Laurinburg Walks:
A Plan for Health & Mobility

City of Laurinburg, NC

Adopted: April 2015

Division of Bicycle & Pedestrian Transportation

Prepared by:

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Communities Transforming
For a healthier North Carolina

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Table of Contents

Chapter 1: Introduction

Purpose 1-1
Background 1-2
Vision and Goals....1-2
  Vision Statement 1-2
  Goals 1-2
Process....1-3
  Public Involvement....1-3
  Plan Development 1-3
Health Benefits of Walking....1-4
  Historical Context of Planning & Public Health 1-4
  Walking for Health 1-4
  Changing Priorities 1-5
Economic Benefits of Walking 1-6

Chapter 2: Community Profile

Introduction 2-1
Population....2-1
Population by Age 2-1
Income....2-2
Mobility 2-3
  Means of Transportation to Work....2-3
  Household Vehicle Availability....2-4
Socioeconomic Status 2-5
Population Vulnerable to Chronic Disease 2-6
Health Concerns....2-7

Chapter 3: Existing Conditions

Introduction....3-1
Vehicular Roadway Network 3-1
Pedestrian Network 3-2
  Pedestrian Facilities 3-3
  Pedestrian Destinations 3-4
Pedestrian Crashes....3-6
Intersections....3-7
Pedestrian Network Strengths & Weaknesses....3-8
  Strengths 3-8
  Weaknesses....3-8
Existing Plans and Programs 3-8
  Downtown Development Plan....3-8
  Scotland Co. Vision Plan....3-8
  Scotland Co. Community Health Assessment....3-8
  Scotland Co. Comprehensive Transportation Plan 3-9
  WalkBikeNC....3-10
Education and Enforcement....3-10

Chapter 4: Network Recommendations

Introduction....4-1
Community Survey 4-1
Pedestrian Network Recommendations 4-1
Sidewalk Recommendations....4-2
Greenway Network Recommendations 4-6
Intersection Enhancements....4-9
  Enhancements – Intersection 1 4-9
  Enhancements – Intersection 2....4-10
  Enhancements – Intersection 3....4-11
  Enhancements – Intersection 4....4-12
  Enhancements – Intersection 5....4-13
  Enhancements – Intersection 6....4-14

Enhancements – Intersection 7 4-15
Enhancements – Intersection 8 4-16
Enhancements – Intersection 9 4-17
Enhancements – Intersection 10 4-18
Enhancements – Intersection 11 4-19
Enhancements – Intersection 12 4-20
Enhancements – Intersection 13 4-21
Enhancements – Intersection 14 4-22
Priority Pedestrian Projects 4-24
Priority Sidewalk Improvements 4-25
Priority Greenway Recommendations 4-26
Priority Intersection Enhancements 4-27
Conceptual Renderings 4-28

Chapter 5: Policies & Programs

Introduction 5-1
Unified Development Ordinance Revisions 5-1
Enforcement Recommendations 5-4
Program and Policy Recommendations 5-4
Let's Go NC 5-4
Walking Programs 5-4
"Watch for Me NC" Pedestrian Campaign 5-5
NCDOT School Crossing Guard Program 5-5
Active Routes to School Program 5-5
Complete Streets Policy 5-6
Methods for Developing Facilities 5-7
Restriping 5-7
Resurfacing 5-7
Roadway Construction and Reconstruction 5-7
Signage and Wayfinding Projects 5-7
Context Sensitive Design 5-8
Funding Sources 5-9
State Transportation Improvement Program 5-9
Strategic Transportation Initiatives 5-9
Safe Routes to School 5-10
Other NCDOT Funding 5-10
Pedestrian Capital Improvement Program 5-11
Other Funding Sources 5-11
Various State and Federal Policies 5-11
References 5-12

Chapter 6: Implementation

Introduction 6-1

Maps

Map 1: Regional Location 1-1
Map 2: 2010 Population Density 2-1
Map 3: 2010 Elderly Concentration 2-2
Map 4: 2010 Median Household Income 2-3
Map 5: 2010 Population Walking to Work 2-4
Map 6: Households with No Vehicle Available 2-5
Map 7: Socioeconomic Status 2-6
Map 8: Population Vulnerable to Chronic Disease 2-7
Map 9: Annual Average Daily Traffic 3-1
Map 10: Pedestrian Destinations 3-5
Map 11: Pedestrian Crashes 3-6
Map 12: Intersections of Concern 3-7
Map 13: Sidewalk Recommendations 4-2
Map 14a: Sidewalk Recommendations (North) 4-3
Map 14b: Sidewalk Recommendations (South) 4-3
Map 15: Recommended Greenway Network 4-7
Map 16: Priority Pedestrian Improvement Areas 4-24
Map 17: Priority Proposed Improvements 4-28

Figures

Figure1: Barriers to Pedestrian Travel 1-2
Figure 2: Plan project website..1-3
Figure 3: Population Walk to Work...1-4
Figure 4: Adolescent & Adult Obesity Rates 1-4
Figure 5: Potential Health Impacts 1-5
Figure 6: Potential Economic Impacts 1-6
Figure 7: Intersection of US15/401 and West Blvd 3-2
Figure 8: South Main Street 3-2
Figure 9: Retail Pedestrian Generator – West Blvd 3-3
Figure 10: Crosswalk Markings 3-3
Figure 11: Sidewalks – Historic Downtown..........................3-4
Figure 12: Retail Corridor – South Main Street....................3-4
Figure 13: Covington Elementary School entrance 3-6
Figure 14: US 1 – Carolina Connector....................................3-10
Figure 15: Typical 5-Foot Wide Concrete Sidewalk...........4-2
Figure 16: Example 10-Foot, Asphalt Multi-Use Path 4-7
Figure 17: S Main St and Church St 4-9
Figure 18: Biggs St and Church St...4-10
Figure 19: Atkinson St and Church St....................................4-11
Figure 20: Covington Elementary School 4-12
Figure 21: Example of School Crossing Sign........................4-13
Figure 22: Atkinson St and West Blvd 4-14
Figure 23: S Main St and Johns Rd...4-15
Figure 24: S Main St and Sunset Dr 4-16
Figure 25: West Blvd 4-17
Figure 26: West Blvd Overpass..4-18
Figure 27: Caledonia Rd and Pitt St...4-19
Figure 28: Caledonia Rd and College Dr...............................4-20
Figure 29: S Main St and Atkinson St......................................4-21
Figure 30: S Main St...4-22
Figure 31: S Main St and Lauchwood Dr 4-23
Figure 32: Conventional Approach 5-8
Figure 33: Context Sensitive Approach 5-8

Tables

Table 1: 2010 Means of Transportation to Work 2-3
Table 2: Intersections...3-7

Appendices

Appendix A: Design Guidelines
Appendix B: Laurinburg Comprehensive Pedestrian Transportation Plan Survey
Appendix C: Proposed Sidewalk Network
Appendix D: Proposed Greenway Network
Appendix E: St Andrews—Lauchwood Trail Segment
Appendix F: Cost Estimates
Appendix G: Full Size Maps (Maps 9-17)

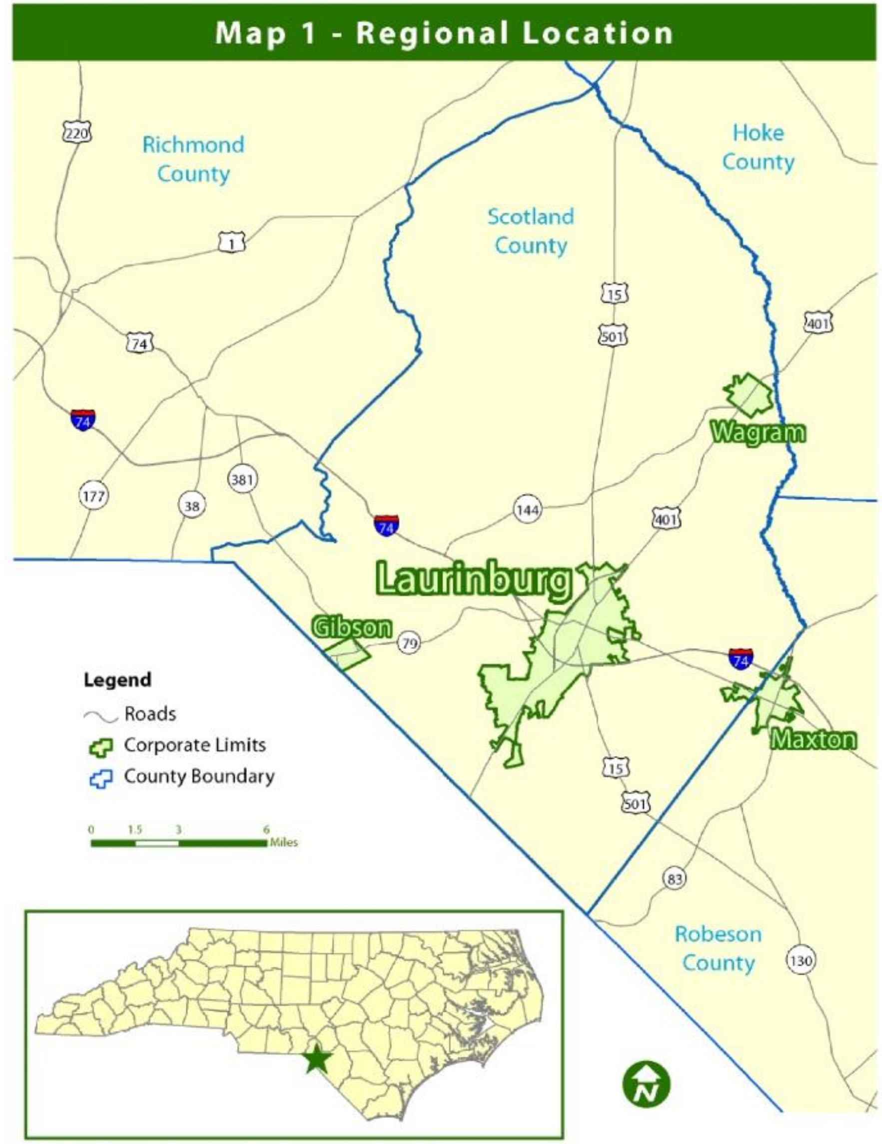
Chapter 1: Introduction

Purpose

Laurinburg Walks: A Plan for Health and Mobility addresses the needs of those individuals looking to travel by foot. This comprehensive pedestrian plan aims to increase pedestrian facilities and use by including recommendations for the long-term development of a cohesive and comprehensive sidewalk network, intersection improvements, and other pedestrian-friendly improvements. The plan supports an educational and promotional initiative that will solidify Laurinburg as a walkable and pedestrian-friendly community. Emphasis is also placed on the linkage between active transportation, such as walking and health outcomes.

The City of Laurinburg is located in Scotland County, which borders South Carolina (see Map 1) and is approximately 25 miles west of Interstate 95. Laurinburg is bisected by the Interstate 74 corridor to the north and south. Laurinburg is the county seat of Scotland County, which is one of the most economically distressed counties in the state. Unemployment rates, 12.6% in December 2013 compared to the state's 6.6% average, have consistently been the highest in the state for the last several years.

The provision for pedestrian infrastructure may seem superficial when faced with substantial challenges such as gainful employment, yet the city and county should strive to support such efforts as many residents may rely on non-motorized infrastructure to seek and reach their place of employment.



During the first steering committee meeting, members were tasked with identifying the primary barriers to pedestrian travel in Laurinburg – the most notable of which being a "lack of sidewalks." Other concerns are shown below in the word cloud created to summarize the primary barriers.

Figure 1: Barriers to pedestrian travel in Laurinburg

Background

In July of 2013, Laurinburg was notified that it had been awarded a pedestrian planning grant from the NCDOT Bicycle and Planning Grant Initiative. The NCDOT Bicycle and Planning Grant Initiative encourages local governments to complete non-motorized transportation plans in an effort to increase facilities used by bicyclists and pedestrians. The initiative has assisted more than 150 communities across the state.
Supplemental funding, for the required local match, was received by Region 6 of North Carolina's Community Transformation Grant (CTG) Project. The North Carolina CTG Project is a CDC-funded initiative to support evidence-based public health efforts to reduce preventable chronic diseases. The project focuses on four strategic directions: healthy eating, active living, tobacco free living, and evidence-based clinical preventive services – with active living serving as the strategic direction for the Laurinburg Comprehensive Pedestrian Transportation Plan. The aim of the project is to create equal access to healthy living opportunities for all North Carolinians.

Vision and Goals

As part of the planning process, a vision statement and overarching goals were developed in concert with the steering committee.

Vision Statement

To foster a healthy community that provides safe and accessible networks of sidewalks, trails, and pedestrian facilities that will support economic development and help connect our community and bring people together. We envision children walking safely to school, seniors walking to nearby destinations, citizens moving safely in high traffic areas, and tourists moving about the community and downtown areas easily on foot.

Goals

- ❑ Increase the number of pedestrian facilities: sidewalks, trails, crosswalks, pedestrian safety improvements at intersections, and other related amenities in the City of Laurinburg.
- ❑ Empower residents with the ability to travel by foot to their place of employment or for trips to access healthy food, medical facilities, or recreation facilities.
- ❑ Improve pedestrian safety along roadways, at intersections, and off-road.
- ❑ Increase the economic vitality of commercial establishments by providing pedestrian connections to retail outlets.
- ❑ Enhance the health and wellness of Laurinburg residents by encouraging walking through school and community-based programs.

Process

The planning process was initiated in December 2013. A steering committee was established to guide the plan framework and ensure local concerns are included. Particular interest was placed on including individuals with a public health background. Two public meetings were held to solicit additional citizen input as it relates to increasing pedestrian infrastructure in the City of Laurinburg. Once the plan was approved by the steering committee, NCDOT's Division of Bicycle and Pedestrian Transportation (DBPT) provided a thorough review to ensure all recommendations, policies, and programs are realistic and achievable.

Public Involvement

A project specific website was created in January 2014, to maintain all materials pertaining to Laurinburg's Comprehensive Pedestrian Transportation Plan. The website information was distributed via the City website and the project steering committee. In addition, a community wide survey focused on pedestrian transportation options was established at the project's onset. The survey was designed to solicit feedback from citizens living and working in Laurinburg. Many concerns were identified, all of which have been summarized as a part of this process.

As mentioned previously, two public open house meetings were held to solicit further input and offer an opportunity for citizens to engage the plan consultant and project manager during the process.

Figure 2: Laurinburg Comprehensive Pedestrian Plan project website

Plan Development

The plan was drafted over a number of months, beginning in January 2014. Sections were submitted for review by the committee and comments were received. After the committee gave final approval the plan was then submitted to NCDOT for further review. Public comment was also received during the second public open house, during which pedestrian network recommendations were presented.

Health Benefits of Walking

Historical Context of Planning & Public Health

In the 19th and early 20th centuries, architects and urban planners in cities across the country helped defeat infectious diseases like cholera and tuberculosis by retrofitting buildings, streets, neighborhoods, clean water systems, and parks. In particular, these buildings and streets were redesigned to increase air flow and provide daylight in an effort to combat bacteria. In the 21st century, planners and urban designers can again play a crucial role in combating the biggest public health epidemics of our time: obesity and related chronic diseases such as diabetes, heart disease, and some cancers. Today, an unhealthy diet and lack of physical activity are second only to tobacco use as the main cause of premature death in the United States.

Walking for Health

In the last hundred years, travel modes have shifted dramatically. Over the last forty years, little emphasis has been placed on the non-motorized forms of movement, often to the detriment of cyclists and pedestrians. In fact, it was not until 1998 that the Federal Highway Administration authored a guidance manual addressing the design of such facilities.[1]

Walking trips, particularly as a means of transportation to work, have experienced a dramatic decline in recent decades. From 1970 to 2010, the percentage of Americans walking to work declined by more than 60%, while at the same time the adult obesity rate increased by nearly 150% (see charts at right). An unintended consequence of our preference for automobile use is the ability to accomplish daily tasks without expending significant energy walking. Meeting the recommended daily exercise guidelines can be easily accomplished by such trips as running errands, walking to work, or walking for leisure. Yet, research shows that less than 10% of adults meet the recommended thirty minutes of exercise per day.[2]

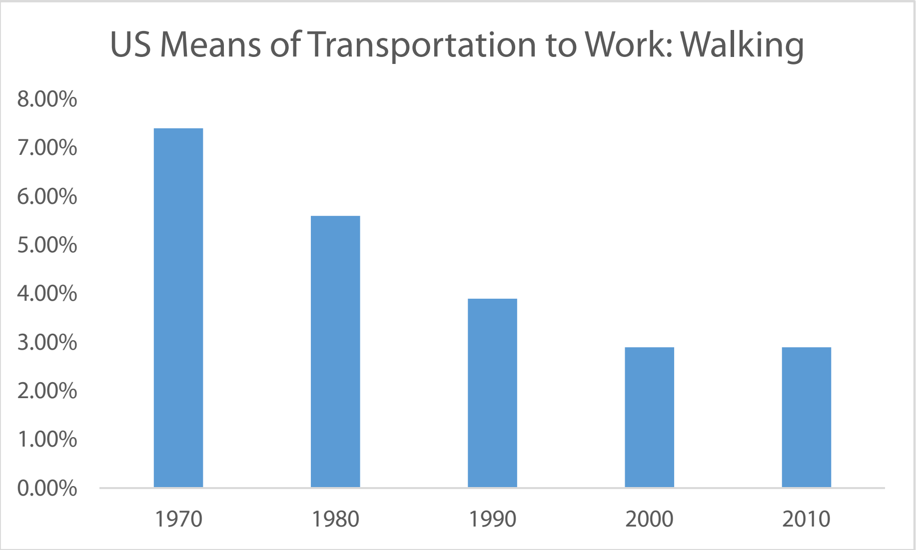


Figure 3: Population walking to work (Source: National Household Travel Survey)

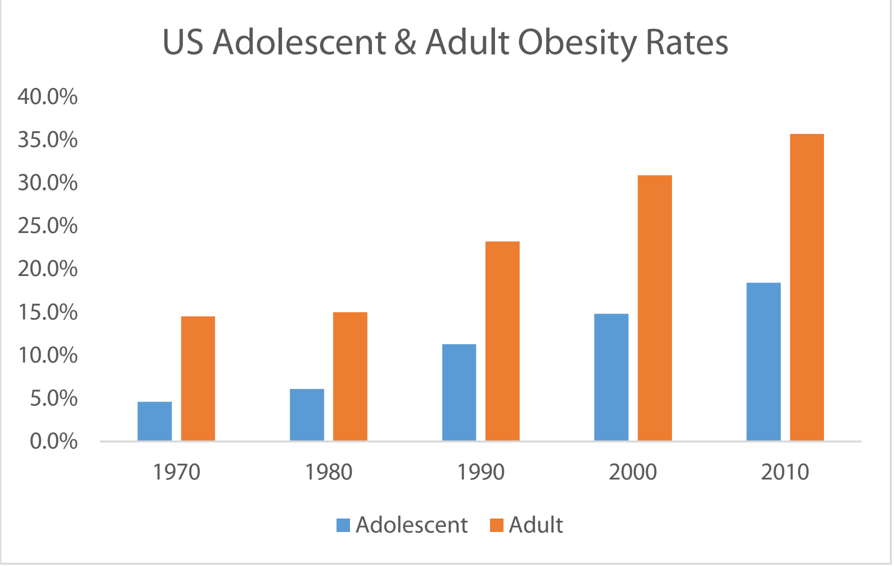


Figure 4: Adolescent & Adult Obesity Rates. In 2009, approximately 47% of females and 39% of males in Scotland County were classified as obese (Source: CDC).

Figure 5: Potential health impacts of pedestrian and bicycle infrastructure. For more information please download the statewide bicycle and pedestrian plan at http://www.ncdot.gov/bikeped/download/WalkBikeNCPlanAppendixlowres.pdf (Source: WalkBikeNC).

The design of the built environment, influenced by our land use and transportation infrastructure, has much to do with the lack of exercise experienced in our daily travels. Over the past ten years, community officials have seen an increasing need to address health disparities through changes to the built environment. The emphasis on public health incorporated into this plan is a result of this evolving thought process. The diagram above details the impact of active transportation use on health.

Changing Priorities

Efficient flow and speed of the private vehicle, the primary determinant of vehicular level of service, is often the only component considered in designing a particular roadway.[3] As a result, non-motorized travelers face difficulties due to a lack of facilities that provide for their safe and efficient movement. Yet, things are changing at the state level. NCDOT now fully supports the Complete Streets initiative and health has been added to their mission statement.

NCDOT Old Mission Statement:

- Connecting people and places safely and efficiently, with accountability and environmental sensitivity for North Carolina residents.

NCDOT New Mission Statement:

- Connecting people and places safely and efficiently, with accountability and environmental sensitivity to **enhance the economy, health, and well-being** of North Carolina.

Lastly, investments in transportation can either discourage or encourage use by non-motorized travelers. Research suggests that providing pedestrian infrastructure will in fact increase use and promote physical activity.[4] In the end, Laurinburg supports the need to enhance facilities for pedestrian use, to make walking an easier choice, and to combat the incidence of chronic disease and obesity.

Economic Benefits of Walking

There are many economic benefits of a walkable community. Preferences for walkable real estate, lower vehicle and fuel costs, and increased competiveness for walkable commercial establishments are among the few. In recent years, Americans have begun to desire walkability over increased household square footage and now place a large preference on the ability to walk to destinations. According to a study conducted by the National Association of Realtors, the presence of sidewalks and places to take walks are among the top community characteristics people consider important when deciding where to live.[5]

In addition, pedestrian-friendly conditions improve the commercial and cultural vibrancy of communities. According to the Policy on Geometric Design of Highways and Streets, a primary roadway design guide used by transportation engineers, accommodations for non-motorized travel are vital to lively commercial districts:

> "Pedestrians are a part of every roadway environment, and attention must be paid to their presence in rural as well as urban areas…Because of the demands of vehicular traffic in congested urban areas, it is often extremely difficult to make adequate provisions for pedestrians. Yet this must be done, because pedestrians are the lifeblood of our urban areas, especially in the downtown and other retail areas. In general, the most successful shopping sections are those that provide the most comfort and pleasure for pedestrians."[6]

Some commercial districts also find that walkability increases business activity. Studies have shown that non-motorized travelers spend far more money per area of commercial land than motorists.[7]

Lastly, among low income residents the costs of vehicle use can be prohibitive to ownership. This creates difficulties in mobility for these residents as they may be forced to rely on family, friends, or their own feet to get from place to place. Money saved on vehicle costs can be put towards housing or medical costs, in addition to other leisure time activities.

Figure 6: Potential economic impacts of active transportation infrastructure in North Carolina For more information please download the statewide bicycle and pedestrian plan at http://www.ncdot.gov/bikeped/download/WalkBikeNCPlanAppendixlowres.pdf (Source: WalkBikeNC).

Chapter 2: Community Profile

Introduction

The following chapter details existing conditions in Laurinburg's corporate limits. Discussion includes statistics relating to demographics, such as income, means of transportation, and health issues.

Population

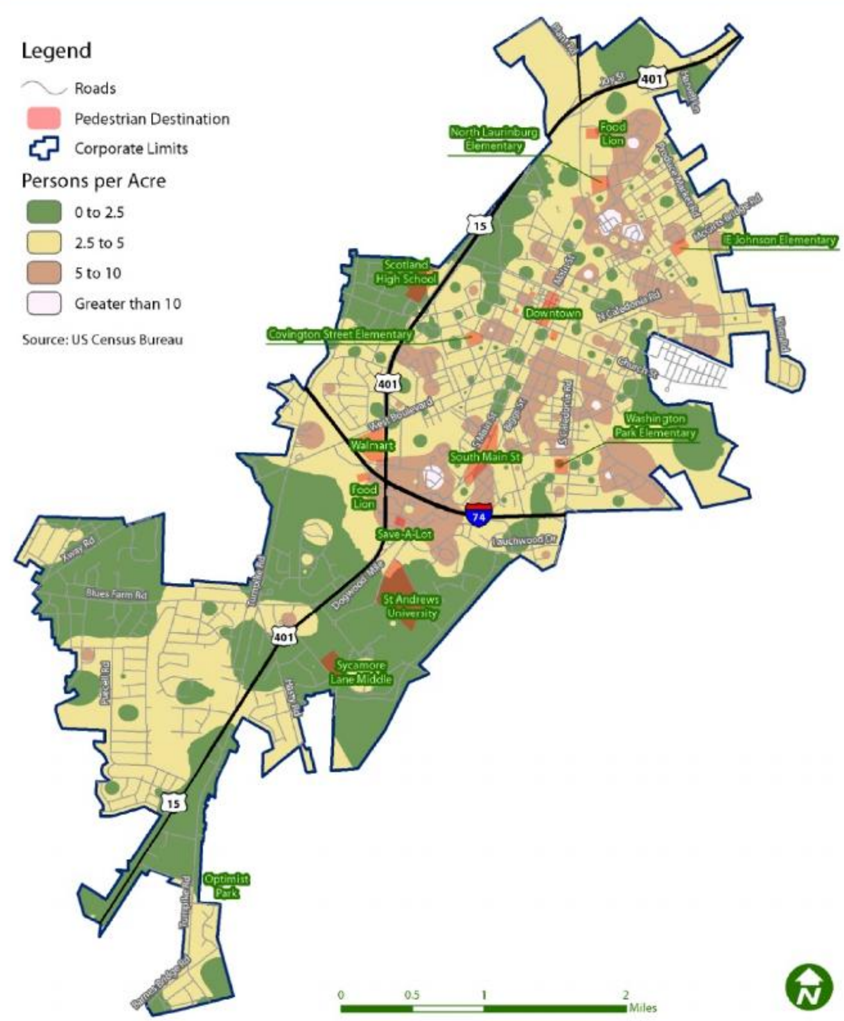
According to the 2010 Census, approximately 15,962 people call Laurinburg home. That number has declined in the last thirty years as 17,266 people resided within the corporate limits in 1980 – a drop in population of 7.5%.

The most densely populated areas in Laurinburg (see Map 2) are just north of the Interstate 74 bypass and north of downtown. Few residents live within the commercial areas of Laurinburg, particularly downtown.

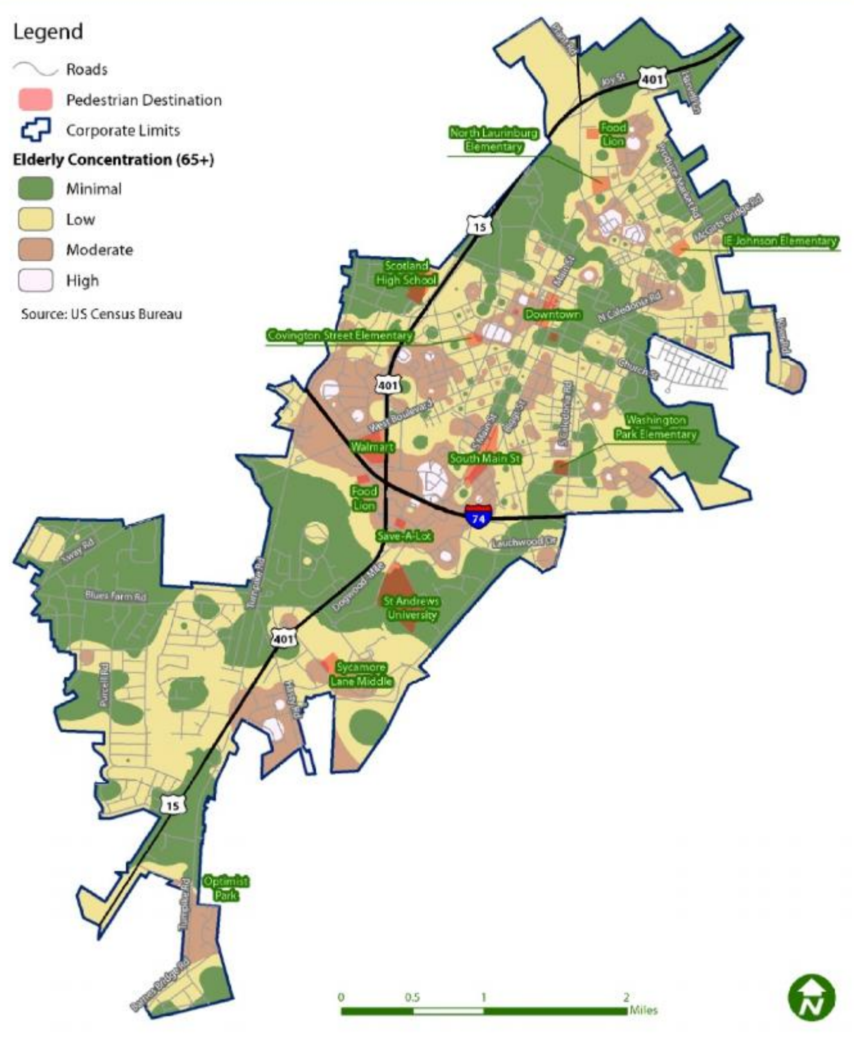
Population by Age

In 2010, the median age of Laurinburg residents was 38.2, slightly higher than the statewide median age of 37.3. Concentrations of elderly individuals (65+) are located throughout Laurinburg's corporate limits (see Map 3). Often times, these individuals have difficulties securing transportation as they may not have access to a private vehicle.

Map 2 - 2010 Population Density



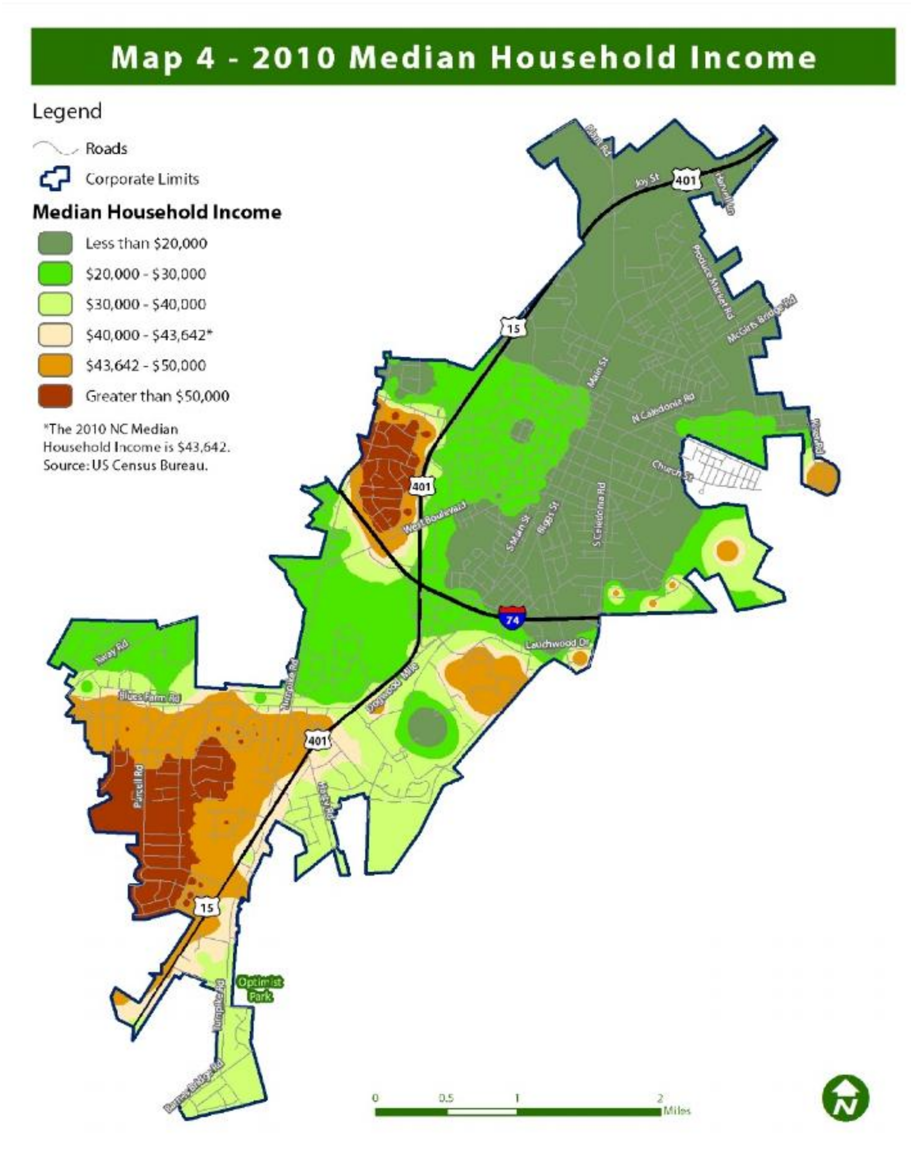
Map 3 - 2010 Elderly Concentration (65+)



Income

Income plays a significant role in health outcomes of individuals. Countless studies have noted the correlation between low-income populations and unhealthy lifestyles. The median household income in Laurinburg, $25,908, is approximately 41% lower than the statewide figure. In North Carolina, the 2010 median household income figure was $43,642. Moreover, Laurinburg's poverty rate is 33.9%, more than double the statewide figure. Poverty is a continuing issue in the city, which was once home to more than a dozen textile manufacturing entities. This fact underscores the importance of providing facilities that allow for the safe travel of pedestrians.

Low income areas in Laurinburg are located east of US 401 and north of the Interstate 74 bypass (see Map 4). Residents in the lower income portions of the city may be reliant on walking for transportation purposes as private vehicle ownership can be quite costly. As such, it may be important to prioritize pedestrian facilities in these areas of the Laurinburg corporate limits. Higher income areas are found outside the city center, in the southwest portion of the corporate limits.



Mobility

Mobility is defined as the movement of people from place to place. For the purposes of this plan, demographics related to transportation modes to work and household vehicle availability are provided.

Means of Transportation to Work

According to the 2010 Census, approximately 2% of Laurinburg residents walk to work. This figure is consistent with the statewide average, but low for similar urban areas across the state. Approximately 85% of residents drove alone to their place of employment.

Table 1: 2010 Means of Transportation to Work		
Drove alone	4,206	85%
Carpooled	398	8%
Public Transportation (excluding taxicab)	9	0%
Taxicab	3	0%
Bicycle	2	0%
Walked	**80**	**2%**
Other means	33	1%
Worked at home	206	4%
Total	4,937	100%

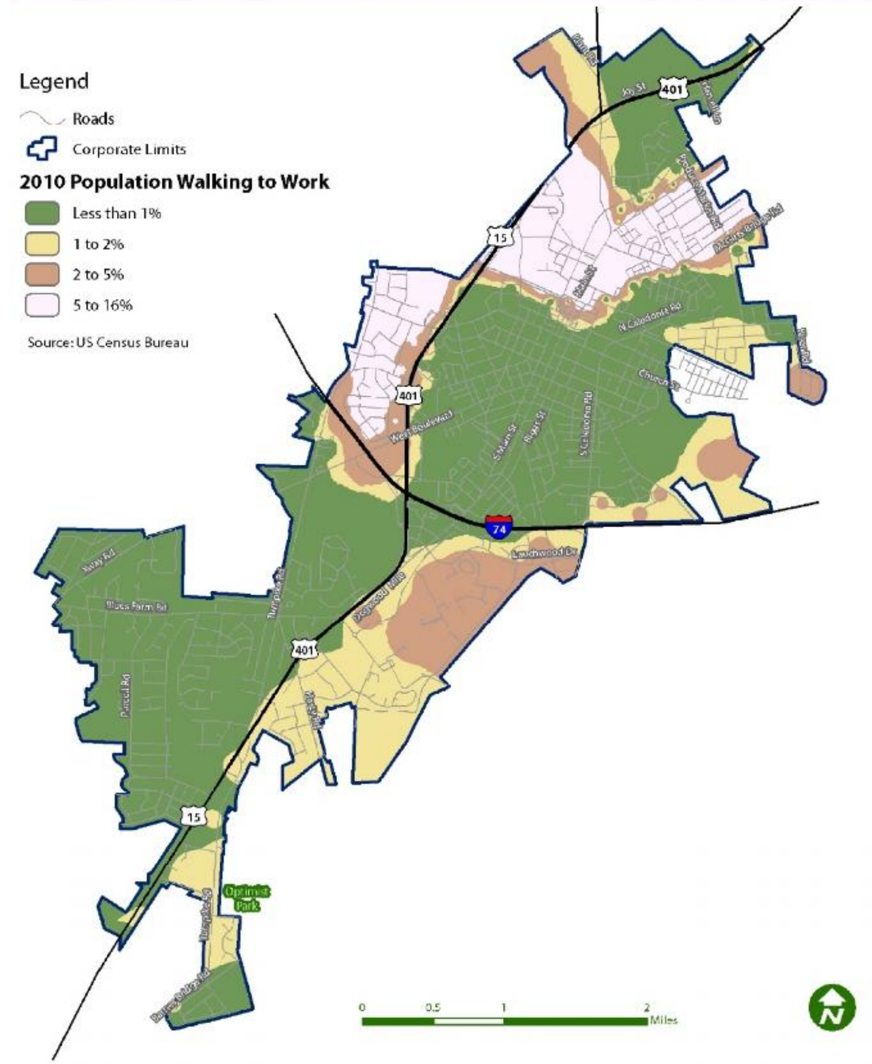
Within the corporate limits, neighborhoods that have a high percentage of residents that walk to work include the Highland Drive neighborhood just west of 401 and north of West Boulevard and residents north of downtown (see Map 5).

Household Vehicle Availability

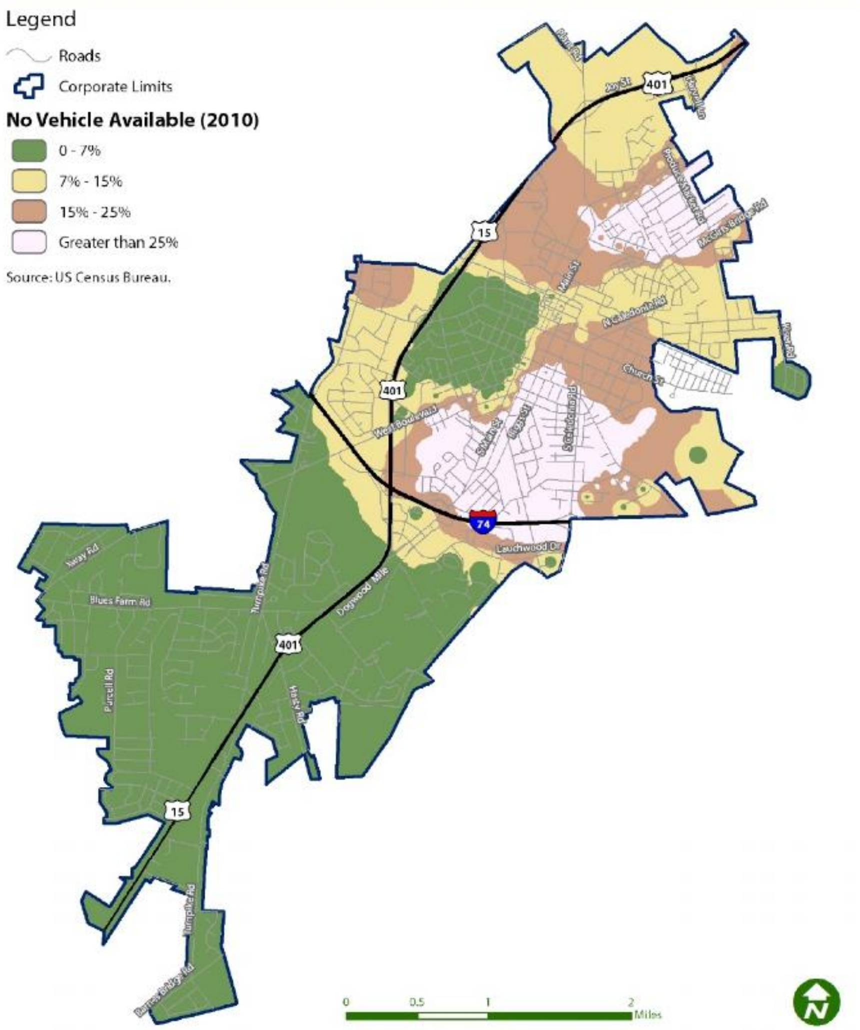
Another measure of mobility is the availability of private vehicles for use. The census bureau also surveys occupied households to determine those that have vehicles available for use. In Laurinburg, 14.7% of occupied households do not have access to a private vehicle. That figure is more than double the statewide average. Among households occupied by renters, nearly 25% are without access to a vehicle. These residents must rely on friends, family, para-transit, or a non-motorized means (bicycling/walking) for transportation to work, medical facilities, or food outlets.

Neighborhoods along South Main Street, Johns Road, and Caledonia Road (see Map 6) have a high percentage of households without access to a vehicle. The primary areas of concern are located north of the Interstate 74 bypass. This finding is also consistent with the lower income areas of Laurinburg's corporate limits (shown on Map 4). Ultimately, residents of these areas must rely on a secondary means of transportation such as the Scotland County Area Transit System (SCATS) – creating difficulties in travel to employment, medical appointments, or food outlets.

Map 5 - 2010 Population Walking to Work



Map 6 - Households with No Vehicle Available (2010)

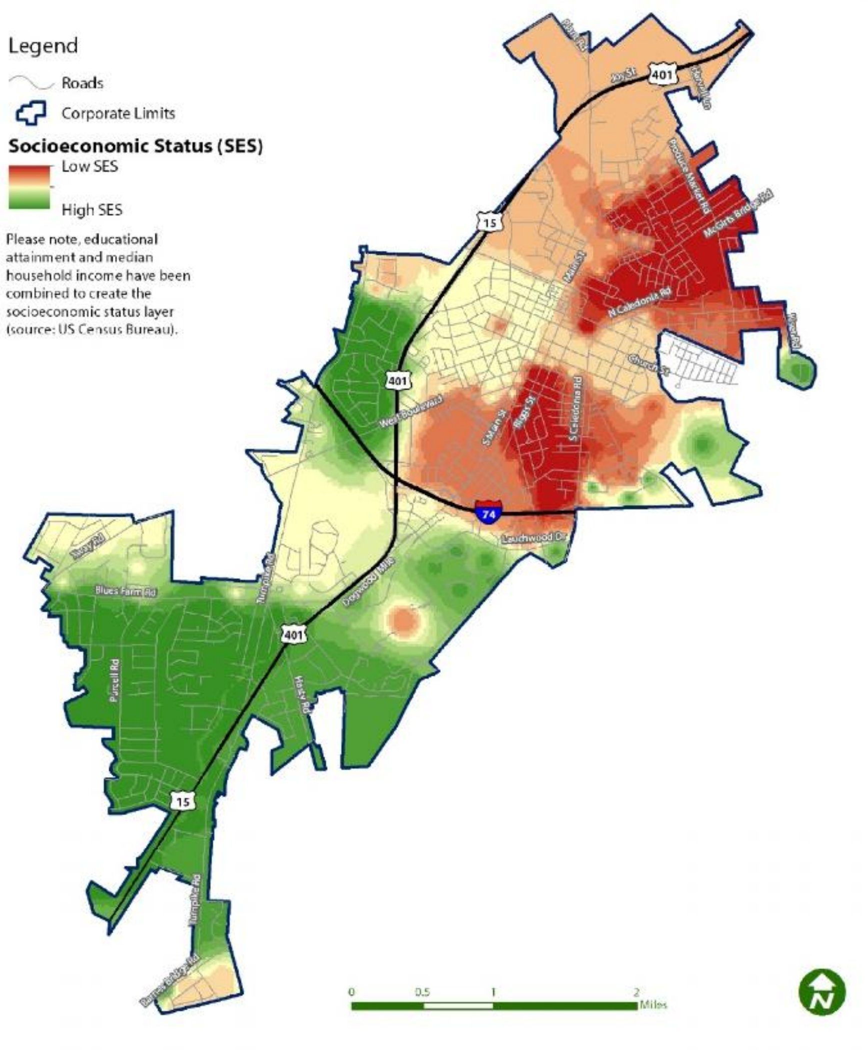


Socioeconomic Status

Many studies have attempted to provide a correlation between socioeconomic status and chronic disease. Obesity, whose leading contributors are poor nutrition and lack of physical activity is the second leading cause of death in the United States and increases the risk factor for a number of chronic diseases.[8] In general, obesity tends to be a multi-faceted problem with no "one solution" to combating its occurrence. However, there are certain segments of the population that are more likely to be obese or face higher rates of chronic disease, as each are more prevalent in the low socioeconomic status (SES) segments of society. Investigations have shown similar results in urban, suburban, and rural communities. In addition, a childhood spent in poor social and economic conditions has been shown to lead to a less healthy adulthood. In both adolescent boys and girls, low SES and parental education levels were related to an unfavorable risk factor profile, indicating a need for early intervention in low SES communities.

To identify areas of Laurinburg that are considered low in socioeconomic status, GIS analysis was used (see Map 7). Census estimates for educational attainment and income levels were combined to locate these areas. Concentrations of low SES are mainly found in the South Main Street, Johns Road, and Caledonia Road neighborhoods. Other concentrations of low SES households are located northeast of downtown.

