

# COMPREHENSIVE PEDESTRIAN PLAN



AUGUST 12, 2013

Prepared By:



Prepared For the City of  
Mount Holly, NC And:



# ACKNOWLEDGEMENTS

## PROJECT STEERING COMMITTEE

Brian DuPont –City of Mount Holly, Planning & Development

Greg Beal – City of Mount Holly, Planning & Development

Jonathan Wilson – City of Mount Holly, Planning & Development

Danny Jackson – City Manager

David Kiser – Eden Group

Wendy Foster – Chair, Mount Holly Tourism Development Authority

Ann Danzi – Mount Holly Community Development Foundation/Catawba River District

Perry Toomey – Mount Holly City Council

J. Jason Gowen – Mount Holly City Council

Billy Rick – Property Owner

Jason Shoemaker – Mount Holly Community Development Foundation

Lauren Shoemaker – Mount Holly Community Development Foundation

James Allen – Economic Development Committee, Interim Chair

Thomas Bell – School Resource Officer

Taylor Marcantel – Gaston Urban Area Metropolitan Planning Organization

Mark Jusko – City of Mount Holly, Parks & Recreation Department

## NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Robert Mosher – Policy & Planning Manager, Division of Bicycle and Pedestrian Transportation

David Keilson – NC DOT Division 12





# CONTENTS

## 1 PROJECT OVERVIEW

Purpose.....	1-1
Background.....	1-1
Vision&Goals.....	1-2
PlanningProcess.....	1-3
BenefitsofWalkableCommunity.....	1-4

## 2 EXISTING CONDITIONS

Overview.....	2-1
LandUse&Development.....	2-2
Demographics.....	2-2
OpportunitiesandChallenges.....	2-7
ExistingPedestrianConditions.....	2-13

## 3 PROGRAMS AND POLICIES

Overview.....	3-1
Education.....	3-2
Encouragement.....	3-5
Enforcement.....	3-8
SafeRoutestoSchoolToolKit.....	3-9
PedestrianPolicies.....	3-12

## 4 NETWORK RECOMMENDATIONS

Overview.....	4-1
Methodology.....	4-1
ThePedestrianNetwork.....	4-2
ProjectCutSheets.....	4-10

## 5 IMPLEMENTATION STRATEGIES

Overview.....	5-1
KeyActionSteps.....	5-1
KeyPartnersinImplementation.....	5-3
PerformanceMeasures.....	5-7
FacilityDevelopmentMethods.....	5-8

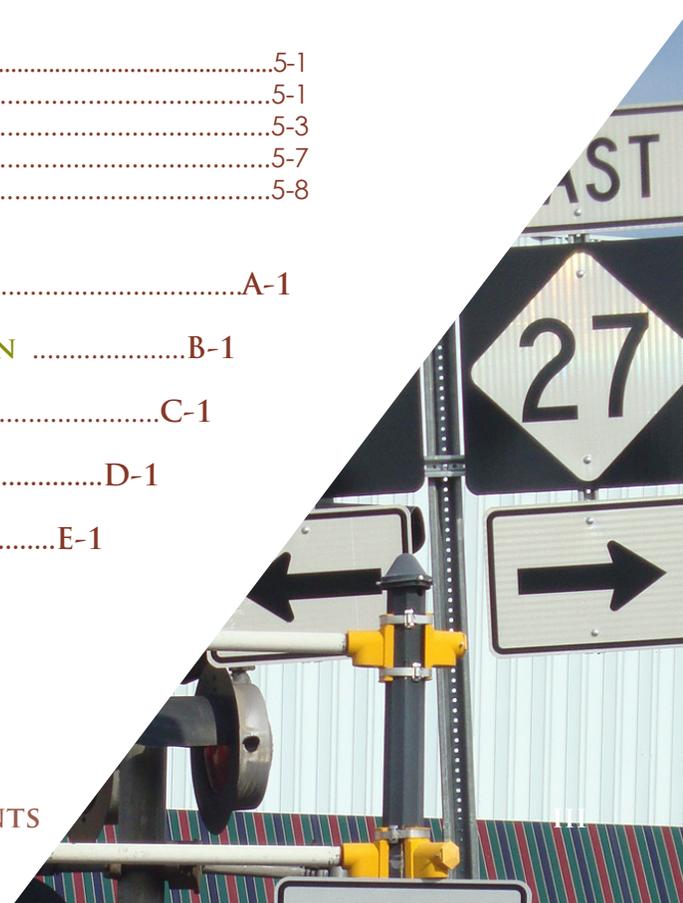
APPENDIX A: PREVIOUS PLANNING EFFORTS.....	A-1
--	-----

APPENDIX B: SIDEWALK PROJECT PRIORITIZATION.....	B-1
--	-----

APPENDIX C: DESIGN GUIDELINES.....	C-1
------------------------------------	-----

APPENDIX D: FUNDING.....	D-1
--------------------------	-----

APPENDIX E: PUBLIC INVOLVEMENT.....	E-1
-------------------------------------	-----





*This page intentionally left blank*



# 1

## PROJECT OVERVIEW

### CHAPTER OUTLINE

PURPOSE (1-1) | BACKGROUND (1-1) | VISION AND GOALS (1-2) | THE PLANNING PROCESS (1-3) | BENEFITS OF A WALKABLE COMMUNITY (1-4)

### PURPOSE

This Plan will guide the City of Mount Holly, NCDOT, and other local and regional partners in improving infrastructure for pedestrians in Mount Holly to foster a 'walking culture' through related programs and policies.

### BACKGROUND

#### NCDOT'S BICYCLE AND PEDESTRIAN PLANNING GRANT INITIATIVE

In 2012, the City of Mount Holly was awarded a matching grant from the North Carolina Department of Transportation (NCDOT) Bicycle and Pedestrian Planning Grant Initiative. The purpose of the grant is to encourage municipalities to develop comprehensive bicycle plans and pedestrian plans. This program has assisted more than 100 North Carolina communities and is administered through NCDOT's Division of Bicycle and Pedestrian Transportation (DBPT).

#### COMMUNITY INITIATIVE

This Plan combines past planning efforts with new research and analysis, and includes public input. The result is a complete, up-to-date framework for moving forward with tangible pedestrian improvements.

The City is very committed to becoming pedestrian-friendly; however, current pedestrian conditions within Mount Holly do not adequately serve the needs of its residents. This Plan will provide guidance for enhancing conditions for pedestrians throughout the City.

Beyond physical improvements, this Plan also outlines policies and programs to help encourage people to walk more often, drive more safely, and to grow as a city with the needs of pedestrians taken into full consideration, particularly in areas identified by the Project Steering Committee, the public, and City staff.



## VISION AND GOALS

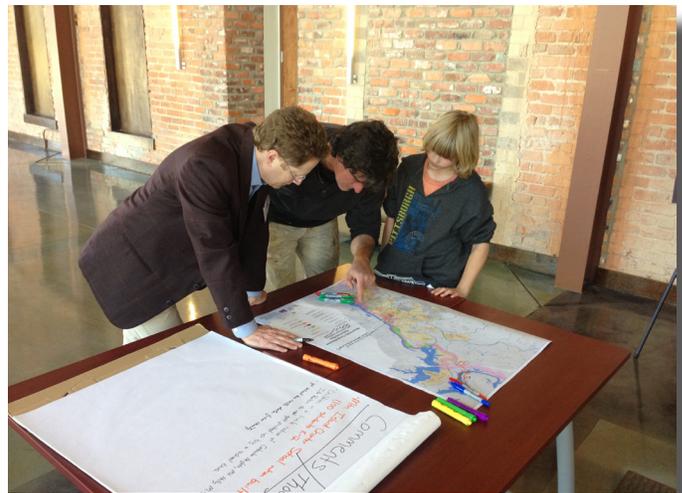
The following vision statement and goals were developed based on Steering Committee and public input to reinforce the goals identified in the City's previous planning efforts. The vision statement applies to both the Plan itself and the desired outcomes of its implementation.

### PEDESTRIAN PLAN VISION STATEMENT

Mount Holly will:

1. **Promote walking** as a healthy alternative.
2. **Create an interconnected system of parks, open space, and trails** to ensure that safe and accessible recreational facilities are available to all, air and water quality are protected, plant and animal species are protected, and historic and cultural places are preserved and accessible.
3. **Be a vibrant, friendly, and walkable city** for people of all ages.
4. **Provide safe and attractive pedestrian connections** for residents and visitors to access local and regional destinations, including retail areas, schools, and parks; to explore downtown, and walk to city events. An expanded network of interconnected streets and sidewalks will provide safe and efficient transportation for pedestrians, bicyclists, and vehicles as the community grows.
5. **Plan for future growth** by requiring new development to construct pedestrian-friendly amenities that add value to the entire community, including sidewalks, street trees, pedestrian scale lighting, and greenways. New development should be required to construct sidewalks, while protecting its environmental resources and maintaining quality public services at an affordable cost. Neighborhoods should be walkable and interconnected.

6. **Be a walkable and safe community** that embraces Complete Streets.
7. **Educate city residents on the benefits of being a walkable community** with greenways, trails and pedestrian facilities.
8. **Create gateways into the community** in key locations along Highway 27, Highway 273, and Mountain Island Lake. Gateways will welcome visitors and give residents a "sense of place" by protecting and enhancing these priority corridors.
9. **Prioritize an action plan for implementation** of the recommendations of the Pedestrian Master Plan.



*One of the City's goals is to be a vibrant, friendly, and walkable city for people of all ages*



## MEASURABLE GOALS OF THE PEDESTRIAN PLAN

1. **Provide walking paths** that connect schools, shopping areas, and key destinations with surrounding neighborhoods.
2. **Fill gaps in the existing sidewalk network** by targeting sidewalk and intersection improvements to the following priority corridors including:
  - Highway 273
  - Noles Drive
  - Beatty Road and Beatty Drive
  - Highway 273 and A&E Drive
  - Craig Street
  - Catawba Avenue
3. **Improve safety of Highway 27 and its crossings** between North River Street and Highland Street through the implementation of a road diet, sidewalk, cycle track, and an improved crossing at Highland Street.
4. **Enhance pedestrian safety at key intersections and crossings**, such as those at Stowe YMCA and Food Lion.
5. **Increase sidewalks in neighborhoods.**
6. **Provide street trees, lighting and benches** to improve comfort and safety of the pedestrian facilities.



*Pedestrian connections should be safe, attractive, and accessible*

## DATA COLLECTION AND ANALYSIS

The consultant team conducted thorough on-the-ground field research in January 2013. Field research included an intersection inventory and a photographic inventory. This base line information in addition to aerial photography and geographic information systems (GIS) data (including the City's sidewalk inventory and planned greenway network) were used in assessing existing conditions, which are the focus of Chapter 2 of this Plan, and to identify opportunities and challenges for pedestrian facility development.

## PUBLIC INVOLVEMENT

In January 2013, a project website was developed with input and guidance from the Steering Committee. The website was publicly launched in January 2013. An online public survey developed for the project and was released on the project website in February 2013.

The first public engagement event was held at the Mount Holly Municipal Complex on March 19, 2013. People were invited to learn about the plan and provide comments about where they would like to see improvements for walking. A public input map, survey, and posters were provided for review and project consultants answered questions and took comments. Attendees were also pointed to an online link where they could fill out a web-based survey if preferred. More than fifteen people representing neighborhoods and Mount Holly

## THE PLANNING PROCESS

### THE PROJECT STEERING COMMITTEE

The project steering committee for the pedestrian plan consisted of local staff and key stakeholders. The project steering committee met with project consultants from Alta Planning + Design four times throughout the process. During the first meeting (January 2013) the committee focused on project vision and goals and existing conditions. During the second meeting (March 2013) the committee discussed proposed improvements and pedestrian related programs needed in the City of Mount Holly. The Consultant team also met with the Steering Committee in May 2013 and Summer 2013.

Appendix E includes a summary of the comments received during these meetings.

institutions and agencies attended the meeting to learn about the plan and provide input. The general feedback was highly positive, with many people impressed that the City of Mount Holly was being proactive in addressing walkability.

On May 11, 2013 the City of Mount Holly provided a booth at the annual Mount Holly Springfest, where City staff and consultants interacted with the public to discuss the plan and its goals. The project team provided maps, project information cards, and hard copies of the survey.

An online survey was developed for the project and made available on-line and paper form between the months of February and June of 2013. A total of 338 responses from city residents were collected. Appendix E presents the results of the public survey and the summary of the public engagement, and steering committee meetings completed throughout the duration of the project.

## BENEFITS OF A WALKABLE COMMUNITY

When considering the level of dedication in time and valuable resources that it takes to create a walkable community, it is also important to assess the immense value of pedestrian friendliness.

### 2011 NATIONAL ASSOCIATIONS OF REALTORS SURVEY

**46%** of respondents answered: my community has too few shops and restaurants within easy walking distance

**46%** of respondents answered: my community has too few sidewalks

**There are economic benefits, quality of life benefits, health benefits, environmental benefits and transportation benefits of a walkable community.**

Walking helps to improve people's health and fitness, enhances environmental conditions, decreases traffic congestion, and contributes to a greater sense of community.

Physical exercise has been accepted as an effective way of managing a person's mental, emotional and physical state. Walking, in particular, is one of the most highly recommended types of exercise to incorporate into daily life.

In a 2011 Community Preference Survey conducted by the National Association of Realtors (NAR), 66% of respondents selected being within walking distance of stores and other community amenities as being important. **When given an opportunity to select which community they would most like to live in, a community described as:**

**"a mix of [housing types], with almost all streets having sidewalks, destinations such as shopping, restaurants, a library, and a school are within a few blocks of your home, and where parking is limited when you decide to drive to local stores, restaurants and other places ranked higher and was found to be more desirable than a community described as:**





“only single family houses on large lots, with no sidewalks, destinations such as shopping, restaurants, a library, and a school are within a few miles of your home, limiting your transportation choices to mainly the automobile, but there is enough parking when you drive to these destinations and public transportation, such as bus, subway, light rail, or commuter rail, is distant or unavailable”.

### ECONOMIC BENEFITS

Walking is an affordable form of transportation. A walkable community directly affects a citizen's transportation costs. According to the Pedestrian

“GREENWAYS AND PEDESTRIAN TRAILS HAVE BEEN SHOWN TO INCREASE THE VALUE OF ADJACENT PROPERTIES BY AS MUCH AS 5 TO 20%.”

and Bicycle Information Center (PBIC), of Chapel Hill, NC, the cost of operating a car for a year is approximately \$5,170, while walking is virtually free. The PBIC explains, “**When safe facilities are provided for pedestrians and bicyclists, more people are able to be productive, active members of society.** Car ownership is expensive, and consumes a major portion of many Americans' income.” A study cited by the Victoria Transport Policy Institute's 2011 “Transportation Affordability” found that households in automobile-dependent communities devote 50% more to transportation (more than \$8,500 annually) than households in communities with more accessible land use and more multi-modal transportation systems (less than \$5,500 annually). Walking becomes even more attractive from an economic standpoint when the rising price of oil (and decreasing availability) is factored into the equation. The unstable cost of fuel reinforces the idea that local communities should be built to accommodate people-powered transportation, such as walking and biking.

There are also economic benefits of a walkable community from a real estate standpoint. The study by CEO's for Cities “Walking the Walk: How Walkability Raises Home Values in U.S. Cities” estimates how much market value home buyers implicitly attach to houses with higher “Walk Scores”. The study looked at data for more than 90,000 recent home sales in 15 different markets around the Nation. While controlling for key characteristics that are known to influence housing value, the study showed **a positive**

“ME THINKS THAT THE MOMENT MY LEGS BEGIN TO MOVE, MY THOUGHTS BEGIN TO FLOW.”

(HENRY DAVID THOREAU)

**correlation between walkability and housing prices** in 13 of the 15 housing markets studied.<sup>1</sup>

Trails can play a part in making communities more walkable, and they too have a positive economic impact. In a survey of home buyers by the National Association of Realtors and the National Association of Home Builders, trails ranked as the second most important community amenity out of a list of 18 choices.<sup>2</sup> Additionally, the study found that **‘trail availability’ outranked 16 other options including security, ball fields, golf courses, parks, and access to shopping or business centers.** Findings from the American Planning Association,<sup>3</sup> the Rails-to-Trails Conservancy,<sup>4</sup> and the Trust for Public Land,<sup>5</sup> further substantiate the positive connection between walkability and property values across the country.

“THE TRUE CHARM OF PEDESTRIANISM DOES NOT LIE IN THE WALKING, OR IN THE SCENERY, BUT IN THE TALKING... THE SCENERY AND THE WOODSY SMELLS ARE GOOD TO BEAR IN UPON A MAN AN UNCONSCIOUS AND UNOBTRUSIVE CHARM AND SOLACE TO EYE AND SOUL AND SENSE; BUT THE SUPREME PLEASURE COMES FROM THE TALK.”

(MARK TWAIN)

For example, within a new development in Apex, North Carolina, new lots situated on greenways were priced \$5,000 higher than comparable lots off the greenway. In Charlotte, national builders typically charge premiums ranging from \$1000 to \$5000 for \$120,000-\$200,000 homes bordering open space and greenways”.<sup>6</sup>

According to the Federal Highway Administration, the basic cost of a single mile of urban, four-lane highway is between \$20 million and \$80 million. In urban bottlenecks where congestion



is the worst, common restrictions such as the high costs of right of ways and the needs to control high traffic volumes can boost that figure to \$290 million or more.<sup>7</sup> By contrast, the costs of bicycle and pedestrian facilities range anywhere from a few thousand dollars per mile to rarely more than \$1 million, with great variability between types of infrastructure and local circumstances.<sup>8</sup>

### QUALITY OF LIFE BENEFITS

Many factors go into determining quality of life for the citizens of a community: the local education system, prevalence of quality employment opportunities, and affordability of housing are all items that are commonly cited. Increasingly however, citizens claim that access to alternative means of transportation and access to quality recreational opportunities such as parks, trails, greenways, and bicycle routes are important factors for them in determining their overall pleasure within their community. Communities with such amenities can attract new businesses, industries, and in turn, new residents. Walking is a fundamental social community activity.

**Members of a community who walk to a destination are more likely to meet or make friends or other social or commercial contacts** than members of a community who drive to a destination. Provided there are viable alternatives to driving, “Americans are willing to change their travel habits, as the dramatic increases in gas prices in 2008 have shown. Every day, more commuters switch to public transportation, bicycling and walking in places where prior infrastructure investments have made these options safe and convenient”.<sup>9</sup>

Other impacts include a reduction in overall neighborhood noise levels. According to the National Center for Safe Routes to School, “Walking or biking to school gives children time for physical activity and a sense of responsibility and independence; allows them to enjoy being outside; and provides them with time to socialize with their parents and friends and to get to know their neighborhoods”.<sup>10</sup>

Walking is particularly important for people who are transportation disadvantaged (people with disabilities, elders, children, and people with low incomes). Poor walking conditions can contribute to what is considered “social exclusion”, that is, the physical, economic and social isolation of vulnerable populations.

In a 2004 Centers for Disease Control and Prevention survey, 1,588 adults answered questions about barriers to walking to school for their youngest child aged 5 to 18 years.<sup>11</sup> The main reasons cited by parents included distance to school, at 62%, and traffic-related danger, at 30%. **Strategic additions to municipal trail systems could shorten the distance from homes to schools**, and overall pedestrian and bicycle improvements can improve the safety of our roadways.

### HEALTH BENEFITS

Many people incorporate walking into their daily routines as a way to manage their mental, emotional and physical state. In a December 2010 article published by the Mayo Clinic, it is suggested that, “walking, like other exercise, can help you achieve a number of important health benefits such as:

- Lowered low-density lipoprotein (LDL) cholesterol (the “bad” cholesterol)
- Higher high-density lipoprotein (HDL) cholesterol (the “good” cholesterol)
- Lowered blood pressure
- Reduced risk of or manage type 2 diabetes
- Improved mood
- Feeling strong and fit

Research shows that “regular, brisk walking can reduce the risk of heart attack by the same

#### CENTER FOR DISEASE CONTROL

30 MINUTES OF “MODERATELY INTENSE EXERCISE” IS EQUIVALENT TO:

- 1.5 miles of walking; or
- 5 miles of bicycling; or
- 1 less slice of pizza.

amount as more vigorous exercise, such as jogging.” In addition to research by the Mayo Clinic, a growing number of studies show that the design of our communities—including neighborhoods, towns, transportation systems, parks, trails and other public recreational facilities—affects people’s ability to reach the recommended daily 30 minutes of moderately intense physical activity (60 minutes for youth). In short, a diverse pedestrian network will create better opportunities for active lifestyles.

The increased rate of disease associated with

“THE CIVILIZED MAN HAS BUILT A COACH,  
BUT HAS LOST THE USE OF HIS FEET.”

(RALPH WALDO EMERSON)

inactivity reduces quality of life for individuals and increases medical costs for families, companies, and local governments. The CDC determined that **creating and improving places to be active could result in a 25% increase in the number of people who exercise** at least three times a week.<sup>12</sup>

This is significant considering that for people who are inactive, even small increases in physical activity can bring measurable health benefits. The establishment of a safe and reliable network of sidewalks and trails can have a positive impact on the health of nearby residents. The Rails-to-Trails Conservancy puts it simply: “Individuals must choose to exercise, but communities can make that choice easier”.<sup>13</sup>

## ENVIRONMENTAL BENEFITS

When people choose to get out of their cars and walk, they make a positive environmental impact. They reduce their use of gasoline, which then reduces the volume of pollutants in the air. Other environmental impacts can be improvements in local water quality as fewer automobile-related discharges wind up in the local rivers, streams, and lakes.

Trails and greenways are also part of the pedestrian network, conveying their own unique environmental benefits. Greenways protect and link fragmented habitat and provide opportunities for protecting plant and animal species. Aside from connecting places without the use of air-polluting automobiles, trails and greenways also reduce air pollution by protecting large areas of plants that create oxygen and filter air pollutants such as ozone, sulfur dioxide, carbon monoxide

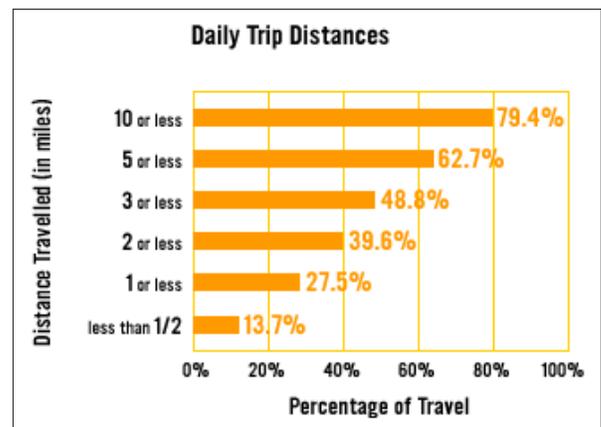
and airborne particles of heavy metal. Finally, greenways improve water quality by creating a natural buffer zone that protects streams, rivers and lakes, preventing soil erosion and filtering pollution caused by agricultural and road runoff.

## TRANSPORTATION BENEFITS

According to the U.S. Environmental Protection Agency, fewer children walk or bike to school than did so a generation ago. In 1969, 48% of students walked or biked to school, but by 2001, less than 16% of students between 5 and 15 walked or biked to or from school.<sup>14</sup>

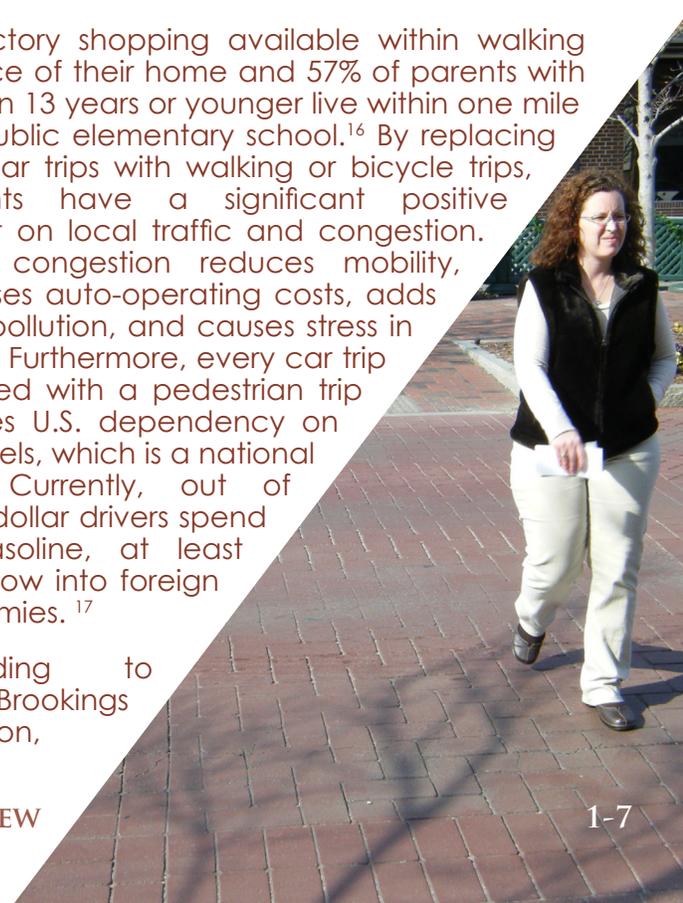
A National Household Travel Survey found that roughly 40% of all trips taken by car are less than two miles (see chart below).<sup>15</sup>

Nearly two-thirds of all households say they have



satisfactory shopping available within walking distance of their home and 57% of parents with children 13 years or younger live within one mile of a public elementary school.<sup>16</sup> By replacing short car trips with walking or bicycle trips, residents have a significant positive impact on local traffic and congestion. Traffic congestion reduces mobility, increases auto-operating costs, adds to air pollution, and causes stress in drivers. Furthermore, every car trip replaced with a pedestrian trip reduces U.S. dependency on fossil fuels, which is a national goal. Currently, out of every dollar drivers spend on gasoline, at least \$0.35 flow into foreign economies.<sup>17</sup>

According to the Brookings Institution,



the number of older Americans is expected to double [between 2000 and 2025].<sup>18</sup> All but the most fortunate seniors will confront an array of medical and other constraints in their mobility even as they continue to seek both an active community life, and the ability to age in place. **Trails built as part of the pedestrian transportation network** generally do not allow for motor vehicles. However, they do **accommodate motorized wheelchairs, which is an important asset for the growing number of senior citizens** who deserve access to independent mobility.

Creating a walkable community provides greater and safer mobility for all residents, especially the non-driving population. According to the U.S. Census Bureau, there are more than 60 million Americans who do not drive because they are not old enough. Another 30 million adults are not licensed to drive for a variety of reasons including economics, age, disability and choice.

Eight million Americans above the age of 60 do not have a driver's license, and there are other licensed drivers who just choose not to drive.<sup>19</sup>

There are **90+ million non-drivers in the United States** and providing sidewalks and other pedestrian facilities to increase mobility for these historically underserved citizens, will enhance environmental conditions, decrease traffic congestion, improve overall health and contribute to a greater sense of community.

These built environments have repeatedly been associated with more walking, bicycling and transit use, more overall physical activity, and lower body weights; lower rates of traffic injuries and fatalities, particularly for pedestrians; lower rates of air pollution and greenhouse gas emissions; and better mobility for non-driving populations".<sup>20</sup>

## FOOTNOTES FROM, "THE BENEFITS OF A WALKABLE COMMUNITY":

1. CEOs for Cities. (2010) Walking the Walk: How Walkability Raises Home Values in U.S. Cities
2. National Association of Realtors and National Association of Home Builders (2002). Consumer's Survey on Smart Choices for Home Buyers.
3. How Cities Use Parks for Economic Development, 2002.
4. Economic Benefits of Trails and Greenways, 2005.
5. Economic Benefits of Parks and Open Space, 1999.
6. <http://www.charmeck.org/mecklenburg/county/ParkandRec/Greenways/Documents/1benefits.pdf>
7. Active Transportation for America: The Case for Federal Investment in Bicycling and Walking. Rails to Trails Conservancy and Bikes Belong Coalition 2008 / Sissel, S., Cost per Highway Mile, 2008.
8. Krizek, K.e Guidelines for Analysis of Investments in Bicycle Facilities, 2006.
9. Active Transportation for America: The Case for Federal Investment in Bicycling and Walking. Rails to Trails Conservancy and Bikes Belong Coalition 2008.
10. National Center for Safe Routes to School. (2006). National Center for Safe Routes to School Talking Points.
11. Centers for Disease Control and Prevention. The Importance of Regular Physical Activity for Children. Accessed in 2005 from [www.cdc.gov/nccdcphp/dnpao/index.html](http://www.cdc.gov/nccdcphp/dnpao/index.html).
12. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2002). Guide to Community Preventive Services.
13. Rails-to-Trails Conservancy. (2006) Health and Wellness Benefits.
14. U.S. EPA (2003). Travel and Environmental Implications of School Siting.
15. 'Daily Trip Distances' chart from the Bicycle and Pedestrian Information Center website, [www.pedbikeinfo.org](http://www.pedbikeinfo.org).
16. U.S. Census Bureau, American Housing Survey for the United States: 2005. 2006.
17. Active Transportation for America: The Case for Federal Investment in Bicycling and Walking. Rails to Trails Conservancy and Bikes Belong Coalition 2008.
18. Brookings Institution. 2003. The Mobility Needs of Older Americans: Implications for Transportation Reauthorization.
19. U.S. DOT "Distribution of Licensed Drivers 2001.
20. American Public Health Association. (2010) The Hidden Health Costs of Transportation.





*This page intentionally left blank*

# 2

## EXISTING CONDITIONS

### CHAPTER OUTLINE

OVERVIEW (2-1) | LAND USE & DEVELOPMENT (2-2) |  
DEMOGRAPHICS (2-2) | OPPORTUNITIES AND CHALLENGES  
(2-7) | EXISTING PEDESTRIAN CONDITIONS (2-13)

### OVERVIEW

Mount Holly's geographic characteristics, existing roadway and land use configurations, and existing pedestrian facilities significantly affect the viability of pedestrian transportation and recreation, and the everyday decisions of pedestrians and motorists. A pedestrian transportation system consists of several types of facilities including sidewalks, crosswalks, curb ramps, pedestrian countdown timers, speed tables, trails, greenways, and pedestrian bridges, thus an analysis of all of these facilities and associated land use and transportation factors is required. This chapter assesses Mount Holly's development history, demographic profile, and existing pedestrian conditions.

The City of Mount Holly has been an area of growth since its beginnings. According to Mount Holly's history ([http://www.carolana.com/NC/Towns/Huntersville\\_NC.html](http://www.carolana.com/NC/Towns/Huntersville_NC.html)), the first land grants were issued in 1754 at Dutchman's Creek. Soon after, others began to settle nearby, and a post office sprang up, along with textile mills and the railroad. The town was officially named "Mount Holly" in 1875. Although the importance of the textile industry in the local economy has diminished over the past twenty-five years, the Mount Holly area has continued to prosper due to improvements in the regional transportation network and the economic growth of the Charlotte-Mecklenburg area. The city's strategic location between Charlotte and Gastonia has created physical growth, which is demonstrated by the city's ever expanding population. This background of **growth emphasizes the need to make the City and its neighborhoods attractive, walkable and accessible destinations.**

Mount Holly is committed to being pedestrian-friendly. During the 2003 "Vision Process" project the City passed a \$5 million bond referendum, and the City was able to construct and replace sidewalks in the downtown core with brick pavers, adorned with decorative street lights and street trees. The City has continued to plan and implement pedestrian improvements through the adoption of the 2007 *Greenprint/Catawba River Corridor* study, the 2009 *Linear Park Plan*, the 2010 *Comprehensive Parks and Recreation Master Plan*, 2009 Highway 27 & 273 Corridors Plans, through partnership with the Carolina Thread Trail, and most recently the commencement of this NCDOT-funded pedestrian plan.





# LAND USE & DEVELOPMENT

Mount Holly is located in the eastern portion of Gaston County, North Carolina, north of the I-85 corridor and south of the Hwy 16 corridor, with the Hwy 27 and Hwy 273 corridors dividing the City. The City is located along the western bank of the Catawba River, which divides Mecklenburg and Gaston counties.

The City has a long term history with major industries, including the National Gypsum, Clariant, American & Efrid and Freightliner Trucking Company. There are three elementary schools and one middle school located in the City that would benefit from a comprehensive pedestrian plan. Mount Holly also borders Belmont Abbey College, with an enrollment of nearly 2,000 students, all of whom have memberships to the Mount Holly Stowe YMCA, and walk from campus to the "Y" without the benefit of sidewalks and safe crossing on Hwy 273.

The City has advanced in the construction of the Linear Park in Downtown, and completed a one-half mile portion of greenway along the Catawba River in Tuckaseege Park, and has plans to connect these two trails with the future construction of additional Catawba River Greenway segments. These improvements add to the current efforts creating a pedestrian friendly community. The development of the riverfront offers excellent opportunities for pedestrian connections to nature and recreational activities.

Outside of the downtown core, small neighborhoods have developed over the past 50 years. Many of these **neighborhoods lack sidewalks**, and are cul-de-sac type developments disconnected from each other. However, low traffic speeds along the roadways and **the short distances between destinations within the city create opportunities for numerous walking trips** once a complete and high quality pedestrian network is developed.



# DEMOGRAPHICS

Needs and demands related to walking can be better understood through an analysis of demographic information. US Census demographic data provide local information such as the primary means of transportation to work and the percent of population not owning a vehicle. **Table 2-1** presents selected population and economic characteristics for the City of Mount Holly obtained from the 2010 U.S. Census and the *American Community Survey* (ACS) estimates for 2007 to 2011.

**TABLE 2-1: CITY OF MOUNT HOLLY CENSUS DEMOGRAPHICS ESTIMATES**

SUBJECT	DATA SOURCE	ESTIMATE	% OF TOTAL
<b>Total Population</b>	<b>2010 US Census</b>	<b>13,656</b>	<b>100</b>
16 years and over		10,583	77.5
16 years and under (calculated)		3,073	22.5
65 years and over		541	4.0
<b>Employed population 16 years and over</b>	<b>ACS (2007-2011)</b>	<b>6,345</b>	<b>100</b>
Commuting to work by car alone		5,439	85.7
Commuting to work by walking		8	0.1
<b>Number of Households</b>		<b>5,155</b>	<b>100</b>
No. of household without access to automobile		333	6.5
Median household income		\$54,470	N/A

Mount Holly's population is 13,656, based on the 2010 Census, which represents a population increase of 42% from the 2000 Census at 9,618. With almost 40% of the City's population ranging from the ages of 25 to 49 the City is relatively young and with the City's proximity to Charlotte and Gastonia, it would be expected for these numbers to continue to grow.

**Figure 2-1** shows six demographic analysis maps which help to identify areas of Mount Holly most in need of pedestrian facilities, and will help with determining project priorities.



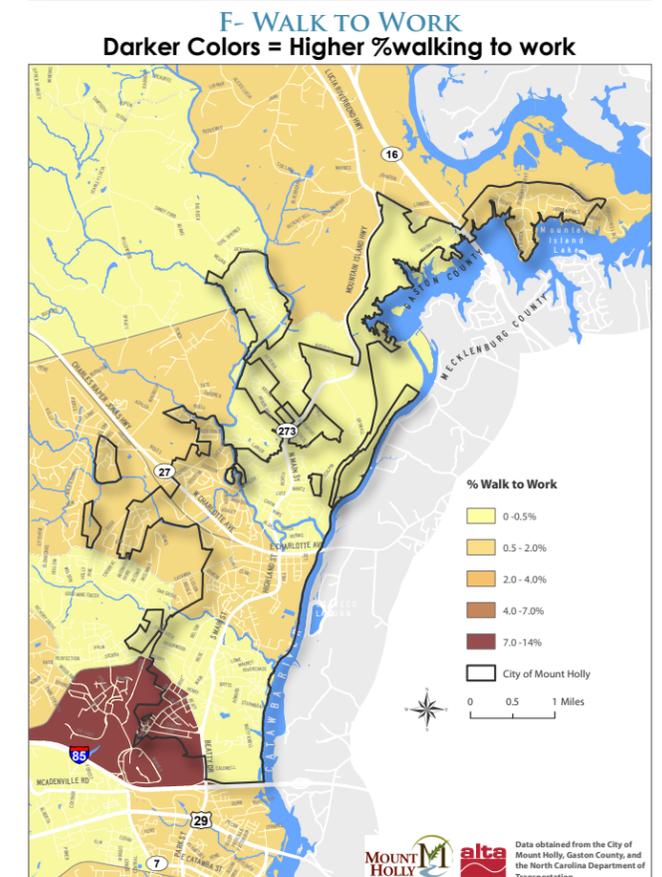
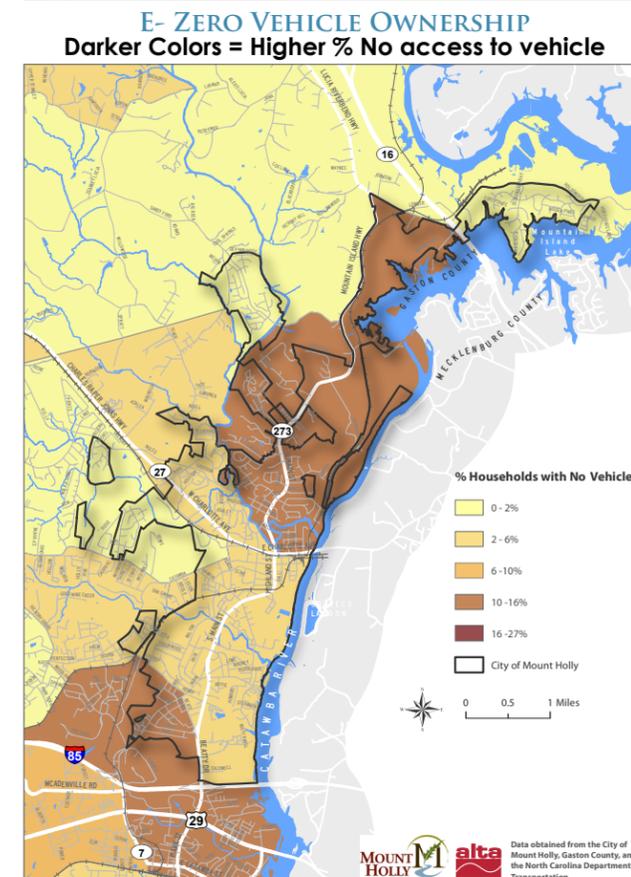
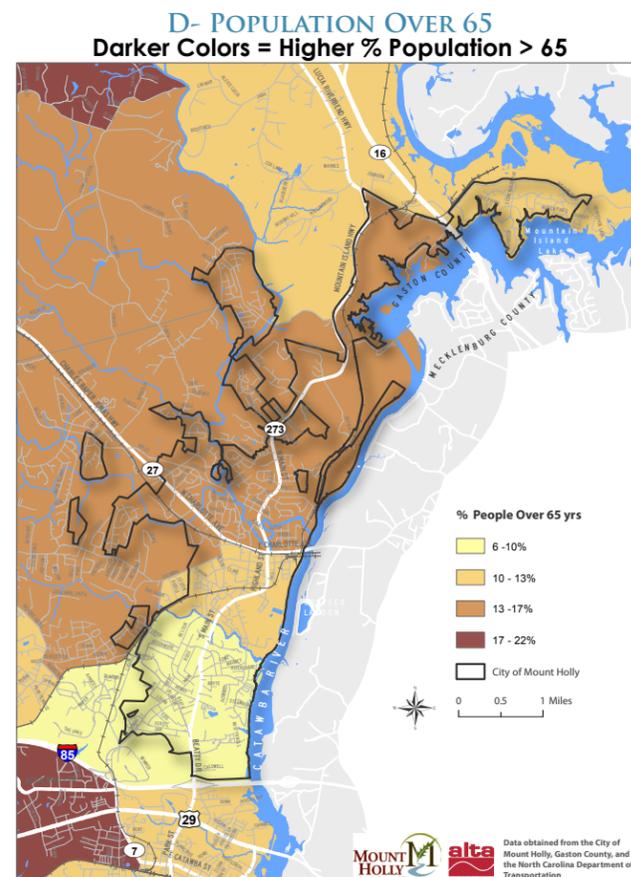
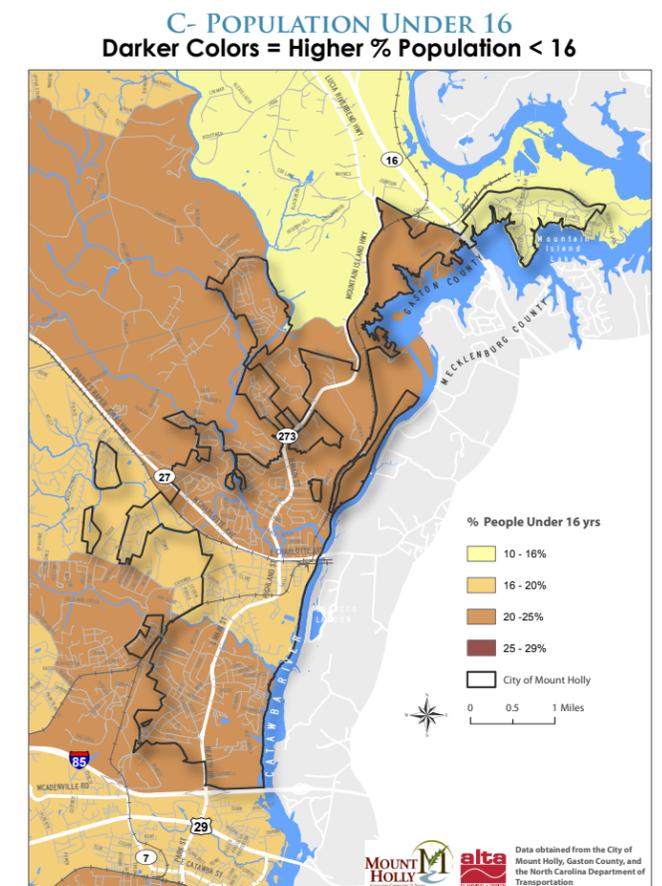
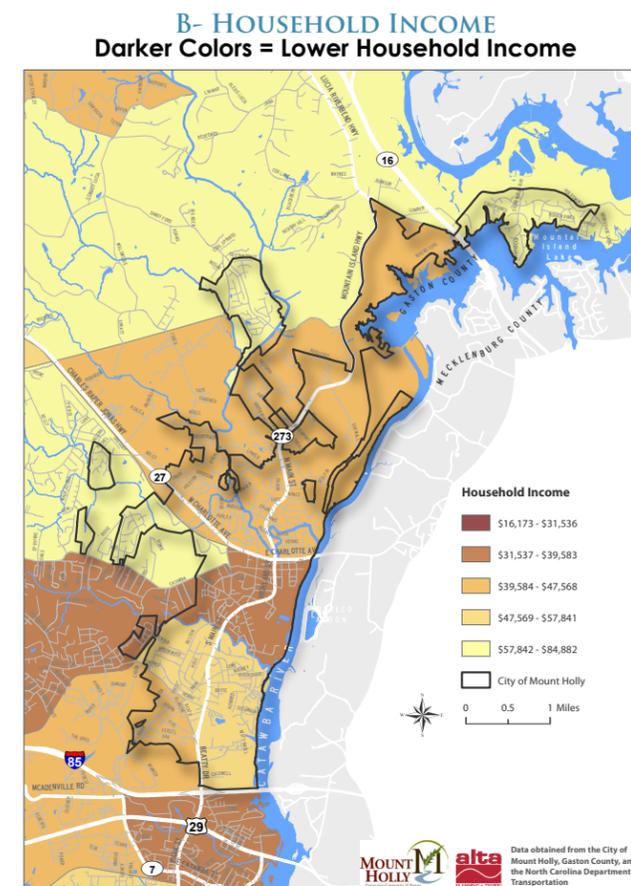
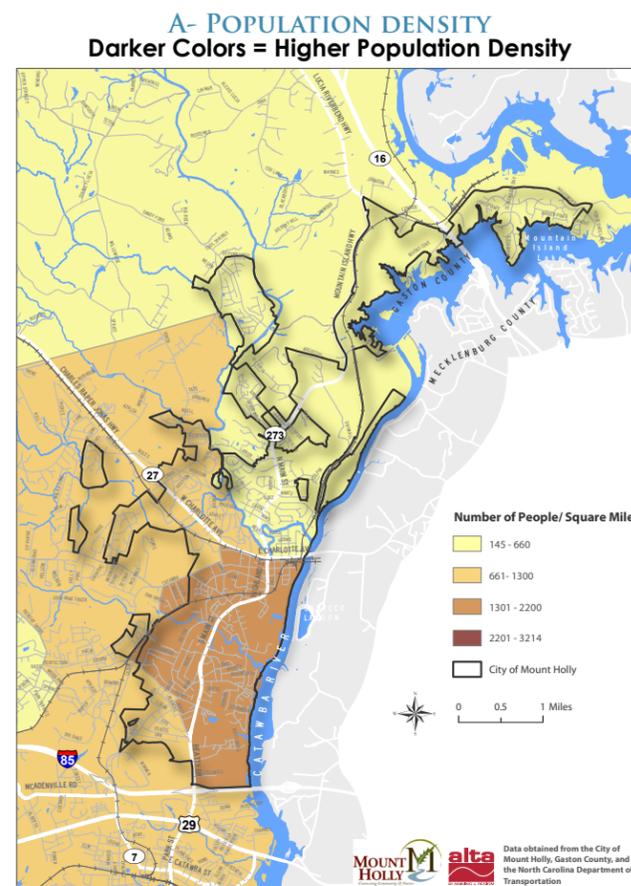
# FIGURE 2-1: DEMOGRAPHIC ANALYSIS MAPS

Figure 2-1 (A) shows population density (persons per square mile) throughout the City. The most densely populated areas in Mount Holly are in the neighborhoods that surround the downtown core and along the riverfront.

The median household income in Mount Holly is \$54,470 per year. Figure 2-1 (B) illustrates household income ranges for Mount Holly. The highest median household incomes are in the northern portions of the City. Some of the lowest median household incomes are in the areas surrounding downtown; these areas are likely to include a higher percentage of households without cars. Figure 2-3 presents walk to work data, as shown in Table 2-1, Mount Holly has a very low percentage of walk commuters. The residential areas near Belmont Abbey College show the highest percentage of walk commuters in the City.

Figures 2-1 (C and D) show the percentage of the total population younger than 16 years old (school age) and older than 65 (senior population), respectively. Considering areas that contain a higher concentration of youth and seniors is important when prioritizing pedestrian improvements, as those younger than 16 (up to 22% of the City's population) cannot legally drive, and many of those over 65 do not drive for reasons of physical disability or other reasons.

Figure 2-1 (E) presents an overview of the percentage of household without a vehicle in the City. The higher percentages of households with no vehicles are located in the northeast portions of the city and in the neighborhoods surrounding the college.





*This page intentionally left blank.*



**Figure 2-2** represents a composite of the six census maps described above. This map overlay intends to highlight (in darker color) the areas in Mount Holly with greater need for improved pedestrian access and mobility based on these demographic factors. The composite map suggests that the areas with higher need for pedestrian facilities are located around Belmont Abbey College and in the northeast neighborhoods of the City. Projects identified in this Plan will be prioritized with input from residents, the Steering Committee and key community stakeholders, and special attention will be paid to projects located in lower-income areas that overlap with higher-density areas and areas of higher walk to work percentages.

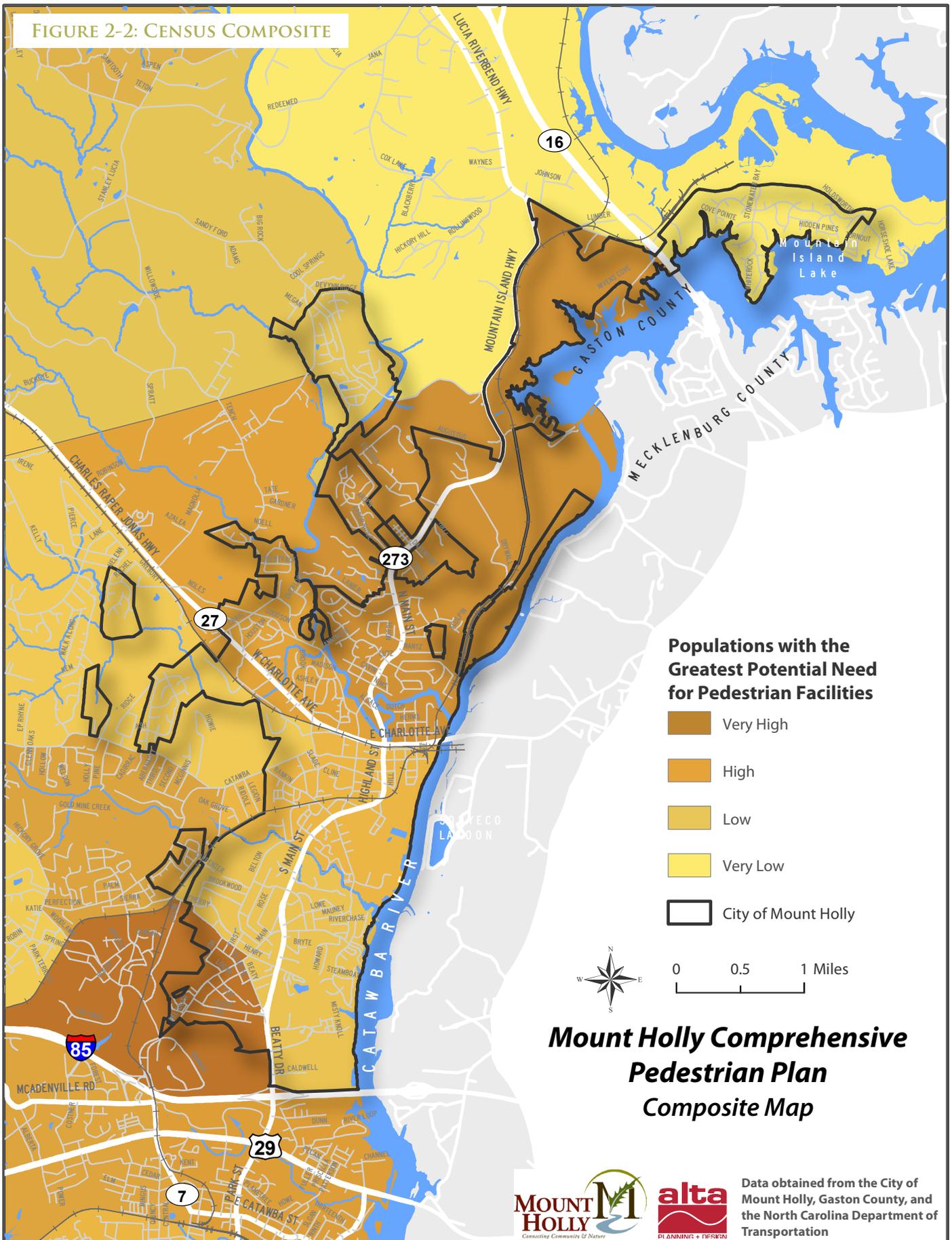


*A demographic analysis can help to identify pockets of population with greater need and demand for pedestrian facilities, such as youth and seniors*





FIGURE 2-2: CENSUS COMPOSITE





# OPPORTUNITIES AND CHALLENGES

## FIELDWORK OBSERVATIONS

The City of Mount Holly features a well-established pedestrian-friendly downtown core, but many intersections and crossing facilities are not safe for pedestrians. In some areas, gaps in the sidewalk network and a lack of crossing treatments make pedestrian travel difficult.

According to City data, currently there are **33 miles of sidewalks** in Mount Holly, and approximately **0.5 miles of the Catawba River Greenway**, which is part of the Carolina Thread Trail. An additional 1.2-mile section of Catawba River Greenway is currently under design, which will connect to the Mount Holly Municipal Complex.

The consultant team performed field work on several days in January 2013. The team observed many students walking to school at Mount Holly Middle School and at Ida Rankin Elementary School. Numerous pedestrians were observed in the downtown core, where sidewalks exist on both sides of the street, traffic is generally slower, and roadway crossing widths are well marked with brick pavers. However, **West Charlotte Avenue (NC 27) and South Main Street (NC 273) are main barriers for pedestrians due to their lack of sidewalks, safe crossings, and high traffic volumes.** For example, the team observed several students from Belmont Abbey College crossing Highway 273 to access the Y, without the benefit of any pedestrian crossing improvements.

Many roads are without sidewalks throughout the City's neighborhoods, such as the Catawba Heights neighborhood and the neighborhood around **Woodlawn Haven Rest Home**. Some **routes to key destinations lack adequate sidewalks, crosswalks, and traffic calming measures**, such as the area around Belmont Abbey College, the YMCA, the area around Food Lion, Tuckasee Road, Highway 27, and areas around schools. The existing sidewalk network, roadway network, parcels, schools and other destinations are shown on **Figure 2-4** on page 2-17.

## OPPORTUNITIES AND CHALLENGES

The analysis of Mount Holly's existing pedestrian conditions reveals a number of elements that are considered opportunities and challenges for making Mount Holly a walkable community. An **opportunity** represents a situation or condition that is favorable to pedestrian conditions, either today or in the future. A **challenge** represents a situation or condition that is a potential limitation or restriction the pedestrian environment. **Figure 2-3** illustrates the opportunities and challenges associated with the existing pedestrian environment in Mount Holly, as noted by the consultant team's field review and input from the public, staff, and key stakeholders.

This section offers the key findings of the pedestrian environment in Mount Holly.

