking lots — rather than in the public right-of-way — is a concern, because vehicles typically operate at relatively low speeds and collisions are thus easily avoidable. Parking lots tend to be areas of heavy pedestrian activity, and both drivers and pedestrians need to be aware of the frequent interaction of motorized and non-motorized modes in these areas. Parking lot design and construction can influence pedestrian safety as well as education and enforcement methods.

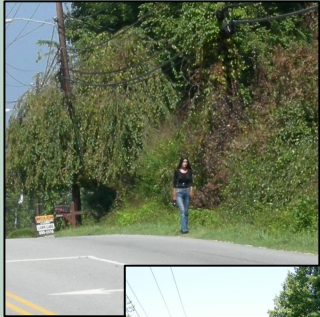
Overall, Hendersonville has a relatively low rate of pedestrian crashes: only 10.6 collisions per year (or 16.8, if parking lot collisions are included) and 2 pedestrian fatalities in a 5-year period. These numbers are limited to pedestrian crashes that have been reported to the law enforcement agencies, and it is expected that many pedestrian-vehicular collisions remain unreported. Property damage resulting from low-speed pedestrian collisions is likely to be minimal, so that the parties involved in these mild and non-injury collisions often do not notify the authorities.



## Pedestrian Friendliness of Local Transportation System

Assessing the pedestrian friendliness of Hendersonville's transportation system involved considering street and highway system access (e.g., intersection treatments, on-road accommodations, and bridges and culverts), pedestrian system access (e.g., connectivity, origin and destination points, transportation compared with recreation function, and gaps, hazards, and barriers), and transit interface (e.g., sidewalk access to stops, shelters, and street furniture), as well as current usage and user demographics. This included assessing walking trip characteristics, population and demographics information, user observations and attitudes, terrain and geographical considerations, and regional context.

**Figure 2.1** shows existing pedestrian facilities. Downtown Hendersonville has a fairly extensive network of sidewalks, which is not surprising considering the downtown was constructed in an era when pedestrians were more prevalent than individual automobiles. As the urban fringe began to develop, accommodations for all other modes became less prevalent. As a result, sidewalks became sparse and discontinuous. Popular destinations, such as grocery stores, shopping plazas, parks, and schools, do not have adequate pedestrian access in Hendersonville today. Also, the limited greenway system serves visitors to Patton, Sullivan, and Jackson Parks and



*Lack of sidewalks on Haywood Road and Blythe Street*

Mud Creek Nature Trail but fails to connect many residents to multiple destinations.

The steering committee and citizens at the public workshops identified the following as high priority corridors where pedestrian improvements are needed:

- Haywood Road (NC 191)
- Brevard (Highway 64 west)
- Blythe Street
- Four Seasons Boulevard (Highway 64)

These corridors are located in areas of recent growth and represent areas of development activity. In addition, these areas lack safe crossing amenities at key intersections. Many public workshop participants expressed an interest in walking more regularly to conduct daily tasks, but were limited due to the lack of pedestrian infrastructure.



*Examples of unsafe crossing conditions in Hendersonville*



## Transit

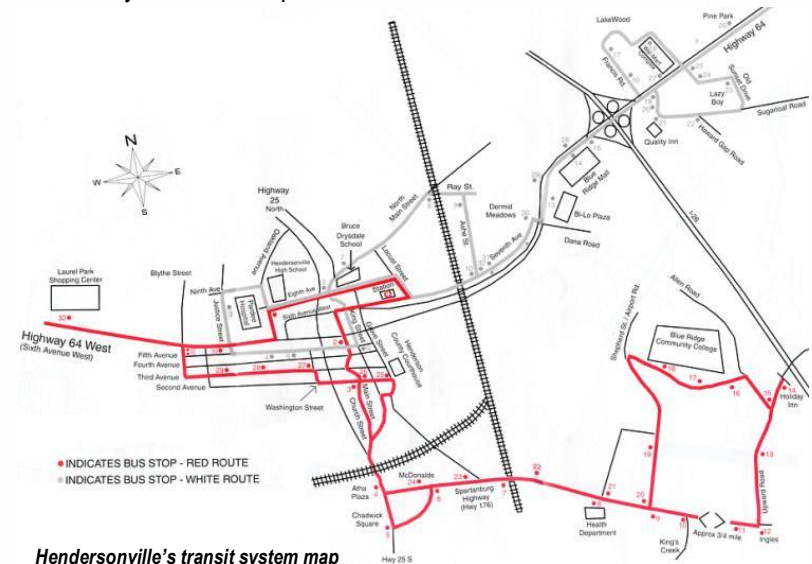
Access to alternative modes of transportation is key to ensuring a pedestrian friendly system, since those people who walk for transportation rather than for recreation are usually doing so out of necessity. Because some of the people who use transit have no other choice for traveling from one place to another, it is reasonable to assume some transit users will have to walk to transit stations. For public transit to serve the citizens of Hendersonville effectively, the pedestrian network must be integrated with the transit system.

Tailored amenities on buses and at bus stops can encourage pedestrian and bicycle activity as well as increase the use of transit. Pedestrians and bicyclists need a secure place protected from the weather to wait for the bus. Pedestrians also need to be assured safe and efficient travel from bus stops to their homes and destinations. Lighting at bus stops improves the visibility of pedestrians to motorists, increases the level of safety, and enhances the character of the area. Features such as covered shelters, benches, and trash cans create a pedestrian friendly environment and improve the convenience of using transit.

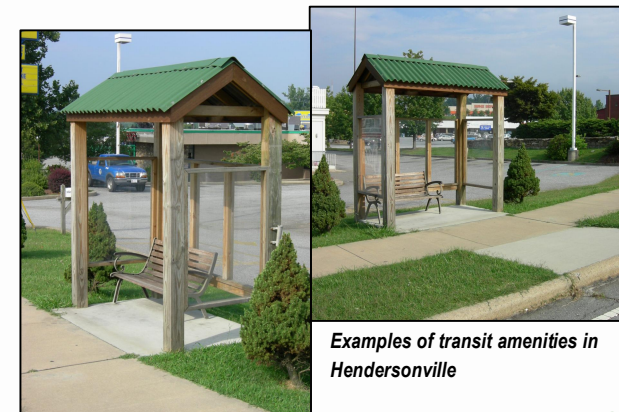
Henderson County's Apple Country Transit can enhance the multimodal riding experience for fixed-route and dial-a-ride service users by providing these facilities. The ability of citizens to walk safely to well-lit shelters and benches will extend the reach of both Hendersonville's transit system and the pedestrian network.



*Apple Country Transit stop without pedestrian facilities*



*Hendersonville's transit system map*



*Examples of transit amenities in Hendersonville*



## Pedestrian Focus Areas

This plan identifies ways to accommodate the needs of special segments of the population that use walking for more than just recreational activity. US Census 2000 data were used to examine the percentage of households owning one vehicle or no vehicle at all within Hendersonville's extraterritorial jurisdiction, as shown in **Figure 2.4**. The Census reported that in a representative sample of City residents, 13.4% of the households had no vehicle available to them, and just over 48% of the households have access to only one vehicle. Members of these households turn to other modes of travel to complete errands and commute to work or school. An improved pedestrian network would be beneficial to people with limited access to cars.

To accommodate typical errands for these citizens, this plan considered connections with shopping areas, municipal buildings, libraries, parks and community centers, tourist areas, and schools — the major destinations in and around Hendersonville. A map of these locations is shown in **Figure 2.5**. The resulting *Hendersonville Pedestrian Plan* was developed to heavily favor the connection of origins and destinations and address connectivity. It also endorses the concept of “one safe route per neighborhood” from the *Walk Wise, Drive Smart* program. The end result is a system that links citizens and tourists with places they want to go.

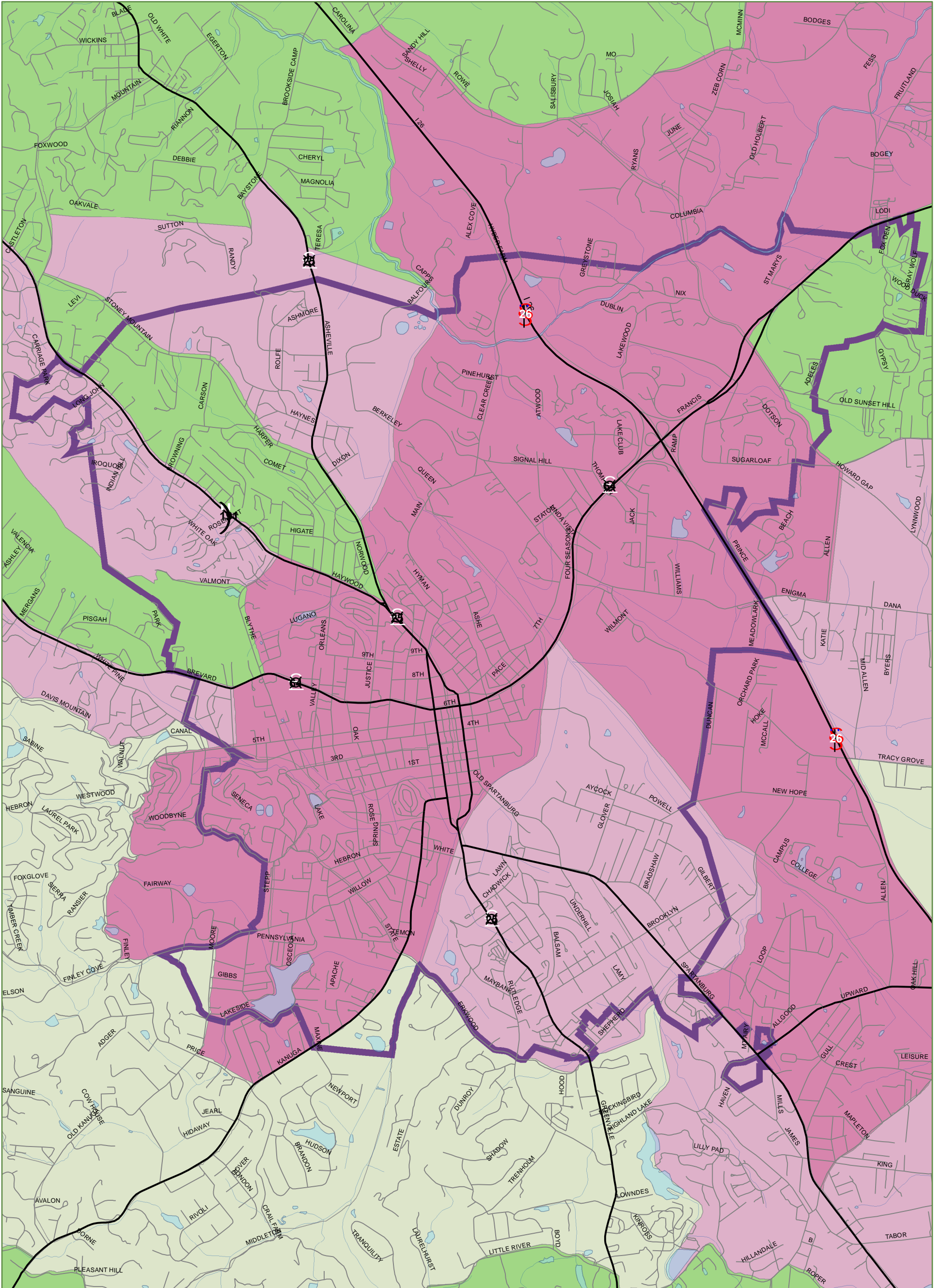
As explained in Chapter 3, the *Walk Wise, Drive Smart* program performed walking audits of the Hendersonville neighborhoods. In addition, the program distributed a questionnaire to solicit feedback on the perceived traffic and pedestrian safety concerns for seniors, a special segment of the population interested in pedestrian issues. Questionnaire responses included the following concerns:

- Heavy, high speed, or aggressive traffic
- Difficulty crossing intersections
- Sidewalk issues (e.g., sidewalk being too close to traffic)
- Fear of crime and/or intrusive people
- Difficulty navigating sidewalk and intersection surfaces
- Concerns about personal health
  - Absence of benches or other places to rest
  - Fear of falling or adverse health event

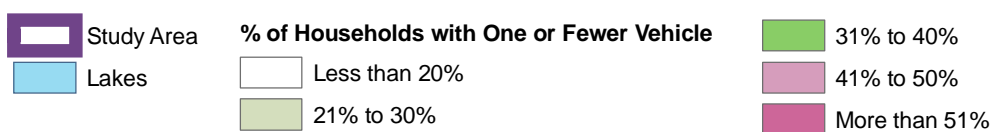
The participants felt that a senior-friendly route should be created in each neighborhood (shown in **Figure 2.6**) and pedestrians should be informed of contact information to report problems. As mentioned previously, several citizens in the *Hendersonville Pedestrian Plan* public workshops stated that they would prefer to walk for their regular errands in addition to walking for recreation, but do not currently feel safe doing so.



Hendersonville destinations



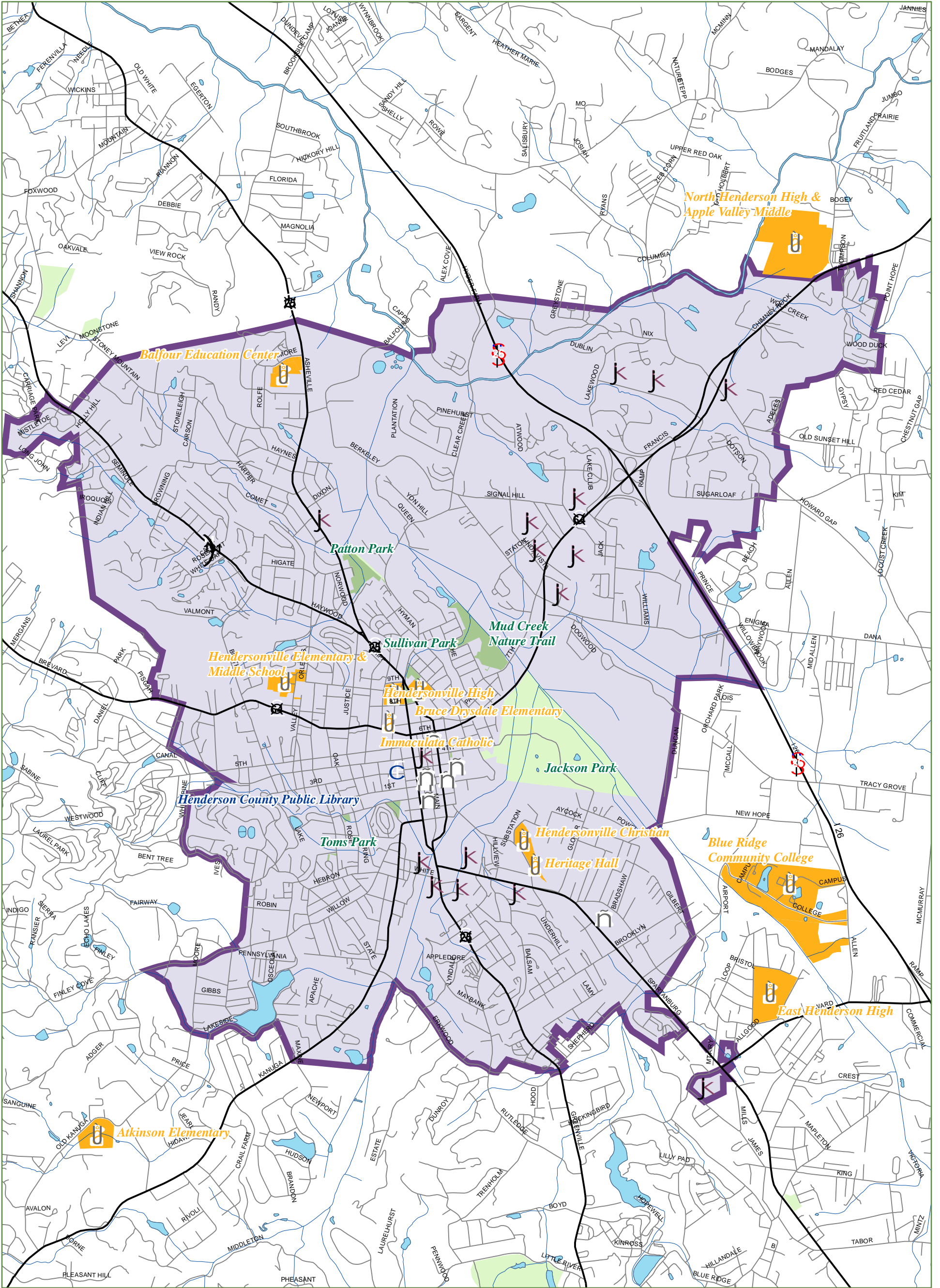
Hendersonville Comprehensive Pedestrian Plan  
Figure 2.4 - Vehicle Ownership Map



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0 0.125 0.25 0.5 Miles





Hendersonville Comprehensive Pedestrian Plan  
Figure 2.5 - Hendersonville Destinations Map



- Study Area
- County Parks
- Schools
- Government Buildings
- Extra-Territorial Jurisdiction
- City Parks
- Library
- Shopping Centers
- Lakes
- Schools

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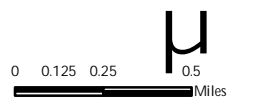
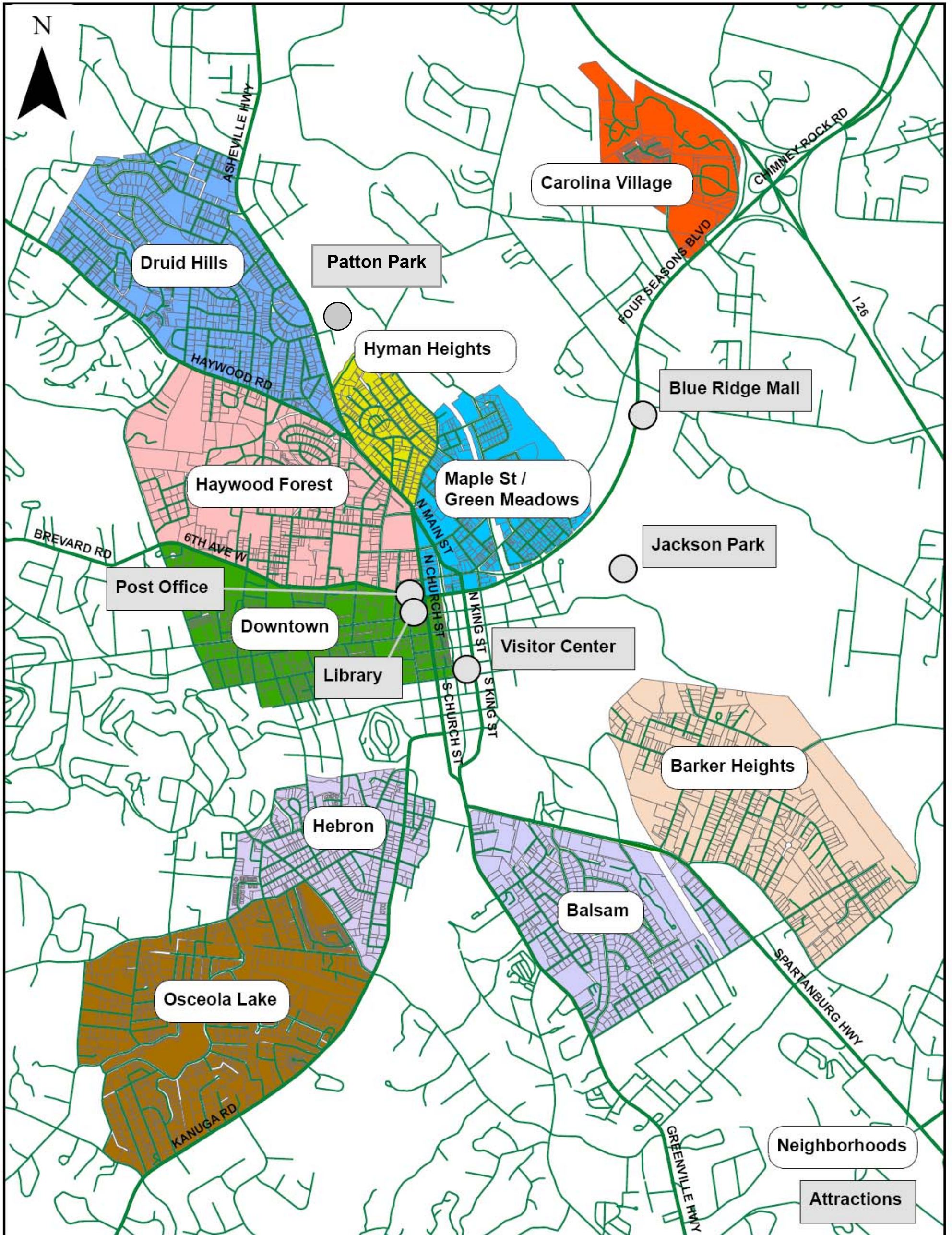


Figure 2.6 – *Walk Wise, Drive Smart*  
Hendersonville Neighborhoods





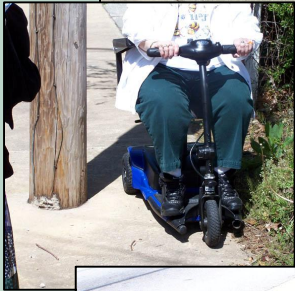


### Prevalent Issues

Hendersonville’s pedestrian facilities present several challenges to potential users. Even when routes are provided from typical origins and destinations, sidewalk quality, trip hazards, and path obstructions can discourage citizens from walking from one place to another. Locations throughout Hendersonville presented the following issues:

Sidewalk Obstructions — Many of Hendersonville’s older sidewalks were originally built with or have been retrofitted with obstructions to pedestrian use, such as utility poles or signs along 4<sup>th</sup> Avenue East. Other obstructions have appeared to discourage walking, such as shrubs, vehicles, or even furniture on the sidewalks. While some of these obstructions can be addressed by citizens willing to clear a path, opportunities for relocating the more permanent structures should be considered as redevelopment occurs.