Map 7 - Socioeconomic Status (SES)



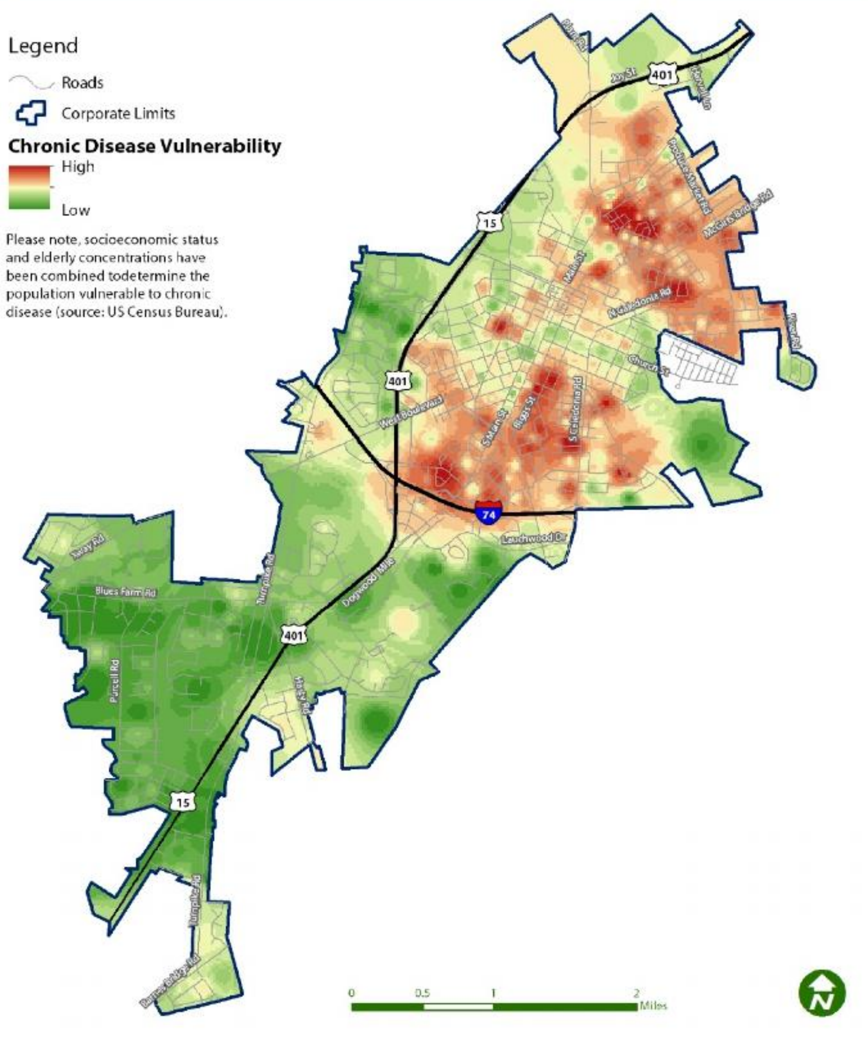
Population Vulnerable to Chronic Disease

Whereas infectious diseases were the gravest health threats of an earlier era, the largest killers of our time have become chronic diseases such as heart disease and strokes, cancers, and diabetes, for which the leading risk factors are obesity, physical inactivity, poor diets, and smoking. According to the CDC, approximately 80% of adults over the age of 65 have at least one chronic condition, and 50% have at least two. As mentioned previously, low socioeconomic status households are also at a greater risk for chronic disease conditions. Combining the two demographics illustrates locations within Laurinburg that may have higher risks of chronic disease.

In order to prioritize investment in pedestrian infrastructure in an effort to combat chronic disease, it is important to spatially locate those areas that may be most vulnerable to chronic ailments. To do so, GIS analysis was used to combine socioeconomic status and concentrations of the elderly population (see Map 8).

> **"Two of the four most common causes of chronic disease include lack of physical activity and poor nutrition. Both causes can be altered by lifestyle changes."**
>
> ***Source: Centers for Disease Control***

Map 8 - Population Vulnerable to Chronic Disease



Health Concerns

Because public health and the design of the built environment are intrinsically linked, particularly as it relates to the ability to navigate a community safely by foot, it is important to include some of the health issues experienced by the Laurinburg populace. Health statistics and data are most commonly collected at the county level. Scotland County, in which Laurinburg is located, has consistently ranked lower for health outcomes compared to other North Carolina counties. In fact, Scotland County ranks 91 out of 100 counties for health outcomes. The health outcome ranking is based equally on morbidity (health effects on quality of life) and mortality (length of life). As such, the 91 out of 100 ranking signifies significant health issues among county residents.

Specific findings are summarized below, garnered from the 2011 State of The County Health Report (SOTCH).

- Scotland County continues to struggle with high mortality rates of heart disease, cancer, and diabetes.
- Obesity is a condition affecting many residents in Scotland County and is the number one health problem in children.
- Lack of physical activity and poor nutritional habits are major factors in overweight and obesity. The North Carolina Child Health Report Card for 2011 reported only 31.2% of students ages 10-17 years, were physically active a total of 60 minutes or more per day on five days or more.
- Targeting priority areas of obesity, tobacco prevention, encouraging physical activity and good nutrition, and making our parks and roadways safer can help make a positive impact on Scotland County.

Chapter 3: Existing Conditions

Introduction

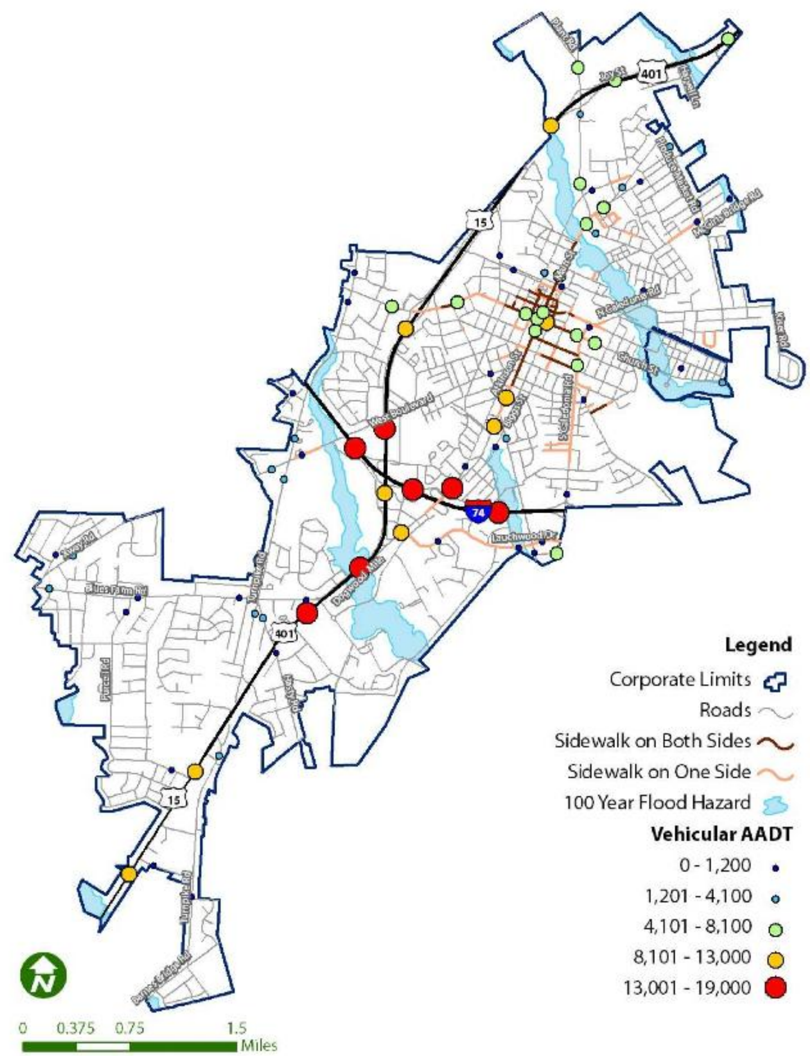
The following chapter details existing conditions in Laurinburg's corporate limits. Specific details relating to the transportation network (motorized and non-motorized), pedestrian crashes, and existing plans/programs is included. Field work was conducted to analyze the pedestrian network condition, right-of-way constraints, crossing distances, perceived danger, and obstructions to pedestrian travel. Please note that full size maps can be found in Appendix G.

Vehicular Roadway Network

Laurinburg is bisected – north and south – by the Interstate 74 bypass. That particular roadway is a limited access interstate facility, which carries the highest numbers of vehicular traffic in the corporate limits (see Map 9). US 15/401, running north to south, moves the second largest volume of vehicular traffic in Laurinburg's corporate limits. US 15/401 is a four-lane facility, with dedicated turning lanes and overpass/underpass facilities at major intersections (see Figure 7). The primary speed limit is 45 miles per hour. At times, automobile traffic along South Main Street can approach 13,000 vehicles per day. South Main Street, in particular, houses multiple retail operations with numerous driveway curb cuts. Navigating the area in a vehicle can be treacherous at times.

Lower speed, lower volume roadways are found within the city's downtown area and adjacent residential neighborhoods. Many of the residential neighborhoods allow for pedestrian traffic as automobile volumes tend to be lower.

Map 9 - Annual Average Daily Traffic (2010)



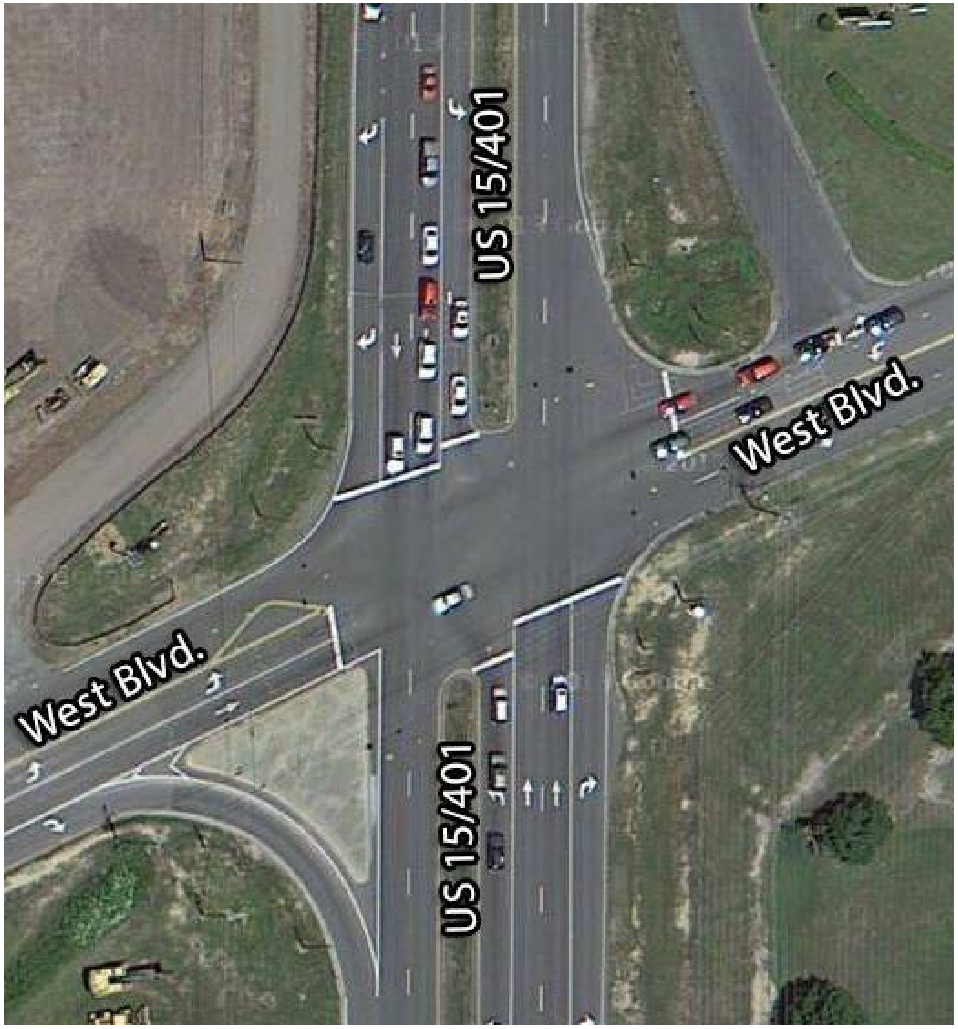


Figure 7: Intersection of US 15/401 and West Boulevard

The roadway network in Laurinburg is designed primarily for the automobile. Most intersections lack crosswalk markings and are designed with geometry that allows for ease of movement for right-turning vehicles.

Figure 8: South Main Street - commercial corridor lacking sidewalks with a high number of driveway curb cuts

Pedestrian Network

Laurinburg's pedestrian network consists of its sidewalks, intersection crossing locations (crosswalks, pedestrian signals), and off-street multi-use paths/trails. The availability of pedestrian facilities is not unlike other small municipalities in North Carolina. Past priorities for the inclusion of sidewalks as a standard component of roadways did not exist. As a result, many city streets and roads were constructed without pedestrian facilities. This fact is especially true along Laurinburg's commercial corridors, such as South Main Street, West Boulevard, and US 15/401.

Figure 9: Retail pedestrian generator along West Boulevard

The following section outlines Laurinburg's available pedestrian facilities, pedestrian destinations, pedestrian crash data, and specific areas of concern and a summary of the strengths and weaknesses of the pedestrian network.

Pedestrian Facilities

Laurinburg has approximately 13.6 miles of sidewalks within the corporate limits. The majority of those facilities are located within the downtown and its immediate vicinity (see Map 10). Sidewalks within the downtown area are located on both sides of the road, whereas sidewalks outside of the downtown area are only available on one side of the road.

Few pedestrian signals are available to pedestrians in Laurinburg. Signals are currently available only on Main Street in the historic downtown. In addition, most crosswalks are lateral markings rather than longitudinal, making them more difficult to see by motorists (see Figure 10).

At most intersections where sidewalks are available, curb ramps are present. These facilities allow for citizens with disabilities to navigate intersections safely.

Lastly, there are multiple intersections that are not configured at a ninety-degree angle and/or have more than two travel lanes. These intersections are ideal for pedestrian refuge islands due to long crossing distances for pedestrians.

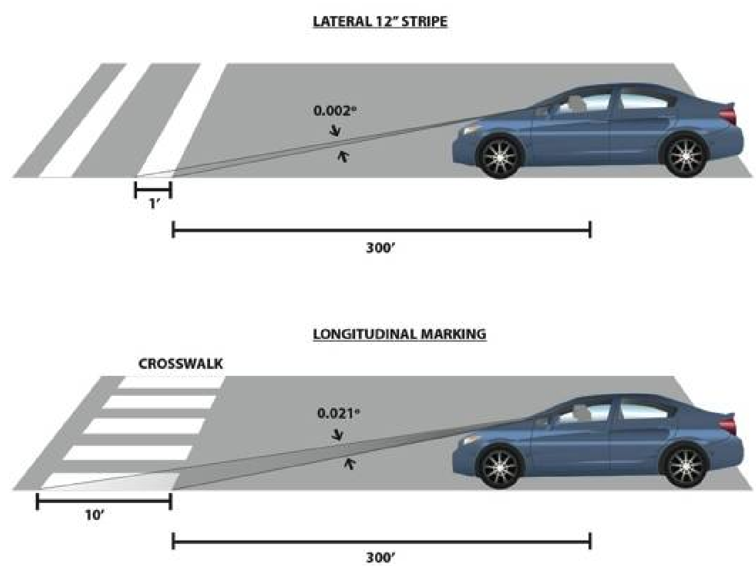


Figure 10: Longitudinal crosswalk markings are more visible than lateral crosswalk markings (Credit: Michelle Weisbart)

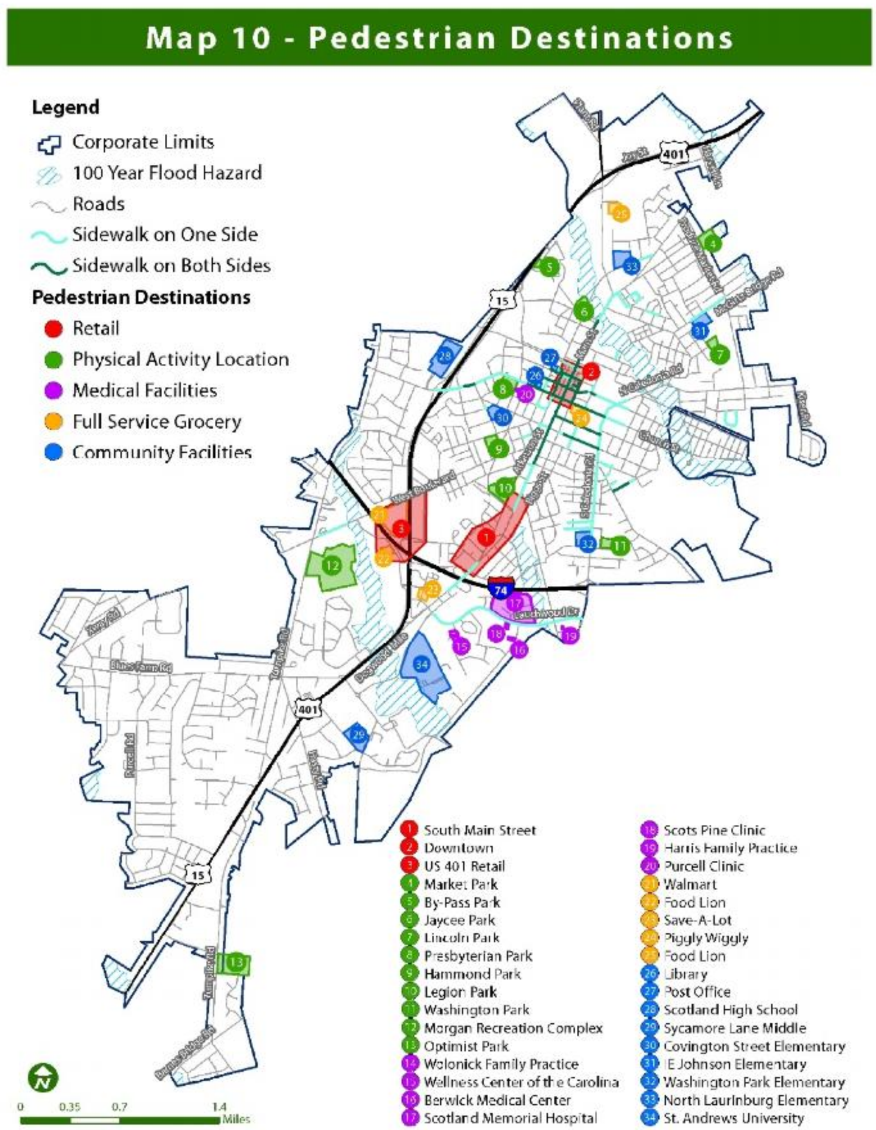
Figure 11: Wide sidewalks are available to pedestrians in Laurinburg's historic downtown

Pedestrian Destinations

Pedestrian destinations or generators are locations where there is a demand for individuals to walk to a particular establishment. Each location is categorized as one of the following (see Map 10):

- Retail – core commercial locations with several different outlets
- Physical Activity Locations – parks and recreation facilities
- Medical Facilities – urgent care, hospital, and general practitioner
- Full Service Grocery Store – food outlets with regular hours that accept SNAP, WIC, and EBT and have fresh fruits and vegetables available for purchase
- Community Facilities – governmental/non-profit facilities such as the library, schools, and post office

Figure 12: Retail corridor along South Main Street



Retail locations shown on Map 10 serve to attract pedestrians throughout the year. The South Main Street retail area is in close proximity to neighborhoods with a high percentage of households without a private vehicle. Thus, this area generates a significant amount of pedestrian traffic.

Physical activity locations are scattered throughout Laurinburg's corporate limits. The majority of facilities (shown green on Map 10) are located north of the Interstate 74 bypass. Medical facilities are concentrated around Scotland Memorial Hospital on Lauchwood Drive. These facilities are shown as purple on Map 10.

Three full-service grocery stores are available to residents in close proximity to US 15/401 and South Main Street. The Walmart located on West Boulevard and US 15/401 is classified as a full-service grocery store and attracts many pedestrians from neighboring communities. Two other full-service grocery stores are available to residents in the northern portion of the corporate limits.

Community facilities attract pedestrians for various reasons. Schools, in particular, are a primary destination for the youth demographic. Studies have shown a reluctance of present-day parents to allow their children to walk to school—the primary reason being safety. According to the National Center for Safe Routes to Schools, approximately 48% of children walked or cycled to school in 1969. "Fast-forward" forty years and that statistic has seen a dramatic decline, with only 13% of children aged 5 to 14 years walking or cycling to school.[9] Not unlike many other municipalities throughout North Carolina, many of the schools within the corporate limits lack adequate pedestrian facilities to allow for safe travel by foot.

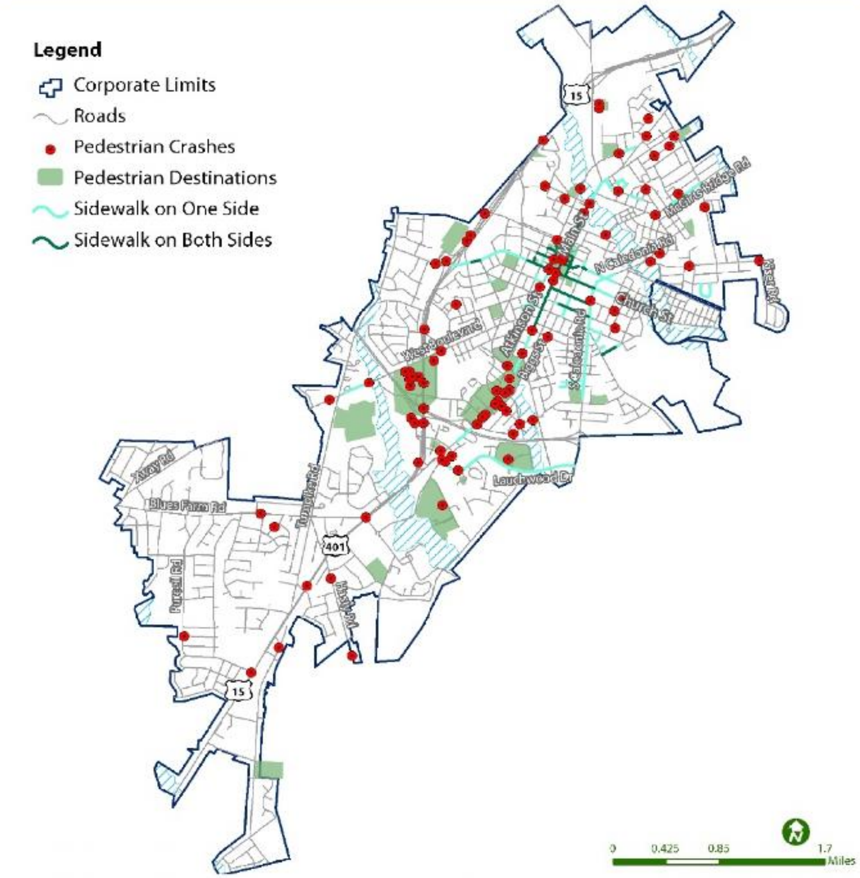
Apart from downtown destinations, the majority of pedestrian generators are not well-served by pedestrian facilities.

Figure 13: The entrance to Covington Elementary School, identified as a community facility

Pedestrian Crashes

Pedestrian crash data is collected by the NC Department of Transportation and UNC's Highway Research Center. All pedestrian crashes from the year 2000 to 2012 are shown on Map 11. In all, there were 93 crashes from 2000 to 2012. There is a high concentration of crashes in all three retail destinations – South Main Street, West Boulevard/US 401, and downtown. The most significant location of crashes, however, is along the commercial corridor on South Main Street.

Map 11 - Pedestrian Crashes



Injury	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Fatal	1		1								1						3
Disabling Injury	2	1	1										1	1			6
Evident Injury	2	5	2	3	1		1	3		3		2	1	1	4	6	34
Possible Injury	3	2	5	2	4	2	1	4	4	2	3	3	1	4	5	3	48
No Injury						1		1				1	1		1		5
Unknown Injury					2		3			2	1		2		1	2	13
Total	8	8	9	5	7	3	5	8	4	7	5	6	6	6	11	11	109

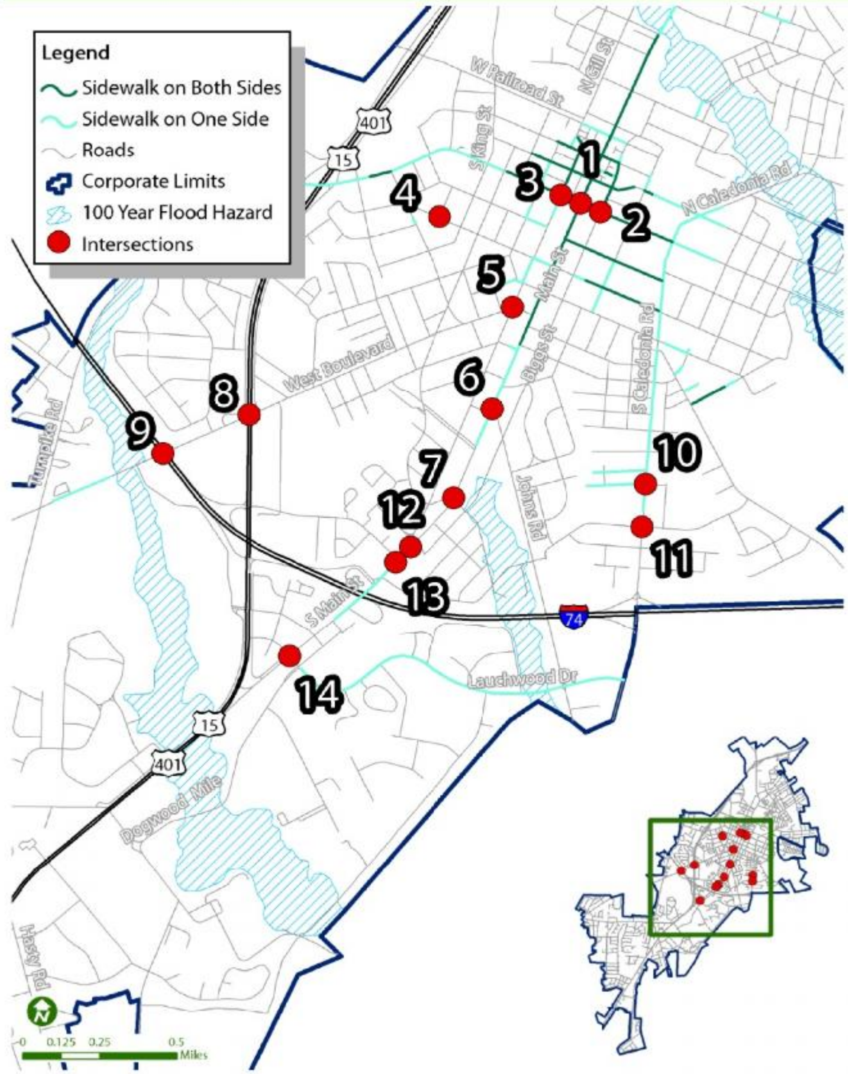
Intersections

Fourteen intersections have been selected for further study as part of the comprehensive pedestrian plan. These intersections have been chosen based on feedback from the steering committee, gaps in the sidewalk network, the community survey, and pedestrian crash data. Recommendations for improvement are included in section four of the pedestrian plan.

Many of the intersections chosen have high vehicular traffic volumes and lack dedicated crossing facilities. In addition, many are located in close proximity to pedestrian destinations. Each intersection studied is listed in the table below and shown on Map 12.

Table 2: Intersections	
1. S Main St and Church St	8. West Blvd and US 401
2. Biggs St and Church St	9. West Blvd/US 74 Overpass
3. Atkinson St and Church St	10. Caledonia Rd and Pitt St
4. Covington St and Malcolm St	11. Caledonia Rd and College Rd
5. Atkinson St and West Blvd	12. S Main St and Atkinson St
6. S Main St and Johns Rd	13. S Main St and Plaza Rd
7. S Main St and Sunset Dr	14. S Main St and Lauchwood Dr

Map 12 - Intersections of Concern



Pedestrian Network Strengths & Weaknesses

Strengths

As mentioned previously, Laurinburg's downtown core is considered a pedestrian friendly environment (see Figure 11). Sidewalks downtown are adequate condition and are wider than 8 feet in the Central Business District. In addition to the downtown area, there are traditional neighborhoods in close proximity to the Central Business District. These neighborhoods have small block sizes, adding to the walkability of the area. Many streets in these neighborhoods, however, are without sidewalks.

Weaknesses:

Physical barriers to pedestrian travel include the presence of the Interstate 74 Bypass, the US 15-401/501 Bypass, and the Laurinburg & Southern rail line adjacent to downtown. The US 15-401/501 bypass runs through a major retail area southwest of the Central Business District (see Figure 7). South Main Street, a major north-south route in Laurinburg, is also a retail-heavy portion of the city. No sidewalks are available to residents seeking to walk from establishment to establishment or from their home to the area (see Figure 8).

There are approximately 13.6 miles of sidewalk in Laurinburg compared with approximately 137.4 miles of curb and gutter. Not all places that house curb and gutter are suitable for sidewalks, but with fewer than 10% of the total mileage of roads outfitted with sidewalks, Laurinburg certainly has room for improvement.

Particular areas of concern include the two-mile radius encompassing schools within the corporate limits. Schools lacking adequate pedestrian connections within a two-mile radius include Scotland High School, Sycamore Lane Middle, Covington Street Elementary, IE Johnson Elementary, Washington Park Elementary, and North Laurinburg Elementary.

Constraints to sidewalk and multi-use path construction primarily include street trees and vegetation. In addition, several intersections will require retrofitting to provide crossing facilities for the multi-use path proposed in Chapter 4. Lighting is also a concern outside of the downtown area. Pedestrian scaled lighting is needed along retail corridors and in close proximity to pedestrian destinations identified on Map 10.

The condition of existing sidewalks vary throughout the city, however, maintenance is a continuing concern.

Existing Plans & Programs

Downtown Development Plan (1988)

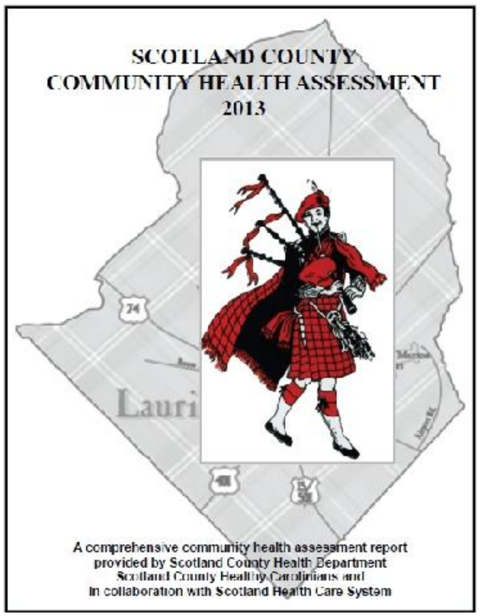
In 1988, a Development Plan for Downtown Laurinburg – crafted by an interdisciplinary team of architects, landscape architects, and planners – noted the importance of "clearly marked, well lighted, tree lined sidewalks." Streetscape improvements did take place because of the planning effort; however, not much has been done to improve pedestrian travel outside the Central Business District. McColl Road (Laurinburg's Main Street) is now outfitted with brick sidewalks and street trees that create an ideal environment for pedestrian travel.

Scotland County Vision Plan (2010)

In 2010, Scotland County adopted a Vision Plan that addressed the needs of all municipalities within the county, including Laurinburg. In particular, the plan looks to increase transportation alternatives to area residents. The Comprehensive Pedestrian Plan will leverage recommendations and progress made through the comprehensive planning process regarding non-motorized transportation options in Laurinburg.

Scotland County Community Health Assessment (2013)

In an effort to improve the health and well-being of it citizens, North Carolina general statutes require each county to complete a Community Health Assessment every four years; although many county health departments complete the assessment every two years. According to the North Carolina Division of Public Health, a Community Health Assessment is the foundation for improving and promoting the health of community members. The role of the community assessment is to determine the general health of the local population, help identify the factors that affect the health of the community, and determine what resources are available within the community to adequately address these factors. It is a "systematic collection, assembly, analysis, and dissemination of information about the health of the community."



The Scotland County Community Health Assessment 2013 serves as a basis for improving and promoting the health of Scotland County residents. Through this assessment, health concerns that affect the population including available resources that can address these concerns have been identified. The information will assist health organizations within Scotland County in determining priority health issues, identifying resources, and planning community health programs. Responses were sought from all areas of the county and across the board representation was provided from all communities and ethnicities to complete the assessment. The results of this assessment are available as a planning tool to determine the focus and direction in addressing health and community concerns with the Healthy People 2020 Objectives in mind.

A community survey was conducted as part of the 2013 Community Health Assessment. Over 550 surveys were completed. A brief summary of the findings is listed below.

- Heart disease, cancer and violence were felt to be the leading causes of death.
- The priority health issues were cancer, high blood pressure, heart disease, diabetes, drug and alcohol abuse, obesity, and teen pregnancy.
- The priority risk factors were lack of physical activity, use of tobacco products, poor nutrition and environmental factors.
- Lack of insurance and inability to pay were the leading factors affecting families seeking medical treatment.
- Lack of funds for health insurance, transportation, medicine, utilities and food were general concerns among respondents.
- Respondents wanted to see more education on chronic disease prevention, cancer, teen pregnancy prevention, dental screenings, substance abuse and physical activity.
- Services that respondents had difficulty finding or using most were transportation, child day care, dental care, parks and recreation, and housing assistance.
- Respondents most wanted to see more job opportunities**, safe places to walk** and play, recreation facilities, healthier food choices and wellness services to help improve the health of their communities.
- Respondents indicated they support tobacco-free public places/buildings in Scotland County.

Scotland County Comprehensive Transportation Plan (Ongoing)

This plan is in the beginning stages of creation. The process was initiated in late 2013 and will be complete by early 2015. A key component of the plan will be the inclusion of all transportation modes. The findings of Laurinburg's Comprehensive Pedestrian Plan will be integrated into the county's comprehensive transportation plan.

WalkBikeNC (2013)

WalkBikeNC is North Carolina's statewide bicycle and pedestrian plan. The process was part of a comprehensive effort to inventory and assess non-motorized transportation conditions across the entire state. The five pillars for which the plan is based include mobility, safety, health, economy, and the environment. Specific detail is included for each pillar, particularly as it relates to the benefits of furthering bicycle and pedestrian infrastructure in the state. Goals included as part of the plan are listed below.

- Improve mobility strategically with greater investment in walking and biking infrastructure (through a Complete Streets approach), improved transportation equity and choice, connectivity between transportation modes, reduced traffic congestion, and through better coordination between land use and transportation planning.
- Improve safety for all roadway users through strategic, consistent, and connected pedestrian and bicycle facility improvements, education, and enforcement strategies.
- Contribute to public health by providing active living environments with safe, connected, accessible facilities along with programs that encourage walking and bicycling.
- Maximize economic competitiveness and return on investment by creating more attractive walkable and bikable communities and jobs through additional NCDOT, public, and private funding.
- Advance environmental stewardship by reducing automobile dependence and connecting and protecting North Carolina's natural resources through a network of greenways.

Specific references to facilities in Laurinburg or Scotland County are included in the WalkBikeNC plan. The US 1 – Carolina Connector is part of a multi-state bike route that traverses Scotland County before entering South Carolina (see Figure 14).

Figure 14: US 1 - Carolina Connector (shown in brown)

Designated as a portion of US Bike Route 1, which runs from Maine to Florida, this route covers almost 200 miles of rolling terrain. It is the main north/south connector route through the central portion of North Carolina. From Virginia, this route enters North Carolina near the Warren/ Vance County border. US 1 continues south between Raleigh and Durham and eventually through Sanford, Southern Pines, and Laurinburg before advancing into South Carolina.

The plan in its entirety can be downloaded/reviewed by clicking on the link: http://www.ncdot.gov/bikeped/planning/walkbikenc/

Education and Enforcement

Currently, there are no ongoing education or enforcement programs.

Chapter 4: Network Recommendations

Introduction

Recommendations for improvements to Laurinburg's pedestrian network are included in this chapter. Supporting information, such as the results of the community survey, analysis of priority locations, and intersections of concerns are also included. All pedestrian facility recommendations along NCDOT maintained roadways will require review and approval by NCDOT Highway Division 8 prior to implementation. All recommended facility improvement types are included in Appendix A, Design Guidelines. Facility cost estimates are provided in Appendix F.

Community Survey

A community survey was initiated in January 2014, to engage citizens and employees that utilize Laurinburg's pedestrian network. Special thanks is given to the nearly 250 residents that responded to the survey over a three month period. The survey was designed to identify issues relating to pedestrian travel within the corporate limits. Most notably, more than 95% of respondents support the goal of making Laurinburg a pedestrian friendly community. Other key findings are highlighted below:

- Approximately 55% of respondents live within the corporate limits; 78% work within the corporate limits.
- The majority of respondents (42%) were aged 50-64; less than 10% were under the age of 30.
- Approximately 43% of respondents reported a member of their household as having high blood pressure.
- Nearly 67% of respondents walk or run now, primarily for exercise.
- Lack of sidewalks was the most significant hindrance to walking.
- Approximately 72% of respondents reported a desire to walk to parks and recreation facilities.
- Public/private partnership was identified as the most important funding mechanism for improvements.
- West Boulevard was identified as the highest priority road for improvements.

The survey results can be found in their entirety in Appendix B.

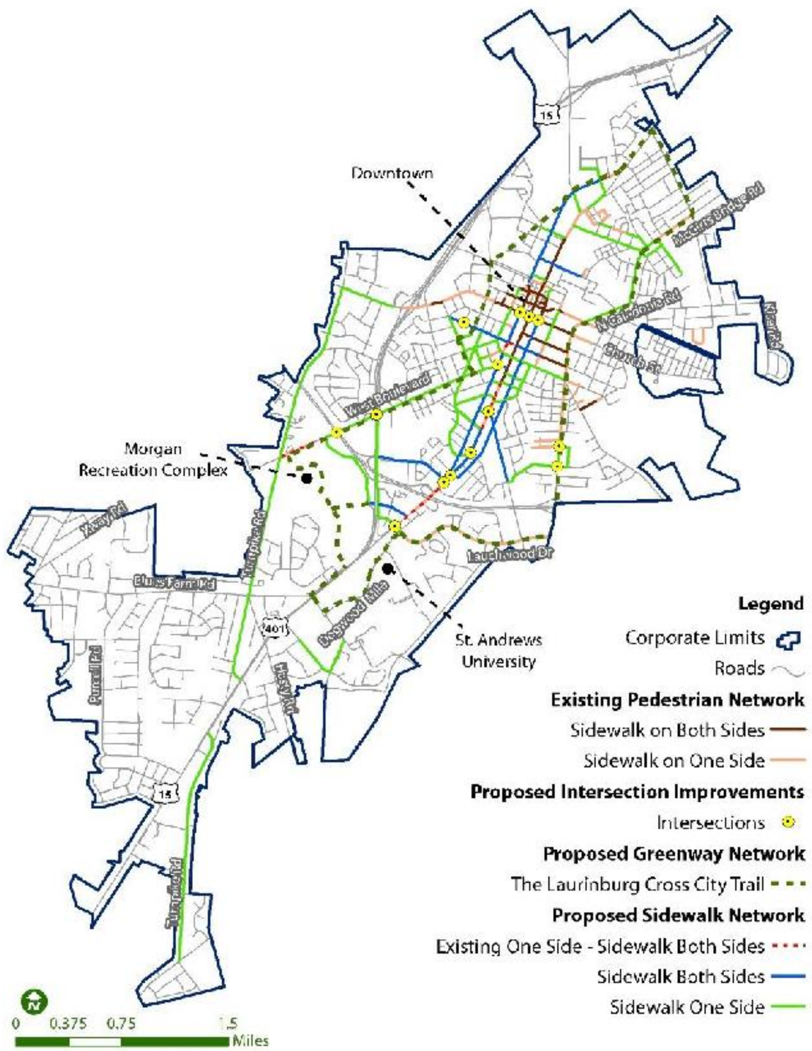
Pedestrian Network Recommendations

A primary focus of this plan is the identification of practical recommendations for improving pedestrian travel options in Laurinburg. The methodology, physical recommendations, intersection enhancements, and priority projects are included in this section. Recommendations are provided for sidewalks, a greenway network, and intersection enhancements.

Methodology

A combination of field work, committee input, community survey results, and practicality led to the creation of the network recommendations contained within this comprehensive pedestrian plan. To identify high priority projects, the committee was tasked with ranking various factors that are most important to improving the pedestrian network in Laurinburg. This information is provided in the "Prioritization" section. Field work conducted by Holland Consulting Planners supplemented input received by the committee and residents. Understanding the existing pedestrian network framework and challenges is important to recommending feasible and effective improvements.

Map 13 - Existing and Proposed Pedestrian Facilities



Sidewalk Recommendations

Proposed improvements to Laurinburg's sidewalk network are shown on Maps 13, 14a, and14b. Recommendations are categorized by the facility type, whether to construct a sidewalk on both sides of a roadway, one side, or add a sidewalk to the other side of a roadway where only one side exists. Within Laurinburg, there is ample pedestrian traffic in areas without sidewalk facilities. Such locations include West Boulevard and South Main Street. Additionally, locations for suggested improvements are in close proximity to pedestrian destinations, pedestrian crash areas, and neighborhoods with low vehicle ownership.

Approximately 25 miles of roadway are recommended for sidewalk improvements at a total estimated cost of $5,210,348. This cost estimate does not include curb ramp installation, crosswalk markings, or proposed pedestrian signals. The recommended facility type is a five-foot wide concrete sidewalk similar to the one shown below. It should be noted that these improvements should be completed over a number of years, ideally, phased in three- to five-year capital improvement plans.