### Key Opportunities

- Waterfront properties with public access are opportunities for greenway development
- Local roadways with low traffic volumes in neighborhoods throughout the City
- Attractive outdoor destinations along the Catawba River with pedestrian access including the Tailrace Marina, and Mountain Island Park
- On-going initiatives to improve Mount Holly downtown, to create a pedestrian-oriented district that acts as an amenity, and to draw more people to visit businesses and destinations

### Key Challenges

- Sidewalk gaps and lack of safe crossings along major City thoroughfares such as West Charlotte Avenue, South Main St., and Beatty Drive
- Many intersections without ADA-accessible facilities
- Limited roadway access to southern communities
- Lack of pedestrian wayfinding around downtown



## FIELD WORK OBSERVATIONS



*Existing sidewalks near Mount Holly Middle School*



*Many major roadways lack sidewalks and crosswalks*



*Existing sidewalks near Catawba Heights Elementary School*



*Typical quiet neighborhood street with no pedestrian facilities*



*Street in downtown Mount Holly featuring wide sidewalks, adequate curb ramps, landscape buffers, and decorative crosswalks*



*Location near Belmont Abbey College, where students cross Highway 273 to access the YMCA*



## PEDESTRIAN OPPORTUNITIES



*Expected development of the Catawba River Greenway, the Riverfront Greenway and the Downtown Linear Park will create pedestrian friendly access to nature and recreational activities along the river for City residents and tourists.*



*Students of Mount Holly Middle school enjoy walking to school. A connected and safe network of sidewalks and facilities to access schools in Mount Holly will foster a healthier community for generations to come.*



*Pedestrian facilities in downtown include wide sidewalks, street trees, mid-block crossings and street furniture.*



*The Robert Lee Stowe Jr YMCA is a key destination for residents and students of Belmont Abbey College. Providing basic pedestrian infrastructure to access this destination will not only improve the pedestrian experience of those who already walk to the facility, but will foster a higher walking mode share in the community.*

## PHYSICAL BARRIERS TO WALKING



*Multi-lane, high vehicle-speed Highland St. is difficult to traverse on foot and unpleasant to walk along, lacking sidewalks and ADA accessible routes.*



*Existing sidewalks are often blocked, impeding universal access.*



*Sidewalk gaps create a disjointed pedestrian network and unprotected crossing conditions.*



*A faded stop bar, no sidewalk or crosswalk, non-ADA compliant curb ramps and a wide turning radius create an dangerous pedestrian environment at the intersection of Belmont-Mount Holly Rd. and Beaty Rd.*

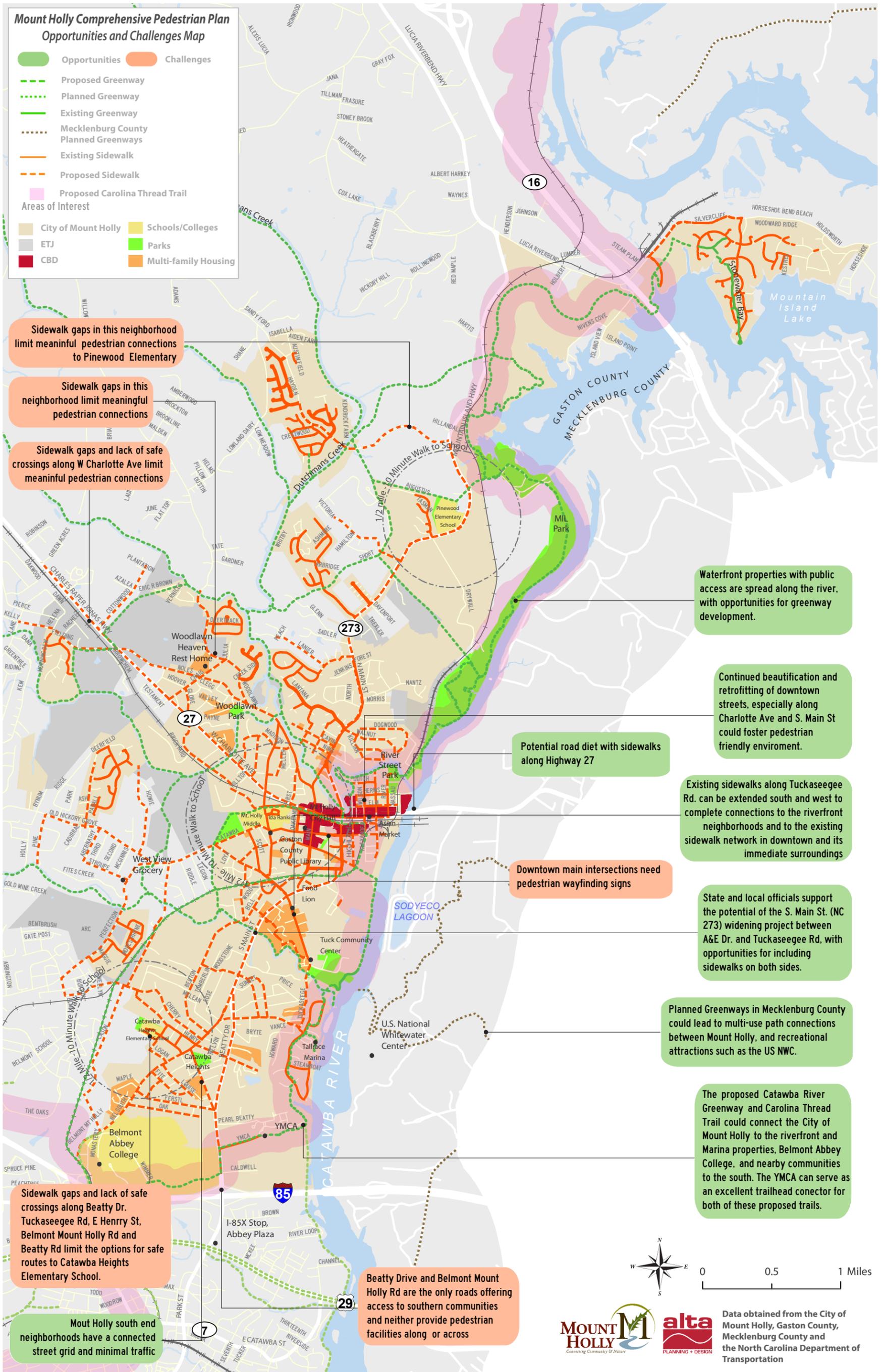


FIGURE 2-3: CITY OF MOUNT HOLLY EXISTING OPPORTUNITIES AND CHALLENGES MAP



*This page intentionally left blank.*

# EXISTING PEDESTRIAN CONDITIONS

This section provides an overview of the major components of the walking environment of the City of Mount Holly. The assessment of existing conditions is based on information collected primarily by gathering existing regional geographic information systems (GIS) data, conducting field work, requesting local information from the City of Mount Holly, and soliciting public input.

## WALKING FRIENDLY COMMUNITY ASSESSMENT

The Walk Friendly Community (WFC) program is a national initiative intended to encourage communities across the country to improve the pedestrian local pedestrian environment and to recognize communities who are successfully doing this. A WFC provides safe accommodation for walking and encourages its residents to walk for transportation and recreation. Communities that are pedestrian-friendly are seen as places with a high quality of life. This often translates into increased property values, business growth and increased tourism<sup>1</sup>. With more people walking, communities experience reduced traffic demands, improved air quality and greater physical fitness.

The WFC program is administered by the Pedestrian and Bicycle Information Center (PBIC). The evaluation criteria for the program is based on five categories often referred to as the Five E's: Engineering, Education, Encouragement, and Evaluation & Planning. The Engineering category refers to infrastructure-related elements, such as sidewalks, ADA accommodations, pedestrian amenities, etc. The other four E's refer to non-infrastructure efforts, such as pedestrian safety campaigns, walking events, media campaigns, etc. **Research has shown that a comprehensive approach to walk-friendliness is more effective than a singular approach that would address infrastructure issues only.**<sup>2</sup>

1 <http://www.ceosforcities.org/work/walkingthewalk>

2 Pucher, J. Dill, J. and Handy, S. (2010). Infrastructure, programs, and policies to increase bicycling: An international review. *Preventative Medicine*, 50. S106-S125; Krizek, K., Forsyth, A., and Baum, L. (2009). *Walking and cycling international literature review*. Melbourne, Victoria: Department of Transport.

## WALK FRIENDLY COMMUNITY SCORECARD

The PBIC offers an online application for communities that seek the WFC status. A community seeking status as WFC must make pedestrian-related advances in each of the Five E's. **Table 2-2** on the next page provides a summary "Scorecard" assessment of existing conditions in the City of Mount Holly, based on key elements of the PBIC - Walk Friendly Community designation criteria. The assessment of each of the Five E's for Mount Holly is based on the field observations conducted by the consulting team and steering committee input. This plan recommends that Mt. Holly complete a full Walk Friendly Community application to assess current strengths and weaknesses.

### Walk Friendly Communities in North Carolina



Currently, all North Carolina WFC communities are designated at Bronze level.

Source: [www.walkfriendly.org/](http://www.walkfriendly.org/)



TABLE 2-2: WALK FRIENDLY COMMUNITY SCORECARD FOR THE CITY OF MOUNT HOLLY

ENGINEERING	YES	NO
Does Mount Holly have a complete streets policy or other policy that requires the accommodation of pedestrians in all new road construction and reconstruction projects? (NCDOT has developed Complete Streets Planning and Design Guidelines document which applies to NCDOT roadway projects).	0.5	0.5
Does Mount Holly have guidelines for pedestrian facility design or provide regular training to engineers and planners regarding pedestrian facility design? (NCDOT provides training on Complete Streets and pedestrian and bicycle facility design that is open to municipal staff).	0.5	0.5
Do you have a connected network of sidewalks, trails, and/or paths in the city?	0.5	0.5
Does Mount Holly have a sidewalk condition and curb ramp inventory process?	0.5	0.5
Are all bridges accessible to pedestrians?	0	1
Are crosswalks provided at all street intersections and at areas with high demand for pedestrian traffic?	0.5	0.5
Are accommodations for persons with disabilities, such as curb ramps or audible signals, provided in Mount Holly?	0.5	0.5
Does the City employ traffic calming measures to slow motor vehicle traffic on city streets (such as road diets, ≤20 mph speed limits, speed tables, etc)?	0	1
<b>ENGINEERING SCORE TOTAL</b>	<b>3/8</b>	
EDUCATION & ENCOURAGEMENT		
Has Mount Holly implemented Safe Routes to School (STRS) programs in any of the local schools within the last 18 months?	0	1
Has Mount Holly implemented any education and training programs related to pedestrian education, safety, or design for city staff?	0	1
Has Mount Holly implemented a program within the last 18 months to educate motorists and pedestrians on safe practices to prevent pedestrian-motor vehicle collisions (e.g., pedestrian safety included in drivers education curriculum, test, manual or bus driver training)?	0	1
Does Mount Holly promote the health and environmental benefits of walking?	0	1
Does Mount Holly offer walking route maps, guides, or tours for residents and visitors?	0	1
Does Mount Holly host any events that promote walking (such as car-free streets)?	0	1
<b>EDUCATION &amp; ENCOURAGEMENT SCORE TOTAL</b>	<b>0/6</b>	
ENFORCEMENT		
Does Mount Holly have Traffic Safety officers that are trained in traffic law as it applies to pedestrians?	1	0
Does Mount Holly use targeted enforcement programs to promote pedestrian safety in crosswalks? (Such as a “crosswalk sting”, media campaign regarding pedestrian-related laws, progressive ticketing, etc)?	0	1
Does Mount Holly have a systematic strategy for selecting locations and countermeasures for traffic and pedestrian safety?	1	0
Do police work regularly with traffic engineers and planners to review sites in need of safety?	0	1
<b>ENFORCEMENT SCORE TOTAL</b>	<b>2/4</b>	

TABLE 2-2: WALK FRIENDLY COMMUNITY SCORECARD FOR THE CITY OF MOUNT HOLLY (CONTINUED)

EVALUATION AND PLANNING		
Does Mount Holly have an ongoing pedestrian counting and/or survey program that allows for long-term benchmark analysis of walking mode share?	0	1
Does Mount Holly collect data related to pedestrian-vehicle crashes, traffic volumes and motor vehicle speeds on existing or future corridor improvement projects?	1	0
Does Mount Holly have a pedestrian master plan or pedestrian safety action plan?	1	0
Has Mount Holly adopted an ADA Transition Plan for the public right of way?	0	1
Does Mount Holly have a policy requiring sidewalks on both sides of arterial streets?	1	0
Has Mount Holly established a connectivity policy, pedestrian-friendly block length standards and connectivity standards for new developments, or convenient pedestrian access requirements?	0.5	0.5
Does Mount Holly have a trails plan?	1	0
Do you have a Pedestrian Coordinator or staff person responsible for pedestrian-related issues?	0	1
Is Mount Holly served by public transportation?	0.5	0.5
<b>EVALUATION AND PLANNING TOTAL</b>		<b>5/9</b>
<b>WALK FRIENDLY TOTAL</b>		<b>10/27</b>

In order to become a walk friendly community, Mouth Holly needs to work on improving the scores across the board in all 5 E's. Education and encouragement strategies are typically low cost and offer quick results in motivating local residents to become more active in the community. However, it is very important for the city to prioritize closing sidewalks gaps and making the existing and future pedestrian network comfortable and appealing to the community.



*Recent improvements and beautification of Downtown streets encourages more pedestrian activity.*



**INTERSECTION EVALUATION**

During field work, the consultant team evaluated pedestrian safety and accessibility at 16 key intersections in Mount Holly. City staff had previously studied and ranked these potentially problematic intersections for safety based on a number of factors, including: traffic counts, signage/markings, line of sight, ADA accessibility, maintenance, etc. The consultant team further studied these intersections, considering additional safety factors, and made recommendations for potential near-term and long-term pedestrian improvements. The intersections that were evaluated are listed in Table 2-3. The majority of intersections that were evaluated are in need of new and/or retrofitted pedestrian crossing facilities. Recommendations for each intersection are presented in Chapter 4.

**TABLE 2-3: PRIORITY INTERSECTIONS**

INTERSECTIONS
Hicks Circle and Rankin Ave.
W. Catawba Ave. and S. Hawthorne St.
Beaty Rd. and Beatty Dr.
Summit Ave. and Highland St.
Tuckaseege Rd. and Beatty Dr.
Craig St. and Woodlawn Ave.
W. Catawba Ave. and Highland St.
Beaty Rd. and Belmont-Mt. Holly Rd.
East Charlotte Ave. and Highland St.
S. Main St. and Rankin Ave.
S. Hawthorne St. and W. Charlotte Ave.
E. Henry St. and Beatty Dr.
Craig St. and Noles Dr.
A&E Dr. and Highland St.
S. Hawthorne St. and Rankin Ave.
Lanier St. and N. Main St.



*Signalized intersection at S. Main St. and Rankin Ave. / Tuckaseege Rd., without sidewalks or pedestrian crossing treatments*



*The intersection at Craig St. and Noles Dr. lacks pedestrian improvements*



*The Tuckaseege Rd. and Beatty Dr. intersection lacks sidewalks and crosswalks*

**DATA INVENTORY**

The City of Mount Holly provided data related to the walking environment of the community. The data related to the following broad categories of existing conditions:

- Transportation (such as streets, and existing sidewalks)
- Land use and ownership (such as parcel boundaries, and zoning designations)
- Points of interest (such as schools, parks, and retail centers)
- Physical geography (such as wetlands)
- Administrative and jurisdictional boundaries (such as city borders)
- Locations of pedestrian crashes between 2008 and 2012

**Figures 2-4 and 2-5** depict the existing bicycling conditions in the City of Mount Holly, including previously recommended sidewalks.

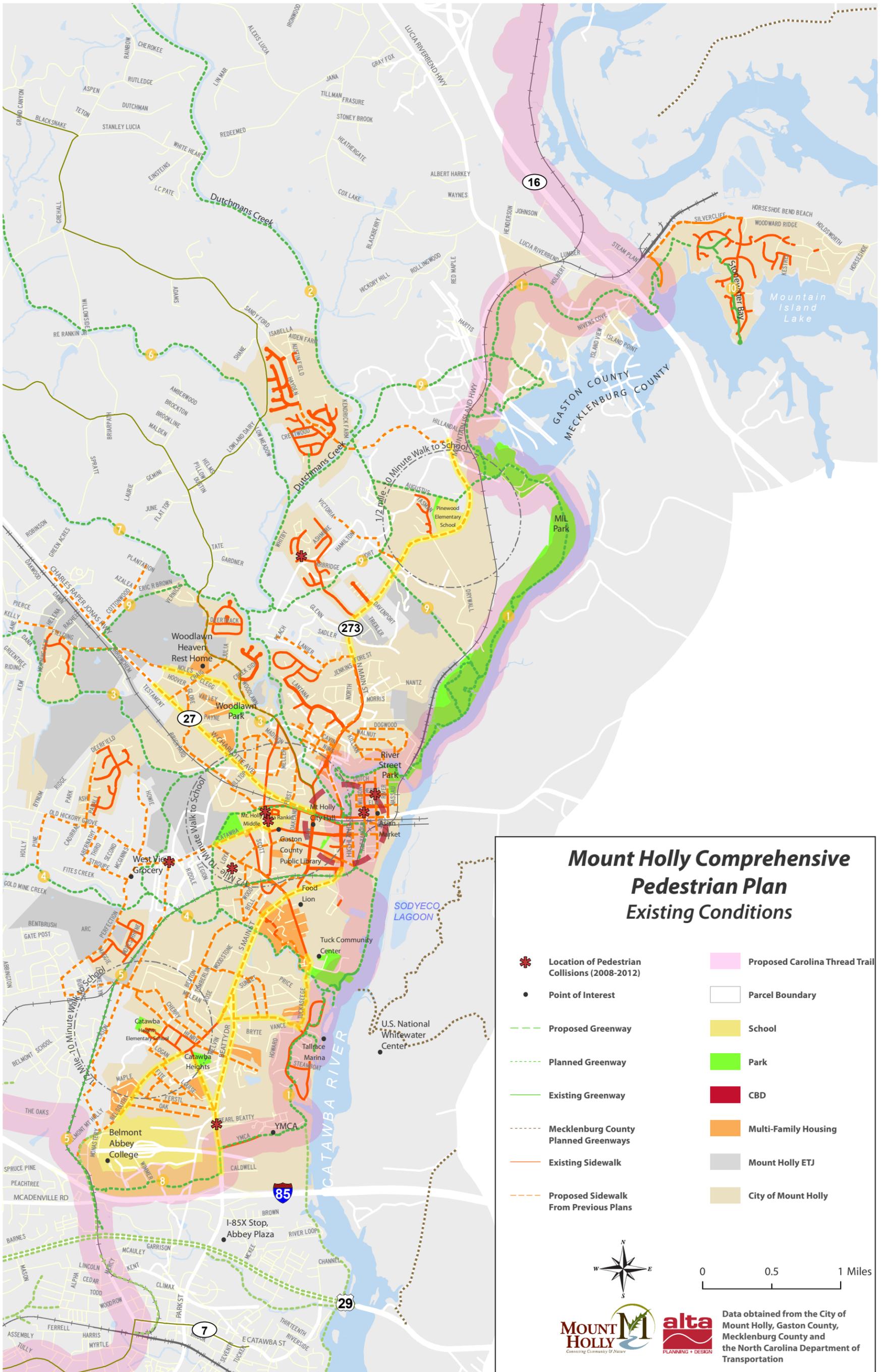


FIGURE 2-4: EXISTING CONDITIONS MAP

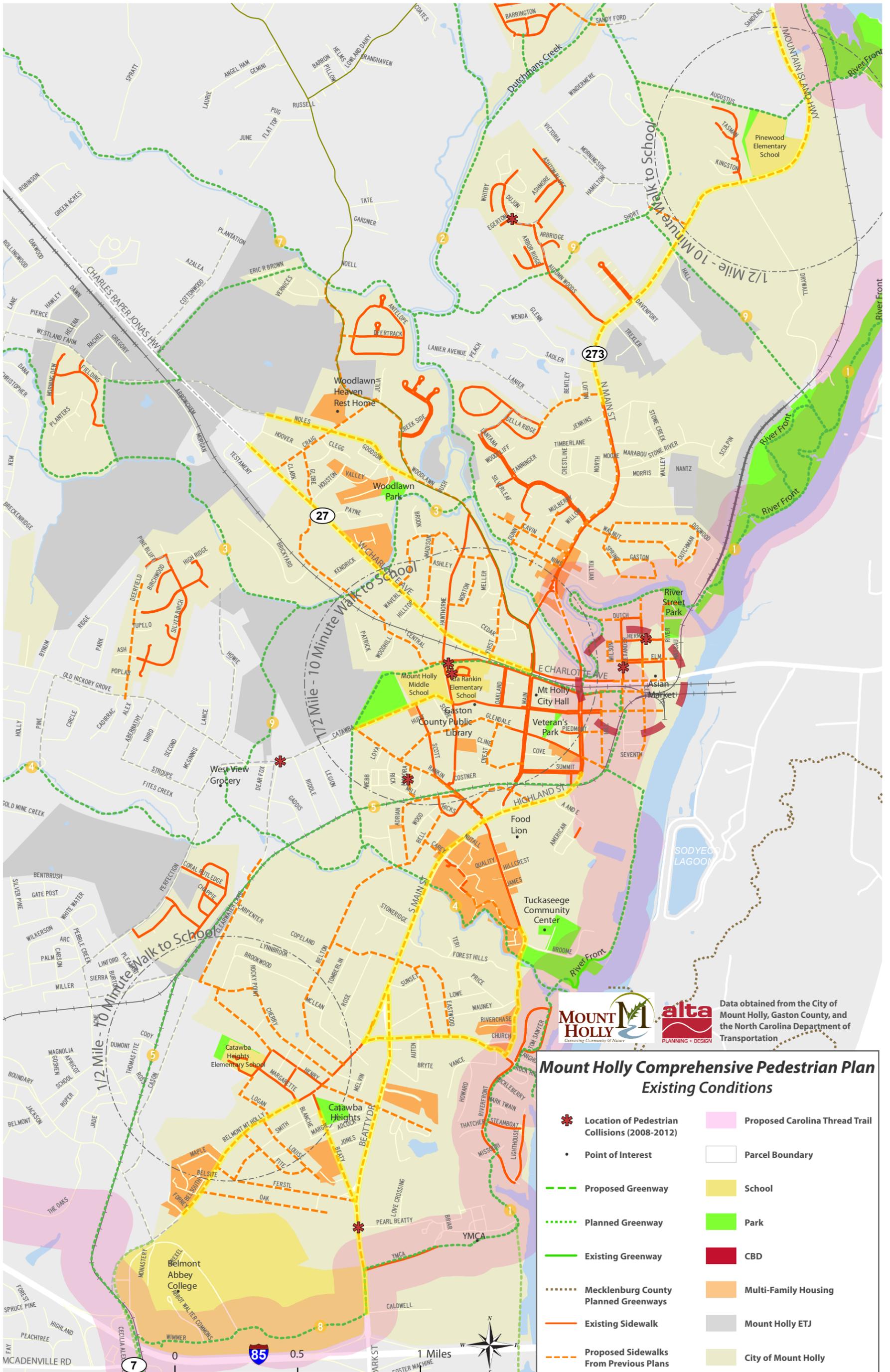


FIGURE 2-5: EXISTING CONDITIONS MAP, MOUNT HOLLY ZOOM-IN



SUMMARY OF PREVIOUS PLANNING EFFORTS

A review of all relevant plans or planning documents related to pedestrian activity in the region supplemented the data inventory. A summary of that review is provided in Table 2-4 below. A full review of these documents is presented in Appendix A.

TABLE 2-4 SUMMARY OF PREVIOUS PLANNING EFFORTS

DOCUMENT	TYPE	KEY CONTRIBUTIONS TO THE MOUNT HOLLY PEDESTRIAN ENVIRONMENT
Mount Holly Application for Bicycle and Pedestrian Grant Funds with NCDOT (2012)	Local	<ul style="list-style-type: none"> <li>• Main source of funding for the production of this Master Plan</li> <li>• Provides background information about Mount Holly's existing pedestrian conditions, and programmatic efforts.</li> </ul>
Mount Holly Comprehensive Parks and Recreation Master Plan (2010)	Local	<ul style="list-style-type: none"> <li>• Presents recommendations for the city's linear parks/greenways</li> <li>• Proposes a 10-year Capital Improvement Plan (CIP) with recommendations of up to \$5.9 million on funding options. Including \$402,500 for Land Acquisition program which will benefit the expansion of the city's greenway and pedestrian network.</li> </ul>
Mount Holly Strategic Vision Plan (2008)	Local	<p><i>Town Goals:</i></p> <ul style="list-style-type: none"> <li>• Provide an expanded network of interconnected streets and sidewalks that is safe and efficient for pedestrians, bicyclists, and vehicles as the community grows.</li> </ul> <p><i>Small Area Plan - South Gateway (Between Henry Street and I-85 and west to the Catawba River):</i></p> <ul style="list-style-type: none"> <li>• Installing brick streetscaping and brick cross-walks on both sides of NC 273 between Holiday Inn and Ferstl Avenue.</li> <li>• Installing safe pedestrian crossings at Peral Beauty Road and the Rehab Hospital and a roundabout at Ferstl Drive and NC 273.</li> </ul> <p><i>Small Area Plan - Downtown and Riverfront:</i></p> <ul style="list-style-type: none"> <li>• Link downtown and Riverfront gateway with pedestrian facilities</li> <li>• Create pedestrian friendly streets</li> </ul> <p><i>Design Guidelines for Small Area Plans</i></p> <ul style="list-style-type: none"> <li>• The core of these guidelines don't foster pedestrian friendly environments</li> </ul> <p><i>Implementation Strategies</i></p> <ul style="list-style-type: none"> <li>• Work with Carolina Thread Trail and U.S. National Whitewater Center to develop a pedestrian bridge across the Catawba River.</li> </ul>
Gaston County Comprehensive Plan (2002)	Regional	<ul style="list-style-type: none"> <li>• Designates Mount Holly as a <b>Primary Target Area:</b> City with adequate infrastructure for new/infill development, and primary transit corridors.</li> <li>• Proposed the following alternative land use development patterns:               <ul style="list-style-type: none"> <li>» Compact development,</li> <li>» walkable distances between various uses,</li> <li>» greenway system along the Catawba river,</li> <li>» walkable environments with pedestrian scale features</li> <li>» Integrate pedestrian infrastructure projects with larger roadway projects.</li> </ul> </li> </ul>
Zoning Ordinance Commercial Design Standards	Local	



*This page intentionally left blank*

# 3 PROGRAMS & POLICIES

## CHAPTER OUTLINE

OVERVIEW (3-1) | EDUCATION (3-2) | ENCOURAGEMENT (3-5) | ENFORCEMENT (3-8) | SAFE ROUTES TO SCHOOL TOOLKIT (3-9) | PEDESTRIAN POLICIES (3-12)

## OVERVIEW

Meeting the goals of this Plan will not only require new facilities; it also requires implementation of pedestrian-related programs and policies. A comprehensive approach is necessary to create a pedestrian-friendly community. The approach must focus on overall livability and walkability in all planning decisions involving land use, growth, and transportation. Programs that encourage walking, educate about safety, and enforce safe behavior are also key components.

## EXISTING PROGRAMS

The Mount Holly Police Department conducts annual safety classes at the three elementary schools to teach students how to walk safely around their school and home. In September 2011, the City and the Catawba River District, a non-profit organization, coordinated the first annual Family Fun Bike Ride. Event participants rode bikes (or walked) from Tuckaseege Park to Ida Rankin Elementary School/Mount Holly Middle School near downtown. The purpose was to educate children and parents on the proper practices of not only maneuvering on a bicycle, but also remaining aware of motorists while on the road for any activity.

The Planning & Zoning Department also coordinates with the Fire and Rescue, Police, and Street & Solid Waste Departments when reviewing road projects on City-maintained roads to identify potential safety issues. The City typically recommends sidewalk construction as part of a resurfacing project to address potential safety issues. The City has also identified key intersections where accidents have taken place, and analyzed potential infrastructure improvements, such as crosswalks or sidewalk bulb-outs, that could be utilized to help reduce safety risks.

## PROGRAM RECOMMENDATIONS AND RESOURCES

Pedestrian-related programs fall into three main categories: education, encouragement, and enforcement. The programs listed in this chapter are provided to demonstrate the variety of opportunities available for promoting walking and active lifestyles in Mount Holly. The City should work closely with local volunteers and community organizations to implement events and activities, research new program ideas, and improve upon existing programs.



## EDUCATION

### PUBLIC EDUCATION AND EDUCATIONAL DEVICES

Mount Holly could develop a variety of safety materials and distribute them throughout the community. Educational materials focus on safe behaviors, rules, and responsibilities. Information may include bulleted keys for safe pedestrian travel and habits, safe motor vehicle operation around pedestrians, and general facility rules and regulations. This safety information is often available for download from national pedestrian advocacy organizations, such as the Pedestrian and Bicycle Information Center website, [www.walkinginfo.org](http://www.walkinginfo.org). Furthermore, NCDOT is preparing a series of pedestrian education and enforcement materials which will be available for distribution to state jurisdictions in the fall of 2013.

The Information can be distributed through brochures, newsletters, newspapers, bumper stickers, and other print media that can be inserted into routine mailings. It can also be posted on municipal websites and shown on local cable access television.



*Local programs such Walk to Work Day, walking school bus demonstrations, and summer camps can be organized by the City and can be utilized to distribute information using a booth to display related print media.*

### BICYCLE AND PEDESTRIAN ADVOCACY COMMITTEE

The City of Mount Holly should support the creation of a local bicycle and pedestrian committee. The Plan's Steering Committee is a good starting point to establishing this group. Even though this is a pedestrian plan, the needs and objectives of bicycle and pedestrian advocates are closely related, and stand to benefit mutually from their combined efforts. Local advocacy groups are beneficial resources for promoting safety, providing feedback on opportunities and obstacles within the bicycle and pedestrian system, and coordinating events and outreach campaigns (such as the programs outlined throughout this section). Advocacy groups also play a critical role in encouraging and evaluating the progress of overall plan implementation.

### INTERNAL EDUCATION

'Internal' education refers to the training of people who are involved in the actual implementation of the Pedestrian Plan. Key City staff, members of the local Planning Board, pedestrian plan Steering Committee, NCDOT Division staff, and Gaston County staff should all be included in training sessions whenever possible. This training could cover aspects of the transportation and development process, including planning, design, development review, construction, and maintenance. This type of 'inreach' can be in the form of brown bag lunches and attendance at special sessions or conferences. Even simple meetings to go over the Pedestrian Plan and communicate its strategies and objectives can prove useful for staff and newly elected officials that may not have otherwise learned about the plan. Guidance and materials for internal education methods is available from the NCDOT Bicycle and Pedestrian Division and the Institute for Transportation Research and Education (ITRE).

Below are several training course examples:

[www.michaelronkin.com/courses](http://www.michaelronkin.com/courses)

[www.pps.org/training/custom-tailored-training/](http://www.pps.org/training/custom-tailored-training/)

[www.fhwa.dot.gov/context/trainingguide/ExistingClasses.htm](http://www.fhwa.dot.gov/context/trainingguide/ExistingClasses.htm)



## COORDINATED CAMPAIGNS

Through cooperation with NCDOT, local municipalities and organizations should provide strong education, encouragement, and enforcement campaigns whenever a major bicycle and/or pedestrian improvement occurs. When a major improvement is made, the roadway environment changes and proper interaction between all users is critical for overall safety. This type of outreach could take place through the local media outlets, on-site, or at special events.

## ADULT EDUCATION

Education should span all age groups. Local community groups could partner and consider adding or expanding the following educational program/event offerings:

- Parent courses for Walking School Buses
- Walkability workshops
- Crossing guard programs
- Pedestrian ambassador programs
- Brown bag events and clinics
- Motorist education
- Educational devices (campaigns, billboards, postcards, local television)

## ENVIRONMENTAL AND HISTORIC EDUCATION / INTERPRETATION

Educational programs and interpretive signage could be developed along future trails and pedestrian routes. Greenway trails provide opportunities for learning outside the classroom. Specific programs that focus on water quality and animal habitat are popular examples. Events such as learning walks about specific animals or insects, tree identification, wildflower walks, environmental issues, stewardship education, and sustainability could be led by area experts. Also, simple educational signage would offer interactive learning opportunities for people who use the trail.



*Greenways and board walks provide opportunities for environmental education.*



*Example of stickers and posters developed for the NCDOT Watch for Me Campaign targeting motorist education*

## EDUCATION RESOURCES

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

<http://americawalks.org>

**“One text or call, you can wreck it all”** is a campaign of the U.S DOT to discourage texting and cellphone usage while driving. Downloadable materials, research and facts are available online.

<http://www.distraction.gov>

**Stepping Out** is an online resource for mature adults to learn about ways to be healthy by walking more often, and walking safely.

[www.nhtsa.dot.gov/people/injury/olddrive/SteppingOut/index.html](http://www.nhtsa.dot.gov/people/injury/olddrive/SteppingOut/index.html)

**Pedestrian Safety** is program of the National Highway Traffic Safety Administration (NHTSA) designed to improve the safety of pedestrians through education, enforcement, and outreach programs. The website includes materials pertaining to school age children available for download.

<http://www.nhtsa.gov/Pedestrians>

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



<http://www.safekids.org/>

**Speed Campaign Tool Kit.** The intent of this NHTSA tool kit is to provide marketing materials, media tools, and marketing ideas for communities to distribute to fit local needs and objectives while at the same time partnering with other states, communities, and organizations all across the country on a speed management program. It includes messaging and templates you may choose from to support your speed management initiatives. Free TV and radio materials, posters, billboards, and other media materials can be downloaded here:

<http://www.nhtsa.gov/Driving+Safety/Enforcement+&+Justice+Services>

**Pedestrian and Bicycle Safety:** Pedestrian information related to children from the FHWA.

[http://safety.fhwa.dot.gov/ped\\_bike/](http://safety.fhwa.dot.gov/ped_bike/)

**Eat Smart, Move More** is a statewide movement that promotes increased opportunities for healthy eating and physical activity wherever people live, learn, earn, play and pray.

<http://www.eatsmartmovemorenc.com/>

## WEBLINKS & RESOURCES

The NCDOT Division of Bicycle and Pedestrian Transportation has an extensive selection of how-to manuals, informative guidebooks, and kits that provide comprehensive information on a variety of topics. These educational materials may be used by the general public, event organizers, teachers, or others. All are downloadable in PDF version. Manuals and guidebooks that are available in hard copy may be requested through the Safety Materials Order Form:

[www.ncdot.gov/bikeped/safetyeducation/manuals/](http://www.ncdot.gov/bikeped/safetyeducation/manuals/)  
[www.ncdot.gov/transit/bicycle/](http://www.ncdot.gov/transit/bicycle/)

For more information and program examples, visit the following websites:

- [www.pedbikeinfo.org](http://www.pedbikeinfo.org) (Pedestrian and Bicycle Information Center)
- [www.bicyclinginfo.org](http://www.bicyclinginfo.org) (Pedestrian and Bicycle Information Center)
- [www.bikewalk.org/workshops](http://www.bikewalk.org/workshops) (National Center for Bicycling and Walking)
- [www.saferoutesinfo.org](http://www.saferoutesinfo.org) (Safe Routes to School)



- [www.active-living.org](http://www.active-living.org) (Spartanburg, SC - Partners for Active Living).
- <http://www.campo-nc.us/bikepedestrian.html> (Capital Area MPO)
- [www.smartcommute.org](http://www.smartcommute.org) (Triangle Area - Smart Commute Challenge)
- [www.usa.safekids.org](http://www.usa.safekids.org) (Safe Kids Worldwide)
- [www.eatsmartmovemorenc.com](http://www.eatsmartmovemorenc.com) (Eat Smart, Move More)
- [www.worldcarfree.net](http://www.worldcarfree.net) (Worldcarfree)
- [www.nhtsa.dot.gov/people/injury/pedbimot/bike/resourceguide/index.html](http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/resourceguide/index.html) (National Highway Traffic Safety Administration: Resource Guide on Laws Related to Pedestrian and Bicycle Safety)

## ENCOURAGEMENT

### SCHOOL PROGRAMS

Many programs focus on developing safer pedestrian facilities around schools. Programs can be adopted by parents and schools to provide initiatives for walking.

Community leaders, parents and schools across the U.S. are using Safe Routes to School programs to encourage and enable more children to safely walk and bike to school. The National Center for Safe Routes to School aims to assist these communities in developing successful Safe Routes programs and strategies. The Center offers a centralized resource of information on how to start and sustain a Safe Routes to School program, case studies of successful programs as well as many other resources for training and technical assistance. For more information on Safe Routes to School, refer to the SRTS toolkit included in this chapter.



### AWARENESS DAYS & EVENTS

A specific day of the year can be devoted to a theme to raise awareness and celebrate issues relating to that theme. A greenway and its amenities can serve as a venue for events that will put the greenway on display for the community. Popular city events serve as excellent opportunities to include pedestrian information distribution.

The City of Mount Holly hosts the annual Mount Holly Springfest in downtown Mount Holly. This event can serve as a venue for launching new pedestrian and safety initiatives. Other events that the City could utilize for public outreach could include:

- Movie night in the summer
- Summer fun festival
- Christmas lighting festival
- Game day at the park
- Health fair for seniors

The following are examples of other national events that can be used to increase use of pedestrian facilities:

### WALK TO WORK DAY / INTERNATIONAL CAR FREE DAY

(September 22) Designate one day a year for people to walk to work to help advance programs, promote active living, and raise awareness for environmental issues. Walk to Work Day can be at the end of an entire week or month of pedestrian promotional activities, including fitness expos, walking and jogging group activities, running and bicycling races and rides, etc.



**STRIVE NOT TO DRIVE DAY**

This event example, from the Town of Black Mountain, NC, is an annual event to celebrate and promote the Town's pedestrian achievements for the year throughout their region. Awards for pedestrian commuters, as well as booths, contests, and other events are organized through their local MPO Bicycle and Pedestrian Task Force and the Land-of-Sky Regional Council. A similar event could be held in Mount Holly as the Pedestrian Plan is implemented.

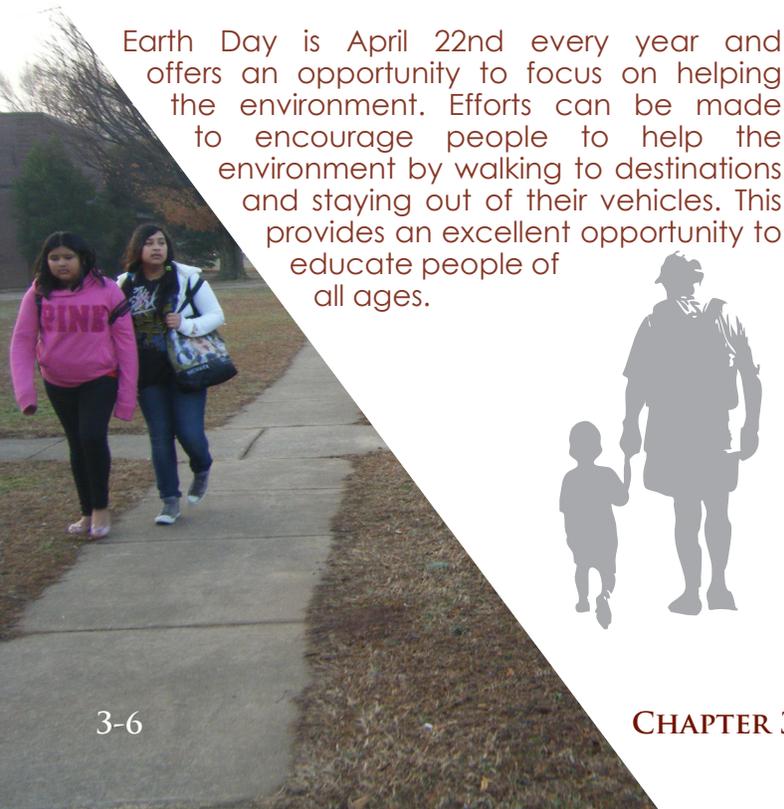


**NATIONAL TRAILS DAY**

This event is held every year in June. Other events, competitions, races, and tours can be held simultaneously to promote future greenways in Mount Holly.

**EARTH DAY**

Earth Day is April 22nd every year and offers an opportunity to focus on helping the environment. Efforts can be made to encourage people to help the environment by walking to destinations and staying out of their vehicles. This provides an excellent opportunity to educate people of all ages.



**USE FACILITIES TO PROMOTE OTHER CAUSES**

Pedestrian facilities, especially trails, could be used for events that promote other causes, such as health awareness. Not only does the event raise money/publicity for a specific cause, but it encourages and promotes healthy living and an active lifestyle, while raising awareness for pedestrian activities. Non-profit organizations such as the American Cancer Society, American Heart Association, and the Red Cross sponsor events such as Breast Cancer Walk, Diabetes Walk, etc.

**PEDESTRIAN ACTIVITIES/PROMOTION WITHIN LOCAL ORGANIZATIONS**

The City of Mount Holly has numerous organizations that could help to promote pedestrian activities (e.g. the YMCA, the Mount Holly Community Development Foundation, and the Police Department). Education, enforcement, and encouragement programs can be advertised and discussed in local organization newsletters, seminars, and meetings. Such organizations could even organize their own group walks, trail clean-ups, and other activities listed in this section.

**WALKING / RUNNING CLUBS**

Neighborhoods, local groups, or businesses could promote walking or running clubs for local residents or employees to meet at a designated area and exercise on certain days before or after work, during lunch breaks, or anytime that works for the group. This informal group could be advertised on local bulletin or information boards. These clubs could be specialized to attract different interest groups. Examples include:

- Relay for Life (American Cancer Society support)
- Mother's Morning Club (moms with strollers)
- Mount Holly Wednesday Walks (weekly walk during lunch break or after work)
- Lunch Bunch (workers who run during their lunch hour)

**ADOPT - A - TRAIL**

Local clubs and organizations provide great volunteer services for maintaining and patrolling trails. This idea could be extended to follow tour routes or specified streets/sidewalks. A sign to recognize the club or organization could be



posted as an incentive to sustain high quality volunteer service. The Boy Scouts of America serve as a good model for participation in this type of program.

### REVENUE GENERATING EVENTS

Mount Holly should consider holding events that can help fund future facilities. Program and event ideas that could be used to generate revenue in Mount Holly include:

- Races/triathlons (fees and/or donations)
- Educational walks/nature walks/historic walks (fees and/or donations)
- Fund-raisers including dinners/galas
- Concerts (fees and/or donations)
- Events coinciding with other local events such as fairs, festivals, or historic/folk events

### HOLD AN OPEN STREETS EVENT

Usually held on a weekend day, open street events temporarily close streets to cars and open them up to people walking, bicycling, skating, playing sports, and so on. These events have been very successful in cities across North America.

For more information about open street events visit: <http://openstreetsproject.org/>



An open street event promotes health and community while celebrating bicycling and walking.

### ENCOURAGEMENT RESOURCES

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

**Walk a Child to School in North Carolina.** A growing number of community groups throughout the nation, such as health professionals, 'Smart Growth' advocates, traffic safety groups, local PTAs, and elected officials, are promoting walking to school initiatives. In North Carolina, Walk a Child to School Programs have gained a foothold and are growing each year. To date more than 5,000 students in 12 communities in the state have participated.

<http://www.walktoschool.org>

**'Preventing Pedestrian Crashes: Preschool/Elementary School Children'** provides information to parents on pedestrian risks for preschool and elementary school children. Information about the Safe and Sober Campaign is available on the NHTSA website.

<http://www.nhtsa.gov/Driving+Safety/Enforcement+&+Justice+Services>

**Kidswalk-to-School** is a resource guide to help communities develop and implement a year-long walk-to-school initiative; sponsored by the Centers for Disease Control and Prevention. <http://www.cdc.gov/nccdphp/dnpa/kidswalk/>



# ENFORCEMENT

## MOTORIST ENFORCEMENT

Based on observed patterns of behavior, local police can use targeted enforcement to focus on key issues such as motorists speeding, not yielding to pedestrians in crosswalks, parking on sidewalks, etc. The goal is for pedestrians and motorists to recognize and respect each other's rights on the roadway.

The NCDOT Division of Bicycle and Pedestrian Transportation funded a study on pedestrian issues, including school zone safety, and decided to establish a consistent training program for law enforcement officers responsible for school crossing guards. According to the office of the North Carolina Attorney General, school crossing guards may be considered traffic control officers when proper training is provided as specified in G.S. 20-114.1.

## ENFORCEMENT ACTIONS

- Local police should use targeted enforcement to focus on key issues such as motorists speeding, not yielding to pedestrians in crosswalks, parking on sidewalks, etc.
- Establish a crossing guard program for peak school hours and for peak pedestrian activity
- Require crossing guards to complete an NCDOT Crossing Guard Training Program.

## ENFORCEMENT RESOURCES

- NCDOT School Crossing Guard Program: [www.ncdot.org/transit/bicycle/safety/programs\\_initiatives/crossing.html](http://www.ncdot.org/transit/bicycle/safety/programs_initiatives/crossing.html)
- NCDOT's A Guide to North Carolina Bicycle and Pedestrian Laws. For an online resource guide on laws related to pedestrian and bicycle safety (provided by the National Highway Traffic Safety Administration), visit [www.nhtsa.dot.gov/people/injury/pedbimot/bike/resourceguide/index.html](http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/resourceguide/index.html)



*A dynamic and innovative campaign to enforce traffic safety around schools*



# SAFE ROUTES TO SCHOOL TOOLKIT

Safe Routes to School (SR2S) is a program with a simple goal: helping more children get to school safely by walking and bicycling. Envision active kids using safe streets, helped by engaged adults (from teachers to parents to police officers), surrounded by responsible drivers.

Safe Routes to School programs use a variety of strategies to make it easy, fun and safe for children to walk and bike to school. These strategies are often called the "Five Es."

**Education:** programs designed to teach children about traffic safety, bicycle and pedestrian skills, and traffic decision-making.

**Encouragement:** programs that make it fun for kids to walk and bike. These programs may be challenges, incentive programs, regular events (e.g. "Walk and Bike Wednesdays") or classroom activities.

**Engineering:** physical projects that are built to improve walking and bicycling conditions.

**Enforcement:** law enforcement strategies to improve driver behavior near schools.

**Evaluation:** strategies to help understand program effectiveness, identify improvements, and ensure program sustainability.

This plan recommends that the City of Mount Holly and its elementary schools seek grants to participate in a SR2S program to help promote and encourage active transportation choices for children to go to and from school.



*Students enjoy the walk to School*

## WHO IS THIS TOOLKIT FOR?

This Toolkit is for any adult who wants to improve traffic safety and air quality around schools, help children be more physically active and "ready to learn" and improve our neighborhoods.

Whether you are a parent, a teacher, a school administrator, a neighbor, a public health professional, city staff, or a city official, this Toolkit will provide you with facts and figures, as well as ideas, inspiration and proven techniques. This Toolkit covers the Why, Who and How of Safe Routes to School.

## BENEFITS OF WALKING AND BICYCLING TO SCHOOL (WHY)

Active kids are healthy kids, and walking or bicycling to school is an easy way to make sure that children get daily physical activity. Benefits to children include:

- Increased physical fitness and cardiovascular health
- Increased ability to focus on school
- A sense of independence and confidence

SR2S also benefits neighborhoods:

- Improved air quality as fewer children are driven to school
- Decreased crashes and congestion as fewer children are driven to school
- More community involvement as parents, teachers and neighbors get involved and put "eyes on the street"

Schools also benefit:

- Fewer discipline problems because children arrive "ready to learn"
- Fewer private cars arriving to drop off and pick up children

- Opportunities to integrate walking, bicycling and transportation topics into curriculum (e.g. “Walk & Bike Across America,” mapping lessons, graphs and charts of distance walked or biked)

### LOCAL RESOURCES (WHO)

Local Safe Routes to School programs are sustained by parents, community leaders, and citizens to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school. Recently, the state of North Carolina has started the NC Safe Routes to School Program based off of the national program. The state has funding for infrastructure improvements within two miles of schools. This funding can also be used towards the development of school related programs to improve safety and walkability initiatives. The state requires the completion of a competitive application to apply for funding and a workshop at the school to determine what improvements are needed. [www.saferoutesinfo.org](http://www.saferoutesinfo.org)

### THE FIVE E’S TOOLS (HOW)

#### Education

Safe Routes to School refers to a variety of multi-disciplinary programs aimed at increasing the number of students walking and bicycling to school. Education programs are an essential component of a Safe Routes to School program. Education programs generally include outreach to students, parents and guardians, and motorists. Students are taught bicycle, pedestrian and traffic safety skills. Parents and motorists receive information on transportation options and driving safely near schools. A menu of SR2S education programs include:

- Safety education classes
- Bicycle rodeos
- Classroom lessons and activities
- School zone traffic safety campaign
- Bus safety campaign



*Students learn pedestrian safety lessons*

#### Encouragement

Encouragement programs focus on bringing the fun back to walking and bicycling while increasing public awareness of the benefits of walking and biking to school. Events and activities help increase the number of students walking and biking to school. The activities often include a variety of special events and contests, outreach campaigns and presentations to school and community groups. Encouragement programs can be used to educate parents, school personnel, students and the community about the health and safety benefits of a successful Safe Routes to School program.

Encouragement programs do not need much funding, but their success depends on a school champion or group of volunteers for sustained support. Some examples include:

- Walk and bike to school day/week/month
- Suggested route to school maps
- Friendly walk and bike to school incentive programs
- Walking school busses
- Bike trains



*Walk and Bike to School Day celebration*

#### Engineering Tools

The environment near the school is often a determining factor when a parent or guardian decides whether or not to allow their child to walk or bicycle to school. There are a variety of engineering solutions available to enhance pedestrian and bicyclist safety and comfort near schools. Engineering improvements are implemented to slow cars, increase the visibility



of students walking and biking, and make it easier for students to cross the street. While some engineering efforts can be costly, many, such as posting signs and striping crosswalks or bike lanes, are relatively inexpensive. Some of the following examples of engineering improvements are described in detail in **Appendix C: Design Guidelines**

- High visibility school zone signage
- Sidewalks
- Trails and greenways
- High visibility crossing markings
- Pedestrian scale lighting
- Advance stop lines and yield lines at mid-block crosswalks
- Pedestrian Countdown Signals
- Medians and pedestrian refuge islands
- Curb extensions/bulb-outs
- Speed tables and speed humps

and other law enforcement, there are numerous complementary strategies that can be undertaken by school officials, crossing guards, parents and volunteers. Some examples include:

- School safety patrols and crossing guards
- Crosswalk enforcement
- School parking "citation"
- Neighborhood speed watch



*Crossing guards help students navigate busy roads near schools*



*Example of a pedestrian refuge island*

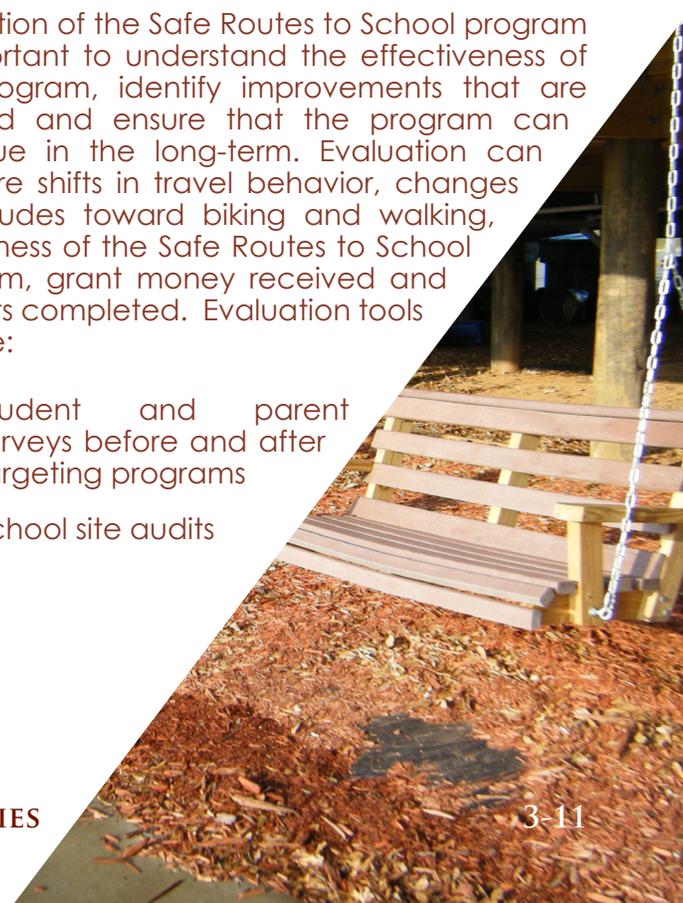
### Evaluation

Evaluation of the Safe Routes to School program is important to understand the effectiveness of the program, identify improvements that are needed and ensure that the program can continue in the long-term. Evaluation can measure shifts in travel behavior, changes in attitudes toward biking and walking, awareness of the Safe Routes to School program, grant money received and projects completed. Evaluation tools include:

- Student and parent surveys before and after targeting programs
- School site audits

### Enforcement Tools

Enforcement tools are aimed at ensuring compliance with traffic and parking laws in school zones. Enforcement activities help to reduce common poor driving behavior, such as speeding, failing to yield to pedestrians, turning illegally, parking illegally and other violations. Enforcement strategies, in conjunction with education efforts, are intended to clearly demonstrate what is expected of drivers of motor vehicles and to hold them accountable for the consequences of their actions. While most enforcement is the responsibility of police



## PEDESTRIAN POLICIES

City planning staff should become familiar with (and, in many cases, continue to support) the following policies and regulations. Walkability should be an item considered with all future development and growth decisions. More people will walk when their proximity to key destinations is reasonable. For example, a mixed use development will engage more walking while the development of a school at the outskirts of the city will promote less walking and more driving. Suggested policy statements and paragraphs by category are provided below.

### COMPLETE STREETS

**Goal:** Adopt a “Complete Streets” approach and philosophy that all streets and development on streets be designed and operated to enable safe access for all users, ages, and abilities.

- Ensure that transportation agencies, planners, engineers, and developers design and operate the entire right of way to enable safe access for all users including transit users, drivers, pedestrians, bicyclists, as well as for seniors, children, and people with disabilities.
- Educate leaders, business owners, residents, and all stakeholders of the benefits of Complete Streets including: livability, safety, increased social interaction, increased economic activity, attractiveness, healthier living, less pollution, and increased access.
- Follow NCDOT's Complete Streets Policy, Implementation and Design Guideline development. The City should ensure that these practices are followed and that local NCDOT Division staff are aware of these new guidelines.

### PEDESTRIAN NETWORK AND CONNECTIVITY

**Goal:** Create and maintain a pedestrian network that provides direct connections between city center, trip attractors, schools, and residential/commercial areas.

- To the maximum extent possible, make walkways accessible to people with physical disabilities.
- Develop a system of informational and directional signage for pedestrian facilities and greenways.
- Provide sidewalks on all roads surrounding schools with safe crosswalks.
- Provide pedestrian access through cul-de-sacs and large parking lots, which are typical obstacles to pedestrian connectivity.
- Accommodate pedestrians and bicyclists on future roadway bridges, underpasses, and interchanges and on any other roadways that are impacted by a bridge, underpass, or interchange project (except on roadways where they are prohibited by law).

### SAFETY

**Goal:** Strive to maintain a complete, safe sidewalk network free of broken or missing sidewalks, curb cuts, or curb ramps and that include safety features such as traffic calming, lighting, and sidewalk repairs.