Pavement Quality — The quality of pavement can greatly affect the safety conditions and accessibility of Hendersonville’s sidewalk facilities. Pavement can be destroyed by encroaching root systems and vegetation, or shifted by settling soil. As part of their data collection efforts, the Bi-Peds committee recorded the quality of the sidewalk pavement, shown in **Figure 2.7**.



*Examples of sidewalk obstructions*



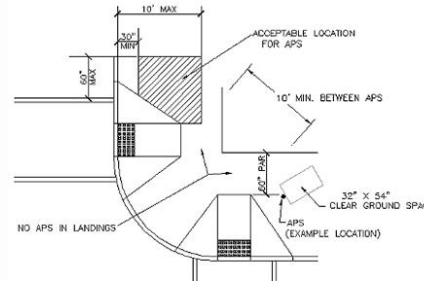
*Examples of poor pavement quality*



**Sidewalk Width** — Federal and state guidelines both recommend a minimum sidewalk width of 5', which gives enough space for two people to walk side-by-side or pass comfortably. **Figure 2.7** also shows the sidewalks that are currently not in compliance with Federal Highway Administration and North Carolina Department of Transportation standards.

**Curb Ramps** — Curb ramps provide access from the sidewalk to the street for wheelchairs, strollers, medical walkers, bicycles, and mobility-impaired pedestrians. While proper width and slope are discussed in Chapter 3, the facilities that have all or some existing curb ramps are shown in **Figure 2.7**.

**Intersection Treatments** — Intersection treatments include a number of design elements such as marked crosswalks, pedestrian signals (including countdown signals), adequate pedestrian crossing phases, tight curb radii, and driveway improvements. Varieties of treatments are needed at Hendersonville intersections to create a pedestrian friendly environment, and should be considered for future community improvements.



*Example of curb ramp*



*Appropriate sidewalk width impeded by overgrown shrubs*



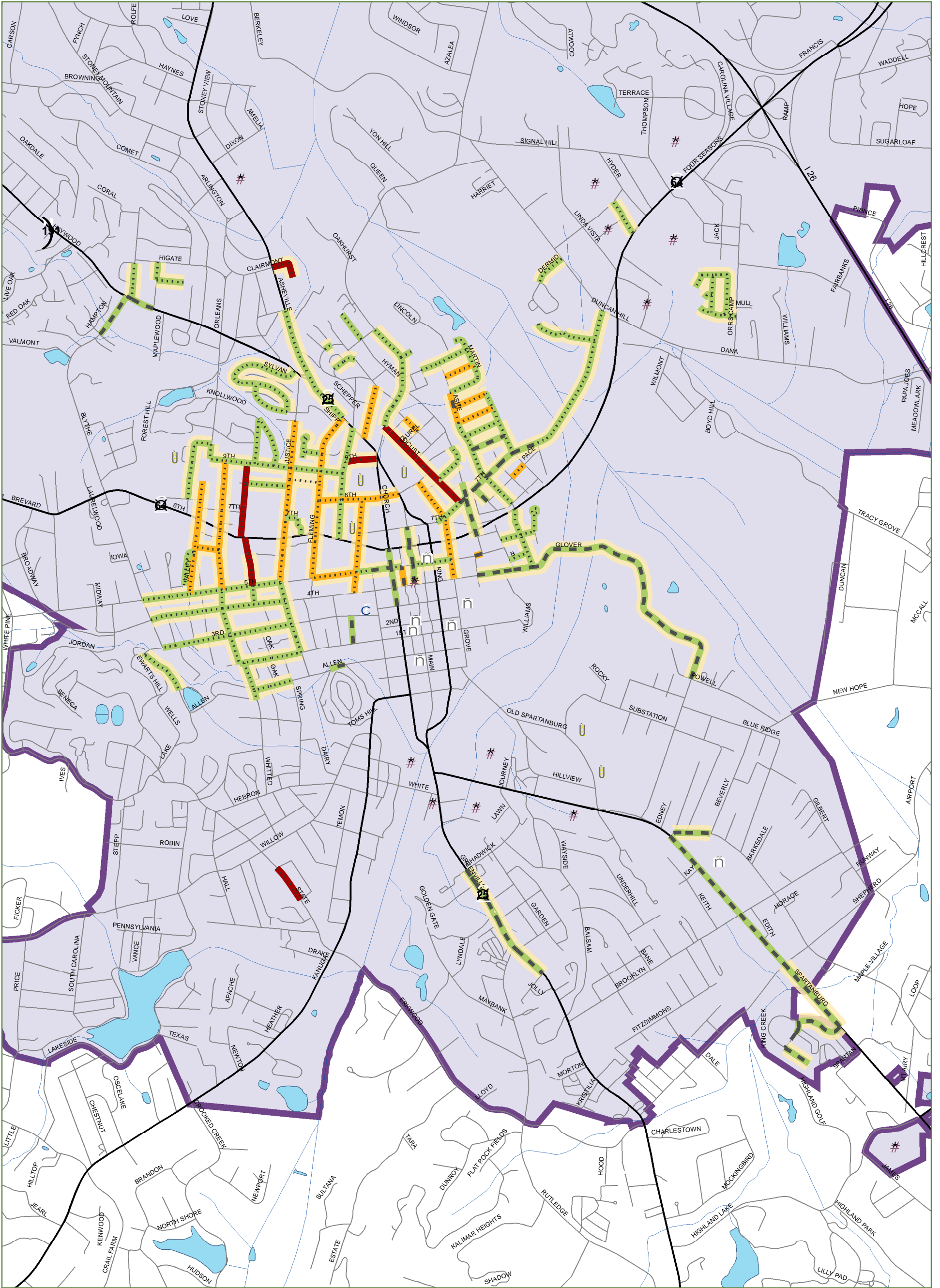
*Examples of areas in need of intersection treatments*



*Example of high visibility crosswalk not aligned with curb ramp*



*Examples of areas in need of intersection treatments*



Hendersonville Comprehensive Pedestrian Plan  
 Figure 2.7 - Selected Facilities Status Map\*



- |                                |                      |                         |                          |
|--------------------------------|----------------------|-------------------------|--------------------------|
| Study Area                     | Government Buildings | <b>Pavement Quality</b> | <b>Sidewalk Width</b>    |
| Extra-Territorial Jurisdiction | Library              | Poor                    | 5' or less               |
| Lakes                          | Shopping Centers     | Fair                    | 5' or more               |
|                                |                      | Good                    | Some Existing Curb Ramps |

\* Selected existing facilities were assessed by the Bi-Peds committee and do not represent a comprehensive review.

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## Constraints

Key constraints and barriers are more than just a nuisance in Hendersonville — they prevent the pedestrian network from serving the needs of its citizens. Natural and manufactured constraints which impede the effective use of pedestrian facilities were identified during the development of this plan.

Natural Constraints — Geographic location and steep terrain significantly constrain the reach of Hendersonville's pedestrian network. **Figure 2.8** shows the percent grade change within the study area. This data was used to determine where potential sidewalks were feasible. The northwestern portion of the study area is significantly constrained by steep slopes, specifically along Browning Road, Stoney Mountain Road, and neighborhoods west of US 25 in this area. **Figure 2.9** shows other natural constraints and environmentally sensitive areas that should be avoided or considered in determining the potential network.

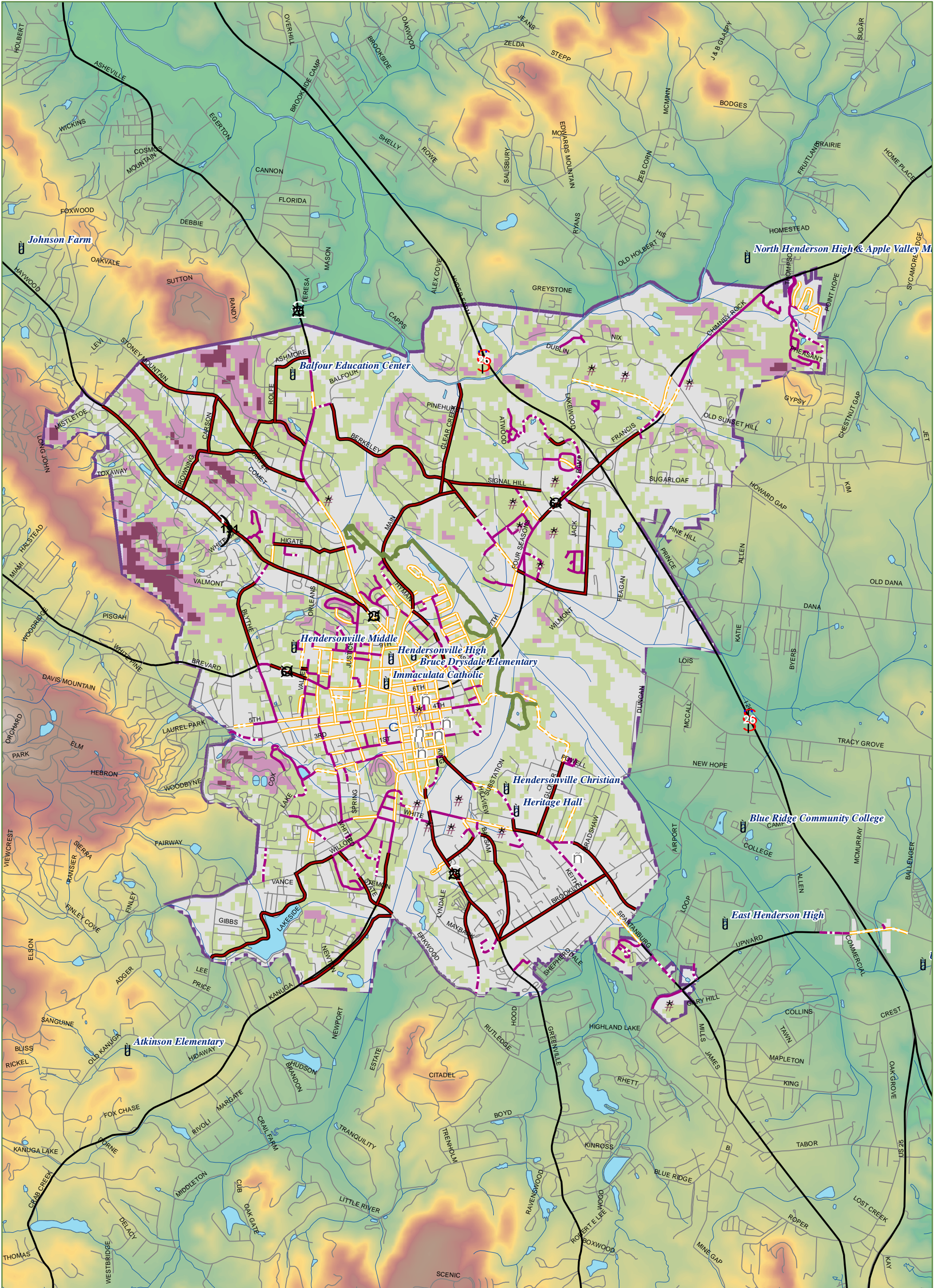
Manufactured Constraints — Hendersonville has manufactured constraints that act as barriers to the pedestrian network. Cul-de sacs, bridges, and culverts all prevent the pedestrian network from effectively serving its citizens. Specifically Interstate 26 and US 64 are considered manufactured constraints that pose a challenge to Hendersonville's pedestrian network.



*Safe pedestrian access is limited in this shopping center*

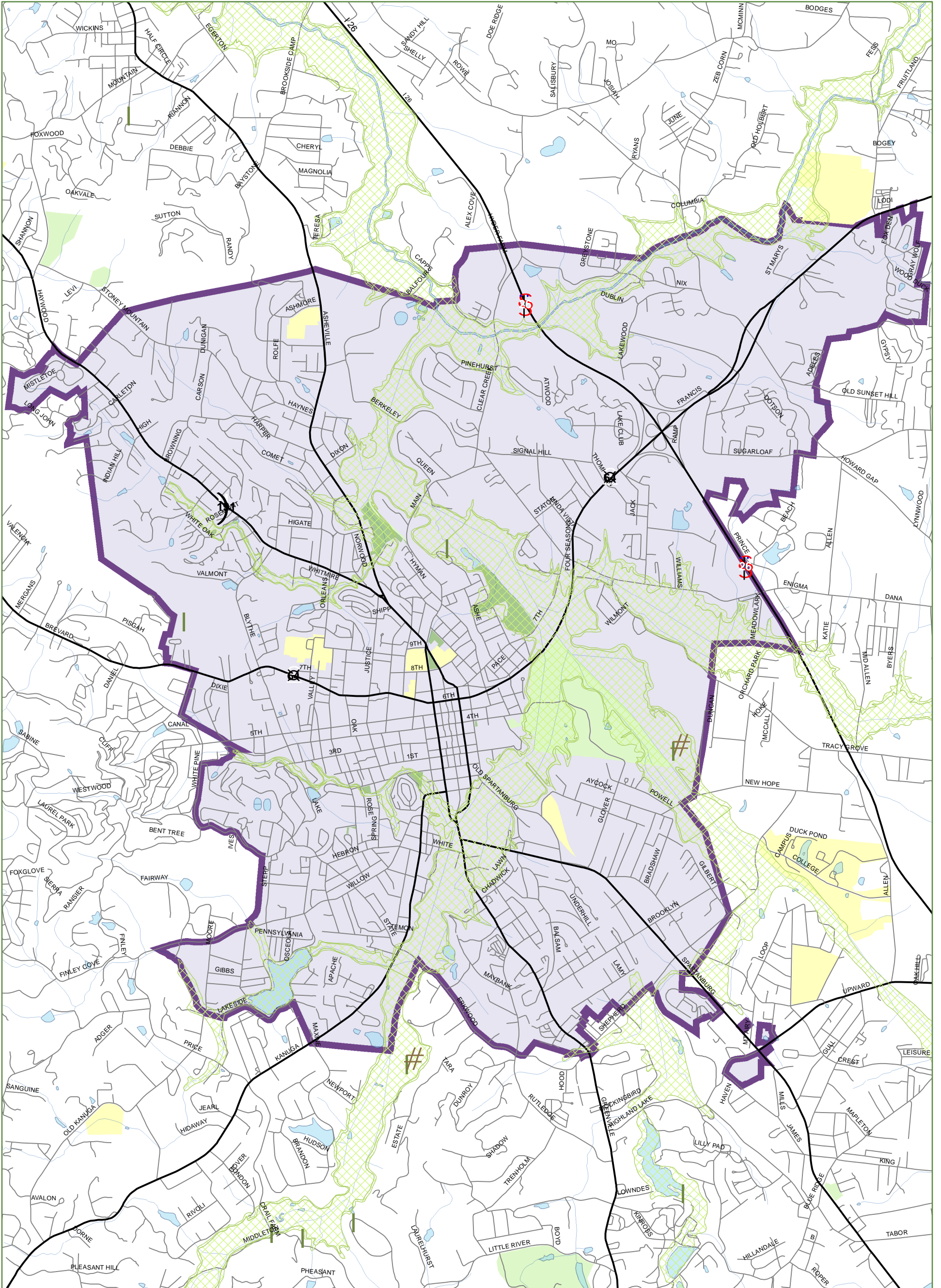


*Manufactured constraints like roadways can discourage pedestrian use, but can be addressed through proper planning*



Hendersonville Comprehensive Pedestrian Plan  
Figure 2.8 - Slope Intensity Map

	<ul style="list-style-type: none"> <li> Study Area</li> <li> Extra-Territorial Jurisdiction</li> <li> Lakes</li> </ul>	<ul style="list-style-type: none"> <li> Schools</li> <li> Library</li> <li> Government Buildings</li> <li> Shopping Centers</li> </ul>	<p><b>Existing Sidewalk</b></p> <ul style="list-style-type: none"> <li> One Side Partial</li> <li> One Side Continuous</li> <li> Both Sides Partial</li> <li> Both Sides Continuous</li> <li> One Side Continuous and One Side Partial</li> </ul>	<ul style="list-style-type: none"> <li> Potential Sidewalk Both Sides Continuous</li> <li> Existing Greenways</li> </ul>	<p><b>Slope Intensity</b></p> <ul style="list-style-type: none"> <li> 0% - 5%</li> <li> 5.1% - 15%</li> <li> 15.1% - 25%</li> <li> 25.1% - 100%</li> </ul>	<p><b>LIDAR Data</b></p> <p>High Low</p>		
--	--	--	---	--	--	--	--	--



Hendersonville Comprehensive Pedestrian Plan  
Figure 2.9 - Environmental Features



- Study Area
- County Parks
- Lakes
- Extra-Territorial Jurisdiction
- City Parks
- Floodplain
- Schools
- Natural Heritage Element Occurrences
- Vascular Plant
- Vertebrate Animal
- # Natural Community



# Chapter 3 — Current Plans, Programs, Policies, and Guidelines

## Introduction

The *Hendersonville Pedestrian Plan* seeks to build from previous planning and programmatic efforts that have been conducted while still remaining open to new ideas and suggestions. Following is an inventory of current plans, programs, and policies that were considered during the development of this plan.

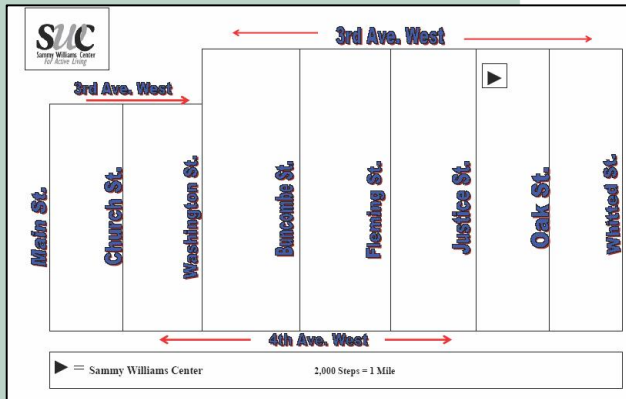
## Current Plans

### Pedestrian Plans

As mentioned in Chapter 2, the community organization Bi-Peds worked with the City in 2005 to inventory sidewalks throughout the community. Individuals performed a walking survey of each street within the City to determine the location and condition of existing

sidewalks. This data was used to create an “existing conditions” map, shown in **Figure 2.1**.

While not as comprehensive as a state-funded pedestrian plan, the Sammy Williams Center for Active Living also created a walking map. Beginning at the Sammy Williams Center, the route illustrates a route for walking a mile circuit, and has been successful in encouraging center visitors to start a walking routine.



Sammy Williams Center for Active Living walking map

## Greenway Plans

Because greenways are typically corridors along a natural area reserved for recreational use, they often complement the network of sidewalks within a community. In 2001, the *Apple Country Greenway Commission Greenways Master Plan* was adopted as a document that addressed greenway needs throughout Henderson County. In addition to identifying existing greenways to be used for recreation and transportation options, the plan also proposed strategies for funding, maintenance, and management. Design concepts were identified along with goals and objectives for greenway development in the county. **Figure 3.1** shows the proposed Apple Country Greenways as referenced in the *Henderson County 2020 Comprehensive Plan*.



Oklawaha Greenway

Hendersonville's existing greenway network is important to the City. Connections are provided between Patton, Sullivan, and Jackson Parks, as well as from key locations to the Mud Creek Nature Trail. This network is heavily traveled by citizens and tourists alike and is considered a major destination for those in the immediate and surrounding areas. **Figure 3.2** shows the existing greenway network.