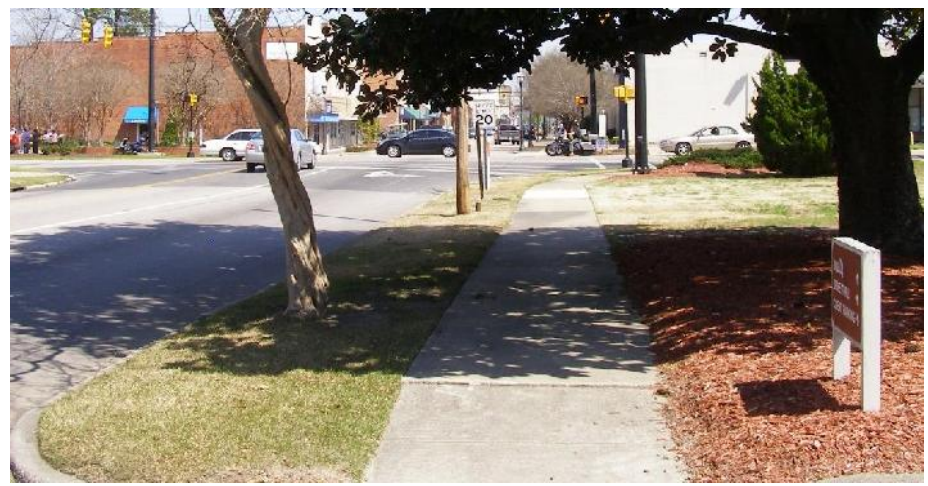
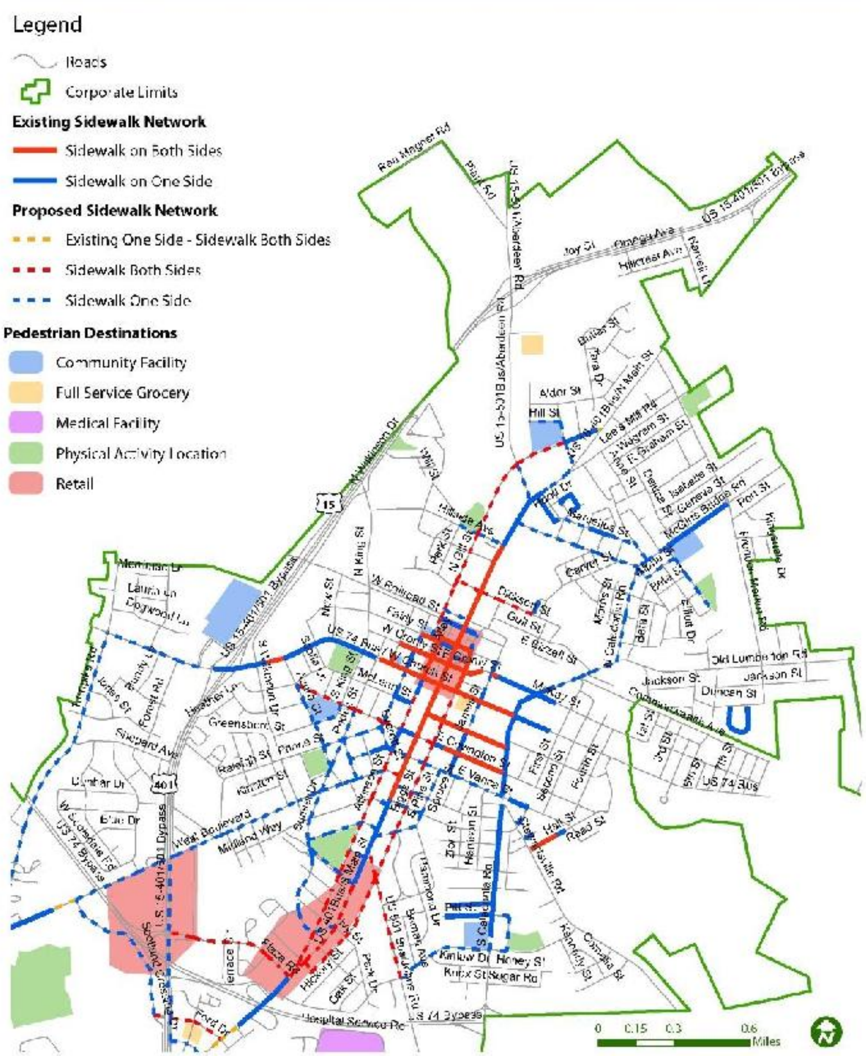
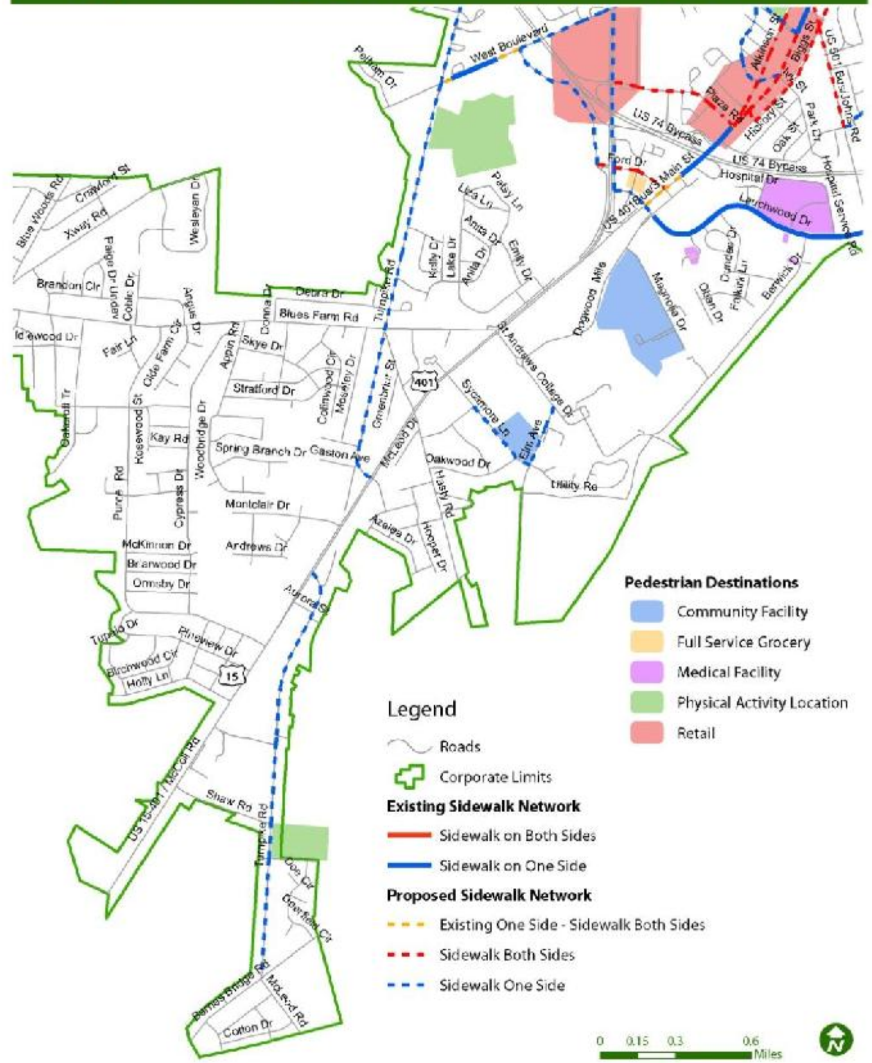


Figure 15: Typical 5-foot wide concrete sidewalk

Map 14a - Sidewalk Recommendations (North)



Map 14b - Sidewalk Recommendations (South)



Proposed Sidewalk Network by Street -- Cost Estimate with ADA Curb Ramp Included								
Street Name	**From**	**To**	**Block Segments**	**Proposed Improvement**	**ADA Ramps**	**Intersections of Concern**	**Length (ft)***	**Estimated Cost with ADA Ramp**
401 Service Rd	Hampton Inn Cir	Lauchwood Cir	2	Install SW One Side	4		1,076.91	$37,701.21
Aberdeen Rd	N Gill St	N Main St	1	Install SW One Side	3		798.38	$27,978.25
Alpha St	Corona Ave	Roseville St	2	Install SW One Side	4		742.89	$27,012.45
Armory St	S Main St	Biggs St	1	Install SW Both Sides	2		267.37	$10,175.92
Atkinson St	S Main St	E Church St	23	Exist One Side - Install SW Both Sides	57	3,5,12	13,724.66	$485,359.12
Azure Ct	W Covington St	Pedan St	4	Install SW One Side	7		1,882.28	$65,902.88
Biggs St	E Railroad	Monroe Alley	1	Install SW One Side	2		365.34	$13,310.79
Biggs St	E Church St	Armory St	12	Install SW Both Sides	50	2	13,772.78	$481,228.86
Bizzell St	N Gill St	N Main	1	Install SW One Side	3		548.48	$19,981.24
N Caledonia Rd	Old Lumberton Rd	McGirts Bridge Rd	4	Install SW One Side	8		2,022.04	$71,185.44
S Caledonia Rd	Old Lumberton Rd	Mckay St	9	Install SW One Side	13		1,808.70	$68,408.48
S Caledonia Rd	Pitt St	McDougald Ave	1	Install SW One Side	3	10,11	739.21	26084.66806
Church St	Turnpike Rd	Scotland High School Rd	5	Install SW One Side	7		2,070.88	$71,938.31
College Dr	Woodlawn St	Flowers St	3	Install SW One Side	10	11	1,932.11	$69,927.48
Corona Ave	McGirts Bridge Rd	Delta St	4	Install SW One Side	2		1,544.45	$51,042.41
Covington St	Azure Ct	James St	9	Exist One Side - Install SW Both Sides	31	4	7,012.27	$249,502.51
Crepe Myrtle Ave	Sunset Dr	S Main St	2	Install SW One Side	5		1,178.02	$41,746.61
Cypress St	Hill St	N Main	2	Install SW One Side	2		965.49	$32,515.78
Dickson St	N Gill St	Carver St	2	Install SW Both Sides	9		2,364.24	$82,945.55
Elm Ave	Atkinson St	S Main	2	Install SW One Side	2		365.98	$13,331.36
ElmSt	St Andrews College Dr	Cameron Dr	1	Install SW One Side	3	6	1,325.30	$44,839.50
Entrance- Scotland Crossing	Scotland Crossing Dr	15-401 Bypass	1	Install SW Both Sides	14		488.74	$26,979.68

Street Name	From	To	Block Segments	Proposed Improvement	ADA Ramps	Intersections of Concern	Length (ft)*	Estimated Cost with ADA Ramp
Everett St (Cronly to Fairly	W Cronly St	Fairly St	1	Install SW One Side	2		361.39	$13,184.38
Flowers St	Pitt St	McDougald Ave	1	Install SW One Side	2		736.30	$25,181.47
Ford Dr	401 Bypass Service Rd	S Main St	2	Install SW Both Sides	10		2,371.76	$83,996.37
Gill St	Alley (@ AtkinsonSt)	N Main	10	Exist One Side - Install SW Both Sides	30		10,487.01	$359,884.29
Hill St	Glenn St	Cypress St	1	Install SW One Side	0		654.33	$20,938.60
Hillside Ave	Perk St	N Main S	2	Install SW One Side	4		1,013.18	$35,661.84
James St	E Cronly St	McRae St	2	Install SW One Side	2		1,013.18	$34,041.84
John St	N Gill St	Carver St	1	Install SW Both Sides	8		1,104.44	$41,822.08
Johns Rd	S Main St	Woodlawn St	4	Install SW Both Sides	25	6	5,475.44	$195,464.06
King St	W Covington St	S King St	1	Install SW One Side	3		758.62	$26,705.97
Lauchwood Cir	401 Bypass Service Rd	S Main St	2	Install SW One Side	13	14	704.23	$33,065.26
Lauchwood Dr.	S Main St	Dogwood Mile	1	Install SW One Side	13	14	309.39	$20,430.49
Main St	Cypress St	Lytch St	2	Install SW One Side	4		894.66	$31,869.23
Main St	Lauchwood Dr	Welch St	26	Exist One Side - Install SW Both Sides	77	6,7,12,13,14	10,105.09	$385,732.94
Marcellus St	Melton St	Washington St	3	Install SW One Side	2		943.85	$31,823.15
McDougald Ave	Woodlawn St	Flowers St	1	Install SW One Side	10	11	355.85	$19,487.14
McGirts Bridge Rd	N Main St	Corona Ave	8	Install SW One Side	12		3,451.13	$120,156.13
Peden St	W Covington St	West Boulevard	5	Install SW One Side	9		1,845.25	$66,337.90
Pine St	E Vance St	Tucker St	3	Install SW One Side	6		1,282.62	$45,903.94
Pitt St	S Caledonia Rd	Flowers St	1	Install SW One Side	4	10	354.83	$14,594.41
Plaza Rd	15-401/501 Bypass	S Main St	5	Install SW Both Sides	24	13	4,333.04	$158,097.28
Prince St	Azure Ct	Everett St	4	Install SW One Side	6		1,394.84	$49,494.74
Richmond St	Prince St	West Boulevard	2	Install SW One Side	6		882.59	$33,102.79
Roseville St	N Caledonia Rd	Alpha St	1	Install SW One Side	5		270.28	$12,699.03
Scotland Crossing Dr	West Boulevard	Entrance- Scotland Crossing	3	Install SW One Side	4		3,238.78	$106,880.83
Sunset Dr	West Boulevard	S Main St	12	Install SW One Side	26	7	3,746.21	$140,938.62
Sycamore Ln	Evergreen Ln	Elm Ave	2	Install SW One Side	2		1,735.05	$57,141.57
Tucker St	S Pine St	S Main St	2	Install SW One Side	13		885.97	$38,881.08

Street Name	From	To	Block Segments	Proposed Improvement	ADA Ramps	Intersections of Concern	Length (ft)*	Estimated Cost with ADA Ramp
Turnpike Rd (McColl to Barnes Bridge)	McColl Rd	Barnes Bridge Rd	8	Install SW One Side	8		8,749.01	$286,448.41
Turnpike Rd (McColl to Church)	McColl Rd	W Church St	15	Install SW One Side	24		15,329.83	$509,994.59
US 15-401 Bypass	West Boulevard	Hampton Inn Cir	1	Install SW One Side	11	8	2,738.45	$96,540.37
Vance St	Richmond St	Scotland St	1	Install SW One Side			403.87	$12,923.72
Vance St	Atkinson St	S Caledonia Rd	9	Install SW One Side	8		2,516.55	$87,009.62
Washington St	Marcellus St	McGirts Bridge Rd	1	Install SW One Side	4		491.33	$18,962.49
Welch St (Atkinson to S Main)	Atkinson St	S Main St	1	Install SW One Side	4		367.77	$15,008.52
Welch St (S Main to Pine)	S Main St	S Pine St	2	Install SW One Side	4		721.67	$26,333.59
West Boulevard	S Main St	Turnpike Rd	22	Exist One Side - Install SW Both Sides	40	5,8,9	9,429.66	$334,149.12
Wilson St	S Main St	S Pine St	2	Install SW One Side	3		723.35	$25,577.29
Woodlawn St	Johns Rd	College Dr	1	Install SW One Side	2		229.72	$8,970.98
Yadkin Ave	S Main	Sunset Dr	4	Install SW One Side	5		1,542.65	$53,414.68
Total			**270**		**685**		**162,594**	**$5,757,853**

* Note: Length has been doubled where a sidewalk on both sides has been recommended.

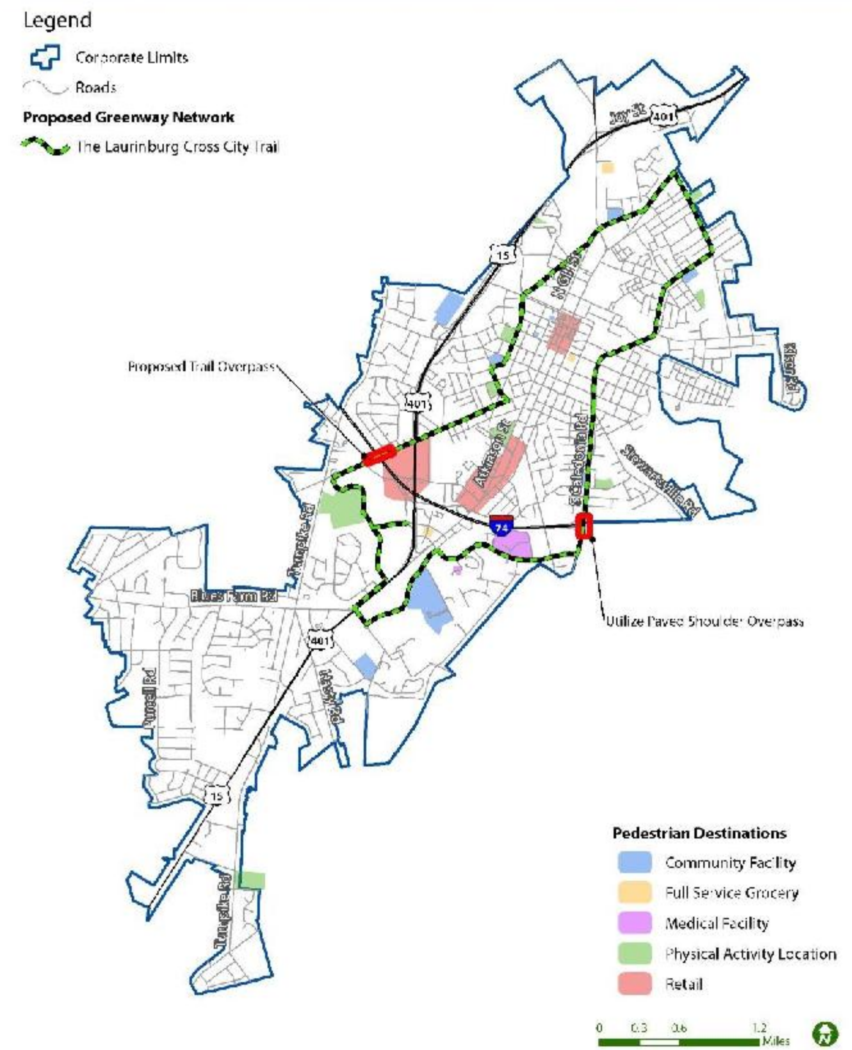
Greenway Network Recommendations

A comprehensive greenway network is proposed within the Laurinburg corporate limits (see Map 15). Collectively, the network is termed ***The Laurinburg Cross City Trail***. The network meanders throughout the corporate limits creating a loop with connections to primary pedestrian destinations. The trail will require an overpass bridge, mid-block crossing/intersection, and a paved shoulder overpass on Caledonia Road/US 74 Bypass. The entire network spans 10.25 miles and is estimated to cost approximately $4,931,685.

The proposed greenway network cost is associated with the construction of a ten-foot asphalt trail. The image below depicts a similar facility located in Wilmington, NC. High visibility signage and crosswalk markings will be necessary at primary intersections on the network. These locations should be determined at the time of construction.

Figure 16: Example 10 foot, asphalt multi-use path (greenway)

Map 15 - Recommended Greenway Network



The proposed network shall be constructed with consideration of existing sidewalks. Where applicable, the sidewalk will be expanded to accommodate the 10-foot wide multi-use trail. Primary constraints include lack of lighting and landscape material (heritage trees).

Proposed Greenway Network					
Segment Name	**From**	**To**	**Length (ft)**	**Miles**	**Estimated Cost**
Azure Court Connector	West Boulevard	S King St	1,394.40	0.26	$125,096.40
Caledonia Trail	74 Bypass Ramp	Lauchwood Dr	852.95	0.16	$76,982.40
Caledonia Trail	74 Bypass Ramp	74 Bypass Ramp	589.21	0.11	$52,925.40
Caledonia Trail	E Vance St	74 Bypass Ramp	4,451.95	0.84	$404,157.60
Caledonia Trail	E Church St	E Vance St	1,723.65	0.33	$158,776.20
Caledonia Trail	Roseville St	Church St	4,552.83	0.86	$413,780.40
Gill Street Trail	Hillside Ave	N Main St	3,828.44	0.73	$351,232.20
Hillside Cemetery Connector	W Bizzell St	Hillside Ave	2,153.15	0.41	$197,267.40
King Street Trail	W Covington St	W Bizzell St	2,636.85	0.50	$240,570.00
King Street Trail	Azure Ct	W Covington St	804.82	0.15	$72,171.00
Main Street Connector	N Gill St	Produce Market Rd	1,989.36	0.38	$182,833.20
McGirts Bridge Connector Trail	Produce Market Rd	Roseville St	2,315.34	0.44	$211,701.60
Produce Market Trail	N Main St	McGirts Bridge Rd	3,500.53	0.66	$317,552.40
Recreation Complex Trail	McColl Rd	West Boulevard	5,610.92	1.06	$510,008.40
Scotland Crossing Connection	TRAIL	Scotland Crossing Dr	1,395.63	0.26	$125,096.40
St. Andrews - Lauchwood Trail	Lauchwood Dr	McColl Rd	2,534.16	0.48	$230,947.20
St. Andrews - Lauchwood Trail	Caledonia Rd	Dogwood Mile	6,052.89	1.15	$553,311.00
West Blvd Trail	15-401/501 Bypass	Azure Ct	4,046.38	0.77	$370,477.80
West Blvd Trail	74 Bypass	15-401/501 Bypass	1,510.61	0.29	$139,530.60
West Blvd Trail	Turnpike Rd	74 Bypass	2,139.65	0.41	$197,267.40
Total			**54,083.69**	**10.25**	**$4,931,685.00**

Intersection Enhancements

Fourteen intersections of concern were identified at the onset of the planning process. For each intersection, recommendations have been made to increase safety and encourage greater use of these facilities. Curb ramps, pedestrian signals, high visibility crosswalks (striping), curb extensions, and median refuge areas are recommended at various locations. Map 12 in Chapter 3 provides the location of all intersection enhancement areas.

Enhancements – Intersection 1

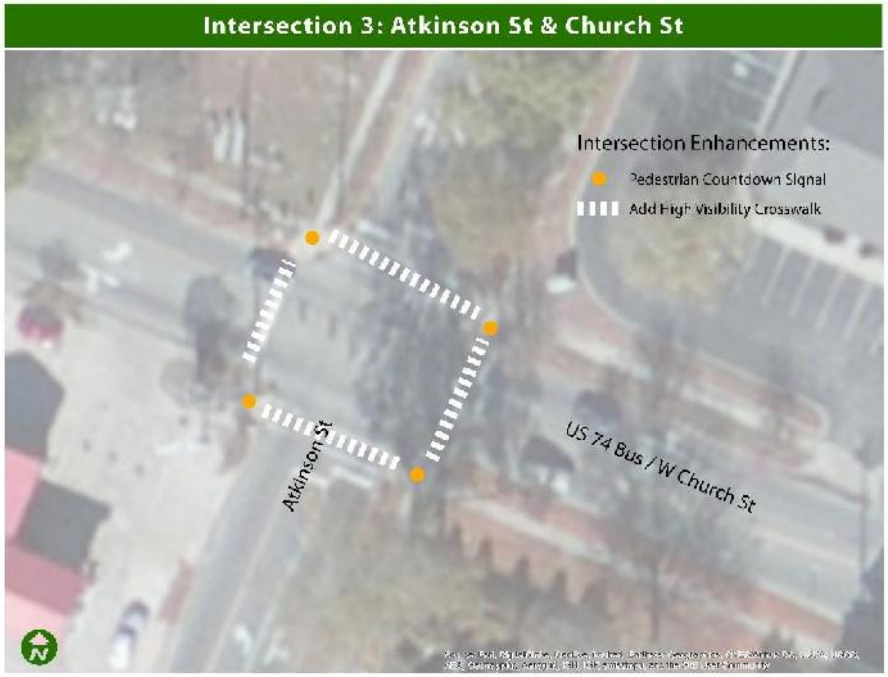
- Upgrade/renovate eight (8) existing curb ramps
- Add four (4) new high visibility crosswalks
- Potential location for curb extension to reduce crossing distance

Figure 17: Pedestrian countdown signals are included at the intersection of S Main Street and Church Street; however, the intersection lacks high visibility crosswalks.

Figure 18: Existing crosswalk at Biggs Street and Church Street is deteriorating. Recommend upgrading to a high visibility crosswalk.

Enhancements – Intersection 2

- Upgrade/renovate two (2) existing curb ramps
- Install two (2) new curb ramps
- Add four (4) new high visibility crosswalks
    - Upgrade two crosswalks and mark two
- Add four (4) pedestrian countdown signals
- May require the relocation of stop bars



Enhancements – Intersection 3

- Add four (4) new high visibility crosswalks
  - Upgrade two crosswalks and mark two
- Add four (4) pedestrian countdown signals
- May require the relocation of stop bars

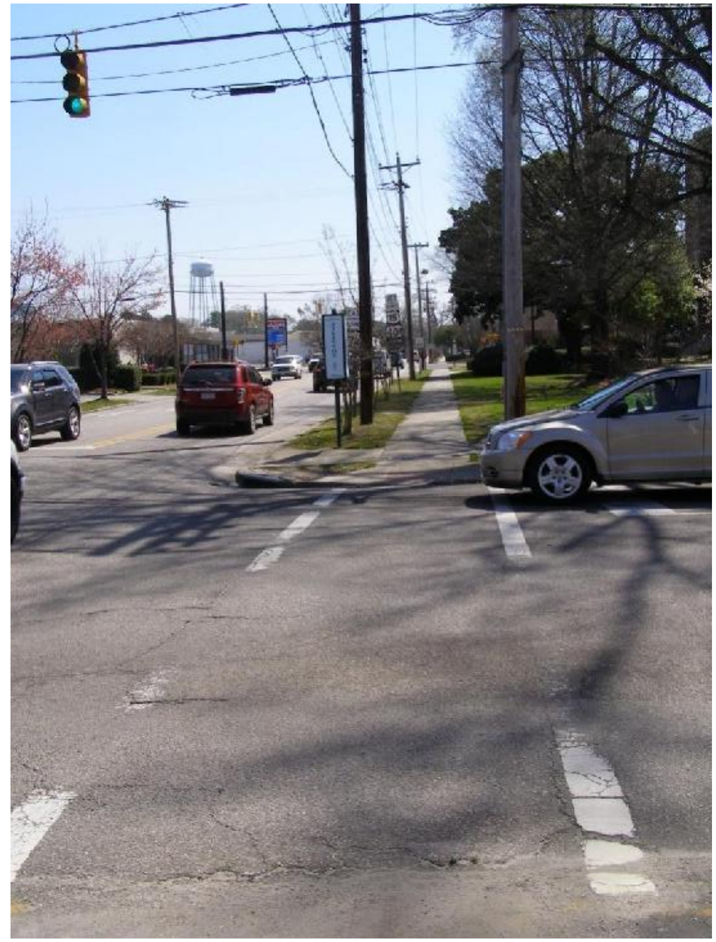
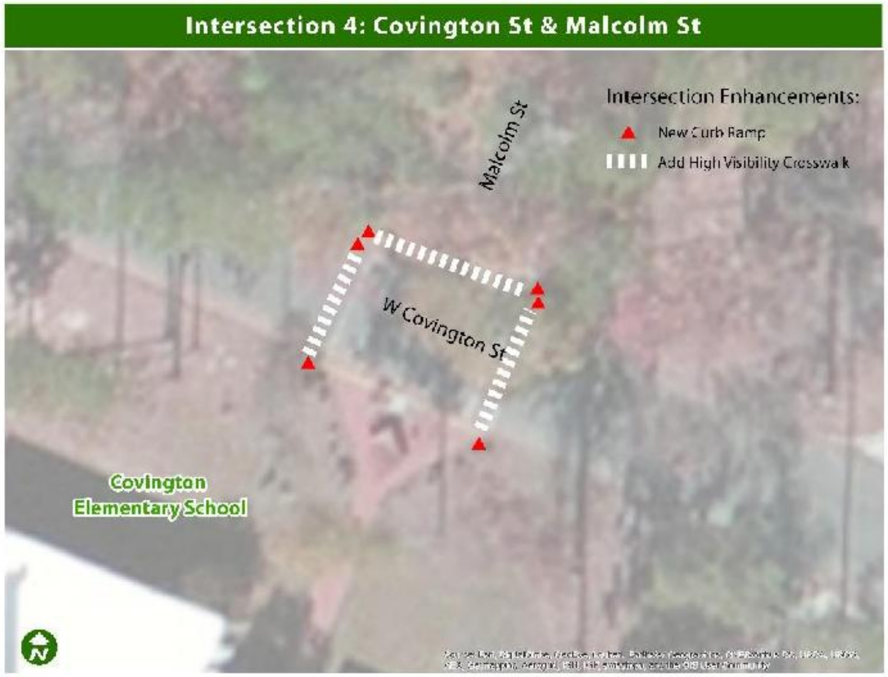


Figure 19: All four curb ramps at Atkinson Street and Church Street are in good condition and meet handicap guidelines. However, the existing crosswalk is deteriorating. Recommend upgrading to a high visibility crosswalk.



Enhancements – Intersection 4

- Add three (3) new high visibility crosswalks
- Add six (6) new curb ramps
    - Relocation of street light may be required on northwest corner of intersection
- Consider including additional high visibility signage (see image to the right)

Figure 20: This entrance to Covington Elementary School does not include curb ramps or high visibility crosswalks. Please note, as part of the pedestrian network recommendations, sidewalks are proposed for both sides of Covington Street.

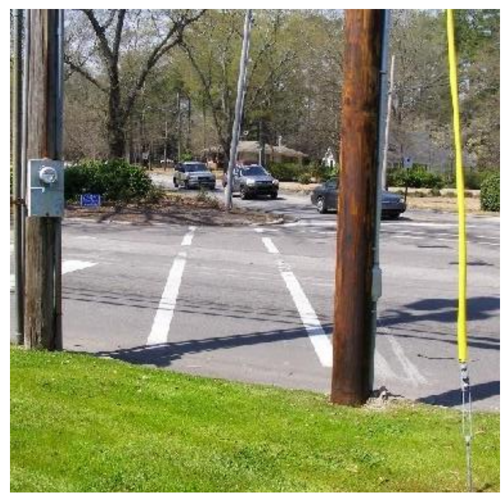
Figure 21: Example of a school crossing sign (high visibility signage).

Figure 22: The geometry of the intersection of Atkinson St and West Blvd makes pedestrian travel more dangerous, coupled with the lack of sidewalks and crossing facilities. Please note, as part of the pedestrian network recommendations, sidewalks are proposed for both sides of West Blvd east of the intersection, and one side of the street west of the intersection. Sidewalks are proposed for both sides of Atkinson Street.

Enhancements – Intersection 5

- Add four (4) new high visibility crosswalks
    - Upgrade three crosswalks and mark one
- Add eight (8) new curb ramps
- Install six (6) pedestrian countdown signals

Further study is recommended at this intersection. Realignment to a perpendicular crossing would provide safety benefits for pedestrians and motorists.



Enhancements – Intersection 6

- Add six (6) high visibility crosswalks
- Add eleven (11) new curb ramps
- Install four (4) pedestrian countdown signals
- Provide pedestrian refuge through an enhanced median and increase crossing safety with a curb extension
- Consider the addition of advanced stop bars on Johns Road south of proposed crosswalk marking

Impacts to truck turning movements should be confirmed prior to installation of the proposed curb extension.

Figure 23: This angled, three-legged intersection at S Main Street and Johns Road offers few options for pedestrians looking to cross. As a result, a pedestrian refuge area is proposed through a median enhancement. Please note, as part of the pedestrian network recommendations, sidewalks are proposed for both sides of Johns Road and S Main Street.

Enhancements – Intersection 7

- Add two (2) new high visibility crosswalks
- Add four (4) new curb ramps
- Install three (3) curb extensions

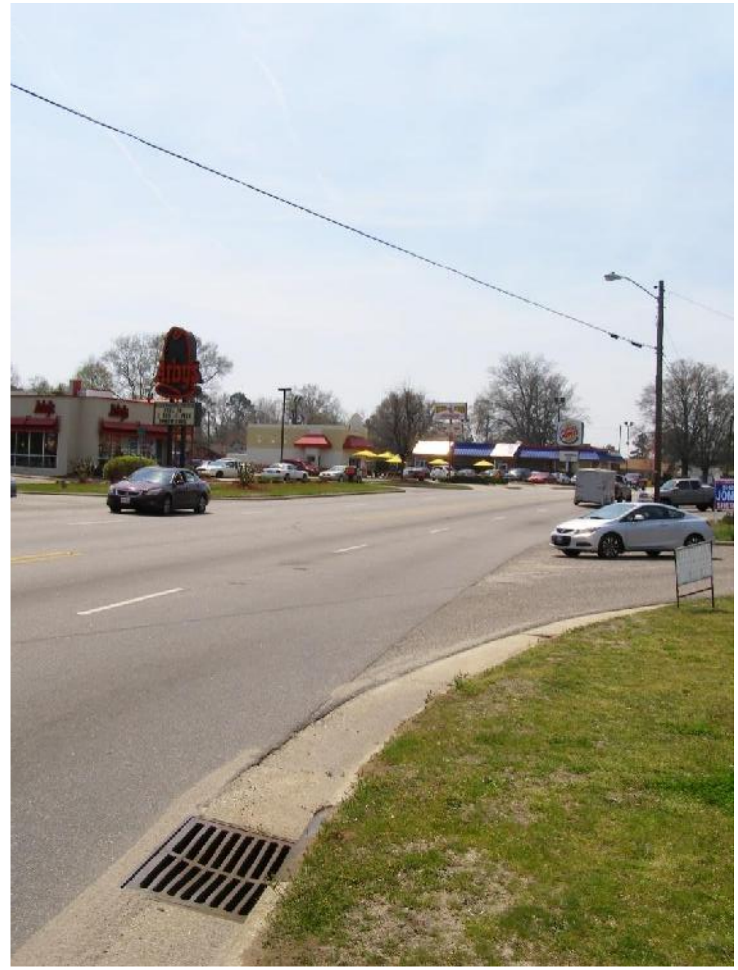
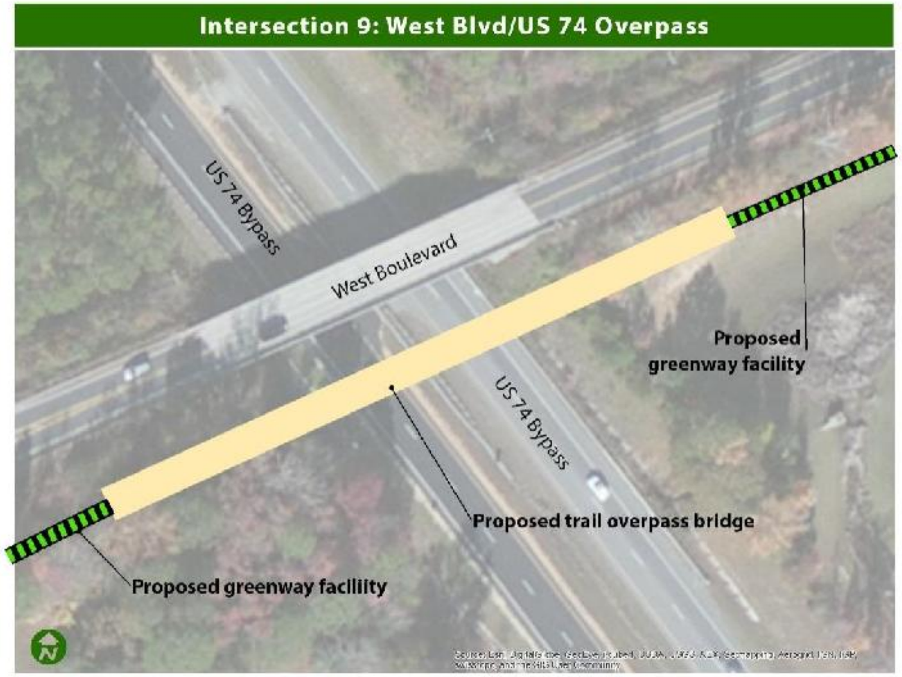


Figure 24: Pedestrians will benefit from curb extensions at S Main Street and Sunset Drive that make them more visible and reduce their crossing distance. Please note, as part of the pedestrian network recommendations, sidewalks are proposed for both sides of S Main Street.

Enhancements – Intersection 8

- Add three (3) new high visibility crosswalks
- Add six (6) new curb ramps
- Install two (2) pedestrian countdown signals
- Install a pedestrian refuge by enhancing the US 401 median

Figure 25: West Blvd was identified as a priority pedestrian improvement area by the steering committee and the community survey. Many residents without access to a private vehicle must cross US 401 without the assistance of a pedestrian signal or crosswalk. Please note, as part of the pedestrian network recommendations, a sidewalk and separate off-street multi-use path (greenway) are proposed for the south side of West Blvd.



Enhancements – Intersection 9

- Trail/multi-use path overpass bridge
- Greenway facility
- Install high visibility signage

It should be noted that construction of the pedestrian bridge may be unlikely. In the event that the bridge is reconstructed, pedestrian accommodations, such as wide shoulders and/or sidewalks should be included. In the short term, the bridge should be restriped to allow for greater separation between vehicles and non-motorized traffic. The addition of plastic bollards will provide a safer crossing location.

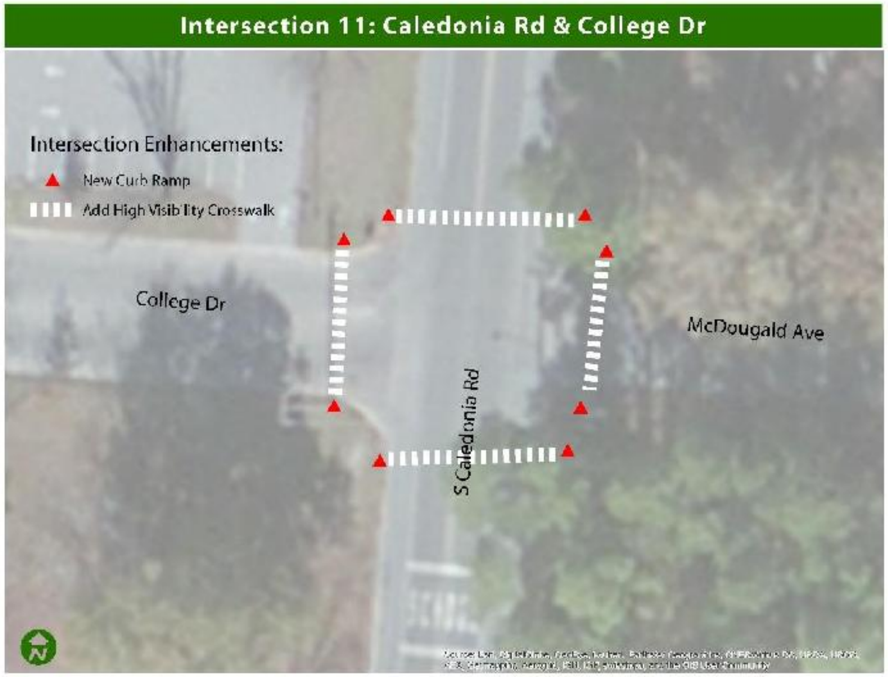
Figure 26: The West Blvd overpass is consistently mentioned as an area of concern for pedestrians. Specifically, the overpass has narrow shoulders that do not accommodate pedestrians. This portion of West Blvd experiences significant pedestrian traffic.

Enhancements – Intersection 10

- Add four (4) new high visibility crosswalks
- Add four (4) new curb ramps
- Install high visibility signage
- Please note, the curb ramps on the western crossing of Pitt St are ADA accessible.

Recommended traffic calming facilities include speed tables or traffic circles.

Figure 27: The Caledonia Road and Pitt Street intersection is adjacent to Washington Park Elementary. Caledonia Road should also be outfitted with traffic calming facilities. Please note, as part of the pedestrian network recommendations, a separate off-street multi-use path (greenway) is proposed for the west side of Caledonia Road.



Enhancements – Intersection 11

- Add four (4) new high visibility crosswalks
- Add eight (8) new curb ramps
- Install high visibility signage

Recommended traffic calming facilities include speed tables or traffic circles.

Figure 28: The Caledonia Road and College Drive intersection is adjacent to Washington Park Elementary. As mentioned previously, Caledonia Road should be outfitted with traffic calming facilities. Please note, as part of the pedestrian network recommendations, a separate off-street multi-use path (greenway) is proposed for the west side of Caledonia Road.

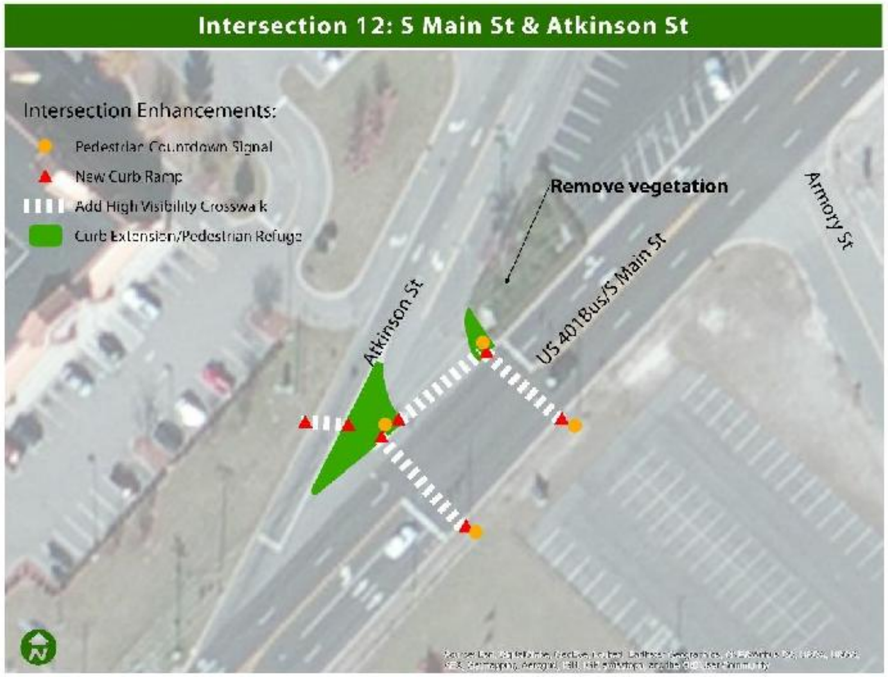


Figure 29: The intersection of S Main Street and Atkinson Street is particularly troubling for pedestrians as individuals must cross a large expanse of roadway. Visibility is limited due to vegetation contained in the KFC parking lot. Dedicated crossing facilities and a median/ pedestrian refuge will enhance both the aesthetics and safety of the intersection. Please note, as part of the pedestrian network recommendations, sidewalks are proposed for both sides of Main Street and Atkinson Street.

Enhancements – Intersection 12

- Add four (4) new high visibility crosswalks
- Add seven (7) new curb ramps
- Install four (4) pedestrian countdown signals
- Construct a pedestrian refuge median and a curb extension on Atkinson Street
- Remove vegetation at southern tip of parking area to increase both driver and pedestrian visibility.
- Consider including additional high visibility signage

Further detailed may be necessary at this intersection. Improvements should be installed/constructed and studied in concert with intersection 13 on the following page.

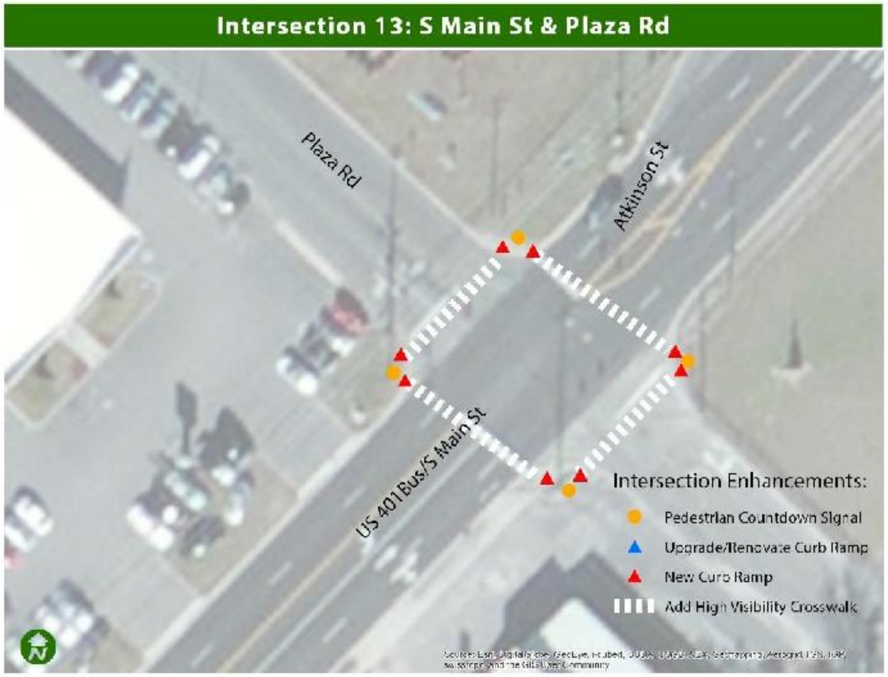
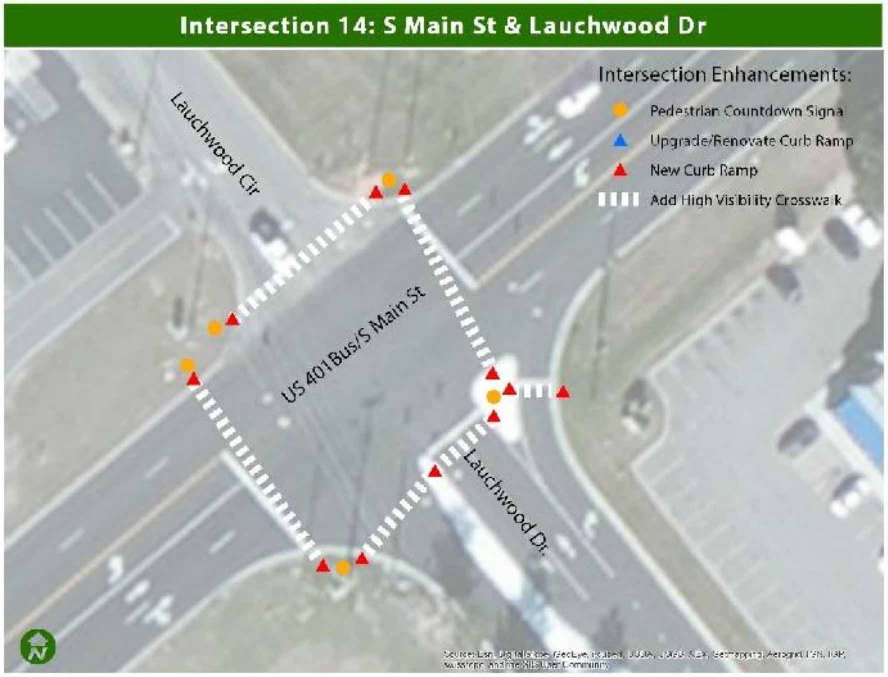


Figure 30: As evidenced by the pedestrian footpath shown in the image above, this area of S Main St experiences a high volume of pedestrians. Enhancing this intersection with pedestrian countdown signals and a crosswalk will enhance safety and usability. Please note, as part of the pedestrian network recommendations, sidewalks are proposed for both sides of Main Street.

Enhancements – Intersection 13

- Add four (4) new high visibility crosswalks
- Add eight (8) new curb ramps
- Install four (4) pedestrian countdown signals
- Relocate stop bars further back into the travel lane to allow for crosswalk



Enhancements – Intersection 14

- Add six (6) new high visibility crosswalks
- Add eleven (11) new curb ramps
- Install five (5) pedestrian countdown signals
- Install additional high visibility signage
- Relocate stop bars

Figure 31: This portion of Main Street is in need of traffic calming measures as traffic appears to move in excess of the posted speed limit. Dedicated crossing facilities and countdown signals will increase safety at this intersection. Please note, as part of the pedestrian network recommendations, sidewalks are proposed for Main Street and Lauchwood Dr.

Intersection Enhancements						
Intersection	Upgrade Curb Ramp	New Curb Ramp	Install Pedestrian Signal	Install High Visibility Crosswalk	Install Pedestrian Refuge	Install Curb Extension
1. Church & S Main	8			4		
2. Church & Biggs	2	2	4	4		
3. Church & Atkinson			4	4		
4. Covington & Malcolm		6		3		
5. West Blvd & Atkinson		8	6	4		
6. S Main & Johns		11	4	6	1	1
7. S Main & Sunset		7		2		3
8. West Blvd & US 401		6	2	3	1	
9. West Blvd Overpass (74)						
10. Caledonia & Pitt		4		4		
11. Caledonia & College		8		4		
12. S Main & Atkinson		7	4	4	1	1
13. S Main & Plaza		8	4	4		
14. S Main & Lauchwood		11	5	6		
Total	**10**	**78**	**33**	**52**	**3**	**5**

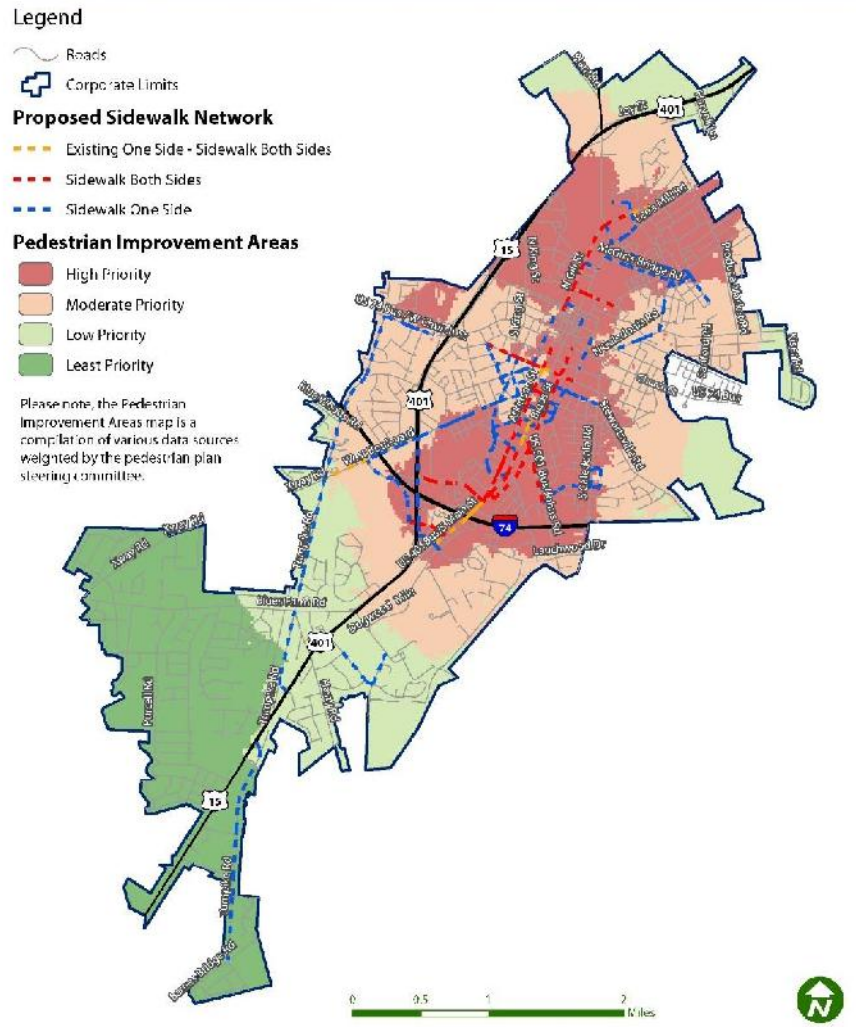
Priority Pedestrian Projects

In order to determine the most important and immediate improvements to Laurinburg's pedestrian infrastructure, several high priority projects have been identified. These projects were identified based upon thirteen different priority factors, the community survey, and input from the steering committee.