- Provide raised medians or pedestrian refuge islands where practical, at crosswalks on streets with more than three lanes, especially on streets with high volumes of traffic. They should be six- to ten-foot wide.
- Monitor and identify pedestrian facilities that are not ADA-compliant including missing, damaged, or non-compliant curb ramps, stairs, or sidewalk segments of inadequate width and create a plan for improving them.
- Develop a traffic calming program to slow traffic through downtown and on major residential corridors, making them aware that they share the corridors with pedestrians.
- Make pedestrian crossings a priority and initiate improvements recommended in **Chapter 4**. Consider variations in pavement texture and clear delineation of crosswalks. Also, ensure that crosswalks are properly lit at night.
- Implement pedestrian-scale lighting at regular intervals in areas of high pedestrian activity to promote pedestrian safety and discourage criminal activity.



- Develop and expand the City's maintenance program of sidewalk repairs, debris removal, and trimming of encroaching vegetation.
- Follow design guidelines in **Appendix C** to the maximum extent possible. For example, the buffer space between the sidewalk and the curb and gutter should be maximized within the available right-of-way.
- Promote parking and development policies that encourage multiple destinations within an area to be connected by pedestrian trips. Specifically, promote the connectivity of parking lots between businesses for increased safety and avoidance of roadway traffic.
- Disallow parked vehicles from blocking pedestrian walkways.

## AESTHETICS COMFORT AND ENJOYMENT

**Goal:** Encourage the inclusion of art, historic, and natural elements along with street furniture and landscaping in pedestrian improvement projects.

- Require street trees and planting buffers between the sidewalk and the street along all new roadways and sidewalk construction. Keep all vegetation trimmed.
- Encourage and/or require private owners (of residences and businesses) to keep their area in and around the sidewalk free of debris and litter.
- Require benches, shelters, sheltered transit stops, trees, and other features to facilitate the convenience and comfort of pedestrians.
- Require pedestrian scale lighting along greenways and most traveled sidewalks across the city.

## LAND USE AND DEVELOPMENT

**Goal:** Promote land uses and site designs that make walking convenient, safe, and enjoyable.

- Encourage a mix of uses through building, zoning, and development codes to connect entrances and exits to sidewalks, and eliminate "blank walls" to promote street level activity.
- Sidewalks should have a minimum width of five feet but should be wider where pedestrian traffic is higher, including near schools, senior centers, multi-family housing, and commercial areas or where sidewalks connect or overlap with recommended on-road greenway connections.
- Require applicable buildings to build to the sidewalk. Also, prohibit parking lots from being developed in front of buildings where possible to develop pedestrian oriented areas.

## GREENWAYS

**Goal:** Establish greenways as part of the City of Mount Holly's public infrastructure.

Define 'Greenways' as part of the City of Mount Holly's public infrastructure. Greenways are public infrastructure that provide important functions to not only offer transportation alternatives, but to protect public health safety and welfare. Within flood prone landscapes, greenways offer the highest and best use of floodplain land, mitigate the impacts from frequent flooding and offer public utility agencies access to floodplains for inspection, monitoring and management. Greenways filter pollutants from stormwater and provide an essential habitat for native vegetation that serves to cleanse water of sediment. Greenway trails provide viable routes of travel for cyclists and pedestrians and serve as alternative transportation corridors for urban and suburban commuters. Greenways serve the health and wellness needs of our community, providing close-to-home and close-to-work access to quality outdoor environments where residents can participate in doctor prescribed or self-initiated health and wellness programs. All of these functions make greenways a vital part of community infrastructure.

- Require subdividers to provide natural buffers along both sides of all perennial streams. Public greenway trails with limited disturbance along perennial and intermittent streams are excellent uses for these spaces and should be dedicated during the subdivision process.
- Encourage utility corridor development practices that allow for maximum compatibility with pedestrian and bikeway corridors. Land and easements purchased for the purpose of providing utilities (such as water and sewer) can serve a greater community benefit if developed to accommodate a greenway.



*This page intentionally left blank*



# 4 NETWORK RECOMMENDATIONS

## CHAPTER OUTLINE

OVERVIEW (4-1) | METHODOLOGY (4-1) | THE PEDESTRIAN NETWORK (4-2) | PROJECT CUT SHEETS (4-10)

## OVERVIEW

This chapter contains a series of recommended changes to the City of Mount Holly's physical environment that will create a more connected, comprehensive pedestrian network. The recommended pedestrian network provides a connected system of sidewalks, greenways (multi-use paths), and crossing improvements that connect to schools, parks, community centers, business corridors, libraries, shopping centers, and other key destinations. The network serves multiple users and interests, and improves access for residents of varying physical capabilities, ages, and skill levels. The chapter describes the methodology for developing the network recommendations, the overall pedestrian network and key project recommendations.

## METHODOLOGY

The guiding philosophy for devising the comprehensive pedestrian network is the hubs and spokes model. Pedestrian corridors (spokes) should connect to trip attractors (hubs), such as parks, schools, Downtown, shopping areas, college, and other pedestrian corridors. The network then becomes a practical solution for pedestrian connectivity. The 'hubs and spokes' model (shown below) conceptually illustrates how destinations in Mount Holly will be linked through various types of pedestrian facilities.



*The 'hubs and spokes' model conceptually illustrates how destinations in Mount Holly will be linked through various types of pedestrian facilities.*



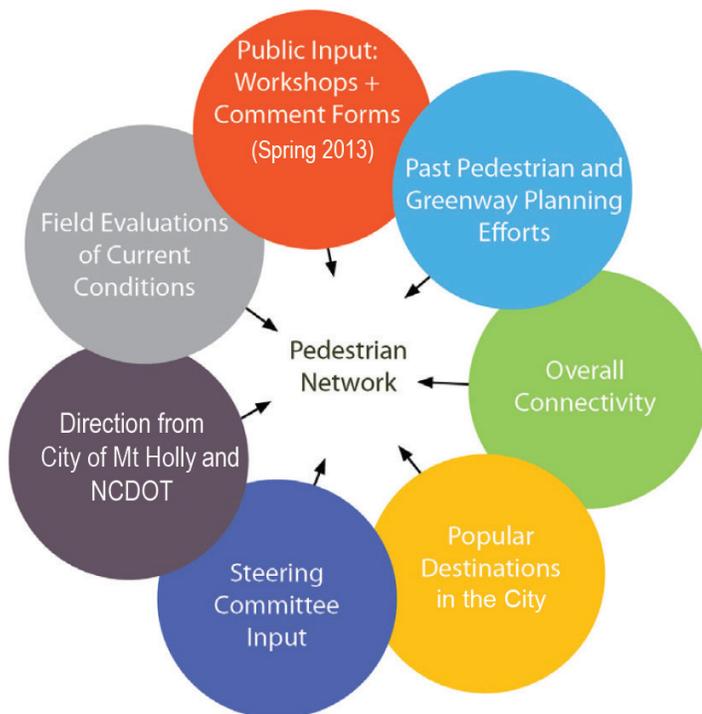


A variety of resources were consulted during the development of the recommended pedestrian network, including:

- Previous plans and studies
- Maps developed from GIS data (demographic data, sidewalk gap analysis)
- Input from the Steering Committee
- Input obtained during public involvement events
- Fieldwork inventory and evaluation
- Identification of pedestrian trip attractors

The graphic below illustrates the approach that was taken during the planning process to obtain input from a variety of sources. As described in **Chapter 2**, fieldwork included an examination of conditions at all major intersections along primary corridors, and a consideration of sidewalk connectivity. Map review and analysis was conducted at Steering Committee meetings and public meetings to pinpoint specific areas in need of pedestrian improvements.

All recommendations are developed at a planning level and will need a more detailed project-level review prior to implementation.



## THE PEDESTRIAN NETWORK

The Proposed Pedestrian System Map (**Figures 4-1 A&B**), depicts existing and proposed pedestrian infrastructure improvements. Proposed improvements include sidewalks, greenways, crossing improvements, and traffic calming projects. Although the map does not depict sidewalks on every street, this Plan recommends that the City develop a policy to ultimately require or provide sidewalks on both sides of all major roads and on at least one side of local streets where warranted by density and/or system connectivity (See **Chapter 3 for policy recommendations**).

The following pages describe and illustrate examples of the following pedestrian infrastructure recommendations:

- Sidewalks
- Intersection Improvements
- Greenways
- Gateway Corridors: “Hwy 27 Feasibility Study”
- Traffic Calming
- Safe Routes to School

### SIDEWALK RECOMMENDATIONS

The recommended sidewalks aim to expand upon the existing network of sidewalks to provide a continuous system that connects destinations along roadways. To complete the sidewalk network along existing streets, special emphasis should be given to completing sidewalk gaps and providing sidewalks on routes serving major pedestrian destinations (e.g. Belmont Abbey College, Mount Holly K-12 schools, Downtown, the YMCA, Food Lion, among others). In the near term, sidewalks on at least one side of collector and arterial streets within the developed areas of the ETJ should be the primary goal. In the longer term, sidewalks on both sides of all arterial and collector streets should be an objective. **Table 4-1** presents a list of the proposed sidewalks shown depicted on **Figures 4-1A & 4-1B**.

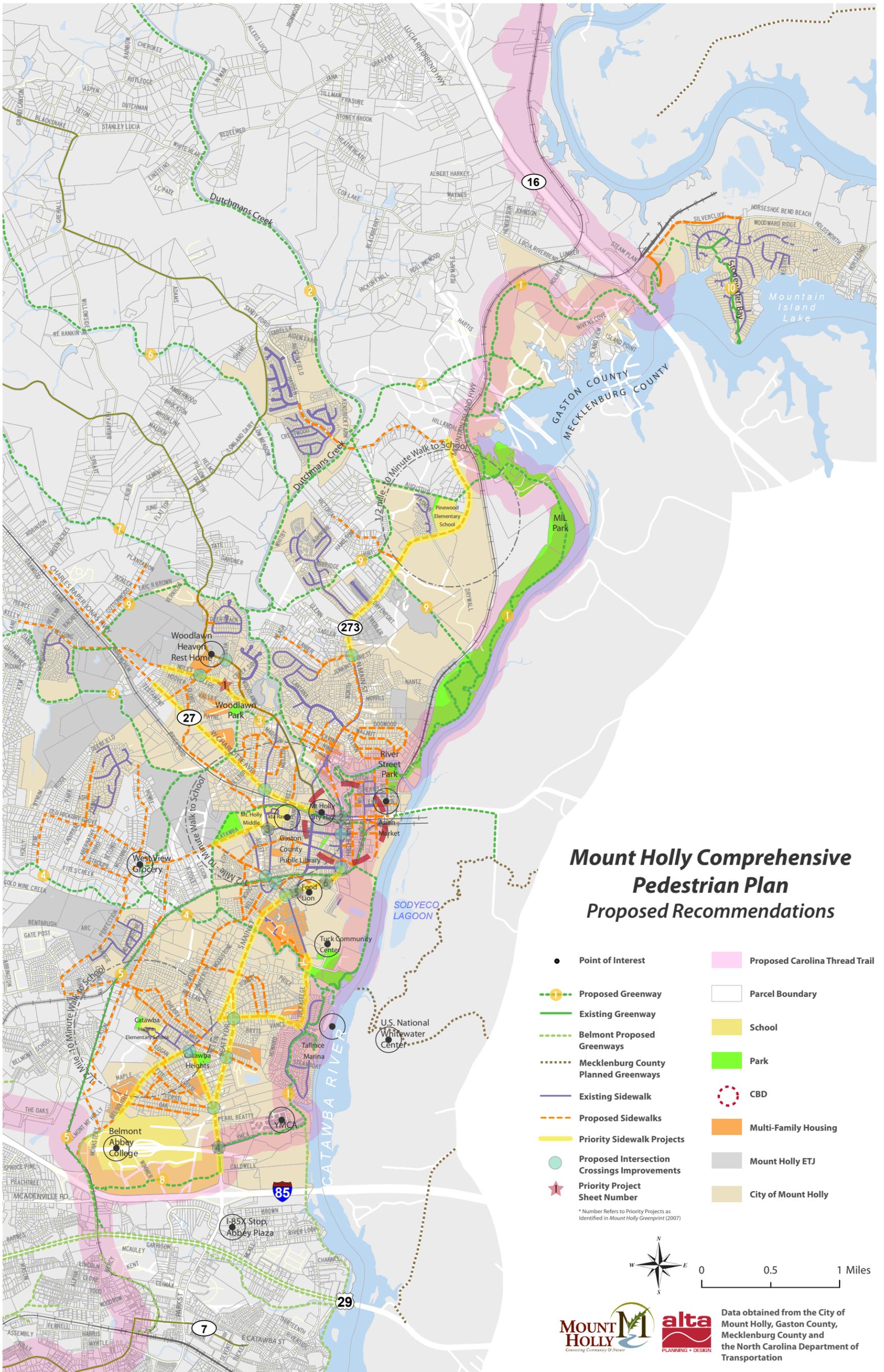


FIGURE 4-1A: PROPOSED PEDESTRIAN SYSTEM MAP - MOUNT HOLLY ETJ BOUNDARIES

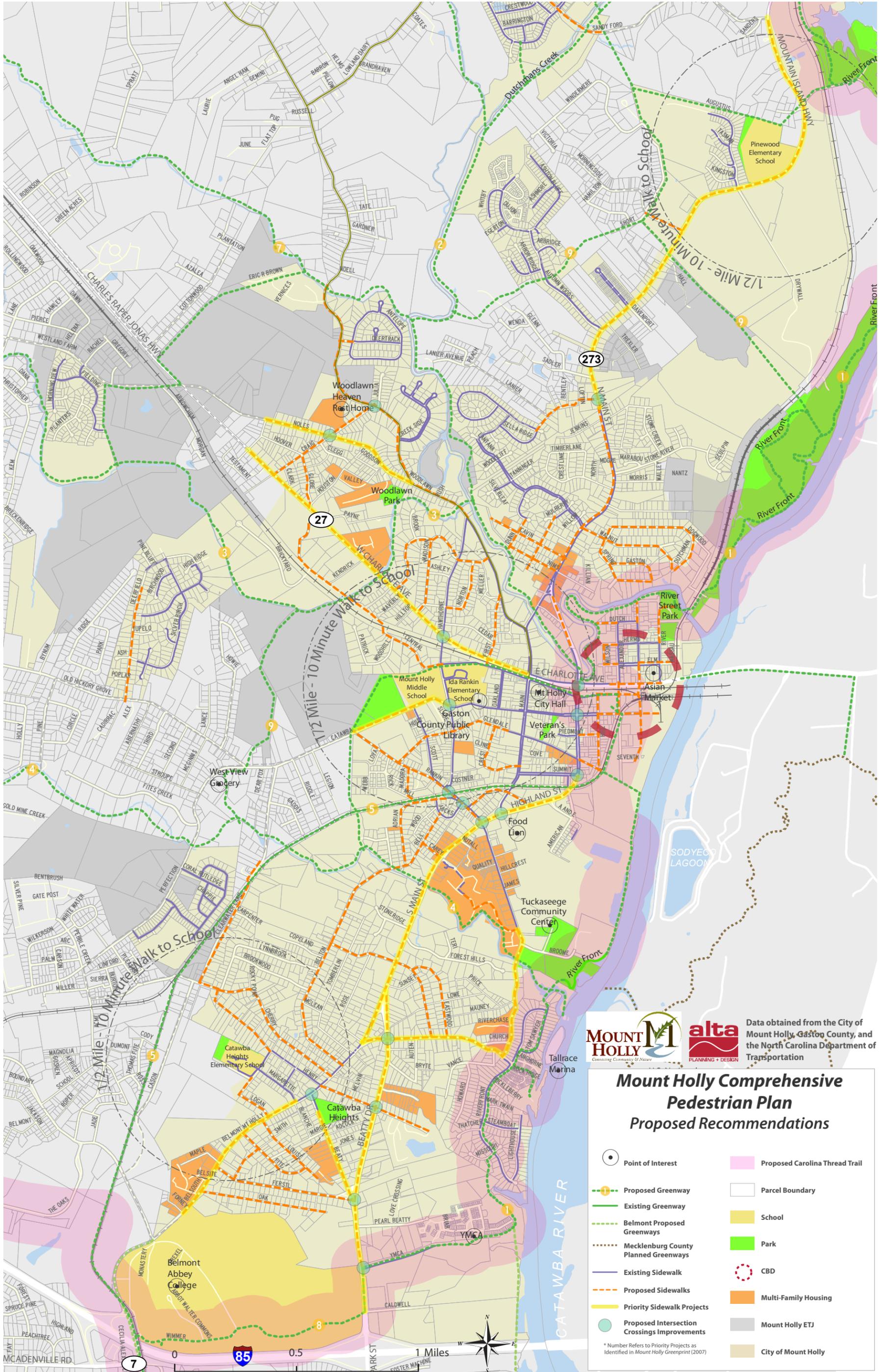




TABLE 4-1: PROPOSED SIDEWALK RECOMMENDATIONS

STREET NAME	LIMIT 1	LIMIT 2	FACILITY TYPE	APX LENGTH MILES	APX LENGTH FEET
Adrian St	Rankin Ave	Belton Ave	Local	0.42	2217
Alexander St	Charlotte Ave	E Catawba Ave	Collector	0.12	655
Beatty Dr/ Hwy 273	S Main St	Mount Holly City Limits	Arterial	1.34	7050
Beaty Rd	Smith St	Ferstl Ave	Collector	0.38	2033
Belmont-Mt Holly Rd	Margarette Ave	Forney Ave	Arterial	0.67	3516
Belton Ave	Hicks Cir	S Main St	Collector	1.34	7070
Carey Ave	Bell St	S Main St	Collector	0.09	498
Cason St	Clearwater Lake Rd	Henry St	Collector	0.08	427
Catawba Ave	Hawthorne St	Rankin Avenue	Arterial	0.42	2230
Catawba Ave	Hill St	End of Road	Local	0.25	1341
Catawba Dr	Belton Ave	Tuckaseege Rd	Local	0.65	3433
Cavin Ave	End of Street	N Main St	Local	0.35	1832
Central Ave	Hill St	Lee St	Collector	0.17	887
Central Ave	Charlotte Ave	Central Ave	Collector	0.99	5216
Charlotte Ave	Alexander St	River St	Arterial	0.21	1095
Cherry St	Henry St	Belmont-Mt Holly	Collector	0.64	3369
Clearwater Lake Rd	City Limits	Cason St	Collector	0.56	2955
Craig St	Woodlawn Ave	Charlotte Ave	Collector	0.51	2680
Crest St	Glendale Ave	Main St	Local	0.32	1707
Deerfield Dr	Existing SW	Old Hickory Grove Rd	Local	0.47	2494
Deertrack Dr	Hwy 27	Antelope Dr	Local	0.05	286
Dunn St	Walnut Ave	Nims Ave	Local	0.15	796
Dutch Ave	End of Road	Alexander St	Local	0.08	429
Eastwood St	Catawba Dr	Tuckaseege Rd	Local	0.37	1941
Elm Ave	Wilson St	Alexander St	Local	0.05	277
Elm Ave	Lee St	Nassau Pl	Local	0.15	793
Ferstl Ave	Belmont-Mt Holly Rd	Beaty Rd	Local	0.58	3085
First St	Woodlawn Ave	W Central Ave	Local	0.29	1555
Fite Rd	Belmont-Mt Holly Rd	Louse Ave	Local	0.33	1736
Glendale Ave	Rankin Ave	Glendale Ave (existing SW)	Collector	0.51	2691
Glendale Avenue	Highland St	Hill St	Local	0.10	514
Globe St	Craig St	Charlotte Ave	Local	0.22	1150
Henry St	Cherry St	Ida St	Local	0.35	1871
Henry St	Belmont-Mt Holly Rd	End of Road	Collector	0.48	2520
Herms Ave	Wilson St	Alexander St	Local	0.05	277
Highland St	N Main St	Existing SW	Arterial	0.22	1182
Highway 273	Summit Ave	Tuckaseege Rd	Arterial	0.45	2396
Hill St	Central Ave	Highland St	Local	0.31	1628
Horseshoe Bend Beach	Stonewater Bay	Boat Launch Parking Lot	Arterial	1.06	5594
Lanier Ave/	N Main St	Brookstone Dr	Local	0.31	1632
Lee St	Elm St	Private Rd.	Local	0.40	2117



TABLE 4-1: PROPOSED SIDEWALK RECOMMENDATIONS (CONTINUED)

STREET NAME	LIMIT 1	LIMIT 2	FACILITY TYPE	APX LENGTH MILES	APX LENGTH FEET
Logan Ln	Ivey St	Belmont-Mt Holly	Local	0.24	1279
Louise Ave	Belmont-Mt Holly	End of Road	Local	0.33	1718
Madison Dr	Woodlawn Ave	Charlotte Ave	Local	0.60	3170
Madora St	Rankin Ave	Adrian St	Local	0.16	822
Morningside Dr	City Limits	N Main St	Local	0.17	875
N Lee St	End of Road	Dutch Ave	Local	0.08	421
N Main St	Sandy Ford Rd	Existing sidewalk	Arterial	2.07	10928
N Main St	N Main St	Existing SW	Arterial (east side)	0.76	4025
NC 27 Hwy	Hoover St	Main St	Arterial	1.49	7845
Nims Ave	Dunn St	N Main St	Local	0.22	1185
Norton Rd	Madison Dr	Hawthorne St	Local	0.26	1395
Nuttall Dr	Existing SW	Tuckaseege Rd	Local	0.32	1714
Oak Grove St	Rankin Ave	Highland St	Local	0.27	1438
Oak Trail	Belmont-Mt Holly	End of Road	Local	0.51	2718
Old Mine Rd	Madison Dr	Charlotte Ave	Local	0.31	1650
Piedmont Ave	Highland St	Hill St	Local	0.08	425
Pine St	Mulberry Ct	End of Street	Local	0.24	1273
Rankin Ave	W Catawba Ave	Scott St	Collector	0.65	3421
River St	End of Road	Herms Ave	Local	0.20	1080
S Main St	Tuckaseege Rd	Rose St (Tuckaseege Rd, south end)	Arterial	1.05	5559
Sandy Ford Rd	Farm Springs Dr	City Limits	Arterial	0.56	2969
Smith St	Fite Rd	Ferstl Ave	Local	0.17	881
Spring St	Walnut Ave	Walnut Ave	Local	0.57	3000
Tuckaseege Rd	S Main St	Nuttall Dr	Collector	1.15	6066
Walnut Ave	N Main St	N Main St	Local	1.03	5452
Noles Dr	Hoover St	N Hawthorne St	Collector	0.67	3544
Wilson St	Herms Ave	Elm Ave	Local	0.08	418
Woodlawn Ave	ETJ Limits	Hawthorne St	Arterial	1.28	6784

TABLE 4-1 NOTES:

- Local streets include all neighborhoods streets. Sidewalks are recommended on at least one side of each street. The Public works department should investigate the feasibility of each side, and complete this portion of the sidewalk network as Town budget permits.
- Sidewalks are recommended on both sides of the street for all arterial and selected collectors. These recommendations should be based on the judgment of the City public works department.

The American Planning Association (APA) publication, *Pedestrian and Transit - Oriented Design*, suggests the following set of sidewalk warrants as guidance for determining the need of sidewalks on one or both sides of a particular street

Arterials/collectors	Both sides
Local Streets commercial areas	Both Sides
Local streets residential areas	
• More than 4 units per acre	Both Sides
• 1-4 Units per acre	One Side
• Fewer than 1 unit per acre	None

Source: Knoblauch et al. 1988, P. 143.

## PRIORITY SIDEWALK PROJECTS

The recommended sidewalk projects were ranked based on the criteria listed on **Table 4-2**, to guide City staff's attention to key projects that can foster the greatest return of benefits to the community as first priority. A list of the top 10 projects is presented in **Table 4-3**. These segments were analyzed at a closer level in order to determine which side of the street has a higher need for sidewalk implementation in the short term. The full list of sidewalk projects is included in **Appendix B**.

**TABLE 4-2: SIDEWALK SCORING CRITERIA**

CRITERIA	DEFINITION
Census Composite	Location of the sidewalk segment within the different zones of greatest demographic needs illustrated in Figure 2-2
Schools	Proximity of sidewalk segments to schools
Public Input	Facility identified by the community or City staff as priority
Planned Facility	Facility previously proposed by other plans
Proximity to Destinations	How close is the facility to a civic point of interest
Access to Greenways	The proposed sidewalk connects to a proposed or exiting greenway
Existing sidewalks	There are no existing sidewalks along the roadway.



**TABLE 4-3: PRIORITY SIDEWALKS RECOMMENDATIONS**

STREET NAME	LIMITS	SIDE OF STREET	COMMENTS
Beatty Dr/ Hwy 273	S Main St to Mt. Holly City Limits	East/South	Presence of more active land uses on this side of the street including the YMCA.
Beaty Rd	Smith St to Ferstl Ave	West	Extends the existing sidewalk on Belmont-Mt Holly Rd
Belmont-Mt Holly Rd	Margarette Ave to Forney Ave	North/West	Extends the existing sidewalk on Margarette Ave. This side of the street serves a large multifamily residential land use
Catawba Ave	Hawthorne St to Rankin Ave	South	South side would serve a larger residential land use
Highway 273	Summit Ave to Tuckaseege Rd	South/East	Extends existing sidewalk in front of Food Lion. This side serves other civic services
N. Main St	Sandy Ford Rd to Existing Sidewalk	North/West	Serves pedestrian traffic to the Circle A Food Mart, Pinewood Elementary School and residential neighborhoods on the north/west side
NC 27 Hwy	Hoover St to Main St	North	Extends to the existing sidewalk in downtown, in addition the north side will serve more residential land uses
Noles Dr	Hoover St to N. Hawthorne St	South	Extends existing sidewalk from Hawthorne St
S. Main St	Tuckaseege Rd to Rose St	East	Serves residential area on east side
Tuckaseege Rd	S Main St to Nuttall Dr	East	Serves residential area on east side including large apartment complex, and connects to existing sidewalk in front of Food Lion



**INTERSECTION AND CROSSING IMPROVEMENTS**

The consultant team evaluated pedestrian safety and accessibility at key intersections in Mount Holly. Intersections were assessed based on field work observations, community input, and feedback received from the Steering Committee. These intersections were evaluated based on the scoring system described in **Table 4-4**. A summary of the recommendation improvements for each of the intersections evaluated is presented in **Table 4-5**

The majority of intersections that were evaluated are in need of new and/or retrofitted pedestrian crossing facilities, including new or enhanced pedestrian markings, signals, ADA ramps, and/or improved sidewalks. Further guidance for development and design of pedestrian facilities is provided in **Appendix C: Design Guidelines**.

**Mid-Block Crossings**

Need for one mid-block crossing was identified along Highway 273 across the entrance to the YMCA with opportunities for pedestrian refuge islands.

Priority intersections and mid-block crossings are identified in the Proposed Pedestrian Recommendations map (**Figure 4-1 A & 4-1 B**)

Detailed graphic illustrations of a potential mid-block crossings and intersection improvements are presented in the Project Cut Sheets section of this chapter. The City should coordinate with NCDOT on all intersection improvements on State-owned roadways. NCDOT can make ADA-compliant curb ramp improvements at intersections as part of resurfacing projects, for example.

**TABLE 4-4: INTERSECTION SCORING CRITERIA**

CRITERIA	DEFINITION
No. of Emergency Incidents	No. of reported incidents in the past 10 years, provided by Police and Fire Departments
Traffic Counts	AADT counts provided by NCDOT
Design Standards	Does the intersection meet the standards of the Land Development Guidelines
Illumination	Are there street lights at the intersection
Signage/ Markings	Are there appropriate signals, signs, and markings in place and properly maintained
Sight Triangle	Are there items in the sight triangle that violate either the Zoning Ordinance or Land Development Guidelines
Line of Sight	The distance that the driver of a vehicle can see horizontally when stopped at an intersection
Maintenance	Determines if the intersection is maintain by the City, the State or a combination
ADA Accessible	Does the intersection meet ADA Guidelines
Civic Proximity	How close is the intersection to a civic use such as school, library, government building, etc.



*Example of a Mid-Block Crossing*



TABLE 4-5: INTERSECTION RECOMMENDATIONS SUMMARY

INTERSECTION	RECOMMENDATIONS						
	SIDE-WALK	ADA RAMP	CROSS-WALK	PED REFUGE	RE-BUILD/REALIGN INTERSECTION	ADJUST DRIVEWAYS	ADD/ADJUST STOP BAR
Hicks Circle and Rankin Ave.		X	X				
W. Catawba Ave. and S. Hawthorne St.			X				
Beaty Rd. and Beatty Dr.			X	X	X		
Summit Ave. and Highland St.	X	X	X				
Tuckaseege Rd. and Beatty Dr.	X		X			X	
Craig St. and Woodlawn Ave.	X	X	X				
W. Catawba Ave. and Highland St.			X				
Beaty Rd. and Belmont-Mt. Holly Rd.			X				
East Charlotte Ave. and Highland St.			X	X			
S. Main St. and Rankin Ave.	X	X	X				X
S. Hawthorne St. and W. Charlotte Ave.	X	X	X				
E. Henry St. and Beatty Dr.	X	X	X	X			
Craig St. and Noles Dr.	X	X	X				X
A&E Dr. and Highland St.	X		X				
S. Hawthorne St. and Rankin Ave.		X	X		X		
Lanier St. and N. Main St.	X	X	X	X			

**LOCAL AND REGIONAL GREENWAYS**

Potential local and regional greenway opportunities were identified during the planning process. Greenways are proposed for Mount Holly to provide transportation and recreational alternatives for pedestrian travel, and to connect to the Carolina Thread Trail regional greenway network. These priority proposed greenways corridors were selected from the recommendations provided in the Mount Holly Greenprint Plan(2007), which prioritized greenway projects anticipated to protect land and water quality near wetlands and floodplains, to offer bicycle and pedestrian connectivity to residents and visitors alike, and to concentrate future growth in nodes of mixed

use and conservation subdivision developments The proposed trails and Greenways are listed in **Table 4-6** and are identified by number in **Figures 4-1A and 4-1B.**





Source: <http://www.carolinathreadtrail.org/>

Catawba River Greenway at Tuckaseege Park

TABLE 4-6: MOUNT HOLLY PROPOSED GREENWAYS

ID	NAME	LIMITS	APX LENGTH MILES*	APX LENGTH FEET
1	Catawba River Greenway	Connects to the existing Stonewater Bay Greenway and extends south to the YMCA property in Mount Holly. One mile section of the trail has been completed already in Tuckaseege Park	13.45	70992
2	Dutchmans Creek Greenway	From Devynn Ridge CT extending southeast to West Charlotte Ave in Downtown	4.64	24499
3	The East Gaston Greenway	From Western City Limits near Morning Dew LN extending east to the proposed Dutchman's Creek Greenway, near Woodlawn Ave	2.81	14837
4	The Fites Creek Greenway	From Catawba Ave at Western City Limits, extending east to the River Front	2.16	11405
5	The Mount Holly-Belmont Greenway	Connects to the proposed Catawba Greenway near Highland Street and extends southwest to the Belmont Abbey Campus.	3.97	20980
6	Stanley Creek Greenway	From western City Limits near Shane Dr, extending south to the proposed Dutchman's Creek	1.16	6125
7	South Stanley Creek Greenway	From western City Limits near Eric Brown Ct, extending east to the proposed Dutchman's Creek	0.57	3010
8	Belmont Abbey -YMCA Trail	Connector trail between Belmont Abbey College and the YMCA	1.67	8832
9	Connector Trails	Varies	-	-

\* The proposed greenways are part of a regional plan extending beyond Mount Holly City Limits. The lengths listed in the table are approximate to the limits of the trail within Mount Holly city Limits

## PROJECT CUT SHEETS

This section offer details for six priority project recommendations in Mount Holly. The purpose of these project sheets is to provide a clear picture of this Plan's recommendations. Criteria used to determine the priority projects include sidewalk and intersection ranking results, community support (as evidenced through the public involvement process of this Plan), and proximity to key destinations.

The photo rendering and plan view illustrations represent a typical treatment scenario of this Plan's recommendations and recommended implementation strategies.

Refer to recommendations map to see the location of priority projects.



## 1. NOLES DRIVE BETWEEN N. HAWTHORNE ST AND CRAIG ST

### Proposed Improvements

Short-term, install stop bars at all four legs of the intersection between Craig St and Noles Dr; install crosswalk across Noles Dr, on north side of Craig St.

Long-term, install sidewalk and ADA ramps on north side of Craig St, and south side of Noles Drive\*.

### Description

Safe access to and from rest home is an important issue for the community. Current conditions are not conducive for residents of the rest home to walk.

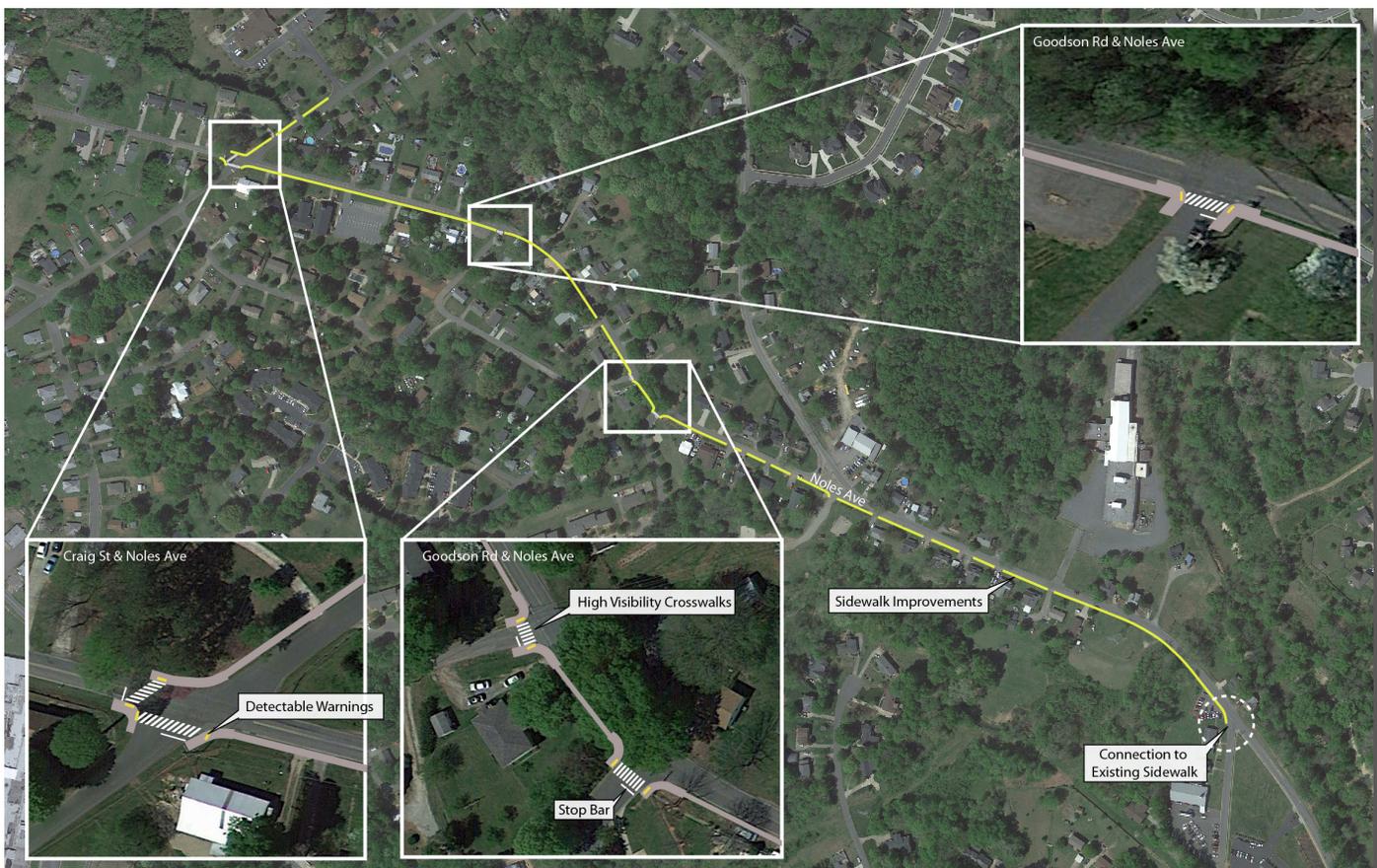
### Issues

Lack of sidewalks and safe crossings to access the Woodlawn Haven Rest Home.

\*A future project could include sidewalks on both sides of Noles Drive.



*Noles Dr., looking west*



*Potential Improvements*

## 2. CHARLOTTE AVENUE AND HIGHLAND CROSSING

### Proposed Improvements

Short-term, install crosswalks across Highland St. to E. Central Ave., across E. Central Ave., across E. Charlotte Ave. (to northeast corner).

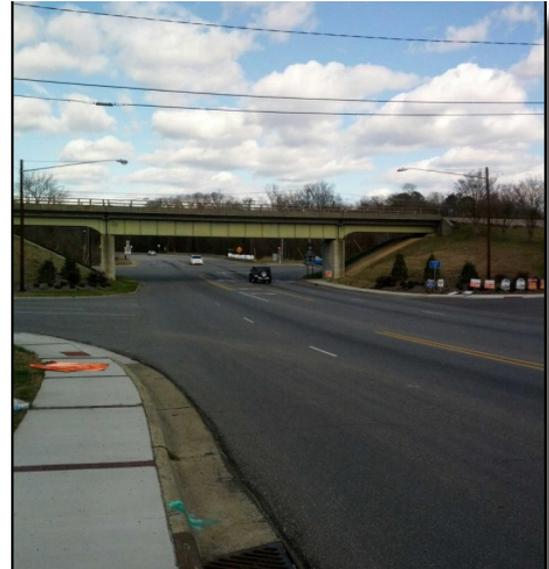
Long-term, consider pedestrian-refuge islands in medians of E. Charlotte Ave. and Highland St. Consider two-stage crossing and/or crossbike, with signage and striping, to facilitate bicycle crossing.

### Description

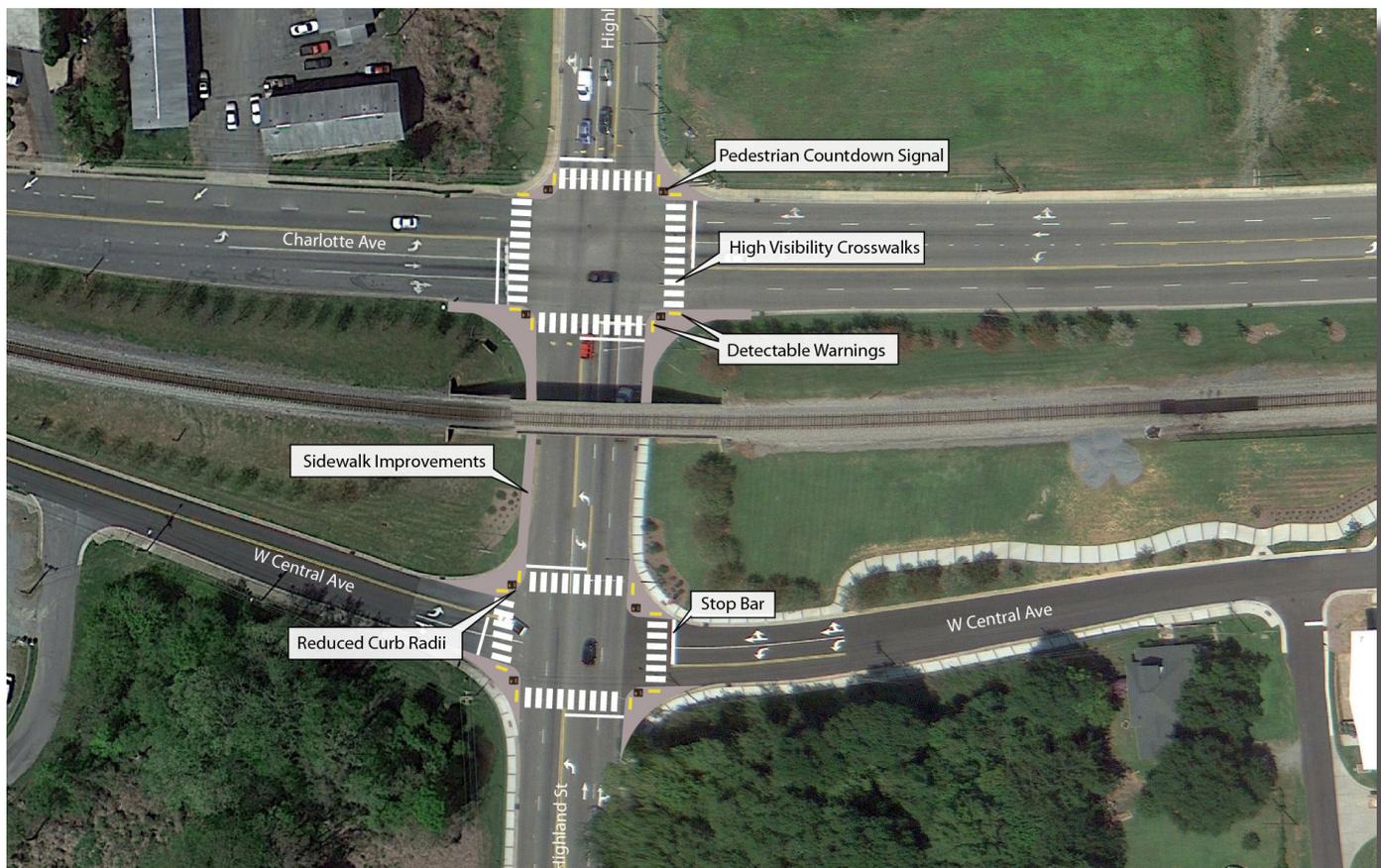
Key intersection to access Downtown Mount Holly, and connects to proposed regional greenways alignments.

### Issues

Sidewalk gap exists between east side of Highland St. and northeast corner of E. Charlotte Ave./Highland St. No crosswalks exist. NCDOT sign currently blocks path of Highland St. sidewalk under railroad bridge (see photo below). Both primary streets are NCDOT streets (NC 27 and NC 273).



*Highland St, looking north*



*Potential Improvements*



### 3. IDA RANKIN ELEMENTARY AND MT. HOLLY MIDDLE SCHOOL

#### Proposed Improvements

Install sidewalk along W. Catawba Ave, and crosswalks at W. Catawba Ave. and S. Hawthorne St. intersection.

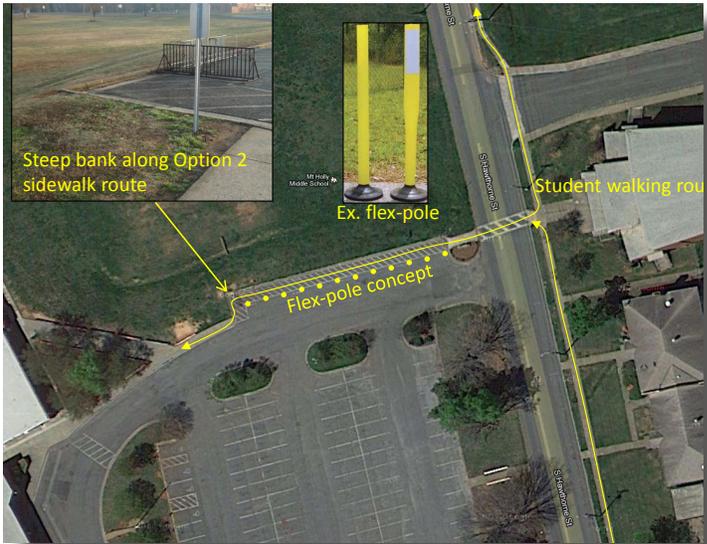
#### Description

Hawthorne Street is a primary walking route for students, and its intersection with W. Catawba Ave. is a key crossing point. The sidewalk along the south side of W. Catawba Ave. serves the neighborhoods south of the school\*, and the high-visibility crosswalks improve safety at a key crossing point.

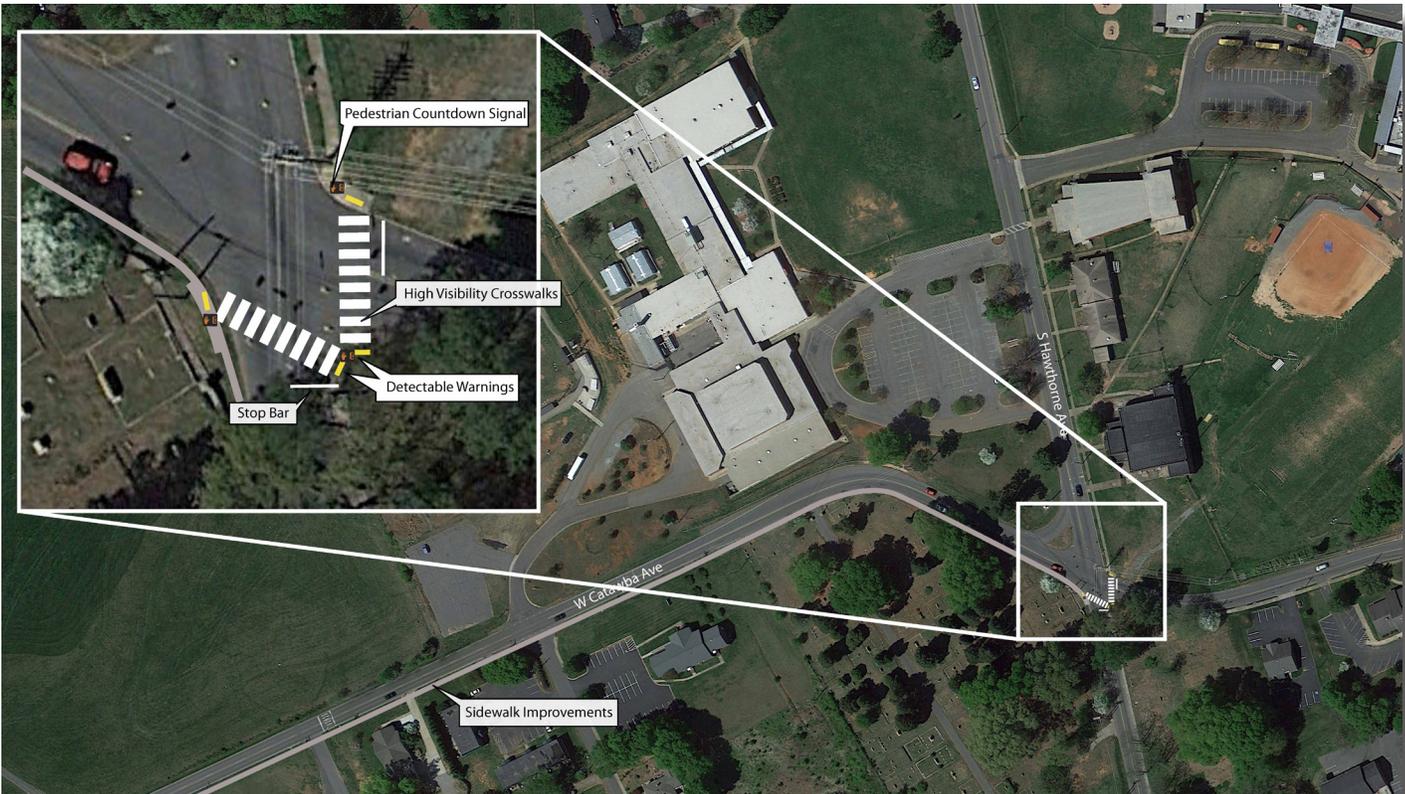
#### Issues

Ida Rankin E.S. has sidewalks connecting from street to school but the lack of high-visibility crosswalks at S. Hawthorne St and W. Catawba Ave., and lack of sidewalk along W. Catawba Avenue, can limit safety for students walking to school.

\*A future project could include sidewalks on both sides of W. Catawba Ave.



Existing site conditions



Potential Sidewalk and Crossing Improvements

## 4. YMCA MID-BLOCK CROSSING ON BEATTY DR

### Proposed Improvements

Midblock crossing

### Description

A midblock crossing enhances safety and comfort for pedestrians who cross the road to connect to the YMCA. A high-visibility crosswalk combined with a HAWK\* could increase awareness of pedestrians for motorists.

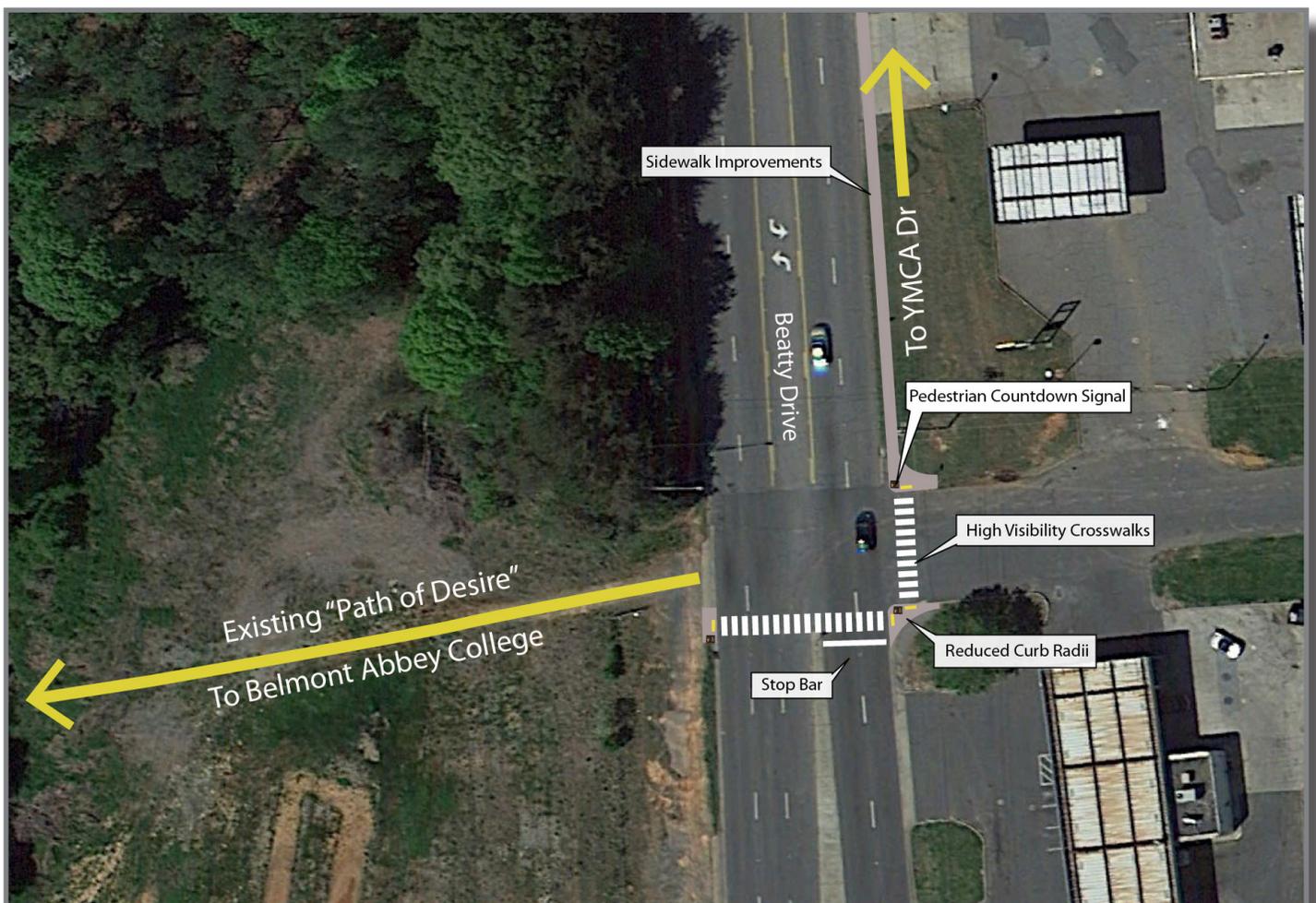
### Issues

Beatty Dr is a high-volume, high vehicle speed roadway. Students from Belmont Abbey College cross this roadway daily to access the YMCA premises.

\* Additional study would be required.



*Existing Crossing segment on Beatty Dr*



*Potential Midblock Crossing Concept*



## 5. HIGHWAY 273 AND RANKIN ST.

### Proposed Improvements

Complete street improvements may include: high-visibility crosswalks, ADA curb ramps, reduced curb radii, a widened landscape strip, pedestrian countdown signals, and pedestrian refuge.

### Description

Highway 273 (S. Main Street) is a high volume, high vehicle speed roadway that links to important pedestrian destinations in downtown, including the Food Lion grocery store.

### Issues

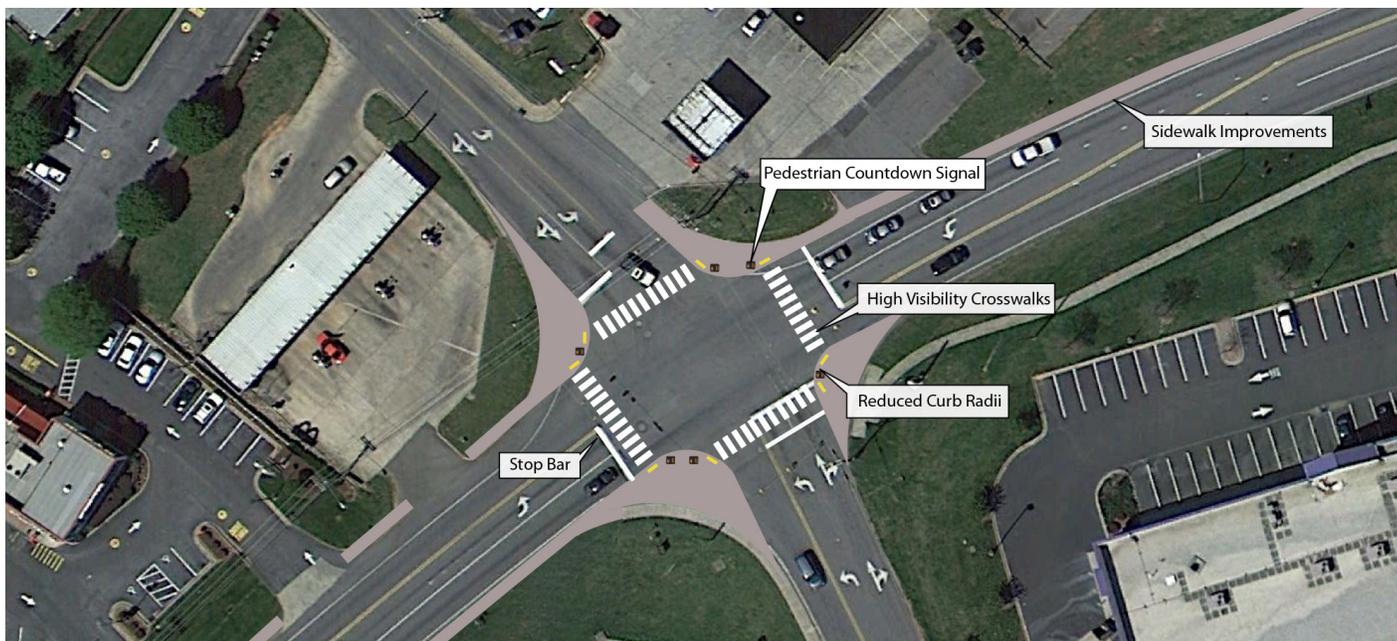
At the time of this Plan's writing, design for a Highway 273 widening project is underway. This Plan recommends that the City and NCDOT refer to NCDOT's "Complete Streets Planning and Design Guidelines", and design Highway 273 and this intersection with these guidelines in mind.