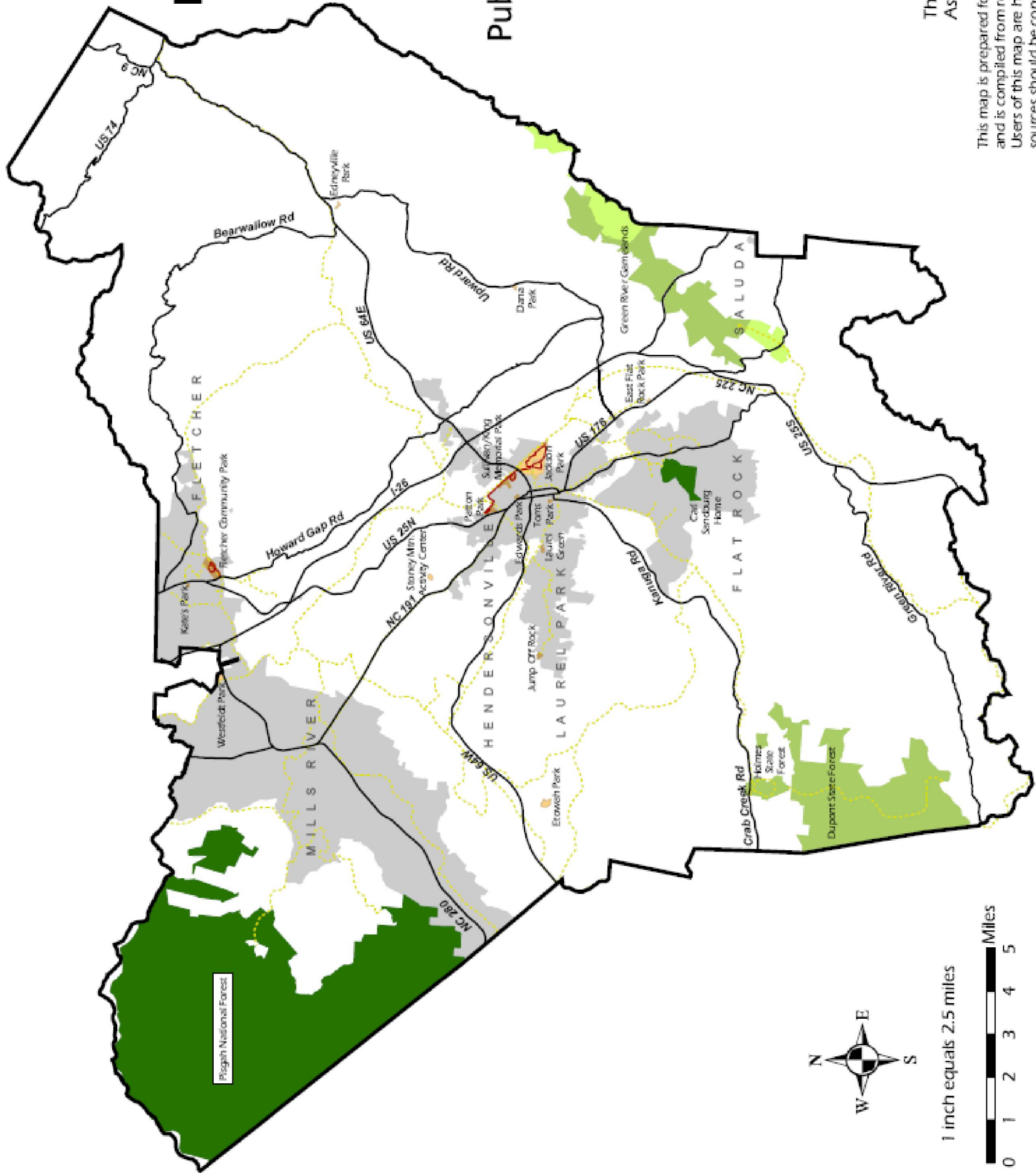
# Henderson County 2020 Comprehensive Plan

## Public Parks, Recreation Sites, and Proposed Greenways

- Major Roads
- Future Greenways
- Proposed Apple Country Greenway
- Municipal Limits
- Park Ownership
  - U.S. Government
  - State of North Carolina
  - N.C. Wildlife Resources Commission
  - Henderson County
  - Municipal

This map was produced by Henderson County GIS, Assessor's, Land Records, & Planning Departments.

This map is prepared for the inventory of real property found within this jurisdiction, and is compiled from recorded deeds, plats, and other public records and data. Users of this map are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information contained on this map. The County and mapping company assume no legal responsibility for the information contained on this map.

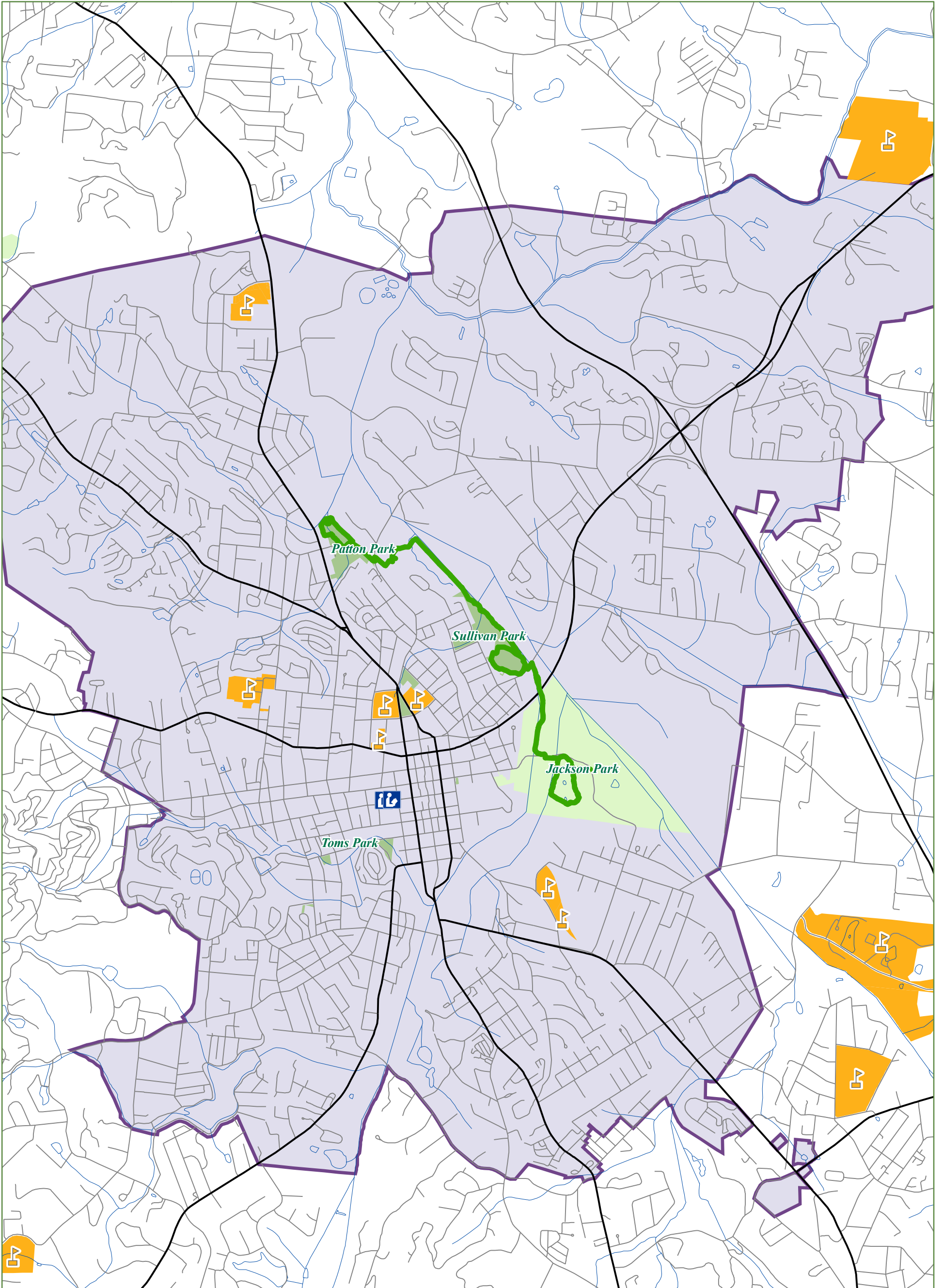


Hendersonville Comprehensive Pedestrian Plan  
 Figure 3.1 ~ Apple Country Greenways

Source: Henderson County 2020 Comprehensive Plan





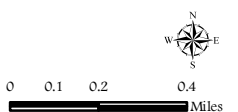


Hendersonville Comprehensive Pedestrian Plan  
**Figure 3.2- Existing Greenway Map**



- Study Area
- Extra Territorial Jurisdiction
- City Parks
- County Parks
- Schools
- Schools
- Library
- Existing Greenway

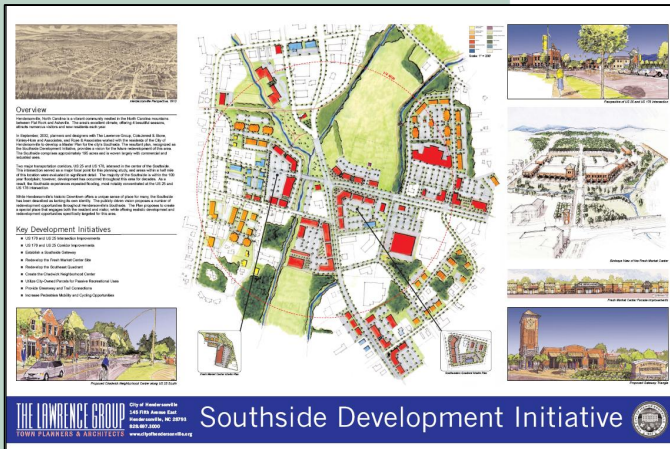
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## Master Plans

The City of Hendersonville initiated a Master Plan for the redevelopment of the City's Southside, an area of approximately 195 acres with US 176 and US 25 intersecting at the center. Key development initiatives of the plan include "providing greenway and trail connections" and "increasing pedestrian mobility and cycling opportunities." The transportation study for this area was adopted by the City Council in October 2006.



## Transportation Plans

The North Carolina Department of Transportation (NCDOT) is responsible for identifying and prioritizing roadway projects that improve safety, set maintenance priorities, protect the environment, and provide alternative transportation choices. This is achieved through the Transportation Improvement Program (TIP), which includes projects in the Hendersonville region. Some projects even encompass pedestrian accommodations. The TIP projects in the Hendersonville region are identified by a combination of letters and numbers, as listed in the project descriptions on this page. The following local projects are identified on the 2006-2012 TIP list.

**I-2800** — Replacement and rehabilitation of pavement on Interstate 26 from SR 1722 (Exit 22) in Henderson County to SR 1142 (Exit 28) in Polk County. *This project is currently at the construction phase, but is unfunded.*

**I-4400** — Widen Interstate 26 to six lanes between US 25 and NC 280. *Planning and design are in progress; construction is currently unfunded.*

**R-2588** — Widen NC 191 to multi-lanes from NC 280 South of Mills River to SR 1411 (Kinsington Road). *Planning in progress.*

**U-4428** — Widen US 64 to three lanes from US 25 to SR 1180 (Blythe Street). *Planning in progress; right-of-way acquisition scheduled for fiscal year 2006; construction scheduled for fiscal year 2008.* (Sidewalks on both sides are indicated on DOT plans.)

**E-4408** — Construct Oklawaha Greenway (multi-use path), sections 2 through 8, from Jackson Park to Patton Park. *Construction scheduled for fiscal year 2007.*

**E-4726** — Construct bikeways/greenways on US 64 West, SR 1756, and US 25 South. *Scheduled for feasibility study.*

**E-4594** — Construct sidewalk and streetscape improvements along Fourth Avenue crossing King, Grove, Pine, and Harris Streets; construct multi-use trail from



Jackson Park to US 64. *Under construction. (While the current TIP lists this project as “under construction,” this project is not currently under construction.)*

In addition to these 2006-2012 TIP projects, NCDOT is completing the design phase of project MA-14013B. This project will consist of the construction of a new bridge over Mud Creek on Old Spartanburg Highway (US 176) with sidewalks on both sides.



## Current Programs

### *Walk Wise, Drive Smart*

As mentioned in Chapter 2, Hendersonville was selected in 2005 by the University of North Carolina Highway Safety Research Center to develop a model program to create safer and more inviting walking environments for older adults. The Hendersonville program is expected to establish a friendly walking environment for senior adults and later can be used as a model by communities across the nation.

Funded by the National Highway Traffic Safety Administration, a team is assessing the walking-friendliness of Hendersonville neighborhoods through pedestrian interviews and environmental audits. The project is being conducted in conjunction with the Senior Friendly Community Initiative, a statewide effort to create more livable communities. The project is intended to raise awareness of older-pedestrian safety issues, as well as educate local traffic engineers, planners, law enforcement personnel, and health professionals on additional steps that can be taken to ensure the safety of older pedestrians.

In addition to funding from the National Highway Traffic Safety Administration, the project is expected to obtain in-kind support from many state and local organizations,

including the N.C. Governor's Highway Safety Program, N.C. Department of Transportation, N.C. Healthy Aging Research Network, Henderson County Council on Aging, N.C. Department of Health and Human Services Division on Aging and Adult Services, Pedestrian and Bicycle Information Center, and Henderson County Healthy Aging Council.



The project website, [www.walk-wise.org](http://www.walk-wise.org), provides additional information about the program and how people can get involved.

### *Community/Advocacy Group Initiatives*

A significant contributor to this plan has been Bi-Peds, a committee of local volunteers that advocate for bicycling and walking as a means for improved community mobility and a healthy way of living. They are focused on helping the City build sidewalks, improve roadways, and develop better land use policies.



In 2005, Bi-Peds worked with Hendersonville to perform a walking survey of each street within the City, determining the location and condition of sidewalks. City staff has used this data to create an "existing conditions" map which serves as a base for the *Hendersonville Pedestrian Plan*.





### **Rails-to-Trails Programs**

While Hendersonville does not currently have any trails converted from unused rails, the opportunity to establish these rail-trails may be considered for future implementation along the Norfolk Southern line to Transylvania County.

### **Rails-to-Trails Conservancy**

The Rails-to-Trails Conservancy is a national program focused on the promotion of national and state level policy that enables trail building. This program protects and encourages the federal transportation enhancement program and defends the federal statute on railbanking. Railbanking is the process of preserving unused but not yet abandoned rail corridors. In addition, the Rails-to-Trails Conservancy offers assistance to the local level through information sharing and training. More information can be found at [www.railtrails.org](http://www.railtrails.org).

### **North Carolina Rails-Trails**

The North Carolina Rails-Trails (NCRT) program is a volunteer organization that works to accomplish the following objectives:

- Establish regional demonstration rail-trails of state significance.

- Obtain favorable rail corridor preservation and interim trail legislation.
- Assist multiple local rail-trail corridor initiatives throughout North Carolina.
- Foster a statewide network of non-motorized commuting and recreation trails.

NCRT pursues rail corridor preservation, retrieval, and conversion to public trails and offers support and leadership to local agencies. More information can be found at [www.ncrail-trails.org](http://www.ncrail-trails.org).



*Rails-to-Trials project — American Tobacco Trail (Durham, NC)*



*Safety is important for children walking to school*

## **Safety and Education Programs**

### **NCDOT Pedestrian and Bicycle Safety Summit Initiatives**

While Hendersonville does not have either of the following specific programs currently underway, safety and education programs can be initiated from state and local officials as well as community stakeholder groups. In late 2000, the Secretary of Transportation directed NCDOT to hold a statewide summit on pedestrian and bicycling safety. The following two initiatives directly related to pedestrian safety resulted from that summit.

#### **Designing Safe Routes to School**

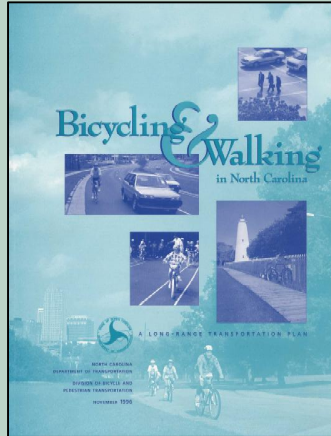
A new federal transportation program will enable and encourage primary and secondary school children to walk and bicycle to school. Both infrastructure-related and behavioral projects will be geared toward providing a safe, appealing environment for walking and biking that will improve the quality of our children's lives and support national health objectives by reducing traffic, fuel consumption, and air pollution in the vicinity of schools. The major nationwide initiative fueling this effort is the Safe Routes to School program. More information is available on the website [www.saferoutestoschool.org](http://www.saferoutestoschool.org).

#### **Bicycle and Pedestrian Safety Education**

Education is critical in the prevention of bicycle and pedestrian crashes. If bicyclists, pedestrians, and motorists do not know and understand standard safety precautions, they are unlikely to practice them. NCDOT's Pedestrian and Bicycle Safety Summit identified the following priorities for pedestrians:

- Develop pertinent safety information and deliver it to target groups, including children, the elderly, and persons convicted of driving under the influence
- Conduct workshops on pedestrian laws for law enforcement officers, transportation officials, public health officials, and others to help them understand their roles in reducing crashes
- Educate motorists about how speeding through neighborhoods and busy urban areas impacts the severity of injury and increases fatalities to pedestrians

More information is available on the websites [www.walkinginfo.org](http://www.walkinginfo.org) and [www.ncdot.org/transit/bicycle](http://www.ncdot.org/transit/bicycle).



## North Carolina Department of Transportation Bicycling and Walking Long Range Plan

The NCDOT Office of Bicycle and Pedestrian Transportation developed a statewide pedestrian plan to complement the North Carolina long range transportation plan by elaborating on the goals, focus areas, and programs specific to biking and walking. The plan — *North Carolina: Bicycling and Walking in North Carolina: A Long Range Transportation Plan* — provides a survey of local leaders within communities of more than 1,000 persons assessing the local walking environment. In addition, the plan discusses crash data and reviews relevant pedestrian content of metropolitan planning organizations (MPOs) throughout the state. The resulting plan includes a list of actions and funding sources as well as a call for project evaluation. The entire plan can be reviewed at [www.ncdot.org/transit/bicycle/about/longrangeplan2.pdf](http://www.ncdot.org/transit/bicycle/about/longrangeplan2.pdf).

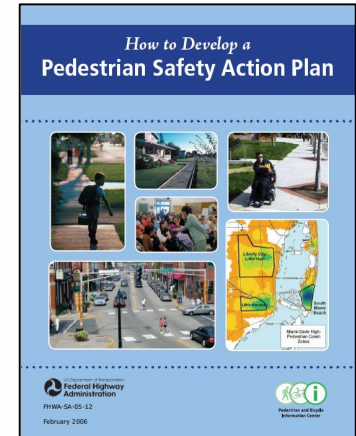
## Developing a Pedestrian Safety Action Plan

Organizations other than NCDOT also have considered guidelines for helping communities provide a safe pedestrian environment. Community stakeholders interested in developing and implementing safety plans can review the recent publication prepared by the Highway Safety Research Center for USDOT. Titled *How to Develop a Pedestrian Safety Action Plan*, this report

presents an overview and framework for state and local agencies to develop and implement a Pedestrian Safety Action Plan tailored to their specific problems and needs. Such a plan is developed by community stakeholders to accomplish the following:

- Improve pedestrian safety throughout the community
- Help state and local officials know where to begin to address pedestrian safety issues
- Assist agencies in further enhancing their existing pedestrian safety programs and activities

This guide can be used by engineers, planners, traffic safety and enforcement professionals, public health and injury prevention professionals, and decision-makers who have the responsibility of improving pedestrian safety at the state or local level. The plan can be viewed at [www.walkinginfo.org/pp/howtoguide2006.pdf](http://www.walkinginfo.org/pp/howtoguide2006.pdf).





## Law Enforcement Programs and Initiatives

### North Carolina Bicycle and Pedestrian Laws

The North Carolina Department of Motor Vehicles provides general statutes that relate to pedestrians. NCDOT Division of Bicycle and Pedestrian Transportation assembled *A Guide to North Carolina Bicycle and Pedestrian Laws* to aid in the education and enforcement of pedestrian safe practices and laws.

Included in this guide is statute 20-173, regarding the Pedestrians' Right-of-Way at Crosswalks:

- (a) Where traffic-control signals are not in place or in operation the driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at or near an intersection.
- (b) Whenever any vehicle is stopped at a crosswalk at an intersection to permit a pedestrian to cross, the driver of any other vehicle approaching from the rear shall not overtake and pass such stopped vehicle.
- (c) Pedestrians have the right-of-way when approaching an alley, building entrance, private road, or driveway, from any sidewalk or walkway.

### North Carolina School Crossing Guard Training Program

The Division of Bicycle and Pedestrian Transportation initiated a program to train local law enforcement officers who are responsible for training school crossing guards. This course is offered throughout the state and the objectives include the following:



A crossing guard at work

- To protect North Carolina school children by standardizing instruction and procedures for crossing guards so that motorists across the state will know what to expect as they travel through school zones across the state.
- To teach children proper pedestrian skills so they will cross safely at other times and locations.

More information can be found at [www.ncdot.org/transit/bicycle/safety/programs\\_initiatives/crossing.html](http://www.ncdot.org/transit/bicycle/safety/programs_initiatives/crossing.html).





## Encouragement Programs

### National Walk to School Day

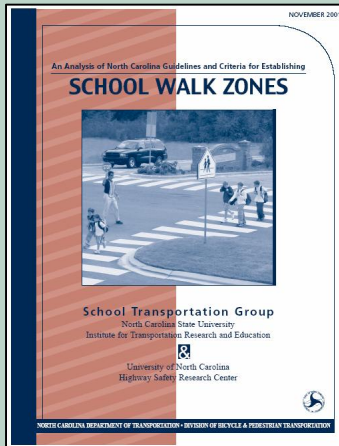
Many cities across the country participate in the National Walk to School Day in October of each year. This program encourages parents, caregivers, faculty, staff, and children to walk to school together. This program has three objectives:



- Encourage adults to teach children safe pedestrian behaviors
- Have adults help children identify and practice safe routes to school
- Remind everyone of the tremendous health benefits of regular, daily walking

### School Walk Zones

The NCDOT Division of Bicycle and Pedestrian Transportation sponsored a study in 2002 that focused on compilation, analysis, and review of existing policies and practices in school zones. The project was intended to research the potential for development of standardized school walk zone policies for the state.