The table below details the importance of the factors utilized in the creation of Map 16. Accordingly, the steering committee identified "Households without a Private Vehicle" as the most important consideration in prioritizing pedestrian improvement projects. Priority sidewalk improvements, greenway network segment recommendations, and intersection enhancements are provided on the following pages.

Priority Factor	Average Rank (lower value most important)
Households without a Private Vehicle	4.09
Access to Full-Service Grocery Store	4.82
Proximity to Pedestrian Crashes	5.27
Proximity to Schools	5.73
Proximity to Households Walking to Work	6.55
Proximity to Medical Facilities	7.00
Low Socioeconomic Status (income & education)	7.18
Proximity to Retail Destinations	7.18
Proximity to Parks & Recreation Facilities	7.27
Elderly Concentration (65+)	7.64
Proximity to Community Facilities (Library, City Hall, Post Office, etc.)	7.73
Population Vulnerable to Chronic Disease	9.36
Near-Term Feasibility of Project (low cost, easier constructability)	10.36

Map 16 - Priority Pedestrian Improvement Areas



Estimated costs are provided for each of the identified priority projects. It should be noted, however, that these estimates may vary according to site specifications and requirements for ancillary items, such as grading and drainage. Cost figures provided are based upon research by the UNC Highway Research Center and facility costs in Laurinburg. A listing of cost estimates can be found in Appendix F.

Priority Sidewalk Improvements

Project Name	Block Segments	Length (ft.)	ADA Ramps	Estimated Cost	Constraints and Project Notes
West Blvd from Sunset Dr to 15-401/501 Bypass: Sidewalk One Side	11	3,473	18	$125,550	Trees and vegetation located within the right-of-way. Large number of driveways.
Main St from Crepe Myrtle Ave to Plaza Rd: Sidewalk on Both Sides	9	2,391	27	$174,626	Extensive driveway curb cuts present.
Atkinson St from W Vance St to S Main St: Sidewalk on Both Sides	20	5,210	56	$378,218	Trees and vegetation located on northern portion of roadway. Utilize parallel parking for construction where applicable.
Gill St from Cypress St to Alley St: Sidewalk on Both Sides	8	4,830	30	$333,149	Constrained right-of-way, utilize parallel parking for construction where applicable.
Main St from Plaza Rd to Lauchwood Dr: Sidewalk Exists on One Side – Add Sidewalk to Other Side	8	2,511	35	$108,360	Extensive driveway curb cuts present. No right-of-way constraints, but utility poles present on both sides. Lighting needed below US 74 Bypass.
Total	56	18,415	166	$1,119,903	

Priority Greenway Recommendations

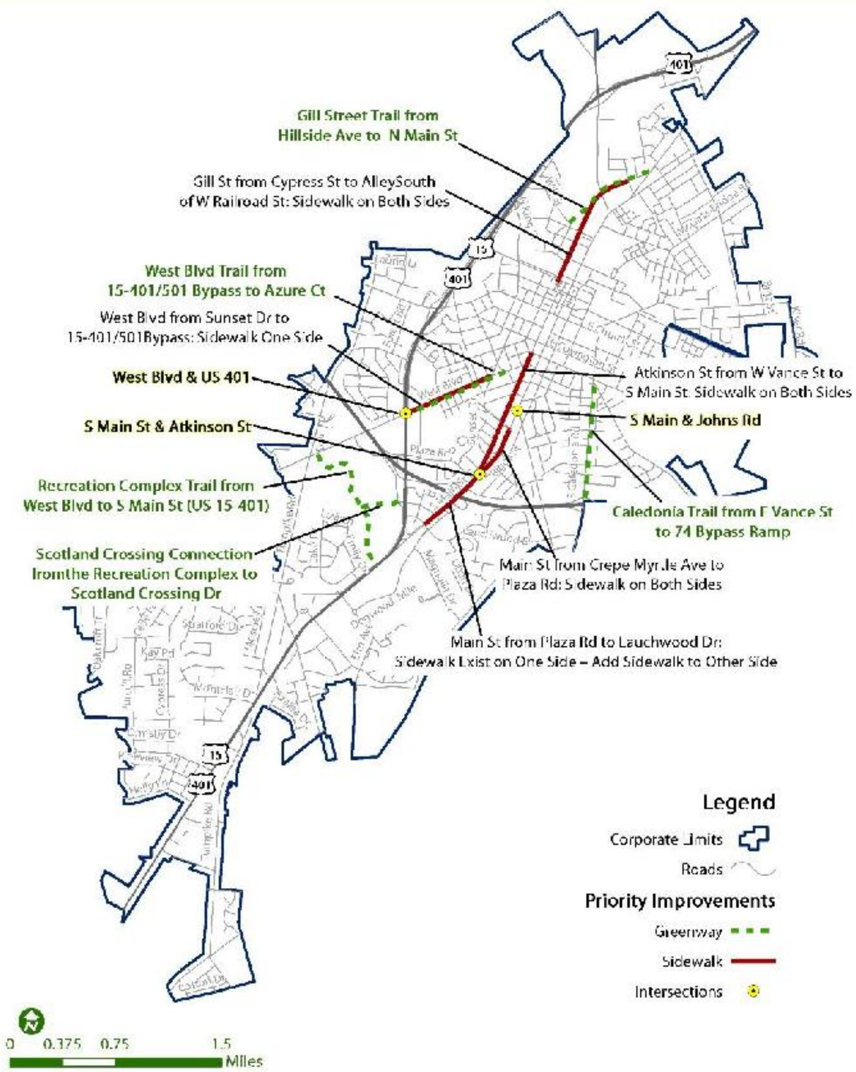
Project Name	Length (ft.)	ADA Ramps	Estimated Cost	Constraints and Project Notes
West Blvd Trail from 15-401/501 Bypass to Azure Ct	4,046	26	$391,277	Trees and vegetation located within the right-of-way. Large number of driveways. Combine greenway with proposed sidewalk.
Recreation Complex Trail from West Blvd to S Main St (US 15-401)	5,611	2	$511,600	Elevation changes and grading necessary. A bridge/boardwalk may be required to cross low lying areas.
Scotland Crossing Connection from the Recreation Complex to Scotland Crossing Dr	1,396	1	$125,896	A bridge/boardwalk may be required to cross low lying areas.
Gill Street Trail from Hillside Ave to N Main St	3,828	8	$357,632	No known constraints.
Caledonia Trail from E Vance St to 74 Bypass Ramp	4,451	17	$417,757	Utilize parallel parking on west side of road where applicable. Alternatively, widen the sidewalk to provide multi-use path.
Total	19,332	54	$1,804,162	

Priority Intersection Enhancements

Intersection enhancements are often installed in tandem with sidewalk construction. In addition, NCDOT typically requires the presence of sidewalks prior to the installation of intersection improvements.

West Blvd & US 401			Constraints and Project Notes
Facility Improvement Type	Count	Estimated Cost	The city must work with NCDOT Division 8 to design these intersection enhancements.
ADA Curb Ramp	6	$4,860	
Pedestrian Countdown Signal	2	$4,440	
Pedestrian Refuge Island	1	$13,000	
High Visibility Crosswalk Markings (thermoplastic)	3	$823	
Total		$23,123	
S Main St & Atkinson St			**Constraints and Project Notes**
Facility Improvement Type	Count	Estimated Cost	Further detail may be necessary at this intersection. Improvements should be installed/constructed and studied in concert with intersection 13: South Main and Plaza Road.
ADA Curb Ramp	7	$5,670	
Pedestrian Countdown Signal	4	$8,880	
Pedestrian Refuge Island	1	$13,000	
Curb Extension	1	$13,000	
High Visibility Crosswalk Markings (thermoplastic)	4	$1,353	
Total		$41,903	
S Main St & Johns Rd			**Constraints and Project Notes**
Facility Improvement Type	Count	Estimated Cost	Impacts to truck turning movements should be confirmed prior to installation of the proposed curb extension.
ADA Curb Ramp	11	$8,910	
Pedestrian Countdown Signal	4	$8,880	
Pedestrian Refuge Island	1	$13,000	
Curb Extension	1	$13,000	
High Visibility Crosswalk Markings (thermoplastic)	6	$1,310	
Total		$45,100	

Map 17 - Priority Proposed Improvements

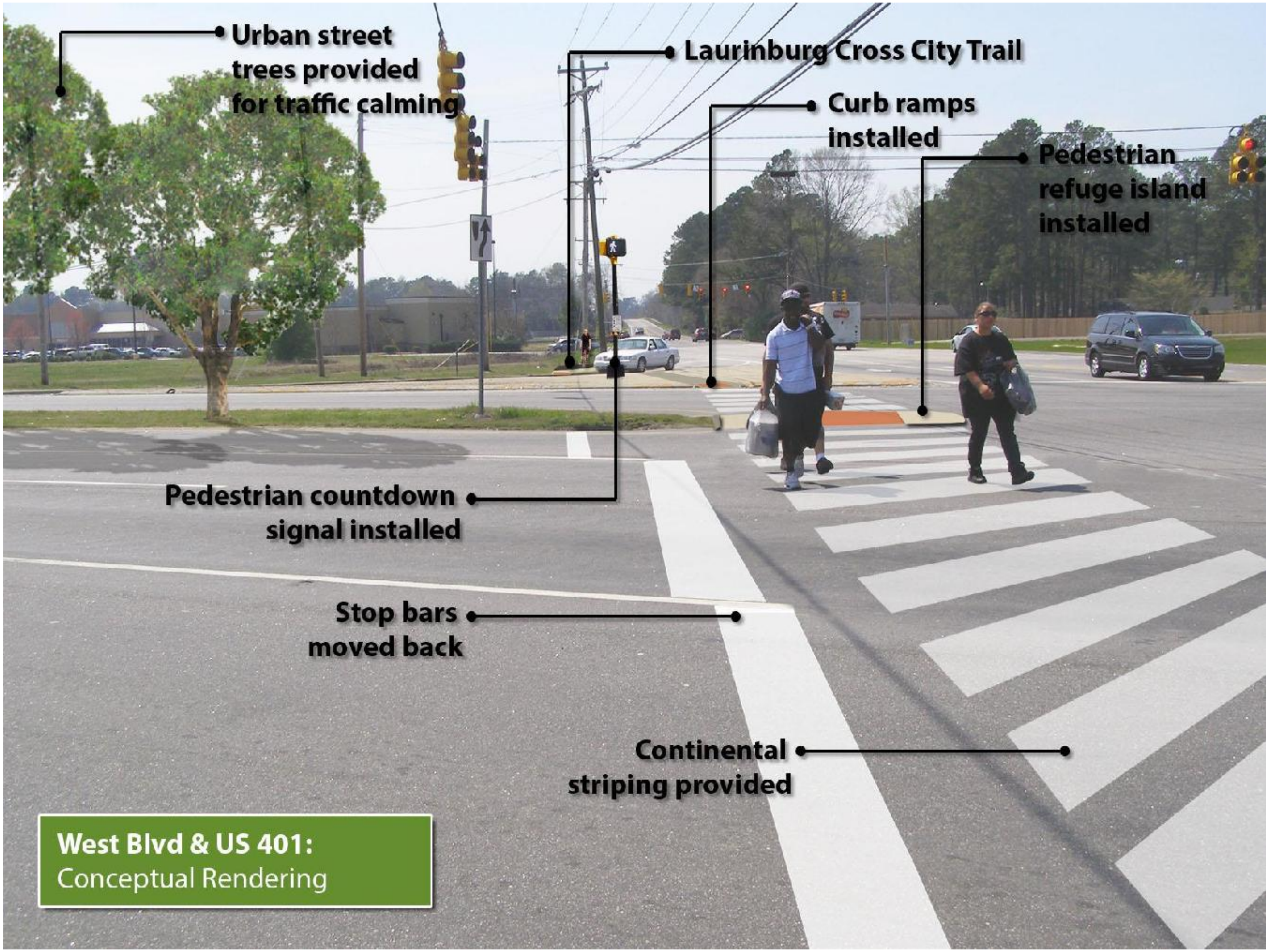


Conceptual Renderings

Conceptual renderings depicting proposed improvements have been provided for two project locations. The first is the intersection of West Boulevard and US 401, the second is the proposed Laurinburg Cross City Trail along Lauchwood Drive.

The renderings are created to enhance the understanding of the proposed improvements, but these visualizations should not serve as details for construction nor an exact representation of installed improvements.


West Blvd & US 401:
Existing Conditions


Urban street trees provided for traffic calming
Laurinburg Cross City Trail
Curb ramps installed
Pedestrian refuge island installed
Pedestrian countdown signal installed
Stop bars moved back
Continental striping provided
West Blvd & US 401:
Conceptual Rendering


Lauchwood Drive at Scotland Memorial:
Existing Conditions


Lauchwood Drive at Scotland Memorial:
Conceptual Rendering
Laurinburg Cross City Trail
(10-12' asphalt multi-use path)
Scotland
Memorial
Hospital
High visibility
signage provided

Chapter 5: Policies & Programs

Introduction

This chapter of Laurinburg's Comprehensive Pedestrian Plan includes a general set of policy recommendations that will enable the City to become more pedestrian-friendly over time. Specifically, polices are provided to enhance enforcement, encourage use, and make roadways safe for non-motorized travel. Suggested revisions to Laurinburg's Unified Development Ordinance are provided as well. Lastly, funding sources and recent changes to the NCDOT funding formula are summarized as it relates to pedestrian oriented projects.

Unified Development Ordinance Revisions

The table below provides recommended revisions for Laurinburg's Unified Development Ordinance (UDO). Revisions and/or additions are provided that will enhance the safety and number of facilities available for pedestrians within Laurinburg's planning jurisdiction. It should be noted, however, that Laurinburg is in the process of updating their Unified Development Ordinance with completion slated for March 2015. Specific performance standards are set to be drafted that will allow for increased pedestrian safety and availability of facilities.

UDO Section Reference	Existing	Addition and/or Revision
Article 2: Section 15 - Definitions	A definition for sidewalk does not currently exist in the UDO.	Sidewalk. Any portion of the street between the curb line and adjacent property line intended for the pedestrian. Recommended minimum width: 5 feet.
	A definition for pedestrian does not currently exist in the UDO.	Pedestrian. People who travel on foot or who use assistive devices, such as wheelchairs, for mobility.
	Road. All private ways used to provide motor vehicle access to (i) two or more lots or (ii) two or more distinct areas or buildings in unsubdivided developments.	Road. All private ways used to provide motor vehicle and non-motorized traveler access to (i) two or more lots or (ii) two or more distinct areas or buildings in unsubdivided developments.
	Sign. Any device that (i) is sufficiently visible to persons not located on the lot where such device is located to accomplish either of this definition; and (ii) is designed to communicate information to them.	Sign. Any device that (i) is sufficiently visible to persons and pedestrians not located on the lot where such device is located to accomplish either of this definition; and (ii) is designed to communicate information to them.

UDO Section Reference	Existing	Addition and/or Revision
	Street. A public street or a street with respect to which an offer of dedication has been made.	Street. A dedicated and accepted public right-of-way for vehicular and pedestrian traffic which affords the principal means of access to abutting property.
	Vehicle Accommodation Area. That portion of a lot that is used by vehicles for access, circulation, parking, and loading and unloading. It comprises the total of circulation areas, loading and unloading areas, and parking areas.	Vehicle Accommodation Area. That portion of a lot that is used by vehicles and pedestrians for access, circulation, parking, and loading and unloading. It comprises the total of circulation areas, loading and unloading areas, and parking areas.
Article 14 Streets and Sidewalks: Section 215 Street Width, Sidewalk, and Drainage Requirements in Subdivisions	(d) The City Council may require the construction of sidewalks adjacent to one side of new streets in subdivisions in which pedestrian traffic is projected to be heavy due to the proximity of schools, parks, open space, playgrounds, or other community or private facilities. The sidewalks required by this section shall be at least four feet in width and constructed according to the specifications set forth in Appendix E.	(d) The City Council may require the construction of sidewalks adjacent to one side of new streets in subdivisions in which pedestrian traffic is projected to be heavy due to the proximity of schools, parks, open space, playgrounds, or other community or private facilities. The sidewalks required by this section shall be at least five feet in width and constructed according to the specifications set forth in Appendix E.
	(e) Whenever the permit-issuing authority finds that a means of pedestrian access is necessary from the subdivision to schools, parks, open space, playgrounds, or other roads or facilities and that such access is not conveniently provided by sidewalks adjacent to the streets, the developer may be required to reserve an unobstructed easement of at least ten feet in width to provide such access.	(e) Whenever the permit-issuing authority finds that a means of pedestrian access is necessary from the subdivision to schools, parks, open space, playgrounds, or other roads or facilities and that such access is not conveniently provided by sidewalks adjacent to the streets, the developer shall be required to reserve an unobstructed easement of at least ten feet in width to provide such access.

UDO Section Reference	Existing	Addition and/or Revision
Article 14 Streets and Sidewalks: Section 221 Road and Sidewalk Requirements in Unsubdivided Developments	(d) In all unsubdivided residential developments, sidewalks shall be provided linking dwelling units with other dwelling units, the public street, and on-site activity centers such as parking areas, laundry facilities, and recreational areas and facilities. Notwithstanding the foregoing, sidewalks shall not be required where pedestrians have access to a road that serves not more than nine dwelling units. The sidewalk requirement may also be waived where, in the opinion of the permit-issuing authority, an adequate system of hiking and/or bicycling trails is provided which would offer acceptable pedestrian facilities and access.	(d) In all unsubdivided residential developments, sidewalks shall be provided linking dwelling units with other dwelling units, the public street, and on-site activity centers such as parking areas, laundry facilities, and recreational areas and facilities. Notwithstanding the foregoing, sidewalks shall not be required where pedestrians have access to a road that serves not more than nine dwelling units. The sidewalk requirement may also be waived where, in the opinion of the permit-issuing authority, an adequate system of ten-foot wide paved multi-use trails is provided which would offer acceptable pedestrian facilities and access.
	(e) The sidewalks required by this section shall be at least four feet wide and constructed according to the specifications set forth in Appendix E, except that the permit-issuing authority may permit the installation of walkways constructed with other suitable materials when it concludes that:	(e) The sidewalks required by this section shall be at least five feet wide and constructed according to the specifications set forth in Appendix E, except that the permit-issuing authority may permit the installation of ten-foot wide paved multi-use trails constructed with other suitable materials when it concludes that:
Appendix E: SPECIFICATIONS FOR STREET DESIGN AND CONSTRUCTION	(a) E-12. Sidewalks: Sidewalk construction shall be similar to street construction, with subgrade compacted to 95% AAASHO T99. Concrete sidewalks shall be 4 inches thick (increasing to 6 inches thick at driveway entrances), and shall be at least 4 feet wide. Expansion joints shall be provided every 30 feet; false joints at 10 feet.	(a) E-12. Sidewalks: Sidewalk construction shall be similar to street construction, with subgrade compacted to 95% AAASHO T99. Concrete sidewalks shall be 4 inches thick (increasing to 6 inches thick at driveway entrances), and shall be at least five (5) feet wide. Expansion joints shall be provided every 30 feet; false joints at 10 feet.

Enforcement Recommendations

Under North Carolina law, pedestrians have the right of way at all intersections and driveways. However, pedestrians must act responsibly, using pedestrian signals where they are available. When crossing the road at any other point than a marked or unmarked crosswalk or when walking along or upon a highway, a pedestrian has a statutory duty to yield the right of way to all vehicles on the roadway. It is the duty of pedestrians to look before starting across a highway, and in the exercise of reasonable care for their own safety, to keep a timely lookout for approaching motor vehicle traffic. On roadways where there is no sidewalk, pedestrians should always walk facing traffic.

To encourage a safer network for pedestrian travel, motorist enforcement should be a top priority. Often times, the pedestrian and motorist view one another as a conflicting user. Through enforcement and education, the goal should be for each respective user to respect and recognize each other within the public right-of-way. Common issues creating a real and perceived danger for pedestrians include motorist speeding, a failure to yield within crosswalks, right-turning vehicles not looking both ways, etc. Laurinburg's police department can take targeted steps to enhance safety for pedestrians. Particular steps to enhance enforcement for the benefit of the pedestrian include the following:

- Enforcing the speed limit on high volume roadways with pedestrian traffic. Example roads include South Main Street, West Boulevard, and Caledonia Street.
- Work with the school system to train cross guards. This task may be accomplished through the NCDOT Crossing Guard Training Program.
- Enforce yielding to pedestrians in crosswalks.

See the link below for more information:
http://www.ncdot.gov/bikeped/download/bikeped_laws_Guidebook-Full.pdf

Program & Policy Recommendations

Let's Go NC

Let's Go NC is a bicycle and pedestrian safety skills program for children in North Carolina. The bicycle component of the curriculum is based on the 1990's Basics of Bicycling Curriculum, developed for fourth and fifth graders. The pedestrian component is based on the NTSHA pedestrian curriculum. Both components are modified for North Carolina and for use to instruct children in grades k-5. The program encourages children to be healthy and active by teaching the skills necessary for safely participating in bicycling and walking activities. The curriculum is available online and includes Safe Routes to School components, classroom curriculum materials, and videos and exercises. Let's Go NC is based on an earlier NCDOT program called "The Basics of Bicycling."

The program should be developed through the Scotland County school system. The curriculum includes encouragement for educators who are responsible for educating students on the program's curriculum. With the assistance and support of NCATA or local advocacy organizations, information should be available to schools and non-profits. These materials would be used to educate students on fun and safe ways to walk and bike to school.

Walking Programs

Walking programs such as a "Weekend Walkabout" are regularly occurring events that promote walking while also bringing attention to pedestrian infrastructure. "Weekend Walkabouts" could be scheduled and held in each region of the state in conjunction with the statewide Walk to School Day that takes place each fall. The events' walking routes should highlight safe and inviting places to walk in the public realm (rather than private or enclosed facilities such as walking tracks) and should be three miles or less in length. These events are ideal for families and seniors.

Different walking programs may be organized based on themes for each event, such as an architectural tour, a "Steeple Chase" tour (visiting historic churches), a tour of parks, neighborhood strolls, etc.

Follow the links below for more information:

- Safe Routes National Center – North Carolina: http://www.saferoutesinfo.org/program-tools/find-state-contacts/north-carolina
- Walk/Bike to School Day: http://www.walkbiketoschool.org/
- Walking School Bus: http://www.walkingschoolbus.org/

"Watch For Me NC" Pedestrian Campaign

The "Watch for Me NC" campaign is intended to improve pedestrian safety by influencing the behaviors of drivers and pedestrians through safety messaging and enforcement. The effort was launched in 2012 through Transportation Enhancement funding provided by NCDOT and federal funds provided by the National Highway Traffic Safety Administration. Funding and expansion for the bicycle component will be launched in 2013.

NCDOT's Bicycle and Pedestrian Division is working with the UNC Highway Safety Research Center to seek out new partners for the 2015 Watch for Me NC campaign. Partners will be selected through a competitive application process. The application will be available January 26 and will be due March 20, 2015.

Eligible applicants include agencies with police departments, such as local governments (both municipal and county) and campus police. If the police department is the lead applicant, they are encouraged to discuss their plans to apply with other local government departments, such as transportation.

See the link below for more information:
http://www.watchformenc.org/

NCDOT School Crossing Guard Program

As traffic continues to increase on North Carolina's streets and highways, concern has grown over the safety of our children as they walk to and from school. At the same time, health agencies, alarmed at the increase in obesity and inactivity among children, are encouraging parents and communities to get their children walking and biking to school.

In response, the 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 GS 20-114.1. For more information please visit the website: http://www.ncdot.gov/bikeped/about/training/school_crossing_guard/).

Active Routes to School Program

North Carolina's Active Routes to School Program aligns Safe Routes to School with North Carolina's Community Transformation Grant Project. The program is designed to assess and evaluate the ability to implement non-motorized transportation improvements in K-8 schools. There are ten regions currently assisting the state. Laurinburg is located in Region 9. The Active Routes to School Coordinator for Region 6 is Rebekah West who works out of the Hoke County Health Department.

Complete Streets Policy

Communities adopt Complete Streets policies for many reasons. Many local policies originate from a desire to improve safety for people walking and bicycling to their destinations and to encourage more walking and bicycling as a way to improve public health. Improving access to public transportation by making it safer, easier, and more attractive for all, including older residents and those with disabilities, is another driving factor in many communities. Safe Routes to School/Active Routes to School proponents also see Complete Streets as essential in providing complete, safe routes for children heading to school. Some communities have rallied around a more equitable vision for transportation that provides better access to employment and educational opportunities in all neighborhoods, regardless of income or ethnicity.

The North Carolina Department of Transportation, which has an official policy, defines Complete Streets as "an approach to interdependent, multi-modal transportation networks that safely accommodate access and travel for all users." See the link below for more information:

http://www.completestreetsnc.org/

An example Complete Streets Policy is provided below. This example, with adjustments as set forth by the Laurinburg City Council, may be adopted as is.

> The City of Laurinburg shall ensure that the safety and convenience of all users of the transportation system are accommodated, including pedestrians, bicyclists, people with disabilities, the elderly, motorists, freight providers, emergency responders, and adjacent land users by creating a connected network of facilities accommodating each mode of travel that is consistent with and supportive of the local community, recognizing that all streets are different and that the needs of various users will need to be balanced in a flexible manner.
>
> In conjunction with projects relating to the design, planning, construction, reconstruction, resurfacing, rehabilitation, or maintenance of City streets, departments, boards and commissions of the City of Laurinburg shall give full consideration to the accommodation of the transportation needs of all users identified above.
>
> Facilities for all users will be considered on City streets, except under one or more of the following conditions:
>
> - An affected roadway prohibits, by law, use by specified users, in which case a greater effort shall be made to accommodate those specified users elsewhere, including on roadways that cross or otherwise intersect with the affected roadway; or
> - The costs of providing accommodation are excessively disproportionate to the need or probable use; or
> - The existing and planned population, employment densities, and traffic volumes around a particular roadway as documented by the Laurinburg Department of Planning and Community Development are so low that future expected

users of the roadway will not include pedestrians, freight vehicles, or bicyclists.

Documentation shall be publicly available and exceptions for City projects shall be granted by the City Manager. For private projects, the owner shall document the exception and approval shall be granted by the Planning and Community Development Director.

The implementation of this Policy shall reflect the context and character of the surrounding built and natural environments, and enhance the appearance of such.

To discern the success of this complete streets policy the following performance measures shall be inventoried:

- Linear feet of new pedestrian accommodation
- Number of new curb ramps and intersection enhancements installed along city streets
- Total miles of on-street bicycle lanes/routes defined by streets with clearly marked or signed bicycle accommodation
- Number of new street trees planted along city streets

Methods for Developing Facilities

The following describes types of transportation facility construction and maintenance projects that can be used to create new facilities. Note that roadway re-construction projects offer excellent opportunities to incorporate facility improvements for bicyclists and pedestrians. It is much more cost-effective to provide a bicycle or pedestrian facility when these road projects are implemented than to initiate the improvement as a "retrofit."

In order to take advantage of upcoming opportunities to incorporate recommendations into routine transportation projects, the city should continue to track the NCDOT repaving schedules, and other lists of projects. The following facility development methods primarily benefit cyclists.

Restriping

The simplest type of restriping project is the addition of bicycle lanes, edgelines, or shoulder stripes to streets without making any other changes to the roadway. Bicycle lanes, edgelines, and shoulder stripes can also be added by narrowing the existing travel lanes or removing one or more travel lanes. In some locations where the existing lanes are 12- or 13-feet wide, it may be possible to narrow them to 10 feet. This requires changing the configuration of the roadway during a resurfacing project.

Resurfacing

Resurfacing (repaving) projects provide a clean slate for revising pavement markings. When a road is resurfaced, the roadway should be restriped to create narrower lanes and provide space for bike lanes and shoulders. In addition, if the space on the sides of the roadway has a relatively level grade and few obstructions, the total pavement width can be widened to include paved shoulders.

Roadway Construction and Reconstruction

Bicyclists and pedestrians should be accommodated any time a new road is constructed or an existing road is reconstructed.

In the long-term, all roadways should have on-road bicycle facilities and sidewalks. However, sidepaths can be an acceptable solution in the short-term when a road has few driveways and high-speed, high-volume traffic.

Signage and Wayfinding Projects

Signage along specific routes or in an entire community can be updated to make it easier for people to find destinations. Bicycle route signs are one example of these wayfinding signs, and they can be installed along routes independently of other signage projects or as a part of a more comprehensive wayfinding improvement project. In addition, historical markers similar to the one below can be placed in locations in and around Laurinburg’s downtown and older neighborhoods.

Context Sensitive Design

Context Sensitive Design changes the thinking and design of transportation planning so that roadways accommodate communities rather than communities accommodating roadways. Many of the principles of Context Sensitive Design are reflected in this planning document, but it is still important that the community establish policy standards that reflect these principles.

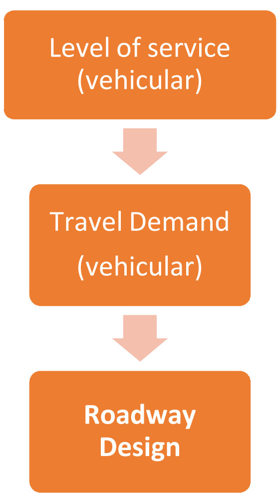


Figure 32: Conventional approach to roadway design is a linear process.

These policies should ensure that all roadway projects are designed to maximize the safety of the facility user and the safety of the surrounding community. The policies should also require that all transportation facility construction be completed in a manner that is consistent with the community’s economic, social, and environmental objectives.

In the end, the benefits of embracing this type of approach to transportation planning are a more efficient use of transportation construction dollars, better preservation of community resources, increased safety, and improved livability in the community.

Continued adherence to the principles of Context Sensitive Design will require the full support of the locally elected officials as well as continued support through state-level transportation actions.

Figure 33: The context sensitive approach to roadway design includes more stakeholders and specifically addresses all community needs. The process results in a feedback loop.

Funding Sources

As part of the Bicycle and Bikeway Act of 1974, the North Carolina General Assembly authorized the North Carolina Department of Transportation "to spend any federal, state, local, or private funds available to the Department and designated for the accomplishment" of fulfilling the duties laid out through the Act, and clearly stated that bicycle facilities "are a *bona fide* highway purpose, subject to the same rights and responsibilities, and eligible for the same considerations as other highway purposes and functions." (See G.S. 136-71.8 Findings and 136-71.12 Funds).

MAP-21, the Moving Ahead for Progress in the 21st Century Act (P.L. 112-141), was signed into law by President Obama on July 6, 2012. Funding surface transportation programs at over $105 billion for fiscal years (FY) 2013 and 2014, MAP-21 is the first long-term highway authorization enacted since 2005.

MAP-21 is a milestone for the U.S. economy and the Nation's surface transportation program. By transforming the policy and programmatic framework for investments to guide the system's growth and development, MAP-21 creates a streamlined and performance-based surface transportation program and builds on many of the highway, transit, bike, and pedestrian programs and policies established in 1991.

In North Carolina, all bicycle and pedestrian projects are prioritized and scheduled into the State Transportation Improvement Program. These projects may be funded through Federal funds or State funds.

State Transportation Improvement Program

Independent bicycle and pedestrian projects across North Carolina are included in NCDOT's State Transportation Improvement Program (STIP) outlining transportation priorities for the next ten years. However, based on current (2014) state legislation, NCDOT does not provide any state funds for independent bicycle and pedestrian projects. The STIP indicates when each phase of a project is slated to begin and the cost of each project phase. Improvements for bicycling and walking may also be included in the STIP as part of the construction of a highway project.

The STIP projects are determined through the strategic prioritization process. Every two years, the Lumber River Rural Planning Organization (RPO) is given an opportunity to recommend bike and pedestrian projects to be included in the STIP. Projects are prioritized and ranked through a methodology created by Division staff. The STIP projects are included in the 5-year Work Program and the 10-year Program & Resource Plan.

Through NCDOT, there are a variety of funding programs comprised of Federal-Aid and/or State dollars. There are also other funding opportunities for projects and programs related to bicycle and pedestrian transportation which are not administered by NCDOT. Other state agencies and local governments may be a more appropriate resource, depending upon the project. In addition, some communities look toward non-profit organizations, foundations, businesses, or other creative public/private partnerships to provide capital or resources as a way to move a project, program, or activity from a concept into reality.

Much of the funding that passes through NCDOT is derived from the varying categories of Federal Aid Construction Funds, including National Highway System (NHS), Surface Transportation Program, or Congestion Mitigation and Air Quality funds. However, the state does provide some State Construction Funds for the construction of sidewalks and bicycle accommodations that are part of roadway improvement projects.

Strategic Transportation Initiatives – Funding Formula

The Strategic Mobility Formula component of the Strategic Transportation Investments bill (passed into law in 2013) outlines the general structure of NCDOT's project prioritization process. The formula includes three funding categories – Statewide Mobility, Regional Impact, and Division Needs. Bike and pedestrian projects are only eligible within the Division Needs category. Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs), and NCDOT Divisions may submit projects through the prioritization process. Independent bike and pedestrian projects (shared-use paths, bike lanes, sidewalks, intersection improvements, etc.) are comparatively evaluated based on safety, access, demand/density, constructability, and benefit-cost criteria.

Bike/pedestrian projects must compete with all other transportation modes with projects across all modes ranked collectively. Projects that score well are selected for programming in the State Transportation Improvement Program. This process occurs every two years. Priority projects are included in the developmental STIP (years 6 to 10) and the 10-year Program & Resource Plan. Further information on state transportation funding legislation and the prioritization process can be found at the following website: https://connect.ncdot.gov/projects/planning/Pages/StrategicPrioritization.aspx.

Safe Routes to School

Safe Routes to School (SRTS) is a program that enables and encourages children to walk and bike to school. The program helps make walking and bicycling to school a safe and more appealing method of transportation for children. SRTS facilitates 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 North Carolina Safe Routes to School Program is supported by federal funds through SAFETEA-LU and MAP-21 legislation. Please note that all SRTS projects "shall be treated as projects on a Federal-aid system under chapter 1 of title 23, United States Code." Although no local match is required and all SRTS projects are 100% federally funded under the SAFETEA-LU, agencies are encouraged to leverage other funding sources that may be available to them, including grant awards, local, state, or other federal funding. SRTS funds can be used for proposed projects that are within 2 miles of a school public or private, K-8, in a municipality or in the county jurisdiction. In response to the Strategic Transportation Investments law of June 2013, proposed SRTS projects will be considered as part of the Bicycle and Pedestrian project input with Strategic Prioritization Office for funding consideration. Most of the types of eligible SRTS projects include sidewalks or a shared-use path. However, intersection improvements (i.e. signalization, marking/upgrading crosswalks, etc.), on street bicycle facilities (bike lanes, wide paved shoulders, etc.) or off-street shared-use paths are also eligible for SRTS funds. For a more inclusive list, please visit the FHWA SRTS program.

Other NCDOT Funding

Below is a list of other funding sources within NCDOT that provide funds for a range of bicycle and pedestrian projects.

- High Hazard Elimination Program
  - http://www.ncdot.gov/doh/preconstruct/traffic/teppl/Topics/F-26/F-26.html
- Governor's Highway Safety Program (GHSP)
  - http://www.ncdot.gov/programs/GHSP/default.html
- State Street-Aid (Powell Bill) Program
  - http://www.ncdot.gov/programs/Powell_Bill/

Pedestrian Capital Improvement Program (CIP)

A Capital Improvement Program (CIP) is a method for developing funding to implement capital projects. The (CIP) is a plan/program that assesses capital facility needs in a jurisdiction against its overall goals and objectives, using a multi-year planning horizon—usually five years. The capital plan contains projects budgeted in the current fiscal year as well as projects in subsequent years for which funding may not have been obtained or authorized. Since the CIP is not a legally binding document, it can and does change in the "out" years. The CIP is often spoken of as a rolling document since older projects drop off and new ones are added each year. A dedicated funding source can be identified to fund items contained in the CIP.

Other Funding Sources

The NC Department of Environment and Natural Resources also provides funds for bicycle and pedestrian projects. The NC Department of Health and Human Services may be a resource for educational and safety programs that increase physical activity and improve health. Here is a list of additional sources:

- NC Recreational Trails Program
- NC Parks and Recreation Trust Fund Program
- National Scenic Byways Program
- Federal Transit Administration Grants
- Highway Safety Improvement Program
- National Park Service - Rivers, Trails, and Conservation Assistance Program
- Bureau of Land Management - Travel Management Implementation
- National Trails Training Partnership - Funding and Resources
- Walkinginfo.org - Funding Resources and Research

Various State and Federal Policies

- Complete Streets Policy – http://www.completestreetsnc.org/
- NCDOT Pedestrian Policy Guidelines http://www.ncdot.gov/bikeped/download/bikeped_Ped_Policy.pdf
- NCDOT Greenway Policy http://www.ncdot.gov/_templates/download/external.html?pdf=http%3A//www.ncdot.gov/bikeped/download/bikeped_laws_Greenway_Admin_Action.pdf
- NCDOT Board of Transportation Resolution for Bicycling and Walking - http://www.ncdot.gov/bikeped/download/bikeped_laws_BOT_Mainstreaming_Resolution.pdf
- Bridge Policy – https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Bridge%20Policy.pdf
- United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations (March 2010) - http://www.fhwa.dot.gov/environment/bikeped/policy_accom.htm

References

[1]**FHWA.** *Improving Conditions for Bicyclists and Pedestrians.* Washington, DC: s.n., 1998.

[2]*Physical Activity in United States Measured by Accelerometer.* **Troiano, R, Berrigan, D and Dodd, K.** 2008, Medicine and Science in Sports Exercise, pp. 181-188.

[3]**Institute of Transportation Engineers.** *Context Sensitive Solutions in Designing Major Urban Thoroughfares.* Washington, DC: s.n., 2006.

[4]*Associations of Perceived Social and Physical Environmental Supports with Physical Activity and Walking Behavior.* **Addy, C, Wilson, D and Kirtland, K.** 2004, American Journal of Public Health, pp.440-443.

[5]**Belden Russonello & Stewart, LLC.** *The 2011 Community Preference Survey: What Americans are Looking for When Deciding Where to Live.* Prepared for the National Association of Realtors, 2011.

[6]**American Association of State Highway and Transportation Officials.** *Policy on Geometric Design of Highways and Streets.* 1994.

[7]**European Community.** *Cycling the Way Ahead for Towns and Cities.* 1999.

[8]*Actual Causes of Death in the United States, 2000.* **Mokdad AH, Marks JS, Stroup DF, Gerberding JL.** 2004, Journal of the American Medical Association.

[9]**The National Center for Safe Routes to School.** *How Children Get to School: School Travel Patterns from 1969 to 2009.* 2011.

Chapter 6: Implementation

Introduction

To fully implement the recommendations contained in this plan will take time, care, and effort on the part of Laurinburg's elected officials, staff, and citizenry. Many communities chose to appoint a specific board or commission that is charged with implementing the recommendations contained in a plan. If Laurinburg were to do so, ideally a Bicycle and Pedestrian Advisory Committee would be appointed. This group should consist of local officials, citizenry, and staff. The committee should meet quarterly to track progress of the pedestrian plan and identify opportunities that may arise as a result of standard road maintenance projects. See Chapter 4 as well as Appendix C and D for a complete list of proposed sidewalk and greenway projects.

Lastly, Laurinburg officials should take strides to implement this plan over time. Recommended facilities should be constructed/installed over the course of many years. The City should track these improvements on a yearly basis and set target goals regarding the number of improvements to the pedestrian network that should be met during a set amount of time.

Strategies for plan implementation are provided in the following table. For each strategy, a timeline, responsible party, and plan section reference is included.

Implementation Strategy	Timeframe	Responsible Party	Section Reference
Establish a Bicycle and Pedestrian Advisory Committee (BPAC) or similar. The committee should meet quarterly to track progress of the pedestrian plan. The first goal of the committee shall be the prioritization of projects contained within this plan. It should be noted that an existing city committee can also function in this capacity.	Short-term	City Council	Chapter 4
Create a five to six year Pedestrian Capital Improvement Program (CIP). The CIP should be based upon the prioritization of projects outlined by the Bicycle and Pedestrian Advisory Committee. A one-year capital improvement budget should complement this effort.	Short-term	BPAC	Chapter 4
Identify and establish a dedicated fund for pedestrian capital improvement projects**.**	Short-term	City Council	N/A
Establish a formal maintenance program for sidewalks and pedestrian accommodations. Pursue training for staff.	Short-term	City staff; City Council; BPAC	Chapter 3
Pursue funding opportunities to construct projects identified in the CIP. Coordination with the Lumber River Rural Planning Organization and the NCDOT Division 8 engineer and planning engineer should take place.	Medium-term	City staff; City Council; BPAC	Chapter 4 & 5

Implementation Strategy	Timeframe	Responsible Party	Section Reference
Adopt a Complete Streets Policy.	Medium-term	City staff; City Council, BPAC	Chapter 5
Revise the Unified Development Ordinance to reflect revisions contained in Chapter 5.	Medium-term	City staff; Planning Board; City Council; BPAC	Chapter 5
Pursue grant funding through the Safe Routes to School Program. Identify K-8 schools, such as Washington and Covington Elementary, which are in need of sidewalk connections. This task will require coordination with NCDOT. Assistance is available.	Medium-term	City staff; City Council; Scotland County Schools; BPAC	Chapter 5
Work with local schools and NCDOT to identify education and enforcement programs suitable for the city. Example programs are listed below and can be found in Chapter 5: • NCDOT School Crossing Guard Program: http://www.ncdot.gov/bikeped/about/training/school_crossing_guard/ • Active Routes to School Program: Hoke County Health Department • Walk/Bike to School Day: http://www.walkbiketoschool.org/ • Walking School Bus: http://www.walkingschoolbus.org/	Medium-term	City staff; City Council; Scotland County Schools; BPAC	Chapter 5
Create a walking tour map that traverses several pedestrian destinations, particularly within the downtown area.	Long-term	City staff; BPAC	Chapter 3 & 4
Establish a lighting enhancement program in retail areas located outside of downtown. Particular locations for enhancement include South Main Street and pedestrian destinations identified on Map 10.	Long-term	City staff; City Council; BPAC	Chapter 3
Work with the Scotland County School system to develop Let's Go NC curriculum. Lesson plans, resources, and materials can be downloaded via the Let's Go NC website at http://www.ncdot.gov/bikeped/safetyeducation/letsgonc/ . Instructor materials can be found by clicking on the link below: http://www.ncdot.gov/bikeped/safetyeducation/letsgonc/downloads/instructors/InstructorsGuide.pdf .	Long-term/Ongoing	City staff; City Council; Scotland County Schools; Scotland County Board of Commissioners; BPAC	Chapter 5

Implementation Strategy	Timeframe	Responsible Party	Section Reference
Submit an application to participate in the "Watch For Me NC" program. The application form asks questions about how the City of Laurinburg will use the resources provided by NCDOT to address bicycle and pedestrian safety in the community. A letter of support is required by the Laurinburg City Council.	Long-term/Ongoing	City staff; City Council; BPAC	Chapter 5
Establish performance measures. The performance measures shall be based upon the use of existing and constructed pedestrian facilities. Pedestrian counts should take place annually at specific locations throughout the city.	Long-term/Ongoing	City staff; City Council; BPAC	Chapter 4

Appendix A: Design Guidelines

Introduction

The following guidelines are provided to serve as a basis for facility design in Laurinburg. Alterations may be necessary for specific projects. Consultation with a professional engineer or licensed landscape architect should take place when designing and installing any of the listed facilities. Coordination with the NC Department of Transportation may be required in instances where innovative practices are utilized.

The following resources were used in the creation of these guidelines:

- NC Complete Streets: http://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities
- Model Design Manual for Living Streets www.Modelstreetdesignmanual.com
- Pedestrian and Bicycle Information Center, 2010 www.walkinginfo.org/engineering/ www.bicyclinginfo.org/engineering/
- Bicycle Parking Design Guidelines www.bicyclinginfo.org/engineering/parking.cfm
- Manual on Uniform Traffic Control Devices (MUTCD) U. S. Department of Transportation, Washington, DC, 2009 http://mutcd.fhwa.dot.gov
- Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities: An ITE Proposed Recommended Practice.

Pedestrian Facilities

ESSENTIAL PRINCIPLES OF PEDESTRIAN CROSSINGS

The following principles should be incorporated into every pedestrian crossing improvement:

- The safety of all street users, particularly more vulnerable groups, such as children, the elderly, and those with disabilities, and more vulnerable modes, such as walking and bicycling, must be considered when designing streets.

- Pedestrian crossings must meet accessibility standards and guidelines.

- Real and perceived safety must be considered when designing crosswalks—crossing must be "comfortable." A "safe" crossing that no one uses serves no purpose.