*Rankin Ave, looking south*



*Gas station access need narrowing on Rankin Ave.*



*Potential Intersection Improvements*

## 6. HIGHWAY 273 AND SOUTH MAIN ST.

### Proposed Improvements

Complete street improvements may include: high-visibility crosswalks, ADA curb ramps, reduced curb radii, a widened landscape strip, pedestrian countdown signals, and pedestrian refuge.

### Description

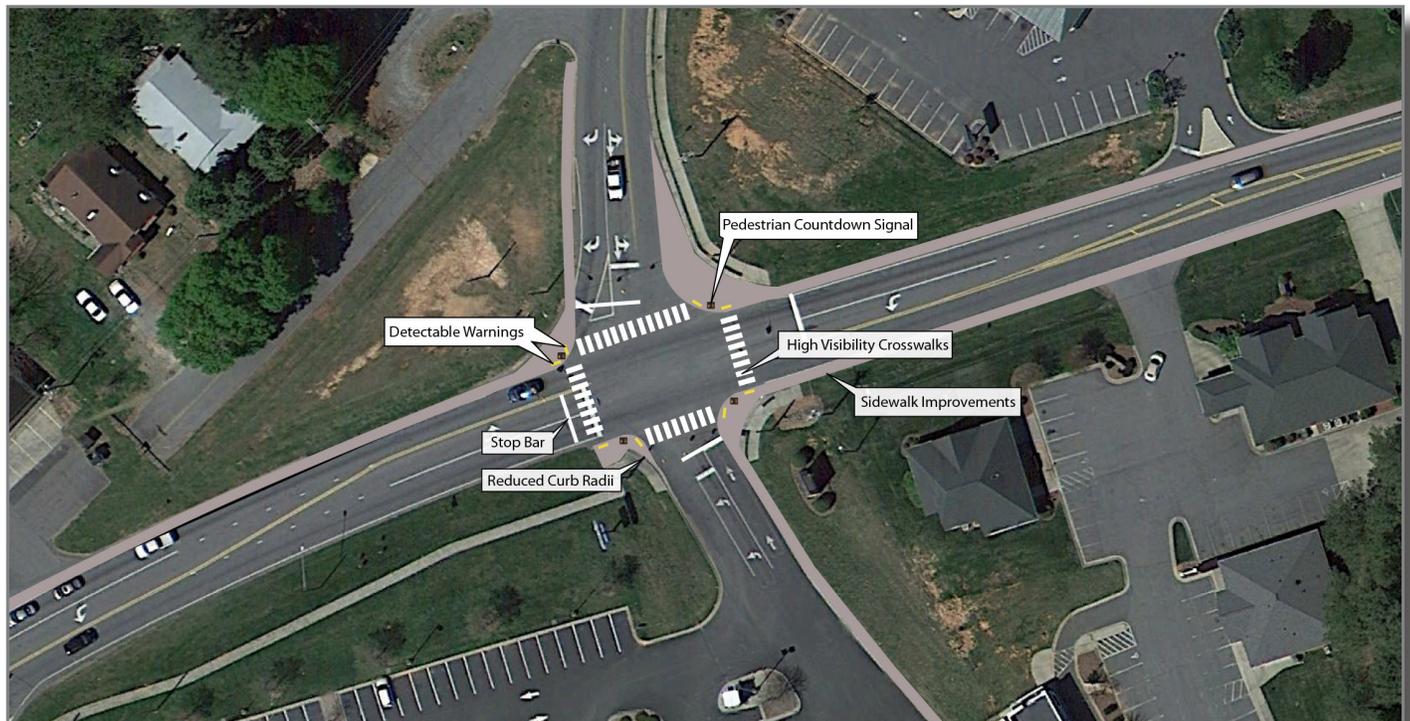
Highway 273 (S. Main Street) is a high volume, high vehicle speed roadway that links to important pedestrian destinations in downtown, including the Food Lion grocery store.

### Issues

At the time of this Plan's writing, design for a Highway 273 widening project is underway. This Plan recommends that the City and NCDOT refer to NCDOT's "Complete Streets Planning and Design Guidelines", and design Highway 273 and this intersection with these guidelines in mind.



*Intersection at Hwy 273 and South Main St*



*Potential Intersection Improvements*



## 6. HIGHWAY 27 FEASIBILITY STUDY

### Proposed Improvements

Sidewalk, street trees, on-street parking, cycle track.

### Description

NC 27 bridge is a key link across the Catawba River to Mt. Holly. The consultant team explored opportunities to improve pedestrian and bicycle access along this high-vehicle speed roadway.

### Issues

High vehicle speeds, wide roadway, lack of street trees.

### NC 27 Bridge Existing Conditions



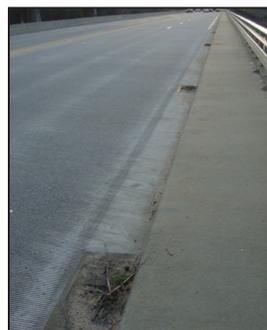
*View toward landing on Catawba River (looking East)*



*Mecklenburg County side of bridge, sidewalk*

### Proposed Recommendations

Utilizing the data collected, a series of 3-D renderings of NC 27's existing and possible street cross-sections were created. Proposed design elements that would achieve better bicycle



*Storm drains silted-over, no edge line*



*Storm drain detail, recessed 1.5", not bike friendly*

and pedestrian level of service while also being cost-effective (i.e. using flexible bollards instead of Jersey barriers in order to preserve drainage patterns; building off the back of existing sidewalk instead of extending sidewalk into street to prevent the need for new drainage and utility infrastructure) were identified.

Based on the street's existing curb-to-curb pavement width, two design options for reallocating the street space to improve bicycle and pedestrian conditions were identified. The two design options are presented in the following pages.

### Conclusion

In addition to changes within the street cross-section, intersections in the corridor would need to be upgraded for improved bicycle and pedestrian access. Access management (driveway removal and/or consolidation) and crosswalk pavement markings would further enhance the street for both bicycle/pedestrian and automobile traffic. The findings also recognized Central Avenue as a key connection between the NC 27 road-diet and downtown Mount Holly, as it could provide a bike route parallel to the portion of NC 27 to the north, which does not have enough pavement width to restripe bike lanes or a cycle track. Existing streetscaping improvements that are underway on Central Avenue support its future use as an enhanced bicycle and pedestrian connection between downtown Mount Holly and the Catawba River (on the Mount Holly side and the Mecklenburg County side, with U.S. National Whitewater Center 2 miles south of Mount Holly).

# NC 27 BRIDGE DESIGN OPTIONS

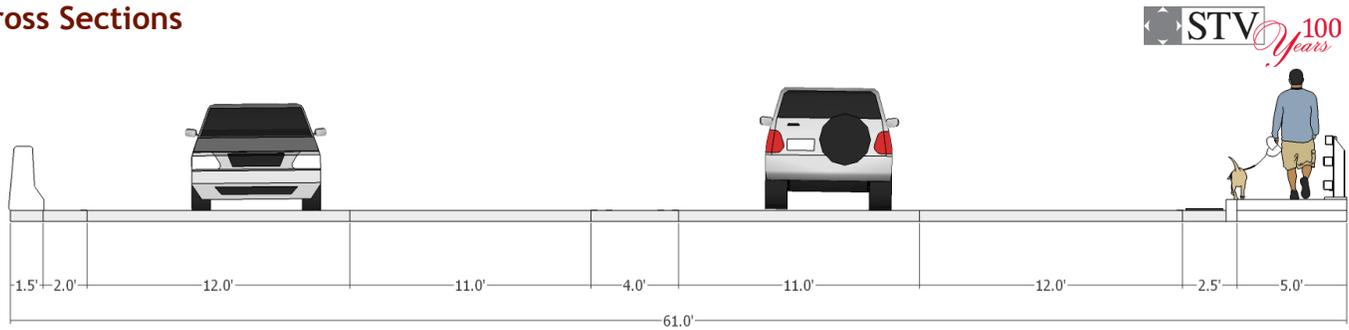
## Proposed Improvements

This option creates a 2-way cycle track on the NC 27 bridge, keeping the existing sidewalk in place. The 2-way cycle track would continue west, removing the existing northern travel lane, until its terminus at Highland Avenue (NC 273). This option would also include on-street parking on the street's north side, with street trees located in the sidewalk in tree wells.

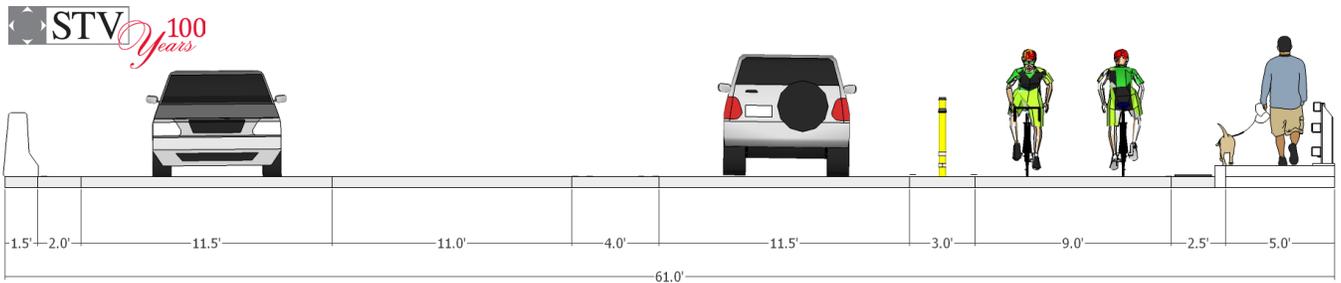
Note: Tree wells are recommended instead of a planting strip for the following reasons:

- Planting strips require greater maintenance (grass watering, cutting, and replanting) than tree wells (minor weed and litter removal).
- Planting strips pose ADA access challenges (canes and wheelchairs sink into vegetated planting strips), while tree wells allow a fully hardscaped extension of the sidewalk to the curb.
- Planting strips convey a suburban/lower-intensity urban character, while tree wells set into wide sidewalks convey a more urban character, which would complement the area's future mixed-use redevelopment.

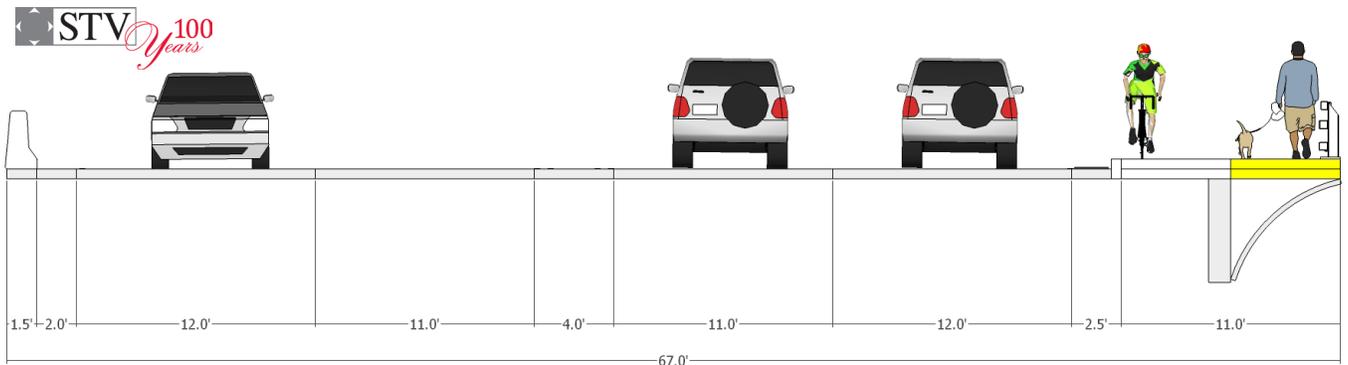
## Cross Sections



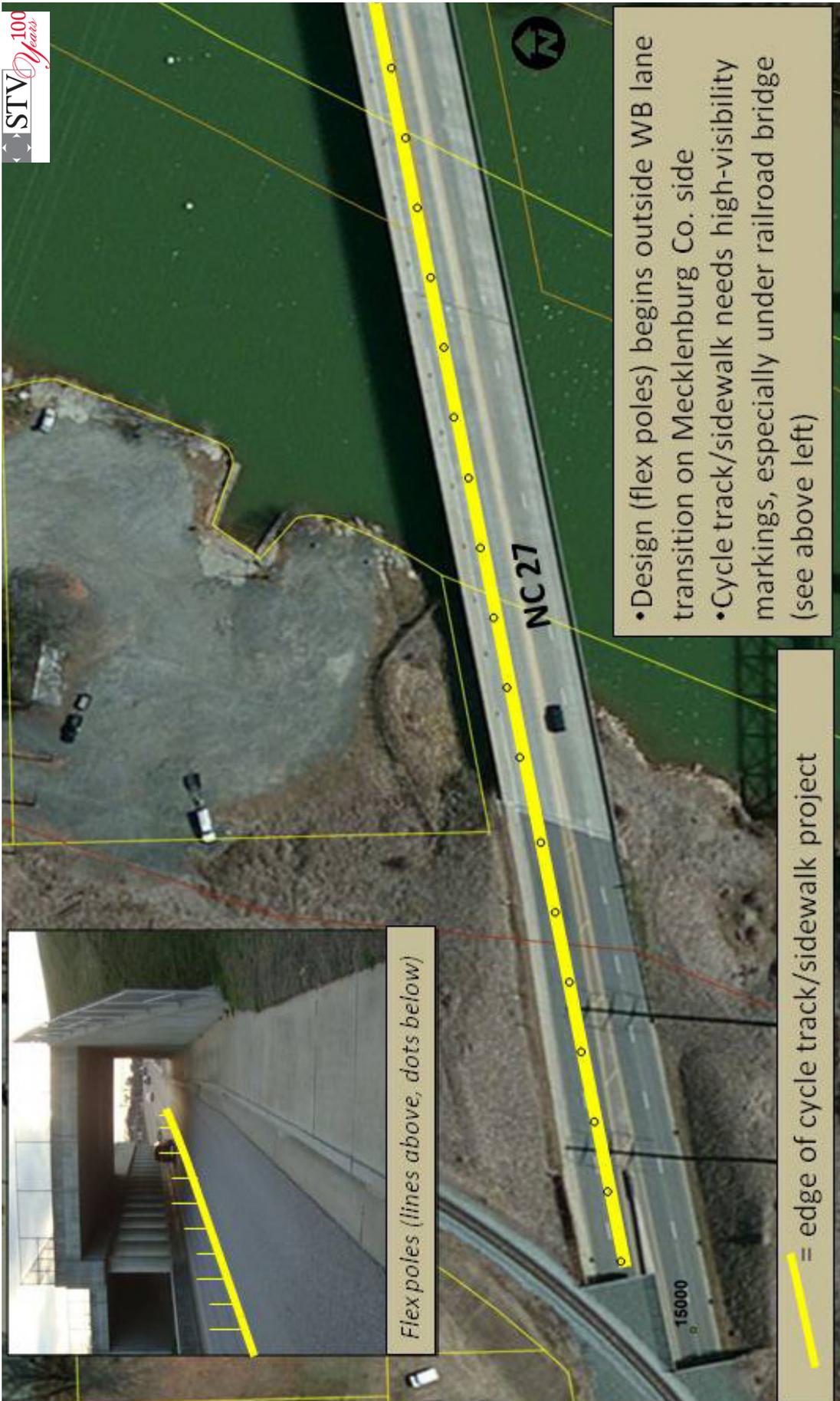
*NC 27 Bridge Existing Cross Section. Sidewalk is effectively 4.5' wide, given railing depth*



*NC 27 Bridge Proposed Cross Section Option A. Based upon NC-27 Road Diet Study by Kublilins*



*NC 27 Bridge Proposed Cross Section Option B. Based upon NC-27 Road Diet Study by Kublilins*



Design Option Plan View - NC 27 Bridge

NC 27 RIVER ST TO HIGHLAND: DESIGN OPTION 1 & 1A

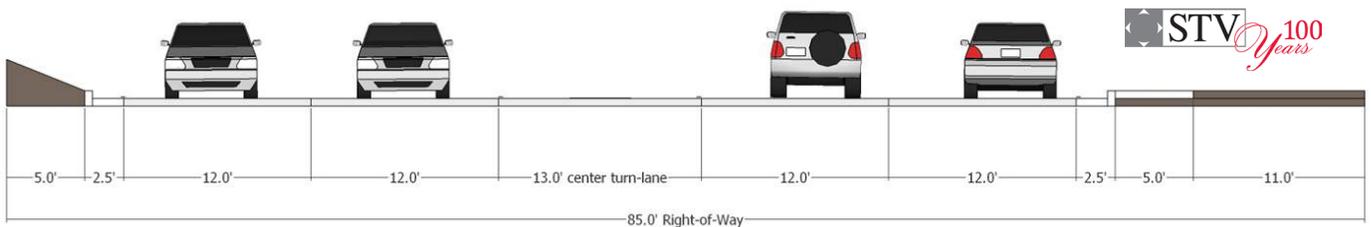
**Proposed Improvements**

This option creates the same 2-way cycle track and on-street parking configuration as Design Option 1, but any street trees/landscaping would be located outside of the right-of-way.

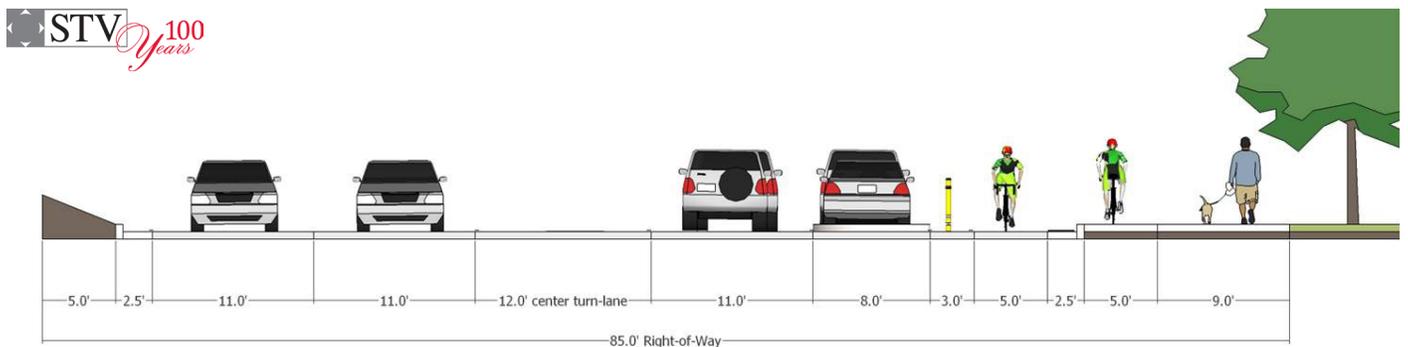
This option:

- Removes the City from responsibility and costs of maintenance on street trees/landscaping, as trees, etc., and would be located on private property.
- Lessens potential conflicts between existing above and below-ground utilities in the right-of-way (i.e. street trees interacting with utility poles and wires).
- Provides a continuous 14-foot wide sidewalk, creating room for a multi-use bicycle and pedestrian path.

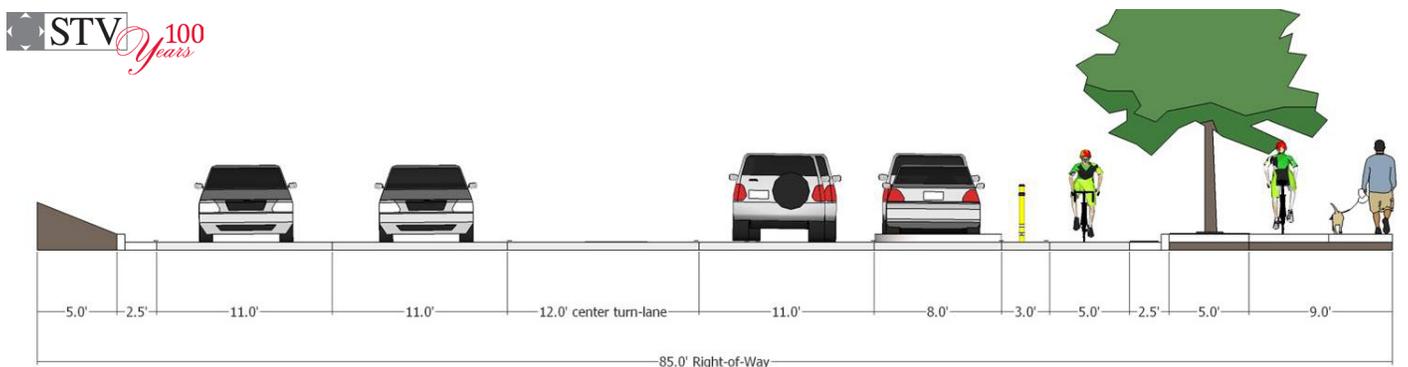
**Cross Sections**



NC 27: River St to Highland St - Existing Cross Section



NC 27: River St to Highland St - Proposed Cross Section Option 1a



NC 27: River St to Highland St - Proposed Cross Section Option 1



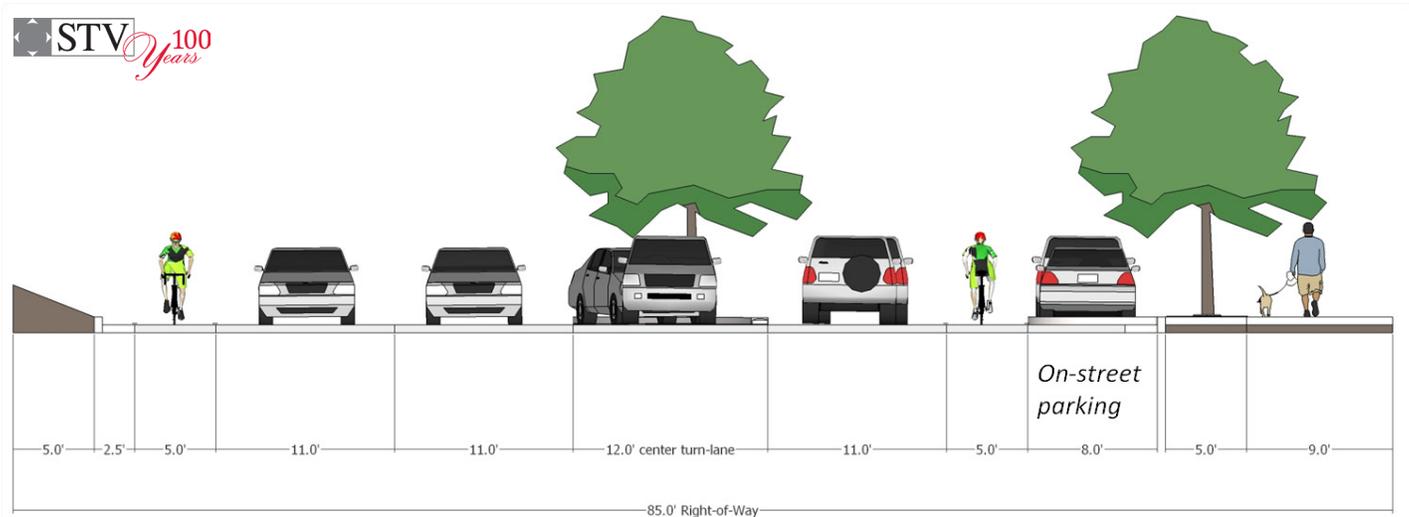
Design Option 1 Plan View - River St to Highland St

NC 27 RIVER ST TO HIGHLAND: DESIGN OPTION 2

**Proposed Improvements**

This option creates the same 2-way cycle track and on-street parking configuration as Design Option 1 up to Lee St. (just west of NC 27 bridge), then changes bicycle accommodation to one-way bike lines on either side of NC 27. This option would require bicyclists in the eastbound (south side) bike lane to cross to the north side of NC 27 at the Lee St. intersection, then cross to the east side of Lee St., where the 2-way cycle track would begin its route to the bridge.

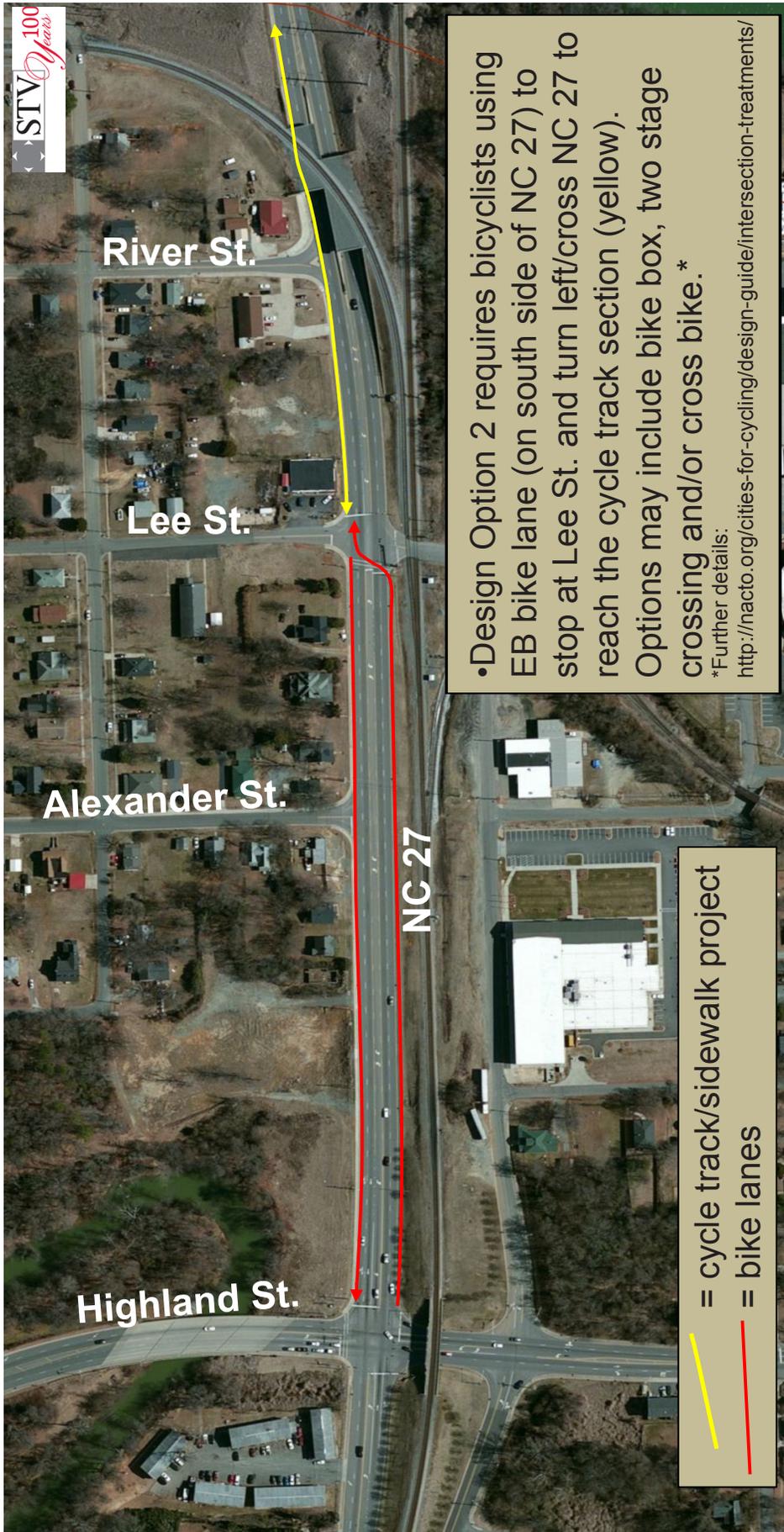
**Cross Sections**



*NC 27: Lee St to Highland St - Cross Section Option 2*

Notes: Restripe existing pavement width (65'), replacing outside WB lane with on-street parking (8'), bike lanes (5') and sidewalk widened by 9' (14' total sidewalk) in existing R.O.W.. Bike lanes are wide enough to keep bikes away from storm drains (lower left).

The crossing from the eastbound bike lane to the cycle track would likely require infrastructure improvements that may include signage, striping, signals, medians, etc.



NC 27: Lee St to Highland St. Design Option 2 Plan View

## OTHER RECOMMENDATIONS

### Traffic Calming

Traffic calming is the name for road design strategies that can be implemented to reduce vehicular traffic speed and volume, create a more pedestrian-friendly environment, and allow residential and commercial streets to better balance their multiple uses. The type of projects can range from a few minor changes to major rebuilding of a street network.

Types of traffic calming techniques vary from community to community and state to state. Techniques that are typically utilized include (but are not limited to) speed limit reduction, speed alert and enforcement, warning signage, gateway signage, speed tables and raised crosswalks, planted center median islands, speed humps, rumble strips, traffic circles, pavement treatments such as cobblestones or bricks, bicycle lanes, curb extensions, road diets, and reducing lane widths as appropriate. Additional information is provided in Appendix C: Design Guidelines.

There are several areas in Mount Holly, including where traffic calming projects could be implemented, including the Downtown streets. Before implementing any traffic calming projects, the City's Public Works Department should analyze each corridor and evaluate the potential impacts of implementing a traffic calming technique.

### Safe Routes to School

Safe Routes to School (SR2S) is a national and international movement that intends to create safe, convenient, and fun opportunities for children to bicycle and walk to and from schools. The goal of SR2S is to get more children bicycling and walking to schools safely on an everyday basis. By reversing the decline in children walking and bicycling to schools, SR2S can also play a critical role in reversing the nationwide trend toward childhood inactivity, obesity and disease. **Chapter 3: Program and Policies**, expands upon the Safe Routes to School program including a SR2S Tool Kit to provide guidance for the Mount Holly about the program.

The most successful SR2S programs incorporate the "Five E's": evaluation, education, encouragement, engineering and enforcement. Improvements in the built environment in and around school properties, which addresses the engineering "E.", can encourage more students

to walk or bicycle to school. The areas in and around Mount Holly Public Schools can be improved with Safe Routes to School as a goal. Concepts for pedestrian improvements around Ida Rankin Elementary and Mt. Holly Middle Schools is provided in the Project Cut Sheets section.

### SUMMARY

Together these proposed Improvements should be developed to create a safe and connected pedestrian network throughout the City of Mount Holly. All pedestrian facility projects undertaken should aim to meet the highest standards possible when topography and right-of-way allows. The design guidelines in **Appendix C** provide detailed information regarding facility type and treatments.

All recommendations are developed at a planning level and will need a more detailed project implementation-level review.

The network should be completed in phases, however, individual projects within the network could be developed as opportunities arise, regardless of the order. Also, as mentioned in the policy section of this plan, new ordinances should make pedestrian accommodations a mandatory part of any commercial or residential development, especially as recommended in this Plan (as discussed in **Chapter 3**).



# 5 IMPLEMENTATION STRATEGIES

## CHAPTER OUTLINE

OVERVIEW (5-1) | KEY ACTION STEPS (5-1) | KEY PARTNERS IN IMPLEMENTATION (5-3) | PERFORMANCE MEASURES (5-7) | FACILITY DEVELOPMENT METHODS (5-8)

## OVERVIEW

The three main ways to improve pedestrian conditions in Mount Holly are through facility construction, program implementation, and policy enforcement. This chapter outlines the implementation priorities, key partners in implementation, and facility development methods.

The following action steps are integral to achieving the goals and vision of this Plan. As guiding recommendations and the clearest representation of specific items to accomplish, they should be referred to often. Additionally, Appendix D provides a variety of in-depth funding resources for assisting in carrying out these tasks.

## KEY ACTION STEPS

### ADOPT THIS PLAN

Before any other action takes place, the City of Mount Holly should adopt this plan. This should be considered the first step in implementation. Through adoption of this plan and its accompanying maps as the City's official pedestrian transportation plan, Mount Holly will be better able to shape transportation and development decisions so that they fit with the goals of this plan. Most importantly, having an adopted plan is extremely helpful in securing funding from state, federal, and private agencies. Adopting this plan does not commit the City to dedicate or allocate funds, but rather indicates the intent of the City to implement this plan over time, starting with these action steps.

### DESIGNATE STAFF

Designate staff to oversee the implementation of this plan and the proper maintenance of the facilities that are developed. It is recommended that a combination of existing Transportation Planning, Administration, Parks and Recreation, and Public Works staff oversee the day-to-day implementation of this Plan. In many municipalities, this task is covered by a full-time bicycle and pedestrian coordinator, but in Mount Holly, it will make more sense to fold these responsibilities into current staff responsibilities. In the long term, a full-time Bicycle and Pedestrian Coordinator position could be considered.

### CREATE A BICYCLE AND PEDESTRIAN ADVISORY COMMISSION (BPAC)

The Steering Committee for this Comprehensive Pedestrian Plan should be invited to create and serve on a City Bicycle and Pedestrian Advisory Commission (BPAC) to assist in the implementation of this Plan. The BPAC would be comprised of local pedestrian and bicycle champions and work to support the implementation of the recommendations of this Plan. The formation of a BPAC will also represent



a significant step in becoming a Walk-Friendly Community. The BPAC's role would be to provide a communications link between the residents of the community and City government. The BPAC should meet periodically, be tasked with assisting the City staff in community outreach, marketing and educational activities recommended by this Plan. Models for BPAC exist throughout the country, including many communities in North Carolina. These organizations, and others like them, traditionally focus on education, advocacy, partnerships, events and community service. Each BPAC member could represent one key functional area: planning, design, safety, maintenance, education, health, recreation, etc. Both the City and the Gaston Urban Area Metropolitan Planning Organization could have separate BPACs.

### BEGIN QUARTERLY MEETING WITH KEY PROJECT PARTNERS

Coordination between key project partners will establish a system of checks and balances, provide a level of accountability, and ensure that recommendations are implemented. This meeting should be organized by the designated City Staff, and should include representatives from different City departments. The purpose of the meeting should be to ensure that this Plan's recommendations are integrated with other transportation planning efforts in the region, as well as long-range and current land use planning, economic development planning, and environmental planning. Attendees should work together to identify and secure funding necessary to immediately begin the first year's work, and start working on a funding strategy that will allow the City to incrementally complete each of the suggested physical improvements, policy changes and programs over a 5-10 year period. A brief progress benchmark report should be a product of these meetings, and goals for the year should be reconfirmed by participants. The meetings could also occasionally feature special training sessions on bicycle, pedestrian, and trail issues.

### SEEK MULTIPLE FUNDING SOURCES AND FACILITY DEVELOPMENT OPTIONS

Multiple approaches should be taken to support pedestrian facility development and programming. It is important to secure the funding necessary to undertake priority projects but also to develop a long-term funding strategy to allow continued development of the overall system. A priority action is to immediately evaluate the recommendations against transportation projects that are currently programmed in the Transportation Improvement Program (TIP) to see where projects overlap, complement, or conflict with each other. The City should also evaluate which of the proposed projects could be added to future TIP updates.

Capital and local funds for pedestrian facilities and trail construction should be set aside every year, even if only for a small amount. Small amounts of local funding can be matched to outside funding sources or could be used to enhance NCDOT projects with bicycle or pedestrian features that may otherwise not be budgeted for by the state. A variety of local, state, and federal options and sources exist and should be pursued. These funding options are described in **Appendix D: Funding**.

### IMPROVE PEDESTRIAN POLICIES

Suggested policy updates included in **Chapter 3** are recommended to ensure future development provides pedestrian and bicycle facilities and improves bicycle/pedestrian friendliness.

### DEVELOP SIDEWALK & TRAIL CONSTRUCTION DOCUMENTS

City engineers could prepare these in-house to save resources, using the design guidelines of this plan and the project **cut-sheets** as starting points. The public should have an opportunity to comment on the design of new facilities.

### LAUNCH PROGRAMS AS NEW PROJECTS ARE BUILT

Through cooperation with the City of Mount Holly BPAC, and groups such as walking clubs, strong education, encouragement, and enforcement campaigns could occur as new facilities are built. When an improvement has been made, the roadway environment has changed and proper interaction between motorists and pedestrians is critical for the safety of all users.



A campaign through local television, on-site enforcement, education events, and other methods will bring attention to the new facility, and educate, encourage, and enforce proper use and behavior. **Chapter 3**, Programs and Policies provides program ideas for the City and the BPAC to choose from.

### OFFER TRAINING FOR ENFORCEMENT

Law enforcement officers have many important responsibilities, yet pedestrians and bicyclists remain the most vulnerable forms of traffic. The Mount Holly Police Department should be involved in implementation. In many cases, citizens (and even sometimes officers) are not fully aware of state and local laws related to bicyclists and pedestrians. Training on this topic can lead to additional education and enforcement programs that promote safety. Training for Mount Holly's officers could be done through free online resources available from the National Highway Traffic Safety Administration (NHTSA) (see links at [www.bicyclinginfo.org/enforcement/training.cfm](http://www.bicyclinginfo.org/enforcement/training.cfm)) and through webinars available through the Association of Pedestrian and Bicycle Professionals (APBP).

### BECOME DESIGNATED AS A WALK FRIENDLY COMMUNITY

One of the goals for this Pedestrian Plan is to transform Mount Holly into a "Walk-Friendly Community" (WFC). The Walk Friendly Community Campaign is an awards program that recognizes municipalities that actively support pedestrian activity and safety. A Walk Friendly Community provides safe accommodation for walking and encourages its residents to walk for transportation and recreation. The program is maintained by the UNC Highway Safety Research Center, with support from a variety of national partners.

The development and implementation of this Plan is an essential first step in eventually becoming a Walk Friendly Community, and a summary Walk Friendly Scorecard that identifies general steps that the City can take to obtain Walk Friendly status is included in Chapter 1. With ongoing efforts and the short term work program recommended here, the City should be in a position to apply for and receive WFC status within two years. An introduction to Walk Friendly Communities can be found at: [www.walkfriendly.org/webinar.cfm](http://www.walkfriendly.org/webinar.cfm).

## KEY PARTNERS IN IMPLEMENTATION

### MOUNT HOLLY CITY COUNCIL

The City Council will be responsible for adopting this Plan. Through adoption, the City's leadership is further recognizing the value of pedestrian transportation and is putting forth a well-thought out set of recommendations for improving public safety and overall quality of life (see the 'Benefits of a Walkable Community' in **Chapter 1**). By adopting this Plan, the Council is also signifying that they are prepared to support the efforts of other key partners in the plan's implementation, including the work of city departments and the local NCDOT, Division 12.

Adoption of this Plan is in line with public support. Mount Holly's online survey (which yielded over 250 responses) showed strong support for improving pedestrian conditions. Though not a statistical survey, the survey results do represent the opinions of local residents. The survey asked, "How important to you is improving walking conditions in Mount Holly?" Over 87% responded "important" or "very important".

See **Appendix E** for more information on public involvement and the results of the public survey.

### ROLE OF THE CITY OF MOUNT HOLLY PLANNING BOARD

The Mount Holly Planning Board serves as an advisory board to the Council on matters of planning and zoning. The Planning Board should be prepared to:

- Become familiar with the recommendations of this Plan, and support its implementation.
- Learn about pedestrian-related policies, as described in detail in **Chapter 3**.



### ROLE OF THE GASTON URBAN AREA METROPOLITAN PLANNING ORGANIZATION (MPO)

The Gaston Urban Area Metropolitan Planning Organization (MPO) is a multi-jurisdictional entity made up of twelve local governments, NCDOT, USDOT, and other providers of transportation services. The Gaston MPO should be prepared to:

- Become familiar with the recommendations of this Plan, and support its implementation.
- Serve as lead coordinator and planner for a newly formed BPAC and for quarterly meetings with project partners.
- Ensure recommendations from this Pedestrian Plan are integrated into the Gaston MPO's regional planning and project implementation. Specifically, during the development of regional transportation projects, the Gaston MPO should review the recommendations of this Pedestrian Plan to ensure consistency and regional connectivity.
- Produce updates to the Long Range Transportation Plan (LRTP) that incorporate recommendations from this Pedestrian Plan.
- Ensure that TIP projects are updated with recommendations from this Plan.
- Follow upcoming roadway reconstruction and resurfacing projects and work early in the design process with The City and NCDOT to ensure pedestrian facilities are incorporated into the design.
- Keep up-to-date on current and changing funding sources and opportunities such as Safe Routes to School.

### ROLE OF THE CITY OF MOUNT HOLLY STREET & SOLID WASTE DEPARTMENT

The Street & Solid Waste Department handles the responsibility for the construction and maintenance of pedestrian facilities on City-owned and maintained roadways, as well as on NCDOT roadways, where encroachment agreements are secured. The department should be prepared to:

- Communicate and coordinate with other City departments and the BPAC on priority pedestrian projects.
- Become familiar with the standards set forth in Appendix C of this Plan, as well as state and national standards for pedestrian facility design.
- Secure encroachment agreements for work on NCDOT-owned and maintained roadways.
- Construct and maintain pedestrian facilities.
- Communicate and coordinate with NCDOT Division 12 on this Plan's recommendations for NCDOT-owned and maintained roadways. Provide comment and reminders about this Plan's recommendations no later than the design phase.
- Work with Division 12 to ensure that when NCDOT-owned and maintained roadways in Mount Holly are resurfaced or reconstructed, that this Plan's adopted recommendations for pedestrian facilities are included on those streets. If a compromise to the original recommendation is needed, then contact NCDOT Division of Bicycle and Pedestrian Transportation for guidance on appropriate alternatives.

### ROLE OF THE CITY OF MOUNT HOLLY PARKS & RECREATION DEPARTMENT

The City of Mount Holly Parks and Recreation Department operates the recreation, athletic, and special event programs for the residents of Mount Holly. They also lead implementation and maintain a variety of community, neighborhood, greenway, and natural park areas. The Parks and Recreation Department should be prepared to:

- Meet with the BPAC; provide progress updates for plan implementation and gather input regarding pedestrian and trail-related issues.



- Pursue grants for funding priority projects and priority programs.
- Select and carry out walking-related programs; Work with local advocacy groups and the BPAC to assist in organizing walking/running events, educational activities, and enforcement programs.
- Communicate and coordinate with Gaston County and neighboring municipalities and counties on regional trail facilities such as the CTT; partner for joint-funding opportunities.
- Identify safety concerns and work with residents to improve trail safety and the perception of safety.
- Become familiar with the standards set forth in Appendix C of this Plan, as well as state and national standards for pedestrian facility design; construct and maintain pedestrian facilities using the highest standards allowed by the State (including the use of innovative treatments on a trial-basis).
- Notify the Mount Holly, Engineering, and Public Works Departments of all upcoming roadway reconstruction or resurfacing/restriping projects in Mount Holly, no later than the design phase; Provide sufficient time for comments from the planning staff.
- If needed, seek guidance and direction from the NCDOT Division of Bicycle and Pedestrian Transportation on issues related to this Plan and its implementation.

### ROLE OF THE BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE

The Committee should be prepared to:

- Meet with staff from the Gaston MPO, Engineering, Parks and Recreation, Planning, and the Public Works Department; evaluate progress of the plan's implementation and offer input regarding pedestrian and trail-related issues.
- Assist City Staff in applying for grants and organizing pedestrian-related events and educational activities.
- Build upon current levels of local support for pedestrian issues and advocate for local project funding.

### ROLE OF THE LOCAL NCDOT, DIVISION 12

Division 12 of the NCDOT is responsible for the construction and maintenance of pedestrian facilities on NCDOT-owned and maintained roadways in the City of Mount Holly, OR is expected to allow for the City to do so with encroachment agreements. Division 12 should be prepared to:

- Recognize this Plan as not only an adopted plan of the City of Mount Holly, but also as an approved plan of the NCDOT.
- Become familiar with the pedestrian facility recommendations for NCDOT roadways in this Plan (**Chapter 4**); take initiative in incorporating this plan's recommendations into the Division's schedule of improvements whenever possible.

### ROLE OF THE CITY OF MOUNT HOLLY POLICE DEPARTMENT

The Police Department is responsible for providing the community the highest quality law enforcement service and protection to ensure the safety of the residents and visitors to the City of Mount Holly. The Police Department should be prepared to:

- Become experts on pedestrian-related laws in North Carolina (see: [www.ncdot.gov/bikeped/lawspolicies/laws/](http://www.ncdot.gov/bikeped/lawspolicies/laws/) )
- Continue to enforce not only pedestrian-related laws, but also motorist laws that affect walking, such as speeding, running red lights, aggressive driving, etc.
- Participate in pedestrian-related education programs.
- Review safety considerations with the Public Works Department before projects are implemented.



## ROLE OF DEVELOPERS

Developers in Mount Holly can play an important role in facility development whenever a project requires the enhancement of transportation facilities or the dedication and development of sidewalks, trails or crossing facilities. Developers should be prepared to:

- Become familiar with the benefits, both financial and otherwise, of providing amenities for walking and biking (including trails) in residential and commercial developments.
- Become familiar with the standards set forth in Appendix C of this Plan, as well as state and national standards for pedestrian facility design.
- Be prepared to account for bicycle and pedestrian circulation and connectivity in future developments.

## ROLE OF LOCAL & REGIONAL STAKEHOLDERS

Stakeholders for pedestrian facility development and related programs, such as Gaston County, Mount Holly Public Schools, Mount Holly Community Development Foundation, and local economic development organizations play important roles in the implementation of this plan. Local and regional stakeholders should be prepared to:

- Become familiar with the recommendations of this Plan, and communicate & coordinate with the City for implementation, specifically in relation to funding opportunities, such as grant writing and developing local matches for facility construction.
- The local school system and school leaders should assist in carrying out SRTS workshops, programs, and walkability audits, and also assist in SRTS grant applications.

## ROLE OF LOCAL RESIDENTS, CLUBS AND ADVOCACY GROUPS

Local residents, clubs and advocacy groups play a critical role in the success of this plan. They should be prepared to:

- Continue offering input regarding pedestrian issues in Mount Holly.
- Assist City Staff and BPAC by volunteering for pedestrian-related events and educational activities and/or participate in such activities.
- Assist City staff and BPAC by speaking at City meetings and advocating for local pedestrian project and program funding.

## ROLE OF VOLUNTEERS

Services from volunteers, student labor, and senior assistance, or donations of material and equipment may be provided in-kind, to offset construction and maintenance costs. Formalized maintenance agreements, such as adopt-a-trail/greenway or adopt-a-highway can be used to provide a regulated service agreement with volunteers. Other efforts and projects can be coordinated as needed with senior class projects, scout projects, interested organizations, clubs or a neighborhood's community service to provide for many of the program ideas outlined in **Chapter 3** of this Plan. Advantages of utilizing volunteers include reduced or donated planning and construction costs, community pride and personal connections to the City of Mount Holly pedestrian networks.



# PERFORMANCE MEASURES

The City of Mount Holly should establish performance measures to benchmark progress towards fulfilling the recommendations of this Plan. These performance measures should be stated in an official report within two years after the Plan is adopted. The purpose for evaluation is to determine the City's success and failures in implementing this Plan and making Mount Holly more walkable. Performance measures should address the following aspects of pedestrian transportation and recreation in Mount Holly. **Table 5-1** expands on the metrics of these performance measurements:

- **Facilities.** Measures of how many pedestrian facilities have been funded and constructed since the Plan's adoption.
- **Safety.** Measures of pedestrian crashes and injuries or speeding in the City.
- **Maintenance.** Measures of existing sidewalk/crosswalk deficiency or maintenance needs
- **Counts.** Measures of pedestrian traffic at specific locations throughout City including schools.

**TABLE 5-1: PERFORMANCE MEASURES METRICS**

TARGET	PERFORMANCE MEASURES	INDICATOR OF PROGRESS
Pedestrian Facilities	Output	
	Miles of sidewalk	Increase in number of sidewalks in the City
	Miles of shared-use paths and greenways	Increase in number of shared-use paths
	Number of signalized pedestrian crossings	Increase in number of safe pedestrian crossings
	Outcome	
	Gaps in the pedestrian network filled	Ratio of length of gap to increase in network connectivity. For example, a ½ mile of sidewalk connects two existing sidewalks, establishing 5 miles of connectivity.
	Use of new or experimental facility types	N/A
	Pedestrian mode share	Increase in pedestrian mode share by type of trip (e.g., commuter, shopping, school, etc.)
Safety	Output	
	Number of schools and students participating in pedestrian or bicycle safety education programs or events. (e.g., Safe Routes to School)	Increase in the number of schools and students participating
	Number residents that receive safety materials provided by the City	Increase in number of residents receiving safety campaign materials
	Outcome	
	Total number of pedestrian and bicycle crashes	Reduction in number of pedestrian and bicycle crashes
	Pedestrian and bicycle crash and fatality rates (police-reported pedestrian and bicycle crashes per unit)	Reduction in number of crash and fatality rates
	Pedestrian and bicycle crashes in areas with low vehicle ownership and low average household income	Reduction in number of pedestrian and bicycle crashes
	Vehicle speeds on identified corridors	Lower vehicle speeds on identified corridors



TARGET	PERFORMANCE MEASURES	INDICATOR OF PROGRESS
Maintenance	Output	
	Number of roadway maintenance or improvement projects planned for the City annually	Number of pedestrian maintenance improvements in one year
	Planned Complete Street Projects	Number of approved projects to retrofit streets with CS projects
	Number of ADA improved sidewalks, and curb ramps	Increase in accessibility for all residents and reduction of compliance complaints to the City administration
	Number of pedestrian amenities such as lighting and benches along trails and sidewalks	Increase of number of pedestrian using these facilities daily
	Outcome	
	Number (or %) of resurfacing or other maintenance projects that result in additional pedestrian facilities (both along and across the roadway)	Increase in number of complete street retrofitting projects in Mount Holly
Counts	Output	
	Number of count locations	Need to increase the number of counts location each year due to additional demand (more people walking)
	Outcome	
	Number of pedestrians and bicyclists per location	Increase in pedestrian activity

## FACILITY DEVELOPMENT

### METHODS

This section describes different construction methods for the proposed pedestrian network outlined in **Chapter 2**. Note that many types of transportation facility construction and maintenance projects can be used to create new pedestrian facilities. It is much more cost-effective to provide pedestrian facilities during roadway construction and re-construction projects than to initiate the improvements later as “retrofit” projects.

To take advantage of upcoming opportunities and to incorporate pedestrian facilities into routine transportation and utility projects, the City should keep track of NCDOT's projects and any other local transportation improvements. While doing this, the City should be aware of the different procedures for local and state roads.

### NCDOT TRANSPORTATION IMPROVEMENT PROGRAM

The Transportation Improvement Program (TIP) is an ongoing program at NCDOT which includes a process asking localities to present their transportation needs to state government. Pedestrian facility and safety needs are an important part of this process. Every other year,

a series of TIP meetings are scheduled around the state. Following the conclusion of these meetings, all requests are evaluated. Pedestrian improvement requests, which meet project selection criteria, are then scheduled into a four-year program as part of the state's long-term transportation program.

There are two types of projects in the TIP:

**Incidental and independent.** Incidental projects are those that can be incorporated into a scheduled roadway improvement project. Independent are those that can stand alone such as a trail project, not related to a particular roadway.

The City of Mount Holly, guided by the priority projects within this Plan, should present pedestrian projects along state roads to the MPO and NCDOT. Local requests for small pedestrian projects, such as crosswalks and smaller segments of sidewalk, can be directed to the MPO or the local NCDOT Division 12 office. Further information, including the criteria evaluated can be found at: [http://www.ncdot.org/transit/bicycle/funding/funding\\_TIP.html](http://www.ncdot.org/transit/bicycle/funding/funding_TIP.html)



## LOCAL ROADWAY CONSTRUCTION OR RECONSTRUCTION

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

## RESIDENTIAL AND COMMERCIAL DEVELOPMENT

The construction of sidewalks and safe crosswalks should be required during development. Construction of pedestrian facilities that corresponds with site construction is more cost-effective than retro-fitting. In commercial development, emphasis should also be focused on safe pedestrian access into, within, and through large parking lots.

This ensures the future growth of the pedestrian network and the development of safe communities.

## RETROFIT ROADWAYS WITH NEW PEDESTRIAN FACILITIES

For priority pedestrian projects, it may be necessary to add new facilities before a roadway is scheduled to be reconstructed. In some places, it may be relatively easy to add sidewalk segments to fill gaps, but other segments may require working with homeowners, removing trees, relocating landscaping or fences, re-grading ditches or cut and fill sections.

## SIGNAGE AND WAYFINDING PROJECTS

As more pedestrian facilities are constructed, the City should consider developing and adopting a signage style policy and procedure, to be applied throughout the entire community, to make it easier for people to find destinations. Mile markers or signs for the City's trails are one example of these wayfinding signs, and they can be installed along routes as a part of a comprehensive wayfinding improvement project. For a step-by-step guide to help non-professionals participate in the process

of developing and designing a signage system, as well as information on the range of signage types, visit the Project for Public Places website: [www.pps.org/info/amenities\\_bb/signage\\_guide](http://www.pps.org/info/amenities_bb/signage_guide)

## EXISTING CITY AND OTHER UTILITY EASEMENTS

The City may have several existing easements offering an opportunity for greenway facilities. Sewer easements are very commonly used for this purpose; offering cleared and graded corridors that easily accommodate trails. This approach avoids the difficulties associated with acquiring land, and it utilizes the City's existing resources. The City should work to allow public access and bicycle/pedestrian movement along City-owned and other public easements.

## MAINTENANCE

All facilities, including sidewalks and crosswalks require regular maintenance to reduce the damage caused over time by the effects of weather, use, and surrounding human and natural infrastructure (such as tree roots). A connected sidewalk system is useless if maintenance is neglected and sidewalks degrade or marked crosswalks fade. Walkway maintenance includes: fixing potholes, sidewalk decay, damaged benches, and re-stripping crosswalks.

In order to maintain passable sidewalk conditions, it is important to have a system in place to identify maintenance needs on existing sidewalks. Options include:

- Devoting a branch of the Public Works department to sidewalk inspection and repair.
- Developing a public reporting system where pedestrians can report maintenance issues.
- Establishing maintenance of existing sidewalks and crosswalks as part of the overall pedestrian facility component of the capital improvement program.