## Maintenance Programs

People will feel safer and will thereby be more likely to use pedestrian facilities if they are well-maintained. The City of Hendersonville designates Powell Bill budget funds each year to repair existing facilities. Powell Bill funds are collected by the state in the form of a gasoline tax. These funds are returned by NCDOT to eligible cities and towns for maintaining, repairing, constructing, reconstructing, or widening municipal streets. Powell Bill funds also are used for the construction and maintenance of sidewalks and bikeways located within the rights-of-way of public streets and highways. With so much time spent on developing these facilities, it only makes sense to identify ways of updating it.

Hendersonville replaced or constructed 3,485 linear feet of sidewalk from 2004 to 2005. The 2006 budget for sidewalk construction and repairs is \$60,000.





***Hendersonville sidewalk policy states that “sidewalks shall be provided in residential zoning districts on one side of every street and in nonresidential districts along both sides of the street.”***

*-Section 6-12, Hendersonville Zoning Ordinance*

## Current Pedestrian Policy

### Local Policy

Hendersonville’s adopted policy regarding sidewalks is found in Section 6-12 of the City’s zoning ordinance:

It is the intent of this section that sidewalks shall be provided in residential zoning districts on one side of every street and in nonresidential districts along both sides of the street. Sidewalks shall be constructed from property line to property line within the street right-of-way, or, in the alternative, within areas set aside by dedication, or otherwise, in accordance with the City’s Sidewalks and Driveway Entrance Standards.

In addition, Section 6-12-3 specifies a payment in lieu of sidewalk construction option for developers which states:

When site characteristics and/or traffic patterns are such that the construction of sidewalks in accordance with this section would be a hardship and would not result in useful pedestrian walkways, the City Manager may allow the applicant to pay the cost of constructing such sidewalks into the City Sidewalk Fund in lieu of requiring construction of the sidewalks.

The Hendersonville Subdivision Ordinance also lends guidance to local developers. Section 501.5 requires the following:

Sidewalks shall be constructed within the street right-of-way or, in the alternative, within areas set aside by dedication, condemnation, or otherwise in accordance with standards of the department of public works. Sidewalks shall be required as follows.

- 1) On all internal roads within a subdivision, a sidewalk shall be required on one side of every street. On streets that end in cul-de-sacs, the sidewalk need only be constructed along the edge of the street, and not around the arc of the radius of the cul-de-sac.
- 2) On all paved peripheral streets of a subdivision, a sidewalk shall be required along its frontage when one of the following conditions exist:
  - a) When the subdivision adjoins property with existing sidewalk.
  - b) When an existing sidewalk is within four hundred (400) feet of the subdivision.
  - c) When the subdivision is within one and one-half (1.5) miles linear traverse of a school, hospital, library, or government building.



- d) Where deemed necessary if designated by the planning board to benefit public safety or convenience.
- 3) In cases where a sidewalk exists on the opposite side of a peripheral street, but not along the area directly opposite the subdivision, and one of the criteria in 501.5(2) above are met, the planning board may require that the sidewalk be built on the opposite side for that part of its frontage, in order to provide for a more continuous flow of sidewalk.
- 4) In cases where a sidewalk already exists on the opposite side of a peripheral street, and no sidewalk exists along the property adjacent to the subdivision, then a sidewalk is not required to be built along the peripheral street.

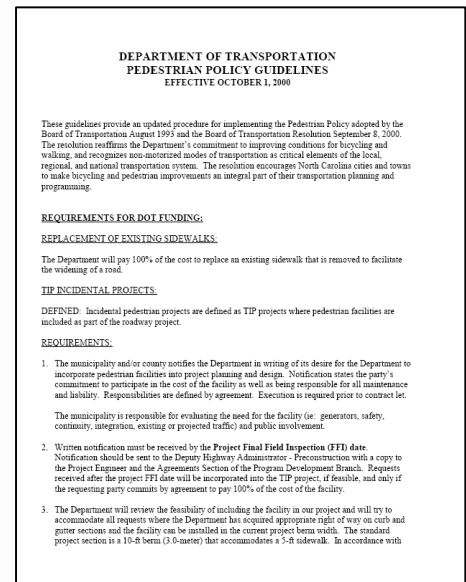
The City of Hendersonville also provides guidance to encourage pedestrian friendly development within mixed-use and urban zones specified in Chapter 5 of the Code of Ordinances. Each of the mixed-use and urban zone categories below specify pedestrian design:

- Central Mixed-Use — Section 5.19
- Greenville Highway Mixed-Use — Section 5.22
- Highway Mixed-Use — Section 5.23
- Urban Village — Section 5.24
- Urban Residential — Section 5.25

## State and Federal Policy

In 1993, a sidewalk policy was developed to partner the NCDOT with local communities to construct sidewalks as incidental features of highway improvement projects. A municipality can request state money to fund a sidewalk if it can provide a certain amount of matching funds, determined by population.

In addition to the statewide sidewalk policy, NCDOT's pedestrian policies are being revised to address the Intermodal Surface Transportation Enhancement Act (ISTEA). *The Department of Transportation Pedestrian Policy Guidelines*, effective in October 2000, "encourages North Carolina cities and towns to make bicycling and pedestrian improvements an integral part of their transportation planning and programming."





## Existing Pedestrian Facility Design Guidelines

### State and Federal Guidelines

Because the recommendations presented in the *Hendersonville Pedestrian Plan* are based on practical experience and industry-accepted assumptions, it is helpful to consider facility guidelines from several organizations. The following section represents a brief summary of existing state and federal guidelines that were reviewed to develop the recommended design guidelines in Chapter 4 of this document. The review included the *AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities*<sup>1</sup>, *Manual on Uniform Traffic Control Devices*<sup>2</sup>, *Design and Safety of Pedestrian Facilities*<sup>3</sup>, *Pedsafe: Pedestrian Safety Guide and Countermeasure*

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<sup>1</sup> American Association of State Highway and Transportation Officials (AASHTO), *AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities*, Washington, DC, 2004.

<sup>2</sup> Federal Highway Administration (FHWA), *Manual on Uniform Traffic Control Devices*, Washington, DC, 2003.

<sup>3</sup> Institute of Transportation Engineers, *Design and Safety of Pedestrian Facilities, A Recommended Practice of the Institute of Transportation Engineers*, Washington, DC, 1998

*Selections System*<sup>4</sup>, and *Designing Sidewalks and Trails for Access, Part I and II*<sup>5</sup>.

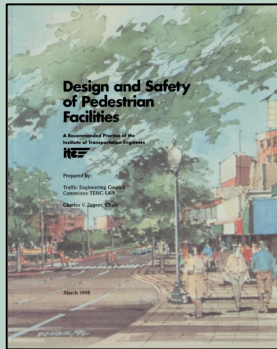
### AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities

The *AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities* discusses planning, design, operations, and maintenance issues associated with pedestrian facilities within the public rights-of-way. With respect to design, it addresses width dimensions, grades, cross slopes, radii, acceleration rates, deceleration rates, and sight distances.

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<sup>4</sup> U.S. Department of Transportation Federal Highway Administration, *Pedsafe: Pedestrian Safety Guide and Countermeasure Selections System*, Washington, DC, 2004

<sup>5</sup> U.S. Department of Transportation Federal Highway Administration, *Designing Sidewalks and Trails for Access, Part I and II*, Washington, DC, 2001





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

Failure to comply with the *MUTCD* can result in being denied federal funds and opens up non-compliant jurisdictions to additional liability in the event of a crash. The *MUTCD* addresses standards for signing, striping, markings, signals, islands, and traffic work zone devices (e.g., cones and barricades). It provides information on what symbols may be used on signs and when sign text can vary from the signs provided. The color, width, types, and applications of striping are defined in detail. It also provides dimensions and shapes of pavement markings and pavement lettering.

### **Pedsafe: The Pedestrian Safety Guide and Countermeasure Selection System**

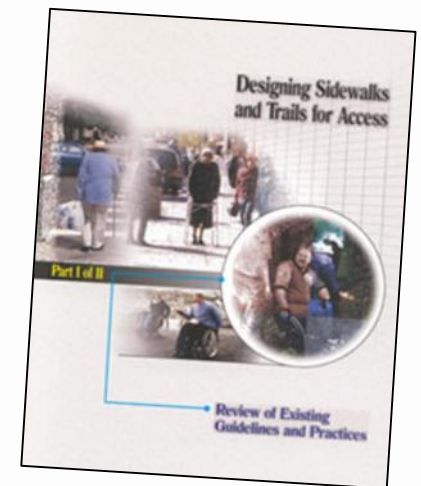
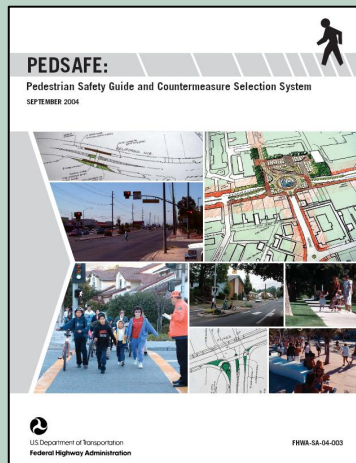
This guide is a comprehensive resource for practitioners and provides an online tool that offers specific countermeasures based on user input. The document is an excellent resource for engineering treatments, education and enforcement programs, and other countermeasures that may be implemented to improve pedestrian safety and mobility. More information can be found at [www.walkinginfo.org/pedsafe/](http://www.walkinginfo.org/pedsafe/).

### **Design and Safety of Pedestrian Facilities, A Recommended Practice of the Institute of Transportation Engineers**

This document presents recommended practices and guidance for the “design and safety of pedestrian facilities to provide safe and efficient opportunities for people to walk near streets and highways.” These guidelines offer a comprehensive review of engineering, education, and enforcement techniques to improve safety for pedestrians.

### **Designing Sidewalks and Trails for Access, Parts 1 and 2**

This document provides guidelines to help the engineers and planners design sidewalks and trails that comply with the Americans with Disabilities Act (ADA) of 1990.





## Facility Design

Development of the *Hendersonville Pedestrian Plan* involved reviewing pedestrian facility design guidelines for sidewalks and walkways, curb ramps, marked crosswalks and enhancements, transit stop treatments, multi-use paths, and sidepaths/wide sidewalks. As a result of this review, specific recommendations for Hendersonville's sidewalk policy and design guidelines can be found in Chapter 4. State and federal guidelines for facility design are identified here.



*Clear pathway*

## Sidewalks and Walkways

The Federal Highway Administration (FHWA) defines walkways as generally being “pedestrian paths, including plazas and courtyards” and sidewalks as “walkways that are parallel to a street or highway.” It recommends that sidewalks and walkways be designed with the following characteristics in mind:

- Wide pathways
- Clearly defined pedestrian furniture and frontage zones
- Minimal obstacles
- Minimal protruding objects
- Moderate grades and cross slopes
- Rest areas outside pedestrian zones

- Minimal changes in level
- Firm, stable, and slip resistant surfaces
- Good lighting

The Institute of Traffic Engineers (ITE), the American Association of State Highway and Transportation Officials (AASHTO), and FHWA all recommend a minimum width of 5 feet for a sidewalk or walkway, which allows two people to pass comfortably or to walk side-by-side. It is also preferred that a 4- to 6-foot buffer zone be provided to separate pedestrians from the street.

Sidewalks and walkways should be designed such that grades and cross slopes are minimized to allow those with mobility impairments to negotiate with greater ease. FHWA recommends that the grade and cross slope not exceed 5 and 2 percent, respectively, wherever possible.



*Wide sidewalk*



*Curb ramp*

## Curb Ramps

Curb ramps provide access between the sidewalk and street for people with mobility limitations and vision impairments. While different designs for curb ramps exist, FHWA suggests the following best practices:

- Provide a level maneuvering area or landing at the top of the curb ramp
- Clearly identify the boundary between the bottom of the curb ramp and the street with a detectable warning
- Design ramp grades that are perpendicular to the curb
- Place the curb ramp within the marked crosswalk area
- Avoid changes of grade that exceed 11 percent over a 24-inch interval
- Design the ramp so that it doesn't require turning or maneuvering on the ramp surface
- Provide a curb ramp grade that can be easily distinguished from surrounding terrain; otherwise, use detectable warnings
- Design the ramp with a grade of  $7.1 \pm 1.2$  percent — do not exceed 1:12

- Design the ramp and gutter with a cross slope of 2 percent
- Provide adequate drainage to prevent the accumulation of water or debris on or at the bottom of the ramp
- Transitions from ramps to gutter and streets should be flush and free of level changes
- Align the curb ramp with the crosswalk, so there is a straight path of travel from the top of the ramp to the center of roadway to the curb ramp on the other side
- Provide clearly defined and easily identified edges or transitions on both sides of the ramp to contrast with sidewalk



*Ramp texture*

Curb ramps must be installed at all intersections and mid-block locations where pedestrian crossings exist, as mandated by federal ADA legislation. Curb ramps provide critical access for those with mobility impairments and are crucial for communities to comply with federal ADA requirements.



*Raised crosswalk*



*Pedestrian refuge island*



*Curb extension*

## Marked Crosswalks and Enhancements

Marked crosswalks indicate the optimal location for pedestrians to cross a street. In North Carolina, pedestrians within a crosswalk have the right-of-way and motorists must yield. Crosswalks are usually installed at signalized intersections, though more and more localities are installing crosswalks at mid-block locations. In locations that require increased levels of pedestrian visibility, enhancements such as raised crosswalks and pedestrian refuge islands can be incorporated into the crosswalk and street design.

A raised crosswalk elevates the roadway by 3 to 6 inches. The effect reduces the speed of automobiles and provides increased visibility for high pedestrian-traveled areas. Raised crosswalks should be well-lit and well-marked so motorists can detect them at night and during inclement weather.

A pedestrian refuge island is a raised island placed in the center of a street to protect pedestrians from vehicles. At such a crossing, pedestrians can concentrate on crossing one direction of traffic at a time by crossing to the center island and waiting for a gap in traffic to complete the trip across the street.

Curb extensions extend the sidewalk into the street to improve pedestrian safety by calming traffic, increasing driver awareness of pedestrian activity, and shortening the

crossing distance for pedestrians. Curb extensions can be placed at intersection or mid-block crossings, and when combined with landscaping can compensate for overly wide streets and improve the street's character.

## Transit Stop Treatments

To accommodate as many users as possible, a transit system must include well-planned routes and safe, accessible stops. Bus stops should be designed to accommodate the appropriate number of users and should be highly visible to pedestrians and motorists.

The location of the bus stop on a block is critical for pedestrian safety. For example, it is good practice to construct a transit stop just beyond an intersection, which encourages riders to cross the intersection behind the bus and in full view of approaching motorists. The location also should be set back enough from the roadway to buffer users from pedestrian activity.



*Transit shelter well-connected with pedestrian facilities*

Safety and comfort at a bus stop is determined by the amenities offered to users. Bus stop signage including





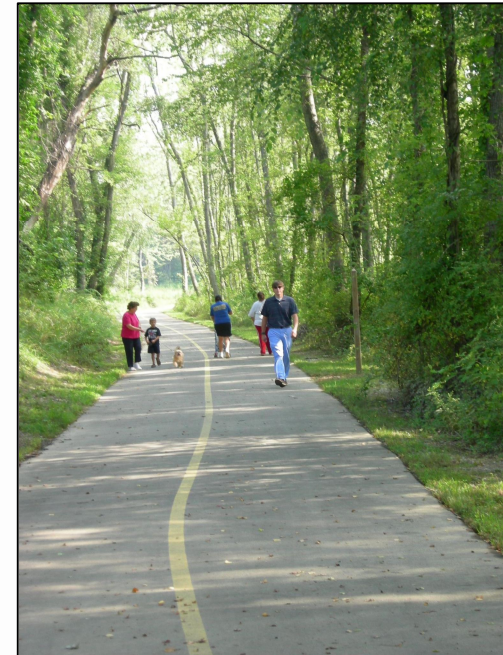
route information, shelter with seating, trash cans, and bicycle parking encourage transit use. Pedestrian-level lighting improves the visibility of pedestrians to motorists and increases the level of safety for users.

### **Multi-Use Paths on Independent Alignments**

Multi-use paths — also known as shared use trails — are becoming quite popular, not only with pedestrians, but with many non-motorized transportation device users across the country. They can provide a high-quality pedestrian experience in an environment that is protected from motor traffic because they are constructed in their own corridor, often within open-space area. Multi-use paths can be paved and should be a minimum of 10 feet wide. Their width may be reduced to 8 feet, depending upon physical or right-of-way constraints. Additional width should be considered for areas with difficult terrain or heavy traffic.

Multi-use paths are, in effect, little roads and should be designed with clearance requirements, minimum radii, stopping sight distance requirements, and other criteria — similar to the criteria for roadway design. High standards should be observed when designing these paths, especially considering that typically little federal and state money is available for their maintenance. Designers must comply with the *MUTCD* and *AASHTO Bicycle Guide* when designing these facilities.

Though paths should be thought of as roadways for geometric and operational design purposes, they require much more consideration for amenities than do roadways. Shade and rest areas with benches and water sources should be designed along multi-use paths. Where possible, vistas should be preserved. Way finding signs (e.g., how far to the library or the next rest area, or directions to restrooms) are important for non-motorized users. These types of design considerations can help make a multi-use path more attractive to potential users.



*Oklawaha Trail*



## Sidepaths/Wide Sidewalks

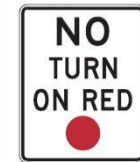
A sidepath is essentially a multi-use path that is oriented alongside a road. The *AASHTO Bike Guide* and *North Carolina Design Guidelines* strongly caution those communities contemplating the construction of a sidepath (or wide sidewalk) facility to investigate various elements of the roadway corridor environment and right-of-way before committing to its construction. AASHTO provides nine cautions and criteria for designing sidepaths.

In addition to the AASHTO cautions, research from the U.S. and abroad confirms that bicycle and motor vehicle crash rates are higher for bicyclists riding on a sidepath than on a roadway. Consequently, designers are advised to be very careful when choosing to design sidepaths.

Some high-volume, high-speed roadways exist where sidepaths are the only bicycle facility that can be provided without costly changes to the roadway corridor. In these cases, a sidepath may be the preferred alternative. This decision to construct a sidepath, however, must consider the magnitude of intersecting driveway and roadway conflicts.

One recently completed research study suggests that some of the safety risks associated with sidepaths can be mitigated. This research effort found that at signalized intersections, it is best to treat the path roadway crossings as crosswalks, bringing the pathway close to the adjacent roadway so its signals can be incorporated into the overall signalization plan. Additional treatments to the typical pedestrian heads may be desirable at these intersections. The most significant of these supplemental treatments is the blank-out sign, NO RIGHT ON RED or

YIELD TO PEDS IN CROSSWALK signage may increase motorist awareness of individuals riding (or walking) in the crosswalks.



R10-11

At unsignalized intersections, it is best to move the sidepath out of the area of the side street intersection with the adjacent roadway. This allows motorists to deal with one intersection at a time.



R1-5

*MUTCD Regulatory Signs*



## Chapter 4 — Recommended Projects, Guidelines, and Programs

### Introduction

The City of Hendersonville Comprehensive Pedestrian Plan was developed based on steering committee, City staff, Bi-Peds (a grass-roots pedestrian and bicycle advocacy group), and public input. Collectively, draft recommendations were formed and presented at a public workshop on September 28, 2006 where participants were asked for their feedback and comments related to the draft short- and long-term pedestrian projects, guidelines, and policy recommendations. The public participant's comments and concerns were addressed and the following projects and guidelines represent a summary of the recommended plan.

### Recommended Projects

Short- and long-term projects were identified and prioritized based on the overall vision and goals established for this plan, introduced in Chapter 1. By clearly identifying priorities and projects, Hendersonville's efforts can be better focused on implementation. The priorities for this planning effort involve improving connectivity for the pedestrians, constructing new sidewalks as needed, and implementing intersection upgrades with sidewalk construction. These improvements

have been prioritized into short-term (5 years) and long-term (5-20 years) projects.

### Short-Term Pedestrian Projects

Fifteen short-term pedestrian projects have been selected within the study area based on existing conditions data (such as existing infrastructure, crash analysis, topography, and other key information), as well as local staff, committee, and public input. These projects represent the highest priority, most cost-effective, and most constructible projects identified during the plan development process. They include construction of safe street crossings (with pedestrian signals and painted crosswalks), sidewalk improvements, and new sidewalk and greenway construction. The short-term projects are shown in **Figure 4.1**. General cost estimates were performed based on unit costs from the City, construction projects in surrounding areas, and NCDOT construction costs. General cost estimates are communicated in **Table 4.1**. The short-term pedestrian projects are described below in no particular order. It is recommended that these projects be implemented as opportunities arise for funding.