- Crossing treatments that have the highest crash reduction factors (CRFs) should be used when designing crossings. A crash reduction factor (CRF) is the percentage crash reduction that might be expected after implementing a given countermeasure at a specific site.

- Safety should not be compromised to accommodate traffic flow.

- Good crossings begin with appropriate speed. In general, urban arterials should be designed to a maximum of 30 mph or 35 mph (note: 30 mph is the optimal speed for moving motor vehicle traffic efficiently).

- Every crossing is different and should be selected and designed to fit its unique environment.

- Ideally, uncontrolled crossing distances should be no more than 21 feet, which allows for one 11-foot lane and one 10-foot lane. Ideally, streets wider than 40 feet should be divided (effectively creating two streets) by installing a median or two crossing islands.

Sidewalks

A Standard sidewalk is usually five feet minimum in width, concrete, and placed along roadways with curb and gutter. In general, the width of sidewalks should accommodate two persons walking past one another, a width generally recognized to be five feet, at a minimum. Other circumstances that may require additional sidewalk width are: (1) to accommodate the overhang of parked vehicles from off-street or angled on-street parking areas; (2) additional buffer from traffic when a planting strip cannot be installed; and (3) high pedestrian use areas such as downtown.

Additional design considerations for on-street sidewalk facilities include the following:

- Maximum cross-slope of 1:50 (2%) is considered to be level. Limit running slope to 5% (1:20), or no greater than 8.33% (1:12) where topography requires it.
- Ramps with level upper and lower landings are necessary for ADA requirements. Eliminating both high and low contact points with tree branches, mast-arm signs, overhanging edges of amenities or furniture, and
- Providing clear space between walls on one side of the walkway and amenities, parking overhang, or plantings on the curb side of the walkway.

In general, standard sidewalks should be concrete, which is more durable than asphalt. A more flexible material, such as rubberized paving, can be considered in situations in which there is the potential for tree roots to crack and lift the concrete. Using these types of materials can reduce the risk of a tripping hazard, and also lower maintenance costs. More permeable materials, such as porous pavers, can also be considered for all pedestrian-ways, and in particular for greenways near streams, in order to reduce run-off from storm events. Caution should be used to consider total, lifecycle costs for alternative materials. For example, porous pavements are more expensive initially to install, but will also usually lose their porosity if the air spaces in the pavement are not regularly cleaned

Crosswalk Markings

According to the MUTCD, the minimum crosswalk marking shall consist of solid white lines. They shall not be less than 6 feet in width, though a wider width (10 ft.) is recommended in areas w/ higher pedestrian traffic.

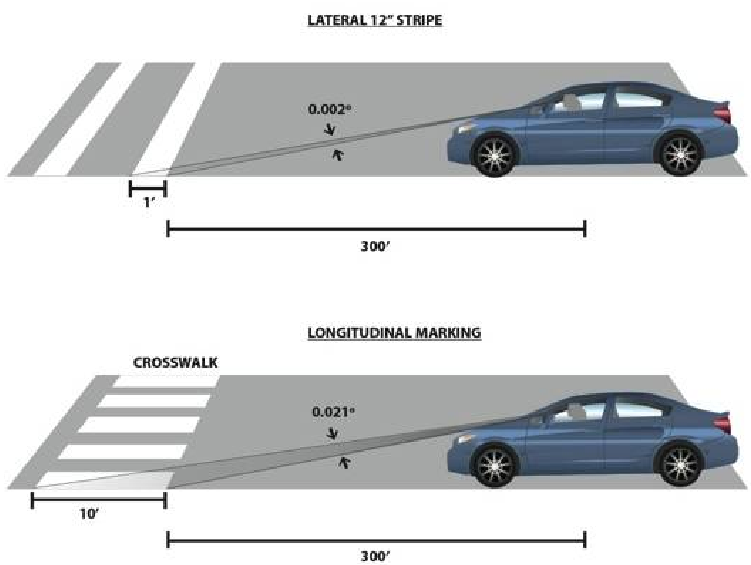
Placement

The best locations to install marked crosswalks are

- All signalized intersections
- Trail crossings
- High land use generators
- School walking routes
- When there is a preferred crossing location due to sight distance
- Where needed to enable comfortable crossings of multi-lane streets between controlled crossings spaced at convenient distances

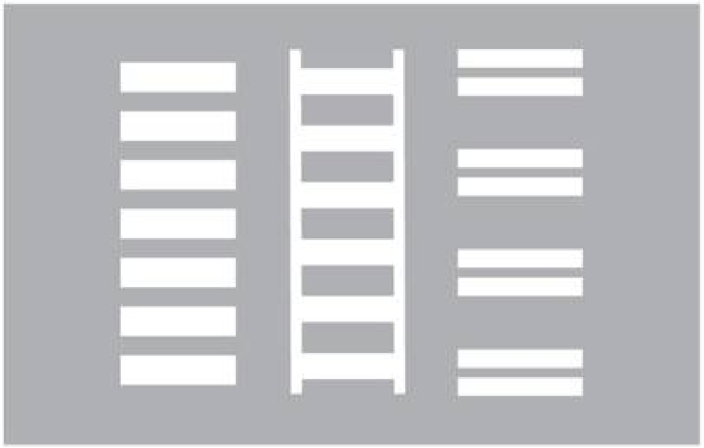
High-Visibility Crosswalks

Because of the low approach angle at which pavement markings are viewed by drivers, the use of longitudinal stripes in addition to or in place of transverse markings can significantly increase the visibility of a crosswalk to oncoming traffic. While research has not shown a direct link between increased crosswalk visibility and increased pedestrian safety, high-visibility crosswalks have been shown to increase motorist yielding and channelization of pedestrians, leading the Federal Highway Administration to conclude that high-visibility pedestrian crosswalks have a positive effect on pedestrian and driver behavior. Colored and stamped crosswalks should only be used at controlled locations.



Longitudinal crosswalk markings are more visible than lateral crosswalk markings
(Credit: Michele Weisbart)

Staggered longitudinal markings reduce maintenance since they avoid vehicle wheel paths.



Typical crosswalk markings:
Continental, Ladder, Staggered Continental
(Credit: Michele Weisbart)

Continental striping (far left) provides the highest visibility.

Pedestrian Signals at Intersections

- A displayed automatic Walk signal with a countdown is recommended at all intersections when pedestrians have the right-of-way to cross, whether or not the button was activated.
- Timed signals should display the entire countdown phase until it reaches zero, when all pedestrian and vehicle traffic should get a red light in that direction. Pedestrian signals should display a walk symbol at all times when the pedestrian has the right of way, and include the countdown as soon as the signal is scheduled to change.
- A safe and adequate time must be allowed for any pedestrian to cross who may already be in the intersection. A 3.8 foot per second walking speed is recommended for timing pedestrian clearance intervals at locations with normal pedestrian demographics (i.e., downtown areas, shopping areas, most neighborhoods, schools areas) or locations where the age or physical disability status of the pedestrian population is unknown. When the proportion of pedestrians over the age of 65 exceeds 20 to 50% of the total pedestrians at a location, walking speeds of 3.3 to 3.6 feet per second are recommended for pedestrian clearance timings. A 2.9 foot per second walking speed is recommended for intersections where nearly all of the pedestrians are over age 65.
- Clear, consistent activation buttons 42" high are necessary where these buttons are preferred.
- Countdown signals can be installed 7 – 10 feet high.
- Visible signs should be placed in the medians for automobiles to be reminded that North Carolina State Law requires vehicles to stop for pedestrians in both marked and unmarked crosswalks.

Pedestrian Countdown Signal
(Credit: Holland Consulting Planners)

Crosswalks and Accessibility

Longitudinal crosswalk markings provide the best visibility for pedestrians with limited vision.

Decorative crosswalk treatments, as shown here in Ayden, NC made of distinctive materials can become uneven over time.

Decorative crosswalk pavement materials should be chosen with care to ensure that smooth surface conditions and high contrast with surrounding pavement are provided. Textured materials within the crosswalk are not recommended. Without reflective materials, these treatments are not visible to drivers at night.

Decorative pavement materials often deteriorate over time and become a maintenance problem while creating uneven pavement.
The use of color or material to delineate the crosswalks as a replacement of retro-reflective pavement marking should not be used, except in slow speed districts where intersecting streets are designed for speeds of 20 mph or less.

Raised/Landscaped Medians

Raised islands and medians are the most important, safest, and most adaptable engineering tool for improving street crossings. *Note* on terminology: a median is a continuous raised area separating opposite flows of traffic. A crossing island is shorter and located just where a pedestrian crossing is needed. Raised medians and crossing islands are commonly used between intersections when blocks are long (500 feet or more in downtowns) and in the following situations:

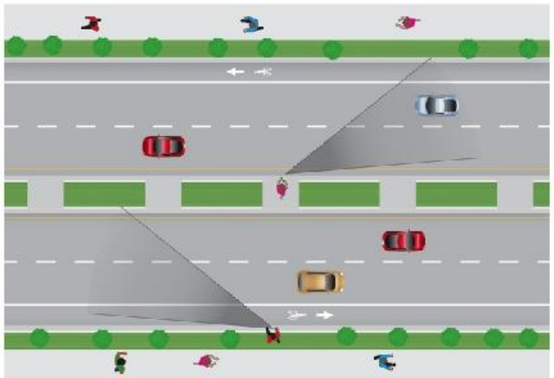
Staggered median crossing
(Credit: Marcel Schmaedick)

- Speeds are higher than desired
- Streets are wide
- Traffic volumes are high
- Sight distances are poor

Raised/landscaped medians parallel to a street should be a minimum of 20 feet in width and a minimum of 6 feet wide. Raised islands have nearly universal applications and should be placed where there is a need for people to cross the street. They are also used to slow traffic.

Reasons for Effectiveness

Their use changes a complex task, crossing a wide street with traffic coming from two opposing directions all at once, into two simpler and smaller tasks. With their use, conflicts occur in only one direction at a time, and exposure time can be reduced from more than 20 seconds to just a few seconds.



Medians and crossing islands allow pedestrians to complete the crossing in two stages.
(Credit: Michele Weisbart)

On streets with traffic speeds higher than 30 mph, it may be unsafe to cross without a median island. At 30 mph, motorists travel 44 feet each second, placing them 880 feet out when a pedestrian starts crossing an 80-foot wide multi-lane road.

In this situation, this pedestrian may still be in the last travel lane when the car arrives there; that car was not within view at the time he or she started crossing. With an island on multi-lane roadways, people would cross two or three lanes at a time instead of four or six. Having to wait for a gap in only one direction of travel at a time significantly reduces the wait time to cross. Medians and crossing islands have been shown to reduce crashes by 40 percent (Federal Highway Administration, Designing for Pedestrian Safety course).

As a general rule, crossing islands are preferable to signal-controlled crossings due to their lower installation and maintenance cost, reduced waiting times, and their safety benefits.

Curb Extensions

Curb extensions extend the sidewalk or curb line out into the parking lane, which reduces the effective street width. Curb extensions significantly improve pedestrian crossings by reducing the pedestrian crossing distance, visually and physically narrowing the roadway, improving the

Curb extensions
(Credit: Michele Weisbart)

ability of pedestrians and motorists to see each other, and reducing the time that pedestrians are in the street. Reducing street widths improves signal timing since pedestrians need less time to cross.

Motorists typically travel more slowly at intersections or mid-block locations with curb extensions, as the restricted street width sends a visual cue to slow down. Turning speeds are lower at intersections with curb extensions (curb radii should be as tight as is practicable). Curb extensions also prevent motorists from parking too close to the intersection.

Example of curb extensions
(Credit: Marcel Schmaedick)

Curb extensions also provide additional space for two curb ramps and for level sidewalks where existing space is limited, increase the pedestrian waiting space, and provide additional space for pedestrian push button poles, street furnishings, plantings, bike parking and other amenities. A benefit for drivers is that extensions allow for better placement of signs (e.g., stop signs and signals).

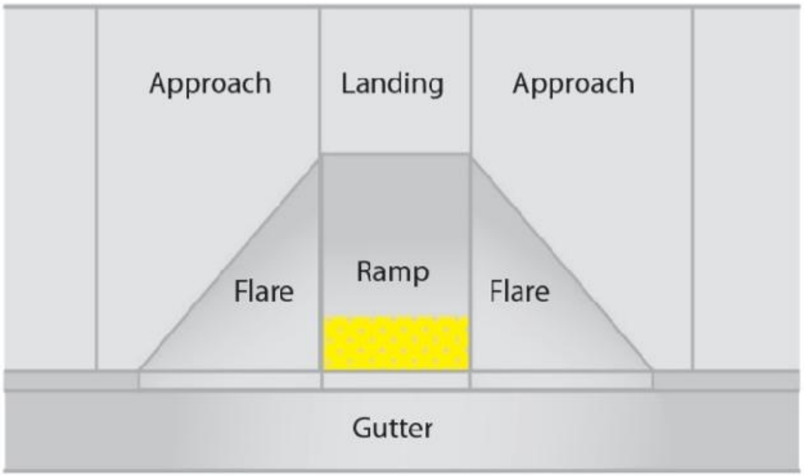
Curb extensions are generally only appropriate where there is an on-street parking lane. Where street width permits, a gently tapered curb extension can reduce crossing distance at an intersection along streets without on-street parking, without creating a hazard. Curb extensions must not extend into travel lanes or bicycle lanes.

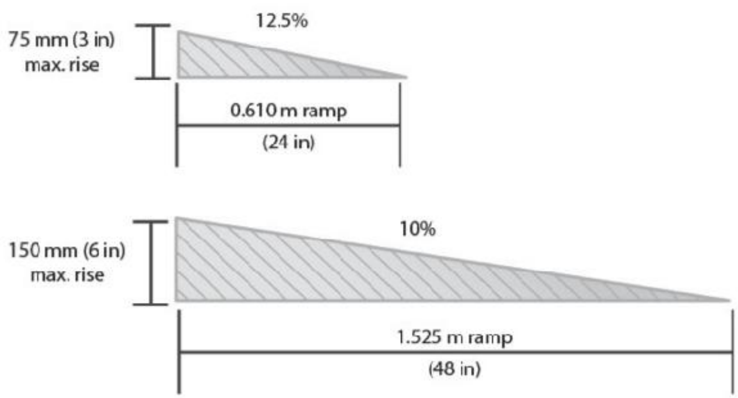
Curb extensions can impact other aspects of roadway design and operation as follows:

- May impact street drainage and require catch basin relocation
- May impact underground utilities
- May require loss of curbside parking, though careful planning often mitigates this potential loss, for example by relocating curbside fire hydrants, where no parking is allowed, to a curb extension
- May complicate delivery access and garbage removal
- May affect the turning movements of larger vehicles such as school buses and large fire trucks

Curb Ramps

Proper curb ramp design is essential to enable pedestrians using assistive mobility devices (e.g., scooters, walkers, and crutches) to transition between the street and the sidewalk. These design guidelines provide a basic overview of curb ramp design. The ADA requires installation of curb ramps in new sidewalks and whenever an alteration is made to an existing sidewalk or street. Curb ramps are typically installed at intersections, mid-block crossings (including trail connections), accessible on-street parking, and passenger loading zones and bus stops.





Curb ramp components, and alternate ramp slopes (Credit: Michele Weisbart).

The following define the curb ramp components along with minimum dimensions:

- **Landing** – the level area at the top of a curb ramp facing the ramp path. Landings allow wheelchairs to enter and exit a curb ramp, as well as travel along the sidewalk without tipping or tilting. This landing must be the width of the ramp and measure at least 4 feet by 4 feet. There should also be a level (not exceeding a 2 percent grade) 4 foot by 4 foot bottom landing of clear space outside of vehicle travel lanes.

- **Approach** – the portion of the sidewalk on either side of the landing. Approaches provide space for wheelchairs to prepare to enter landings.

- **Flare** – the transition between the curb and sidewalk. Flares provide a sloped transition (10 percent maximum slope) between the sidewalk and curb ramp to help prevent pedestrians from tripping over an abrupt change in level. Flares can be replaced with curb where the furniture zone is landscaped.

- **Ramp** – the sloped transition between the sidewalk and street where the grade is constant and cross slope at a minimum. Curb ramps are the main pathway between the sidewalk and street.

- **Gutter** – the trough that runs between the curb or curb ramp and the street. The slope parallel to the curb should not exceed 2 percent at the curb ramp.

- **Detectable Warning** – surface with distinct raised areas to alert pedestrians with visual impairments of the sidewalk-to-street transition.

There are several different types of curb ramps. Selection should be based on local conditions. The most common types are diagonal, perpendicular, parallel, and blended transition.

Diagonal Curb Ramps

Diagonal curb ramps are single curb ramps at the apex of the corner. These have been commonly installed by many jurisdictions to address the requirements of the ADA, but have since been identified as a non-preferred design type as they introduce dangers to wheelchair users. Diagonal curb ramps send wheelchair users and people with strollers or carts toward the middle of the intersection and make the trip across longer.

Perpendicular Curb Ramps

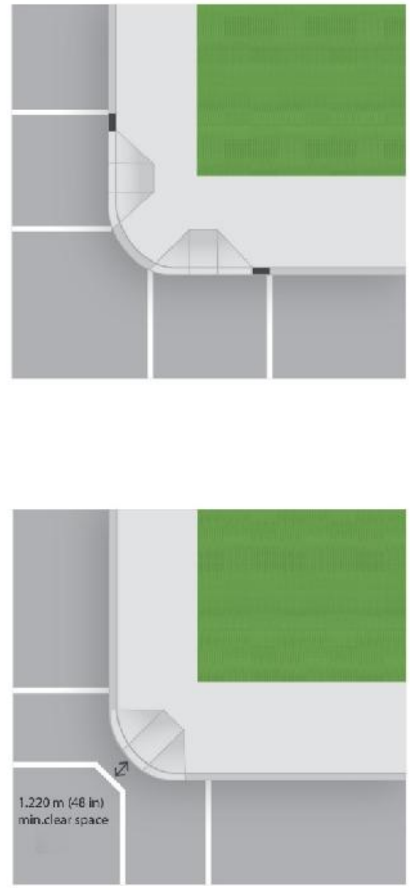
Perpendicular curb ramps are placed at a 90-degree angle to the curb. They must include a level landing at the top to allow wheelchair users to turn 90 degrees to access the ramp, or to bypass the ramp if they are proceeding straight. Perpendicular ramps work best where there is a wide sidewalk, curb extension, or planter strip. Perpendicular curb ramps provide a direct, short trip across the intersection.

Parallel Curb Ramps

Parallel curb ramps are oriented parallel to the street; the sidewalk itself ramps down. They are used on narrow sidewalks where there isn't enough room to install perpendicular ramps. Parallel curb ramps require pedestrians who are continuing along the sidewalk to ramp down and up. Where space exists in a planting strip, parallel curb ramps can be designed in combination with perpendicular ramps to reduce the ramping for through pedestrians. Careful attention must be paid to the construction of the bottom landing to limit accumulation of water and/or debris.

Curb Ramp Placement

One ramp should be provided for each crosswalk, which usually translates to 2 per corner. This maximizes access by placing ramps in line with the sidewalk and crosswalk, and by reducing the distance required to cross the street, compared with a single ramp on the apex.



One ramp per crosswalk vs.
single ramp at the apex
(Credit: Michele Weisbart)

A single ramp at the apex requires users to take a longer, more circuitous travel path to the other side and causes users to travel towards the center of the intersection where they may be in danger of getting hit by turning cars; being in the intersection longer exposes the user to greater risk of being hit by vehicles. A single ramp at the apex should be avoided in new construction and may be used only for alterations where a design exception is granted because of existing utilities and other significant barriers. In all cases, reducing the curb radius makes ramp placement easier.

Signs

Signs can provide important information to improve road safety by letting people know what to expect, so they can react and behave appropriately. Sign use and placement should be done judiciously, as overuse breeds noncompliance and disrespect. Too many signs create visual clutter.

Regulatory signs, such as STOP, YIELD, or turn restrictions, require driver actions and can be enforced. Warning signs provide information, especially to motorists and pedestrians unfamiliar with an area.

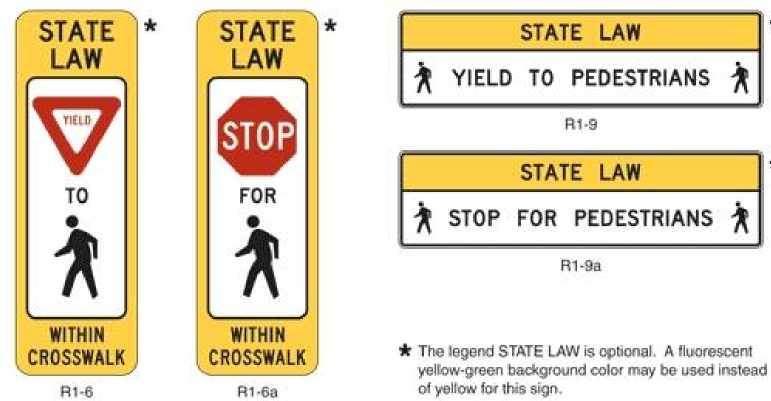
Advance pedestrian warning signs should be used where motorists may not expect pedestrian crossings, especially if there are many motorists who are unfamiliar with the area. The fluorescent yellow/green color is designated specifically for pedestrian, bicycle, and school warning signs (Section 2A.10 of the 2009 MUTCD) and should be used for all new and replacement installations. This bright color attracts the attention of drivers because it is unique.

R1-5 R1-5a R1-5b R1-5c

Sign R1-5 should be used in conjunction with advance yield lines, as described below. Sign R1-6 may be used on median islands, where they will be more visible to motorists than signs placed on the side of the street, especially where there is on-street parking.

Signs W11-1, W11-2, W11-15, may be used where pedestrian and bicycle users are expected. W11-15 can be used in conjunction with trail crossings. All signs should be periodically checked to make sure that they are in good condition, free from graffiti, reflective at night, and continue to serve a purpose.

All sign installations need to comply with the provisions of the MUTCD.



* The legend STATE LAW is optional. A fluorescent yellow-green background color may be used instead of yellow for this sign.

Wayfinding

Provide signs at decision points to help wayfinding decisions. Place signs, when necessary, at decision points. Decision points are where the navigator must make a wayfinding decision (for example, whether to continue along the current route or to change direction.) A sign embeds additional information into the space to direct the navigator's next navigational choice. This information should be relevant to both the choices offered to the navigator at that point, and the larger goal of the navigational task. Simply put, a sign should tell the navigator what's in the direction it points, and the destinations so indicated should help the navigator reach his eventual goal.

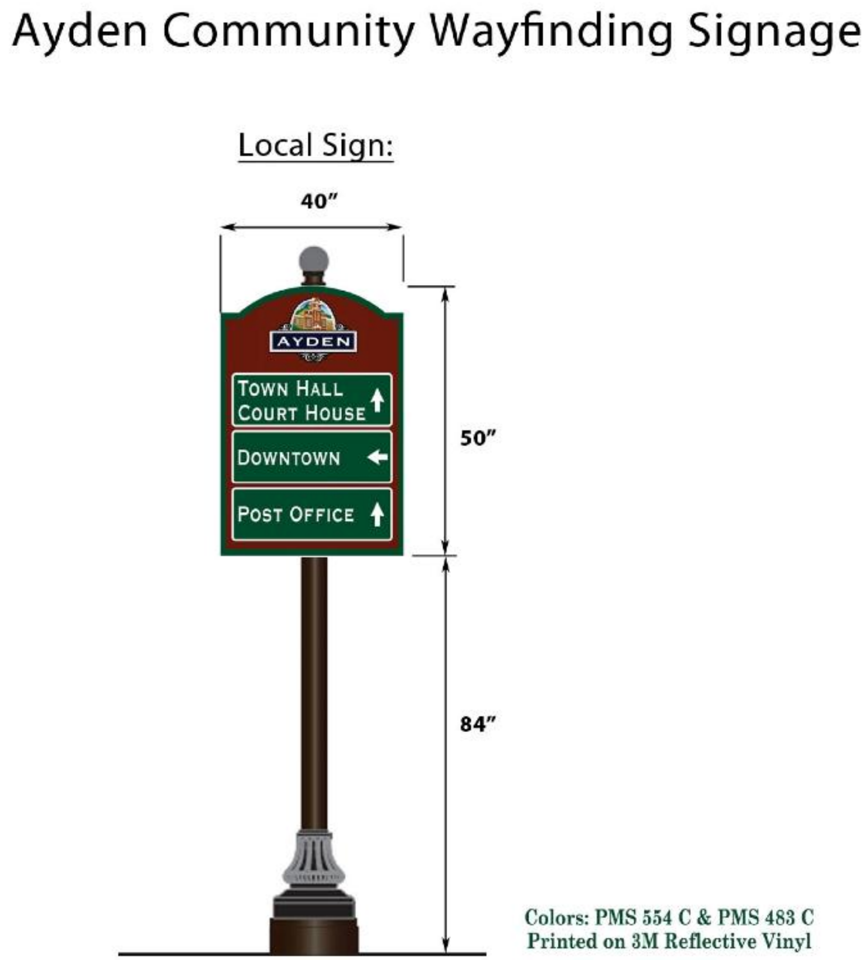
At decision points along the route, the navigator combines observation of local features with previous knowledge of the space to make the proper navigational move.

When the navigator does not have previous knowledge of the space, or a map to refer to, only the local features at the decision point can inform his navigational choice. A sign placed at a decision point in this framework, needs to inform the navigator of the correct route.

By design, signs must be in a location to acquire the navigator's attention, yet space for signage is a scarce resource. The benefits of signage must be weighed against the other potential uses for the space it occupies.

Other Considerations:

- An encroachment agreement may be required on NCDOT roads
- The signage must meet standards set forth in the MUTCD
- Font type, color, and size are all important components in the creation of wayfinding signs.



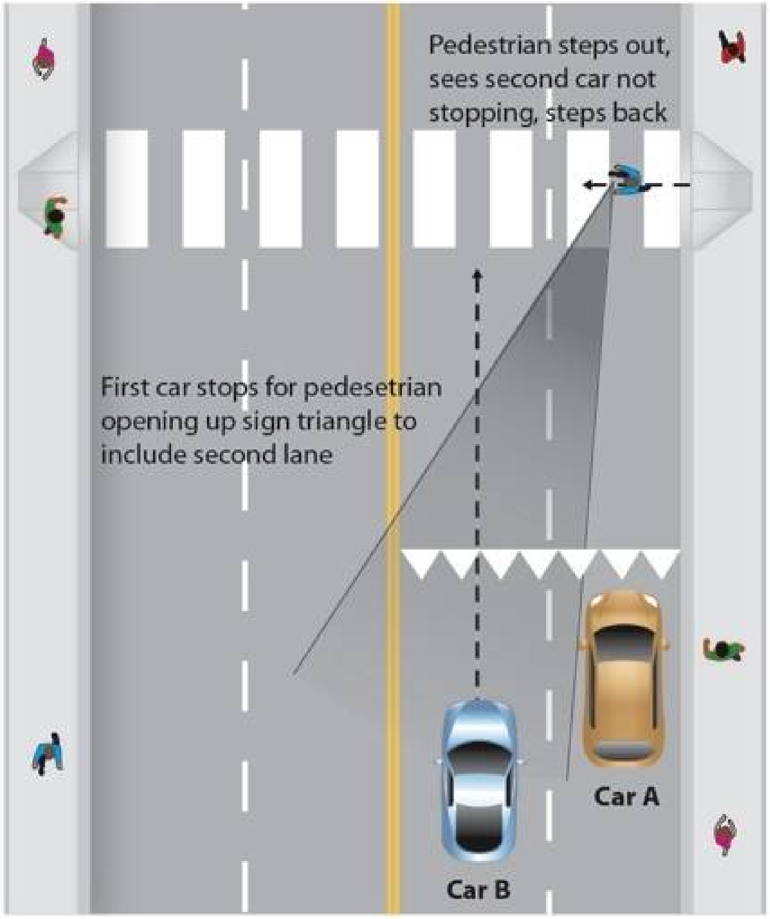
Example Wayfinding Sign in Ayden, NC. (Credit: Holland Consulting Planners)

Advanced Yield/Stop Lines

Stop lines are solid white lines 12 to 24 inches wide, extending across all approach lanes to indicate where vehicles must stop in compliance with a stop sign or signal. Advance stop lines reduce vehicle encroachment into the crosswalk and improve drivers' view of pedestrians. At signalized intersections, a stop line is typically set back between 4 and 6 feet.

When used at controlled intersections, stop lines should be placed approximately 3.0 m [10 ft], and no less than 1.2 m [4 ft], in advance of and parallel to the nearest crosswalk line."

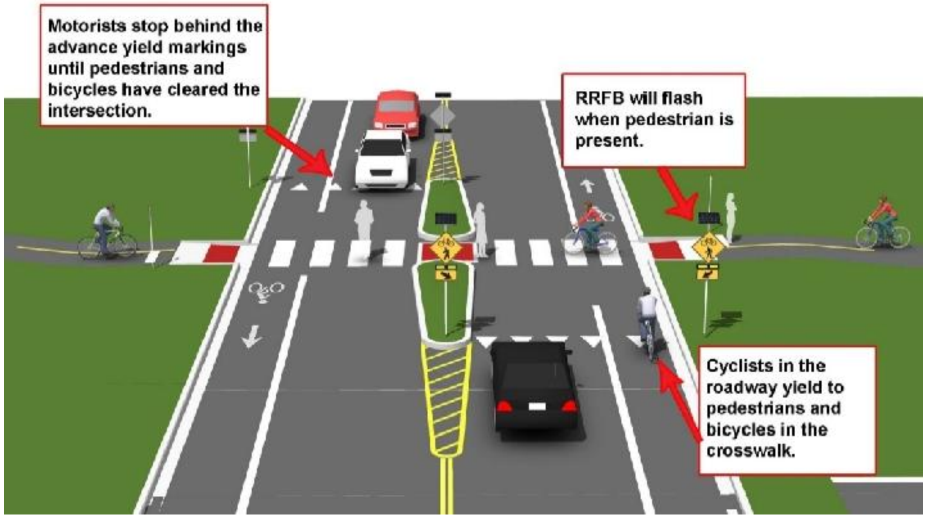
At uncontrolled crossings of multi-lane roads, advance yield lines can be an effective tool for preventing multiple threat vehicle and pedestrian collisions. Section 3B.16 of the MUTCD specifies placing advanced yield markings 20 to 50 feet in advance of crosswalks, depending upon location-specific variables such as vehicle speeds, traffic control, street width, on-street parking, potential for visual confusion, nearby land uses with vulnerable populations, and demand for queuing space. Thirty feet is the preferred setback for effectiveness at many locations. This setback allows a pedestrian to see if a car in the second (or third) lane is stopping after a driver in the first lane has stopped.



Rectangular Rapid Flash Beacon (RRFB)

- RRFBs are user-actuated amber LEDs that supplement warning signs at unsignalized intersections or mid-block crosswalks. They can be activated by pedestrians manually by a push button or passively by a pedestrian detection system.

- RRFBs use an irregular flash pattern that is similar to emergency flashers on police vehicles.
- RRFBs may be installed on either two-lane or multi-lane roadways.



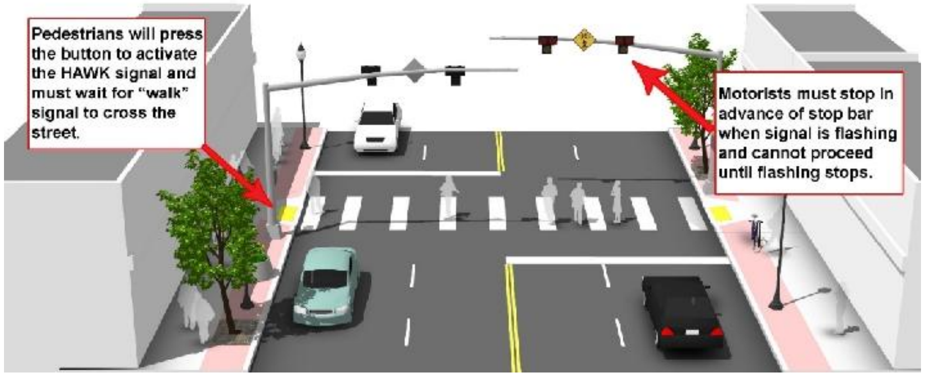
RRFB - Image Source: City of Bloomington, Indiana

Potential Benefits

- RRFBs are a lower cost alternative to traffic signals and hybrid signals that are shown to increase driver yielding behavior at crosswalks significantly when supplementing standard pedestrian crossing warning signs and markings.
- An official FHWA-sponsored experimental implementation and evaluation conducted in St. Petersburg, Florida found that RRFBs at pedestrian crosswalks are dramatically more effective at increasing driver yielding rates to pedestrians than traditional overhead beacons.
- The novelty and unique nature of the stutter flash may elicit a greater response from drivers than traditional methods.
- The addition of RRFB may also increase the safety effectiveness of other treatments, such as the use of advance yield markings with YIELD (or STOP) HERE FOR PEDESTRIANS signs. These signs and markings are used to reduce the incidence of multiple-threat crashes at crosswalks on multi-lane roads (i.e., crashes where a vehicle in one lane stops to allow a pedestrian to cross the street while a vehicle in an adjacent lane, traveling in the same direction, strikes the pedestrian), but alone they only have a small effect on overall driver yielding rates.

High Intensity Activated Crosswalk (HAWK) Signal

The HAWK signal is a mid-block crosswalk that is used on roads where the pedestrian would require help crossing with a signal. This system uses traditional traffic and pedestrian signal heads but in a different configuration. It includes a sign instructing motorists to "stop on red" and a "pedestrians" overhead sign. There is also a sign informing pedestrians on how to cross the street safely. When not activated, the signal is blanked out. The HAWK signal is activated by a pedestrian push button. The overhead signal begins flashing yellow and then solid yellow, advising drivers to prepare to stop. The signal then displays a solid red and shows the pedestrian a "Walk" indication. Finally, an alternating flashing red signal indicates that motorists may proceed when safe, after coming to a full stop. The pedestrian is shown a flashing "Don't Walk" with a countdown indicating the time left to cross.



HAWK Signal - Image Source: City of Bloomington, Indiana

Mid-Block Crossings

- Install only on roads with a speed limit of less than 45 MPH.
- Do not install within 300 feet from another signalized crossing point.
- Base installation of a mid-block crossing on an engineering study or pedestrian route.
- These crossings are recommended near schools, pedestrian routes, retail areas, recreation, and residential areas.
- Require advance warning signs and good visibility for both the driver and the pedestrian.
- Placing a stop bar with signage a few car lengths before the crosswalk will ensure better visibility for the vehicles and the pedestrian.
- Providing a safe crossing point is necessary since pedestrians will not walk far for a signalized intersection.
- Provide an audible tone at signalized crosswalks.
- Include a pedestrian refuge island on wide streets where:
    - There are fast vehicle speeds or large vehicle or pedestrian traffic volumes.
    - There is more than one travel lane in any direction.
    - Children, people with disabilities, or elderly people would cross.
    - There are complex vehicle movements.
    - There is insufficient time to cross the entire road because of traffic demands.

Trail Overpass

Bridges are used for above-grade crossings and should be designed with specific structural engineering and safety considerations. If crossing an interstate highway, specific and stringent standards will apply.

- Safety should be the primary consideration in bridge/overpass design.
- Specific design and construction specifications will vary for each bridge and can be determined only after all site-specific criteria are known.
- Always consult a structural engineer before completing bridge design plans, before making alterations or additions to an existing bridge, and prior to installing a new bridge.
- A 'signature' bridge should be considered in areas of high visibility, such as over major roadways. While often more expensive, a more artistic overpass will draw more attention to the trail system in general, and could serve as a regional landmark.
- For shared-use facilities, a minimum width of 14-feet is recommended.
- Trail overpasses are prohibitively expensive and should only be placed in areas of substantial need.

Greenways/Multi-Use Path

Width and Clearance

Ten feet is the recommended minimum width for a two-way, shared use path on a separate right- of-way. Other critical measurements include:

- 8 feet (2.4m) may be used where bicycle traffic is expected to be low at all times, pedestrian use is only occasional, sightlines are good, passing opportunities are provided, and maintenance vehicles will not destroy the edge of the trail.
- 12 feet is recommended where substantial use by bicycles, joggers, skaters, and pedestrians is expected, and where grades are steep (see later).
- 2 feet of graded area should be maintained adjacent to both sides of the path.
- 3 feet of clear distance should be maintained between the edge of the trail and trees, poles, walls, fences, guardrails or other lateral obstructions.
- 8 feet of vertical clearance to obstructions should be maintained; rising to 10 feet in tunnels and where maintenance and emergency vehicles must operate.

Design Speed, Horizontal and Vertical Alignment

The design of a shared use path should take into account the likely speed of users, the ability of bicyclists to turn corners without falling over, skidding, or hitting their pedal on the ground as they lean over.
The AASHTO Guide for the Design of Bicycle Facilities has a number of tables, and equations to help designers meet the tolerances of a bicyclist based on the following key numbers:

- 20 miles per hour (30 km/h) is the minimum design speed to use in designing a trail
- 30 miles per hour (50 km/h) should be used where downgrades exceed 4 percent
- 15 miles per hour (25 km/h) should be used on unpaved paths where bicyclists tend to ride more slowly (and cannot stop as fast without skidding or sliding on a loose surface)

The result is a series of recommended desirable minimum curve radii for corners that should be safe for bicyclists.

Grade

Another critical factor in trail design is the grade or slope of the path. Generally, grades greater than 5 percent (one feet of climbing for every 20 feet traveled forward) are undesirable as they are hard for bicyclists to climb and may cause riders to travel downhill at a speed where they cannot control their bicycle. However, recognizing that trails cannot always remain quite flat, the AASHTO Guide offers the following suggested lengths for certain grades:

- 5-6 percent is acceptable for up to 800 feet (240m)
- 7 percent is acceptable for up to 400 feet (120 m)
- 8 percent is acceptable for up to 300 feet (90m)
- 9 percent is acceptable for up to 200 feet (60m)
- 10 percent is acceptable for up to 100 feet (90m)
- 11 percent plus is acceptable for up to 50 feet (15m)

However, slopes with 9 percent grade are not acceptable for inexperienced bicyclists and are not compliant with Americans with Disabilities Act (ADA) guidelines. Consider the ADA grade guidelines as a guide to better meet the needs of pedestrians or bicyclists with disabilities and inexperienced bicyclists.

And, suggestions are offered for ways to mitigate the impact of steeper slopes, such as:

- adding 4-6 feet of additional width to the trail to allow sufficient space for a cyclist to dismount and walk their bicycle without blocking the trail, or to allow cyclists to pass each other,
- alerting cyclists to the approaching grade with appropriate signs and markings posting a recommended descent speed
- exceeding the usual minimum stopping sight distances to allow for the higher speeds
- exceeding the usual minimum thresholds for providing recovery areas, railings etc
- using a series of short switchbacks to contain the speed of descending riders

Sight Distances

The ability of a cyclist to stop or slow down to avoid a collision or crash is affected by many things. The rider must have time to identify a potential problem and react accordingly, which means that they must be able to see approaching intersections or corners in plenty of time even when they are traveling at the design speed of the trail. The bicycle itself must be able to be stopped or brought under control in time, which is affected by the braking ability of the bike, the surface material (a loose surface requires greater stopping distance), and the weather (wet conditions require greater stopping distances than dry). Once again, the AASHTO Guide and state/local manuals have tables and charts to enable the designer to calculate the appropriate sight distances in a range of situations.

Drainage

In response to a message about trail maintenance posted recently to an e-mail listserv, one trail manager identified the three most important issues: drainage, drainage and drainage. Poor drainage can ruin a good trail. The AASHTO Guide recommends a minimum cross slope of 1 percent and the need to make trails accessible to people using wheelchairs demands a maximum cross slope of 2 percent. Other considerations to ensure adequate drainage include:

- slope the trail in one direction rather than having a crown in the middle of the trail
- ensure a smooth surface to prevent ponding and ice formation
- place a ditch on the upside of a trail constructed on the side of a hill (where needed)
- place drainage grates, utility covers etc out of the travel path of bicyclists, unless they can be made fully bicycle-friendly.
- preserve natural ground cover adjacent to the trail to inhibit erosion

Surface

Another important consideration in trail design is the type of surface that will be provided. A hard surface, such as cement or asphalt, will generally see cyclists operating at a faster speed than a soft surface, but may not be as popular with joggers and is more expensive to install. A soft surface trail (i.e. crushed granite) will discourage or prevent in-line skating but may be less expensive to install (although it will require more maintenance than concrete). Factors such as weather conditions and soil types can affect the choice of asphalt, concrete, or crushed rock. Choices in surface will affect requirements for periodic monitoring of the path surface and appropriate levels of maintenance.

Structures

One of the great advantages and unique features of trails along former railroad corridors is that they often have grade separated intersections with the highway system, and have bridges to carry them over rivers or stream valleys. However, not all corridors have this asset and structures of all kinds are needed to carry trail users under or over obstacles such as highways, rivers, freeways etc. The critical dimensions to use in designing underpasses, overpasses, bridges and tunnels, include:

a. the minimum width of the trail (usually 10 feet) should be maintained through the structure

b. the clear distance of two feet on either side of the trail surface should also be maintained through the structure — otherwise, riders will tend to ride in the center of the trail to stay away from the wall or railing of the structure

c. an overhead clearance of 10 feet (8 feet with good horizontal and vertical clearance, good sightlines etc) should be maintained through an underpass or tunnel

d. railings, fences, or barriers on both sides of a path on a structure should be at least 42 inches (1.1m) high, and where they are higher than this a rub rail should be provided at the approximate handlebar height of 42 inches.

e. clearances should allow for maintenance and emergency vehicles, as should the strength of the bridge (live loading)

Under-crossings are generally less expensive than overpasses and require less change in grade as a clearance height of only 10 feet is required. However, they may present security problems due to reduced visibility and drainage problems, both of which can be expensive to fix.

Over-crossings are more open and present fewer security problems but they require much longer approaches to achieve the minimum 17 feet of clearance from a roadway, and they are often more expensive. Overpasses also may result in complaints from nearby residences due to a loss of privacy or due to aesthetic concerns.

Another issue is when retrofitting a shared use path onto an existing highway bridge, should a separate path on one side, both sides, or an on-street facility be recommended?

The Florida DOT's Bicycle Facilities Planning and Design Handbook discusses the various options and recommends that:

- the shared use path should be carried across the bridge on one side where:
    - the bridge facility connects to a shared use path at both ends
    - sufficient width exists on one side of the bridge, or can be obtained by widening or restriping lanes
- provisions are made to physically separate bicycle and pedestrian traffic from motor vehicle traffic on-street facilities such as bike lanes may be advisable where:
    - the shared use path transitions into bicycle lanes at one end of the bridge

- sufficient width exists or can be obtained by widening or restriping.

The AASHTO Guide also warns that this latter option must only be used if the transition from bike lanes to shared use path can be achieved without increasing the potential for wrong way riding or inappropriate crossing movements.

Lighting

Shared use paths in urban and suburban areas often serve travel needs both day and night, for example, commuter routes and trails accessing college campuses. Fixed source lighting improves visibility along trails and at intersections, and is critical for lighting tunnels and underpasses. The AASHTO guide recommends using average maintained illumination levels of between 5 and 22 lux.

Preventing Motor Vehicle Use of Paths

In some locations, shared use paths may be mistaken for motor vehicle roads or may suffer from illegal or unauthorized motorized use. At intersections with roadways, therefore, the path should be clearly signed, marked and/or designed to discourage or prevent unauthorized motorized access. A variety of alternatives exist to achieve this:

a. Bollards. Probably the most common device is the bollard, often lockable, collapsible or removable to allow for authorized access to the trail. Great care should be used in locating the bollard to ensure that they are visible, allow trail users through, and are not placed so as to channel both directions of trail users towards the same point in the trail. If bollards are to be used, they should be retro-reflective, brightly colored, and have pavement markings around them. On a ten foot trail, one bollard should be used in the center of the trail. If more than one bollard is necessary, there should be five feet between them.

b. Splitting the trail in two. Many manuals suggest the option of splitting a ten foot trail into two five foot approaches to an intersection, with a planted triangle between them. This may increase maintenance costs.

c. Medians. The Florida DOT manual notes that "curbing with tight radii leading up to the roadway can often prevent motorists from attempting to enter the path. Medians should be set back from the intersection 25 feet (8m) to allow bicyclists to exit the roadway fully before navigating the reduced pathway width."

Signing and marking

While fewer signs may be needed on paths compared to on-street facilities, adequate signing and marking are essential on shared use paths, just as they are on streets and highways. Trail users need to know about potential conflicts, regulatory information, destinations, cross streets etc. The Manual on Uniform Traffic Control Devices (MUTCD) provides some minimum traffic control measures that should be applied and a range of options.

Striping: a yellow center line stripe is recommended where trails are busy, where sight distances are restricted, and on some unlit trails where night time riding is expected. The line should be dashed when adequate passing sight distance exists, and solid when no passing is recommended.

A solid white line may be used to separate pedestrians from bicycle/blading traffic, and solid white edge stripes may also be useful where nighttime riding is expected.

Warning signs: a range of warning signs can be used to inform users that recommended design criteria cannot be met, for example curve radii or grades or where unexpected conditions may exist.

Informational signs: trail users need to know where they are, where they are going, what cross streets they are crossing, how far destinations are away, and what services are available close to the trail. The MUTCD has information on the appropriate signs to use in these instances. Although not in the MUTCD, many trails post signs encouraging uniform trail user etiquette (e.g. "give audible signal when passing" or which type of trail user has the right-of-way).

Intersection markings and signs: pavement marking and signs at intersections should channel users to cross at clearly defined locations and indicate that crossing traffic is to be expected. Similar devices to those used on roadways (STOP and YIELD signs, stop bars, etc) should be used on trails as appropriate.