Typical pedestrian facility maintenance problems include:

- Step separation (vertical displacement at any point in the walkway that could cause pedestrians to trip or prevent wheelchair or stroller wheels from rolling smoothly)
- Badly cracked concrete/asphalt
- Settled areas that trap water (depressions in sidewalk or curb ramp that hold water)
- Tree root damage
- Vegetation overgrowth
- Obstacles in sidewalk
- Pedestrian countdown signal malfunction
- Faded, invisible marked crosswalk
- Damaged ancillary facilities such as benches, garbage cans, and pedestrian-scale lighting

It is recommended that the City of Mount Holly take a three-step approach to pedestrian facility maintenance. First, the City should provide a hotline and/or maintenance request form to accept residents complaints for improvement and repair. Residents complaints should be given first consideration for improvement or repair if the reporting involves a safety or access issue. Secondly, the City should devote some of its Public Works staff to conducting routine sidewalk and crosswalk inspection. Public Works staff will need to work closely with NCDOT staff to ensure sidewalk and crosswalk maintenance on all roads in Mount Holly as part of regular practice. Third, the City should make it the responsibility of individual property owners to maintain clear sidewalks, free of debris and vegetation.

# A PREVIOUS PLANNING EFFORTS

## APPENDIX OUTLINE

OVERVIEW (A-1) | EXISTING PLANS (A-1)

## OVERVIEW

To supplement field review of the study area, the project team reviewed various county and community plans for direction and goals as they pertain to the provision and planning for pedestrian and bicycle facilities in the City of Mount Holly. The development of each plan reviewed below involved public input and (in some cases) final adoption by City Council. This section provides a summary of the key plans reviewed for this improvement plan, their relevant goals, and relevant recommendations.

## EXISTING PLANS

### GASTON COUNTY COMPREHENSIVE PLAN

The July 2002 plan designated a Development Strategy of directing growth into three Target Areas:

- Target Area 1 (Primary) Existing towns/cities with adequate infrastructure for new/infill development, industrial parks >50 acres, and primary transit corridors.
- Target Area 2 (Secondary) Towns/cities without adequate infrastructure for new/infill development, less suitable than Target Area 1 areas.
- Target Area 3 (Tertiary) By-pass dependent areas, with less infrastructure availability and lower-density/cluster development patterns encouraged.

With Mount Holly designated Target Area 1, the plan also divided Gaston County into five Small Area planning areas, with Mount Holly located in the Northeast area. The section The County Tomorrow noted that proximity to NC 16 and NC 27, which link the area to Charlotte-Mecklenburg County, and the availability of utilities would continue to foster growth in the area (attested by City of Mount Holly's population growth from 9,618 (2000) to 13,656 (2010), 42% growth rate). Two scenarios were then laid out for the area, along with illustrative figures comparing them (see below):

### Trendline

- Large lot residential subdivisions.
- Incremental development of individual parcels for commercial and residential uses.
- Highway-oriented shopping centers.
- Residual land preserved for open space.

### Alternative





- A mix of uses that include a variety of housing types and densities, community facilities, civic uses, and neighborhood retail.

- Compact development that is organized around a central green or other urban greenspace.



- Walkable distance between various uses.

- Connected road network.

- Greenway

trail system parallel to the Catawba River that ties into a more intricate system of trails linking the greenspaces.



reviewed the City of Mount Holly for parks and recreation based on a typology of eight park types:

1. Regional parks
2. District parks
3. Community parks
4. Neighborhood parks
5. Mini parks
6. School parks
7. Linear park/greenway
8. Unique or special areas

Of these park types, linear parks/greenways have the most relevance as potential transportation routes for pedestrians. The plan commended the City for purchasing Jack's Place, located northeast of downtown and south of the National Gypsum factory, on the waterfront end of Drywall Drive.

The fifth and final section of the plan, Implementation, recommended a 10-year Capital Improvement Plan (CIP), with recommendations on funding options.

The section Recommendations included:

- Directing growth into the county's "Target Areas", with emphasis on infill development in existing cities and along future transit corridors.
- Adhering to urban design principles including a walkable environment created through street connectivity and pedestrian scale development.
- Enhancing pedestrian and bicycle infrastructure by integrating it early and often into larger roadway/transit plans and projects.
- Considering the modification of development standards (zoning, subdivision, street design, etc.) to allow roadway standards flexible enough to allow context-appropriate designs.

- Renovation/Maintenance Program: \$325,000
- Land Acquisition Program: \$402,500
- Park Development Program: \$1,925,000
- Special Use Facilities: \$3,300,000
- Total Capital Improvement: \$5,952,500

Of these line-items, the **Land Acquisition Program** has the most direct relevance to expansion the City's greenway and pedestrian route network. **However, if the City wishes to acquire land at an aggressive pace in order to build out the Catawba River Corridor, it would need greatly increase its fund for Land Acquisition to at least double its current amount of \$402,500.** Funding options recommended to the City included:

- General tax revenues
- User fees

**COMPREHENSIVE  
PARKS AND  
RECREATION  
MASTER PLAN**

This June  
2010 plan

**APPENDIX A: PREVIOUS PLANNING EFFORTS**



- General obligation bonds
- Revenue bonds
- Limited option or special use tax
- Park Foundation (Partners for Parks)
- General foundations

STRATEGIC VISION PLAN

This May 2008 plan began with Phase 1, Visioning. This process created six core values for the City:

1. Small Town Character
2. Natural Environment
3. Visionary Leadership
4. Broad Business Base
5. Efficient Transportation
6. Excellence in Education

From these, goals emerged including:

- **Woods and Waters District.** Reinforce the City's image as an active living-friendly city by providing water's edge trails, parks and access points in a district that stretches from Mountain Island Lake to Belmont.
- **Thriving Downtown.** Re-establish downtown as the center of the community's social and economic life.
- **Gateway Corridors.** Establish four key gateway corridors into Mount Holly: Riverfront Gateway, along Highway 27/ Central Avenue from the Catawba River to Downtown; South City/Gaston Gateway, at Highway 273 and I-85; North City Gateway, at Mountain Island Lake and Highway 16; and, West City Gateway, at Highway 27 and Kelly Road.
- **Transportation.** Provide an expanded network of interconnected streets and sidewalks that is safe and efficient for pedestrians, bicyclists, and vehicles as the community grows.
- **Great Neighborhoods.** Grow great neighborhoods that are walkable, interconnected, and compatible with the City's traditional neighborhood design.
- **Housing Choices.** Ensure a range of housing choices is available, from affordable

apartments and starter homes to higher-end homes.

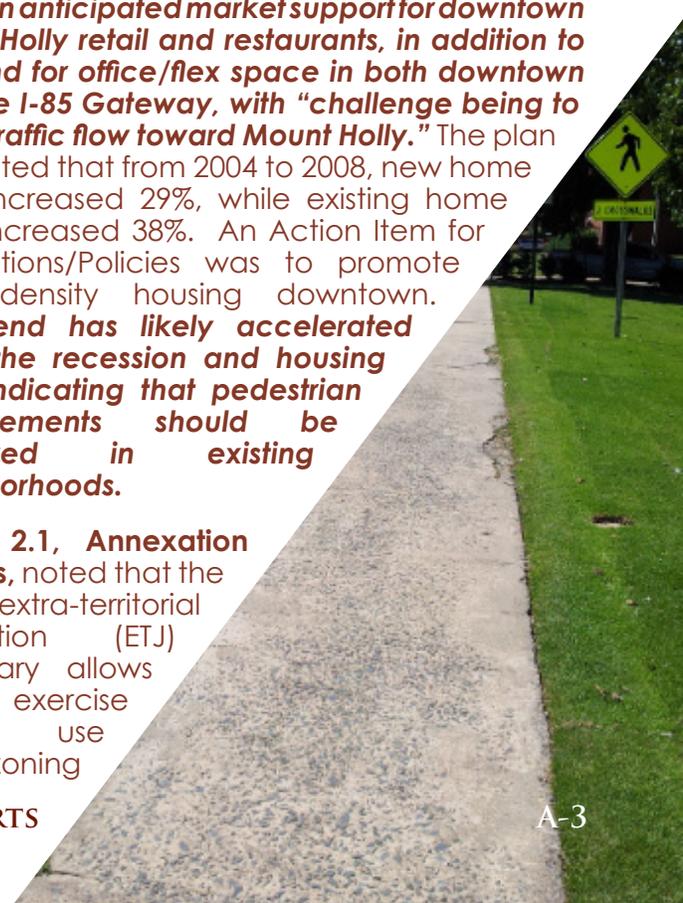
- **Planning for Growth.** Elevate the importance of Planning in the City, commit to longer-term planning and investments, set higher development expectations.

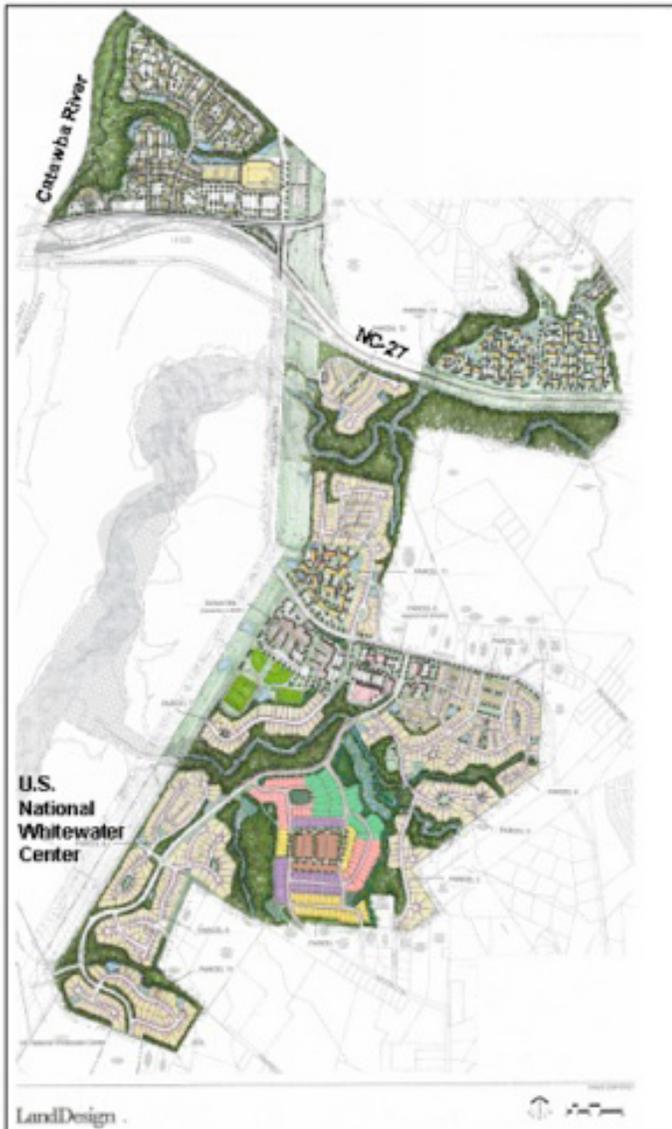
**Phase 2, Market Study** highlighted demographics, real estate markets, S.W.O.T. (Strengths-Weaknesses-Opportunities-Threats) and created Action Plan items to follow up on these findings. As of May 2008, 14 residential projects were underway in or near Mount Holly, with a total of 2,972 lots, of which 1,972 lots, or 66%, were unsold. Eight of the 14 projects had been started since 2004, and the plan assumed that with an absorption rate of 260 homes per year, **the market had a 7 year supply of unsold residential lots.**

A likely factor in this figure was the planned Whitewater development (Crossland Development, see figure on next page) across the Catawba River in Mecklenburg County. The 908-acre community was planned for a 10-year phasing from 2008 to 2018, with 642 acres south of NC 27 to be Phase I, with 975 single-family homes, 165 townhomes, 90,000 SF of retail, 20,000 SF of office. Later phases north of NC 27 (directly adjacent to Mount Holly) were planned for commercial space, including a hotel and multi-family housing.

**The plan anticipated market support for downtown Mount Holly retail and restaurants, in addition to demand for office/flex space in both downtown and the I-85 Gateway, with "challenge being to divert traffic flow toward Mount Holly."** The plan also noted that from 2004 to 2008, new home sales increased 29%, while existing home sales increased 38%. An Action Item for Regulations/Policies was to promote higher-density housing downtown. **This trend has likely accelerated since the recession and housing bust, indicating that pedestrian improvements should be prioritized in existing neighborhoods.**

**Phase 2.1, Annexation Policies,** noted that the City's extra-territorial jurisdiction (ETJ) boundary allows it to exercise land use and zoning





Crossland Whitewater Site Plan

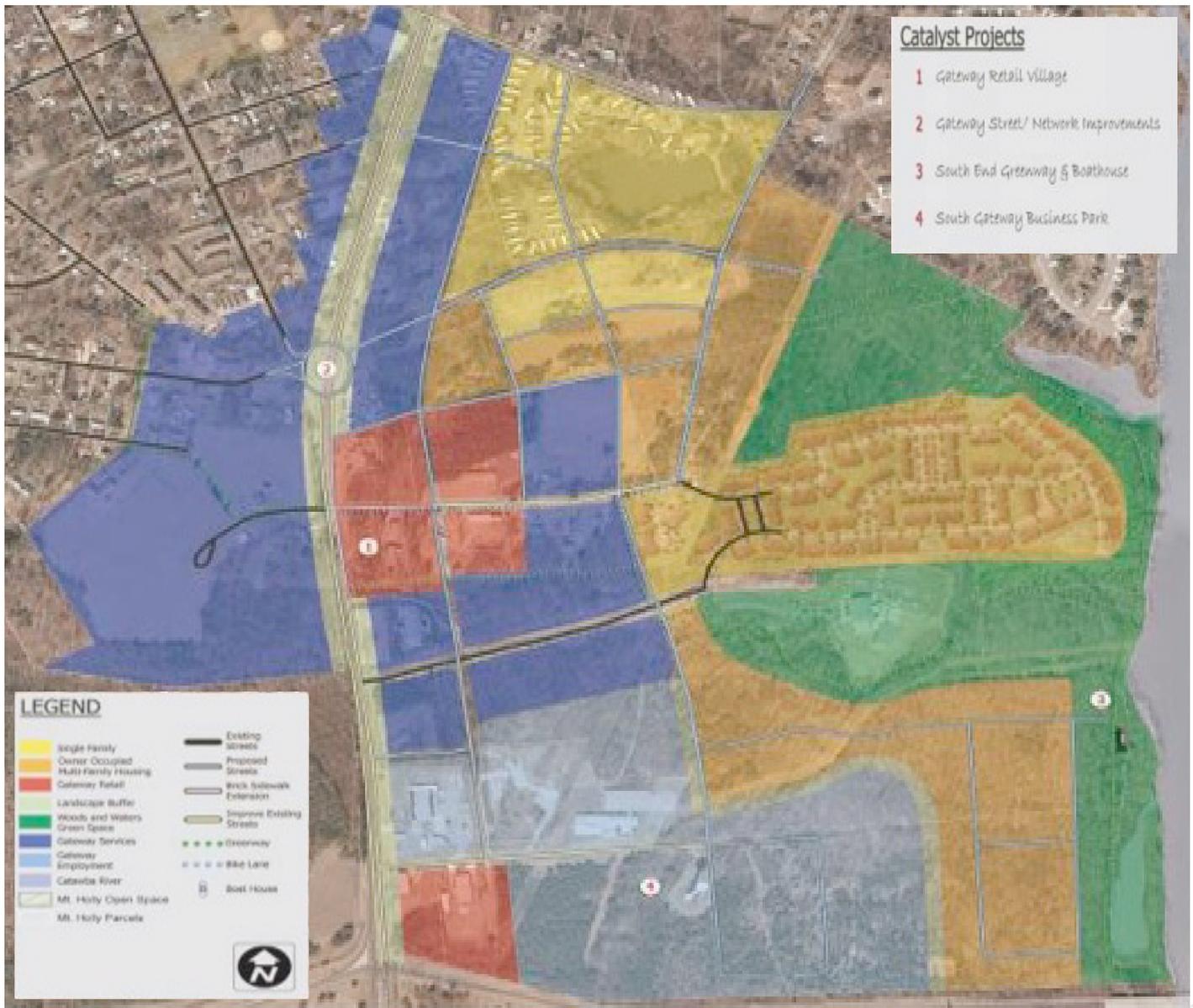
would not foster a pedestrian environment, as it would increase distances between the sidewalk and homes/businesses behind the buffer. This element also called for requiring buildings to face the street, requiring parking to be to the side or the rear. Again, a 100-foot buffer would negate any positive aspects of orienting buildings to the street and screening parking – any sense of pedestrian-scale development is lost, as the walking distance from sidewalk to home/business is long (100+ feet), plus the homes/businesses would provide no “eyes on the street,” in security terms, for pedestrians walking on the sidewalk. Additionally, a landscape buffer of that size presents significant maintenance issues/costs, plus limits the visibility from NC 273, and therefore viability, of any business behind the 100 foot buffer. The **Expanded Street Network** called for a new grid of streets in the area, along with Growth in Housing, with new housing near the Catawba River Greenway, while maintaining Catawba Heights as single-family. **Both of these goals are reasonable in supporting a pedestrian environment and should be pursued if the area develops.**

Goals for the area’s Transportation Network included:

- Creating a “sense of entry” from I-85, via 100 foot landscaped buffer, wayfinding. See comments above regarding how the 100 foot buffer contradicts pedestrian-scale design and business viability.
- Installing brick streetscaping and brick cross-walks on both sides of NC 273 between Holiday Inn and Ferstl Avenue. Brick sidewalks have higher capital and maintenance costs than concrete sidewalks, not to mention potential ADA issues, so if the basic goal is pedestrian connectivity/safety, standard concrete sidewalks should be planned. Brick crosswalks, or stamped asphalt “brick” crosswalks, are not as cost-effective or safety-effective as leaving the street section of asphalt in-place and placing high-visibility thermoplastic or traffic paint/retroreflective glass bead Continental crosswalk pavement markings.
- Installing pedestrian-safe crossings at Pearl Beaty Road and the Rehab Hospital entrance, plus converting the intersection of Ferstl Drive and NC 273 to a roundabout. A safe pedestrian crossing between the hospital entrance and Pearl Beaty Road will not be possible until the Beaty Road/Beaty Drive/Ferstl Avenue intersection is

control over areas that are likely to be annexed in the future.

**Phase 3.1, Small Area Plan – South Gateway**, detailed planning elements for an area of the City from Henry Street (northern boundary) to I-85 (southern boundary) and east to the Catawba River. Elements included A Welcoming City Entrance, including requiring a 100 foot landscaped buffer along NC 273, including control of signs and curb-cuts, from I-85 to Henry Street. This buffer



*Future Land Use Map, Small Area Plan - South Gateway*

reconstructed to a more simplified, urban standard. A roundabout could offer a design compromise between the existing highway-scale design and converting the intersection back to an urban 90-degree intersection. See next page for figure depicting roundabout, 100 foot landscape buffer, etc.

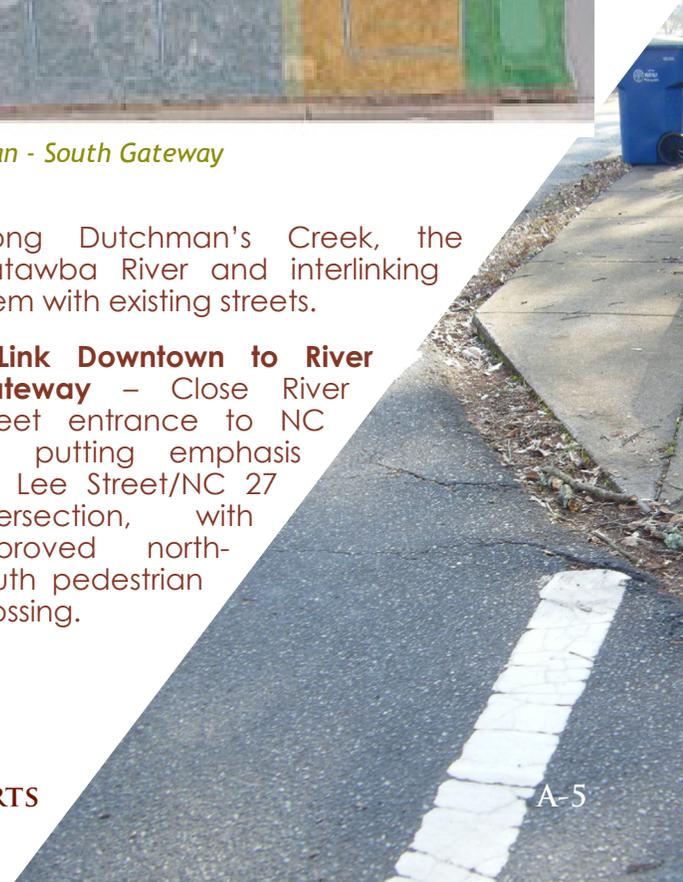
**Small Area Plan – South Gateway**

**Phase 3.2, Small Area Plan** – Downtown and Riverfront, detailed planning elements for the downtown area and land along Dutchman's Creek immediately north of it (see figure on next page). Recommendations included:

- **Woods & Waters District**–Extend greenways

along Dutchman's Creek, the Catawba River and interlinking them with existing streets.

- **Link Downtown to River Gateway** – Close River Street entrance to NC 27, putting emphasis on Lee Street/NC 27 intersection, with improved north-south pedestrian crossing.





• **Downtown Character** – Discourage automobile-dependent uses such as retail drive-thru windows. Allow medium-density housing types (condos, townhomes, small urban-scale single family homes) in R-8 zoning in order to support intensified uses in the CBD. See earlier note in Zoning section re: lot sizes, housing options.

• **Transportation Network & Wayfinding** – Install pedestrian-safe crossings at Central Avenue, between N. Main Street and NC 27 (Charlotte Avenue). Much needed. This element also called for “creating a sense of entry into downtown” by creating traffic circles at the intersections of N. Main Street/Highland Avenue and S. Main Street/



*S. Main/Glendale*

**Annexations**, detailed planning elements for areas considering annexation. Recommendations included:

**KEY POINT #3**

**New development should be built around great streets.**

**Street Guidelines**

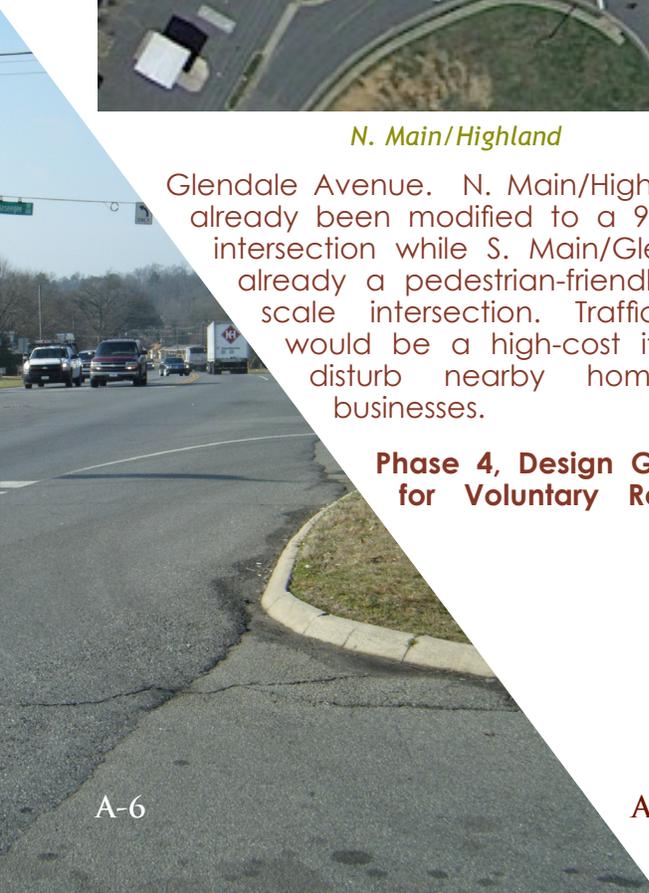
- All new residential streets must:
- Have a minimum of five foot wide sidewalks on both sides of the street;
- have a minimum of six foot wide planted strip between the sidewalk and the road on both sides of the street
- have street trees of at least a 3" caliper planted every 40' on center in the planted strip on both sides of the street; Preferred tree specimens are those recommended Street Tree List available at <http://trees.ddot.dc.gov>.
- Have underground utilities;
- have low level decorative street lighting located at a minimum of every 200';
- have maximum curb to curb widths of 24' for residential streets;
- have vertical rather than rolled curbs and gutters where driveways are not present;
- have no more than 20% of the garage

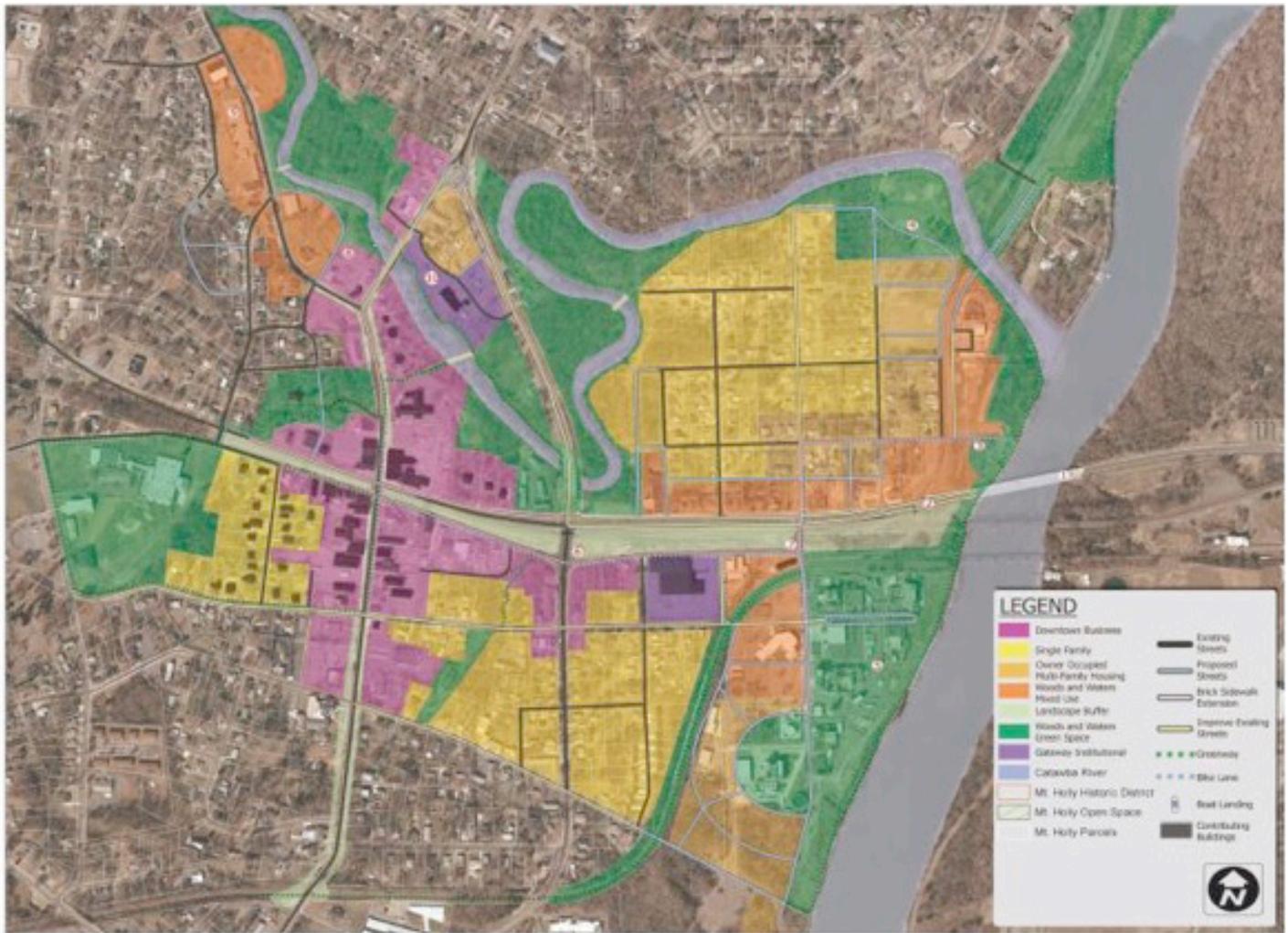


*N. Main/Highland*

Glendale Avenue. N. Main/Highland has already been modified to a 90-degree intersection while S. Main/Glendale is already a pedestrian-friendly urban-scale intersection. Traffic circles would be a high-cost item and disturb nearby homes and businesses.

**Phase 4, Design Guidelines for Voluntary Residential**





*Future Land Use Map, Small Area Plan - South Gateway*

doors or carport entrances facing the street unless:

- a. the home is located on a corner lot, in which case the garage door or carport entrance should be located on the side not the front face of the home, and
- b. the garage or carport is located behind or even with the rear facade of the building.
- have maximum driveway widths of 12' within 20' of the street, if driveways are present
- hold all homes to a similar set back distance throughout the subdivision to ensure consistency.

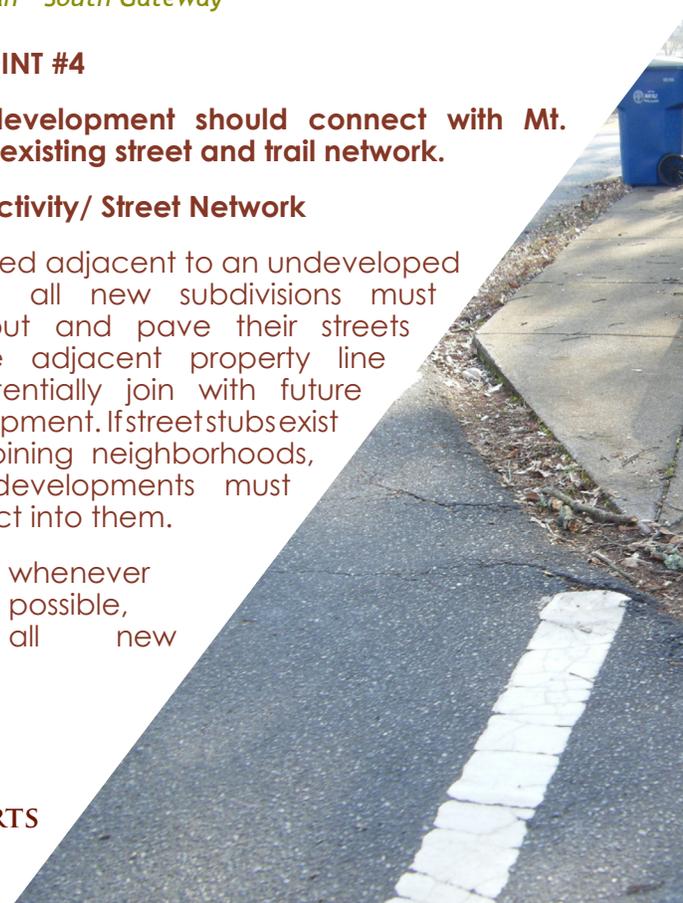
**KEY POINT #4**

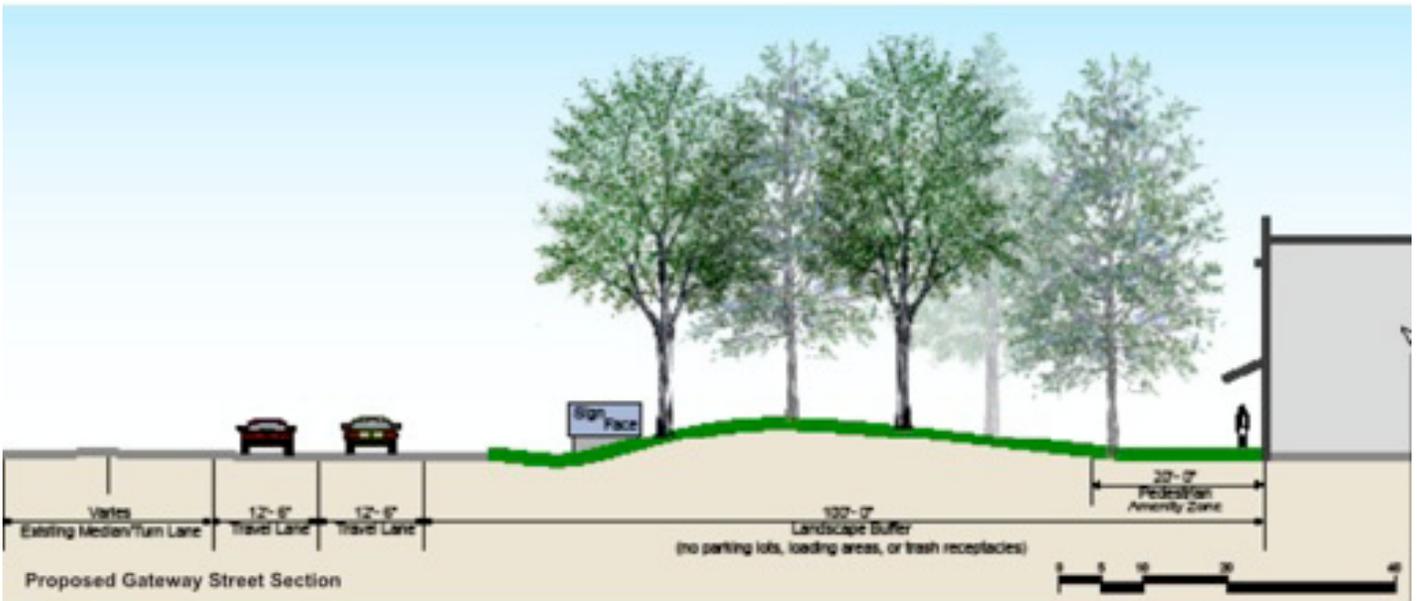
**New development should connect with Mt. Holly's existing street and trail network.**

**Connectivity/ Street Network**

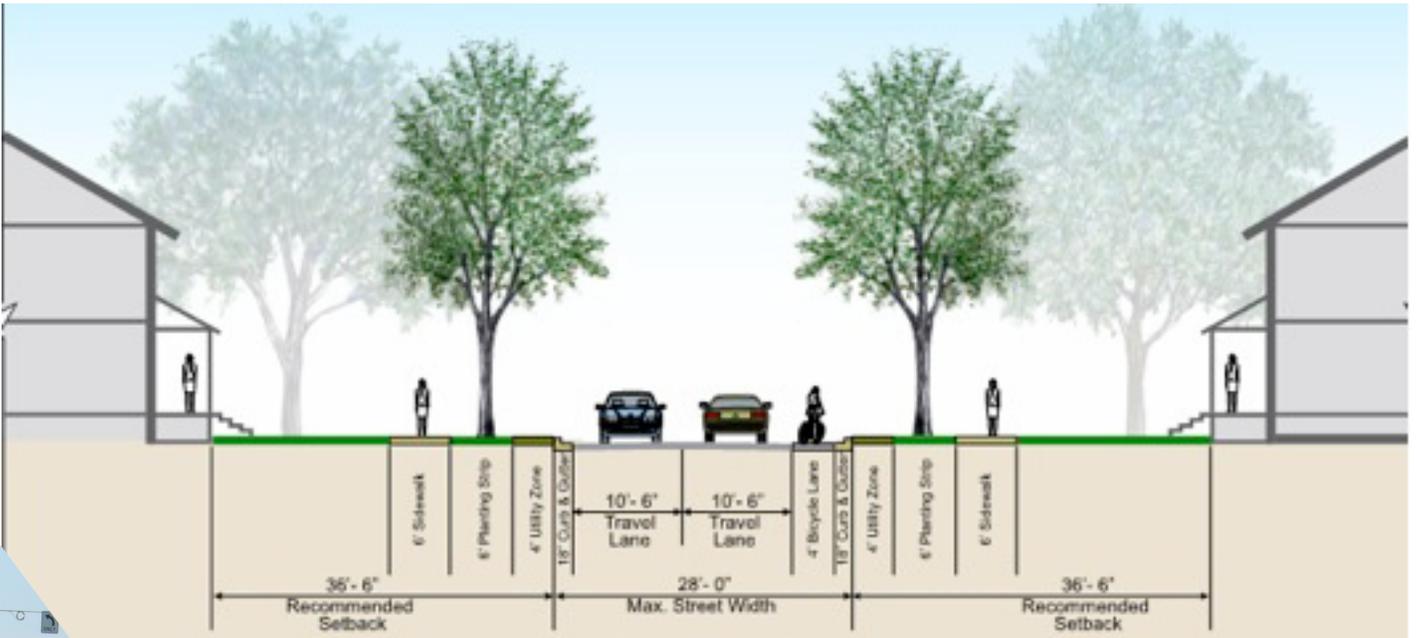
If located adjacent to an undeveloped parcel, all new subdivisions must stub out and pave their streets to the adjacent property line to potentially join with future development. If street stubs exist in adjoining neighborhoods, new developments must connect into them.

- whenever possible, all new





100-foot buffer and NC 273 section



Local street section

annexations should have more than one vehicular entry and exit point.

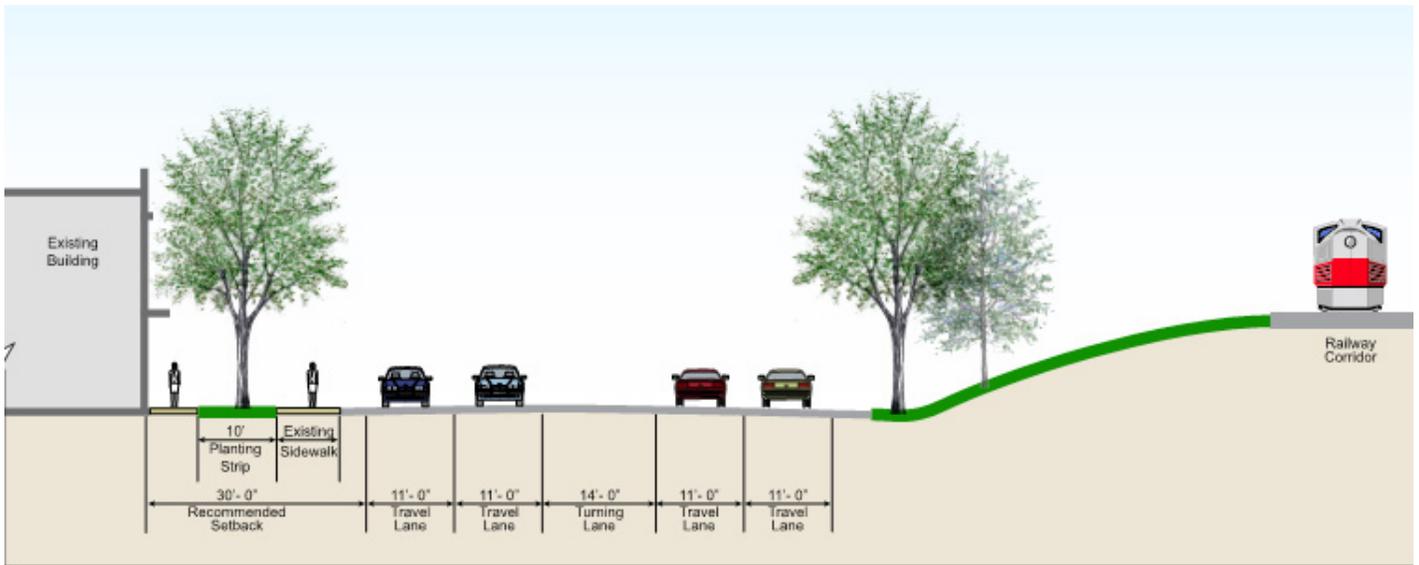
- All entry/ exits must contain at least two exit lanes in addition an entry lane.

These guidelines are generally supportive of pedestrian-scale design, especially the preference for vertical vs. rolled curbs (this prevents illegal over-

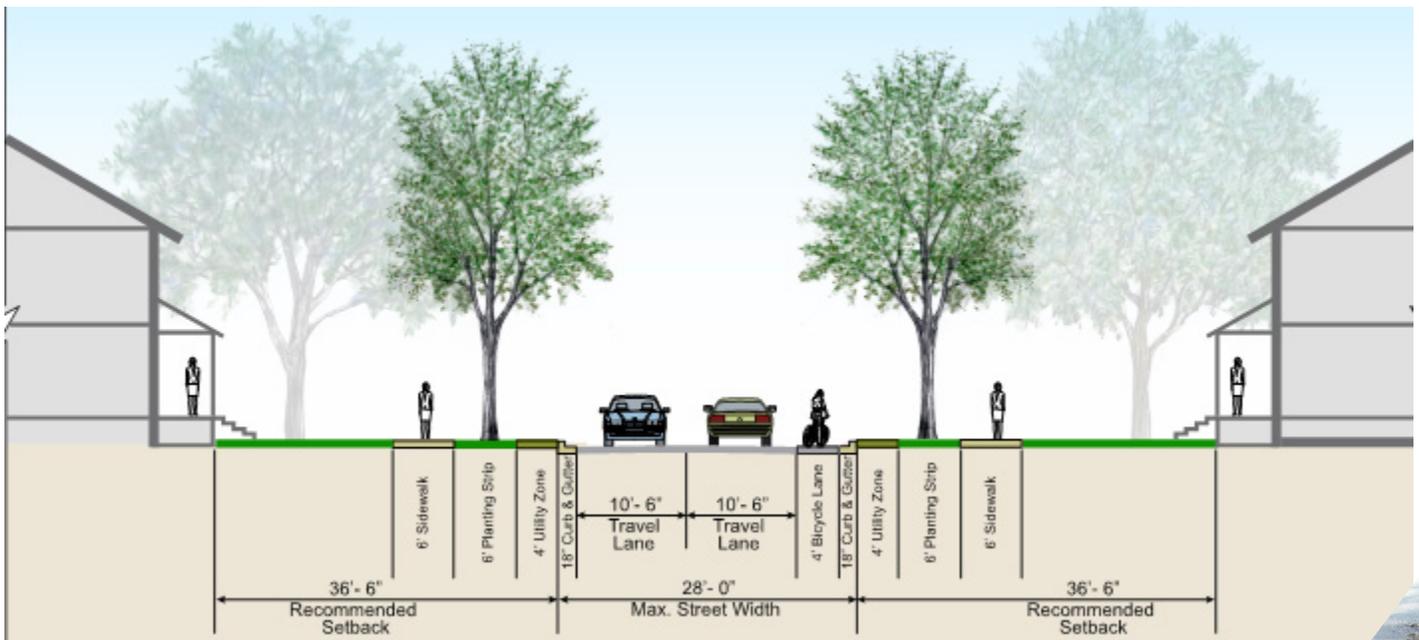
the-sidewalk parking) and the emphasis on street connectivity. The only questionable standard is maximum street width of 24 feet curb-to-curb for residential streets: 36 feet allows parking on both sides and two travel lanes. If the 24 foot standard is desired, on-street parking would likely need to be restricted to one side of the street.

**Phase 4.1, Design Guidelines for South Gateway**, detailed planning elements for this Small Area Plan. Recommendations consisted of more detailed refinements from **Phase 3.1, Small Area Plan – South Gateway**. The proposed 100 foot landscape buffer along NC 273 (see figure above) further noted:

**APPENDIX A: PREVIOUS PLANNING EFFORTS**



NC 27 Section



Local street section

- Encourage clearing of under-story trees in the buffer area. A significant cost to any developer.
- Pedestrian amenities (sidewalks, paths, benches, bike racks, etc) shall be located within 20 feet of outer most edge of 100 foot setback). This standard is illogical – either move the street furniture to the buildings or move the buildings to the street. Bicyclists want parking that is close to building entrances for both access/convenience and security (bikes out-of-view, i.e. in a landscaped buffer, are more theft-prone).
- Local street maximum curb-to-curb width is 28 feet. This is not enough width for on-

street parking, unless restricted to 2 travel lanes, 1 parking lane. Bike lanes are not needed on local streets.

**Phase 4.2, Design Guidelines for The Downtown & Riverfront,** detailed planning elements for this Small Area Plan. Recommendations consisted of more detailed refinements from Phase 3.2, Small Area Plan – Downtown and Riverfront. A



number of architectural and street design standards are listed, but the two most relevant standards to pedestrian design are:

- A recommended 30 foot setback for NC 27 includes a 10 foot planting strip (see figure on page A-9). Unless the existing sidewalk will be removed for a planting strip, or kept for on-street parking passenger access, a more realistic standard would be an 8-15 foot sidewalk to include tree pits, similar to existing pattern at NC 27/N. Main Street intersection.
- Local street maximum curb-to-curb width is 28 feet. This is not enough width for on-street parking, unless restricted to 2 travel lanes, 1 parking lane. Bike lanes are not needed on local streets.

**Phase 5, Implementation**, listed several priorities following up on Small Area Plans, etc. Key actions items were:

- Developing a Wayfinding Program to establish signage from I-85 and NC 16 into Mount Holly, with signs identifying local attractions/facilities.
- Incorporating street improvements identified in Small Area Plans and Design Guidelines into ordinance language.
- Rewriting the zoning code.
- Working with Carolina Thread Trail and U.S. National Whitewater Center to develop a pedestrian bridge across the Catawba River.
- Identifying conflicts in existing ordinances and add or revise land use classifications to achieve desired usage.
- Improve key intersections:
  - o Highland Avenue/NC 27 (Charlotte Avenue)
  - o Lee Street/NC 27 (Charlotte Avenue)
  - o NC 273/Pearl Beaty Road

# B PROJECT PRIORITIZATION

## APPENDIX OUTLINE OVERVIEW (B-1)

### OVERVIEW

The recommended sidewalk projects were ranked based on the criteria listed in **Table 4-2**, to guide City staff's attention to key projects that can foster the greatest return to the community as first priority. A list of the top 10 projects is presented in **Table 4-3**. These segments were analyzed at a closer level in order to determine which side of the street has a higher need for sidewalk implementation in the short term. The full list of sidewalk projects is included below.

NAME	FROM	TO	MILES	FEET	RANKING
Beatty Dr/ Hwy 273	S Main St	Mount Holly City Limits	1.22	7050	16
NC 27 Hwy	Hoover St	Main St	1.49	7845	15
Catawba Ave	Hawthorne St	Rankin Avenue	0.42	2230	15
Belmont Mt Holly Rd	Margarette Ave	Forney Ave	0.67	3516	15
N Main St	Sandy Ford Rd	Existing sidewalk	2.07	10928	14
Highway 273	Summit Ave	Tuckaseege Rd	0.45	2396	13
S Main St	Tuckaseege Rd (north end)	Rose St (Tuckaseege Rd, south end)	1.05	5559	13
Tuckaseege Rd	S Main St	Nuttall Dr	1.15	6066	12
Beaty Rd	Smith St	Ferstl Ave	0.38	2033	12
Noles Dr	Hoover St	N Hawthorne St	0.95	5026	12
Glendale Ave	Rankin Ave	Glendale Ave (existing Sw)	0.51	2691	11
Catawba Ave	Hill St	End of Road	0.25	1341	11
Oak Trail	Belmont Mt Holly	End of Road	0.51	2718	11
Logan Ln	Ivey St	Belmont Mt Holly	0.24	1279	11
First St	Woodlawn Ave	W Central Ave	0.29	1555	11
Central Ave	Hill St	Lee St	0.17	887	11
Central Ave	Charlotte Ave	Central Ave	0.99	5216	11
Ferstl Ave	Belmont Mt Holly Rd	Beaty Rd	0.58	3085	11
Cason St	Clearwater Lake Rd	Henry St	0.08	427	11





NAME	FROM	TO	MILES	FEET	RANKING
Dutch Ave	End of Road	Alexander St	0.08	429	10
Woodlawn Ave	ETJ Limits	Hawthorne St	1.28	6784	10
Dunn St	Walnut Ave	Nims Ave	0.15	796	10
N Main St	N Main St	Existing SW	0.76	4025	10
Morningside Dr	City Limits	N Main St	0.17	875	10
Smith St	Fite Rd	Ferstl Ave	0.17	881	9
Fite Rd	Belmont Mt Holly Rd	Louise Ave	0.33	1736	9
Louise Ave	Belmont Mt Holly	End of Road	0.33	1718	9
Henry St	Cherry St	Ida St	0.35	1871	9
Belton Ave	Hicks Cir	S Main St	1.34	7070	9
Pine St	Mulberry Ct	End of Street	0.24	1273	9
Cherry St	Henry St	Belmont Mt Holly	0.64	3369	9
Lee St	Elm St	Private Road	0.40	2117	9
Alexander St	Charlotte Ave	E Catawba Ave	0.12	655	9
Nims Ave	Dunn St	N Main St	0.22	1185	9
Crest St	Glendale Ave	Main St	0.32	1707	8
Craig St	Woodlawn Ave	Charlotte Ave	0.51	2680	8
Old Mine Rd	Madison Dr	Charlotte Ave	0.31	1650	8
Madison Dr	Woodlawn Ave	Charlotte Ave	0.60	3170	8
Norton Rd	Madison Dr	Hawthorne St	0.26	1395	8
River St	End of Road	Herms Ave	0.20	1080	8
N Lee St	End of Road	Dutch Ave	0.08	421	8
Glendale Avenue	Highland St	Hill St	0.10	514	8
Rankin Ave	W Catawba Ave	Scott St	0.65	3421	8
Adrian St	Rankin Ave	Belton Ave	0.42	2217	8
Nutall Dr	Existing SW	Tuckaseege Rd	0.32	1714	8





NAME	FROM	TO	MILES	FEET	RANKING
Oak Grove St	Rankin Ave	Highland St	0.27	1438	8
Hill St	Central Ave	Highland St	0.31	1628	8
Piedmont Ave	Highland St	Hill St	0.08	425	8
Clearwater Lake Rd	City Limits	Cason St	0.56	2955	8
Herms Ave	Wilson St	Alexander St	0.05	277	8
Elm Ave	Wilson St	Alexander St	0.05	277	8
Wilson St	Herms Ave	Elm Ave	0.08	418	8
Madora St	Rankin Ave	Adrian St	0.16	822	8
Cavin Ave	End of Street	N Main St	0.35	1832	7
Walnut Ave	N Main St	N Main St	1.03	5452	7
Spring St	Walnut Ave	Walnut Ave	0.57	3000	7
Henry ST	Belmont Mt Holly Rd	End of Road	0.48	2520	7
Lanier Ave	N Main St	Brookstone Dr	0.31	1632	7
Elm Ave	Lee St	Nassau Pl	0.15	793	7
Westland Farm RD	Hoover St	N Hawthorne St	0.67	3544	7
Globe St	Craig St	Charlotte Ave	0.22	1150	6
Deertrack Dr	Hwy 27	Antelope Dr	0.05	286	6
Carey Ave	Bell St	S Main St	0.09	498	6
Sandy Ford Rd	Farm Springs Dr	City Limits	0.56	2969	6
Catawba Dr	Belton Ave	Tuckaseege Rd	0.65	3433	5
Eastwood St	Catawba Dr	Tuckaseege Rd	0.37	1941	5
Horseshoe Bend Beach	Stonewater Bay	Boat Launch Parking Lot	1.06	5594	5
Deerfield Dr	Existing SW	Old Hickory Grove Rd	0.47	2494	5





*This page intentionally left blank*

# C DESIGN GUIDELINES

## APPENDIX OUTLINE

OVERVIEW (C-1) | DESIGN NEEDS OF PEDESTRIANS (C-2) | SIDEWALKS (C-3) | PEDESTRIANS AT INTERSECTIONS (C-7) | GREENWAYS (C-17) | GREENWAY CROSSINGS (C-24)

## OVERVIEW

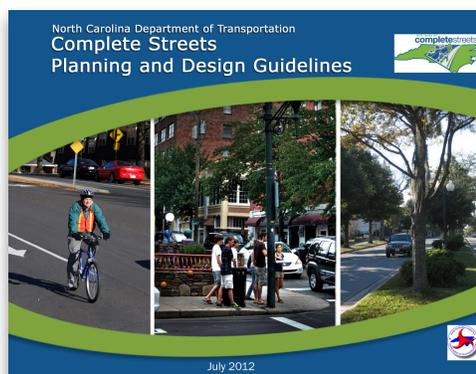
The sections that follow serve as an inventory of pedestrian design treatments and provide guidelines for their development. These treatments and design guidelines are important because they represent the tools for creating a pedestrian-friendly, safe, accessible community. The guidelines are not, however, a substitute for a more thorough evaluation by a landscape architect or engineer upon implementation of facility improvements. Some improvements may also require cooperation with the NCDOT for specific design solutions. The following standards and guidelines are referred to in this guide.

The Federal Highway Administration's **Manual on Uniform Traffic Control Devices** (MUTCD) is the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings.

American Association of State Highway and Transportation Officials (AASHTO) **Guide for the Planning, Design and Operation of Pedestrian Facilities**, provides guidance on dimensions, use, and layout of specific pedestrian facilities, including sidewalks and street crossings.

Meeting the requirements of the Americans with Disabilities Act (ADA) is an important part of any pedestrian facility project. The United States Access Board's proposed **Public Rights-of-Way Accessibility Guidelines** (PROWAG) and the **2010 ADA Standards for Accessible Design** (2010 Standards) contain standards and guidance for the construction of accessible facilities.

Should the national standards be revised in the future and result in discrepancies with this chapter, the national standards should prevail for all design decisions. A qualified engineer or landscape architect should be consulted for the most up-to-date and accurate cost estimates.



*The NCDOT Complete Streets Planning and Design Guidelines, Pedestrian and Bicycle Information Center, AASHTO, the MUTCD, nationally recognized bikeway standards, and other sources have all informed the content of this chapter.*





# DESIGN NEEDS OF PEDESTRIANS

## TYPES OF PEDESTRIANS

Pedestrians have a variety of characteristics and the transportation network should accommodate a variety of needs, abilities, and possible impairments. Age is one major factor that affects pedestrians' physical characteristics, walking speed, and environmental perception. Children have low eye height and walk at slower speeds than adults. They also perceive the environment differently at various stages of their cognitive development. Older adults walk more slowly and may require assistive devices for walking stability, sight, and hearing. Table A-1 to the right summarizes common pedestrian characteristics for various age groups.

The MUTCD recommends a normal walking speed of three and a half feet per second when calculating the pedestrian clearance interval at traffic signals. The walking speed can drop to three feet per second for areas with older populations and persons with mobility impairments. While the type and degree of mobility impairment varies greatly across the population, the transportation system should accommodate these users to the greatest reasonable extent.