### **A. King Street Sidewalk Infill**

This 560-foot corridor is located between 1<sup>st</sup> Avenue East and 3<sup>rd</sup> Avenue East in downtown Hendersonville. One side of the corridor has an existing sidewalk. Constructing sidewalks along both sides of this corridor would enhance the connectivity of the pedestrian infrastructure throughout the downtown area. New sidewalks are recommended for construction on both sides of this corridor.

**Estimated cost: \$41,000** (excluding right-of-way costs)

### **B. Grove Street Sidewalk Infill**

This improvement involves a 350-foot corridor between 2<sup>nd</sup> Avenue East and 3<sup>rd</sup> Avenue East in the downtown section of Hendersonville. Similar to the King Street Sidewalk Infill improvement project, constructing sidewalks along both sides of this corridor would improve pedestrian safety while increasing the connectivity of the pedestrian infrastructure throughout the downtown area. New sidewalks are recommended for construction on both sides of this corridor.

**Estimated cost: \$27,000** (excluding right-of-way costs)

### **C. Church Street Sidewalk Infill**

Church Street between 1<sup>st</sup> Avenue East and Kanuga Road is near several municipal buildings, parks, and the library. Improvements along this corridor should improve

connectivity and safety for pedestrians and provide enhanced access to pedestrian attractions. Sidewalks are recommended for construction continuously along both sides of this 1,050-foot corridor.

**Estimated cost: \$69,000** (excluding right-of-way costs)

### **D. Four Seasons Boulevard (US 64) Sidewalk Improvement**

This 1.7-mile corridor between Dana Road and Howard Gap Road is located in the northeast quadrant of the city. The land use in the area is primarily commercial. New sidewalks are recommended for construction on both sides of the corridor as a short-term treatment. Additional short-term improvement recommendations include creating safe crossings at the following intersections:

- Hyder Street
- Highlands Square Drive
- Howard Gap Road
- Thompson Street
- Linda Vista Drive
- Dana Road

The safe crossing improvement recommendations include new signal design and construction to accommodate crosswalks and pedestrian signal operations.

**Estimated cost: \$765,000** (excluding right-of-way costs)



### **E. Britton Creek Greenway**

This 1.6-mile corridor is located parallel to Haywood Road (NC 191). Construction of a greenway along Britton Creek would provide a critical connection for those existing neighborhoods northwest of downtown Hendersonville to the city center and more extensive sidewalk facilities.

**Estimated cost: \$190,000** (excluding right-of-way costs)

### **F. South Main Street Pedestrian Safety Improvements**

This 1, 500-foot corridor is located between Spartanburg Highway (US 176) and Casewell Street close to downtown Hendersonville. The condition of the sidewalks along this corridor is poor and includes inadequate widths, large crack formations, and deficient accessibility for persons with special needs. In addition, crosswalks need to be upgraded and repainted in several locations. Short-term safe crossing improvements are recommended at the intersection of Spartanburg Highway (US 176) and are associated with Project H – Spartanburg Highway (US 176) – Greenville Highway (NC 225) to Clover Avenue.

**Estimated cost: \$112,000** (excluding right-of-way costs)

### **G. Old Spartanburg Road Sidewalk Improvement**

This roadway is a 0.75-mile corridor between Spartanburg Highway (US 176) and Barnwell Street in the southeast quadrant of the city. The land use in this corridor is predominately residential. Also, a private school is located at Old Spartanburg Road and Substation Street serving students who would benefit from a more connected, continuous sidewalk network in the area. The short-term recommendation involves constructing new sidewalks on both sides of the roadway.

**Estimated cost: \$262,000** (excluding right-of-way costs)

### **H. Spartanburg Highway (US 176) – Greenville Highway (NC 225) to Glover Avenue**

This recommended project along Spartanburg Highway (US 176) between Greenville Highway (NC 225) and Glover Avenue is a 0.75-mile corridor with significant pedestrian traffic on both sides of the roadway. The construction of sidewalks on both sides of the roadway is recommended as a short-term improvement. Safe crossing improvements are recommended as short-term priorities along this corridor at the following intersections:

- Greenville Highway (NC 225)
- Chadwick Avenue



**Estimated cost: \$339,000** (excluding right-of-way costs)

### **I. Spartanburg Highway (US 176) – Glover Avenue to Upward Road**

This 1.4-mile corridor with significant pedestrian traffic on one side of the roadway is located along Spartanburg Highway (US 176) between Glover Avenue and Upward Road. A new sidewalk is recommended for construction as a short-term pedestrian improvement. A short-term safe crossing improvement is recommended at the intersection with Brooklyn Avenue.

**Estimated cost: \$300,000** (excluding right-of-way costs)

### **J. Greenville Highway (NC 225)**

The Greenville Highway (NC 255) project is 1,700 feet in length and has no existing sidewalks between Brooklyn Avenue and Shepherd Street. Sidewalks will be constructed in 2007 along the east side of this corridor.

**Estimated cost: \$193,000** (excluding right-of-way costs)

### **K. Green Meadows Greenway Connector**

The Green Meadows Greenway Connector is a proposed multi-use path on new location. The project is approximately 720 feet in length and is recommended to

provide a link between the Sullivan Park at the terminus of Martin Circle and the regional greenway.

**Estimated cost: \$17,000** (excluding right-of-way costs)

### **L. Intersection of King Street and Martin Luther King, Jr. Drive (US 64)**

The intersection of King Street and Martin Luther King, Jr. Drive (US 64) has been identified as a safety concern by the public and local staff. This intersection should be improved to safely accommodate pedestrians.

**Estimated cost: \$38,000** (excluding right-of-way costs)

### **M. Blythe Street Sidewalk Improvement**

Blythe Street is a 1.4-mile thoroughfare in the northwestern quadrant of the city. Land use along the street is primarily residential, but the corridor serves as a connector between Brevard Road (US 64) and Haywood Road (NC 191). The narrow travelway does not adequately accommodate pedestrians. Steep grades only allow sidewalk construction on one side of the roadway. A sidewalk is recommended for construction along one side of this corridor as a short-term improvement.

**Estimated cost: \$240,000** (excluding right-of-way costs)



### **N. Patton Park Greenway Connector**

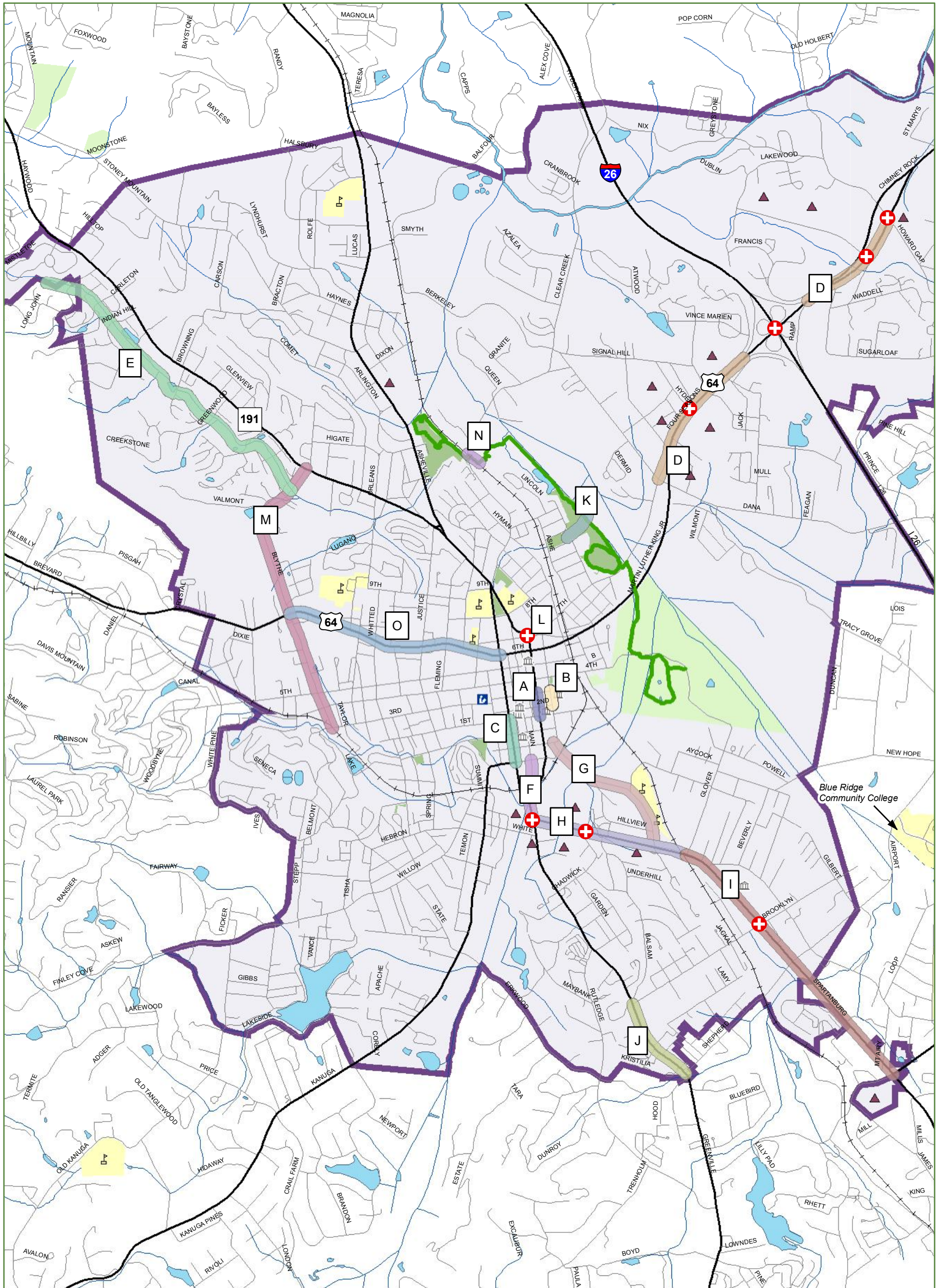
The Patton Park Greenway Connector is a proposed 960-foot multi-use path. It has been recommended to improve a link from Mud Creek Nature Trail/Clear Creek Road to Patton Park. The railroad tracks have been identified as a potential constraint associated with this project, requiring careful consideration and coordination to construct a safe crossing for pedestrians.

Estimated cost: \$22,000 (excluding right-of-way costs)

### **O. 6<sup>th</sup> Avenue (US 64) – North Church Street (US 25) to Blythe Street**

This 1.0-mile corridor with significant pedestrian traffic is located along 6<sup>th</sup> Avenue (US 64) between Church Street (US 25) and Blythe Street. New sidewalk is recommended for construction as a short-term pedestrian improvement and should be constructed as part of NCDOT's TIP widening project U-4428. Sidewalks are currently indicated on DOT plans.

Estimated cost: \$390,000 (excluding right-of-way costs)



Hendersonville Comprehensive Pedestrian Plan  
**Figure 4.1 ~ Short-Term Recommended Pedestrian Projects**



- Study Area
- Streets
- Extra-Territorial Jurisdiction
- Existing Greenways
- City Parks
- Railroad
- County Parks
- Government Buildings
- Library
- Schools
- Shopping Centers
- Short-Term Crossing Improvement
- Project ID

Kimley-Horn and Associates, Inc.



0 0.125 0.25 0.5 Miles





**Table 4.1 - General Cost Estimates, Short-Term Projects**

Project ID	Project Name	Improvements	Length (feet)	Estimated Cost	Cost Estimate Includes:
A	King Street Sidewalks	New Sidewalk Infill	560	\$41,000	New 5' Sidewalk Infill (both sides), new curb and gutter (both sides), and 12 curb ramps
B	Grove Street Sidewalks	New Sidewalk Infill	350	\$27,000	New 5' Sidewalk Infill (both sides), new curb and gutter (both sides), and 8 curb ramps
C	Church Street Sidewalks	New Sidewalk Infill	1,050	\$69,000	New 5' Sidewalk Infill (both sides), new curb and gutter (both sides), and 16 curb ramps
D	US 64/Four Seasons Blvd Sidewalks	New Sidewalk	8,730	\$765,000	New 5' Sidewalk (both sides), new curb and gutter (both sides), 54 curb ramps, and 4 pedestrian intersection upgrades
E	Britton Creek Greenway	New Greenway	8,450	\$190,000	New 8' multi-use path, 12' clearing and grubbing
F	Main Street Pedestrian Safety	Sidewalk Repair	1,500	\$112,000	Repair 5' sidewalk, new curb and gutter (both sides), and 10 new curb ramps
G	Old Spartanburg Road Sidewalks	New Sidewalk	3,860	\$262,000	New 5' Sidewalk (both sides), new curb and gutter (both sides), and 16 curb ramps
H	US 176/Spartanburg Highway Sidewalks	New Sidewalk Infill	3,840	\$339,000	New 5' sidewalk (both sides), new curb and gutter (both sides), 18 curb ramps, and 2 pedestrian intersection improvements
I	US 176/Spartanburg Highway Sidewalks	New Sidewalk Infill	7,430	\$300,000	New 5' Sidewalk (one side), new curb and gutter (one side), 24 curb ramps, and 1 pedestrian intersection improvement
J	NC 225/Greenville Hwy Sidewalks	New Sidewalk	1,700	\$193,000	New 5' Sidewalk (both sides), new curb and gutter (both sides), and 22 curb ramps
K	Green Meadows Greenway Connector	New Multi-Use Path	720	\$17,000	New 8' multi-use path, 12' clearing and grubbing
L	King Street and US 64 Pedestrian Intersection Improvement	Intersection Improvement	-	\$38,000	New Pedestrian signals and pavement markings, four new curb ramps, and new sidewalks in the approach of the intersection
M	Blythe Street Sidewalks	New Sidewalk	7,090	\$240,000	New 5' Sidewalk (one side), new curb and gutter (one side), and 44 curb ramps
N	Patton Park Greenway Connector	New Multi-Use Path	960	\$22,000	New 8' multi-use path, 12' clearing and grubbing
O	6th Avenue / US 64 Sidewalks	New Sidewalk	5,400	\$390,000	New 5' Sidewalk (both sides), new curb and gutter (both sides), and 20 curb ramps
<b>TOTAL:</b>				<b>\$3,005,000</b>	

\*\*No Right-of-Way has been included for these estimates

\*\*\*The following represent unit costs that were used for this estimate:

- New Sidewalk = \$15.00/LF
- Sidewalk Repair = \$16.63/LF
- New Curb and Gutter = \$13.50/LF
- New Multi-Use Path = \$17.60/LF
- Multi-Use Path Clearing and Grubbing = \$2.75/LF
- Design and Construction for Pedestrian Upgrades = \$38,000/intersection
- Curb Ramps = \$1200



**VISION STATEMENT**

**“Hendersonville will develop and maintain a pedestrian network that includes sidewalks, pedestrian crossings, and greenways that:**

- **Offer safety and connectivity to citizens and visitors**
- **Motivates and rewards the choice to walk and use transit**
- **Improves access for those with disabilities**
- **Integrates and balances pedestrians with other modes of transportation**
- **Adds to the quality of life and unique character of the City of Hendersonville”**

**Long-Term Pedestrian Projects**

Although fourteen short-term projects were identified during the planning process, a need for pedestrian facilities beyond these projects exists. **Figure 4.2** displays the long-term comprehensive pedestrian plan network. The pedestrian facility infrastructure is recommended based on identified needs, connectivity improvements, environmental and built constraints, existing plans and general feasibility. The long-term network provides local staff, citizens, and developers with a vision plan that can be implemented over the next 20 years to further the vision and goals established during this planning process.

**Table 4.2** summarizes the recommended long-term general cost estimates based on facility type. This plan includes a recommended approximately 19 miles of new sidewalk, 0.75 miles of new greenway, and 22 intersection improvements be constructed. Long-term projects are recommended along corridors such as Haywood Road (NC 191), Greenville Highway (US 225), Brooklyn Avenue, and several other areas that will increase the connectivity of Hendersonville’s pedestrian network. The long-term pedestrian projects are described below in no particular order. It is recommended that these projects be implemented as opportunities arise.

**P. Haywood Road (NC 191) Sidewalk**

It is recommended that sidewalks be constructed on both sides of Haywood Road (NC 191) from Holly Hill Drive to Asheville Highway (US 25 Business). This corridor is approximately 11,950 feet in length.

**Q. Higate Road Sidewalk**

It is recommended that sidewalks be constructed on both sides of Higate Road from Ewbank Drive to Asheville Highway (US 25 Business). This corridor is approximately 2,650 feet in length.

**R. Browning Avenue Sidewalk**

It is recommended that sidewalks be constructed on both sides of Browning Avenue from Stoney Mountain Road to Haywood Road (NC 191). This corridor is approximately 3,550 feet in length.

**S. Carson Drive Sidewalk**

It is recommended that sidewalks be constructed on both sides of Carson Drive from Stoney Mountain Road to Browning Avenue. This corridor is approximately 1,950 feet in length.



### **T. Stoney Mountain Road Sidewalk**

It is recommended that sidewalks be constructed on both sides of Stoney Mountain Road from the northern study area boundary to Asheville Highway (US 25 Business). This corridor is approximately 7,450 feet in length.

### **U. Bracton Road Sidewalk**

It is recommended that sidewalks be constructed on both sides of Bracton Road from Stoney Mountain Road to Lyndhurst Drive. This corridor is approximately 950 feet in length.

### **V. Lyndhurst Drive Sidewalk**

It is recommended that sidewalks be constructed on both sides of Lyndhurst Drive from Bracton Road to Asheville Highway (US 25 Business). This corridor is approximately 2,000 feet in length.

### **W. Rolfe Street Sidewalk**

It is recommended that sidewalks be constructed on both sides of Rolfe Street from Greater Druid Hills Boulevard to Ashmore Avenue. This corridor is approximately 1,950 feet in length.

### **X. Ashmore Avenue Sidewalk**

It is recommended that sidewalks be constructed on both sides of Ashmore Avenue from Rolfe Street to Asheville Highway (US 25 Business). This corridor is approximately 1,250 feet in length.

### **Y. Berkeley Road and Signal Hill Road Sidewalk**

It is recommended that sidewalks be constructed on one side of Berkeley Road and Signal Hill Road from Balfour Road to Thompson Street. This corridor is approximately 9,200 feet in length.

### **Z. Clear Creek Road Sidewalk**

It is recommended that sidewalks be constructed on both sides of Clear Creek Road from Main Street to Balfour Road. This corridor is approximately 4,450 feet in length.

### **AA. North Main Street Sidewalk**

It is recommended that sidewalks be constructed on both sides of North Main Street from Duncan Hill Road to Ocain Court. This corridor is approximately 5,950 feet in length.



### **AB. Dana Road Sidewalk**

It is recommended that sidewalks be constructed on both sides of Dana Road in the sections between 7<sup>th</sup> Avenue and Four Seasons Boulevard and Henderson Crossing Plaza and Orrs Camp Road. The combined length of this corridor is approximately 2,140 feet.

### **AC. Orrs Camp Road Sidewalk**

It is recommended that sidewalks be constructed on both sides of Orrs Camp Road from Mitchelle Drive to Dana Road. This corridor is approximately 3,700 feet in length.

### **AD. Carolina Village Road Sidewalk**

It is recommended that sidewalks be constructed on both sides of Carolina Village Road from White Quail Trail to Tanager Trail. This corridor is approximately 650 feet in length.

### **AE. 7<sup>th</sup> Avenue Sidewalk**

It is recommended that sidewalks be constructed on both sides of 7<sup>th</sup> Avenue from Valley Street to Prince Drive. This corridor is approximately 250 feet in length.

### **AF. Maple Street Sidewalk**

It is recommended that sidewalks be constructed on both sides of Maple Street in the sections between North Main

Street and Laurel Street, 9<sup>th</sup> Avenue East and Lynn Street, and 8<sup>th</sup> Avenue East and Track Street. The combined length of this corridor is approximately 1,550 feet in length.

### **AG. North Lakeside Drive Sidewalk**

It is recommended that sidewalks be constructed along one side of North Lakeside Drive from Archangel Lane to Willow Road. This corridor is approximately 5,700 feet in length.

### **AH. Willow Road Sidewalk**

It is recommended that sidewalks be constructed along one side of Willow Road from North Lakeside Drive to Saddlebrook Drive. This corridor is approximately 1,450 feet in length.

### **AI. State Street and Erkwood Drive Sidewalk**

It is recommended that sidewalks be constructed on both sides of State Street and Erkwood Drive in the sections between Willow Road and Pine Spring Drive and Pine Spring Drive and the potential regional greenway. The recommended improvements along this corridor are approximately 2,200 feet in length.



### **AJ. Kanuga Road Sidewalk**

It is recommended that sidewalks be constructed on both sides of Kanuga Road from State Street to Judsen Lane. This corridor is approximately 1,850 feet in length.

### **AK. Chadwick Avenue Sidewalk**

It is recommended that sidewalks be constructed on both sides of Chadwick Avenue from Greenville Highway (NC 225) to Christian Walk Lane. This corridor is approximately 1,300 feet in length.

### **AL. Balsam Road / Wayside Lane Sidewalk**

It is recommended that sidewalks be constructed on both sides of Balsam Road / Wayside Lane from Wayside Lane to Greenville Highway (NC 225). This corridor is approximately 4,050 feet in length.