The AASHTO Guide notes that in addition to traditional warning signs in advance of intersections, motorists can be alerted to the presence of a trail crossing through flashing warning lights, zebra-style or colored pavement crosswalks, raised crosswalks, signals, and neck-downs/curb-bulbs. However, some devices such as flashing warning lights are expensive to install and maintain and should be kept to a minimum.

Sidepaths

A sidepath is essentially a multi-use path that is oriented alongside a road but is separate from the road. The AASHTO Guide to the Development of Bicycle Facilities and North Carolina Bicycle Facilities Planning and Design Guidelines strongly caution those contemplating a sidepath (or wide sidewalk) facility to investigate various elements of the roadway corridor environment and right-of-way before making a decision. AASHTO provides nine cautions/criteria (pp. 34-35) for designing sidepaths.

In addition to AASHTO's cautions, research from the US and abroad confirm that bicycle/motor vehicle crash rates are higher for bicyclists riding on a sidepath than on a roadway. Consequently, designers are advised to be very careful when choosing to design sidepaths. There are some high-volume, high-speed roadways where sidepaths are the only bicycle facility that can be provided without very costly changes to the roadway corridor. In these cases, it may be preferable to provide a sidepath. This decision must consider the magnitude of intersecting driveway and roadway conflicts. In addition, sidepaths should be provided on both sides of the roadway if possible to encourage bicyclists to ride in the same direction as adjacent traffic. Finally, the long-term strategy on these roadways should be to widen the road or narrow the lanes to provide additional space for bicyclists in on-road bike lanes or shoulders.

Intersection markings and signs: pavement marking and signs at intersections should channel users to cross at clearly defined locations and indicate that crossing traffic is to be expected. Similar devices to those used on roadways (STOP and YIELD signs, stop bars, etc) should be used on trails as appropriate.

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Streetscape

Urban Forestry

The urban forest includes all trees, shrubs, and other understory plantings on both public and private lands. Street trees and landscaping are essential parts of the urban forest, as they contribute positively to the urban environment—to climate control, stormwater collection, and the comfort and safety of people who live or travel along the street. A street lined with trees and other plantings looks and feels narrower and more enclosed, which encourages drivers to slow down and to pay more attention to their surroundings. Trees provide a physical and a psychological barrier between pedestrians and motorized traffic, increasing safety as well as making walking more enjoyable.

A healthy urban forest is also a powerful stormwater management tool. Leaves and branches catch and slow rain as it falls, helping it to soak into the ground. The plants themselves take up and store large quantities of water that would otherwise contribute to surface runoff. Part of this moisture is then returned to the air through evaporation to further cool the town.

As an important element along sidewalks, street trees must be provided with conditions that allow them to thrive, including adequate uncompacted soil, water, and air. This section provides guidance for appropriate conditions and selecting, planting, and caring for street trees, as well as for other landscaping along streets.

Street Trees

Goals and Benefits of Street Trees

The goal of adding street trees is to increase the canopy cover of the street, the percentage of its surface either covered by or shaded by vegetation, not simply to increase the overall number of trees. The selection, placement, and management of all elements in the street should enhance the longevity of a town's street trees and healthy, mature plantings should be retained and protected whenever possible.

Principles for Street Trees

The following principles influence the selection of street trees and landscaping design:

- **Seek out and reclaim space for trees**. Streets have a surprising number of residual or left-over spaces between areas required for travel lanes and parking, once they are examined from this perspective. Traffic circles, medians, channelization islands, and curb extensions can provide space for trees and landscaping.
- **Create optimum conditions for growth.** Space for roots and above ground growth is the main constraint to the urban forest achieving its highest potential. Typically a 6 to 8-foot wide, continuous sidewalk furniture zone must be provided, with uncompacted soil to a minimum of a 3-foot depth. If space for trees is constrained, provisions should be made to connect these smaller areas below the surface to form larger effective areas for the movement of air, root systems, and water through the soil.
- **Select the right tree for the space**. In choosing a street tree, consider what canopy, form, and height will maximize benefits over the course of its life. Provide necessary clearances below overhead high-intensity electrical transmission lines and prevent limbs from overhanging potentially sensitive structures such as flat roofs. In commercial areas where the visibility of façade-mounted signs is a concern, choose species whose mature canopy allows for visibility, with the lowest branches at a height of 12 to 14 feet or

more above the ground. Select trees with non-aggressive root systems to avoid damaging paving and sidewalks.

- **Start with good nursery stock and train it well.** When installing plant material, choose plants that have complete single leaders and are in good "form," and check that boxed trees are not root bound. Proper watering and pruning every three to four years will allow trees to mature and thrive for many years of service.

- **Do not subject plants to concentrated levels of pollutants.** Trees and other plants should be integrated within stormwater management practices whenever possible, but filtering of pollutants from "first flush" rain falls and street runoff will extend the life of trees and prevent toxic buildup of street pollutants in tree wells.

Guidelines

Climate and Soil

Selecting trees that are adapted to a site's climate and local rain cycles can create a more sustainable urban forest. The urban environment is harsh for many plants. Often plants native to an area are best adapted to that area's climate. Select plants that can tolerate the environmental elements, such as radiant heat from the sidewalk or street surface or 50 to 60 mph winds from passing traffic.

Urban soils have became highly compacted through construction activities and the passage of vehicle and even foot traffic. Compaction reduces the soil's capacity to hold and absorb water. Plants need healthy soil, air, and water to thrive.

Using planters in the urban forest can increase the biomass and canopy cover, but these plants and trees are still compromised and confined. At its bottom and sides, a barrier will exist as the prepared area meets the surrounding compacted soils. Covering the soil surface with some form of mulch can help as the shade, cooling, and retained moisture that mulch provides help support the biological activities close to the soil's surface. These activities open the pore structure of the soil over time, help keep it open, and cushion the impact of foot traffic. This process works better if the mulch material is organic, as opposed to stones. If planters have limited resources for soil preparation, they should have an extensive covering of mulch.

The generalized soil types map for a town can be used as a starting point when planning projects, but then the basic soil classifications should be identified on-site, especially when confronted by planting sites at the extreme ends of the spectrum: very fast-draining, nutrient-poor sands, and dense, often nutrient-rich, but oxygen-starved poorly drained clays.

Planting Sites

Traditionally, trees have been squeezed into whatever limited space is easily found, but this does not work well for either the tree or the street. The following guidelines provide recommended planting areas:

- Establish and maintain 6 to 8-foot wide sidewalk furniture zones, where possible. Many large trees need up to 12 feet in width, and are not suitable for placement in narrower furniture zones. In residential areas, sidewalk furniture zones within the root zone should be unpaved and planted/surfaced with low groundcover, mulch, or stabilized decomposed granite where these can be maintained. Where maintenance of such extensive sidewalk furniture zones is not feasible, provide 12-foot long tree wells with true permeable pavers (standard interlocking pavers are not permeable).

- If the above conditions are not feasible, provide for the tree's root system an adequate volume of uncompacted soil or structural or gap-graded soil (angular rock with soil-filled gaps) to a depth of 3 feet under the entire sidewalk (in the furniture, frontage, and pedestrian sidewalk zones).

- Spacing between trees will vary with species and site conditions. The spacing should be 10 percent less than the mature canopy spread. Closer spacing of large canopy trees is encouraged to create a lacing of canopy, as trees in groups or groves can create a more favorable microclimate for tree growth than is experienced by isolated trees exposed to heat and desiccation from all sides. On residential streets where lots are 40 or 50 feet wide, plant one tree minimum per lot between driveways. Where constraints prevent an even spacing of trees, it is preferable to place a tree slightly off the desired rhythm than to leave a gap in the pattern.

- Planting sites should be graded, but not overly compact, so that the soil surface slopes downward toward the center, forming a shallow swale to collect water. The crown of the tree should remain 2 inches above finished grade and not be in the center of a swale, but off to the side. The finished soil elevation after planting is held below that of the surrounding paving so 2 to 3 inches of mulch can be added. The mulch layer must be replenished as needed to maintain a nearly continuous level surface adjacent to paving.

- Generally tree grates and guards are best used along streets with heavy pedestrian traffic. Along streets without heavy foot traffic and in less urban environments, use mulch in lieu of tree grates.

<u>Species Selection</u>

- Select trees with non-aggressive root systems to avoid damaging paving and sidewalks.

- In general, street trees should be species that will achieve a height and spread of 50 feet on residential streets and 40 feet on commercial streets within 10 years of planting to provide reasonable benefits. Typically, trees on commercial streets will not achieve the same scale as they will on residential streets where greater effective root zone volumes may be achieved. On commercial streets with existing multi-story buildings and narrow sidewalks, select trees with a narrower canopy than can be accommodated on the limited sidewalk width.

- Cities and towns should establish a list of recommended tree species for use in the public street rights-of-way. On commercial streets with ground-floor retail, deciduous trees with a strong central leader, such as Ginkos and London Planes, are desirable as they grow rapidly above the ground floor business signs. A town's list of recommended tree species should specify minimum planting site widths for each and which trees may be planted below utility lines. Where there are overhead power lines that are less than 50 feet above grade, braided insulated electrical wire should be used so that trees do not have to be pruned to avoid the electrical lines. If braided insulated electrical wire cannot be provided, appropriate trees that will not grow tall enough to reach the power lines should be specified and planted.

- Consistent use of a single species helps reinforce the character of a street or district, but a diversity of species may help the urban canopy resist disease or insect infestations. New plantings added to streets with existing trees should be selected with the aim of meeting the same watering requirements and creating visual harmony with existing trees and plantings. Native species should be considered for inclusion whenever possible, but consideration should be first given to a species' adaptability to urban conditions.

- Consider evergreen species where it is desirable to maintain foliage through the winter months.
- Consider deciduous species where their ability to allow sunlight to penetrate into otherwise shaded areas (such as south facing windows of adjoining buildings) during the winter months will be a plus.

Tree Spacing and Other Considerations

- Most jurisdictions have spacing requirements between trees and street lights (typically about 30 feet high), which typically vary from 10 to 20 feet. The smaller setback provides greater flexibility in tree spacing and allows for a more complete tree canopy.
- Pedestrian lights, which are about 12 feet tall, generally do not conflict with the tree canopy, so spacing is less rigid. Some jurisdictions still require wide clearance for their convenience in maintaining the lights, but this wide spacing greatly reduces tree canopy and is therefore discouraged. Spacing of 10 feet away from trees is generally adequate.
- An 8-foot minimum clearance must be maintained between accessible parking spaces and trees.
- Adequate clear space should be provided between trees and awnings, canopies, balconies, and signs so they will not come into conflict through normal growth or require excessive pruning to remediate such conflicts.
- Trees may be planted in medians that are 4 feet or wider, but must have an adequate clear height between the surface of the median and the lowest branches so that pedestrians can be seen. Where trees hang over the street, the clear height should be 14 feet.

Understory Landscaping

Understory landscaping refers to landscape elements beneath the tree canopy in areas within the public right-of-way not required for vehicular or pedestrian movement, including

- Medians
- Curb extensions
- Furniture and frontage zones

Benefits of Understory Landscaping

- Complements and supports street trees, in particular by providing uncompacted, permeable areas that accommodate roots and provide air, water, and nutrients
- Reduces impervious area and surface runoff
- Treats stormwater, improving water quality
- Provides infiltration and groundwater recharge
- Provides habitat
- Reduces the perceived width of the street by breaking up wide expanses of paving, particularly when the understory is in medians and sidewalk furniture zones
- Contributes to traffic calming
- Provides a buffer between the walkway zone and the street, contributing to pedestrian comfort
- Improves the curb appeal of properties along the street, potentially increasing their value

- Enhances the visual quality of the community

Principles

- Trees take precedence: the understory landscape should support them. It should not compete with them.
- Only pave where necessary: keep as much of the right-of-way unpaved and planted as possible to maximize benefits
- Design understory areas to infiltrate water
- The entire understory area does not have to be covered with plants—composted mulch is a good groundcover (top of mulch should be below adjoining hardscape so that runoff will flow into planting areas)
- Make the understory sustainable: use drought-tolerant plants
- Replenish the soil with compost
- Design the understory to contribute to the sense of place

Guidelines

Soil

Provide good quality, uncompacted, permeable soil. Soil analyses should address the concentration of elements that may affect plant growth, such as pH, salinity, infiltration rate, etc. Remove and replace or amend soil as needed. Good preparation saves money in the long run because it reduces the need to replace plants, lowers water consumption, and reduces fertilizer applications.

Design

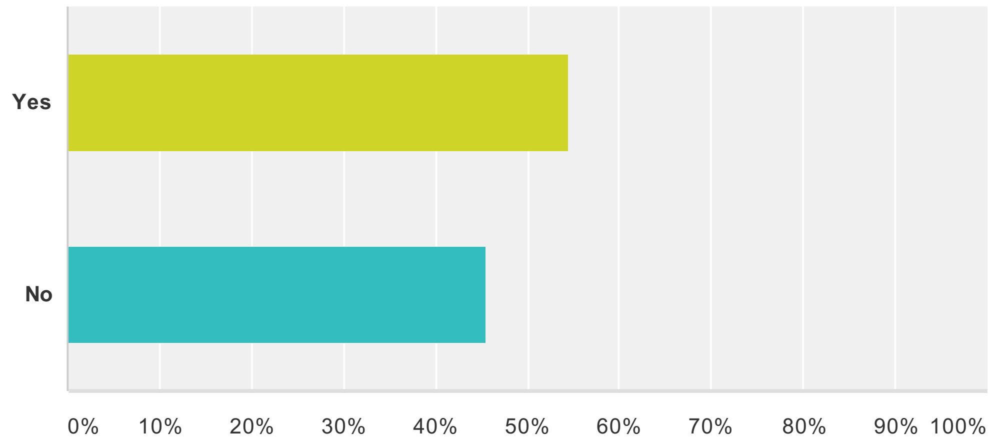
Generally, understory landscaped areas should be as wide as possible where there are trees: when feasible, at least 6 to 9 feet wide for parkways and 8 to 12 feet wide for medians. However, many existing parkways and medians are less wide. Narrower parkways can support understory plants and some tree species. A path or multiple paths should be added as needed across a parkway as a means of access from the curb to the sidewalk. For example, where there are striped curbside parking spaces, a path across the parkway should be provided at every one or two parking spaces.

Install plant species that:

- Do not require mowing more frequently than once every few months
- Are drought tolerant and can survive with minimal irrigation upon establishment
- Do not exceed a height of 2 feet within 5 feet of a driveway/curb cut and within 20 feet of a crosswalk, and, excluding trees, 3 feet elsewhere
- Do not have thorns or sharp edges adjacent to any walkway or curb
- Are located at least 4 feet from any tree trunk

Q1 Do you live in the Laurinburg city limits?

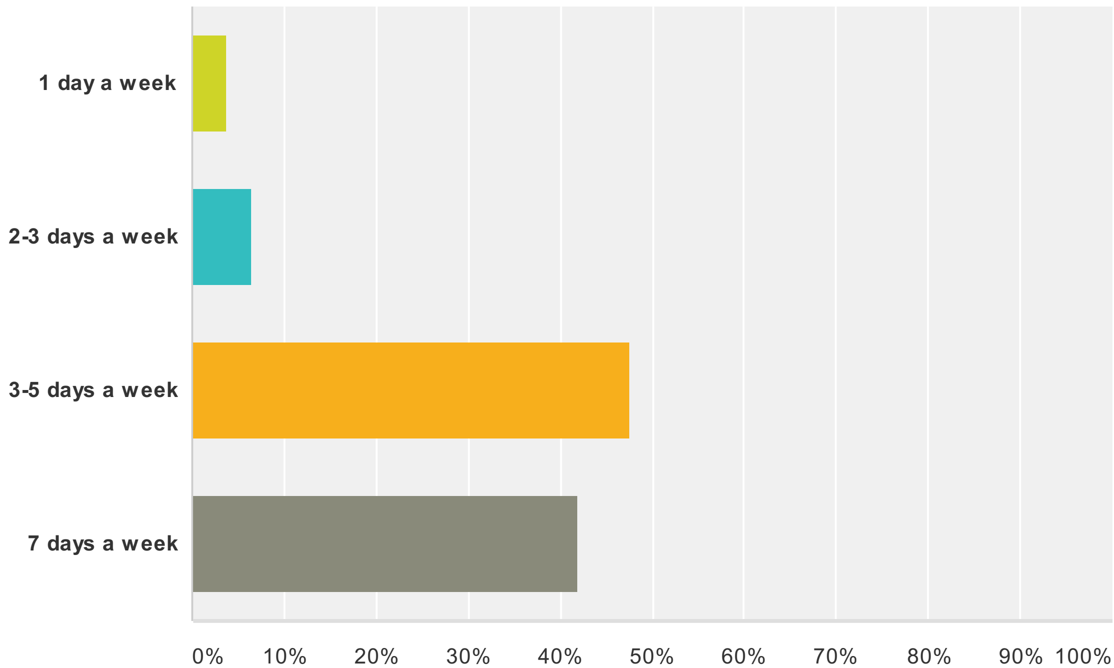
Answered: 239 Skipped: 0



Answer Choices	Responses	
Yes	54.39%	130
No	45.61%	109
Total		239

Q2 If not, how often are you within the Laurinburg city limits?

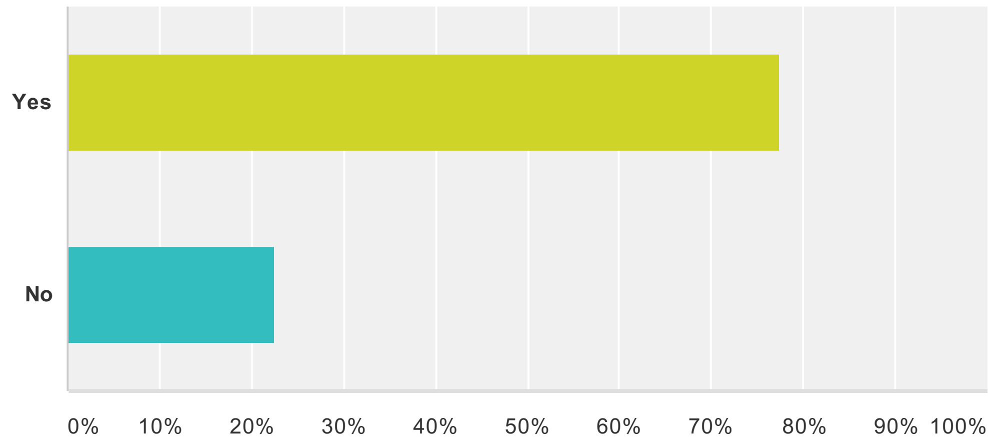
Answered: 107 Skipped: 132



Answer Choices	Responses	
1 day a week	**3.74%**	4
2-3 days a week	**6.54%**	7
3-5 days a week	**47.66%**	51
7 days a week	**42.06%**	45
Total		**107**

Q3 Do you work within the Laurinburg city limits?

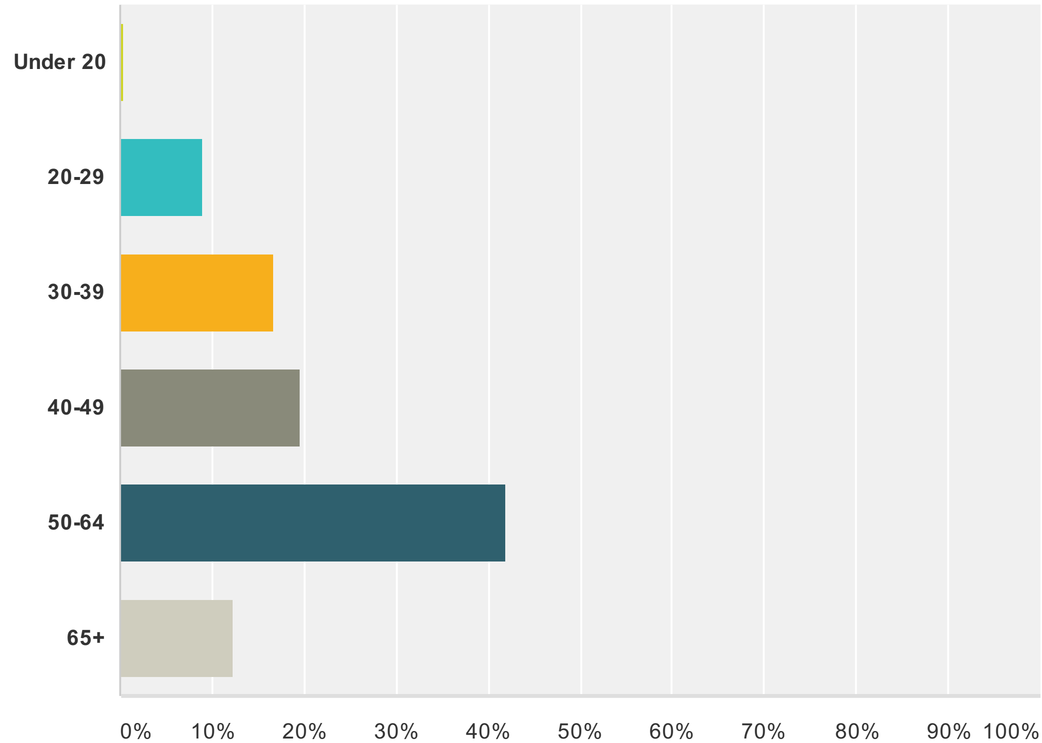
Answered: 234 Skipped: 5



Answer Choices	Responses	
Yes	**77.35%**	181
No	**22.65%**	53
Total		**234**

Q4 What is your age?

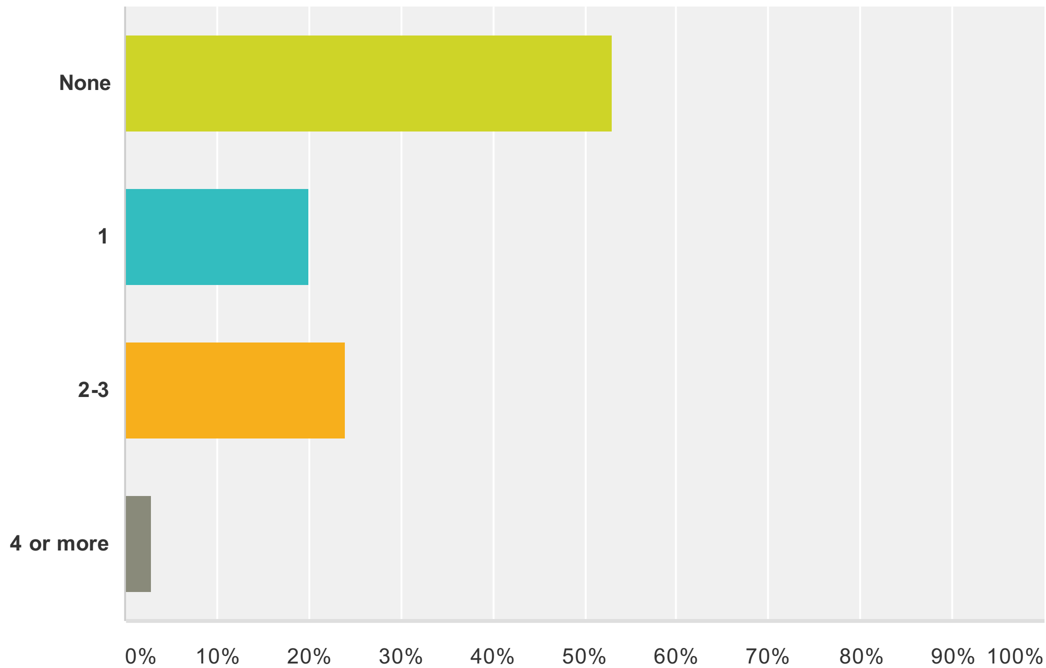
Answered: 234 Skipped: 5



Answer Choices	Responses	
Under 20	**0.43%**	1
20-29	**8.97%**	21
30-39	**16.67%**	39
40-49	**19.66%**	46
50-64	**41.88%**	98
65+	**12.39%**	29
Total		**234**

Q5 How many children are in your household?

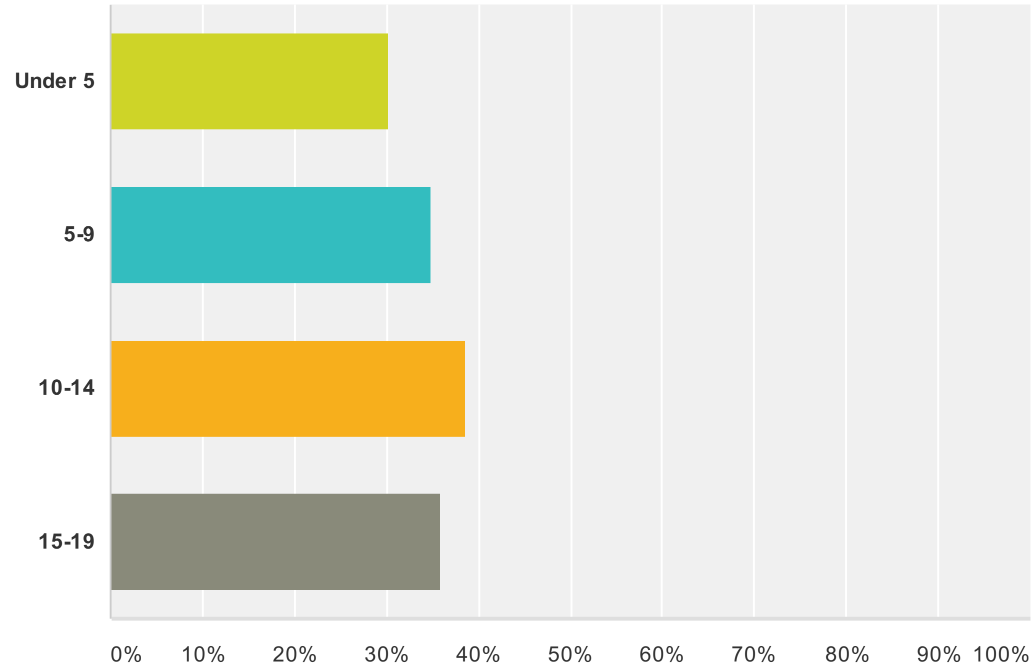
Answered: 234 Skipped: 5



Answer Choices	Responses	
None	**52.99%**	124
1	**20.09%**	47
2-3	**23.93%**	56
4 or more	**2.99%**	7
Total		**234**

Q6 What is their age?

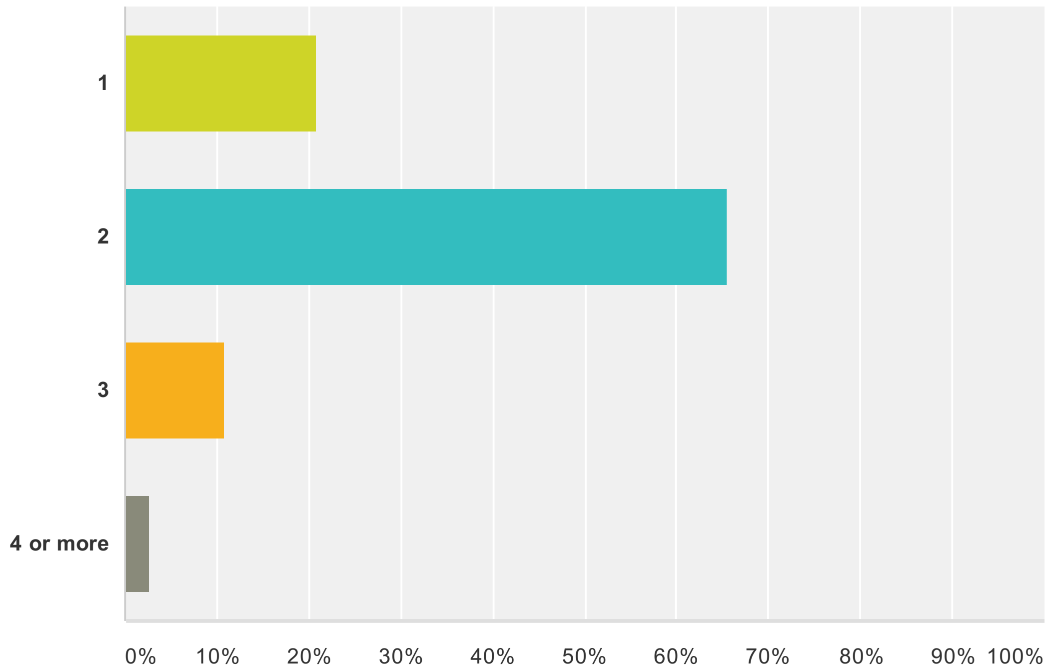
Answered: 106 Skipped: 133



Answer Choices	Responses	
Under 5	**30.19%**	32
5-9	**34.91%**	37
10-14	**38.68%**	41
15-19	**35.85%**	38
Total Respondents: 106		

Q7 How many adults are in your household?

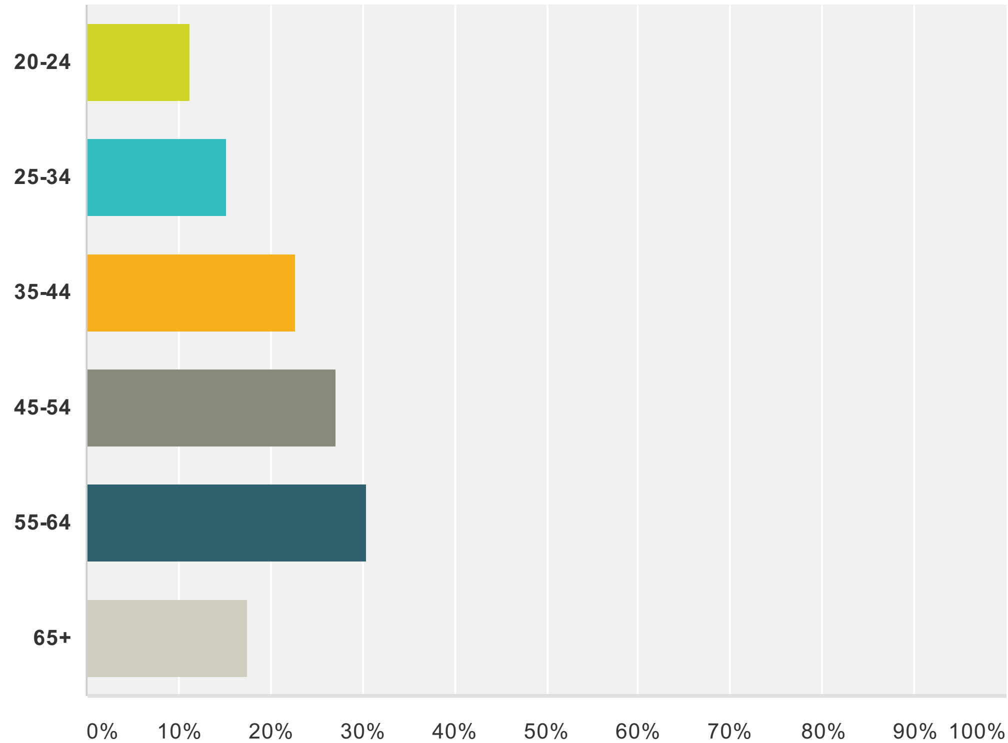
Answered: 229 Skipped: 10



Answer Choices	Responses	
1	**20.96%**	48
2	**65.50%**	150
3	**10.92%**	25
4 or more	**2.62%**	6
Total		**229**

Q8 What is their age?

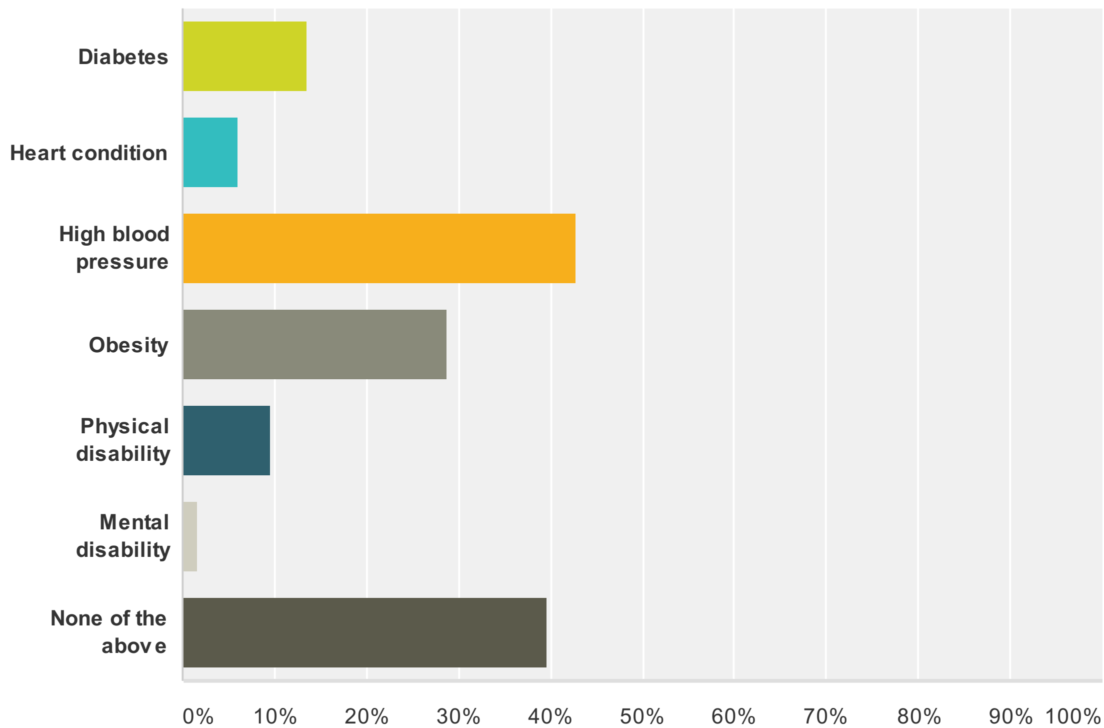
Answered: 229 Skipped: 10



Answer Choices	Responses	
20-24	**11.35%**	26
25-34	**15.28%**	35
35-44	**22.71%**	52
45-54	**27.07%**	62
55-64	**30.57%**	70
65+	**17.47%**	40
Total Respondents: 229		

Q9 Of the members in your household, do any of the following conditions exist? Check all that apply.

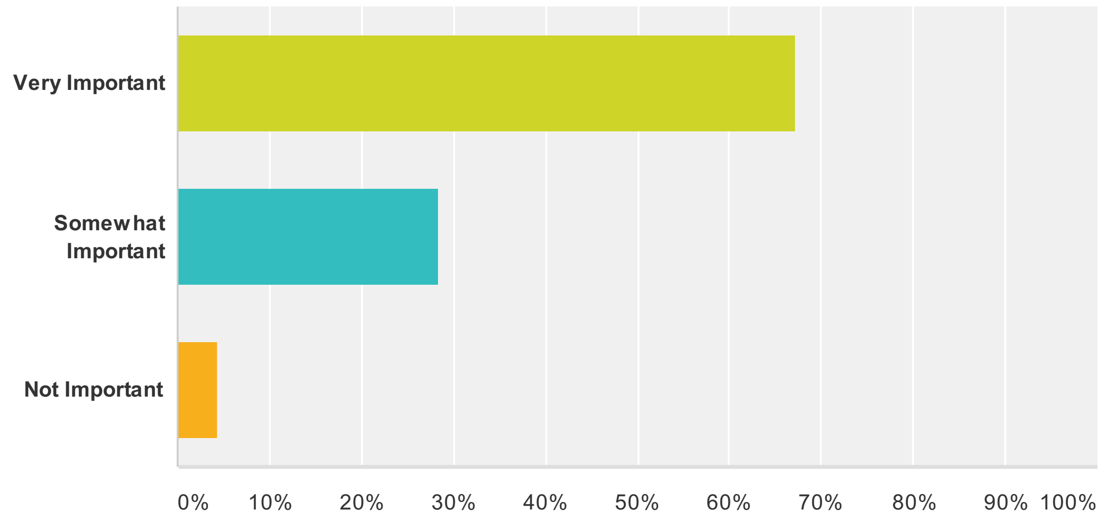
Answered: 229 Skipped: 10



Answer Choices	Responses	
Diabetes	**13.54%**	31
Heart condition	**6.11%**	14
High blood pressure	**42.79%**	98
Obesity	**28.82%**	66
Physical disability	**9.61%**	22
Mental disability	**1.75%**	4
None of the above	**39.74%**	91
Total Respondents: 229		

Q10 How important to you is it to live in a community that is pedestrian friendly?

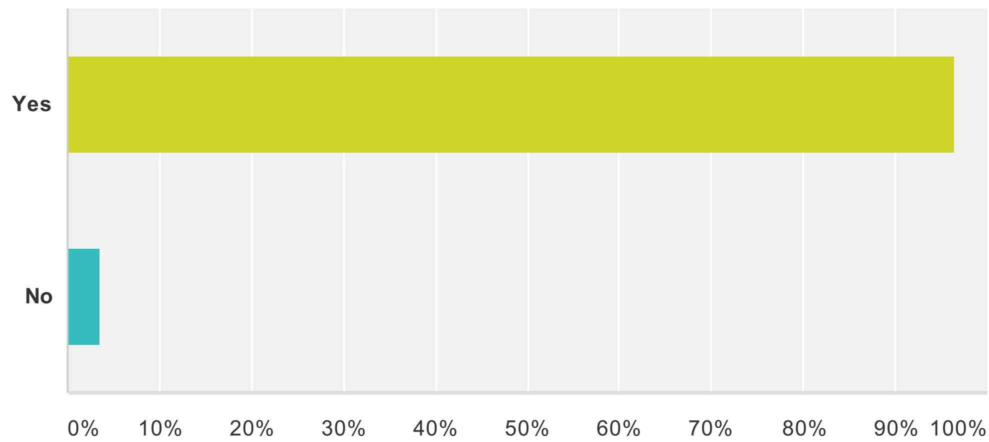
Answered: 229 Skipped: 10



Answer Choices	Responses	
Very Important	**67.25%**	154
Somewhat Important	**28.38%**	65
Not Important	**4.37%**	10
Total		**229**

Q11 Do you support the goal of making Laurinburg a pedestrian friendly community?

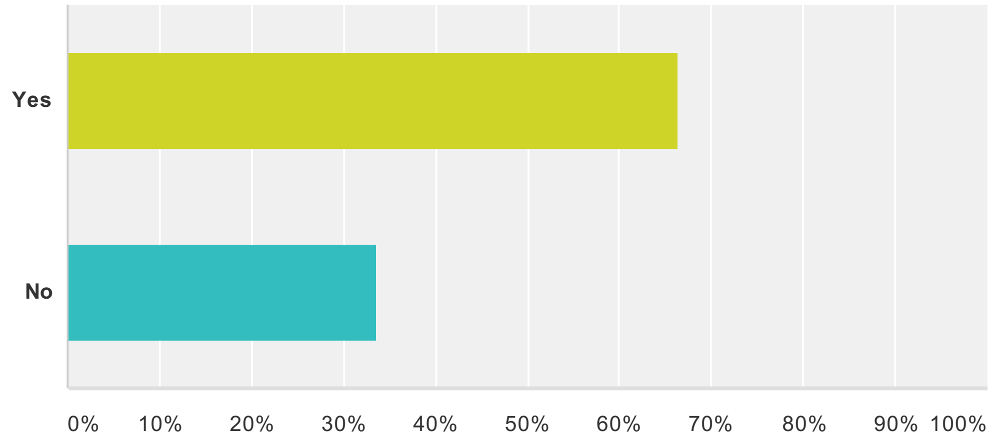
Answered: 229 Skipped: 10



Answer Choices	Responses	
Yes	**96.51%**	221
No	**3.49%**	8
Total		**229**

Q12 Do you walk or run now?

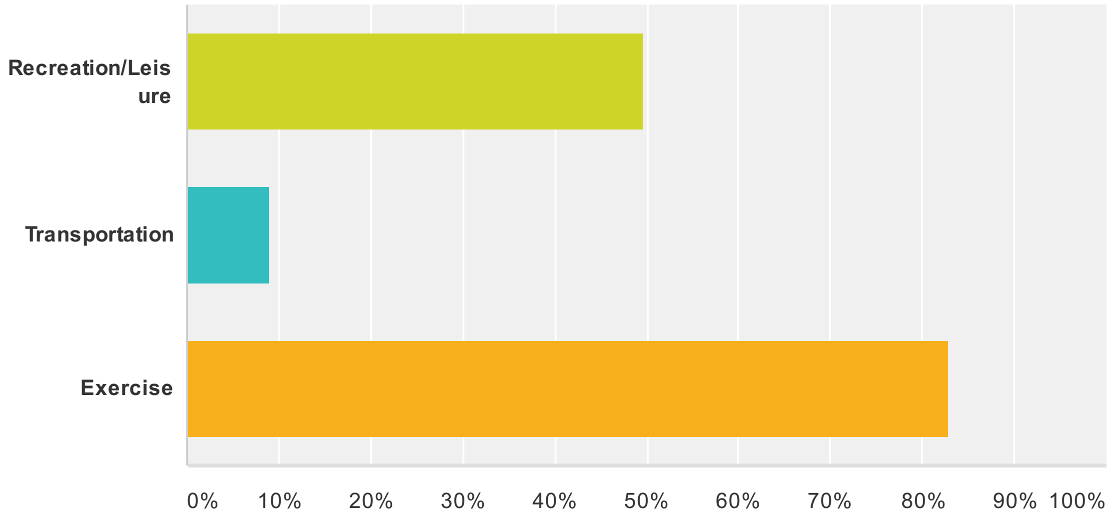
Answered: 229 Skipped: 10



Answer Choices	Responses	
Yes	**66.38%**	152
No	**33.62%**	77
Total		**229**

Q13 If yes, for what purpose?

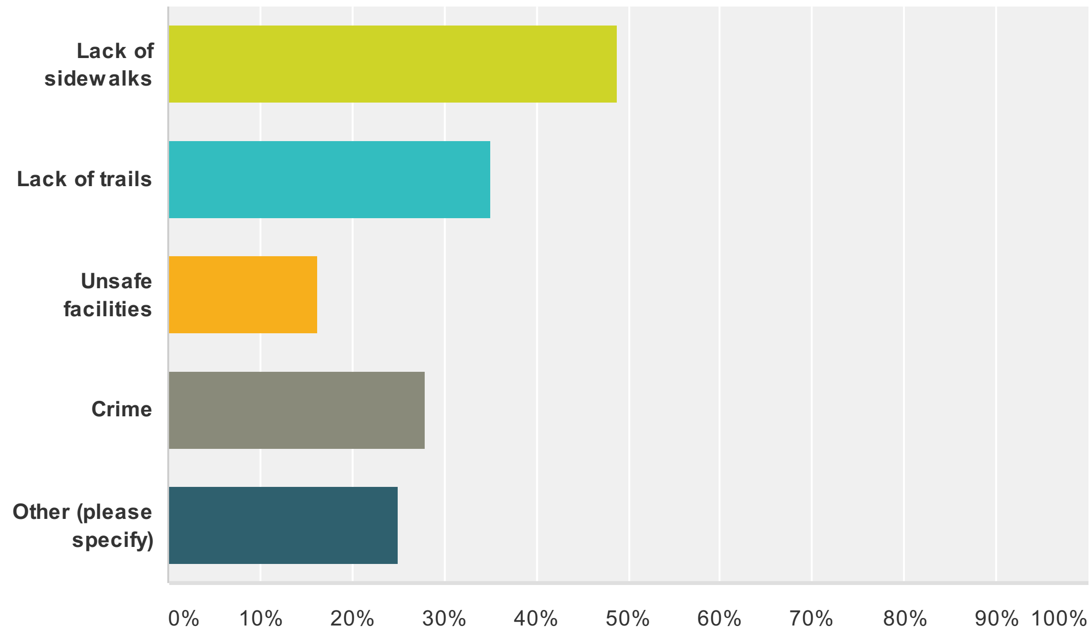
Answered: 135 Skipped: 104



Answer Choices	Responses	
Recreation/Leisure	**49.63%**	67
Transportation	**8.89%**	12
Exercise	**82.96%**	112
Total Respondents: 135		

Q14 What would you say is the biggest factor that hinders you from walking?

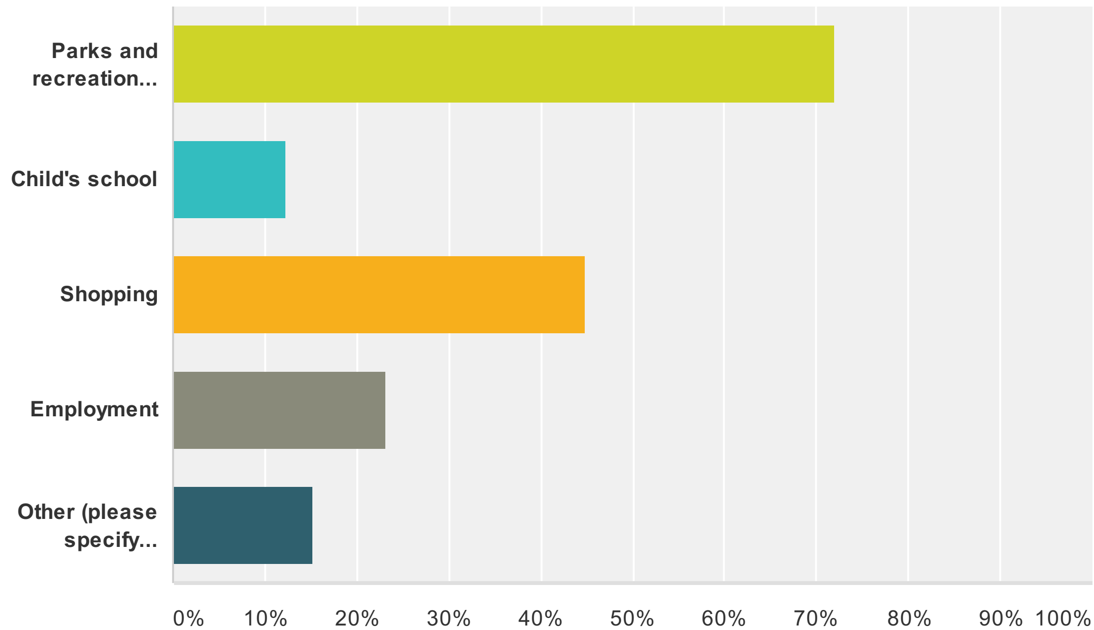
Answered: 203 Skipped: 36



Answer Choices	Responses	
Lack of sidewalks	**48.77%**	99
Lack of trails	**34.98%**	71
Unsafe facilities	**16.26%**	33
Crime	**28.08%**	57
Other (please specify)	**25.12%**	51
Total Respondents: 203		

Q15 Where in Laurinburg would you like to be able to walk to?