TABLE A-1: PEDESTRIAN CHARACTERISTICS BY AGE

AGE	CHARACTERISTICS
0-4	Learning to walk Requires constant adult supervision Developing peripheral vision and depth perception
5-8	Increasing independence, but still requires supervision Poor depth perception
9-13	Susceptible to "dart out" intersection dash Poor judgment Sense of invulnerability
14-18	Improved awareness of traffic environment Poor judgment
19-40	Active, fully aware of traffic environment
41-65	Slowing of reflexes
65+	Difficulty crossing street Vision loss Difficulty hearing vehicles approaching from behind





## SIDEWALKS

Sidewalks are the most fundamental element of the walking network, as they provide an area for pedestrian travel that is separated from vehicle traffic. Sidewalks are typically constructed out of concrete and are separated from the roadway by a curb or gutter and sometimes a landscaped planting strip area. Sidewalks are a common application in both urban and suburban environments.

Attributes of well-designed sidewalks include the following:

**Accessibility:** A network of sidewalks should be accessible to all users.

**Adequate width:** Two people should be able to walk side-by-side and pass a third comfortably. Different walking speeds should be possible. In areas of intense pedestrian use, sidewalks should accommodate a high volume of walkers.

**Safety:** Design features of the sidewalk should allow pedestrians to have a sense of security and predictability. Sidewalk users should not feel they are at risk due to the presence of adjacent traffic.

**Continuity:** Walking routes should be obvious and should not require pedestrians to travel out of their way unnecessarily.

**Landscaping:** Plantings and street trees should contribute to the overall psychological and visual comfort of sidewalk users, and be designed in a manner that contributes to the safety of people.

**Drainage:** Sidewalks should be well graded to minimize standing water.

**Social space:** There should be places for standing, visiting, and sitting. The sidewalk area should be a place where adults and children can safely participate in public life.

**Quality of place:** Sidewalks should contribute to the character of neighborhoods and business districts.







# SIDEWALK OBSTRUCTIONS AND DRIVEWAY RAMPS

## DESCRIPTION

Obstructions to pedestrian travel in the sidewalk corridor typically include driveway ramps, curb ramps, sign posts, utility and signal poles, mailboxes, fire hydrants and street furniture.

## GUIDANCE

- Reducing the number of accesses reduces the need for special provisions. This strategy should be pursued first.
- Obstructions should be placed between the sidewalk and the roadway to create a buffer for increased pedestrian comfort.

Dipping the entire sidewalk at the driveway approaches keeps the cross-slope at a constant grade. This is the least preferred driveway option.

Where constraints preclude a planter strip, wrapping the sidewalk around the driveway allows the sidewalk to still remain level.

When sidewalks abut hedges, fences, or buildings, an additional two feet of lateral clearance should be added to provide appropriate shy distance.



Planter strips allow sidewalks to remain level, with the driveway grade change occurring within the planter strip.

When sidewalks abut angled on-street parking, wheel stops should be used to prevent vehicles from overhanging in the sidewalk.

## DISCUSSION

Driveways are a common sidewalk obstruction, especially for wheelchair users. When constraints only allow curb-tight sidewalks, dipping the entire sidewalk at the driveway approaches keeps the cross-slope at a constant grade. However, this may be uncomfortable for pedestrians and could create drainage problems behind the sidewalk.

### ADDITIONAL REFERENCES AND GUIDELINES

USDOJ. (2010). ADA Standards for Accessible Design.  
 United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).  
 AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

### MATERIALS AND MAINTENANCE

Excessive cracks, gaps, pits, settling, and lifting of the sidewalk creates a pedestrian tripping hazard and reduces ADA accessibility; damaged sidewalks should be repaired.

# PEDESTRIAN AMENITIES

## DESCRIPTION

A variety of streetscape elements can define the pedestrian realm, offer protection from moving vehicles, and enhance the walking experience. Pedestrian amenities should be placed in the furnishing zone on a sidewalk corridor. Signs, meters, and tree wells should go between parking spaces. Key features are presented below.

## STREET TREES

In addition to their aesthetic and environmental value, street trees can slow traffic and improve safety for pedestrians. Trees add visual interest to streets and narrow the street's visual corridor, which may cause drivers to slow down. It is important that trees do not block light or the vision triangle.

## STREET FURNITURE

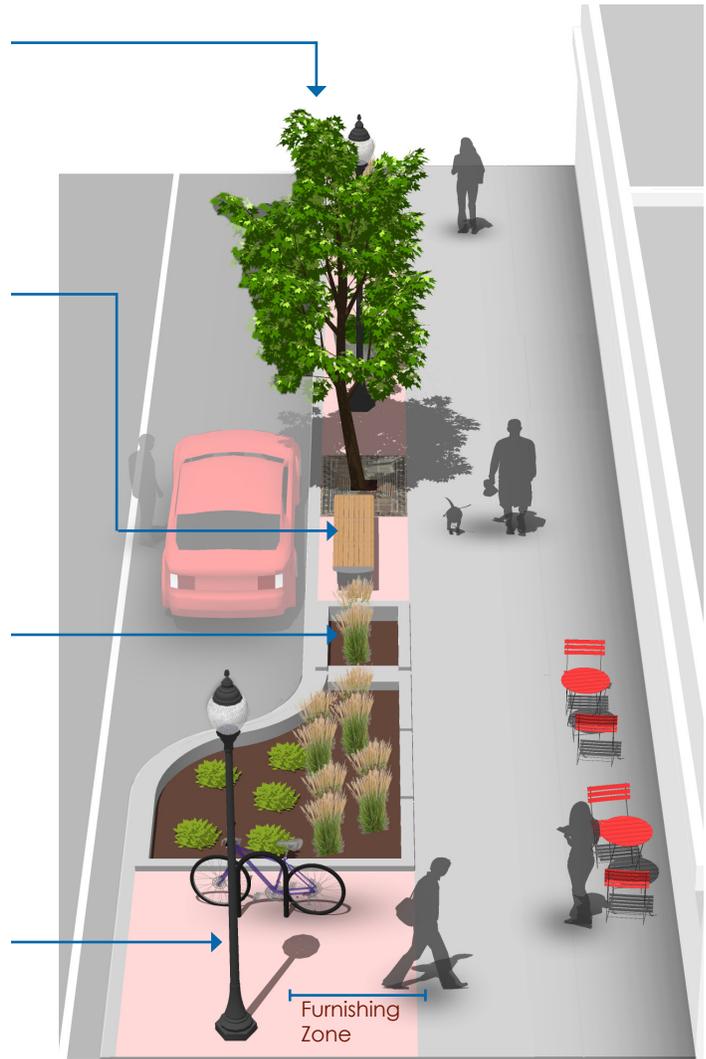
Providing benches at key rest areas and viewpoints encourages people of all ages to use the walkways by ensuring that they have a place to rest along the way. Benches should be 20" tall to accommodate elderly pedestrians comfortably. Benches can be simple (e.g., wood slats) or more ornate (e.g., stone, wrought iron, concrete). If alongside a parking zone, street furniture must be 3 feet from the curbface.

## GREEN FEATURES

Green stormwater strategies may include bioretention swales, rain gardens, tree box filters, and pervious pavements (pervious concrete, asphalt and pavers). Bioswales are natural landscape elements that manage water runoff from a paved surface. Plants in the swale trap pollutants and silt from entering a river system.

## LIGHTING

Pedestrian scale lighting improves visibility for both pedestrians and motorists - particularly at intersections. Pedestrian scale lighting can provide a vertical buffer between the sidewalk and the street, defining pedestrian areas.



## ADDITIONAL REFERENCES AND GUIDELINES

- United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).
- NCDOT. (2012). Complete Streets Planning and Design Guidelines.

## MATERIALS AND MAINTENANCE

Establishing and caring for your young street trees is essential to their health. Green features may require routine maintenance, including sediment and trash removal, and clearing curb openings and overflow drains.



## PEDESTRIANS AT INTERSECTIONS

Attributes of pedestrian-friendly intersection design include:

**Clear Space:** Corners should be clear of obstructions. They should also have enough room for curb ramps, for transit stops where appropriate, and for street conversations where pedestrians might congregate.

**Visibility:** It is critical that pedestrians on the corner have a good view of vehicle travel lanes and that motorists in the travel lanes can easily see waiting pedestrians.

**Legibility:** Symbols, markings, and signs used at corners should clearly indicate what actions the pedestrian should take.

**Accessibility:** All corner features, such as curb ramps, landings, call buttons, signs, symbols, markings, and textures, should meet accessibility standards and follow universal design principles.

**Separation from Traffic:** Corner design and construction should be effective in discouraging turning vehicles from driving over the pedestrian area. Crossing distances should be minimized.

**Lighting:** Adequate lighting is an important aspect of visibility, legibility, and accessibility.

These attributes will vary with context but should be considered in all design processes. For example, suburban and rural intersections may have limited or no signing. However, legibility regarding appropriate pedestrian movements should still be taken into account during design.



# MARKED CROSSWALKS

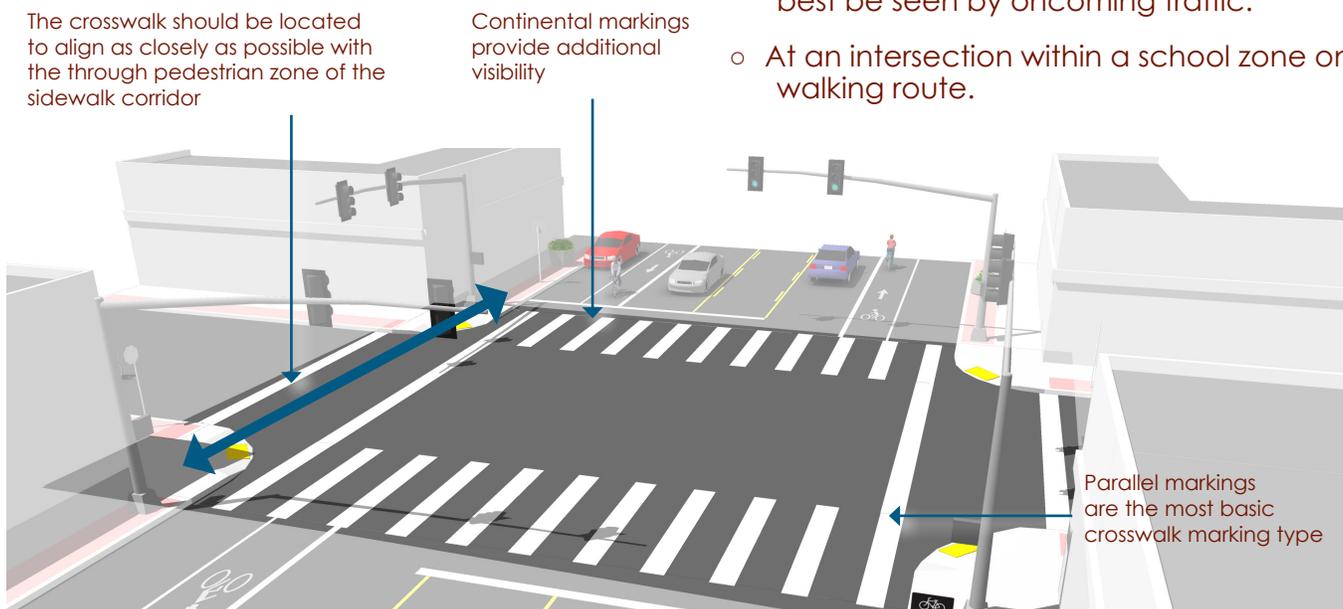
## DESCRIPTION

A marked crosswalk signals to motorists that they must stop for pedestrians and encourages pedestrians to cross at designated locations. Installing crosswalks alone will not necessarily make crossings safer especially on multi-lane roadways.

At mid-block locations, crosswalks can be marked where there is a demand for crossing and there are no nearby marked crosswalks.

## GUIDANCE

- At signalized intersections, all crosswalks should be marked. At unsignalized intersections, crosswalks may be marked under the following conditions:
  - At a complex intersection, to orient pedestrians in finding their way across.
  - At an offset intersection, to show pedestrians the shortest route across traffic with the least exposure to vehicular traffic and traffic conflicts.
  - At an intersection with visibility constraints, to position pedestrians where they can best be seen by oncoming traffic.
  - At an intersection within a school zone on a walking route.



## DISCUSSION

Continental crosswalk markings should be used at crossings with high pedestrian use or where vulnerable pedestrians are expected, including: school crossings, across arterial streets for pedestrian-only signals, at mid-block crosswalks, and at intersections where there is expected high pedestrian use and the crossing is not controlled by signals or stop signs.

### ADDITIONAL REFERENCES AND GUIDELINES

- FHWA. (2009). Manual on Uniform Traffic Control Devices. (3B.18)
- AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.
- FHWA. (2005). Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations.
- FHWA. (2010). Crosswalk Marking Field Visibility Study.

### MATERIALS AND MAINTENANCE

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority. Thermoplastic markings offer increased durability compared to conventional paint.



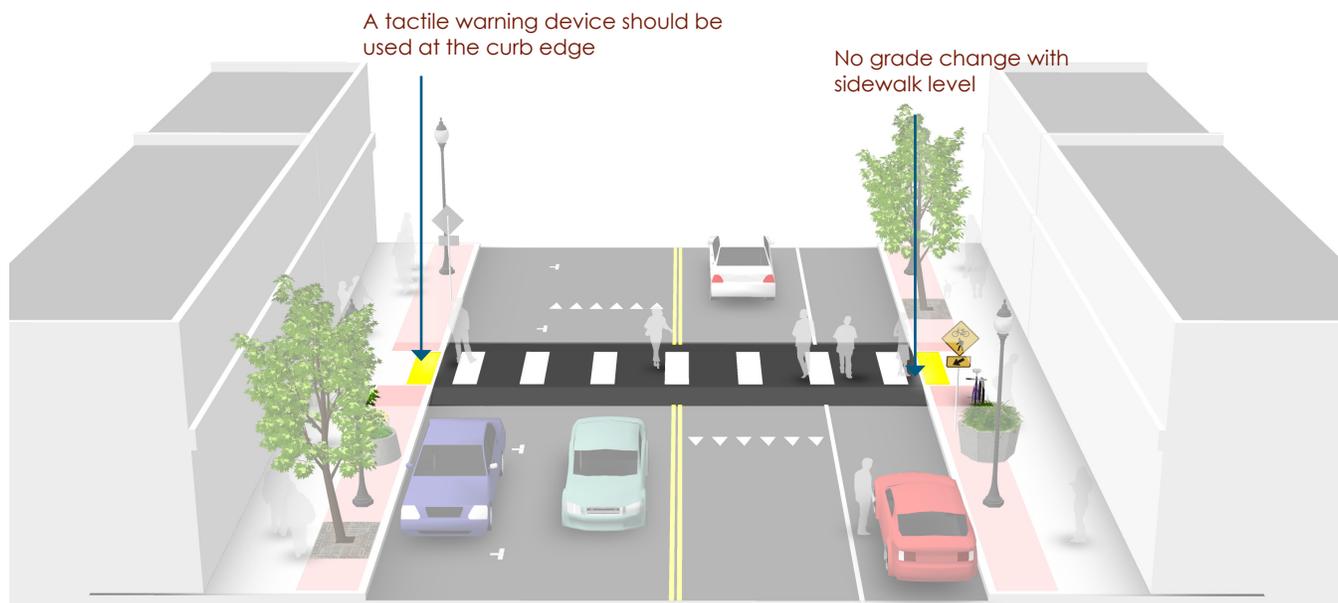
# RAISED CROSSWALKS

## DESCRIPTION

A raised crosswalk or intersection can eliminate grade changes from the pedestrian path and give pedestrians greater prominence as they cross the street. Raised crosswalks should be used only in very limited cases where a special emphasis on pedestrians is desired, and application should be reviewed on case-by-case basis.

## GUIDANCE

- Use detectable warnings at the curb edges to alert vision-impaired pedestrians that they are entering the roadway.
- Approaches to the raised crosswalk may be designed to be similar to speed humps.
- Raised crosswalks can also be used as a traffic calming treatment.



## DISCUSSION

Like a speed hump, raised crosswalks have a traffic slowing effect which may be unsuitable on emergency response routes.

### ADDITIONAL REFERENCES AND GUIDELINES

FHWA. (2009). Manual on Uniform Traffic Control Devices. (3B.18)  
 AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.  
 USDOJ. (2010). ADA Standards for Accessible Design.  
 NCDOT. (2012). Complete Streets Planning and Design Guidelines.

### MATERIALS AND MAINTENANCE

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority.

# MEDIAN REFUGE ISLANDS

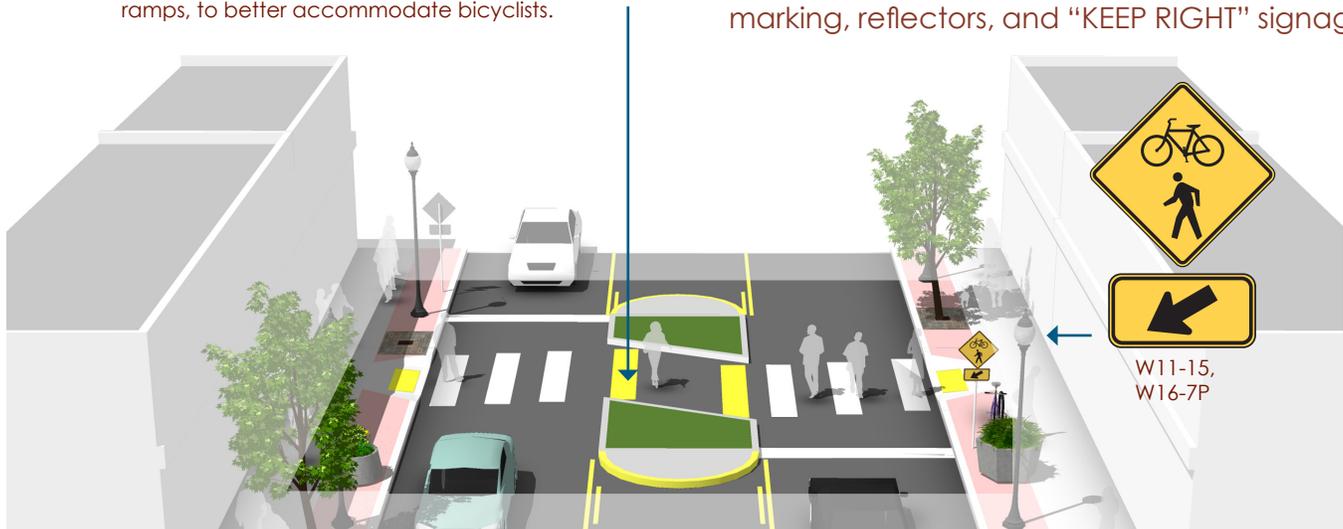
## DESCRIPTION

Median refuge islands are located at the midpoint of a marked crossing and help improve pedestrian safety by allowing pedestrians to cross one direction of traffic at a time. Refuge islands minimize pedestrian exposure by shortening crossing distance and increasing the number of available gaps for crossing.

## GUIDANCE

- Can be applied on any roadway with a left turn center lane or median that is at least 6' wide.
- Appropriate at signalized or unsignalized crosswalks
- The refuge island must be accessible, preferably with an at-grade passage through the island rather than ramps and landings.
- The island should be at least 6' wide between travel lanes (to accommodate bikes with trailers and wheelchair users) and at least 20' long.
- On streets with speeds higher than 25 mph there should also be double centerline marking, reflectors, and "KEEP RIGHT" signage.

Cut through median islands are preferred over curb ramps, to better accommodate bicyclists.



## DISCUSSION

If a refuge island is landscaped, the landscaping should not compromise the visibility of pedestrians crossing in the crosswalk. Shrubs and ground plantings should be no higher than 1 ft 6 in.

On multi-lane roadways, consider configuration with **active warning beacons** for improved yielding compliance.

## ADDITIONAL REFERENCES AND GUIDELINES

FHWA. (2009). Manual on Uniform Traffic Control Devices.  
 AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.  
 NACTO. (2012). Urban Bikeway Design Guide.  
 NCDOT. (2012). Complete Streets Planning and Design Guidelines.

## MATERIALS AND MAINTENANCE

Refuge islands may collect road debris and may require somewhat frequent maintenance. Refuge islands should be visible to snow plow crews and should be kept free of snow berms that block access.



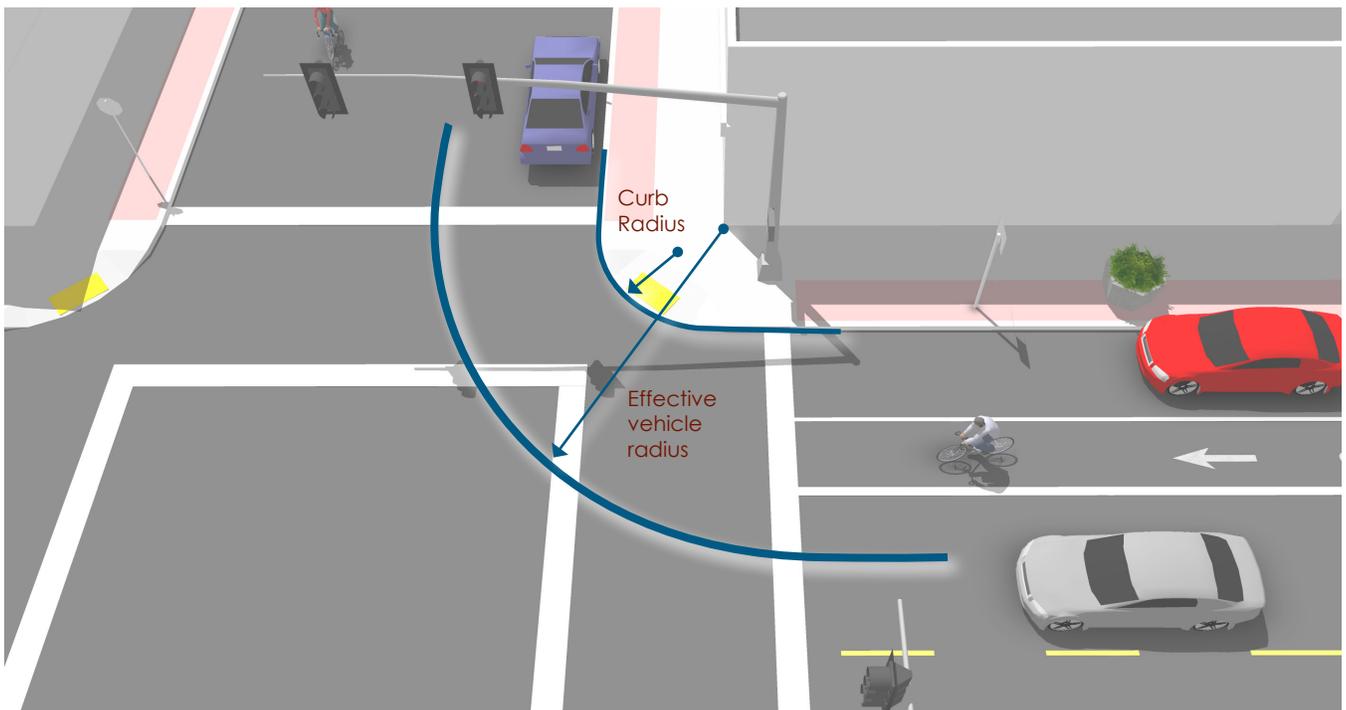
# MINIMIZING CURB RADII

## DESCRIPTION

The size of a curb's radius can have a significant impact on pedestrian comfort and safety. A smaller curb radius provides more pedestrian area at the corner, allows more flexibility in the placement of curb ramps, results in a shorter crossing distance and requires vehicles to slow more on the intersection approach. During the design phase, the chosen radius should be the smallest possible for the circumstances.

## GUIDANCE

- The radius may be as small as 3 ft where there are no turning movements, or 5 ft where there are turning movements, adequate street width, and a larger effective curb radius created by parking or bike lanes.



## DISCUSSION

Several factors govern the choice of curb radius in any given location. These include the desired pedestrian area of the corner, traffic turning movements, street classifications, design vehicle turning radius, intersection geometry, and whether there is parking or a bike lane (or both) between the travel lane and the curb.

### ADDITIONAL REFERENCES AND GUIDELINES

AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.  
 AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.  
 NCDOT. (2012). Complete Streets Planning and Design Guidelines.

### MATERIALS AND MAINTENANCE

Improperly designed curb radii at corners may be subject to damage by large trucks.

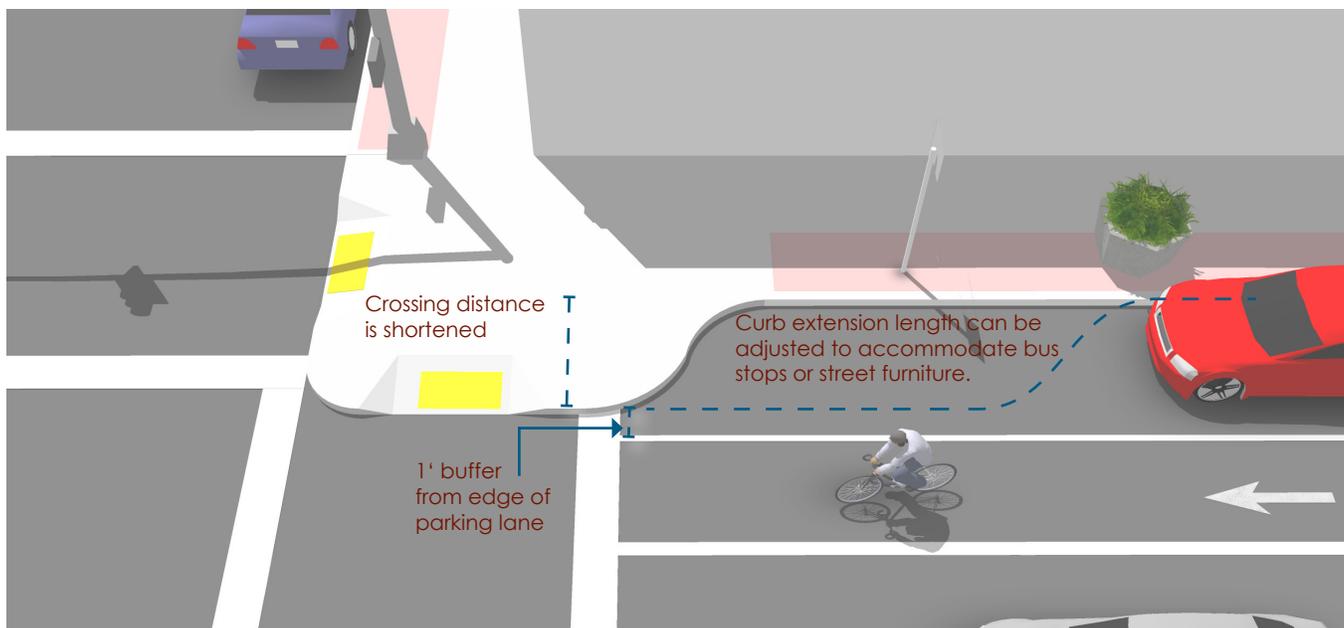
# CURB EXTENSIONS

## DESCRIPTION

Curb extensions minimize pedestrian exposure during crossing by shortening crossing distance and giving pedestrians a better chance to see and be seen before committing to crossing. They are appropriate for any crosswalk where it is desirable to shorten the crossing distance and there is a parking lane adjacent to the curb.

## GUIDANCE

- In most cases, the curb extensions should be designed to transition between the extended curb and the running curb in the shortest practicable distance.
- For purposes of efficient street sweeping, the minimum radius for the reverse curves of the transition is 10 ft and the two radii should be balanced to be nearly equal.
- Curb extensions should terminate one foot short of the parking lane to maximize bicyclist safety.



## DISCUSSION

If there is no parking lane, adding curb extensions may be a problem for bicycle travel and truck or bus turning movements.

### ADDITIONAL REFERENCES AND GUIDELINES

AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.  
 AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.  
 NCDOT. (2012). Complete Streets Planning and Design Guidelines.

### MATERIALS AND MAINTENANCE

Planted curb extensions may be designed as a bioswale, a vegetated system for stormwater management.



# ADA COMPLIANT CURB RAMPS

## DESCRIPTION

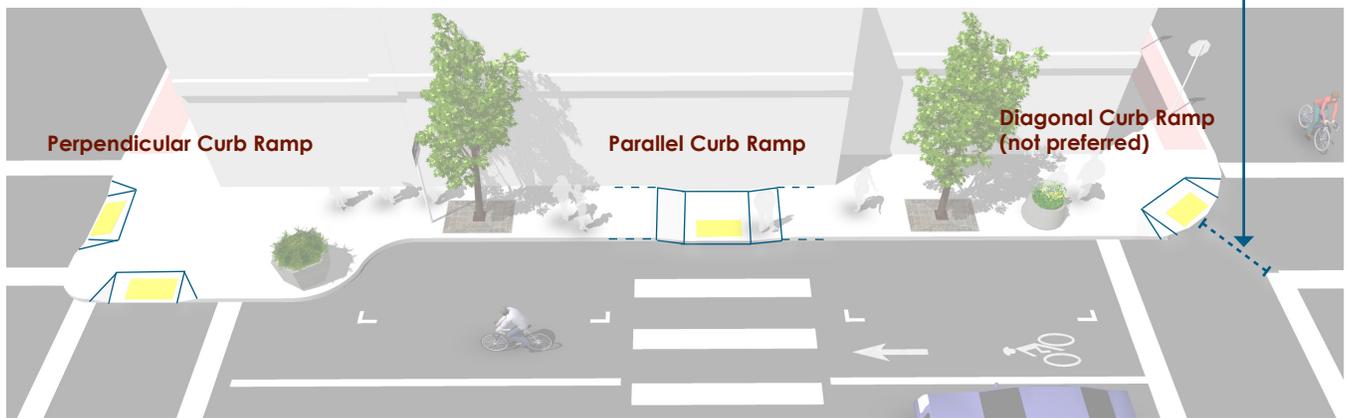
Curb ramps are the design elements that allow all users to make the transition from the street to the sidewalk. There are a number of factors to be considered in the design and placement of curb ramps at corners. Properly designed curb ramps ensure that the sidewalk is accessible from the roadway. A sidewalk without a curb ramp can be useless to someone in a wheelchair, forcing them back to a driveway and out into the street for access.

Although diagonal curb ramps might save money, they create potential safety and mobility problems for pedestrians, including reduced maneuverability and increased interaction with turning vehicles, particularly in areas with high traffic volumes. Diagonal curb ramp configurations are the least preferred of all options.

## GUIDANCE

- The landing at the top of a ramp shall be at least 4 feet long and at least the same width as the ramp itself.
- The ramp shall slope no more than 1:50 (2.0%) in any direction.
- If the ramp runs directly into a crosswalk, the landing at the bottom will be in the roadway.
- If the ramp lands on a dropped landing within the sidewalk or corner area where someone in a wheelchair may have to change direction, the landing must be a minimum of 5'-0" long and at least as wide as the ramp, although a width of 5'-0" is preferred.

Diagonal ramps shall include a clear space of at least 48" within the crosswalk for user maneuverability



Crosswalk spacing not to scale. For illustration purposes only.

## DISCUSSION

The edge of an ADA compliant curb ramp will be marked with a tactile warning device (also known as truncated domes) to alert people with visual impairments to changes in the pedestrian environment. Contrast between the raised tactile device and the surrounding infrastructure is important so that the change is readily evident. These devices are most effective when adjacent to smooth pavement so the difference is easily detected. The devices must provide color contrast so partially sighted people can see them.

### ADDITIONAL REFERENCES AND GUIDELINES

- United States Access Board. (2002). Accessibility Guidelines for Buildings and Facilities.
- United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).
- USDOJ. (2010). ADA Standards for Accessible Design.

### MATERIALS AND MAINTENANCE

It is critical that the interface between a curb ramp and the street be maintained adequately. Asphalt street sections can develop potholes at the foot of the ramp, which can catch the front wheels of a wheelchair.

## SIGNALIZATION

Crossing beacons and signals facilitate crossings of roadways for pedestrians and bicyclists. Beacons make crossing intersections safer by clarifying when to enter an intersection and by alerting motorists to the presence of pedestrians and bicyclists.

Flashing amber warning beacons can be utilized at unsignalized intersection crossings. Push buttons, signage, and pavement markings may be used to highlight these facilities for pedestrians, bicyclists and motorists.

Determining which type of signal or beacon to use for a particular intersection depends on a variety of factors. These include speed limits, traffic volumes, and the anticipated levels of pedestrian and bicycle crossing traffic.

An intersection with crossing beacons may reduce stress and delays for crossing users, and discourage illegal and unsafe crossing maneuvers.





# PEDESTRIANS AT SIGNALIZED CROSSINGS

## DESCRIPTION

### Pedestrian Signal Head

- All traffic signals should be equipped with pedestrian signal indications except where pedestrian crossing is prohibited by signage.
- Countdown signals should be used at all signalized intersections to indicate whether a pedestrian has time to cross the street before the signal phase ends.

### Signal Timing

- Providing adequate pedestrian crossing time is a critical element of the walking environment at signalized intersections. The MUTCD recommends traffic signal timing to assume a pedestrian walking speed of 4' per second, meaning that the length of a signal phase with parallel pedestrian movements should provide sufficient time for a pedestrian to safely cross the adjacent street.
- At crossings where older pedestrians or pedestrians with disabilities are expected, crossing speeds as low as 3' per second may be assumed.
- In busy pedestrian areas such as downtowns, the pedestrian signal indication should be built into each signal phase, eliminating the requirement for a pedestrian to actuate the signal by pushing a button.

Audible pedestrian traffic signals provide crossing assistance to pedestrians with vision impairment at signalized intersections



## DISCUSSION

When push buttons are used, they should be located so that someone in a wheelchair can reach the button from a level area of the sidewalk without deviating significantly from the natural line of travel into the crosswalk, and marked (for example, with arrows) so that it is clear which signal is affected.

In areas with very heavy pedestrian traffic, consider an all-pedestrian signal phase to give pedestrians free passage in the intersection when all motor vehicle traffic movements are stopped.

### ADDITIONAL REFERENCES AND GUIDELINES

United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).  
 AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.  
 NCDOT. (2012). Complete Streets Planning and Design Guidelines.

### MATERIALS AND MAINTENANCE

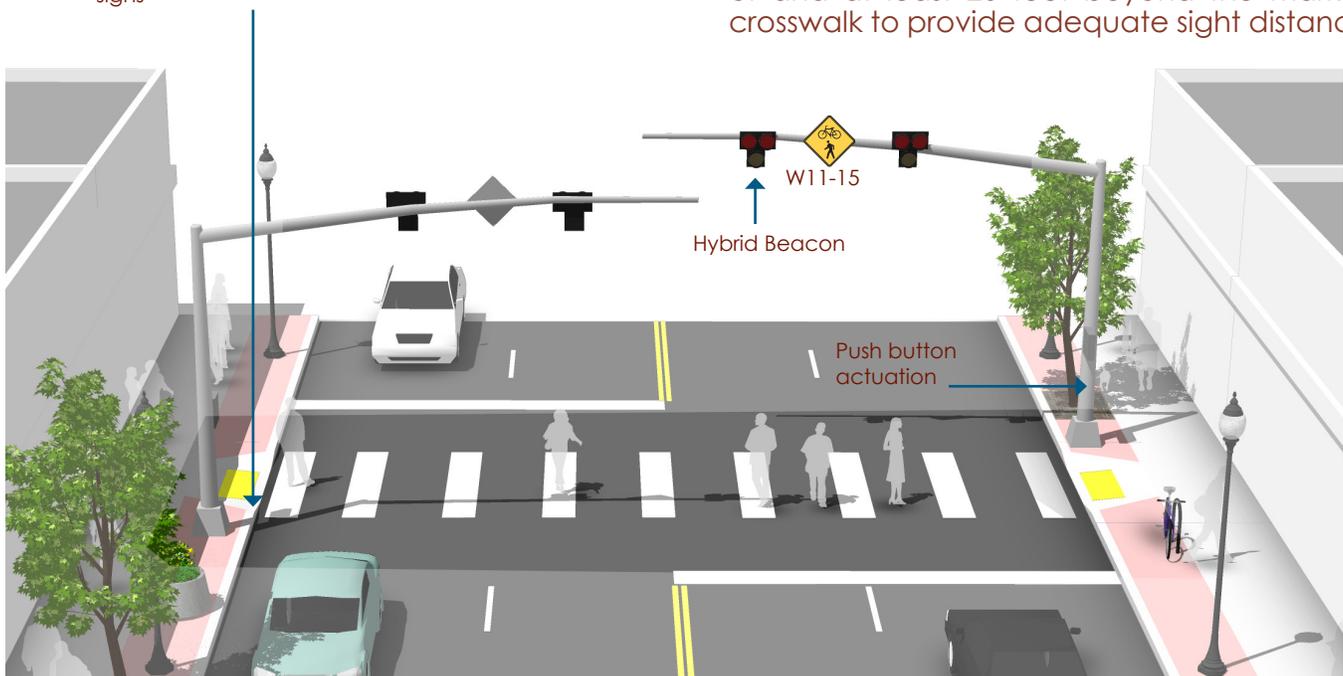
It is important to repair or replace traffic control equipment before it fails. Consider semi-annual inspections of controller and signal equipment, intersection hardware, and loop detectors.

# PEDESTRIAN HYBRID BEACON

## DESCRIPTION

Hybrid beacons are used to improve non-motorized crossings of major streets. A hybrid beacon consists of a signal-head with two red lenses over a single yellow lens on the major street, and a pedestrian signal head for the crosswalk.

Should be installed at least 100 feet from side streets or driveways that are controlled by STOP or YIELD signs



## GUIDANCE

- Hybrid beacons may be installed without meeting traffic signal control warrants if roadway speed and volumes are excessive for comfortable pedestrian crossings.
- If installed within a signal system, signal engineers should evaluate the need for the hybrid signal to be coordinated with other signals.
- Parking and other sight obstructions should be prohibited for at least 100 feet in advance of and at least 20 feet beyond the marked crosswalk to provide adequate sight distance.

## DISCUSSION

Hybrid beacon signals are normally activated by push buttons, but may also be triggered by infrared, microwave or video detectors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street.

Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety.

### ADDITIONAL REFERENCES AND GUIDELINES

FHWA. (2009). Manual on Uniform Traffic Control Devices.  
 NACTO. (2012). Urban Bikeway Design Guide.  
 NCDOT. (2012). Complete Streets Planning and Design Guidelines.

### MATERIALS AND MAINTENANCE

Hybrid beacons are subject to the same maintenance needs and requirements as standard traffic signals. Signing and striping need to be maintained to help users understand any unfamiliar traffic control.

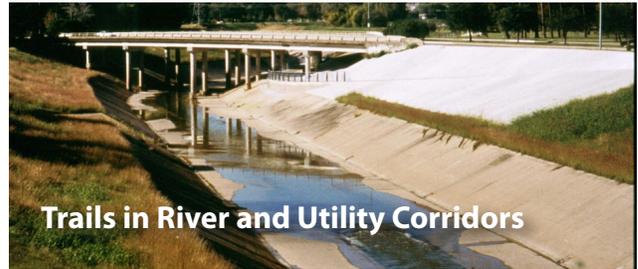


## GREENWAYS

A greenway (also known as a shared-use path) allows for two-way use by pedestrians, skaters, bicyclists, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles. Path facilities can also include amenities such as lighting, signage, and fencing (where appropriate).

Key features of greenways include:

- Frequent access points from the local road network.
- Directional signs to direct users to and from the path.
- A limited number of at-grade crossings with streets or driveways.
- Terminating the path where it is easily accessible to and from the street system.
- Separate treads for pedestrians and bicyclists when heavy use is expected.



## NEIGHBORHOOD GREENWAYS

Also included in this section is a facility called a Neighborhood Greenway. Unlike conventional greenways, this facility is not a separate path, but is rather a calm street designed for a broad spectrum of users. Traffic calming treatments for neighborhood greenways are selected as necessary to create appropriate automobile volumes and speeds, and to provide safe crossing opportunities of busy streets.



# GENERAL DESIGN PRACTICES

## DESCRIPTION

Greenways can provide a desirable facility for users of all skill levels preferring separation from traffic, particularly for recreation. Greenways should generally provide directional travel opportunities not provided by existing roadways.

## GUIDANCE

### Width

- 8 feet is the minimum allowed for a two-way greenway path and is only recommended for low traffic situations.
- 10 feet is recommended in most situations and will be adequate for moderate to heavy use.
- 12 feet is recommended for heavy use situations with high concentrations of multiple users. A separate track (5' minimum) can be provided for pedestrian use.

### Lateral Clearance

- A 2 foot or greater shoulder on both sides of the path should be provided. An additional foot of lateral clearance (total of 3') is required by the MUTCD for the installation of signage or other furnishings.

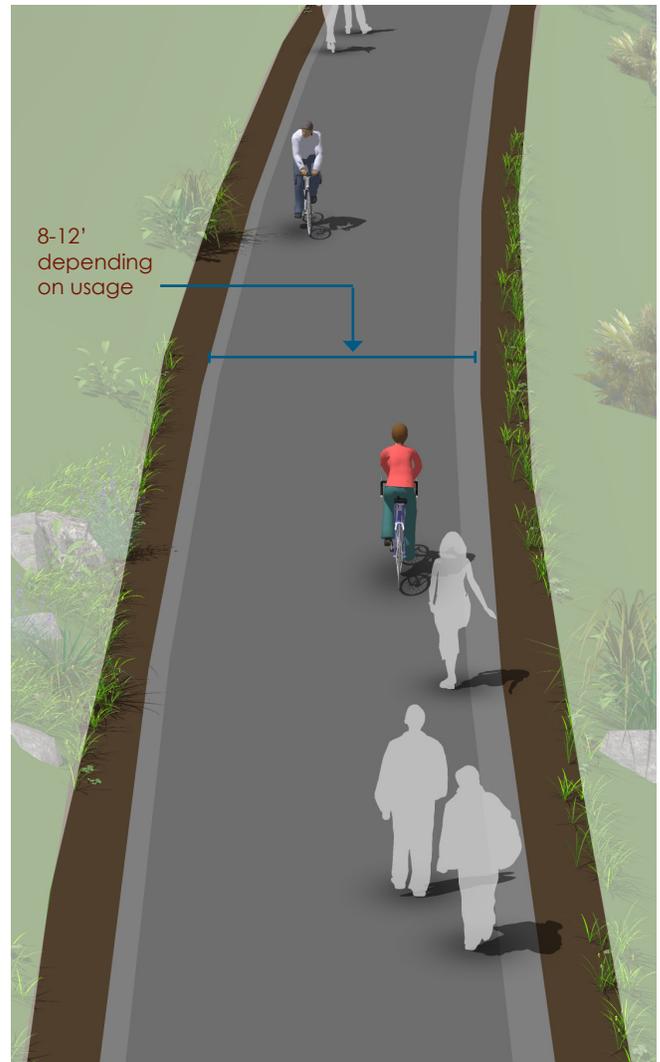
### Overhead Clearance

- Clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.

### Striping

- When striping is required, use a 4 inch dashed yellow centerline stripe with 4 inch solid white edge lines. Solid centerlines can be provided on tight or blind corners, and on the approaches to roadway crossings.

Terminate the path where it is easily accessible to and from the street system, preferably at a controlled intersection or at the beginning of a dead-end street.



## ADDITIONAL REFERENCES AND GUIDELINES

AASHTO. (2012). Guide for the Development of Bicycle Facilities.  
 FHWA. (2009). Manual on Uniform Traffic Control Devices.  
 Flink, C. (1993). Greenways: A Guide To Planning Design And Development.  
 NCDOT. (2012). Complete Streets Planning and Design Guidelines.

## MATERIALS AND MAINTENANCE

Asphalt is the most common surface for greenways. Thicker asphalt sections and a well-prepared subgrade will reduce deformation over time and reduce long-term maintenance costs.



# GREENWAYS IN INACTIVE RAIL CORRIDORS

## DESCRIPTION

Commonly referred to as Rails-to-Trails or Rail-Trails, these projects convert vacated rail corridors into greenway paths. Rail corridors offer several advantages, including relatively direct routes between major destinations and generally flat terrain.

In some cases, rail owners may rail-bank their corridors as an alternative to a complete abandonment of the line, thus preserving the rail corridor for possible future use.

The railroad may form an agreement with any person, public or private, who would like to use the banked rail line as a trail or linear park until it is again needed for rail use. Municipalities should acquire abandoned rail rights-of-way whenever possible to preserve the opportunity for greenway development.

## GUIDANCE

- Greenways in abandoned rail corridors should meet or exceed general design practices. If additional width allows, wider paths, and landscaping are desirable.
- In full conversions of abandoned rail corridors, the sub-base, superstructure, drainage, bridges, and crossings are already established. Design becomes a matter of working with the existing infrastructure to meet the needs of a rail-trail.
- If converting a rail bed adjacent to an active rail line, see Greenways in Active Rail Corridors



## DISCUSSION

It is often impractical and costly to add material to existing railroad bed fill slopes. This results in trails that meet minimum path widths, but often lack preferred shoulder and lateral clearance widths.

Rails-to-trails can involve many challenges including the acquisition of the right of way, cleanup and removal of toxic substances, and rehabilitation of tunnels, trestles and culverts. A structural engineer should evaluate existing railroad bridges for structural integrity to ensure they are capable of carrying the appropriate design loads.

### ADDITIONAL REFERENCES AND GUIDELINES

AASHTO. (2012). Guide for the Development of Bicycle  
 Flink, C. (1993). Greenways: A Guide To Planning Design And  
 Development.  
 NCDOT. (2012). Complete Streets Planning and Design  
 Guidelines.

### MATERIALS AND MAINTENANCE

The use of concrete for paths has proven to be more durable over the long term compared to asphalt. Saw cut concrete joints, rather than troweling, to improve the experience of path users.

# GREENWAYS IN ACTIVE RAIL CORRIDORS

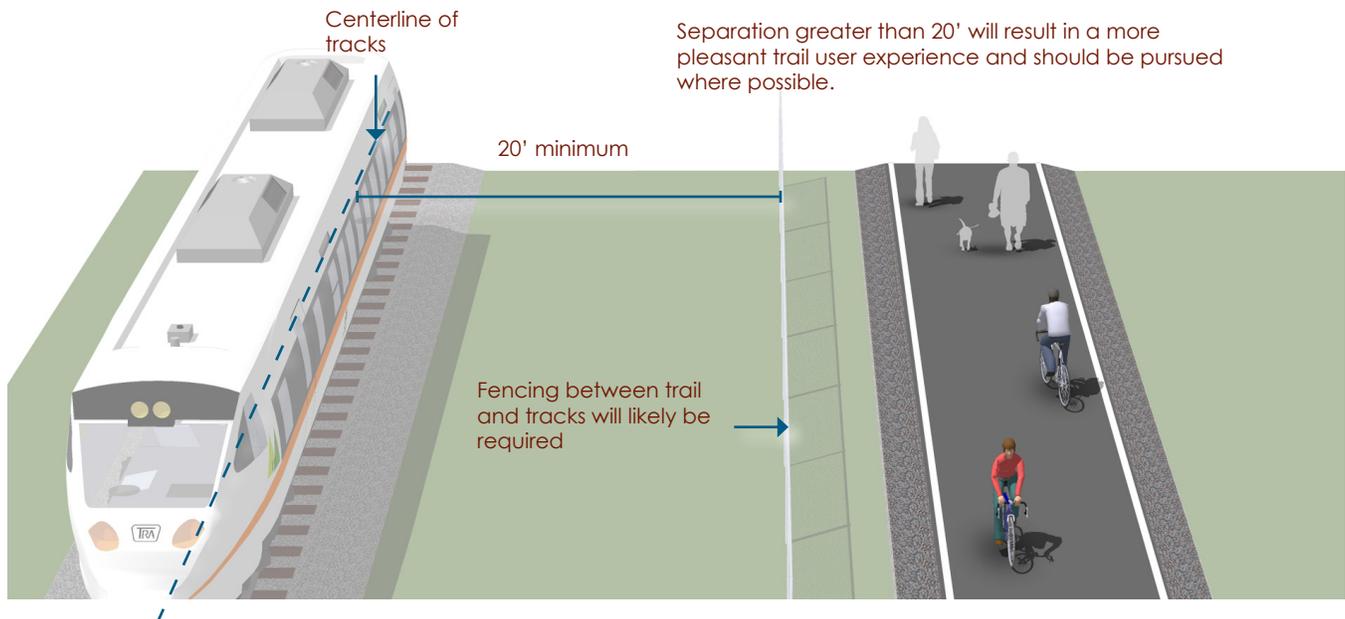
## DESCRIPTION

Rails-with-Trails projects typically consist of paths adjacent to active railroads. It should be noted that some constraints could impact the feasibility of rail-with-trail projects. In some cases, space needs to be preserved for future planned freight, transit or commuter rail service. In other cases, limited right-of-way width, inadequate setbacks, concerns about safety/trespassing, and numerous mid-block crossings may affect a project's feasibility.

## GUIDANCE

- Greenways in active rail corridors should meet or exceed general design standards. If additional width allows, wider paths, and landscaping are desirable.
- If required, fencing should be a minimum of 5 feet in height with higher fencing than usual next to sensitive areas such as switching yards. Setbacks from the active rail line will vary depending on the speed and frequency of trains, and available right-of-way.

## DISCUSSION



Railroads typically require fencing with all rail-with-trail projects. Concerns with trespassing and security can vary with the amount of train traffic on the adjacent rail line and the setting of the greenway, i.e. whether the section of track is in an urban or rural setting.

## MATERIALS AND MAINTENANCE

AASHTO. (2012). Guide for the Development of Bicycle Facilities.  
 FHWA. (2009). Manual on Uniform Traffic Control Devices.  
 FHWA. (2002). Rails-with-Trails: Lessons Learned.

Concrete paths may cost more to build than asphalt paths but do not become brittle, cracked and rough with age, or deformed by roots.

## ADDITIONAL REFERENCES AND GUIDELINES



# LOCAL NEIGHBORHOOD ACCESSWAYS

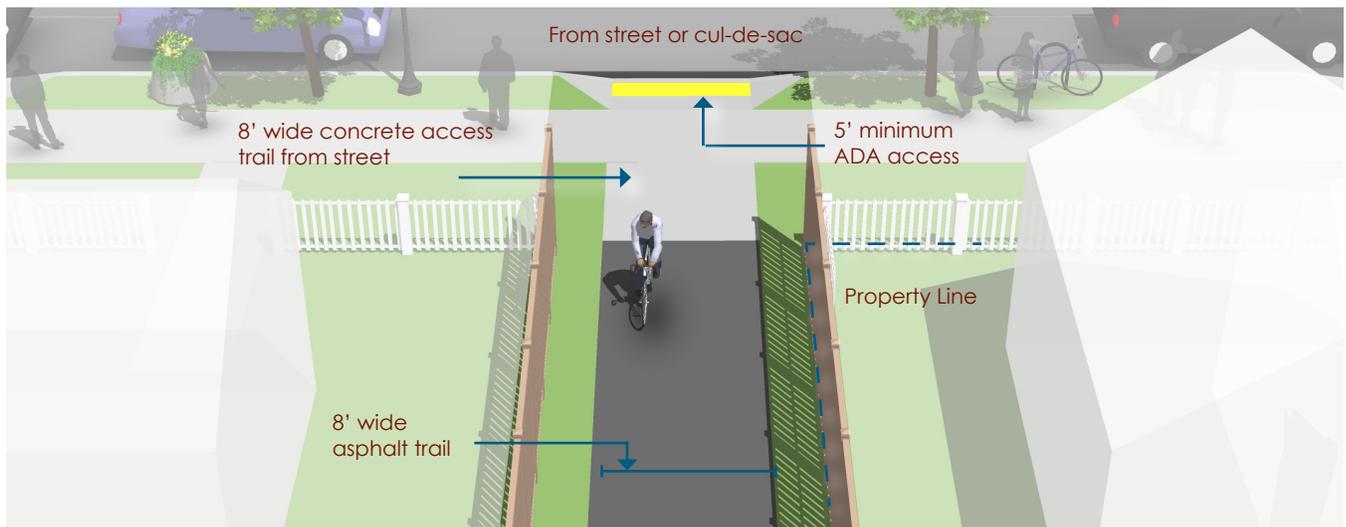
## DESCRIPTION

Neighborhood accessways provide residential areas with direct pedestrian access to parks, trails, greenspaces, and other recreational areas. They most often serve as small trail connections to and from the larger trail network, typically having their own rights-of-way and easements.

Additionally, these smaller trails can be used to provide pedestrian connections between dead-end streets, cul-de-sacs, and access to nearby destinations not provided by the street network.

## GUIDANCE

- Neighborhood accessways should remain open to the public.
- Trail pavement shall be at least 8' wide to accommodate emergency and maintenance vehicles, meet ADA requirements and be considered suitable for multi-use.
- Trail widths should be designed to be less than 8' wide only when necessary to protect large mature native trees over 18" in caliper, wetlands or other ecologically sensitive areas.
- Access trails should slightly meander whenever possible.



## DISCUSSION

Neighborhood accessways should be designed into new subdivisions at every opportunity and should be required by City/County subdivision regulations.

For existing subdivisions, neighborhood and homeowner association groups are encouraged to identify locations where such connects would be desirable. Nearby residents and adjacent property owners should be invited to provide landscape design input.

### ADDITIONAL REFERENCES AND GUIDELINES

AASHTO. (2012). Guide for the Development of Bicycle Facilities.  
FHWA. (2009). Manual on Uniform Traffic Control Devices.  
FHWA. (2006). Federal Highway Administration University Course on Bicycle and Pedestrian Transportation. Lesson 19: Greenways and Shared Use Paths.

### MATERIALS AND MAINTENANCE

Asphalt greenways should be designed with sufficient surfacing structural depth for the subgrade soil type to support maintenance and emergency vehicles.