### **AM. Brooklyn Avenue Sidewalk**

It is recommended that sidewalks be constructed on both sides of Brooklyn Avenue from Greenville Highway (NC 225) to Old Spartanburg Road. This corridor is approximately 4,400 feet in length.

### **AN. Old Spartanburg Road Sidewalk**

It is recommended that sidewalks be constructed on both sides of Old Spartanburg Road from Heavenly Valley Lane to Beverly Avenue. This corridor is approximately 3,250 feet in length.

### **AO. Glover Street Sidewalk**

It is recommended that sidewalks be constructed along one side of Glover Street from Spartanburg Highway (US 25 Business) to Powell Street. This corridor is approximately 2,700 feet in length.

### **AP. Rutledge Drive Sidewalk**

It is recommended that sidewalks be constructed on both sides of Rutledge Drive from Acton Briar Plaza to Greenville Highway (NC 225). This corridor is approximately 2,350 feet in length.

### **AQ. South Main Street Sidewalk**

It is recommended that sidewalks be constructed on both sides of South Main Street from South King Street to South Church Street. This corridor is approximately 350 feet in length.



### **AR. Greenville Highway (NC 225) Sidewalk**

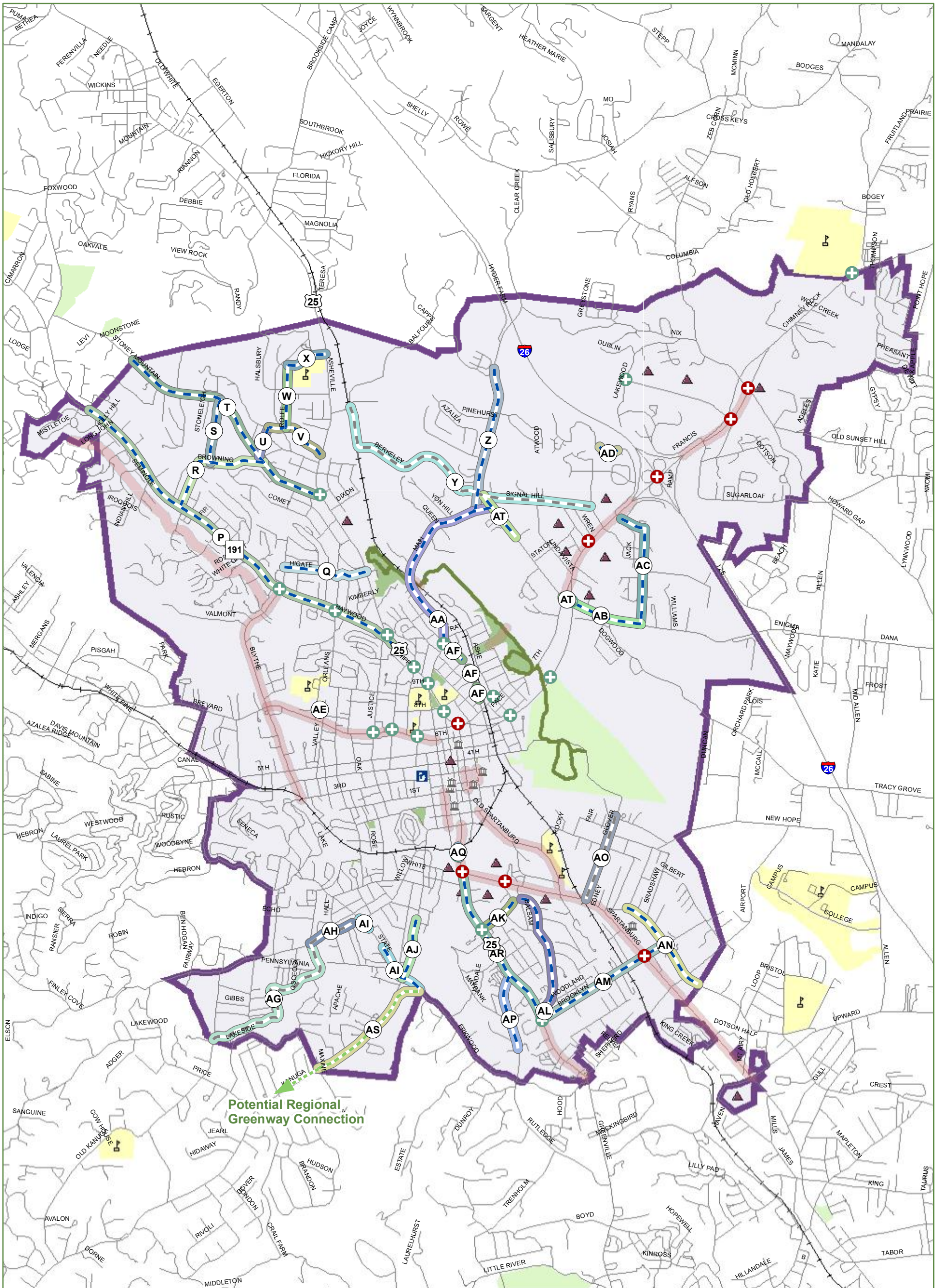
It is recommended that sidewalks be constructed on both sides of Greenville Highway (NC 225) from Spartanburg Highway (US 25 Business) to Brooklyn Avenue. This corridor is approximately 5,250 feet in length.

### **AS. Potential Regional Greenway Project**

It is recommended that a regional greenway project be considered for construction to connect Hendersonville with the extensive greenway and trail network in the surrounding region. The portion of this project that lies within the study area boundary is approximately 4,045 feet in length.

### **AT. Duncan Hill Road Sidewalk**

It is recommended that sidewalks be constructed on both sides of Duncan Hill Road from East Duncan Hill Road to Signal Hill Road. This corridor is approximately 1,560 feet in length.



Hendersonville Comprehensive Pedestrian Plan  
**Figure 4.2 ~ Long-Term Recommended Pedestrian Projects**



- |              |                      |                                       |                                      |
|--------------|----------------------|---------------------------------------|--------------------------------------|
| Study Area   | Shopping Centers     | <b>Recommended Long-Term Projects</b> | Recommended Short-Term Project       |
| ETJ          | Government Buildings | Sidewalk Both Sides                   | Short-Term Intersection Improvements |
| City Parks   | Library              | Sidewalk One Side                     | Long-Term Intersection Improvement   |
| County Parks | Existing Greenways   | Greenway Project                      | Long-Term Project ID                 |

Kimley-Horn and Associates, Inc.



0 0.125 0.25 0.5 Miles



**Table 4.2 - General Cost Estimates, Long-Term Projects**

Facility Type	Length (feet)	Estimated Cost	Cost Estimate Includes:
Long-term Sidewalk (both sides)	78,950	\$5,503,000	New 5' Sidewalk (both sides), new curb and gutter (both sides), and 460 curb ramps
Long-term Sidewalk (one side)	19,050	\$648,000	New 5' Sidewalk (one side), new curb and gutter (one side), and 42 curb ramps
Long-term Greenway	4,045	\$83,000	New Multi-Use Path
Intersection Improvements	22	\$836,000	Design and Construction for Pedestrian Upgrades

**TOTAL:** \$7,070,000

**RANGE:** \$ 7,000,000-\$7,500,000

\*\*No Right-of-Way has been included for these estimates

\*\*\*The following represent unit costs that were used for this estimate:

New Sidewalk = \$15.00/LF

New Curb and Gutter = \$13.50/LF

New Multi-Use Path = \$17.60/LF

Multi-Use Path Clearing and Grubbing =\$2.75/LF

Design and Construction for Pedestrian Upgrades = \$38,000/intersection

Curb Ramps = \$1200





## Recommended Guidelines

In general, the sidewalks constructed in Hendersonville as part of this plan and in the future should be required to extend along the entire frontage of a property abutting a public street. This plan identifies key standards to ensure new sidewalks are uniformly implemented, and provides guidance on when and how to accommodate variations.

### Construction Materials and Methods

Improvements for new, retrofitted, and repair to sidewalks in Hendersonville should be constructed using the following methods and materials:

*Materials* — Sidewalks should be constructed of Portland Cement Concrete (PCC) with a 14-day flexural strength that is not less than 3,000 pounds per square inch (psi).

*Subgrade Preparation* — Subgrade should be thoroughly compacted and finished to a smooth, firm surface, and should be moist at the time the concrete is placed.

*Subgrade Compaction* — Except in areas where it is impractical to use standard type rollers, compaction should be by means of vibratory hand compactors.

*Final Finish* — Surface finish for sidewalks should be completed by brushing (with brooms) or by another approved method to provide a uniform non-skid surface.

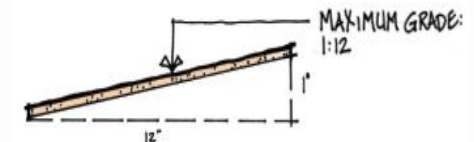
*Inspections and Performance* — Sidewalk forms should be inspected by Engineering and Inspections staff prior to the placement of concrete. Concrete that does not meet minimum mixture and strength standards or settles after placement should be removed and replaced by the installer.

*Alternative Materials Usage* — Use of materials for sidewalks other than concrete and the construction methods used therewith must be approved by the City Engineer or designated representative on a case by case basis.

### Grade

Continuous sidewalk grades should not exceed 5% (1:20). However, in areas where the existing

topography or the adjacent street cause grades of more than 5%, sidewalk grades of up to 8.33% (1:12) may be used for a rise of no more than 2.5 feet, provided that level



Example of sidewalk construction

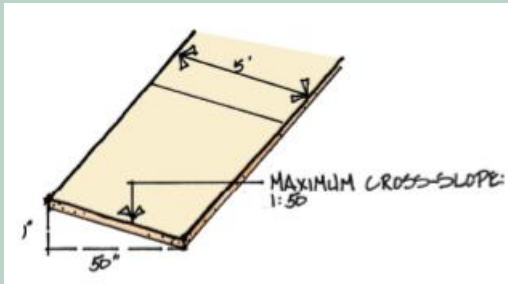


landings (grades less than 0.5%) are provided at the end of such grades and are at least 5 feet long.

In cases where grades greater than 8.33% (1:12) must be negotiated, switchbacks or other approved ramping techniques must be provided and will conform to ADA requirements. Additional right-of-way and/or easements necessary to accommodate these features will be obtained by the applicant and legally dedicated to the City.

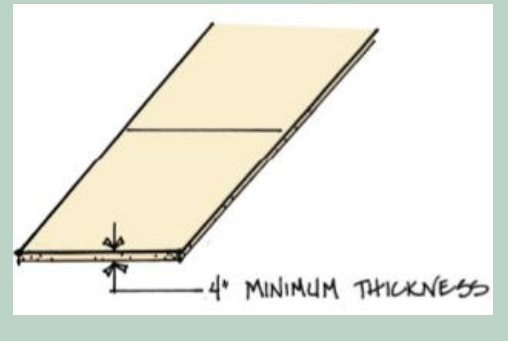
### Cross-Slope

The maximum allowable cross-slope for sidewalks is 2% (1:50). At driveways, curb cuts, and both marked and unmarked crosswalks, the maximum allowable cross-slope must be maintained for a minimum width of 3 feet. Cross-slope should be oriented toward the adjacent roadway and sufficient to provide storm water runoff without creating standing water on the walkway.



### Sidewalk Thickness

A minimum thickness (or depth) of 4 inches of concrete is required for all new sidewalks except as noted. To accommodate the additional loading caused by pedestrian density or by vehicles crossing a sidewalk, a thickness of 6 inches is required where sidewalks intersect at wheelchair/crosswalk ramps, and at driveways that use a ramp or apron-type access to cross the sidewalk from the adjacent public street.

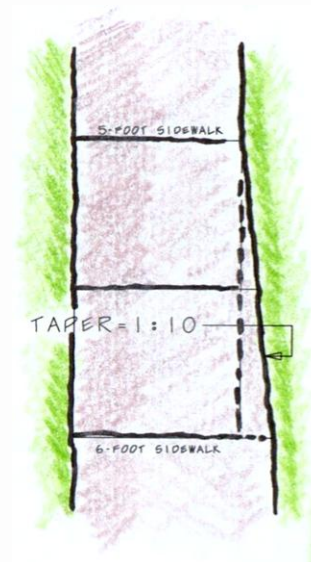


### Transitions

Wheelchair ramp and driveway transitions to or crossing sidewalks must conform to current ADA requirements.

### Tapers

Transitional tapers to and from sidewalks of different widths are to be at a maximum rate of 1-foot of width per 10 feet of length (1:10) except as approved by the City.



Example of sidewalk taper

### Sidewalk Path

Sidewalks should parallel the roadway, and all exceptions to this must be approved by the City.

Typical exceptions include:

*Horizontal Curve Sections on Roadways* — In situations where a roadway curves at an angle greater than 60 degrees (and where right-of-way permits), the designer is permitted to adjust the curve of the sidewalk to more easily accommodate pedestrians.

*Presence of Obstructions* — The designer is permitted to alter the sidewalk path to avoid significant obstructions



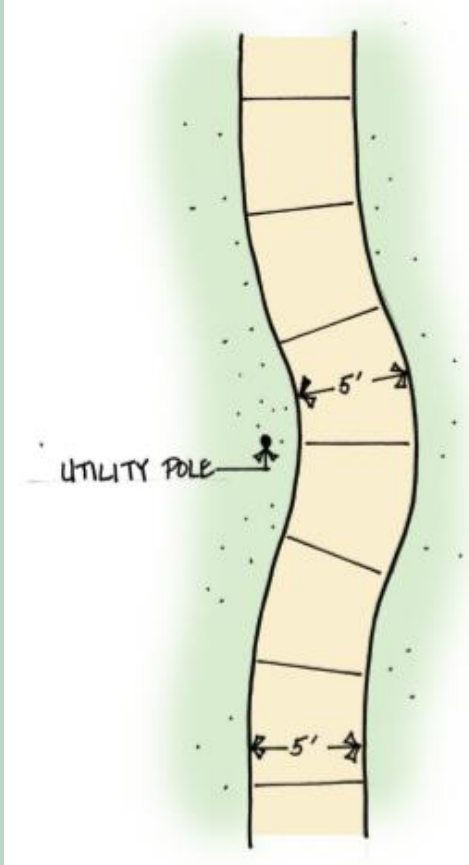
including but not limited to: transformers, utilities and utility poles, fire hydrants, and traffic signal hardware. Sidewalk path exceptions should be evaluated and approved on a case-by-case basis by the City.

*Meanders* — Sidewalk meandering is strongly discouraged. In order to avoid obstructions, meanders are acceptable after evaluation and approval from the City. Meanders must meet minimum ADA requirements unless otherwise approved by the City.

### Sidewalk and Buffer Width

#### Sidewalk Width

Providing appropriate width for a sidewalk is a primary design consideration. Sidewalks that are too narrow often go unused. In general, sidewalks should be wide enough to allow two adult pedestrians to pass each other in opposite directions without either person having to step off the sidewalk. They should also be wide enough to allow a person in a wheelchair or person pushing a stroller to pass a pedestrian traveling in the opposite direction without either person diverting from the sidewalk. Federal and state guidelines specify a 5-foot minimum width for sidewalk construction.



Example of an acceptable sidewalk meander

#### Street-Side Buffers

Street-side buffer areas are a key element of successful sidewalks.

Pedestrians feel safer and more comfortable

where there is physical separation between themselves and adjacent traffic. In addition, street-side buffers are areas where utilities, signs, fire hydrants, trees, and street furniture can be located without obstructing a sidewalk. Street-side buffer width varies according to land use and adjacent physical conditions.

In instances where immovable objects or other physical barriers limit the ability to provide the minimum required street-side buffer and sidewalk, it is preferable to maintain the sidewalk minimum width and appropriately adjust the width of the street-side buffer. In such instances, reduction of the street-side buffer should be subject to approval by the City.





## Requirements

For clarity, sidewalk width and street-side buffer width requirements have been separated into the following two broad categories:

**Category A** pertains to requirements for sidewalks along streets that are not in areas described by usage, character, land use, or zoning as pedestrian activity areas. Sidewalks in this category are often located along rural or suburban roadways and have lower anticipated/actual pedestrian usage than streets contained in Category B.

**Category B** pertains to sidewalks along streets that are in areas described by usage, character, land use, or zoning as pedestrian activity areas. Sidewalks in this category are often found within urban areas especially within the central business district (downtown), and within pedestrian designated zones/areas.

### Category A Sidewalks

These sidewalks typically experience lower pedestrian volumes and usage and are not in designated pedestrian activity zones. **Table 4.3** describes ideal and minimum sidewalk and (street-side) buffer widths for sidewalks in this category.

**Table 4.3 — Ideal and Minimum Required Sidewalk and Buffer Widths**

Location	Sidewalk Width	Buffer Width	
		No street trees	With street trees
Thoroughfares/ Arterials	7ft (5ft)	6ft (3ft)	8ft (5ft)
Collector Streets	6ft (5ft)	4ft (2ft)	6ft (4ft)
Subcollectors/ Local Streets	5ft (5ft)	3ft (2ft)	5ft (4ft)
Legend: Ideal Width (Minimum Required Width)			

Similarly, the following text describes minimum sidewalk and buffer width requirements for Category A sidewalks. Minimum requirements in **Table 4.3** and in the text that follows are the same.

### Thoroughfares/Arterials

*Sidewalk Width* — Sidewalks along thoroughfares and arterials as identified by the City of Hendersonville should be constructed to an optimum clear width of 7 feet.

*Street-Side Buffer Width* — A street-side buffer area should be required along all thoroughfares and arterials, with a minimum buffer width of 6 feet. Buffer areas



designated to have street trees should be a minimum of 8 feet in width.

### **Collector Streets**

*Sidewalk Width* — Sidewalks along collector streets as identified by the City of Hendersonville should be constructed to an optimum clear width of 6 feet.

*Street-Side Buffer Width* — A street-side buffer area should be required along all collector streets, with a minimum buffer width of 4 feet. Buffer areas designated for street trees should be a minimum of 6 feet in width.

### **Sub-Collector Streets/Local Streets**

*Sidewalk Width* — Sidewalks along sub-collector facilities should be required to be constructed to a minimum clear width of 5 feet.

*Street-Side Buffer Width* — A street-side buffer area should be required along all sub-collector streets. The minimum buffer width for this classification should be 3 feet. Buffer areas along collector streets designated for street trees should be 5 feet in width.

### **Category B Sidewalks**

These sidewalks experience higher pedestrian volumes and usage or are designated pedestrian activity areas.

This category includes sidewalks located in the following areas:

- Central Business District (CBD)
- Business or Commercial Districts (outside the CBD)
- Other public generators such as parks, libraries, and public service/government buildings
- Schools (outside the CBD)

### **Central Business District**

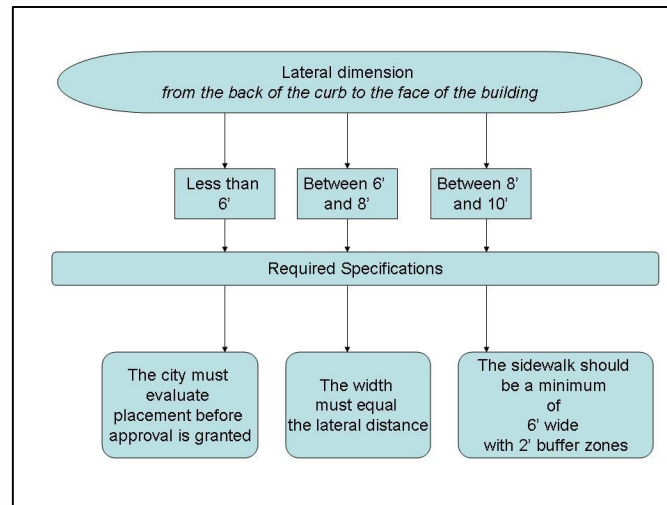
In this area, sidewalks should be constructed to a width that is equal to the lateral dimension between the back of the curb and the face of the adjacent building. This distance varies, but is typically 10 feet or more. The optimum width allowed for sidewalks in the CBD is 8 feet unless otherwise approved by the City. In cases where the lateral dimension is greater than 16 feet, a suitable hardscape plan incorporating landscape features should accompany the sidewalk installation.

Although a continuous street-side buffer is not required, a street tree/landscape plan indicating locations and sizes of planted areas and plant matter should be required.



## Business/Commercial Districts

In commercial districts where significant pedestrian traffic exists or in areas designated by zoning and/or land use as having the potential to attract pedestrian activity, sidewalks requirements should be based on the criteria shown in the illustration below:



## Other Public Generators

Regardless of street classification, sidewalks constructed along public streets abutting libraries, government buildings, and other public generators — except parks — should be constructed to an optimum of 8 feet in width. This width applies to the entire property frontage.

Appropriate transition sections are required where sidewalks in this category join other sidewalks.