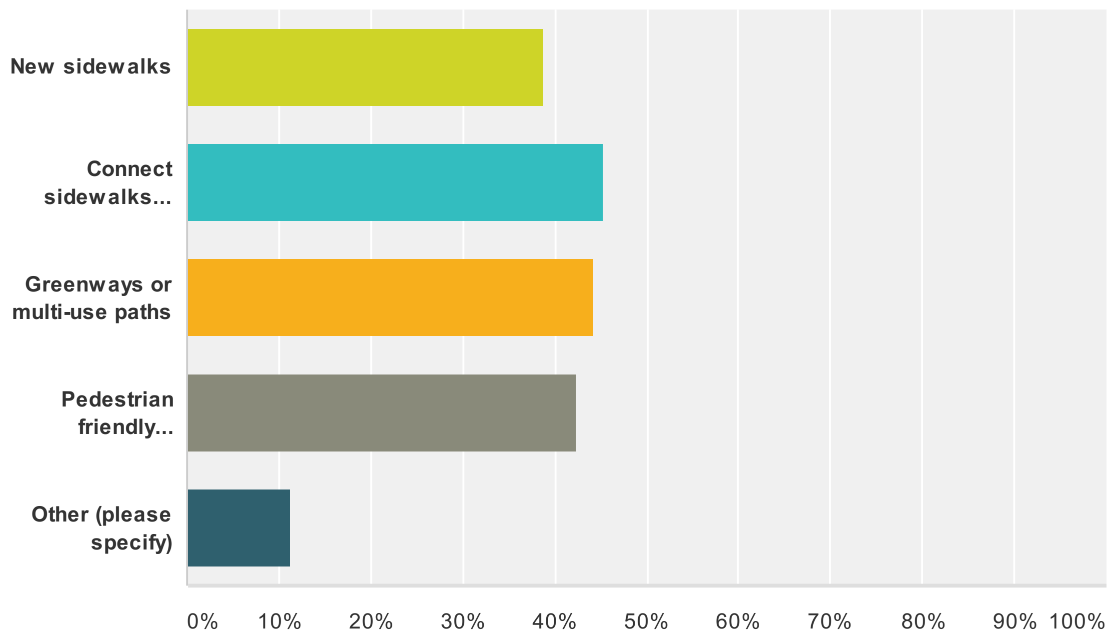
Answered: 203 Skipped: 36



Answer Choices	Responses	
Parks and recreation facilities	**71.92%**	146
Child's school	**12.32%**	25
Shopping	**44.83%**	91
Employment	**23.15%**	47
Other (please specify location)	**15.27%**	31
Total Respondents: 203		

Q16 In regards to transforming Laurinburg into a more pedestrian friendly city, what do you think would be the most important accomplishment?

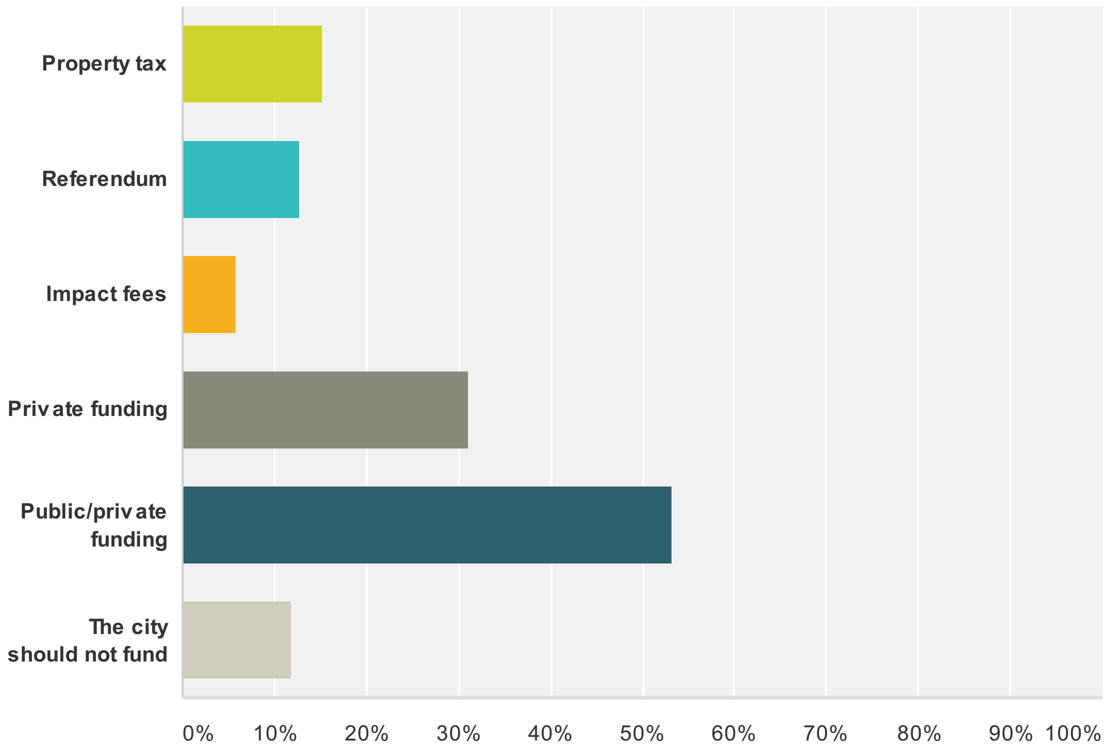
Answered: 203 Skipped: 36



Answer Choices	Responses	
New sidewalks	**38.92%**	79
Connect sidewalks (i.e., fill gaps)	**45.32%**	92
Greenways or multi-use paths	**44.33%**	90
Pedestrian friendly intersections (i.e., crosswalks, pedestrian signals)	**42.36%**	86
Other (please specify)	**11.33%**	23
Total Respondents: 203		

Q17 How should the city fund these improvements?

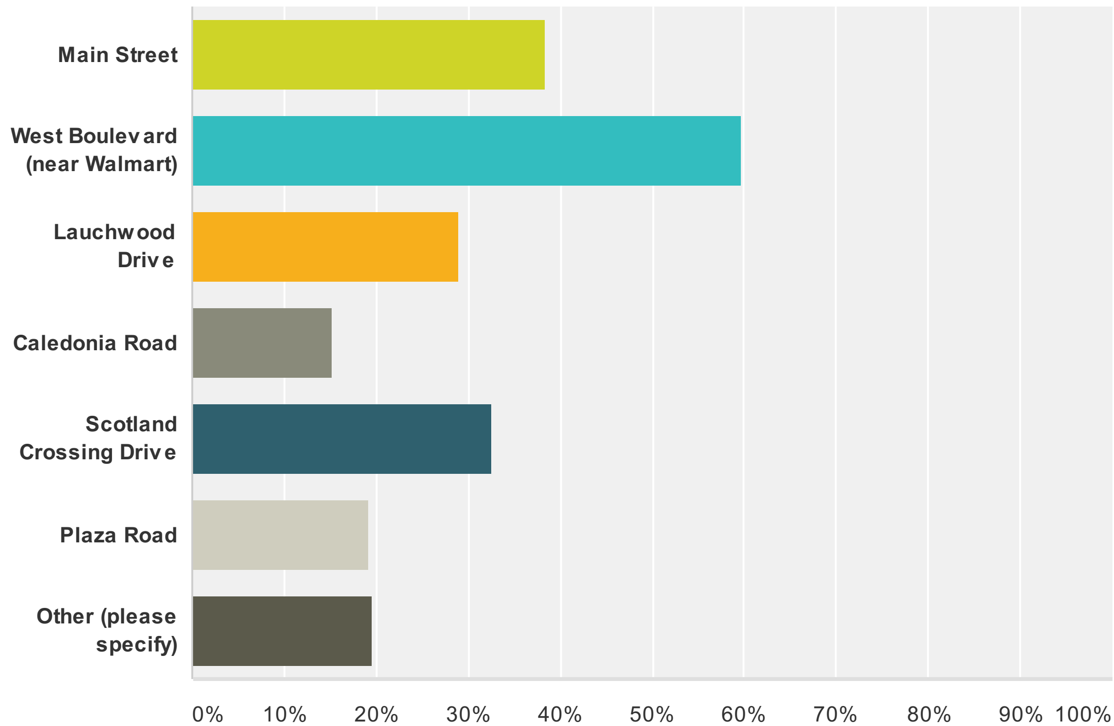
Answered: 203 Skipped: 36



Answer Choices	Responses	
Property tax	**15.27%**	31
Referendum	**12.81%**	26
Impact fees	**5.91%**	12
Private funding	**31.03%**	63
Public/private funding	**53.20%**	108
The city should not fund	**11.82%**	24
Total Respondents: 203		

Q18 On what roads would you most like to see pedestrian improvements?

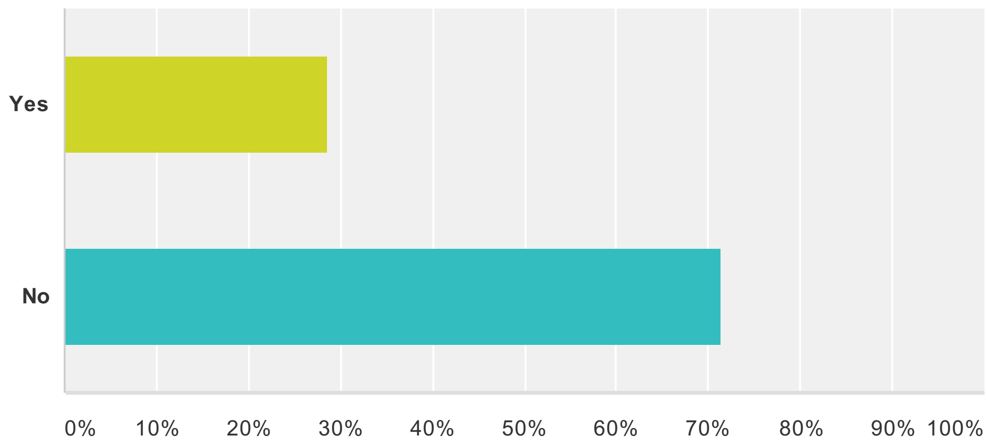
Answered: 203 Skipped: 36



Answer Choices	Responses	
Main Street	**38.42%**	78
West Boulevard (near Walmart)	**59.61%**	121
Lauchwood Drive	**29.06%**	59
Caledonia Road	**15.27%**	31
Scotland Crossing Drive	**32.51%**	66
Plaza Road	**19.21%**	39
Other (please specify)	**19.70%**	40
Total Respondents: 203		

Q19 Have you experienced a recurring issue regarding pedestrian safety that you feel should be addressed?

Answered: 203 Skipped: 36



Answer Choices	Responses	
Yes	**28.57%**	58
No	**71.43%**	145
Total		**203**

Q20 If yes, please briefly explain:

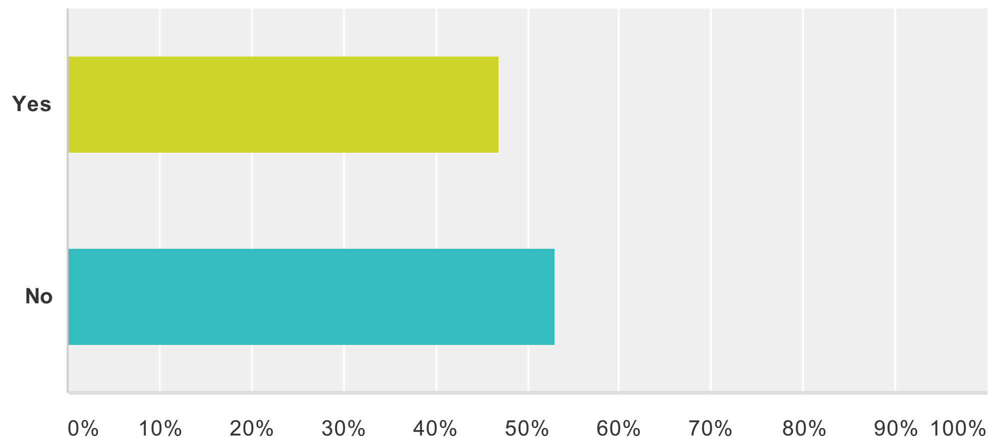
Answered: 58 Skipped: 181

Q21 What is your zip code?

Answered: 202 Skipped: 37

Q22 Would you be willing to tell us more about yourself in order to better apply the information from this community survey?

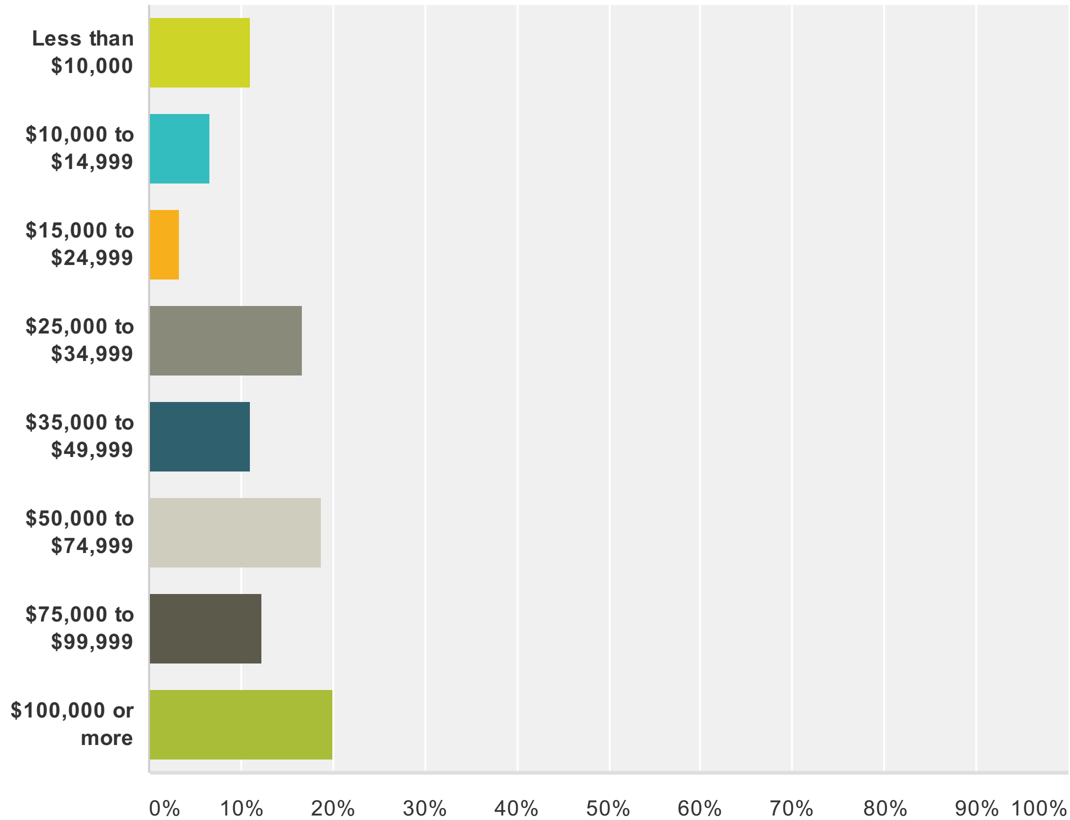
Answered: 202 Skipped: 37



Answer Choices	Responses	
Yes	**47.03%**	95
No	**52.97%**	107
Total		**202**

Q23 What is your income level?

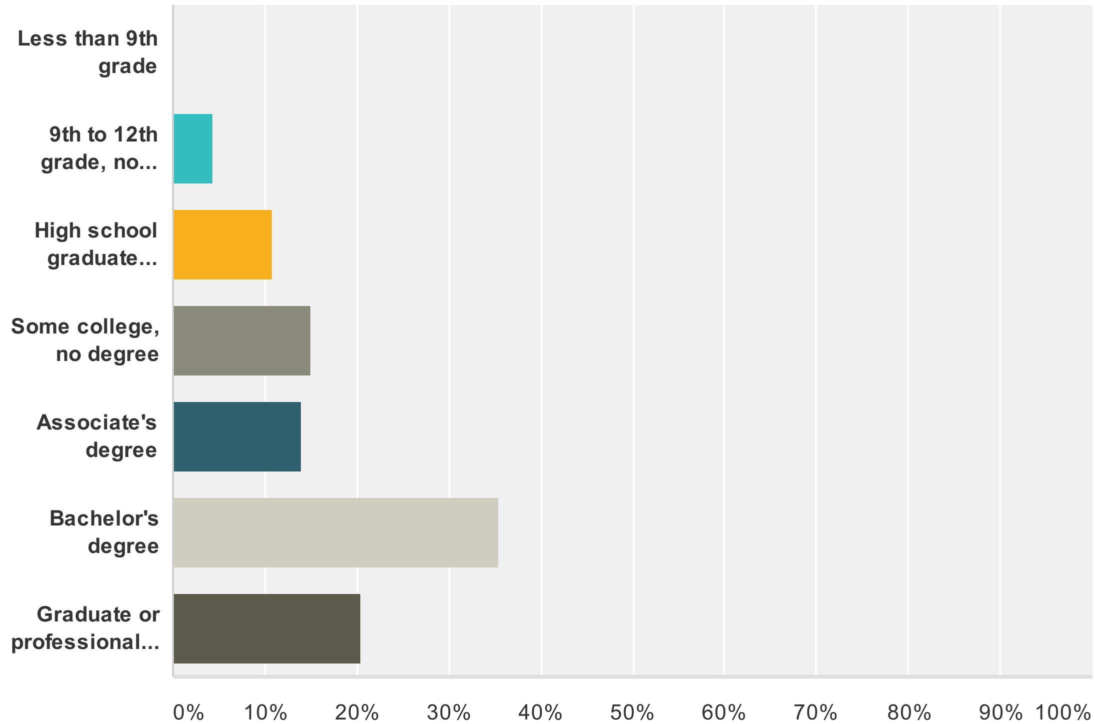
Answered: 90 Skipped: 149



Answer Choices	Responses	
Less than $10,000	**11.11%**	10
$10,000 to $14,999	**6.67%**	6
$15,000 to $24,999	**3.33%**	3
$25,000 to $34,999	**16.67%**	15
$35,000 to $49,999	**11.11%**	10
$50,000 to $74,999	**18.89%**	17
$75,000 to $99,999	**12.22%**	11
$100,000 or more	**20.00%**	18
Total		**90**

Q24 What is your education level?

Answered: 93 Skipped: 146



Answer Choices	Responses	
Less than 9th grade	**0.00%**	0
9th to 12th grade, no diploma	**4.30%**	4
High school graduate (includes equivalency)	**10.75%**	10
Some college, no degree	**15.05%**	14
Associate's degree	**13.98%**	13
Bachelor's degree	**35.48%**	33
Graduate or professional degree	**20.43%**	19
Total		**93**

Appendix C: Proposed Sidewalk Network							
Street Name	Maintenance	NCDOT State Route	Proposed Improvement	From	To	Length (ft)	Estimated Cost
401 Service Rd	NCDOT	SR1174	Install SW One Side	Hampton Inn Cir	Lauchwood Cir	482.62	$15,443.87
401 Service Rd	NCDOT	SR1173	Install SW One Side	Hampton Inn Cir	Lauchwood Cir	594.29	$19,017.34
Aberdeen Rd	NCDOT	US 501 Bus	Install SW One Side	N Gill St	N Main St	798.38	$25,548.25
Alpha St	Laurinburg		Install SW One Side	Corona Ave	Roseville St	295.18	$9,445.91
Alpha St	Laurinburg		Install SW One Side	Corona Ave	Roseville St	447.70	$14,326.54
Armory St	NCDOT	SR1640	Install SW Both Sides	S Main St	Biggs St	267.37	$17,111.83
Atkinson St	NCDOT	SR1107	Exist One Side - Install SW Both Sides	W Covington St	E Vance St	463.88	$14,844.21
Atkinson St	NCDOT	SR1107	Install SW Both Sides	E Church St	W Covington St	582.68	$37,291.36
Atkinson St	NCDOT	SR1107	Install SW Both Sides	E Church St	W Covington St	606.11	$38,791.23
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	75.70	$4,844.51
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	229.26	$14,672.39
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	546.62	$34,983.87
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	311.58	$19,941.08
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	287.16	$18,378.27
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	443.54	$28,386.57
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	32.49	$2,079.33
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	617.84	$39,541.52
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	24.33	$1,557.06
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	515.65	$33,001.52
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	16.63	$1,064.46
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	52.13	$3,336.22
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	340.65	$21,801.29
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	634.86	$40,631.25
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	525.77	$33,649.58
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	344.75	$22,063.71
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	29.53	$1,890.07
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	73.26	$4,688.61
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	81.70	$5,229.07
Atkinson St	NCDOT	SR1107	Install SW Both Sides	W Vance St	S Main St	26.22	$1,678.02
Azure Ct	Laurinburg		Install SW One Side	W Covington St	Pedan St	473.15	$15,140.79
Azure Ct	Laurinburg		Install SW One Side	W Covington St	Pedan St	507.74	$16,247.68
Azure Ct	Laurinburg		Install SW One Side	W Covington St	Pedan St	502.28	$16,072.85
Azure Ct	Laurinburg		Install SW One Side	W Covington St	Pedan St	399.11	$12,771.56
Biggs St	NCDOT	SR1641	Install SW Both Sides	E Church St	Armory St	525.15	$33,609.55
Biggs St	NCDOT	SR1642	Install SW Both Sides	E Church St	Armory St	681.15	$43,593.46
Biggs St	NCDOT	SR1642	Install SW Both Sides	E Church St	Armory St	559.74	$35,823.40
Biggs St	NCDOT	SR1642	Install SW Both Sides	E Church St	Armory St	349.22	$22,350.21
Biggs St	NCDOT	SR1642	Install SW Both Sides	E Church St	Armory St	508.44	$32,540.06

Biggs St	NCDOT	SR1642	Install SW Both Sides	E Church St	Armory St	462.94	$29,628.27
Biggs St	NCDOT	SR1642	Install SW Both Sides	E Church St	Armory St	653.74	$41,839.18
Biggs St	NCDOT	SR1642	Install SW Both Sides	E Church St	Armory St	1,040.89	$66,616.94
Biggs St	NCDOT	SR1641	Install SW Both Sides	E Church St	Armory St	504.09	$32,261.48
Biggs St	NCDOT	SR1641	Install SW Both Sides	E Church St	Armory St	970.39	$62,105.09
Biggs St	NCDOT	SR1641	Install SW Both Sides	E Church St	Armory St	447.98	$28,670.84
Biggs St	NCDOT	SR1643	Install SW One Side	E Railroad St	Monroe Alley	365.34	$11,690.79
Bizzell St	Laurinburg		Install SW One Side	N Gill St	N Main	548.48	$17,551.24
Caledonia Rd	NCDOT	SR1433	Install SW One Side	McGirts Bridge Rd	Old Lumberton Rd	465.42	$14,893.51
Caledonia Rd	NCDOT	SR1433	Install SW One Side	McGirts Bridge Rd	Old Lumberton Rd	591.94	$18,942.18
Caledonia Rd	NCDOT	SR1433	Install SW One Side	McGirts Bridge Rd	Old Lumberton Rd	552.98	$17,695.37
Caledonia Rd	NCDOT	SR1433	Install SW One Side	McGirts Bridge Rd	Old Lumberton Rd	411.70	$13,174.38
Caledonia Rd	NCDOT	SR1438	Install SW One Side	Old Lumberton Rd	N Caledonia Rd	566.70	$18,134.36
Caledonia Rd	NCDOT	SR1438	Install SW One Side	Old Lumberton Rd	N Caledonia Rd	935.15	$29,924.76
Caledonia Rd	NCDOT	SR1438	Install SW One Side	Old Lumberton Rd	N Caledonia Rd	112.14	$3,588.57
Caledonia Rd	NCDOT	SR1438	Install SW One Side	Old Lumberton Rd	N Caledonia Rd	194.71	$6,230.79
Caledonia Rd	NCDOT	SR1438	Install SW One Side	Pitt St	McDougald Ave	739.21	$23,654.67
Church St	NCDOT	US74Bus	Install SW One Side	Turnpike Rd	Scotland High School Rd	44.77	$1,432.59
Church St	NCDOT	US74Bus	Install SW One Side	Turnpike Rd	Scotland High School Rd	414.95	$13,278.41
Church St	NCDOT	US74Bus	Install SW One Side	Turnpike Rd	Scotland High School Rd	441.38	$14,124.31
Church St	NCDOT	US74Bus	Install SW One Side	Turnpike Rd	Scotland High School Rd	958.49	$30,671.84
Church St	NCDOT	US74Bus	Install SW One Side	Turnpike Rd	Scotland High School Rd	211.29	$6,761.16
College Dr	Laurinburg		Install SW One Side	Woodlawn St	Flowers St	343.37	$10,987.89
College Dr	Laurinburg		Install SW One Side	Woodlawn St	Flowers St	1,305.35	$41,771.22
College Dr	Laurinburg		Install SW One Side	Woodlawn St	Flowers St	283.39	$9,068.37
Corona Ave	Laurinburg		Install SW One Side	McGirts Bridge Rd	Delta St	288.65	$9,236.72
Corona Ave	Laurinburg		Install SW One Side	McGirts Bridge Rd	Delta St	429.49	$13,743.68
Corona Ave	Laurinburg		Install SW One Side	McGirts Bridge Rd	Delta St	440.18	$14,085.90
Corona Ave	Laurinburg		Install SW One Side	McGirts Bridge Rd	Delta St	386.13	$12,356.12
Covington St	Laurinburg		Exist One Side - Install SW Both Sides	Atkinson St	S Main St	362.67	$11,605.32
Covington St	Laurinburg		Install SW Both Sides	Azure Ct	Atkinson St	624.33	$39,957.31
Covington St	Laurinburg		Install SW Both Sides	Azure Ct	Atkinson St	400.87	$25,655.63
Covington St	Laurinburg		Install SW Both Sides	Azure Ct	Atkinson St	319.37	$20,439.38
Covington St	Laurinburg		Install SW Both Sides	Azure Ct	Atkinson St	404.07	$25,860.33
Covington St	Laurinburg		Install SW Both Sides	Azure Ct	Atkinson St	317.51	$20,320.81
Covington St	Laurinburg		Install SW Both Sides	Azure Ct	Atkinson St	327.47	$20,958.14
Covington St	Laurinburg		Install SW Both Sides	S Main St	James St	556.54	$35,618.63
Covington St	Laurinburg		Install SW Both Sides	S Main St	James St	374.64	$23,977.18
Crepe Myrtle Ave	Laurinburg		Install SW One Side	Sunset Dr	S Main St	381.04	$12,193.33
Crepe Myrtle Ave	Laurinburg		Install SW One Side	Sunset Dr	S Main St	796.98	$25,503.28
Crossover - US 401 Bus	NCDOT		Install SW One Side	401 Bypass Service Rd	Dogwood Mile	51.54	$1,649.26

Cypress St	Laurinburg		Install SW One Side	Hill St	N Main	521.26	$16,680.46
Cypress St	Laurinburg		Install SW One Side	Hill St	N Mainc	444.23	$14,215.34
Dickson St	Laurinburg		Install SW Both Sides	N Gill St	Carver St	731.07	$46,788.44
Dickson St	Laurinburg		Install SW Both Sides	N Gill St	Carver St	451.05	$28,867.12
Elm Ave	Laurinburg		Install SW One Side	Atkinson St	S Main	365.98	$11,711.45
Elm Ave	Laurinburg		Install SW One Side	St Andrews College Dr	Cameron Dr	451.95	$14,462.30
Elm Ave	Laurinburg		Install SW One Side	St Andrews College Dr	Cameron Dr	873.35	$27,947.20
Entrance- Scotland Crossing	NCDOT	SR1175	Install SW Both Sides	Scotland Crossing Dr	15-401 Bypass	244.38	$15,640.05
Everett St	Laurinburg		Install SW One Side	Fairly St	W Cronly St	361.39	$11,564.41
Everett St	Laurinburg		Install SW One Side	Prince St	E Vance St	456.95	$14,622.50
Everett St	Laurinburg		Install SW One Side	W Church	Prince	603.96	$19,326.73
Everett St	Laurinburg		Install SW One Side	W Church	Prince	583.25	$18,664.10
Flowers St	Laurinburg		Install SW One Side	Pitt St	McDougald Ave	736.30	$23,561.47
Ford Dr	Laurinburg		Install SW Both Sides	401 Bypass Service Rd	S Main St	486.57	$31,140.35
Ford Dr	Laurinburg		Install SW Both Sides	401 Bypass Service Rd	S Main St	699.31	$44,756.02
Gill St	NCDOT	SR1107	Exist One Side - Install SW Both Sides	N Main St	Cypress St	354.48	$11,343.48
Gill St	NCDOT	SR1107	Exist One Side - Install SW Both Sides	N Main St	Cypress St	471.63	$15,092.02
Gill St	NCDOT	SR1107	Install SW Both Sides	Cypress St	Alley St	504.61	$32,295.14
Gill St	NCDOT	SR1107	Install SW Both Sides	Cypress St	Alley St	410.55	$26,275.35
Gill St	NCDOT	SR1107	Install SW Both Sides	Cypress St	Alley St	669.18	$42,827.37
Gill St	NCDOT	SR1107	Install SW Both Sides	Cypress St	Alley St	158.02	$10,113.32
Gill St	NCDOT	SR1107	Install SW Both Sides	Cypress St	Alley St	1,088.09	$69,637.69
Gill St	NCDOT	SR1107	Install SW Both Sides	Cypress St	Alley St	1,692.45	$108,316.70
Gill St	NCDOT	SR1107	Install SW Both Sides	Cypress St	Alley St	196.04	$12,546.62
Gill St	NCDOT	SR1107	Install SW Both Sides	Cypress St	Alley St	111.51	$7,136.90
Hill St	Laurinburg		Install SW One Side	Glenn St	Cypress St	654.33	$20,938.60
Hillside Ave	Laurinburg		Install SW One Side	Perk St	N Main St	428.96	$13,726.62
Hillside Ave	Laurinburg		Install SW One Side	Perk St	N Main St	584.23	$18,695.22
James St	Laurinburg		Install SW One Side	E Cronly St	McRae St	681.65	$21,812.93
James St	Laurinburg		Install SW One Side	E Cronly St	McRae St	629.82	$20,154.37
John St	Laurinburg		Install SW Both Sides	N Gill St	Carver St	552.22	$35,342.29
Johns Rd	NCDOT	US501Bus	Install SW Both Sides	S Main St	Woodlawn St	558.26	$35,728.62
Johns Rd	NCDOT	US501Bus	Install SW Both Sides	S Main St	Woodlawn St	606.67	$38,827.07
Johns Rd	NCDOT	US501Bus	Install SW Both Sides	S Main St	Woodlawn St	328.16	$21,002.06
Johns Rd	NCDOT	US501Bus	Install SW Both Sides	S Main St	Woodlawn St	1,244.63	$79,656.31
King St	Laurinburg		Install SW One Side	W Covington St	S King St	758.62	$24,275.97
Lauchwood Cir	Laurinburg		Install SW One Side	401 Bypass Service Rd	Dogwood Mile	350.83	$11,226.56
Lauchwood Cir	Laurinburg		Install SW One Side	401 Bypass Service Rd	Dogwood Mile	353.40	$11,308.71
Lauchwood Dr.	NCDOT	SR1674	Install SW One Side	401 Bypass Service Rd	Dogwood Mile	309.39	$9,900.49
Main St	NCDOT	US15/401Bus	Exist One Side - Install SW Both Sides	Plaza Rd	Lauchwood Dr	299.18	$9,573.79
Main St	NCDOT	US15/401Bus	Exist One Side - Install SW Both Sides	Plaza Rd	Lauchwood Dr	117.48	$3,759.27

Main St	NCDOT	US15/401Bus	Exist One Side - Install SW Both Sides	Plaza Rd	Lauchwood Dr	194.29	$6,217.27
Main St	NCDOT	US15/401Bus	Exist One Side - Install SW Both Sides	Plaza Rd	Lauchwood Dr	86.75	$2,776.13
Main St	NCDOT	US15 401 Bus	Exist One Side - Install SW Both Sides	Plaza Rd	Lauchwood Dr	189.93	$6,077.88
Main St	NCDOT	US15 401 Bus	Exist One Side - Install SW Both Sides	Plaza Rd	Lauchwood Dr	1,055.17	$33,765.34
Main St	NCDOT	US15 401 Bus	Exist One Side - Install SW Both Sides	Plaza Rd	Lauchwood Dr	551.51	$17,648.17
Main St	NCDOT	US15 401 Bus	Exist One Side - Install SW Both Sides	Plaza Rd	Lauchwood Dr	16.96	$542.63
Main St	NCDOT	US15 401 501Bus	Exist One Side - Install SW Both Sides	Welch St	Crepe Myrtle Ave	95.93	$3,069.70
Main St	NCDOT	US15 401 501Bus	Exist One Side - Install SW Both Sides	Welch St	Crepe Myrtle Ave	548.34	$17,546.83
Main St	NCDOT	US15 401 501Bus	Exist One Side - Install SW Both Sides	Welch St	Crepe Myrtle Ave	139.90	$4,476.94
Main St	NCDOT	US15/401Bus	Exist One Side - Install SW Both Sides	Welch St	Crepe Myrtle Ave	101.00	$3,232.15
Main St	NCDOT	US15 401 Bus	Exist One Side - Install SW Both Sides	Welch St	Crepe Myrtle Ave	620.52	$19,856.70
Main St	NCDOT	US15 401 501Bus	Exist One Side - Install SW Both Sides	Welch St	Crepe Myrtle Ave	411.41	$13,165.00
Main St	NCDOT	US15/401Bus	Install SW Both Sides	Crepe Myrtle Ave	Plaza Rd	39.20	$2,508.92
Main St	NCDOT	US15/401Bus	Install SW Both Sides	Crepe Myrtle Ave	Plaza Rd	413.71	$26,477.41
Main St	NCDOT	US15/401Bus	Install SW Both Sides	Crepe Myrtle Ave	Plaza Rd	53.46	$3,421.71
Main St	NCDOT	US15 401 Bus	Install SW Both Sides	Crepe Myrtle Ave	Plaza Rd	527.93	$33,787.74
Main St	NCDOT	US15 401 Bus	Install SW Both Sides	Crepe Myrtle Ave	Plaza Rd	25.42	$1,626.71
Main St	NCDOT	US15 401 Bus	Install SW Both Sides	Crepe Myrtle Ave	Plaza Rd	591.52	$37,857.05
Main St	NCDOT	US15 401 Bus	Install SW Both Sides	Crepe Myrtle Ave	Plaza Rd	283.90	$18,169.76
Main St	NCDOT	US15 401 Bus	Install SW Both Sides	Crepe Myrtle Ave	Plaza Rd	398.82	$25,524.27
Main St	NCDOT	US15/401Bus	Install SW Both Sides	Crepe Myrtle Ave	Plaza Rd	57.07	$3,652.59
Main St	NCDOT	US 501 Bus	Install SW One Side	Cypress St	Lytch St	208.38	$6,668.12
Main St	NCDOT	US 501 Bus	Install SW One Side	Cypress St	Lytch St	401.48	$12,847.41
Main St	NCDOT	US 501 Bus	Install SW One Side	Cypress St	Lytch St	284.80	$9,113.70
Marcellus St	Laurinburg		Install SW One Side	Melton St	Smith St	443.06	$14,178.06
Marcellus St	Laurinburg		Install SW One Side	Mills St	Washington St	268.63	$8,596.03
Marcellus St	Laurinburg		Install SW One Side	Mills St	Washington St	232.16	$7,429.06
McDougald Ave	Laurinburg		Install SW One Side	Woodlawn St	Flowers St	355.85	$11,387.14
McGirts Bridge Rd	NCDOT	SR1433	Install SW One Side	Corona Ave	McGirts Bridge Rd	228.62	$7,315.89
McGirts Bridge Rd	NCDOT	SR1433	Install SW One Side	Corona Ave	McGirts Bridge Rd	340.43	$10,893.91
McGirts Bridge Rd	NCDOT	SR1433	Install SW One Side	Corona Ave	McGirts Bridge Rd	159.77	$5,112.76
McGirts Bridge Rd	NCDOT	SR1471	Install SW One Side	N Main St	N Caledonia	905.92	$28,989.48
McGirts Bridge Rd	NCDOT	SR1471	Install SW One Side	N Main St	N Caledonia	422.49	$13,519.59
McGirts Bridge Rd	NCDOT	SR1471	Install SW One Side	N Main St	N Caledonia	442.93	$14,173.84
McGirts Bridge Rd	NCDOT	SR1471	Install SW One Side	N Main St	N Caledonia	437.41	$13,997.08
McGirts Bridge Rd	NCDOT	SR1471	Install SW One Side	N Main St	N Caledonia	513.55	$16,433.58
Peden St	Laurinburg		Install SW One Side	W Covington St	West Boulevard	426.86	$13,659.37
Peden St	Laurinburg		Install SW One Side	W Covington St	West Boulevard	626.54	$20,049.14
Peden St	Laurinburg		Install SW One Side	W Covington St	West Boulevard	675.67	$21,621.58
Peden St	Laurinburg		Install SW One Side	W Covington St	West Boulevard	77.47	$2,479.14
Peden St	Laurinburg		Install SW One Side	W Covington St	West Boulevard	38.71	$1,238.69

Pine St	Laurinburg		Install SW One Side	E Vance St	Tucker St	347.99	$11,135.80
Pine St	Laurinburg		Install SW One Side	E Vance St	Tucker St	654.01	$20,928.22
Pine St	Laurinburg		Install SW One Side	E Vance St	Tucker St	280.62	$8,979.92
Pitt St	Laurinburg		Install SW One Side	S Caledonia Rd	Flowers St	354.83	$11,354.41
Plaza Rd	Laurinburg		Install SW Both Sides	15-401/501 Bypass	S Main St	295.12	$18,887.49
Plaza Rd	Laurinburg		Install SW Both Sides	15-401/501 Bypass	S Main St	522.57	$33,444.22
Plaza Rd	Laurinburg		Install SW Both Sides	15-401/501 Bypass	S Main St	386.44	$24,732.20
Plaza Rd	Laurinburg		Install SW Both Sides	15-401/501 Bypass	S Main St	962.40	$61,593.88
Plaza Rd	Laurinburg		Install SW Both Sides	15-401/501 Bypass	S Main St	668.06	$42,755.72
Prince St	Laurinburg		Install SW One Side	Azure Ct	Everett St	429.14	$13,732.43
Prince St	Laurinburg		Install SW One Side	Azure Ct	Everett St	428.20	$13,702.54
Prince St	Laurinburg		Install SW One Side	Azure Ct	Everett St	418.06	$13,377.94
Prince St	Laurinburg		Install SW One Side	W Church	Prince	119.43	$3,821.84
Richmond St	Laurinburg		Install SW One Side	Prince St	West Boulevard	445.38	$14,252.05
Richmond St	Laurinburg		Install SW One Side	Prince St	West Boulevard	437.21	$13,990.74
Roseville St	Laurinburg		Install SW One Side	N Caledonia Rd	Alpha St	270.28	$8,649.03
Scotland Crossing Dr	Laurinburg		Install SW One Side	West Boulevard	Entrance- Scotland Crossing	946.74	$30,295.78
Scotland Crossing Dr	Laurinburg		Install SW One Side	West Boulevard	Entrance- Scotland Crossing	945.66	$30,261.19
Scotland Crossing Dr	Laurinburg		Install SW One Side	West Boulevard	Entrance- Scotland Crossing	1,346.37	$43,083.86
Sunset Dr	Laurinburg		Install SW One Side	S Main St	Atkinson St	492.37	$15,755.80
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	622.68	$19,925.77
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	584.11	$18,691.64
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	458.96	$14,686.61
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	88.11	$2,819.60
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	32.67	$1,045.39
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	68.23	$2,183.29
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	325.63	$10,420.30
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	305.68	$9,781.84
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	25.99	$831.77
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	179.59	$5,746.81
Sunset Dr	Laurinburg		Install SW One Side	West Boulevard	Atkinson St	562.18	$17,989.78
Sycamore Ln	Laurinburg		Install SW One Side	Evergreen Ln	Elm Ave	326.80	$10,457.73
Sycamore Ln	Laurinburg		Install SW One Side	Evergreen Ln	Elm Ave	1,408.25	$45,063.84
Tucker St	Laurinburg		Install SW One Side	S Pine St	S Main St	446.98	$14,303.51
Tucker St	Laurinburg		Install SW One Side	S Pine St	S Main St	438.99	$14,047.57
Turnpike Rd	NCDOT	SR1105	Install SW One Side	74 Bypass	West Boulevard	484.62	$15,507.78
Turnpike Rd	NCDOT	SR1105	Install SW One Side	74 Bypass	West Boulevard	2,303.98	$73,727.27
Turnpike Rd	NCDOT	SR1105	Install SW One Side	Blues Farm Rd	McColl Rd	2,492.77	$79,768.69
Turnpike Rd	NCDOT	SR1105	Install SW One Side	Blues Farm Rd	McColl Rd	372.33	$11,914.68
Turnpike Rd	NCDOT	SR1105	Install SW One Side	Blues Farm Rd	McColl Rd	402.17	$12,869.39
Turnpike Rd	NCDOT	SR1105	Install SW One Side	Blues Farm Rd	McColl Rd	47.30	$1,513.62

Turnpike Rd	NCDOT	SR1271	Install SW One Side	McColl Rd	Barnes Bridge Rd	724.85	$23,195.25
Turnpike Rd	NCDOT	SR1271	Install SW One Side	McColl Rd	Barnes Bridge Rd	2,513.21	$80,422.70
Turnpike Rd	NCDOT	SR1271	Install SW One Side	McColl Rd	Barnes Bridge Rd	579.48	$18,543.51
Turnpike Rd	NCDOT	SR1271	Install SW One Side	McColl Rd	Barnes Bridge Rd	346.07	$11,074.26
Turnpike Rd	NCDOT	SR1271	Install SW One Side	McColl Rd	Barnes Bridge Rd	1,657.44	$53,038.07
Turnpike Rd	NCDOT	SR1271	Install SW One Side	McColl Rd	Barnes Bridge Rd	192.65	$6,164.80
Turnpike Rd	NCDOT	SR1271	Install SW One Side	McColl Rd	Barnes Bridge Rd	1,018.91	$32,605.15
Turnpike Rd	NCDOT	SR1271	Install SW One Side	McColl Rd	Barnes Bridge Rd	1,716.40	$54,924.66
Turnpike Rd	NCDOT	SR1105	Install SW One Side	W Church St	74 Bypass	1,538.41	$49,229.21
Turnpike Rd	NCDOT	SR1105	Install SW One Side	W Church St	74 Bypass	619.77	$19,832.63
Turnpike Rd	NCDOT	SR1105	Install SW One Side	W Church St	74 Bypass	1,285.54	$41,137.25
Turnpike Rd	NCDOT	SR1105	Install SW One Side	W Church St	74 Bypass	515.95	$16,510.25
Turnpike Rd	NCDOT	SR1105	Install SW One Side	West Boulevard	Blues Farm Rd	1,719.18	$55,013.78
Turnpike Rd	NCDOT	SR1105	Install SW One Side	West Boulevard	Blues Farm Rd	1,167.55	$37,361.57
Turnpike Rd	NCDOT	SR1105	Install SW One Side	West Boulevard	Blues Farm Rd	776.82	$24,858.34
Turnpike Rd	NCDOT	SR1105	Install SW One Side	West Boulevard	Blues Farm Rd	537.77	$17,208.64
Turnpike Rd	NCDOT	SR1105	Install SW One Side	West Boulevard	Blues Farm Rd	1,065.67	$34,101.47
US 15-401 Bypass	NCDOT	15 501 401 BYP	Install SW One Side	West Boulevard	Hampton Inn Cir	259.00	$8,288.09
US15401	NCDOT	15 501 401Bypass	Install SW One Side	West Boulevard	Hampton Inn Cir	2,479.45	$79,342.27
Vance St	Laurinburg		Install SW One Side	Atkinson St	S Caledonia Rd	403.34	$12,906.97
Vance St	Laurinburg		Install SW One Side	Atkinson St	S Caledonia Rd	153.01	$4,896.17
Vance St	Laurinburg		Install SW One Side	Atkinson St	S Caledonia Rd	363.65	$11,636.71
Vance St	Laurinburg		Install SW One Side	Atkinson St	S Caledonia Rd	372.88	$11,932.04
Vance St	Laurinburg		Install SW One Side	Atkinson St	S Caledonia Rd	204.67	$6,549.54
Vance St	Laurinburg		Install SW One Side	Atkinson St	S Caledonia Rd	311.94	$9,982.19
Vance St	Laurinburg		Install SW One Side	Atkinson St	S Caledonia Rd	357.53	$11,441.12
Vance St	Laurinburg		Install SW One Side	Atkinson St	S Caledonia Rd	349.53	$11,184.87
Vance St	Laurinburg		Install SW One Side	Richmond St	Scotland St	403.87	$12,923.72
Washington St	Laurinburg		Install SW One Side	Marcellus St	McGirts Bridge Rd	491.33	$15,722.49
Welch St	Laurinburg		Install SW One Side	Atkinson St	S Main	367.77	$11,768.52
Welch St	Laurinburg		Install SW One Side	S Main St	S Pine St	369.86	$11,835.37
Welch St	Laurinburg		Install SW One Side	S Main St	S Pine St	351.82	$11,258.22
West Boulevard	NCDOT	SR1108	Exist One Side - Install SW Both Sides	Scotland Crossing Dr	Turnpike Rd	1,818.02	$58,176.79
West Boulevard	NCDOT	SR1108	Install SW Both Sides	Atkinson St	S Main St	364.29	$23,314.54
West Boulevard	NCDOT	SR1108	Install SW One Side	15-401/501 Bypass	74 Bypass	194.42	$6,221.41
West Boulevard	NCDOT	SR1108	Install SW One Side	15-401/501 Bypass	74 Bypass	480.63	$15,380.18
West Boulevard	NCDOT	SR1108	Install SW One Side	15-401/501 Bypass	74 Bypass	883.64	$28,276.45
West Boulevard	NCDOT	SR1108	Install SW One Side	74 Bypass	Scotland Crossing Dr	473.38	$15,148.12
West Boulevard	NCDOT	SR1108	Install SW One Side	Atkinson St	Pedan St	403.60	$12,915.28
West Boulevard	NCDOT	SR1108	Install SW One Side	Atkinson St	Pedan St	191.24	$6,119.74
West Boulevard	NCDOT	SR1108	Install SW One Side	Atkinson St	Pedan St	499.61	$15,987.40