# NATURAL SURFACE GREENWAYS

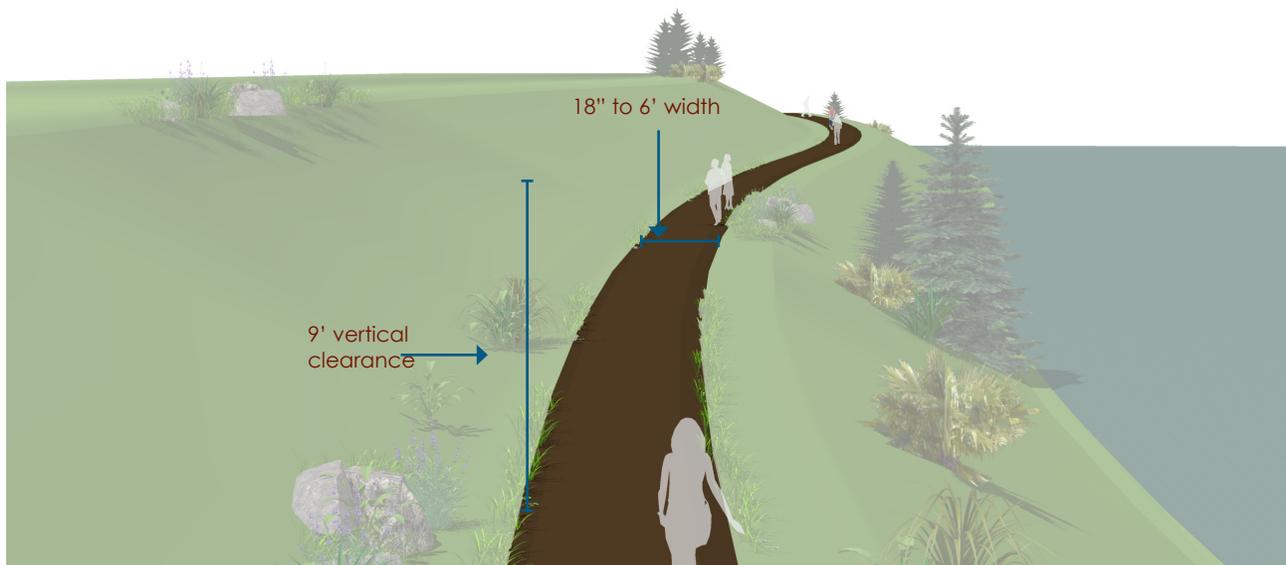
## DESCRIPTION

Sometimes referred to as footpaths or hiking trails, the natural surface trail is used along corridors that are environmentally-sensitive but can support bare earth, wood chip, or boardwalk trails. Natural surface trails are a low-impact solution and found in areas with limited development or where a more primitive experience is desired.

Guidance presented in this section does not include considerations for bicycle users. Natural surface trails designed for bicycle users are typically known as single track trails.

## GUIDANCE

- Trails can vary in width from 18 inches to 6 feet or greater; vertical clearance should be maintained at nine-feet above grade.
- Base preparation varies from machine-worked surfaces to those worn only by usage.
- Trail surface can be made of dirt, rock, soil, forest litter, or other native materials. Some trails use crushed stone (a.k.a. "crush and run") that contains about 4% fines by weight, and compacts with use.
- Provide positive drainage for trail tread without extensive removal of existing vegetation; maximum slope is five percent (typical).



## DISCUSSION

Trail erosion control measures include edging along the low side of the trail, steps and terraces to contain surface material, and water bars to direct surface water off the trail; use bedrock surface where possible to reduce erosion.

### ADDITIONAL REFERENCES AND GUIDELINES

Flink, C. (1993). *Greenways: A Guide To Planning Design And Development*.

### MATERIALS AND MAINTENANCE

Consider implications for accessibility when weighing options for surface treatments.



# NEIGHBORHOOD GREENWAYS

## DESCRIPTION

Neighborhood greenways are low-volume, low-speed streets modified to enhance bicyclist comfort by using treatments such as signage, pavement markings, traffic calming and/or traffic reduction, and intersection modifications. These treatments allow through movements of bicyclists while discouraging similar through-trips by non-local motorized traffic.

## GUIDANCE

- Signs and pavement markings are the minimum treatments necessary to designate a street as a neighborhood greenway.
- Neighborhood greenways should have a maximum posted speed of 25 mph. Use traffic calming to maintain an 85th percentile speed below 22 mph.
- Implement volume control treatments based on the context of the neighborhood greenway, using engineering judgment. Target motor vehicle volumes range from 1,000 to 3,000 vehicles per day.
- Intersection crossings should be designed to enhance safety and minimize delay for bicyclists.

**Signs and Pavement Markings** identify the street as a pedestrian and bicycle priority route.



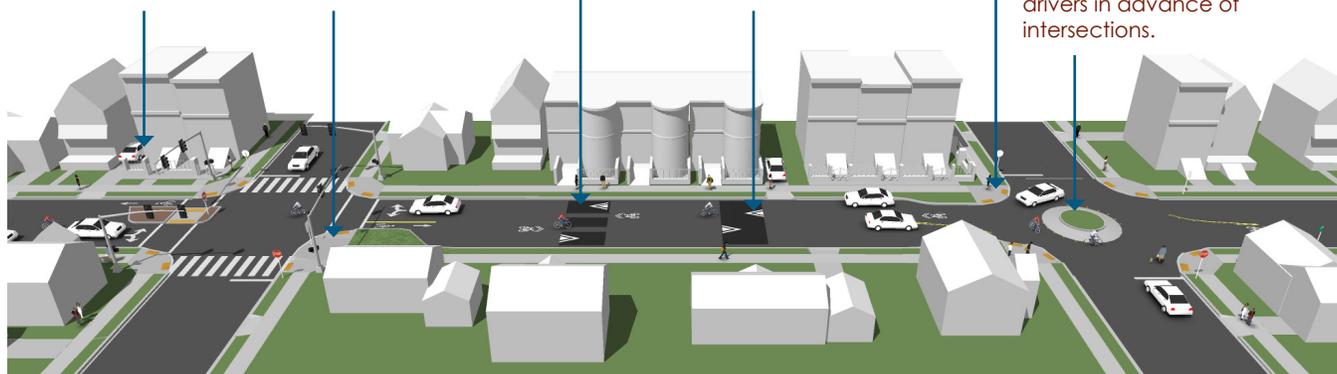
**Enhanced Crossings** use signals, beacons, and road geometry to increase safety at major intersections.

**Partial Closures** and other volume management tools limit the number of cars traveling on the neighborhood greenway.

**Speed Humps** manage driver speed.

**Curb Extensions** shorten pedestrian crossing distance.

**Mini Traffic Circles** slow drivers in advance of intersections.



## DISCUSSION

Neighborhood greenway retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments to assist pedestrian crossing, these intersections can become major barriers along the neighborhood greenway and compromise safety.

Traffic calming can deter motorists from driving on a street. Anticipate and monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes.

### ADDITIONAL REFERENCES AND GUIDELINES

Alta Planning + Design and IBPI. (2009). Bicycle Boulevard Planning and Design Handbook.  
 BikeSafe. (No Date). Bicycle countermeasure selection system.  
 Ewing, Reid. (1999). Traffic Calming: State of the Practice.  
 Ewing, Reid and Brown, Steven. (2009). U.S. Traffic Calming Manual.

### MATERIALS AND MAINTENANCE

Maintenance needs for bicycle signs are similar to other signs. Signs will need periodic replacement due to wear.

## GREENWAY CROSSINGS

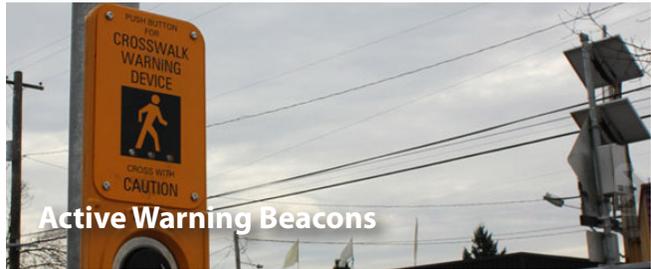
At-grade roadway crossings can create potential conflicts between path users and motorists, however, well-designed crossings can mitigate many operational issues and provide a higher degree of safety and comfort for path users. This is evidenced by the thousands of successful facilities around the United States with at-grade crossings. In most cases, at-grade path crossings can be properly designed to provide a reasonable degree of safety and can meet existing traffic and safety standards. Path facilities that cater to bicyclists can require additional considerations due to the higher travel speed of bicyclists versus pedestrians.

Consideration must be given to adequate warning distance based on vehicle speeds and line of sight, with the visibility of any signs absolutely critical. Directing the active attention of motorists to roadway signs may require additional alerting devices such as a flashing beacon, roadway striping or changes in pavement texture. Signage for path users may include a standard "STOP" or "YIELD" sign and pavement markings, possibly combined with other features such as bollards or a bend in the pathway to slow bicyclists. Care must be taken not to place too many signs at crossings lest they begin to lose their visual impact.

A number of striping patterns have emerged over the years to delineate path crossings. A median stripe on the path approach will help to organize and warn path users. Crosswalk striping is typically a matter of local and State preference, and may be accompanied by pavement treatments to help warn and slow motorists. In areas where motorists do not typically yield to crosswalk users, additional measures may be required to increase compliance.



Marked/Unsignalized Crossings



Active Warning Beacons



Route Users to Existing Signals



# UNSIGNALIZED MARKED CROSSINGS

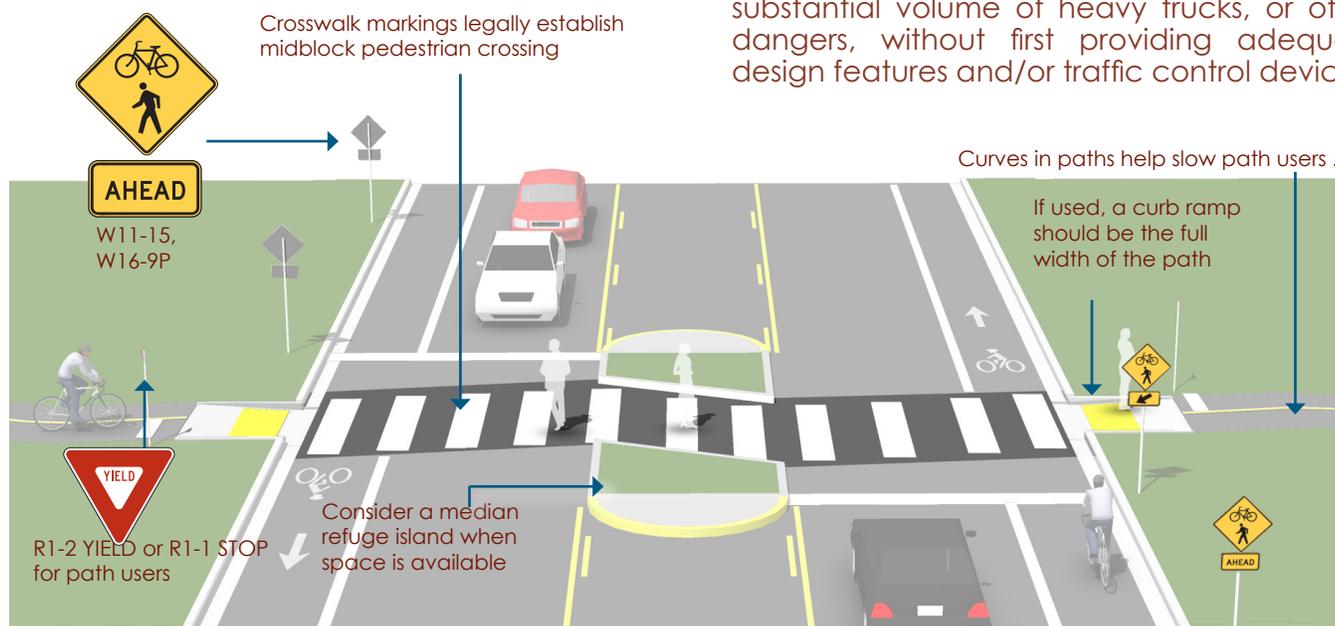
## DESCRIPTION

An unsignalized marked crossing typically consists of a marked crossing area, signage and other markings to slow or stop traffic. The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, pathway traffic, use patterns, vehicle speed, road type, road width, and other safety issues such as proximity to major attractions.

When space is available, using a median refuge island can improve user safety by providing pedestrians and bicyclists space to perform the safe crossing of one side of the street at a time.

## GUIDANCE

- Refer to the FHWA report, "Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations" for specific volume and speed ranges where a marked crosswalk alone may be sufficient.
- Where the speed limit exceeds 40 miles per hour, marked crosswalks alone should not be used at unsignalized locations.
- Crosswalks should not be installed at locations that could present an increased risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices.



## DISCUSSION

Marked crosswalks alone will not make crossings safer, nor will marked crosswalks necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g. raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions, etc.) as needed to improve the safety of the crossing. These are general recommendations; good engineering judgment should be used in individual cases for deciding which treatment to use.

### ADDITIONAL REFERENCES AND GUIDELINES

AASHTO. (2012). Guide for the Development of Bicycle Facilities.  
 FHWA. (2009). Manual on Uniform Traffic Control Devices.  
 NCDOT. (2012). Complete Streets Planning and Design Guidelines.

### MATERIALS AND MAINTENANCE

Locate markings out of wheel tread when possible to minimize wear and maintenance costs.

# ACTIVE WARNING BEACONS

## DESCRIPTION

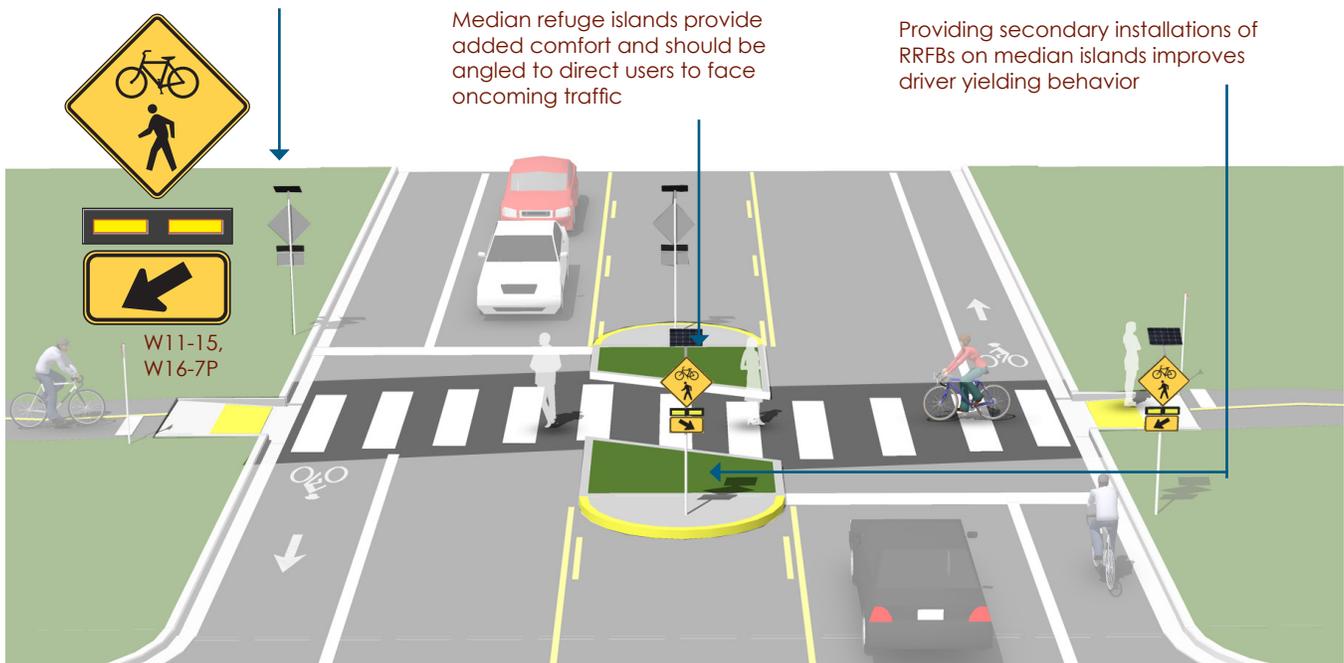
Enhanced marked crossings are unsignalized crossings with additional treatments designed to increase motor vehicle yielding compliance on multi-lane or high volume roadways.

These enhancements include pathway user or sensor actuated warning beacons, Rectangular Rapid Flash Beacons (RRFB) shown below, or in-roadway warning lights.

Rectangular Rapid Flash Beacons (RRFB) dramatically increase compliance over conventional warning beacons

## GUIDANCE

- Guidance for Unsignalized Marked Crossings applies.
- Warning beacons shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic control signals.
- Warning beacons shall initiate operation based on user actuation and shall cease operation at a predetermined time after the user actuation or, with passive detection, after the user clears the crosswalk.



Rectangular rapid flash beacons show the most increased compliance of all the warning beacon enhancement options.

A study of the effectiveness of going from a no-beacon arrangement to a two-beacon RRFB installation increased yielding from 18 percent to 81 percent. A four-beacon arrangement raised compliance to 88%. Additional studies of long term installations show little to no decrease in yielding behavior over time.

## MATERIALS AND MAINTENANCE

NACTO. (2012). Urban Bikeway Design Guide.  
 FHWA. (2009). Manual on Uniform Traffic Control Devices.  
 FHWA. (2008). MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11)  
 NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Depending on power supply, maintenance of active warning beacons can be minimal. If solar power is used, signals should run for years without issue.

## ADDITIONAL REFERENCES AND GUIDELINES



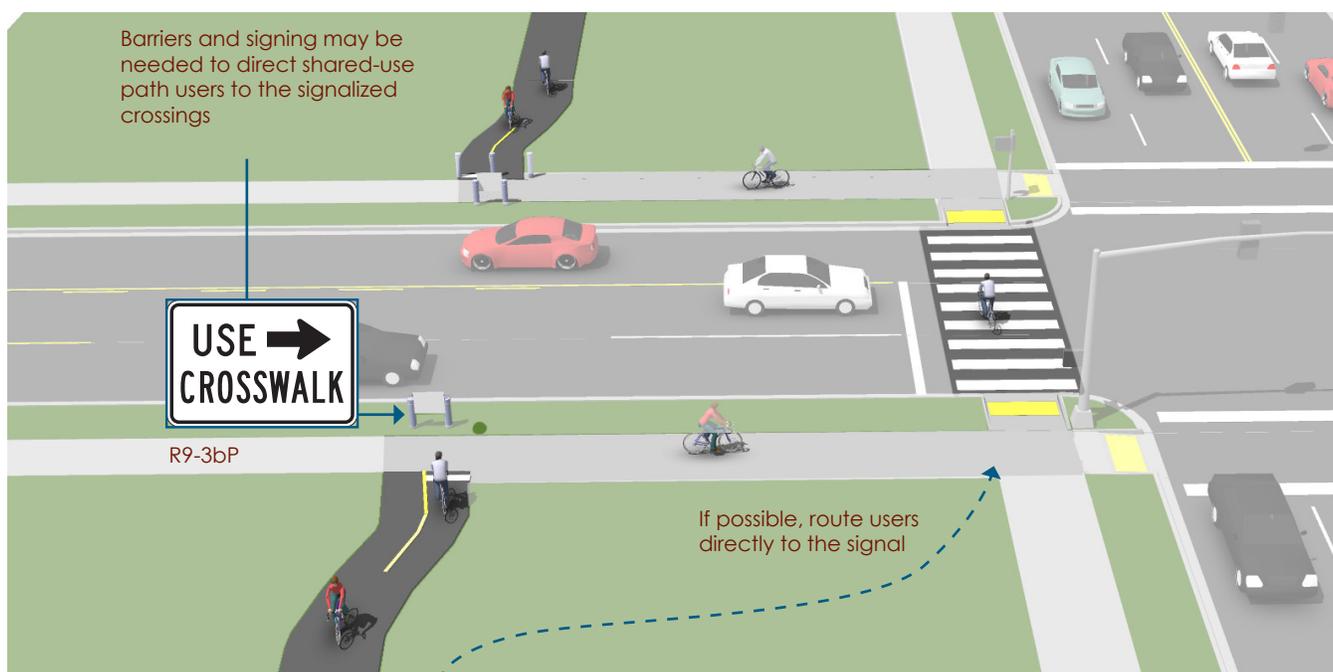
# ROUTE USERS TO SIGNALIZED CROSSINGS

## DESCRIPTION

Path crossings within approximately 400 feet of an existing signalized intersection with pedestrian crosswalks are typically diverted to the signalized intersection to avoid traffic operation problems when located so close to an existing signal. For this restriction to be effective, barriers and signing may be needed to direct path users to the signalized crossing. If no pedestrian crossing exists at the signal, modifications should be made.

## GUIDANCE

- Path crossings should not be provided within approximately 400 feet of an existing signalized intersection. If possible, route path directly to the signal.



## DISCUSSION

In the US, the minimum distance a marked crossing can be from an existing signalized intersection varies from approximately 250 to 660 feet. Engineering judgement and the context of the location should be taken into account when choosing the appropriate allowable setback. Pedestrians are particularly sensitive to out of direction travel and jaywalking may become prevalent if the distance is too great.

### ADDITIONAL REFERENCES AND GUIDELINES

- AASHTO. (2012). Guide for the Development of Bicycle Facilities.
- AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

### MATERIALS AND MAINTENANCE

Municipalities should maintain comprehensive inventories of the location and age of bicycle wayfinding signs to allow incorporation of bicycle wayfinding signs into any asset management activities.

# WAYFINDING AND SIGNAGE

## INTRODUCTION

The ability to navigate through a city is informed by landmarks, natural features and other visual cues. Signs throughout the city should indicate to bicyclists:

- Direction of travel
- Location of destinations
- Travel time/distance to those destinations
- These signs will increase users' comfort and accessibility to the bicycle systems.

Signage can serve both wayfinding and safety purposes including:

- Helping to familiarize users with the bicycle network
- Helping users identify the best routes to destinations
- Helping to address misperceptions about time and distance
- Helping overcome a “barrier to entry” for people who are not frequent bicyclists (e.g., “interested but concerned” bicyclists)

Bicycle wayfinding signs also visually cue motorists that they are driving along a bicycle route and should use caution. Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes. Too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists rather than per vehicle signage standards.

## SIGNAGE TYPOLOGIES

- Bikeway Network Wayfinding Sign Types
- Bikeway Network Wayfinding Sign Placement
- Regulatory Signs
- Etiquette Signage
- Interpretive Displays
- Kiosks and Message Centers





# BIKEWAY NETWORK

## DESCRIPTION

A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes. There are three general types of wayfinding signs:

### Confirmation Signs

Indicate to bicyclists that they are on a designated bikeway. Make motorists aware of the bicycle route.

Can include destinations and distance/time. Do not include arrows.

### Turn Signs

Indicate where a bikeway turns from one street onto another street. Can be used with pavement markings.

Include destinations and arrows.

### Decisions Signs

Mark the junction of two or more bikeways.

Inform bicyclists of the designated bike route to access key destinations.

Destinations and arrows, distances and travel times are optional but recommended.



## DISCUSSION

There is no standard color for bicycle wayfinding signage. Section 1A.12 of the MUTCD establishes the general meaning for signage colors. Green is the color used for directional guidance and is the most common color of bicycle wayfinding signage in the US, including those in the MUTCD.

### ADDITIONAL REFERENCES AND GUIDELINES

AASHTO. Guide for the Development of Bicycle Facilities. 2012.  
 FHWA. Manual on Uniform Traffic Control Devices. 2009  
 NACTO. Urban Bikeway Design Guide. 2012.

### MATERIALS AND MAINTENANCE

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

# BIKEWAY NETWORK WAYFINDING SIGN PLACEMENT

## GUIDANCE

Signs are typically placed at decision points along bicycle routes – typically at the intersection of two or more bikeways and at other key locations leading to and along bicycle routes.

### Decisions Signs

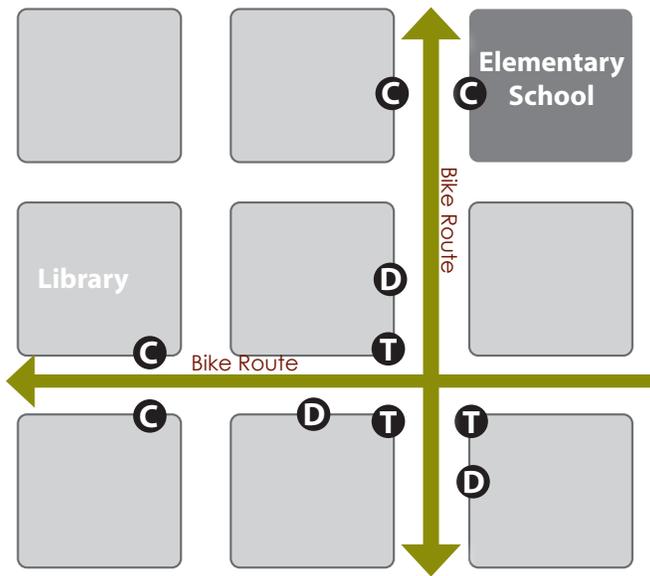
- Near-side of intersections in advance of a junction with another bicycle route.
- Along a route to indicate a nearby destination.

### Confirmation Signs

Every ¼ to ½ mile on off-street facilities and every 2 to 3 blocks along on-street bicycle facilities, unless another type of sign is used (e.g., within 150 ft of a turn or decision sign). Should be placed soon after turns to confirm destination(s). Pavement markings can also act as confirmation that a bicyclist is on a preferred route.

### Turn Signs

Near-side of intersections where bike routes turn (e.g., where the street ceases to be a bicycle route or does not go through). Pavement markings can also indicate the need to turn to the bicyclist.



**D** Decision Sign



**C** Confirmation Sign



**T** Turn Sign



## DISCUSSION

It can be useful to classify a list of destinations for inclusion on the signs based on their relative importance to users throughout the area. A particular destination's ranking in the hierarchy can be used to determine the physical distance from which the locations are signed. For example, primary destinations (such as the downtown area) may be included on signage up to five miles away. Secondary destinations (such as a transit station) may be included on signage up to two miles away. Tertiary destinations (such as a park) may be included on signage up to one mile away.

### ADDITIONAL REFERENCES AND GUIDELINES

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- FHWA. Manual on Uniform Traffic Control Devices. 2009.
- NACTO. Urban Bikeway Design Guide. 2012.

### MATERIALS AND MAINTENANCE

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.



# REGULATORY SIGNS

## DESCRIPTION

Regulatory signs give a direction that must be obeyed, and apply to intersection control, speed, vehicle movement and parking. They are usually rectangular or square with a white background and black, white or colored letters.

Regulatory signs with a red background are reserved for STOP, YIELD, DO NOT ENTER or WRONG WAY messages.

Red text indicates a restricted parking conditions, and a circle with a line through it means the activity shown is not allowed.

## GUIDANCE

- Small-sized signs or plaques may be used for bicycle-only traffic applications, such as along greenways.
- See the MUTCD 9B for a detailed list of regulatory sign application and guidance.

### Common Greenway Oriented Regulatory Signs:



### Common On-Street Regulatory Signs:



## DISCUSSION

Signs for the exclusive use of bicyclists should be located so that other road users are not confused by them.

### ADDITIONAL REFERENCES AND GUIDELINES

AASHTO. Guide for the Development of Bicycle Facilities. 2012.  
 FHWA. Manual on Uniform Traffic Control Devices. 2009.

### MATERIALS AND MAINTENANCE

Maintenance needs for regulatory signs are similar to other signs and will need periodic replacement due to wear.

# ETIQUETTE SIGNAGE

## DESCRIPTION

Informing trail users of acceptable trail etiquette is a common issue when multiple user types are anticipated. Yielding the right-of-way is a courtesy and yet a necessary part of a safe trail experience involving multiple trail users.

The message must be clear and easy to understand. The most common trail etiquette systems involve yielding of cyclists to pedestrians and equestrians and the yielding of pedestrians to equestrians.

## GUIDANCE

- Trail right-of-way information should be posted at trail access points and along the trail.

### Common trail etiquette sign:



### MUTCD compliant signs:



R9-6

## DISCUSSION

More detailed educational information may be provided at kiosks and message centers.

Education curriculums, similar to the "Safe Routes to Schools" Programs, could be used to encourage safe practices of various trail users on the trail.

### ADDITIONAL REFERENCES AND GUIDELINES

AASHTO. Guide for the Development of Bicycle Facilities. 2012.  
 FHWA. Manual on Uniform Traffic Control Devices. 2009.  
 US Forest Service. Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds. 2007.

### MATERIALS AND MAINTENANCE

Maintenance needs for trail signs are similar to other signs and will need periodic replacement due to wear.



# INTERPRETIVE DISPLAYS

## DESCRIPTION

Interpretive displays provide greenway and trail users with information about the trail, wild life, vegetation, history and the significance of elements along the greenway. Interpretive displays may also be combined with public art and sculpture opportunities along the trail.

## GUIDANCE

- There is a wide variety of interpretive signage styles and amount/type of information they can provide.
- Consider the character of the greenway trail and surrounding elements when designing these signs.
- A professional graphic designer/sign consultant should be consulted for sign design.
- Locate interpretive signage three feet from the edge of the trail.



## DISCUSSION

Interpretive signage primarily serves an informational or educational function. It should be clear, easy to understand, and engaging. It should also be weather-proof or protected from the elements and secured to the ground.

### ADDITIONAL REFERENCES AND GUIDELINES

FHWA. Designing Sidewalks and Trails for Access. 2001.

### MATERIALS AND MAINTENANCE

Interpretive signage should be inspected periodically for damage and vandalism.

# KIOSKS AND MESSAGE CENTERS

## DESCRIPTION

Kiosks and message centers provide visitors with information to orient themselves, learn of site opportunities, read the rules and regulations of the site, find the hours of operation and read about local events such as activities programmed for the greenway or seasonal festivals.



## GUIDANCE

- Install Kiosks at each trailhead.
- Kiosk design should be coordinated with the character of the entire green way trail system.
- Keep the style of the kiosk simple and readily identifiable by trail users as an information contact station.
- Bulletin boards, regional trail maps, rules and regulations and accessibility advisories should be designed as part of the kiosk.
- When locating kiosks next to parking facilities, set the units back far enough from traffic and protect the support posts or structure with appropriately sized bollards.



## DISCUSSION

Kiosks and message centers serve an informational/advisory/regulatory function. As such, the information conveyed should be clear, easy to understand, and engaging. It should also be weather-proof or protected from the elements and secured to the ground.

### ADDITIONAL REFERENCES AND GUIDELINES

US Forest Service. Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds. 2007.

### MATERIALS AND MAINTENANCE

Kiosks and message centers should be inspected periodically for damage and vandalism, and information should be updated as appropriate.

# D FUNDING STRATEGIES

## APPENDIX OUTLINE

OVERVIEW (D-1) | STATE & FEDERAL (D-1) | LOCAL GOVERNMENT (D-3) | PRIVATE & NON-PROFIT SECTORS (D-4)

## OVERVIEW

When considering possible funding sources for the City of Mount Holly's pedestrian projects, it is important to remember that not all construction activities or programs will be accomplished with a single funding source. It will be necessary to consider several sources of funding, that when combined, would support full project completion. This appendix outlines the most likely sources of funding for the projects at the federal, state, local government level and from the private sector.

## STATE AND FEDERAL

Federal funding is typically directed through State agencies to local governments either in the form of grants or direct appropriations. State budget shortfalls may make it extremely difficult to accurately forecast available funding for future project development. The following is a list of possible Federal and State funding sources that could be used to support construction of the many pedestrian projects. Federal funding sometimes requires a 20% local match, however the recent stimulus money does not require a match. Since these funding categories are difficult to forecast, it is recommended that the City continue to work with the Gaston Urban Area Metropolitan Planning Organization on submitting pedestrian projects to NCDOT for inclusion in the STIP (State Transportation Improvement Program), as discussed below.

### NCDOT'S DEPARTMENT OF ENERGY (DOE)

The Department of Energy's Energy Efficiency and Conservation Block Grants (EECBG) grants may be used to reduce energy use and fossil fuel emissions and for improvements in energy efficiency. Section 7 of the funding announcement states that these grants provide opportunities for the development and implementation of transportation programs to conserve energy used in transportation including development of infrastructure such as bicycle lanes and pathways and pedestrian walkways. Although this grant period has passed, more opportunities may arise.

More information can be found at <http://www1.eere.energy.gov/wip/eecbg.html>

### MOVING AHEAD FOR PROGRESS IN THE TWENTY-FIRST CENTURY (MAP-21)

The largest source of federal funding for bicycle and pedestrian is the US DOT's Federal-Aid Highway Program, which Congress has reauthorized roughly every six years since the passage of the Federal-Aid Road Act of 1916. The latest act, Moving Ahead for Progress in the Twenty-First Century (MAP-21) was enacted in July 2012 as Public Law 112-141. The Act replaces the Safe, Accountable, Flexible, Efficient Transportation Equity Act – a Legacy for Users (SAFETEA-LU), which was valid from August 2005 - June 2012.



MAP-21 authorizes funding for federal surface transportation programs including highways and transit for the 27 month period between July 2012 and September 2014. It is not possible to guarantee the continued availability of any listed MAP-21 programs, or to predict their future funding levels or policy guidance. Nevertheless, many of these programs have been included in some form since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, and thus may continue to provide capital for active transportation projects and programs.

In North Carolina, federal monies are administered through the North Carolina Department of Transportation (NCDOT) and Metropolitan Planning Organizations (MPOs). Most, but not all, of these programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. Federal funding is intended for capital improvements and safety and education programs, and projects must relate to the surface transportation system.

There are a number of programs identified within MAP-21 that are applicable to bicycle and pedestrian projects. These programs are discussed below.

More information: <http://www.fhwa.dot.gov/map21/summaryinfo.cfm>

### NC DEPARTMENT OF ENVIRONMENT – RECREATIONAL TRAILS AND ADOPT-A-TRAIL GRANTS

The State Trails Program is a section of the N.C. Division of Parks and Recreation. The program originated in 1973 with the North Carolina Trails System Act and is dedicated to helping citizens, organizations and agencies plan, develop and manage all types of trails ranging from greenways and trails for hiking, biking and horseback riding to river trails and off-highway vehicle trails. The Recreation Trails Program awards grants up to \$75,000 per project. The Adopt-A-Trail Program awards grants up to \$5,000 per project.

### POWELL BILL FUNDS

Annually, State street-aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways.

### COMMUNITY DEVELOPMENT BLOCK GRANT FUNDS

Community Development Block Grant (CDBG) funds are available to local municipal or county governments that qualify for projects to enhance the viability of communities by providing decent housing and suitable living environments and by expanding economic opportunities, principally for persons of low- and moderate-income. State CDBG funds are provided by the U.S. Department of Housing and Urban Development (HUD) to the state of North Carolina. Some urban counties and cities in North Carolina receive CDBG funding directly from HUD. Each year, CDBG provides funding to local governments for hundreds of critically-needed community improvement projects throughout the state. These community improvement projects are administered by the Division of Community Assistance and the Commerce Finance Center under eight grant categories. Two categories might be of support to bicycle and pedestrian projects in 'entitlement communities': infrastructure and community revitalization.

### LAND AND WATER CONSERVATION TRUST FUND

The Land and Water Conservation Fund (LWCF) has historically been a primary funding source of the US Department of the Interior for outdoor recreation development and land acquisition by local governments and state agencies. In North Carolina, the program is administered by the Department of Environment and Natural Resources (DENR).



### N.C. PARKS AND RECREATION TRUST FUND (PARTF)

The Parks and Recreation Trust Fund (PARTF) provide dollar-for-dollar matching grants to local governments for parks and recreational projects to serve the general public. Counties, incorporated municipalities and public authorities, as defined by G.S. 159-7, are eligible applicants.

A local government can request a maximum of \$500,000 with each application. An applicant must match the grant dollar-for-dollar, 50% of the total cost of the project, and may contribute more than 50%. The appraised value of land to be donated to the applicant can be used as part of the match. The value of in-kind services, such as volunteer work, cannot be used as part of the match.

More information: [http://www.ncparks.gov/About/grants/partf\\_main.php](http://www.ncparks.gov/About/grants/partf_main.php)

### SAFE ROUTES TO SCHOOL PROGRAM (MANAGED BY NCDOT, DBPT)

The NCDOT Safe Routes to School Program is a federally funded program that was initiated by the passing of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005, which establishes a national SRTS program to distribute funding and institutional support to implement SRTS programs in states and communities across the country. SRTS programs facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools. The Division of Bicycle and Pedestrian Transportation at NCDOT is charged with disseminating SRTS funding.

The state of North Carolina was allocated \$15 million in Safe Routes to School funding for fiscal years 2005 through 2009 for infrastructure or non-infrastructure projects. In 2009, more than \$3.6 million went to 22 municipalities and local agencies for infrastructure and non-infrastructure projects. All proposed projects must relate to increasing walking or biking to and from an elementary or middle school. An example of a non-infrastructure project is an education or encouragement program to improve rates of walking and biking to school. An example of an infrastructure project is construction of sidewalks around a school. Infrastructure improvements under this program must be made within 2

miles of an elementary or middle school. The state requires the completion of a competitive application to apply for funding.

For more information, visit [www.ncdot.org/programs/safeRoutes/](http://www.ncdot.org/programs/safeRoutes/) or contact DBPT/NCDOT, (919) 807-0774.

### RIVERS, TRAILS AND CONSERVATION ASSISTANCE PROGRAM

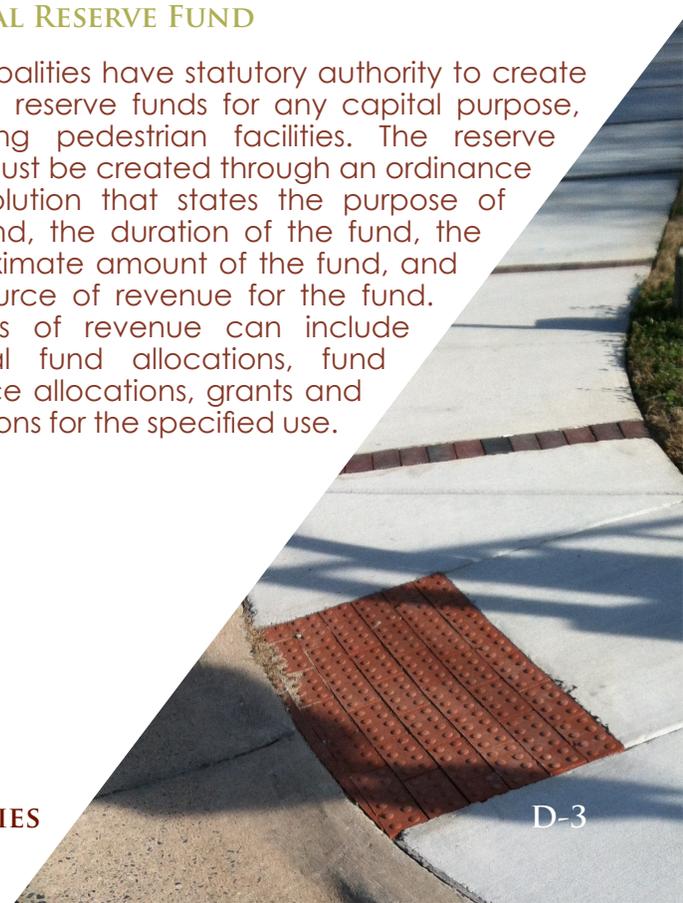
The Rivers, Trails and Conservation Assistance Program (RTCA) is a National Park Service program which provides technical assistance via direct staff involvement, to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program provides only for planning assistance—there are no implementation funds available. Projects are prioritized for assistance based on criteria that include conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments.

## LOCAL GOVERNMENT

Local funding sources that would support bicycle and pedestrian facility project construction will most likely be limited but should be explored.

### CAPITAL RESERVE FUND

Municipalities have statutory authority to create capital reserve funds for any capital purpose, including pedestrian facilities. The reserve fund must be created through an ordinance or resolution that states the purpose of the fund, the duration of the fund, the approximate amount of the fund, and the source of revenue for the fund. Sources of revenue can include general fund allocations, fund balance allocations, grants and donations for the specified use.





**CAPITAL PROJECT ORDINANCES**

Municipalities can pass Capital Project Ordinances that are project specific. The ordinance identifies and makes appropriations for the project.

**MUNICIPAL SERVICE DISTRICT**

Municipalities have statutory authority to establish municipal service districts, to levy a property tax in the district additional to the city-wide property tax, and to use the proceeds to provide services in the district. Downtown revitalization projects are one of the eligible uses of service districts, and can include projects such as street, sidewalk, or bikeway improvements within the downtown taxing district.

**TAX INCREMENT FINANCING**

Project Development Financing bonds, also known as Tax Increment Financing (TIF) is a relatively new tool in North Carolina, allowing localities to use future gains in taxes to finance the current improvements that will create those gains. When a public project (e.g., sidewalk improvements) is constructed, surrounding property values generally increase and encourage surrounding development or redevelopment. The increased tax revenues are then dedicated to finance the debt created by the original public improvement project. Streets, streetscapes, and sidewalk improvements are specifically authorized for TIF funding in North Carolina. Tax Increment Financing typically occurs within designated development financing districts that meet certain economic criteria that are approved by a local governing body. TIF funds are generally spent inside the boundaries of the TIF district, but they can also be spent outside the district if necessary to encourage development within it.

**OTHER LOCAL FUNDING OPTIONS**

- Bonds/Loans
- Taxes, impact fees
- Partnerships
- Installment purchase financing

**PRIVATE AND NON-PROFIT SECTORS**

Many communities have solicited greenway funding assistance from private foundations and other conservation-minded benefactors. Below are several examples of private funding opportunities available.

**LAND FOR TOMORROW CAMPAIGN**

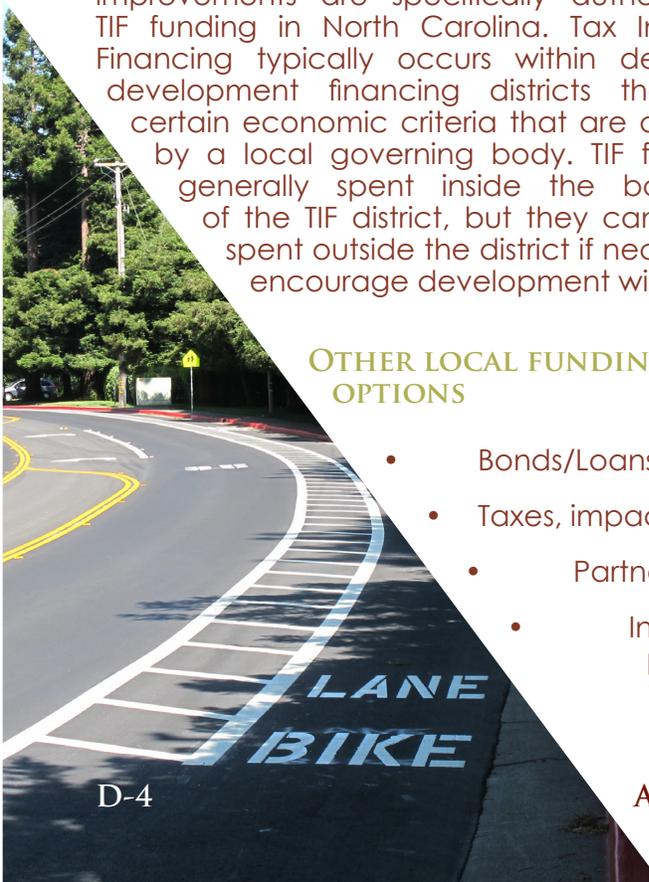
Land for Tomorrow is a diverse partnership of businesses, conservationists, farmers, environmental groups, health professionals and community groups committed to securing support from the public and General Assembly for protecting land, water and historic places. The campaign is asking the North Carolina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

Website: <http://www.land4tomorrow.org/>

**THE ROBERT WOOD JOHNSON FOUNDATION**

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

- To assure that all Americans have access to basic health care at a reasonable cost
- To improve care and support for people with chronic health conditions
- To promote healthy communities and lifestyles
- To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs
- For more specific information about what types of projects are funded and how to apply, visit [www.rwjf.org/applications/](http://www.rwjf.org/applications/).





## NORTH CAROLINA COMMUNITY FOUNDATION

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

Web site: <http://nccommunityfoundation.org/>

## Z. SMITH REYNOLDS FOUNDATION

This Winston-Salem-based foundation has been assisting the environmental projects of local governments and non-profits in North Carolina for many years. They have two grant cycles per year and generally do not fund land acquisition. However, they may be able to offer support in other areas of open space and greenways development.

More information is available at [www.zsr.org](http://www.zsr.org).

## BANK OF AMERICA CHARITABLE FOUNDATION, INC.

The Bank of America Charitable Foundation is one of the largest in the nation. The primary grants program is called Neighborhood Excellence, which seeks to identify critical issues in local communities. Another program that applies to greenways is the Community Development Programs, and specifically the Program Related Investments. This program targets low and moderate income communities and serves to encourage entrepreneurial business development.

Visit the web site for more information: [www.bankofamerica.com/foundation](http://www.bankofamerica.com/foundation).

## DUKE ENERGY FOUNDATION

Funded by Duke Energy shareholders, this non-profit organization makes charitable grants to selected non-profits or governmental subdivisions. Each annual grant must have:

- An internal Duke Energy business "sponsor"
- A clear business reason for making the contribution

The grant program has three focus areas: Environment and Energy Efficiency, Economic Development, and Community Vitality. Related to this project, the Foundation would support programs that support conservation, training and research around environmental and energy efficiency initiatives.

Web site: <http://www.duke-energy.com/community/foundation.asp>.

## AMERICAN GREENWAYS EASTMAN KODAK AWARDS

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

For more information visit The Conservation Fund's website at: [www.conservationfund.org](http://www.conservationfund.org).

## NATIONAL TRAILS FUND

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

Projects the American Hiking Society will consider include:



- Securing trail lands, including acquisition of trails and trail corridors, and the costs associated with acquiring conservation easements.
- Building and maintaining trails which will result in visible and substantial ease of access, improved hiker safety, and/or avoidance of environmental damage.
- Constituency building surrounding specific trail projects - including volunteer recruitment and support.

Web site: [www.americanhiking.org/alliance/fund.html](http://www.americanhiking.org/alliance/fund.html).

### THE CONSERVATION ALLIANCE

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to protect wild and natural areas. One hundred percent of its member companies' dues go directly to diverse, local community groups across the nation - groups like Southern Utah Wilderness Alliance, Alliance for the Wild Rockies, The Greater Yellowstone Coalition, the South Yuba River Citizens' League, RESTORE: The North Woods and the Sinkyo Wilderness Council (a Native American-owned/operated wilderness park). For these groups, who seek to protect the last great wild lands and waterways from resource extraction and commercial development, the Alliance's grants are substantial in size (about \$35,000 each), and have often made the difference between success and defeat.

Since its inception in 1989, The Conservation Alliance has contributed \$4,775,059 to grassroots environmental groups across the nation, and its member companies are proud of the results: To date the groups funded have saved over 34 million acres of wild lands and 14 dams have been either prevented or removed - all through grassroots community efforts.

The Conservation Alliance is a unique funding source for grassroots environmental groups. It is the only

environmental grant maker whose funds come from a potent yet largely untapped constituency for protection of ecosystems - the non-motorized outdoor recreation industry and its customers. This industry has great incentive to protect the places in which people use the clothing, hiking boots, tents and backpacks it sells. The industry is also uniquely positioned to educate outdoor enthusiasts about threats to wild places, and engage them to take action. Finally, when it comes to decision-makers - especially those in the Forest Service, National Park Service, and Bureau of Land Management, this industry has clout - an important tool that small advocacy groups can wield.

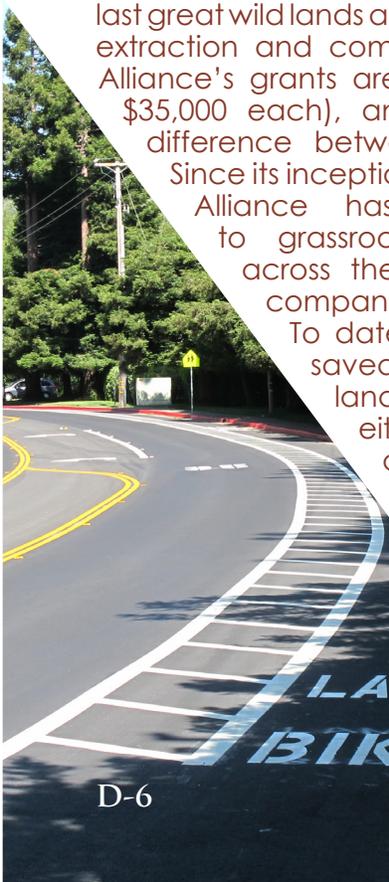
The Conservation Alliance Funding Criteria: The Project should be focused primarily on direct citizen action to protect and enhance our natural resources for recreation. We're not looking for mainstream education or scientific research projects, but rather for active campaigns. All projects should be quantifiable, with specific goals, objectives and action plans and should include a measure for evaluating success. The project should have a good chance for closure or significant measurable results over a fairly short term (one to two years). Funding emphasis may not be on general operating expenses or staff payroll.

Web site: [www.conservationalliance.com/index](http://www.conservationalliance.com/index)

### NATIONAL FISH AND WILDLIFE FOUNDATION (NFWF)

The National Fish and Wildlife Foundation (NFWF) is a private, nonprofit, tax-exempt organization chartered by Congress in 1984. The National Fish and Wildlife Foundation sustains, restores, and enhances the Nation's fish, wildlife, plants and habitats. Through leadership conservation investments with public and private partners, the Foundation is dedicated to achieving maximum conservation impact by developing and applying best practices and innovative methods for measurable outcomes.

The Foundation awards matching grants under its Keystone Initiatives to achieve measurable outcomes in the conservation of fish, wildlife, plants and the habitats on which they depend. Awards are made on a competitive basis to eligible grant recipients, including federal, tribal, state, and local governments, educational institutions, and non-profit conservation organizations. Project proposals are received on a year-round, revolving basis with two decision cycles per year. Grants generally range from \$50,000-\$300,000



and typically require a minimum 2:1 non-federal match.

Funding priorities include bird, fish, marine/coastal, and wildlife and habitat conservation. Other projects that are considered include controlling invasive species, enhancing delivery of ecosystem services in agricultural systems, minimizing the impact on wildlife of emerging energy sources, and developing future conservation leaders and professionals.

Website: <http://www.nfwf.org/AM/Template.cfm?Section=Grants> where additional grant programs are described.

### THE TRUST FOR PUBLIC LAND

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

- Create urban parks, gardens, greenways, and riverways.
- Build livable communities by setting aside open space in the path of growth.

Conserve land for watershed protection, scenic beauty, and close-to home recreation safeguard the character of communities by preserving historic landmarks and landscapes.

#### The following are TPL's Conservation Services:

**Conservation Vision:** TPL helps agencies and communities define conservation priorities, identify lands to be protected, and plan networks of conserved land that meet public need.

**Conservation Finance:** TPL helps agencies and communities identify and raise funds for conservation from federal, state, local, and philanthropic sources.

**Conservation Transactions:** TPL helps structure, negotiate, and complete land transactions that create parks, playgrounds, and protected natural areas.

**Research and Education:** TPL acquires and shares knowledge of conservation issues and techniques to improve the practice of conservation and

promote its public benefits.

Since 1972, TPL has worked with willing landowners, community groups, and national, state, and local agencies to complete more than 3,000 land conservation projects in 46 states, protecting more than 2 million acres. Since 1994, TPL has helped states and communities craft and pass over 330 ballot measures, generating almost \$25 billion in new conservation-related funding.

For more information, visit [www.tpl.org/](http://www.tpl.org/).

### BLUECROSS BLUESHIELD OF NORTH CAROLINA FOUNDATION (BCBS)

Blue Cross Blue Shield (BCBS) focuses on programs that use an outcome approach to improve the health and well-being of residents. The Health of Vulnerable Populations grants program focuses on improving health outcomes for at-risk populations. The Healthy Active Communities grant concentrates on increased physical activity and healthy eating habits. Eligible grant applicants must be located in North Carolina, be able to provide recent tax forms and, depending on the size of the nonprofit, provide an audit.

<http://www.bcbsncfoundation.org/>

### ALLIANCE FOR BIKING & WALKING: ADVOCACY ADVANCE GRANTS

Bicycle and pedestrian advocacy organizations play the most important role in improving and increasing biking and walking in local communities, states, and provinces. Advocacy Advance Grants enable state and local bicycle and pedestrian advocacy organizations to develop, transform, and provide innovative strategies in their communities. Thanks to remarkable support from SRAM, Planet Bike, and Bikes Belong, the Alliance for Biking & Walking has awarded more than \$500,000 in direct grants, technical assistance and scholarships to advocacy organizations across North America since the Advocacy Advance Grant program's inception. In 2009 and 2010, these one-year grants were awarded twice annually to startup



organizations and innovative campaigns to dramatically increase biking and walking. Through the Advocacy Advance Partnership with the League of American Bicyclists, the Alliance also provided necessary technical assistance, coaching, and training to supplement the grants.

For more information, visit [www.peoplepoweredmovement.org](http://www.peoplepoweredmovement.org)

### LOCAL TRAIL SPONSORS

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

### VOLUNTEER WORK

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

# E

# PUBLIC INVOLVEMENT

## APPENDIX OUTLINE

OVERVIEW (E-1) | PUBLIC WORKSHOPS (E-1) | CITIZENS & STATE-BASED STEERING COMMITTEE (E-1) | PUBLIC SURVEY (E-7)

## OVERVIEW

In order to gain local knowledge and input, a public outreach component was included as an integral part of planning efforts for the Mount Holly Comprehensive Pedestrian Plan. Public input was gathered through several different means including the following: Steering Committee meetings, a project website, an online survey form, and two public workshops. This offered the representatives and residents of Mount Holly opportunities to contribute to the Plan's development.

Steering Committee meetings were held throughout the planning process with representatives from Mount Holly, NCDOT, and the community. These took place to establish visions and goals for this effort. Committee members also identified key opportunities and strategies for improving the pedestrian system in their community.

## PUBLIC WORKSHOPS

Two public engagement sessions were conducted during the planning process. The first opportunity was a public open house at the Mount Holly Community Center on March 19, 2013. This initial public input session sought to gather preliminary input from citizens to assist in the development of draft recommendations for the plan. The second public engagement event was held May 11, 2013 at the Mount Holly Springfest where draft recommendations were presented to the public and public feedback was received from City residents.

At the public meetings, public input was taken in the form of map markups, written comments, question and answer sessions; and discussions between citizens, Consultant staff, and City staff. In addition, a hardcopy public survey was developed and distributed for hand written responses at the meetings.

## CITIZEN & STAFF-BASED STEERING COMMITTEE

The Steering Committee, composed of residents, City staff, NCDOT staff, and other key representatives met four times during the planning process. The group established visions and goals for the Plan, identified areas of need in the Mount Holly area, and reviewed the Plan. Members of the Steering Committee marked up maps and identified pedestrian problem areas and possible solutions. The goals are listed in **Chapter 1** and input from the Steering Committee is reflected throughout the recommendations of this planning document. The Steering Committee also provided comments on the Draft Plan. These comments led to revisions made by the Consultant in the development of the Final Plan. A summary of the Steering Committee meetings is provided in the following pages.