In the case of parks, sidewalks on primary pedestrian paths (park entrance or exit connections) should be a minimum of 8 feet in width. Sidewalks adjacent to city parks not serving a park entrance or exit should be evaluated for requirements based on the following conditions:

1. Is the park in the CBD?

**Yes** — default to CBD requirements

**No** — continue to condition 2

2. Is the park in a Business/Commercial District?

**Yes** — default to Business/Commercial District requirements

**No** — continue to condition 3

3. Is the park a part of or in a school zone?

**Yes** — default to School requirements

**No** — use requirements outlined for Category A sidewalks

## Schools

Sidewalks along the frontage of and adjoining school property require special attention. Along school owned



property frontages, sidewalks should be required to be a minimum of 6 feet in width. **Table 4.4** details requirements for sidewalks and street-side buffers along school owned property frontage.

**Table 4.4—Ideal and Minimum Requirements for Sidewalks and Buffers near Schools**

Location	Sidewalk Width	Buffer Width	
		no street trees	with street trees
Thoroughfares/Arterials	8ft (6ft)	6ft (4ft)	8ft (5ft)
Collector Streets	8ft (5ft)	4ft (3ft)	6ft (4ft)
Sub-Collectors/Local Streets	8ft (5ft)	3ft (2ft)	5ft (4ft)
Legend: Ideal Width (Minimum Required Width)			

Sidewalks adjoining but not on school owned property should continue at the appropriate minimum width until reaching a logical transition point similar, but not limited to, one of the following:

- Adjacent cross streets having a sidewalk
- Greenways or other well-used pedestrian specific corridors
- Major neighborhoods/subdivision entrances

- Any other major school related pedestrian origin or destination

Requirements for sidewalks within designated school zones not addressed in this subcategory should follow the requirements of Category A sidewalks discussed previously.

### Right-of-Way

It is important to consider the availability of right-of-way in planning and designing sidewalks. A right-of-way that is too narrow will not allow adequate space for sidewalks and street-side buffers.

For new roadway projects or where development is required to install sidewalks or other roadway improvements along a property frontage, sufficient right-of-way should be dedicated by the developer or obtained through easements with the developer to accommodate sidewalk requirements for the facility type of intended usage.

For projects that involve installing sidewalks along already constructed roadways or in areas where right-of-way will be constrained due to the built environment, the following is offered as guidance:



- For locations where rights-of-way of 7 feet or more are available to accommodate pedestrian facilities, a minimum 5-foot wide sidewalk should be constructed with a minimum 2-foot wide street-side buffer
- For areas where there are rights-of-way of less than 7 feet but 5 feet or greater, the sidewalk width should be equal to the lateral distance between the back of the curb and the edge of the right-of-way
- For right-of-way areas of less than 5 feet, additional right-of-way to accommodate a sidewalk will need to be acquired or an easement sufficient to accommodate the pedestrian facility may be negotiated

### Exceptions

Administrative exceptions have been established to provide a means of consistent interpretation of applying the ordinance, the sidewalk policy, and the standards and guidelines identified here. These administrative exceptions are intended to be applied to unusual cases that fall outside the standards presented here. These controls provide open alternatives to the design criteria previously specified. They also permit flexible interpretation and application to appropriately address exceptional situations. These provisions are intended to preclude the arbitrary requirement of increased standards as well as inventory

situations where more detailed standards may be applicable. Finally, administrative exceptions are not intended to limit hardship or mitigate development costs. The following text describes conditions that may warrant an administrative exception.

### Fixed Objects and Immovable Obstructions

Sidewalk variations will be evaluated in the following situations.

*Utilities* — The presence of utilities may have a greater effect on the location and placement of sidewalk than any other factor. Utility poles, boxes, and equipment such as transformers are common fixtures along public streets. Frequently, they occupy or share space that would otherwise be used for a sidewalk.

*Landmark Trees* — In some areas it may be necessary for a sidewalk to be diverted to accommodate a landmark tree. Landmark trees are typically identified by species, age, caliper (diameter), or by intrinsic value to the surrounding community.

*Topographic Features and Environmental Conditions* — Topography may impact the path and placement of sidewalks or street-side buffers. Features include substantial grades (greater than 8.33%), stream crossings, wetlands, and floodplains where construction

Hendersonville utility obstructions



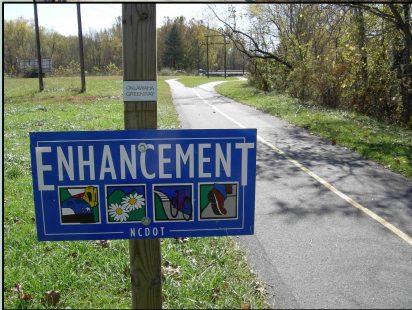
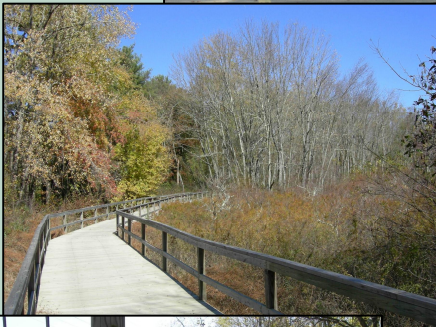


may be prohibited, and areas requiring significant cut or fill.

*Bridges and Structures* — A sidewalk width of 5 feet is desirable for all bridges and similar structures. However, this dimension may be reduced to 4 feet if an appropriate barrier (e.g., jersey barrier, guardrail, or similar separator) between the sidewalk and adjacent travel lane is provided.

*Other* — Where evidence of other immovable features exists, variations in design standards may be warranted. Other immovable features may include but are not limited to retaining walls, bridges, tunnels, signs, gates, drainage structures, and guardrails.

Throughout Hendersonville, there are sidewalks that are less than 5 feet wide. While many of these sidewalks are suitable for light use, many do not meet minimum ADA requirements. Where the linear distance is 200 feet or less, exceptions will be allowed in cases where existing sidewalks less than 5 feet wide will be connected by a new sidewalk that is less than 5 feet wide. In other cases, sidewalks must meet standard minimum dimensions.



## Greenways

Trails are usually a hard-surfaced pathway between major trailheads. They should be designed to have the least possible environmental impact, and provide opportunities for walking along designated routes. For greenways, or a system made up of sidewalk or recreational trails, the designs should include the following considerations:

*Sidewalk Trail* — These should be 8 to 10 feet wide and paved, either within the right-of-way or immediately adjacent to it.

*Multi-Use Path* — These are paved trails which are wide enough to provide opportunities for walking and biking typically located within a park or nature center.

*Recreational Trail* — These are unpaved trails and provide opportunities of hiking, equestrian use, or mountain biking. These also can be smaller paved trails located within an urban park.

Generally, recreational trails are not accessible to mobility-impaired users, so sidewalk trails should be designed to provide full accessibility to a wide range of users. Also, the amenities placed along trails — such as lighting and furniture to provide rest areas — should consider accessibility. Seating and plantings should be located in areas where they will not interfere with the openings of car doors or vehicles equipped to operate with lifts.

Hendersonville trails

## Traffic Signals

For all new signals, count down pedestrian signal heads indicating permission and time left to cross should be installed. Ideally, older crosswalks also will be retrofitted with these devices. As existing signals are modified over time by public and private entities, improvements including crosswalks and pedestrian signal heads should be added.

## Typical Cross-Sections and Pedestrian Design Considerations

Sample cross-sections have been developed to visually reflect recommended guidelines for various locations.

**Figure 4.3** represents a typical two lane cross-section with sidewalk constructed on both sides. There is a substantial planting strip and the sidewalks are shown as the minimum recommended width of 5 feet. Bicycle lanes could be constructed along each travel lane if determined appropriate within the corridor. **Figures 4.3 and 4.4** represents a typical two-lane section with a multi-use path constructed on one side. The multi-use path is shown constructed at 8 to 10 feet wide. This could potentially represent the recommendation along Haywood Road (NC 191).



Figure 4.3 — Sample Sidewalk Both Sides Cross-Section

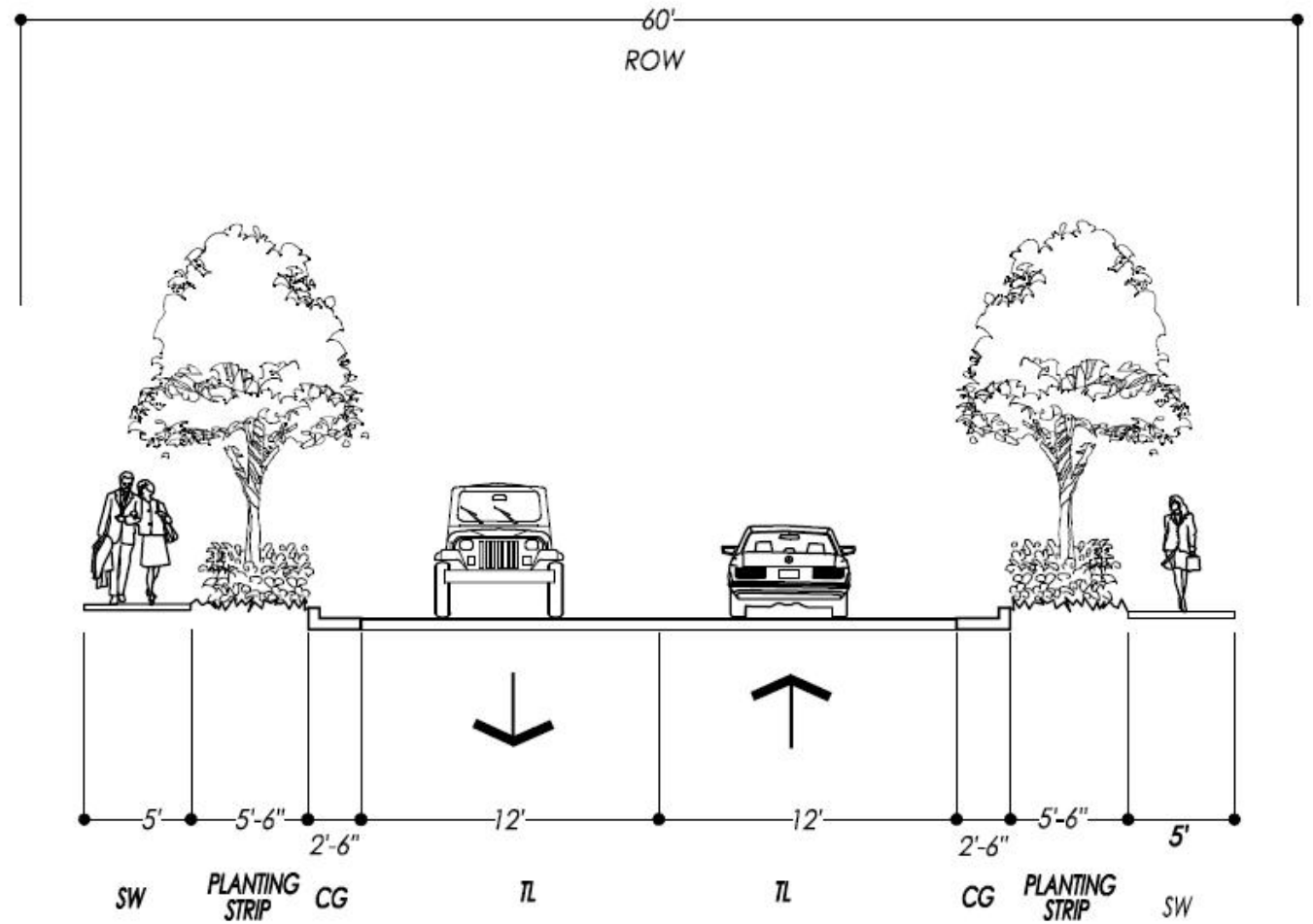
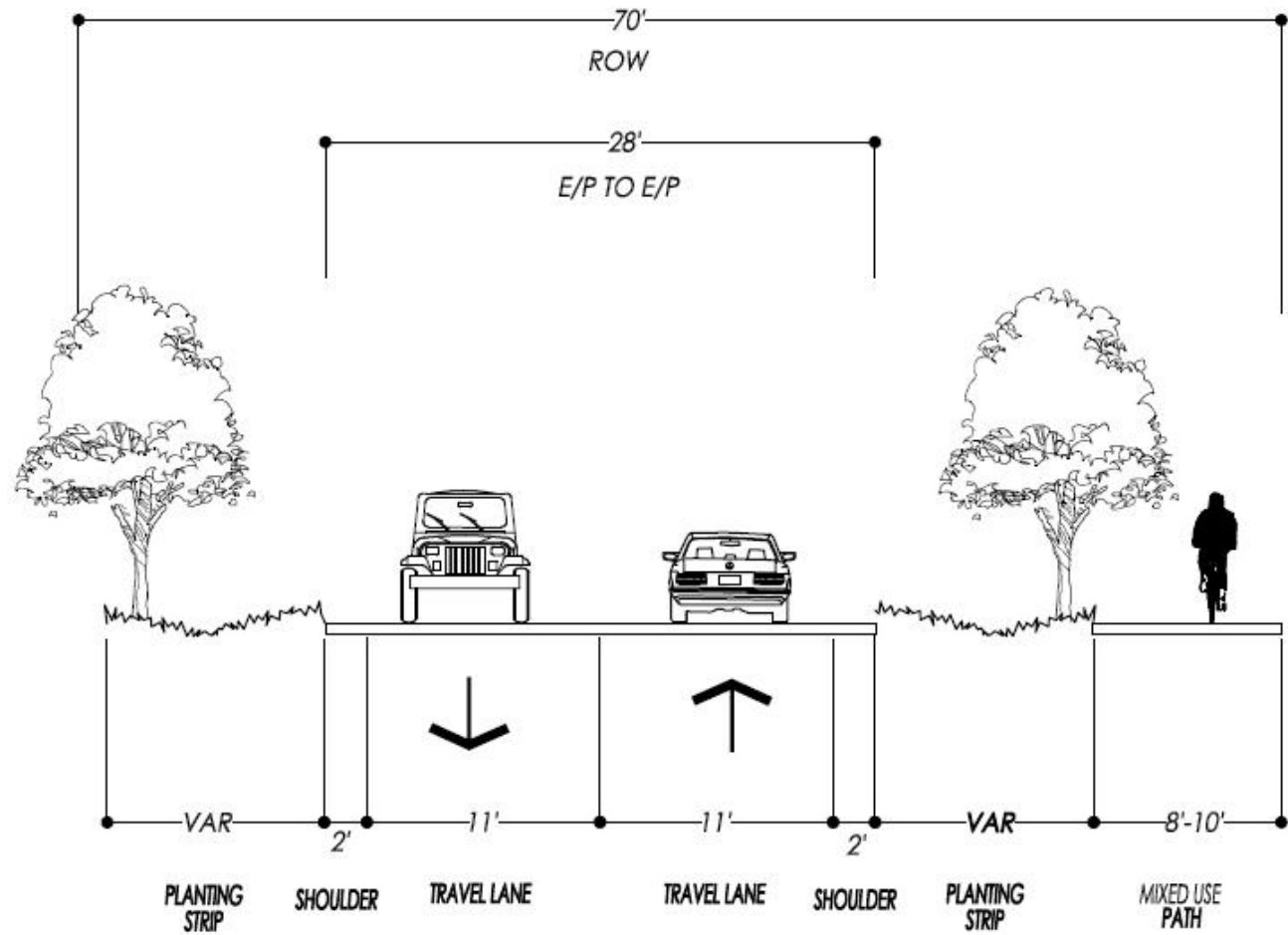
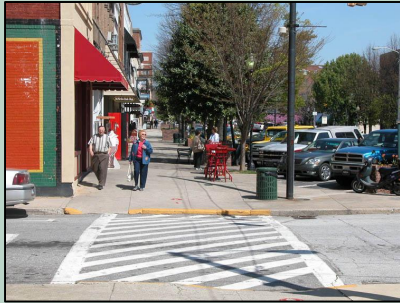




Figure 4.4 – Sample Multi-Use Path Cross-Section

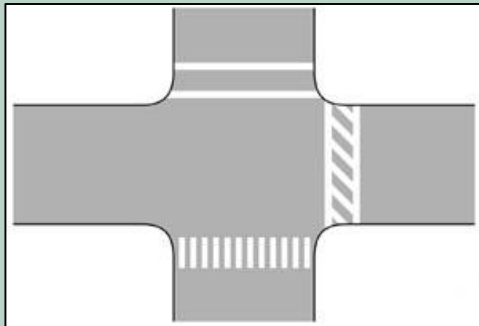




Sidewalks and pedestrian walkways play an important role in providing safe opportunities for pedestrian crossings at intersections. The following treatments are therefore recommended:

**Crosswalks**

Crosswalk treatments like the one shown in the picture to the left provide a safe environment for pedestrians to cross the roadway. The inclusion of crosswalks at signalized intersections provides the optimal location for pedestrian crossings. Crosswalk markings will vary by location, but typically look like one of the three variations shown in the MUTCD rendering to the left. Best available practices should be utilized in the design and locating of crosswalks.



Crosswalk treatment variations  
Source — MUTCD



Example of a mid-block cross walk

**Signals**

Signalization of heavily traveled intersections allows for the combination of pedestrian signals and crosswalks to safely move pedestrians across roadways without conflict. Pedestrian signals provide not only a safe window for pedestrians to cross, but newer versions also provide a timeframe necessary to cross the intersection (countdown pedestrian signals).



**Mid-block crossings**

Mid-block crossings provide the same safe environment as intersection crosswalks without requiring the pedestrian to travel to the major intersections. Mid-block crossings can be either signalized or un-signalized.

**Pedestrian refuges**

Bulb-outs, median refuges, and other treatments provide shorter trips for pedestrians by either reducing the overall length of crossing or by providing a safe refuge for pedestrians. The photo to the right shows an existing median refuge in Hendersonville.



**Roundabouts**

Roundabouts are a traffic calming measure intended to slow oncoming vehicles while providing a safe environment for pedestrians and motorists. The photo to the right shows a roundabout with pedestrian treatments.





### **Streetscape**

Streetscape improvements not only provide an aesthetically-pleasing roadway environment, but they also encourage pedestrian safety and mobility by slowing vehicles and increasing pedestrian friendly spacing.

## **Ancillary Programs**

Ancillary programs can be an excellent tool for the education, enforcement, and encouragement of the community. Chapter 3 summarized existing programs Hendersonville has in place and identified current programs available throughout the state and country. The following recommendations offer ways to build on existing programs and take advantage of other available programs.

### **Existing Programs**

Walk Wise, Drive Smart and the Bi-Peds programs are currently active in Hendersonville. It is recommended that the Walk Wise, Drive Smart program recommendations, including the recommendations for 10 community neighborhood walking routes, be incorporated and implemented in conjunction with this plan. It is also recommended that the Bi-Peds program continue to offer support and enthusiasm for pedestrian and bicycle projects throughout Hendersonville.

### **Rails-to-Trails**

It is recommended that the City of Hendersonville work in cooperation with other interested jurisdictions to railbank — or preserve the right-of-way of — the currently unused portions of the Norfolk Southern line. Should this line be abandoned in the future, the City should consider initiating construction of a rails-to-trails project.

### **Safety and Education Programs**

It is recommended that Hendersonville take part in the Safe Routes to School program to encourage and provide a safe environment for children and educators to walk or bike to school. More information on this program can be found at [www.safety.fhwa.dot.gov/saferoutes](http://www.safety.fhwa.dot.gov/saferoutes).

It is further recommended that a workshop be conducted to educate City officials on safe practices for walkers and drivers, as well as laws pertaining to bicyclists and pedestrians. Next, it is recommended that a sub-group of workshop participants develop a Pedestrian Safety Action Plan which could be used throughout the community to improve pedestrian safety.

### **Enforcement Programs**

Local enforcement agencies should monitor driving speeds on local roads and actively ticket speeders when problems are identified.



It is also recommended that Hendersonville participate in the North Carolina School Crossing Guard Training Program to properly train law enforcement officers who are responsible for training crossing guards.

### ***Encouragement Programs***

It is recommended that Hendersonville publicize and participate in National Walk to School Day in October each year. This program offers encouragement to children, parents, faculty, and staff to walk to school and provides an opportunity to educate students about safe practices and the benefits of walking. Walk Wise, Drive Smart is promoting and developing a variety of walking encouragement techniques.

The City should coordinate with local transit to develop programs which will encourage people to use transit in combination with walking to reach their desired destination.

### ***Maintenance Programs***

People will feel safer and will thereby be more likely to use pedestrian facilities if they are well-maintained. It is recommended that the City of Hendersonville increase their sidewalk maintenance budget to \$120,000 to better maintain and repair existing sidewalks. This would equate to 1.4 miles of sidewalk replacement/repair per year.



## Chapter 5 — Implementing the Plan

### Introduction

Planning, design, and implementation are all critical components of a successful plan. The citizens of Hendersonville have expressed a desire to implement a pedestrian network that will add to the quality of life and unique character of the City. With limited funding resources, however, implementation can be challenging and time-consuming. With this in mind, policy recommendations and an action plan have been developed to help local staff focus their efforts and strategically seek opportunities to help expedite the implementation of this plan.

This chapter provides general policy recommendations, reviews funding opportunities, and provides an action plan to assist local decision-makers and planning staff in the implementation of the *Hendersonville Pedestrian Plan*.

### General Policy Recommendations

The following policies should be considered by the City to encourage a pedestrian-friendly environment. As defined in the first chapter, the vision statement for the Hendersonville Pedestrian Plan is intended “to develop and maintain a pedestrian network that includes sidewalks, pedestrian crossings, and greenways.” The

policy objectives listed below will help to reinforce the vision statement developed during the planning process.

- The City of Hendersonville should offer safety and connectivity to citizens and visitors by developing and maintaining a safe pedestrian network of sidewalks, crossings, and greenways.
- The City of Hendersonville should motivate and reward the choice to walk and use transit by creating an attractive network of pedestrian and bicycle facilities to attractions throughout the city.
- The City of Hendersonville should improve access for those with disabilities by enhancing the infrastructure to include Americans with Disabilities Act (ADA) compliant facilities.
- The City of Hendersonville should integrate and balance pedestrian travel with other travel modes by ensuring consistent implementation of pedestrian infrastructure as development occurs.
- The City of Hendersonville should secure resources sufficient to realize the vision of a walkable community. Resources are available through public-





private partnerships and grants (including county, region, state, and federal funding).

Local staff and decision-makers should consider the implementation of this plan as a method to reduce vehicular traffic and apply policy decisions based on this mindset. The provision of adequate pedestrian facilities should be considered as policy in accommodating travel demand. Emphasis also should be placed on non-motorized transportation of students to Hendersonville schools through recommended programs in Chapter 4.

### **Requirements for Infrastructure Associated with New Developments**

The following requirements should be adopted as policy for new and existing commercial and residential development.

- Construct new commercial development to accommodate pedestrians with sidewalks and parking lots that provide safe refuge from moving vehicles
- Provide a connection between new and existing developments
- Establish connections for pedestrians, bicyclists, and vehicles between commercial and residential areas
- Connect new residential communities with existing commercial and residential developments

- Require commercial, residential, and mixed-use developments to provide sidewalks on both sides of their internal streets

## **Parking Policy Recommendations**

### **Parking Demand Planning**

The following parking policy statements provide guidance on limiting the amount of parking for commercial developments while encouraging infill development.

- Modify zoning ordinance section 6-5 to allow the market to dictate the amount of parking that is created for development
- Encourage shared parking between multiple commercial developments
- Reduce parking requirement when a commercial development is within 0.25 miles of a transit stop
- Infill under-used parking spaces with new mixed-use development
- Include adequate bicycle racks and pedestrian walkways with appropriate ordinances



## Parking Standards

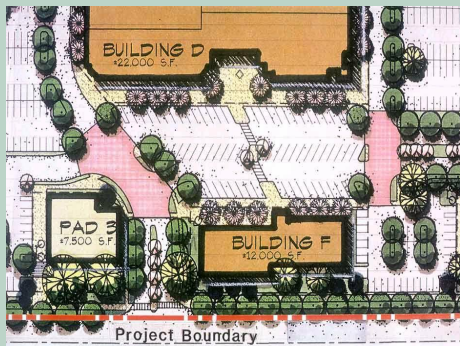
Acceptance of the following policy statements by the City of Hendersonville would improve pedestrian safety within parking lots.

- Revise current parking lot standards to include pedestrian mobility and safety standards
- Develop safe queuing locations for pedestrians
- Construct pedestrian infrastructure within parking lots to be compliant with ADA standards
- Provide pedestrian refuge within parking lots
- Construct sidewalks to channel pedestrians from their vehicles to the store entrance
- Construct raised crosswalks and implement traffic calming techniques through primary vehicular aisles
- Develop uniform policy guidelines for new and existing commercial development to make sure necessary improvements will be made

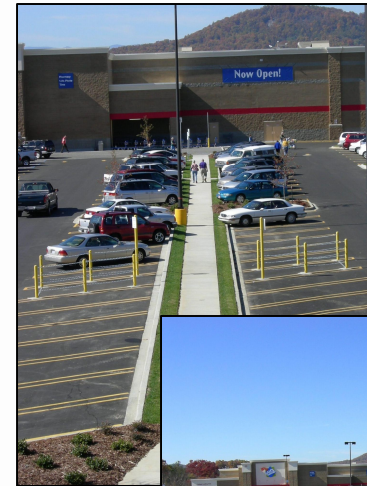
Illustrated in the image to the left, the Charlotte Wilkinson Boulevard Wal-Mart is a good example of best practices that should be used when designing and constructing a parking lot.



*Example of a pedestrian channel crosswalk*



*Charlotte - Wilkinson Boulevard Wal-Mart site layout*



*Example of pedestrian channels in parking lots*



### **Roadway Safety Improvements**

The following policy improvements will enhance pedestrian safety on thoroughfares throughout Hendersonville.

- Change suggested speed limit for residential communities to 20 mph
- Provide traffic calming when necessary
- Avoid placing pedestrian entrances to schools along North Carolina state roads

### **Easements for Pedestrian Projects**

While some improvements to the pedestrian facilities in Hendersonville will not be impacted by right-of-way acquisition, some proposed and future improvements will require easements and additional right-of-way. To provide the best environment for right-of-way acquisition and make the most of the pedestrian environment in Hendersonville, the following policy changes are recommended.

- Adopt policies concerning the construction of sidewalks and pedestrian projects not included in the public right-of-way

- Require residential developments that impact a public facility to set aside land and make it available for purchase by public agencies
- Create policy to accommodate property owners inclined to provide sidewalks or multi-use paths for new projects without property acquisition through use of easements
- Dedicate easements for future pedestrian facilities when located within a planned residential or commercial development

Policy recommendations should also encourage implementation and continuation of the existing safety and enhancement, encouragement, enforcement, and maintenance programs identified in Chapter 4.



## Funding Opportunities

The construction of a comprehensive connected pedestrian network and ancillary facilities can occur through incremental adoption of local policies and programs and State programs, as well as through the receipt of private contributions. With this in mind, it will be important for the City of Hendersonville to identify funding sources to implement the recommendations of this plan. While some projects and programs will be funded by the City, alternatives are available to provide financial support for improving the local pedestrian network.

### Local Programs

Local funds should be used for projects not on major state routes. Usually these are most successful when a state-funded incidental project — such as a road widening — has already been programmed. Local funding sources tend to be flexible, and include general revenue expenditures as well as proceeds from bond programs. An exception to this policy may include high priority connections along roads unlikely to be developed.

### Improvement Program

Several types of potential local pedestrian funding sources are available for the City of Hendersonville. Over the 2004-2005 fiscal year of the Capital Improvement

Programs (CIP), the City has budgeted \$60,000 for sidewalk repairs and construction of new sidewalks. As future CIPs are assembled, there will be an opportunity to reallocate funds in order to promote this type of project.

### Powell Bill

Powell Bill funds are collected by the state in the form of a gasoline tax. The amount of these funds distributed to a municipality is based on the number of street miles to be maintained and the City's population.

### Transportation Bonds

Transportation bonds have been instrumental in the strategic implementation of local roadways, transit, and non-motorized travel throughout North Carolina. Voters in communities both large and small regularly approve the use of bonds in order to improve their transportation system. Improvements to the pedestrian system in Hendersonville would be a type of project that could be funded using a transportation bond program.

On February 3, 2004, the City of Hendersonville passed a bond referendum for \$2.1 million. This funding is to be used “for construction, reconstructing and improvement of sidewalks in said City, including the acquisition of any necessary land and rights-of-way and the installing of related landscape improvements.” The City is awaiting



completion and adoption of this plan to allocate these funds to specific projects.

### **Asheville Metropolitan Planning Organization (MPO)**

Hendersonville is a member of the Asheville MPO which is one of 17 MPOs designated by NCDOT. The MPO aides in local planning efforts and provides services and guidance in coordinating with NCDOT. The Asheville MPO is also responsible for developing the Unified Planning Work Program (UPWP) which allocates funds to its members.

### ***State and Federal Programs***

In comparison with local funds, state and federal funds are not as flexible in terms of their use. Usually these projects focus on the needs of vehicles, either in terms of capacity or safety — for example, widening projects. It can be difficult, however, to secure sidewalk and pedestrian crossing facilities in state construction projects.

The 1998 Transportation Equity Act for the Twenty-First Century (TEA-21) required the North Carolina Department of Transportation to set aside federal funds from eligible categories for the construction of bicycle and pedestrian transportation facilities. On August 10, 2005, the President signed into law the Safe, Accountable, Flexible, Efficient

Transportation Equity Act: A Legacy for Users (SAFETEA-LU). With guaranteed funding for highways, highway safety, and public transportation totaling \$244.1 billion, SAFETEA-LU represents the largest surface transportation investment in our Nation's history. Provisions address specific safety issues, including pedestrian and bicycle safety.

Funds for pedestrian and bicycle projects come from several different sources that are described in this section; however, allocation of those funds depends on the type of project or program and other criteria. The information provided in this section is intended to present a basic overview of the process.

### **Transportation Improvement Program (TIP)**

As a part of the state's Transportation Improvement Program (TIP), pedestrian TIP projects can receive allocations through an array of funding resources including Federal Aid Construction Funds and State Construction Funds. As a part of the application process, strict criteria must be met before project selection. These criteria include providing right-of-way information, meeting a set of design standards, showing a need for a project, local support of the project, and the inclusion of the project in a pedestrian planning process. Currently, three TIP pedestrian projects are identified through enhancement grants (E-4408, E-4726, and E-4594).



Pedestrian projects may also appear in the TIP as incidental projects through another roadway project. See [www.ncdot.org/transit/bicycle/funding/funding\\_TIP.html](http://www.ncdot.org/transit/bicycle/funding/funding_TIP.html) for more information.

### **Hazard Elimination and Railway-Highway Crossing Programs**

These funds are an additional subset of the State Transportation Improvement Program (STIP) funding, constituting 10% of a state's funds. This program is intended to inventory and correct the safety concerns of all travel modes.

### **NCDOT Division Funds**

NCDOT separates the state into 14 divisions. Henderson County is in Division 14. Division funds are another resource that provides allocations or discretionary funding for special projects within each division.

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

At the end of each fiscal year, 6.5 percent (or a minimum of \$30 million) of the unreserved credit balance in North Carolina's General Fund is placed in the CWMTF. The revenue of this fund is allocated as grants to local governments, state agencies, and conservation non-profits to help finance projects that specifically address

water pollution problems. CWMTF funds may be used to establish a network of riparian buffers and greenways for environmental, educational, and recreational benefits.

### **Governor's Highway Safety Program (GHSP)**

The Governor's Highway Safety Program is committed to enhancing the safety of the roadways in North Carolina. To achieve this, GHSP funding is provided through an annual program, upon approval of specific project requests, to undertake a variety of pedestrian and bicycle safety initiatives. Communities may apply for a GHSP grant to be used as seed money to start a program to enhance highway safety. Once a grant is awarded, funding is provided on a reimbursement basis and evidence of reductions in crashes, injuries, and fatalities is required. More information about the program can be found at [www.ncdot.org/secretary/GHSP](http://www.ncdot.org/secretary/GHSP).

### **Public/Private Initiatives**

#### **Active Living by Design (ALbD)**

Active Living by Design is a program sponsored by the Robert Wood Johnson Foundation. ALbD seeks to bring together the health care and transportation communities to create an environment that encourages residents to pursue active forms of transportation such as walking and bicycling. Grants are awarded each year to a selected



number of communities that are then required to produce a local match. These grants can be used to create plans, change land use policies, institute education policies, and develop pilot projects. For more information, visit [www.activelivingbydesign.org](http://www.activelivingbydesign.org).

### **Fit Together**

Fit Together is a partnership of the NC Health and Wellness Trust Fund and Blue Cross and Blue Shield of NC. The grant initiative “recognizes and rewards North Carolina communities’ efforts to support physical activity and healthy eating initiatives in the community, schools, and workplaces, as well as tobacco-free school environments.” This program awards up to nine partnerships with up to \$30,000 annually for a two year period. For more information on the Fit Together grant initiative, visit [www.healthwellNC.com](http://www.healthwellNC.com).

### **The Trust for Public Land**

Founded in 1972, the Trust for Public Land (TPL) is the only national nonprofit working exclusively to protect land to enhance the health and quality of life in American communities. TPL works with landowners, government agencies, and community groups to create urban parks and greenways as well as to conserve land for watershed protection. For more information on the Trust for Public Land, visit [www.tpl.org](http://www.tpl.org).

### **Developer Contributions**

Through diligent planning and early project identification, regulations, policies, and procedures could be developed to protect future pedestrian corridors and require contributions from developers when the property is subdivided. To accomplish this goal, it will take a cooperative effort between local planning staff, NCDOT planning staff, and the development community.

However, if setting requirements is not a desired alternative, the developer could be provided with incentives, such as reducing the number of parking spaces since there will be an option for people to travel to the site by an alternate mode.

### **Impact Fees**

Developer impact fees and system development charges are another funding option for communities looking for ways to pay for transportation infrastructure. They are most commonly used for water and wastewater system connections or police and fire protection services, but they have recently been used to fund school systems and pay for the impacts of increased traffic on existing roads. Impact fees place the costs of new development directly on developers and indirectly on those who buy property in the new developments. Impact fees free other taxpayers from the obligation to fund costly new public services that do not directly benefit them. Although other states in the



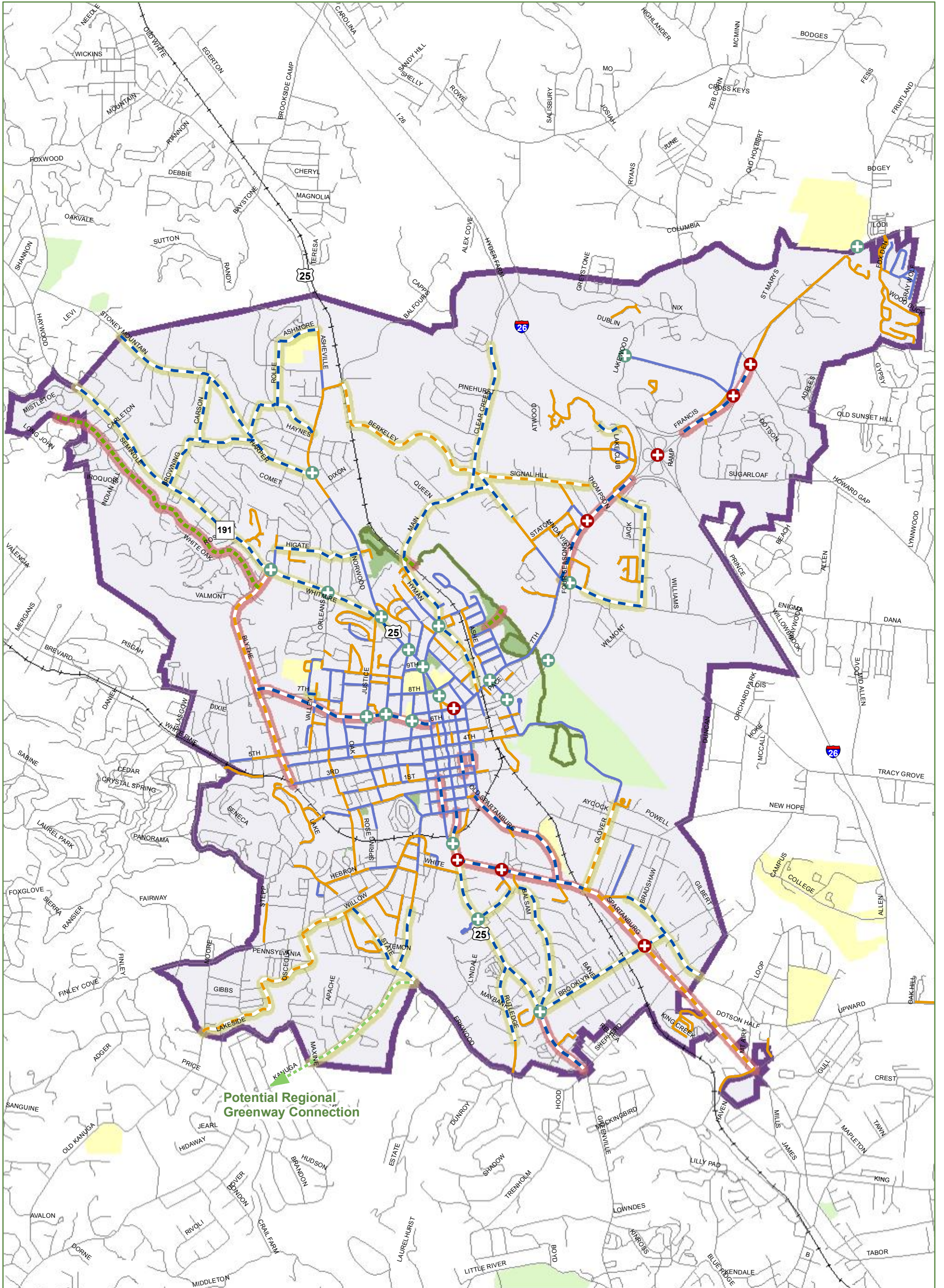
country use impact fees, they have been controversial in North Carolina and only a handful of communities have approved the use of impact fees. The use of impact fees requires special authorization by the North Carolina General Assembly.

## Action Plan

The action plan was developed in an effort to consolidate recommendations and provide direction and focus to key stakeholders. By implementing this action plan, the established vision and goals for the *Hendersonville Pedestrian Plan* will be accomplished. **Figure 5.1** represents the comprehensive long-term recommended pedestrian network.

The action plan matrix shown in **Table 5.1** clearly defines action items and identifies key stakeholders as well as the lead party for each action item. The City of Hendersonville should use this action plan matrix as a guide in implementing the *Hendersonville Pedestrian Plan*.





Potential Regional Greenway Connection

Hendersonville Comprehensive Pedestrian Plan  
**Figure 5.1 ~ Comprehensive Recommended Pedestrian Network**



- |            |              |                                       |  |                                      |
|------------|--------------|---------------------------------------|--|--------------------------------------|
| Study Area | City Parks   | <b>Existing Pedestrian Facilities</b> | <b>Recommended Pedestrian Projects</b> | Recommended Short-Term Project       |
| ETJ        | County Parks | Sidewalk Both Sides                   | Sidewalk Both Sides                    | Recommended Long-Term Project        |
|            | Schools      | Sidewalk One Side                     | Sidewalk One Side                      | Short-Term Intersection Improvements |
|            |              | Existing Greenways                    | Greenway Project                       | Long-Term Intersection Improvement   |

Kimley-Horn and Associates, Inc.



0 0.125 0.25 0.5 Miles



**Table 5.1 — Pedestrian Action Plan Matrix**

Action Items	City	County	NCDOT	MPO	Bi-Peds	Developers
Adopt the Hendersonville Pedestrian Plan	★					
Revise sidewalk requirements to ensure implementation of facilities included in the pedestrian plan — Chapter 4, Typical Cross-Sections and Pedestrian Design Considerations, 4-19 to 4-23	★					
Enhance existing sidewalk policy to ensure consistent implementation of pedestrian facilities — Chapter 4, Recommended Guidelines, 4-10 to 4-23	★					
Provide enhanced pedestrian infrastructure to attractions throughout the city — Chapter 4, Recommended Projects, 4-1 to 4-10	★					
Increase transportation connectivity by connecting roads and sidewalks incrementally as development occurs — Chapter 3, Local Policy, 3-10 to 3-11; Chapter 5, Requirements for Infrastructure Associated with New Developments, 5-2						★
Develop revised design standards for pedestrian facilities for land use context zones — Chapter 4, Requirements, 4-13 to 4-16	★					
Address neighborhood speeding through enhanced enforcement and traffic calming — Chapter 4, Typical Cross-Sections and Pedestrian Design Considerations, 4-19 to 4-23	★					
Provide balanced roadway design criteria in high pedestrian activity zones — Chapter 4, Requirements, 4-13 to 4-16	★					
Relocate existing obstructions that limit the clear width of existing sidewalks — Chapter 4, Fixed Objects and Immovable Obstructions, 4-17 to 4-18	★					
Coordinate pedestrian infrastructure with transit route planning — Chapter 2, Transit, 2-8; Chapter 3, Transit Stop Treatments, 3-16 to 3-17	★					
Revise existing parking lot design standards to improve pedestrian safety — Chapter 5, Parking Policy Requirements, 5-2 to 5-3	★					
Identify and implement Safe Routes to School — Chapter 4, Ancillary Programs, 4-23	★					
Require that all new NCDOT roadways include pedestrian accommodations — Chapter 3, Transportation Plans, 3-3 to 3-4			★			
Seek enhanced funding for sidewalk construction and maintenance — Chapter 5, Funding Opportunities, 5-5 to 5-8	★					
Require pedestrian safety to be addressed during upgrades or modification to existing or new signalized intersections — Chapter 4, Traffic Signals, 4-19	★					
Promote walkability throughout the area — Chapter 5, General Policy Recommendations, 5-1 to 5-2					★	
Require traffic impact analysis to address pedestrian safety — Chapter 5, Requirements for Infrastructure Associated with New Developments, 5-2	★					
Coordinate pedestrian infrastructure planning with local school district — Chapter 4, Safety and Education Programs, 4-23	★					
Coordinate sidewalk and greenway planning between NCDOT, Henderson County, nearby communities, and MPO					★	
Increase City of Hendersonville maintenance budget to better serve and infill existing facilities — Chapter 4, Ancillary Programs, 4-25	★					

Lead	★
Affected parties	