PO Box 2453  
108 S. Main Street, Suite B (physical) | P.O. Box 2453 (mailing)  
Davidson, NC 28036  
(704) 255-6200 phone  
[www.altaplanning.com](http://www.altaplanning.com)  
Transportation | Recreation | Innovation

Date: January 18, 2013

To: Brian DuPont, City Mount Holly Planning & Zoning

From: John Cock and Maya Agarwal, Alta Planning + Design

**Re: Mount Holly Comprehensive Pedestrian Plan, Steering Committee Meeting #1 Notes 01/15/2013**

---

**City of Mount Holly Comprehensive Pedestrian Plan**

Steering Committee Meeting #1

Date: January 15, 2013

Mount Holly Municipal Complex Training Room

Time: 6:00pm

**Introductions -** John Cock, Principal – Alta/Greenways  
Scott Adams, Transportation Planner - STV/Ralph Whitehead Associates

**Steering Committee Members and others in attendance (Economic Development Commission):**

Brian DuPont, Mt. Holly Planning

Hank Graham, Gaston MPO

Jonathan Wilson, Mt. Holly Planning

Thomas Bell, Mt. Holly Police Dept.

Mark Jusko, Mt. Holly Parks & Rec

Wendy Foster, MHTDA

Jason Gowen, Mt. Holly City Council

Lauren Shoemaker, Mt. Holly Community Development Foundation

Perry Toomey, Mt. Holly City Council

Billy Rick, EDC

Ann Danzi, EDC

Greg Beal, City of Mt. Holly Planning

James Allen, EDC

Danny Jackson, City Manager of Mt. Holly

Taylor Marcantel, Gaston MPO

David Kiser, Eden Group (EDC)

Presentation of Planning Process and Scope – Alta/Greenways

- Purpose of plan and role of Steering Committee



## MT. HOLLY COMP. PED PLAN STEERING COMMITTEE MEETING #1 NOTES JAN. 15, 2013

- Communication process/protocol
- Intended schedule for Steering Committee participation
- Project Overview, Scope, and Process
- Project Schedule
- Q&A about project and process
- Preliminary understanding of opportunities and challenges based on existing plans/projects

## Work Session

- Visions and Goals for pedestrian facilities in Mount Holly
  - **Increased pedestrian access to key destinations**
    - Parks: (e.g., Sidewalks on Tuckaseegee Rd, Woodlawn, etc.)
    - Schools need sidewalk connectivity
    - 1 grocery store: difficult ped access and area around 273 and towards downtown (a lot of ped access to grocery)
    - Pedestrian connections to transit (including express bus stop in Belmont)
  - **Improved Infrastructure**
    - West Catawba and West Central need sidewalks
    - Catawba sidewalk is narrow and in bad repair (poles in sidewalk)
    - Craig Street: people driving on motorized wheelchairs in the road; no sidewalks
    - Hilton Head meandering walkways/greenways. Old NC27: can't get to town; look at other ped connection opportunities besides just sidewalks;
    - (Woodlawn Drive: no sidewalks going west)
    - Reduce traffic around schools by increasing walking
    - Increase safety at higher traffic areas (e.g., Food Lion)
  - **Pedestrian Education:**
    - More cost effective; educate children who will educate parents and support initiatives (currently do bike safety, stranger danger, gun safety, reading)
    - Health and wellness; help people understand
    - Educate peds to walk on sidewalks vs. street and on sidewalk etiquette
  - **Connectivity:**
    - Bringing neighborhoods together;
    - Bringing people downtown
    - Tie Catawba Heights to downtown: sidewalks (at least) and bicycle facilities; make community feel more connected
    - Connect neighborhoods (e.g., Riverfront; hard to connect to Tuck park – currently have to drive): no connectivity outside of neighborhoods
    - Using NC 27 as future ped/greenway crossing of river as an alternate to river crossing at waste water facility; like to see further study in the plan
      - Reventure willing to donate land on the Mecklenburg side for connection

## MT. HOLLY COMP. PED PLAN STEERING COMMITTEE MEETING #1 NOTES JAN. 15, 2013

- Generate more foot traffic downtown: Connect to outlying areas, neighborhoods around, outside of downtown
  - **Encouragement**
    - Map and guide; walking routes, destinations, parking areas for fitness walkers
    - (Kiosk component in the current wayfinding effort)
  - **Policy/Implementation Goals/Objectives**
    - MPO needs recommendations that connect to adjacent communities (easier to fund): greenways, sidewalks on major thoroughfares; safety improvements; complete street policy recommendations; incorporate into LRTP; MPO will be able to help seek grants for projects
      - Pedestrian bridge across River may be cheaper if not carrying wastewater pipes (Land Design did concepts; could be revised; in MPO project list)
      - Need prioritized projects
    - Commercial sidewalk requirements will lead to gaps in system; need funds to fill in gaps
    - Need plan to justify regulatory and other projects
- Mapping Exercise
  - **Specific Pedestrian Issues/Needs**
    - Hwy 27 from Main to Hawthorne: needs sidewalk
    - Cooperation from the State when putting in sidewalks; implementation process
    - A lot peds on west side of 273 near CMC (north of interstate)
  - **Destinations**
    - Schools
    - Parks, Mtn Island Park
    - Grocery Store (Food Lion)
    - Downtown
    - Greenway trailheads and greenways
    - Industrial Park (planned east of town; off of N. Main; behind National Gypsum)
    - YMCA (incl. connection to Belmont Abbey; students get memberships as part of tuition)
  - Opportunities/Challenges

## Next Steps and Scheduling

- Steering Committee Meetings
  - March 19 (tentative)
- Public Meetings
  - Consider March 19 in conjunction with Steering Committee meeting; do meeting as drop in style on same night as committee meeting (consider ~ 4-7pm)
  - 2<sup>nd</sup> public meeting at May 11 Spring Fest; table in conjunction with public agency tent
- Other
  - Send copy of presentation to Brian to send to committee.



PO Box 2453  
108 S. Main Street, Suite B (physical) | P.O. Box 2453 (mailing)  
Davidson, NC 28036  
(704) 255-6200 phone  
[www.altaplanning.com](http://www.altaplanning.com)  
Transportation | Recreation | Innovation

Date: March 27, 2013

To: Brian DuPont, City of Mount Holly Planning & Zoning

From: John Cock and Maya Agarwal, Alta Planning + Design

**Re: Mount Holly Comprehensive Pedestrian Plan, Steering Committee Meeting #2 Notes 03/19/2013**

---

City of Mount Holly Comprehensive Pedestrian Plan  
Steering Committee Meeting #2  
Date: March 19, 2013  
Mount Holly Municipal Complex Training Room  
Time: 6:00pm

**Steering Committee Members and others in attendance (Economic Development Commission):**

Brian DuPont, City of Mt. Holly Planning  
Jason Gowen, Mt. Holly City Council  
Perry Toomey, Mt. Holly City Council  
James Allen, EDC  
Taylor Marcantel, Gaston MPO  
Mark Jusko, Mt. Holly Parks & Rec  
Thomas Bell, Mt. Holly Police Dept.  
Danny Jackson, City Manager of Mt. Holly  
Greg Beal, City of Mt. Holly Planning  
Lauren Shoemaker, Mt. Holly Community Development Foundation  
David Keilson, NCDOT

Project Update Presentation – Alta/Greenways, STV/Ralph Whitehead

- Review of Field Work Evaluation
  - Existing Conditions Map
  - Existing Conditions Assessment
  - Opportunities and Challenges
  - Intersection Evaluation
- Preliminary Demographic Analysis
- Highway 27 Roadway Improvements
  - Preliminary Findings and Analysis

## MT. HOLLY COMP. PED PLAN STEERING COMMITTEE MEETING #2 NOTES MARCH 19, 2013

## Public Engagement Update &amp; Strategies

- Public Survey
- “Live” Project Website
- Public Engagement Event #1: today’s event
- Public Engagement Event #2: Mount Holly Springfest, May 11
  - Goals/Approach
  - Project information card
- Other Outreach Efforts

## Mt. Holly Pedestrian Plan Steering Committee feedback:

- Convenience stores as major destinations for foot traffic (identify on map)
- Need crossings near Dollar General on NC 27
  - Pedestrian death in the area in 2008 or 2009 (See article in grant application)
- Canoe access point off Mecklenburg Side of NC 27 (private property, but open to public with a fee?)
  - Alta/Greenways to check with STV regarding location
- NC 27 Roadway Improvements:
  - Existing plans for 6’ PS + 8’ Sidewalk on North side (hospital site); overhead lines in way of proposed large trees
  - NCDOT position on planting in median +planting strips?
  - Why two lanes out and 1 lane in? Message: easier to get out than in
  - Want to slow people down in corridor
  - Check out design concepts for streetscapes from linear park plan
    - City staff to provide plan



PO Box 2453  
108 S. Main Street, Suite B (physical) | P.O. Box 2453 (mailing)  
Davidson, NC 28036  
(704) 255-6200 phone  
[www.altaplanning.com](http://www.altaplanning.com)  
Transportation | Recreation | Innovation

Date: May 31, 2013

To: Brian DuPont, City of Mount Holly Planning & Zoning

From: John Cock and Maya Agarwal, Alta Planning + Design

**Re: Mount Holly Comprehensive Pedestrian Plan, Steering Committee Meeting #3 Notes 05/08/2013**

---

**City of Mount Holly Comprehensive Pedestrian Plan**

Steering Committee Meeting #3

Date: May 8, 2013

Mount Holly Municipal Complex Training Room

Time: 6:00pm

**Introductions -**

**Steering Committee Members and others in attendance (Economic Development Commission):**

- Brian DuPont, Mt. Holly Planning
- Greg Beal, City of Mt. Holly Planning
- Mark Jusko, Mt. Holly Parks & Rec
- Bob Mosher, NCDOT Division of Bicycle and Pedestrian Transportation
- Lauren Shoemaker, Mt. Holly Community Development Foundation
- Jonathan Wilson, City of Mount Holly Planning
- James Allen, EDC
- David Keilson, NCDOT
- Danny Jackson, City Manager of Mt. Holly

**Others in Attendance:**

- Billy Rick, EDC/RTR Renovations

**Project Update Presentation – Alta/Greenways**

- Overview of Mount Holly Pedestrian Plan (Draft)
- Comments during presentation:
- Change “Beatty Road” to “Beatty Drive”
- Charlotte Ave and Highland Ave: reason for sidewalk gaps:

## MT. HOLLY COMP. PED PLAN STEERING COMMITTEE MEETING #3 NOTES MAY 8, 2013

- Previous focus on completing crosswalk at Catawba Ave rather than W. Central Ave. This intersection was designed as part of a linear park plan – lack of funding prevented completion of sidewalk
- Addition of HAWK (High-Intensity Activated crossWalK beacon) should be studied at YMCA midblock crossing.
- Powell Funds – A certain percentage could be used for sidewalk repair. Can only use for City streets.
  - Each year the City has a list of paving (resurfacing) projects. Can the city save money by building sidewalk at the same time?

**Next Steps and Scheduling, to be confirmed:**

- Steering Committee's comments on draft plan due to Brian by end of May 2013. Brian will compile one set of comments and will send to the consultant.
- Prepare final plan (Alta)
- June 24, 2013 City Council work session: present plan to Council
- Present final plan to the Mount Holly City Council, August 12, 2013.
  - City would likely adopt the plan

**Questions from the Steering Committee:**

Q1: What is the horizon for projects?

A1: Plan needs to be revisited in 5 years. Priority projects could be focused on in next 5 years.

Q2: Do you show sidewalks that only need improvement such as the sidewalk isn't ADA accessible.

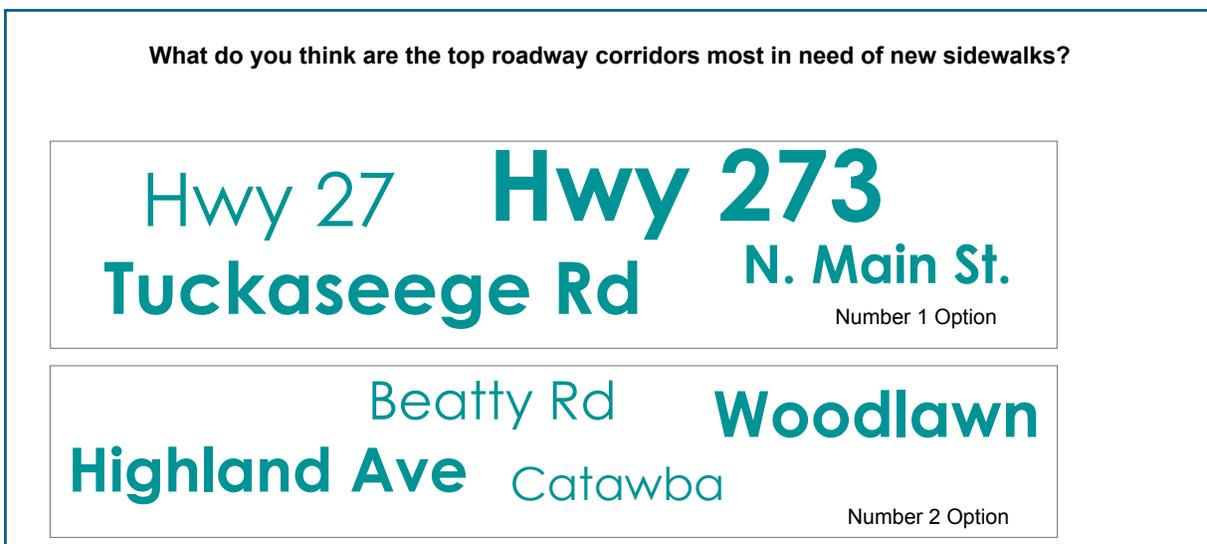
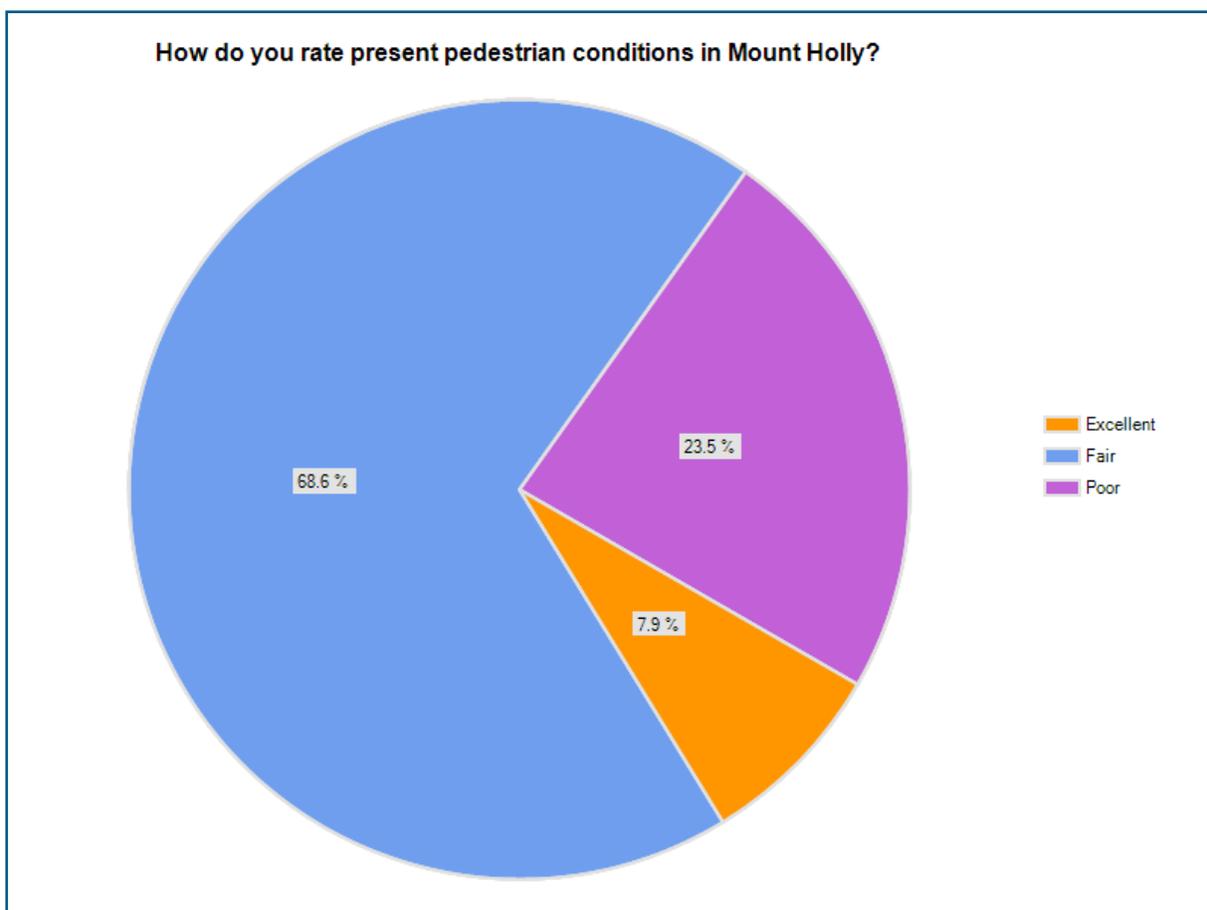
A2: We identified sidewalks that need ADA accessibility.



## PUBLIC SURVEY

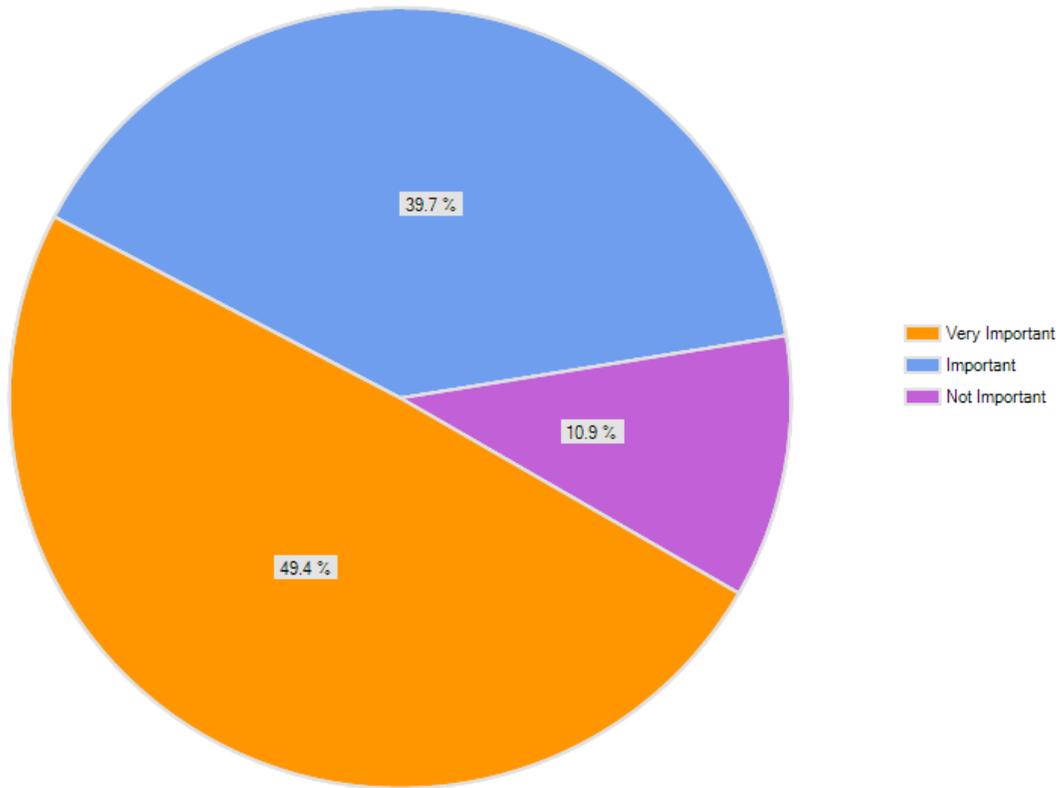
A public survey was developed for Mount Holly during this process and made available in both hardcopy and online form. The survey was available online throughout the duration of the project. To maximize the responses to the survey, the web address was distributed at the public meeting, to local interest groups, in newsletters. A total of 338 surveys were completed during the data collection period.

The final survey results shown on the following pages have been tabulated by the Consultant to provide insight into local residents' opinions and values. Feedback received through the survey served as a guide in the development of the recommendations included in this Plan.

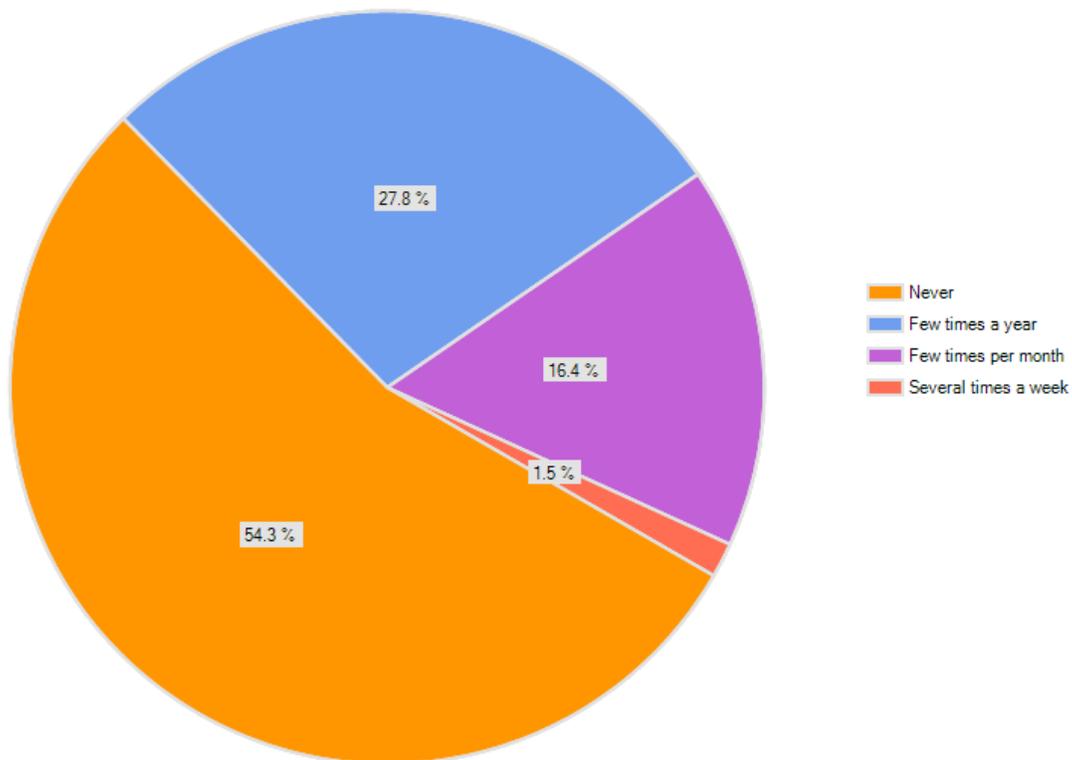




How important to you is improving walking conditions in Mount Holly?

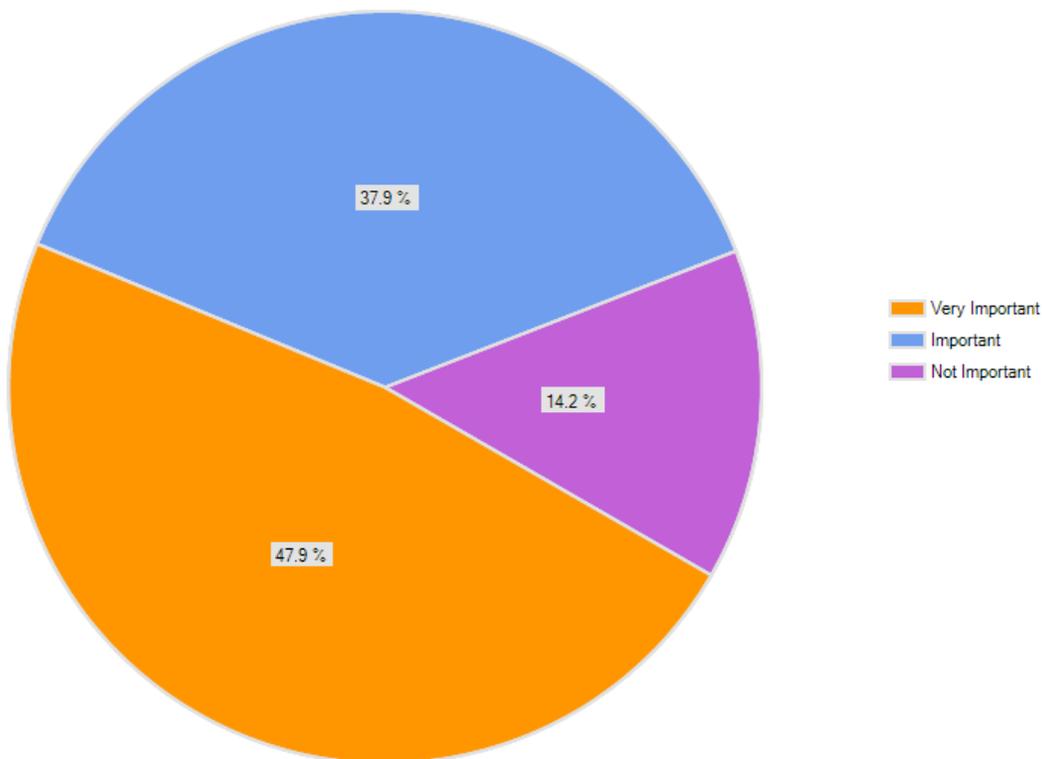


How often do you use a greenway now? (e.g., the Catawba River Greenway)

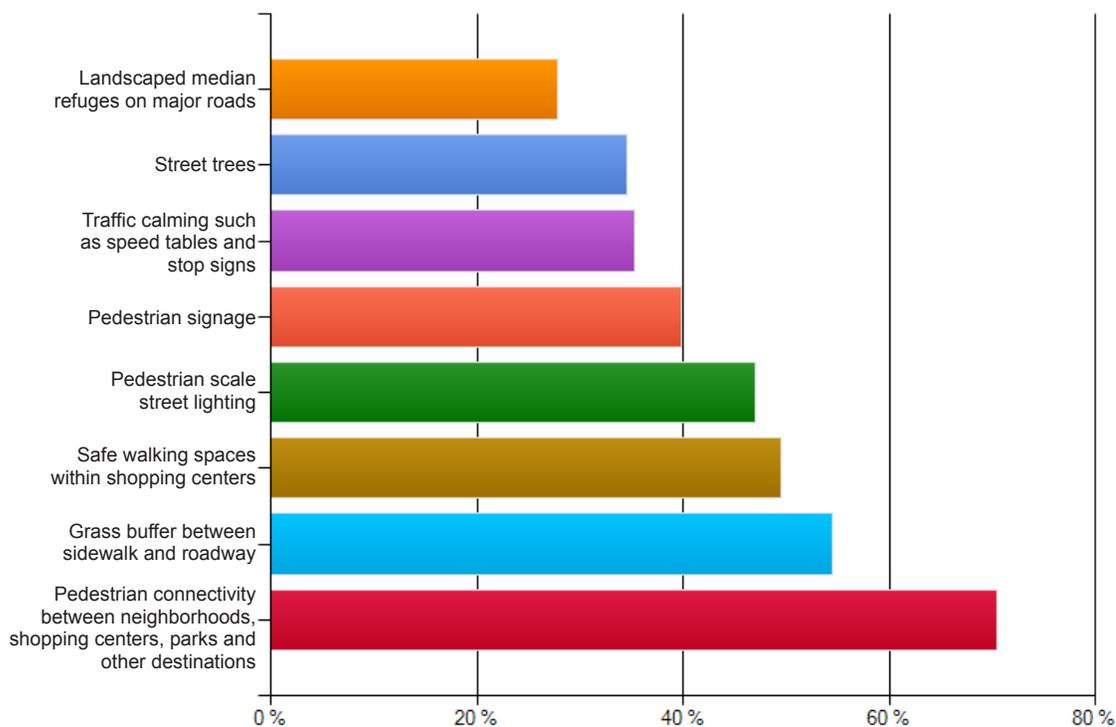


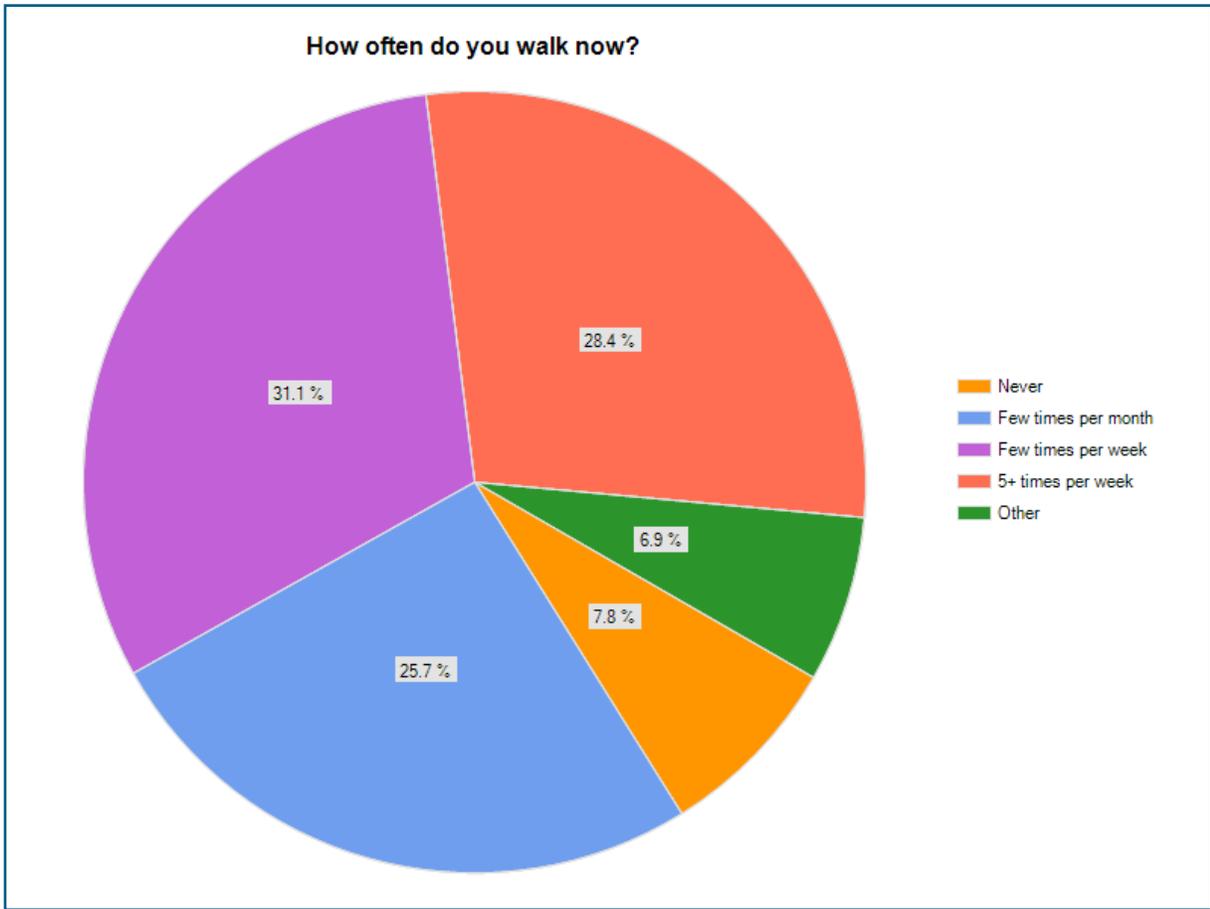
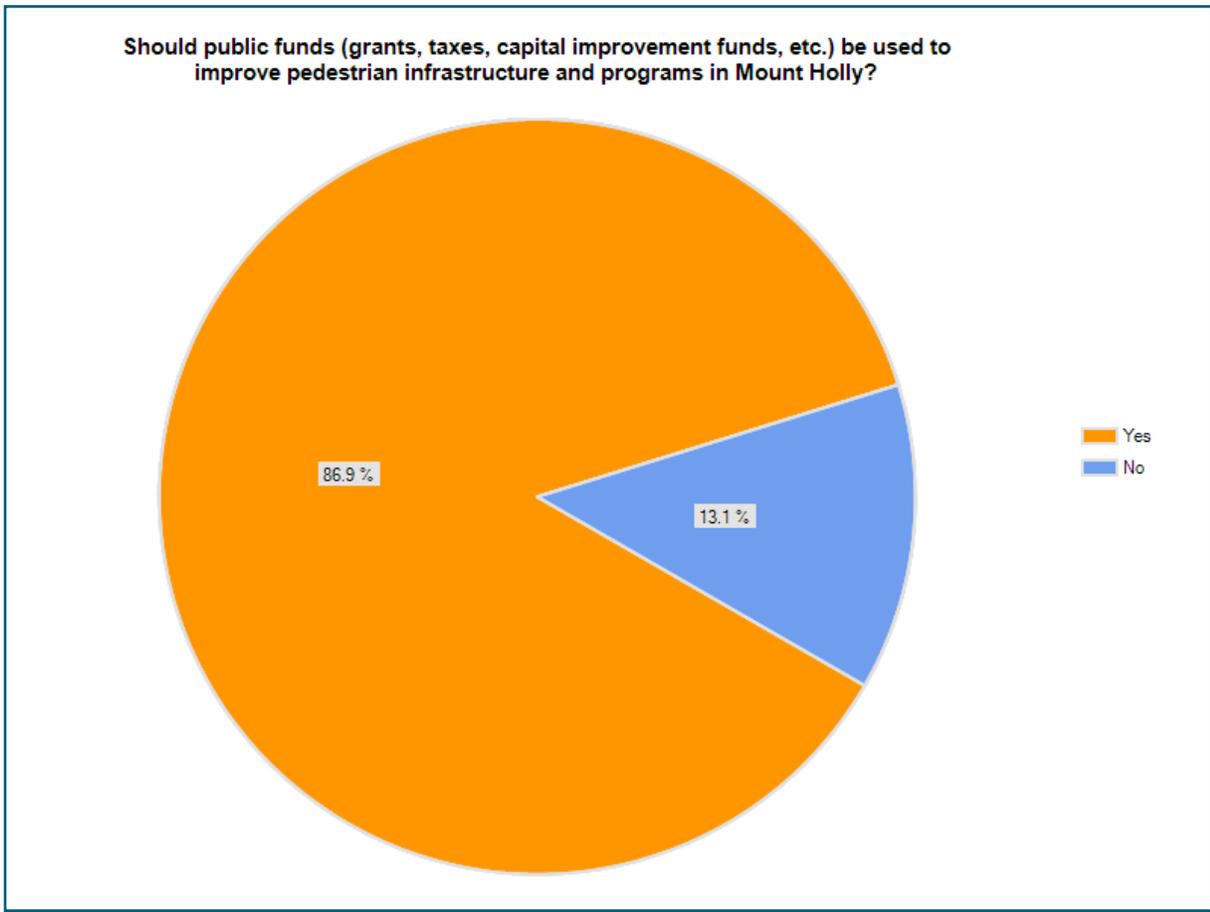


How important to you is the goal of creating more greenways in Mount Holly? Select one.



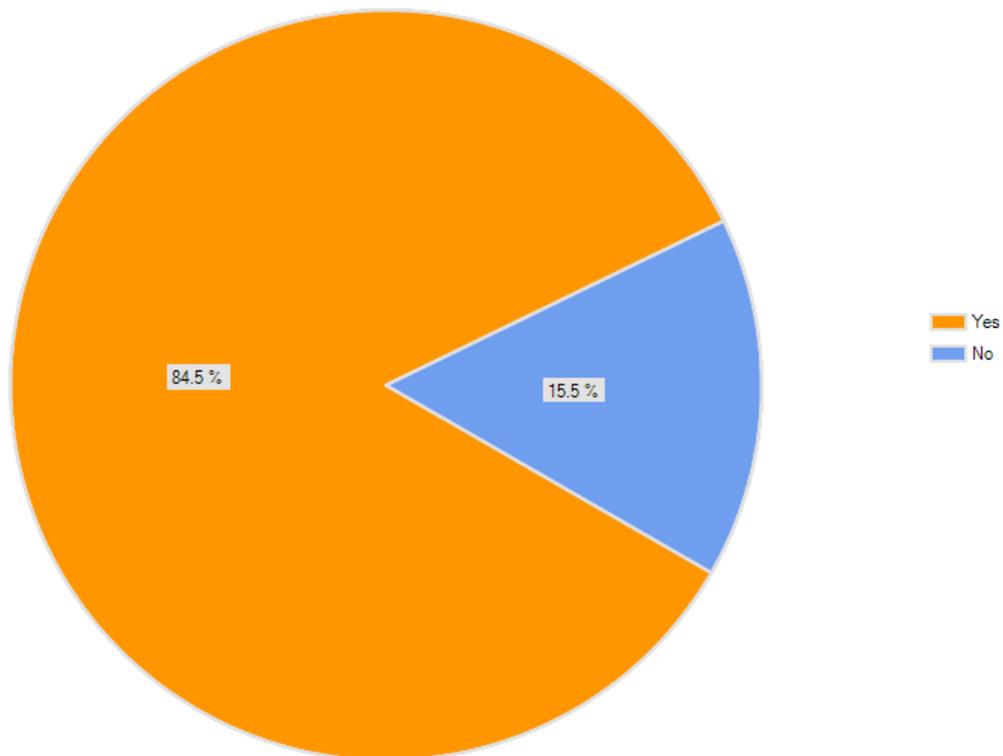
Which pedestrian design requirements should be required with future construction, reconstruction of new or existing roadway, and/or land development or redevelopment? (select all that apply)



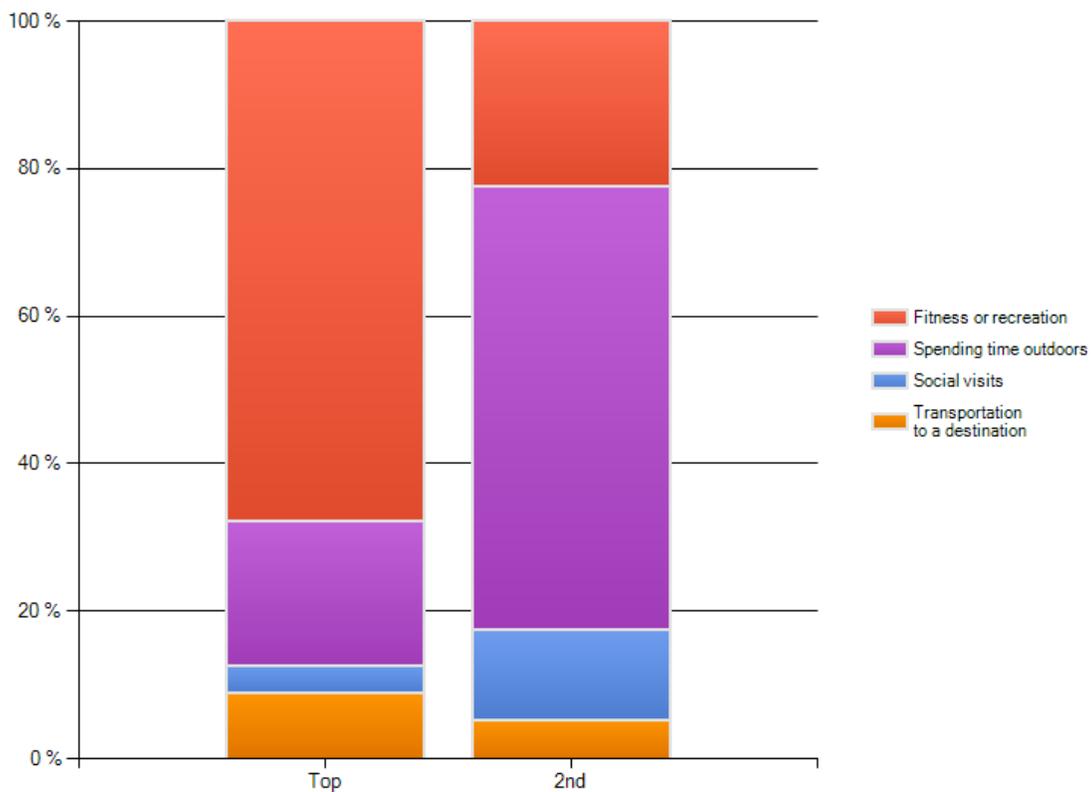


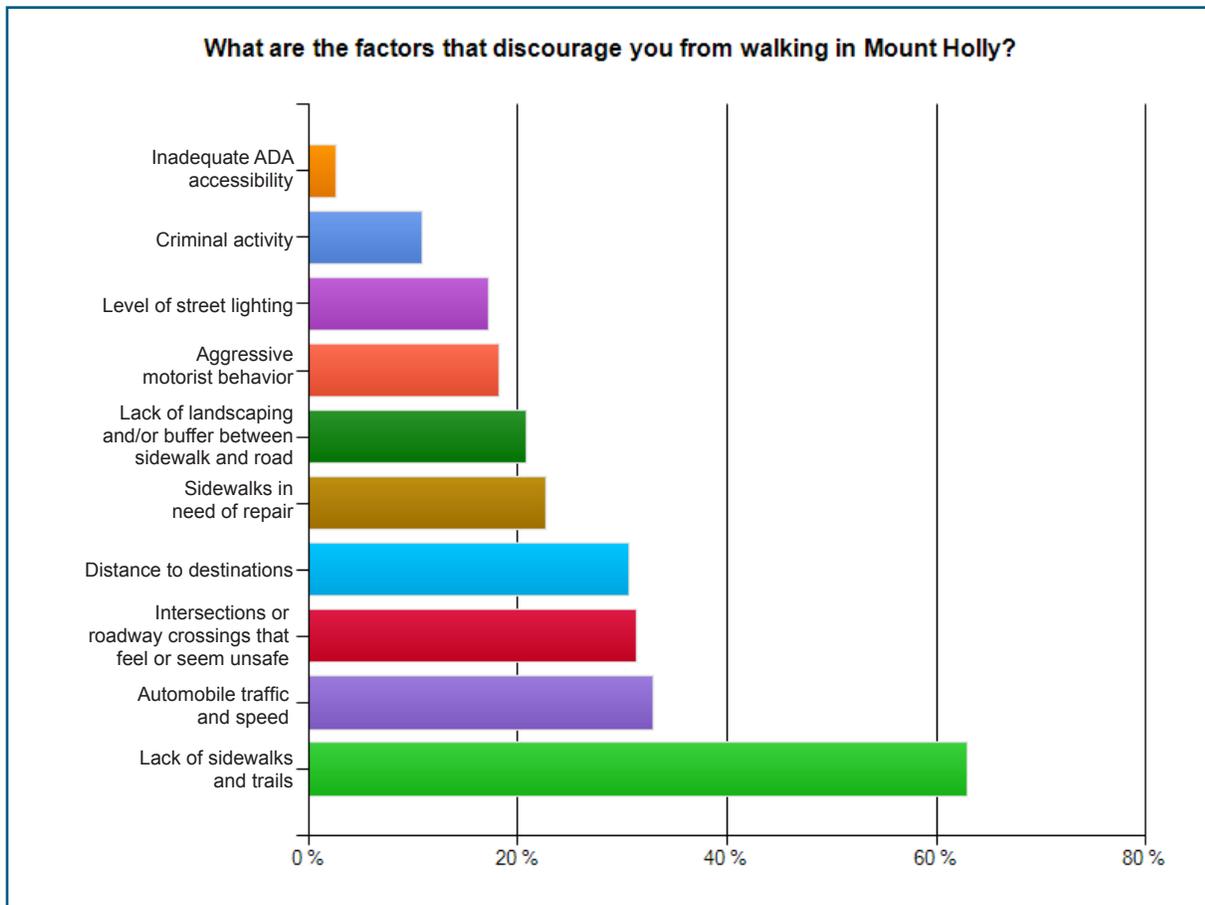
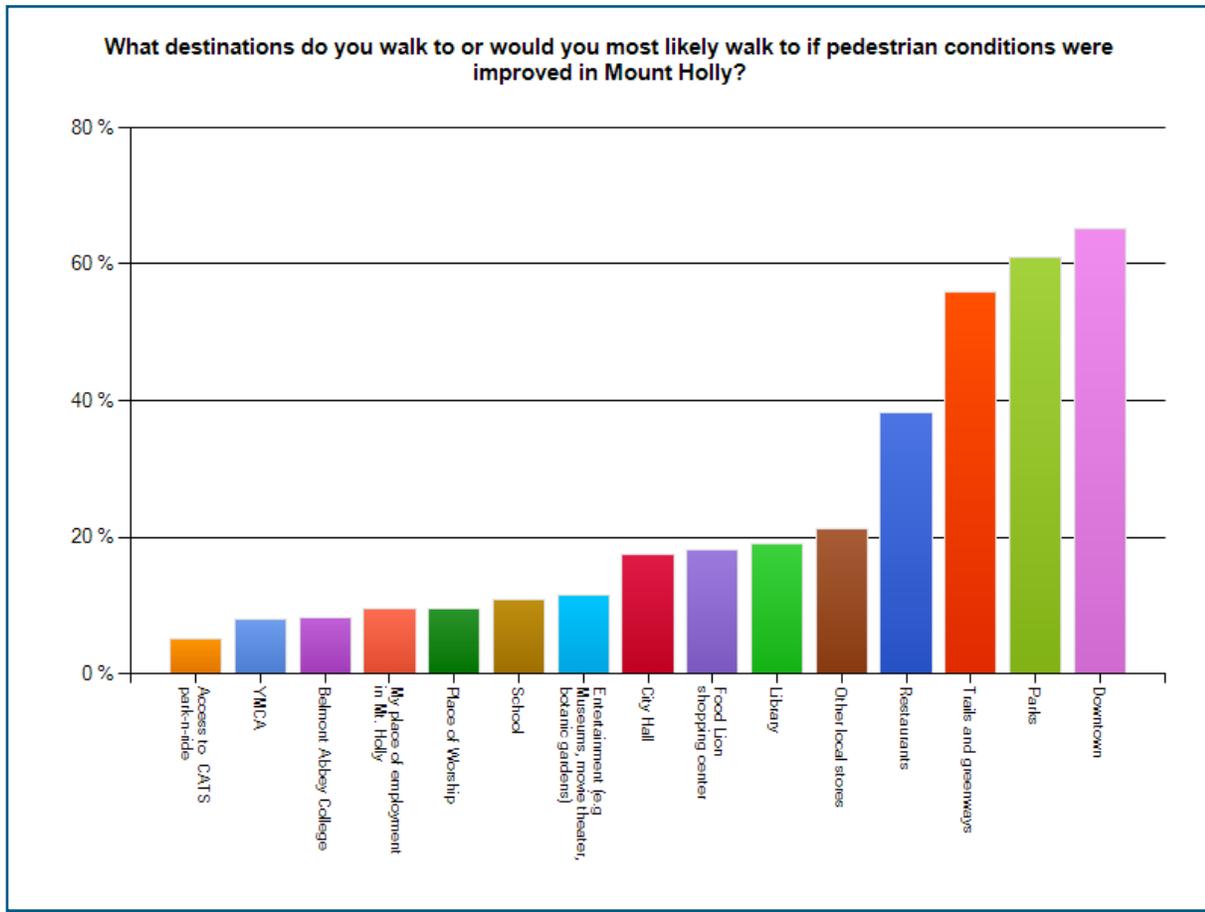


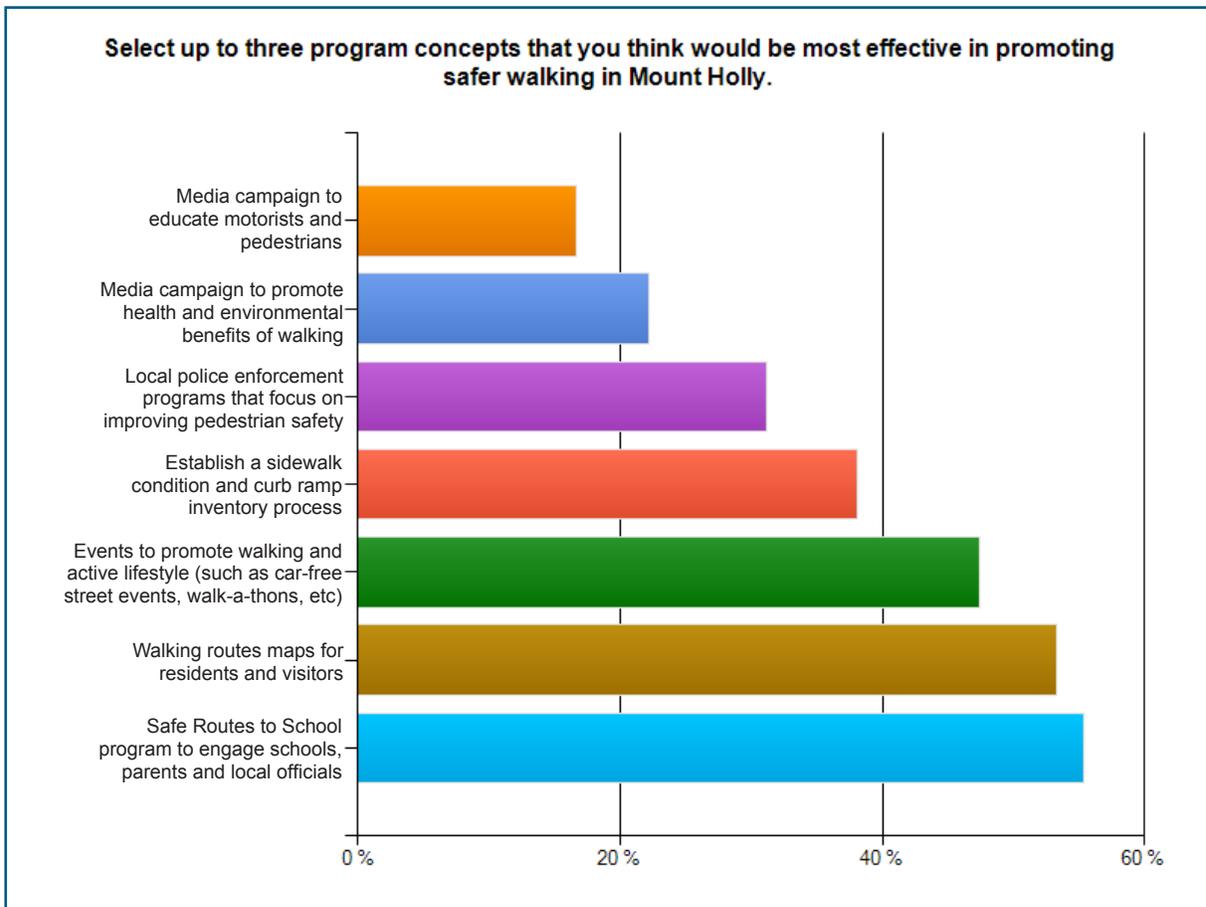
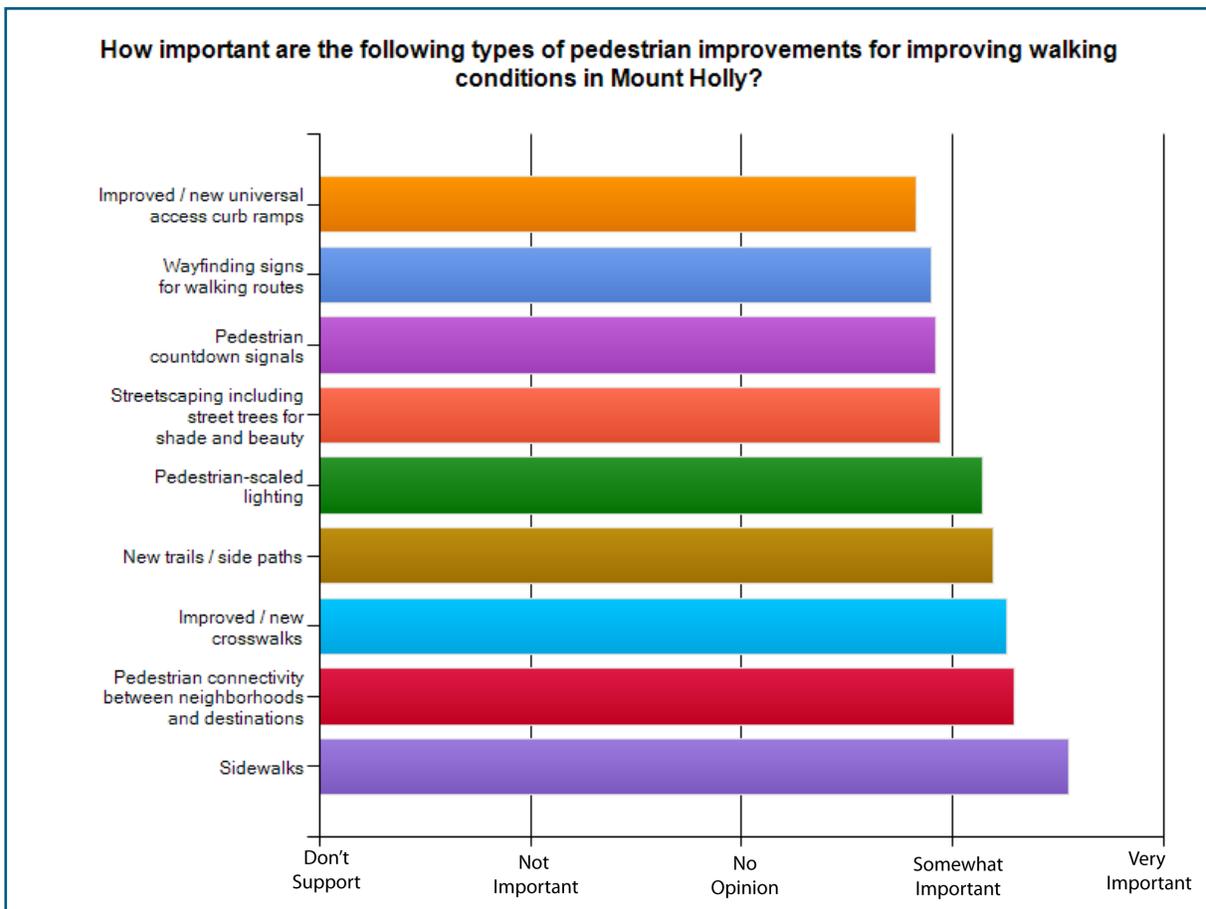
Would you walk more often if more sidewalks, trails and safe roadway crossings were provided for pedestrians?



What are the top (2) most common reasons why you walk?









This page intentionally left blank



The City of Mount Holly would like to invite you to a public meeting on **March 19th from 4 to 7 PM** at the Mount Holly Municipal Complex.

The event will be drop-in format and please bring your kids. We want your input on how to improve walking and pedestrian activities around your schools, homes, and businesses.

Also, please go to [www.mtholly.us](http://www.mtholly.us) where you can take an online survey.

Date: March 19th

Time: Drop-In 4 to 7 PM  
400 E. Central Avenue: Mount  
Holly Municipal Complex

City Of Mount Holly

Planning & Development  
704-827-3931