West Boulevard	NCDOT	SR1108	Install SW One Side	Atkinson St	Pedan St	147.40	$4,716.91
West Boulevard	NCDOT	SR1108	Install SW One Side	Atkinson St	Pedan St	135.72	$4,342.92
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	264.54	$8,465.35
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	291.34	$9,322.72
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	606.09	$19,394.86
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	127.00	$4,063.97
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	424.06	$13,569.81
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	207.49	$6,639.60
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	139.41	$4,461.23
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	544.50	$17,424.00
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	124.71	$3,990.67
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	255.49	$8,175.81
West Boulevard	NCDOT	SR1108	Install SW One Side	Sunset Dr	15-401/501 Bypass	488.81	$15,642.05
Wilson St	Laurinburg		Install SW One Side	S Main St	S Pine St	370.78	$11,865.01
Wilson St	Laurinburg		Install SW One Side	S Main St	S Pine St	352.57	$11,282.28
Woodlawn St	Laurinburg		Install SW One Side	Johns Rd	College Dr	229.72	$7,350.99
Yadkin Ave	Laurinburg		Install SW One Side	Atkinson St	S Main	367.22	$11,750.89
Yadkin Ave	Laurinburg		Install SW One Side	Atkinson St	Sunset Dr	452.38	$14,476.13
Yadkin Ave	Laurinburg		Install SW One Side	Atkinson St	Sunset Dr	293.79	$9,401.30
Yadkin Ave	Laurinburg		Install SW One Side	Atkinson St	Sunset Dr	429.26	$13,736.36
Total						**129,806.34**	**$5,210,348.18**

Proposed Sidewalk Network by Street -- Cost Estimate with ADA Curb Ramp Included					
Street Name	Block Segments	Proposed Improvement	ADA Ramps	Intersections of Concern	Estimated Cost with ADA Ramp
401 Service Rd	2	Install SW One Side	4		$37,661.21
Aberdeen Rd	1	Install SW One Side	3		$27,948.25
Alpha St	2	Install SW One Side	4		$26,972.45
Armory St	1	Install SW Both Sides	2		$18,711.83
Atkinson St	23	Exist One Side - Install SW Both Sides	57	3,5,12	$265,194.71
Azure Ct	4	Install SW One Side	7		$65,832.88
Biggs St	12	Install SW Both Sides	50	2	$492,420.04
Bizzell St	1	Install SW One Side	3		$19,951.24
Church St	5	Install SW One Side	7		$71,868.31
College Dr	3	Install SW One Side	10	11	$69,827.48
Corona Ave	4	Install SW One Side	2		$51,022.41
Covington St	9	Exist One Side - Install SW Both Sides	31	4	$142,799.03
Crepe Myrtle Ave	2	Install SW One Side	5		$41,696.61
Cypress St	2	Install SW One Side	2		$32,495.79

Dickson St	2	Install SW Both Sides	9		$82,855.56
Elm Ave	2	Install SW One Side	2		$44,009.50
ElmSt	1	Install SW One Side	3	6	$14,111.46
Entrance- Scotland Crossing	1	Install SW Both Sides	14		$26,840.05
Everett St (Church to Vance)	3	Install SW One Side	9		$59,813.12
Everett St (Cronly to Fairly	1	Install SW One Side	2		$13,164.42
Flowers St	1	Install SW One Side	2		$25,161.47
Ford Dr	2	Install SW Both Sides	10		$83,896.37
Gill St	10	Exist One Side - Install SW Both Sides	30		$205,010.04
Hill St	1	Install SW One Side	0		$20,938.60
Hillside Ave	2	Install SW One Side	4		$35,621.84
James St	2	Install SW One Side	2		$43,567.30
John St	1	Install SW Both Sides	8		$41,742.29
Johns Rd	4	Install SW Both Sides	25	6	$195,214.06
King St	1	Install SW One Side	3		$26,675.97
Lauchwood Cir	2	Install SW One Side	13	14	$32,935.26
Lauchwood Dr.	1	Install SW One Side	13	14	$20,300.49
Main St	26	Exist One Side - Install SW Both Sides	77	6,7,12,13,14	$308,450.09
Marcellus St	3	Install SW One Side	2		$31,803.15
McDougald Ave	1	Install SW One Side	10	11	$19,387.14
McGirts Bridge Rd	8	Install SW One Side	12		$120,036.13
N Caledonia Rd	9	Install SW One Side	11		$131,384.00
Peden St	5	Install SW One Side	9		$66,247.92
Pine St	3	Install SW One Side	6		$45,843.94
Pitt St	1	Install SW One Side	4	10	$14,554.41
Plaza Rd	5	Install SW Both Sides	24	13	$200,613.51
Prince St	4	Install SW One Side	6		$49,434.74
Richmond St	2	Install SW One Side	6		$33,042.79
Roseville St	1	Install SW One Side	5		$12,649.03
S Caledonia Rd	9	Install SW One Side	13	10,11	$34,054.66
Scotland Crossing Dr	3	Install SW One Side	4		$106,840.83
Sunset Dr	12	Install SW One Side	26	7	$140,678.62
Sycamore Ln	2	Install SW One Side	2		$57,121.57
Tucker St	2	Install SW One Side	13		$38,751.08
Turnpike Rd (McColl to Barnes Bridge)	8	Install SW One Side	8		$286,368.41
Turnpike Rd (McColl to Church)	15	Install SW One Side	24		$789,755.00
US 15-401 Bypass	1	Install SW One Side	6		$13,088.09
US15401	1	Install SW One Side	5	8	$83,342.27
Vance St	9	Install SW One Side	8		$99,853.34
Washington St	1	Install SW One Side	4		$18,922.49
Welch St (Atkinson to S Main)	1	Install SW One Side	4		$14,968.51

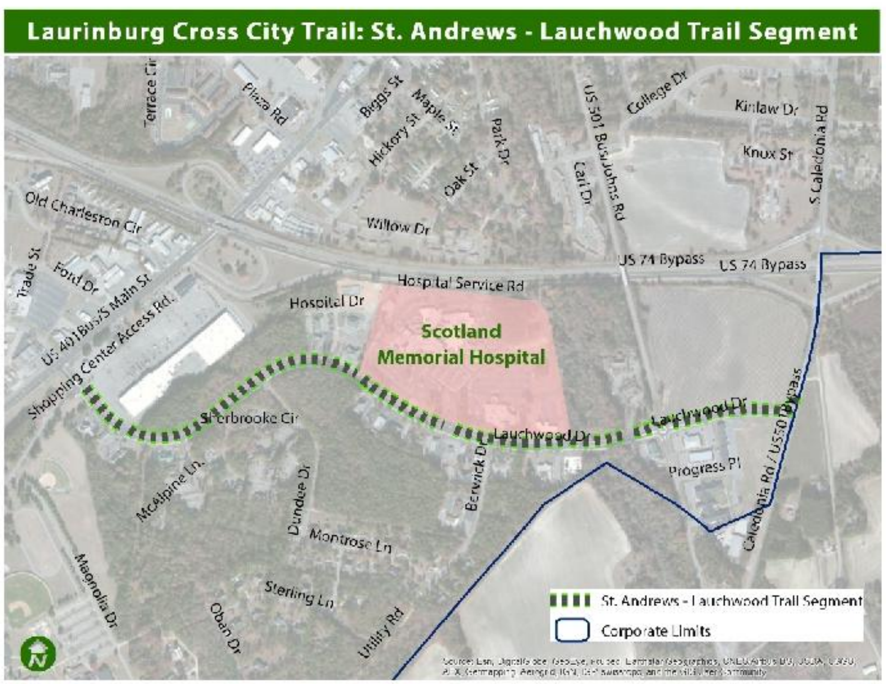
Welch St (S Main to Pine)	2	Install SW One Side	4		$26,293.59
West Boulevard	22	Exist One Side - Install SW Both Sides	40	5,8,9	$322,092.56
Wilson St	2	Install SW One Side	3		$25,547.29
Woodlawn St	1	Install SW One Side	2		$8,950.99
Yadkin Ave	4	Install SW One Side	5		$53,364.68
Total	**271**		**679**		**$5,489,700.90**

Appendix D: Proposed Greenway Network						
Segment Name	From	To	Length (ft)	Miles	Estimated Cost	Project Name
Azure Court Connector	West Boulevard	S King St	1,394.40	0.26	$125,096.40	Azure Court Connector from West Boulevard to S King St
Caledonia Trail	74 Bypass Ramp	Lauchwood Dr	852.95	0.16	$76,982.40	Caledonia Trail from 74 Bypass Ramp to Lauchwood Dr
Caledonia Trail	74 Bypass Ramp	74 Bypass Ramp	589.21	0.11	$52,925.40	Caledonia Trail from 74 Bypass Ramp to 74 Bypass Ramp
Caledonia Trail	E Vance St	74 Bypass Ramp	4,451.95	0.84	$404,157.60	Caledonia Trail from E Vance St to 74 Bypass Ramp
Caledonia Trail	E Church St	E Vance St	1,723.65	0.33	$158,776.20	Caledonia Trail from E Church St to E Vance St
Caledonia Trail	Roseville St	Church St	4,552.83	0.86	$413,780.40	Caledonia Trail from Roseville St to Church St
Gill Street Trail	Hillside Ave	N Main St	3,828.44	0.73	$351,232.20	Gill Street Trail from Hillside Ave to N Main St
Hillside Cemetery Connector	W Bizzell St	Hillside Ave	2,153.15	0.41	$197,267.40	Hillside Cemetery Connector from W Bizzell St to Hillside Ave
King Street Trail	W Covington St	W Bizzell St	2,636.85	0.50	$240,570.00	King Street Trail from W Covington St to W Bizzell St
King Street Trail	Azure Ct	W Covington St	804.82	0.15	$72,171.00	King Street Trail from Azure Ct to W Covington St
Main Street Connector	N Gill St	Produce Market Rd	1,989.36	0.38	$182,833.20	Main Street Connector from N Gill St to Produce Market Rd
McGirts Bridge Connector Trail	Produce Market Rd	Roseville St	2,315.34	0.44	$211,701.60	McGirts Bridge Connector Trail from Produce Market Rd to Roseville St
Produce Market Trail	N Main St	McGirts Bridge Rd	3,500.53	0.66	$317,552.40	Produce Market Trail from N Main St to McGirts Bridge Rd
Recreation Complex Trail	McColl Rd	West Boulevard	5,610.92	1.06	$510,008.40	Recreation Complex Trail from McColl Rd to West Boulevard
Scotland Crossing Connection	TRAIL	Scotland Crossing Dr	1,395.63	0.26	$125,096.40	Scotland Crossing Connection from TRAIL to Scotland Crossing Dr
St. Andrews - Lauchwood Trail	Lauchwood Dr	McColl Rd	2,534.16	0.48	$230,947.20	St. Andrews - Lauchwood Trail from Lauchwood Dr to McColl Rd
St. Andrews - Lauchwood Trail	Caledonia Rd	Dogwood Mile	6,052.89	1.15	$553,311.00	St. Andrews - Lauchwood Trail from Caledonia Rd to Dogwood Mile
West Blvd Trail	15-401/501 Bypass	Azure Ct	4,046.38	0.77	$370,477.80	West Blvd Trail from 15-401/501 Bypass to Azure Ct
West Blvd Trail	74 Bypass	15-401/501 Bypass	1,510.61	0.29	$139,530.60	West Blvd Trail from 74 Bypass to 15-401/501 Bypass
West Blvd Trail	Turnpike Rd	74 Bypass	2,139.65	0.41	$197,267.40	West Blvd Trail from Turnpike Rd to 74 Bypass

Appendix E: St. Andrews – Lauchwood Trail Segment

Scotland Memorial Hospital, located on Lauchwood Drive, generates pedestrian traffic from employees, patients, and visitors. The hospital has received grant funds to complete a FIT Trail to provide an exercise location for each of those three user groups. Further detail for the Laurinburg Cross City Trail segment (St. Andrews – Lauchwood Trail) is provided to ensure clarity and coordination with the hospital's proposed FIT Trail.

The St. Andrew – Lauchwood Trail segment of the proposed Cross City Trail spans approximately 2,500 feet and is just short of half a mile in total length. The proposed greenway segment is planned for the northern portion of Lauchwood Drive. If fully implemented, the facility would provide non-motorized access to retail entities located on US 401/McColl Road.



The image above represents the existing conditions along Lauchwood Drive. A dirt footpath has formed where pedestrians have utilized the northern boundary of Lauchwood Drive to walk between destinations or for exercise. This finding indicates a clear need for a non-motorized facility in this location. See the conceptual rendering on the next page depicting the proposed improvements.

This proposed greenway segment is estimated to cost approximately $242,947.20. This cost estimate includes the installation of 15 ADA accessible curb ramps.

Construction began in January 2015.

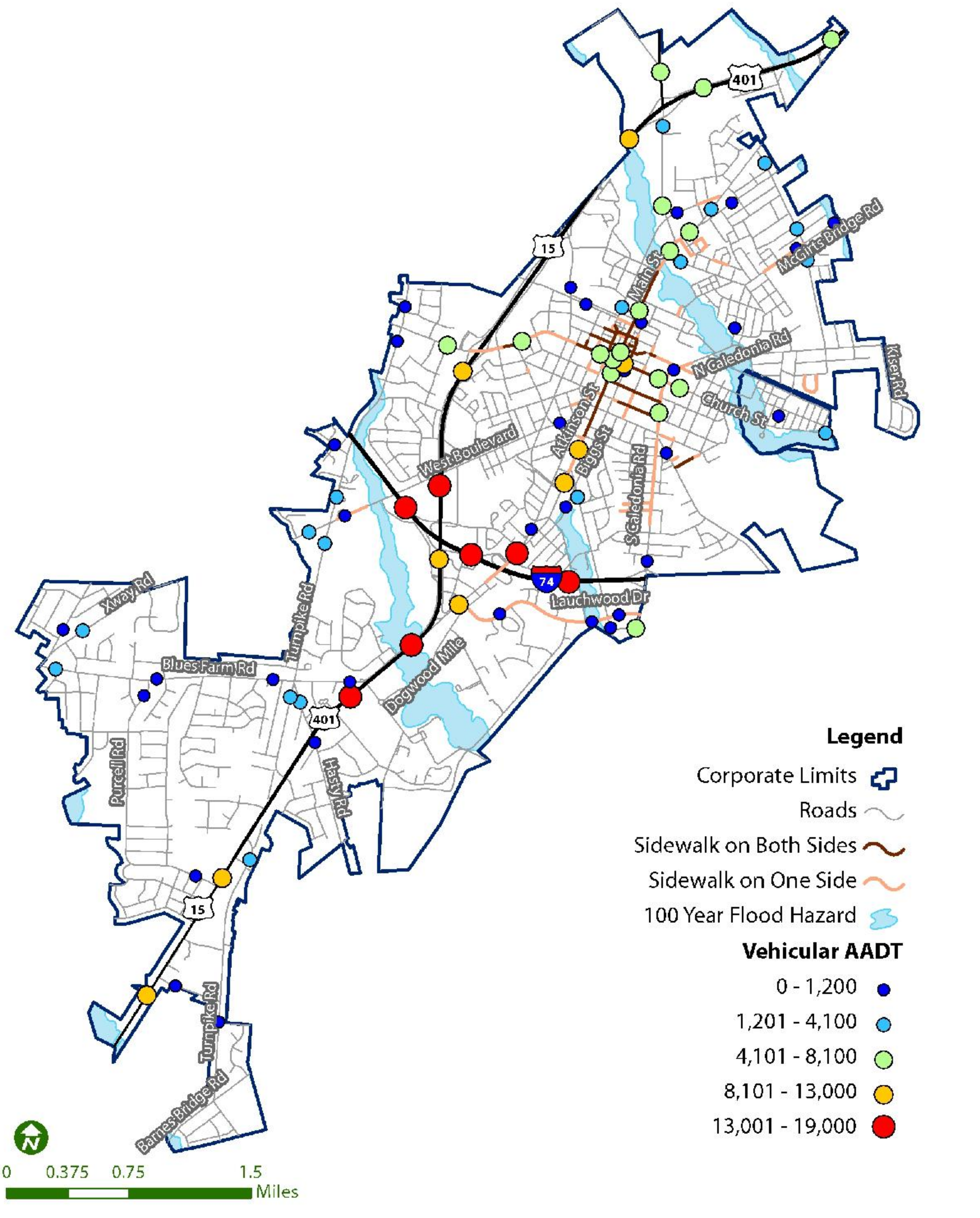

Lauchwood Drive at Scotland Memorial:
Conceptual Rendering
Laurinburg Cross City Trail
(10-12' asphalt multi-use path)
Scotland
Memorial
Hospital
High visibility
signage provided

Appendix F: Cost Estimates	
Facility	**Estimated Cost**
Sidewalk	$32 per linear foot
Multi-use path/Greenway (asphalt 10 foot wide)	$481,400 per mile
ADA Curb Ramp	$810 each
Pedestrian Countdown Signal	$2,220 each
High Visibility Crosswalk (Thermoplastic)	$2,540 each/$7 per linear foot
Curb Extension/Pededestrian Refuge Island	$13,000 each
HAWK Signal	$50,000 each

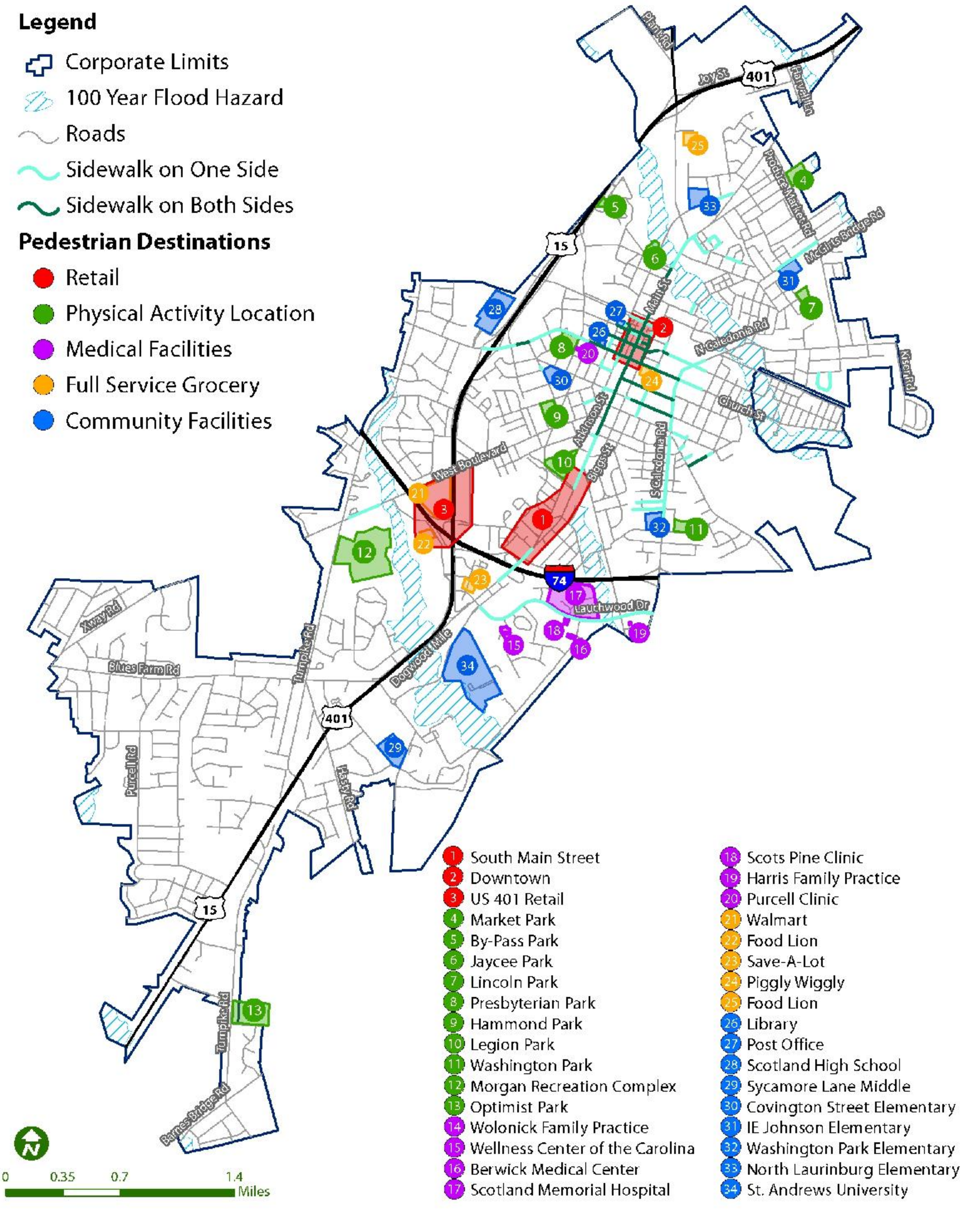
*A 15% contigency is estimated for all projects

**Design fees can be estimated as 20% of a project's total budget

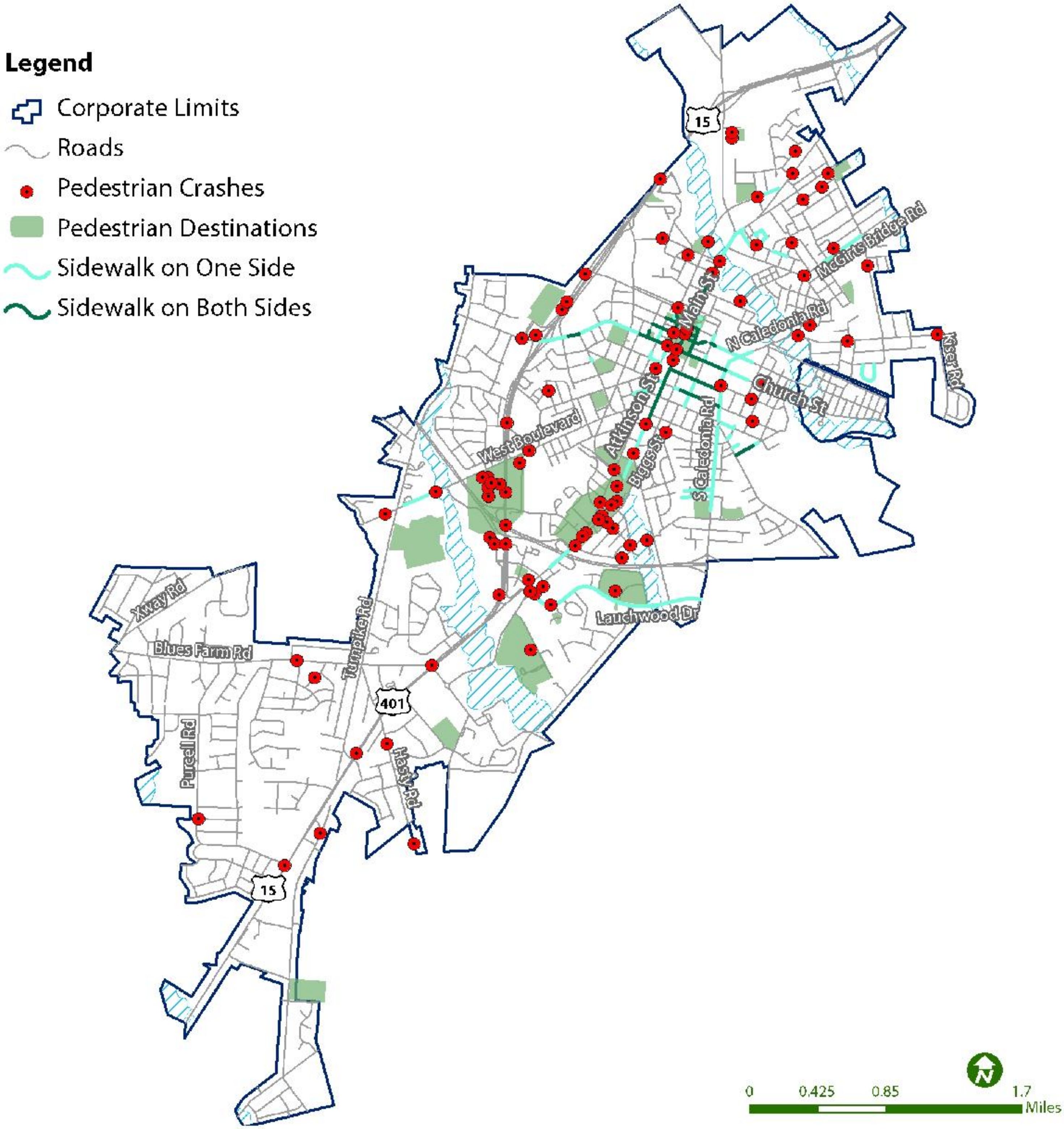
Map 9 - Annual Average Daily Traffic (2010)



Map 10 - Pedestrian Destinations

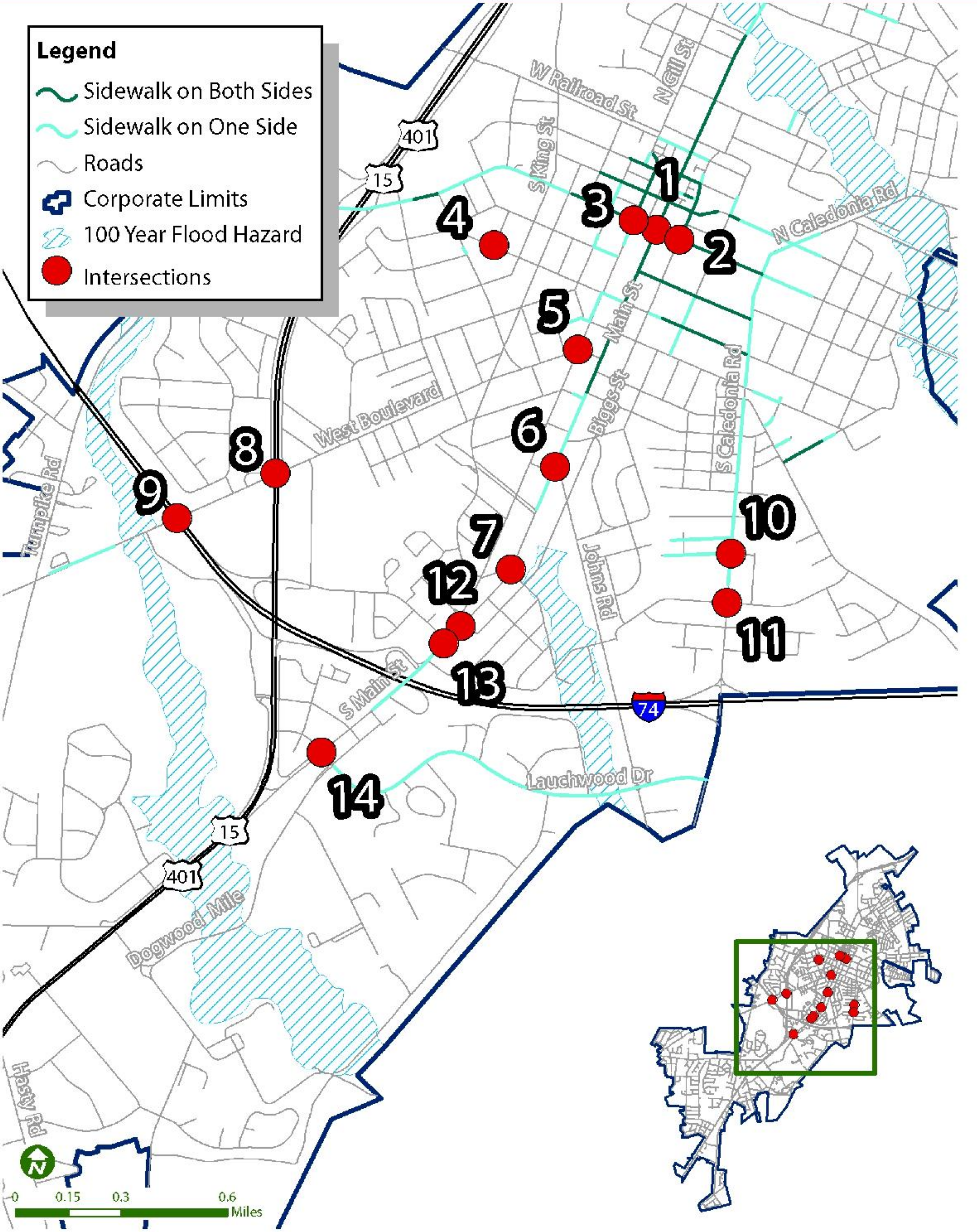


Map 11 - Pedestrian Crashes

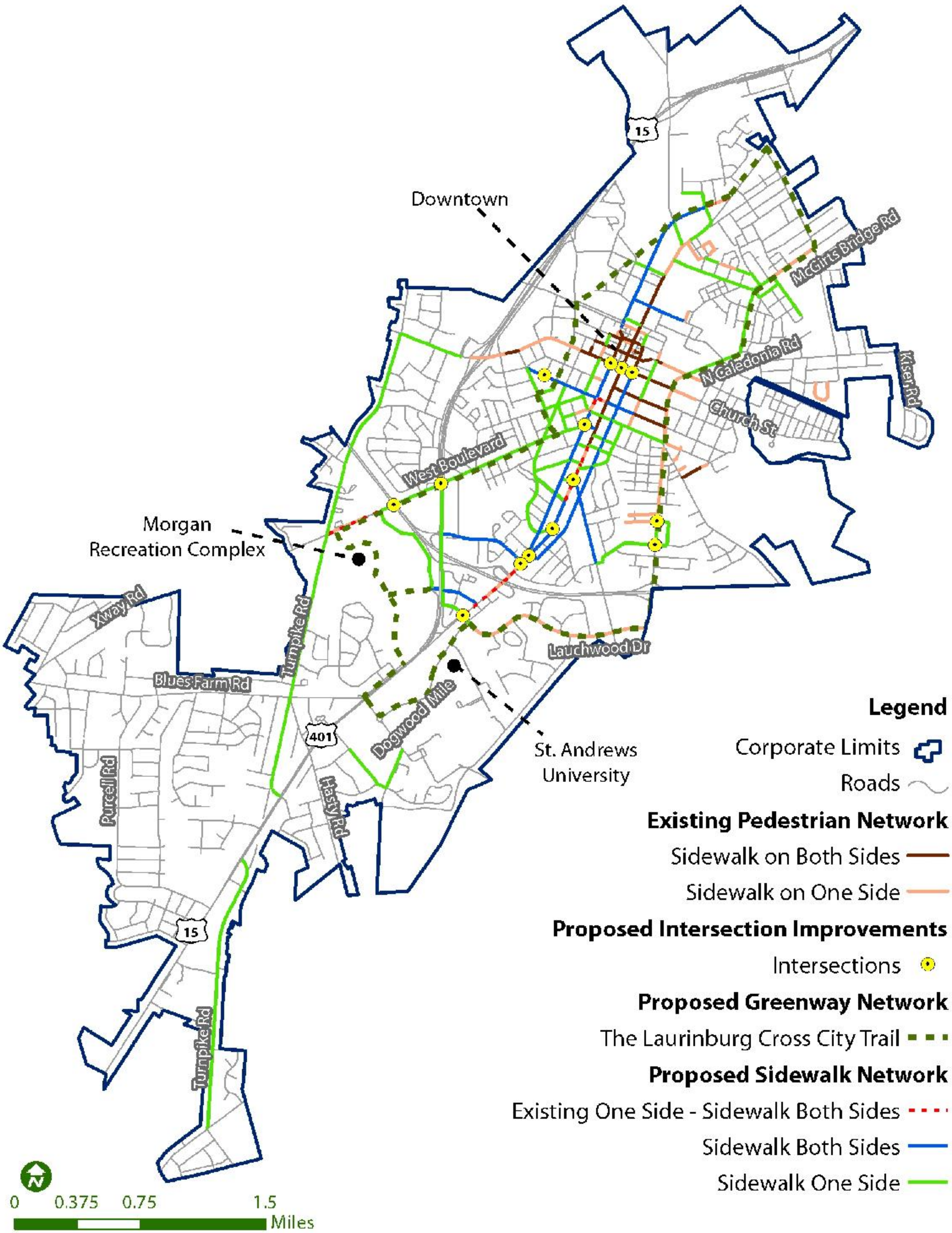


Injury	Year 1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Fatal	1		1								1						**3**
Disabling Injury	2	1	1										1	1			**6**
Evident Injury	2	5	2	3	1		1	3		3		2	1	1	4	6	**34**
Possible Injury	3	2	5	2	4	2	1	4	4	2	3	3	1	4	5	3	**48**
No Injury						1		1				1	1		1		**5**
Unknown Injury					2		3			2	1		2		1	2	**13**
Total	**8**	**8**	**9**	**5**	**7**	**3**	**5**	**8**	**4**	**7**	**5**	**6**	**6**	**6**	**11**	**11**	**109**

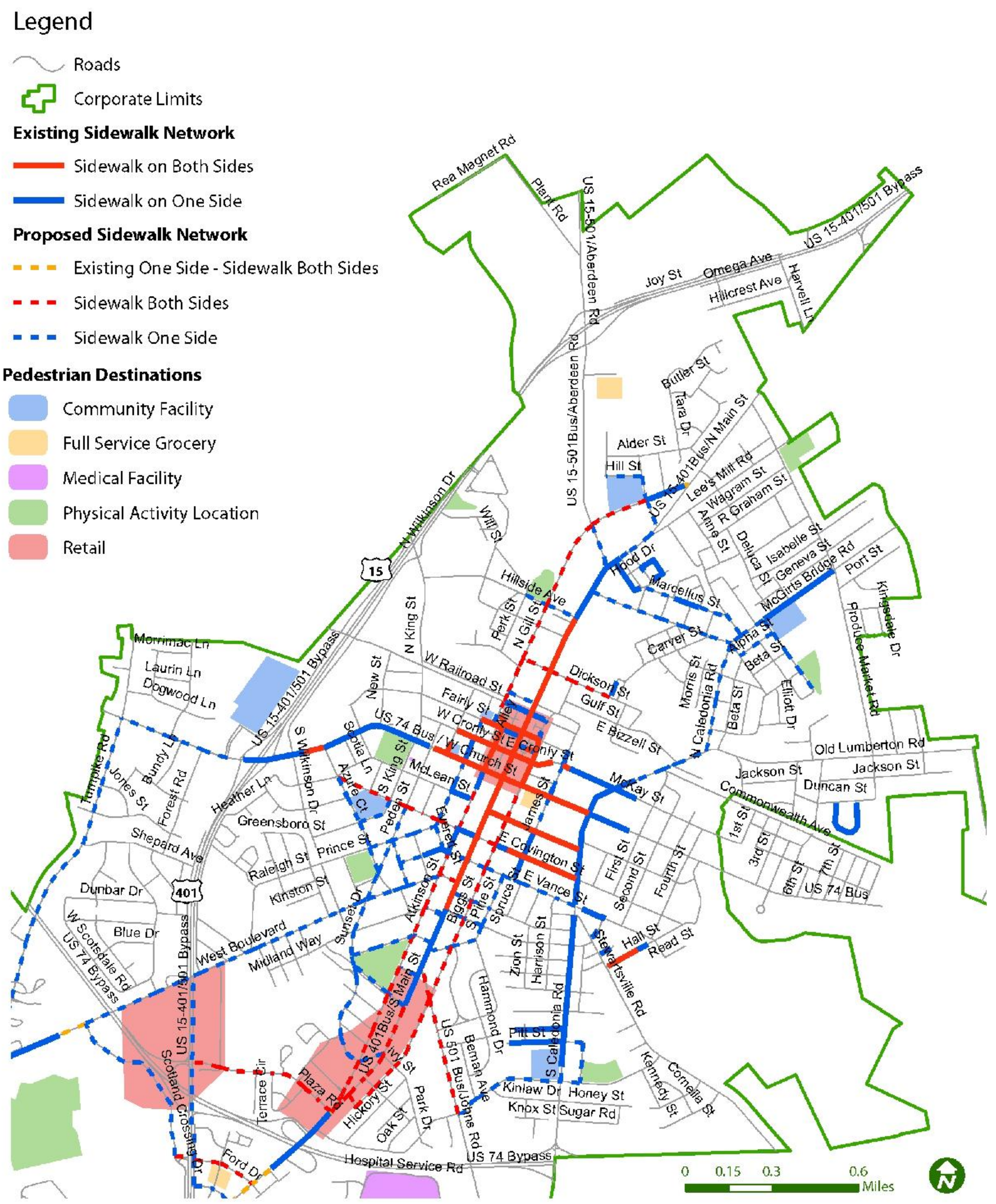
Map 12 - Intersections of Concern



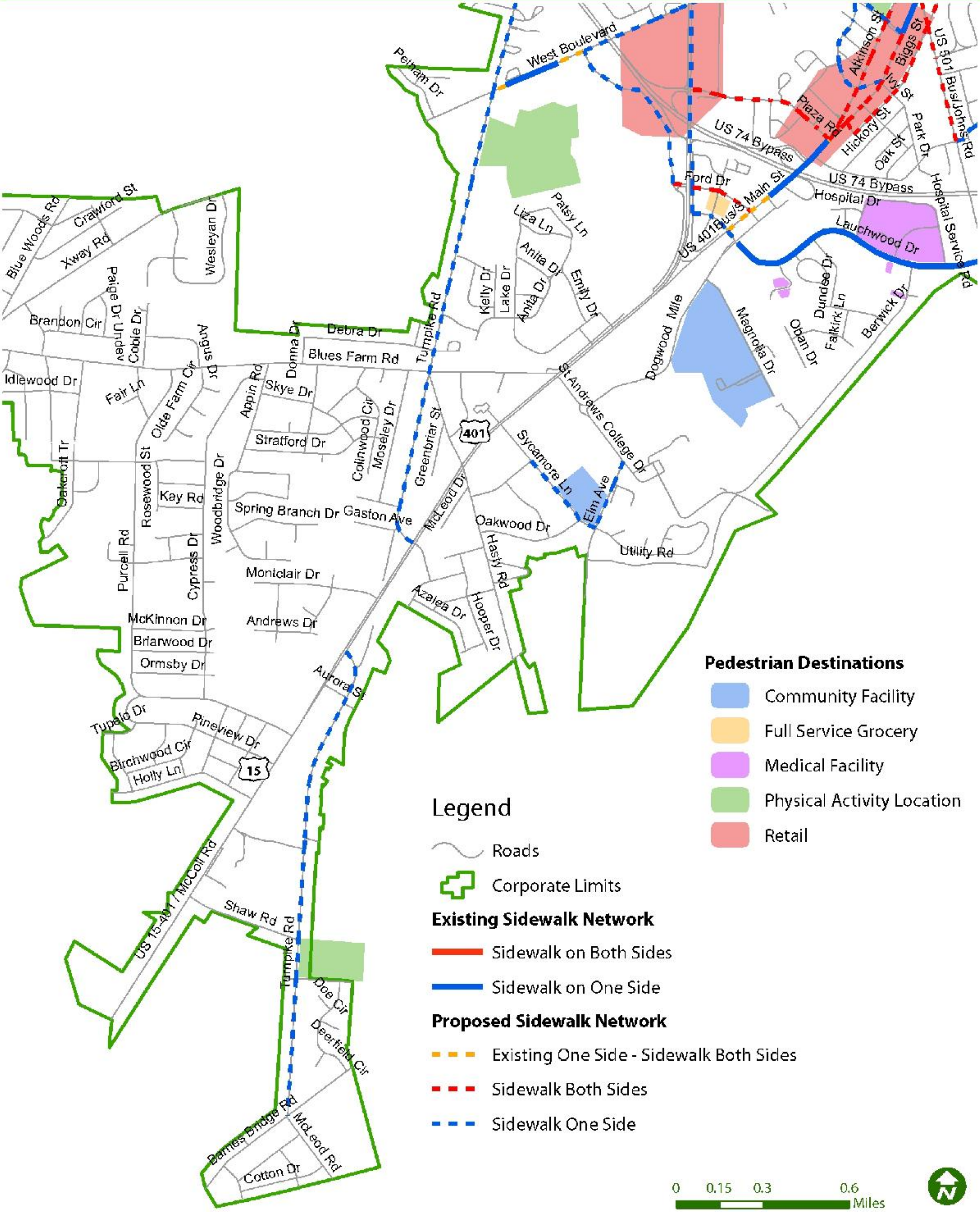
Map 13 - Existing and Proposed Pedestrian Facilities



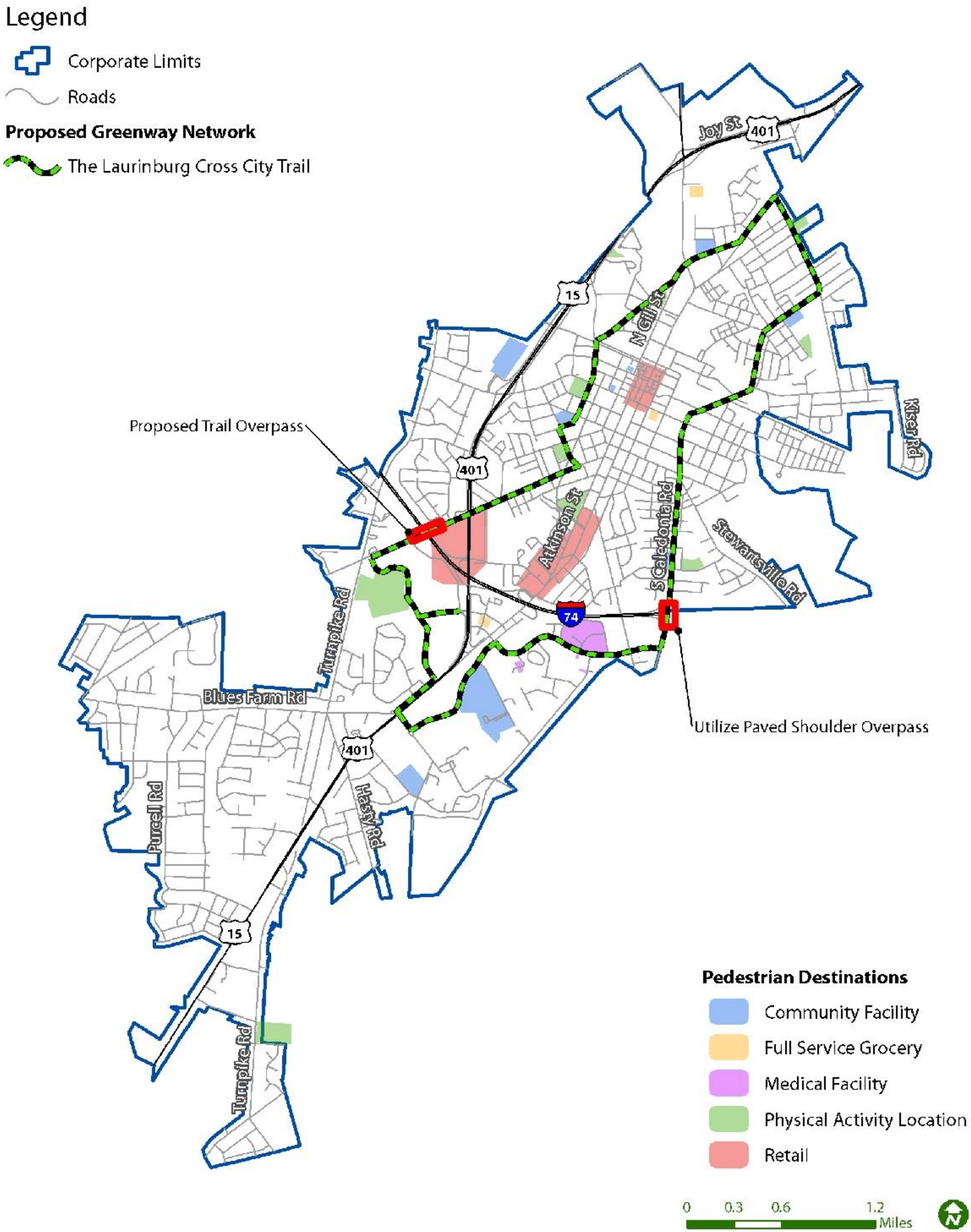
Map 14a - Sidewalk Recommendations (North)



Map 14b - Sidewalk Recommendations (South)



Map 15 - Recommended Greenway Network



Map 16 - Priority Pedestrian Improvement Areas

Legend

Roads

Corporate Limits

Proposed Sidewalk Network

Existing One Side - Sidewalk Both Sides

Sidewalk Both Sides

Sidewalk One Side

Pedestrian Improvement Areas

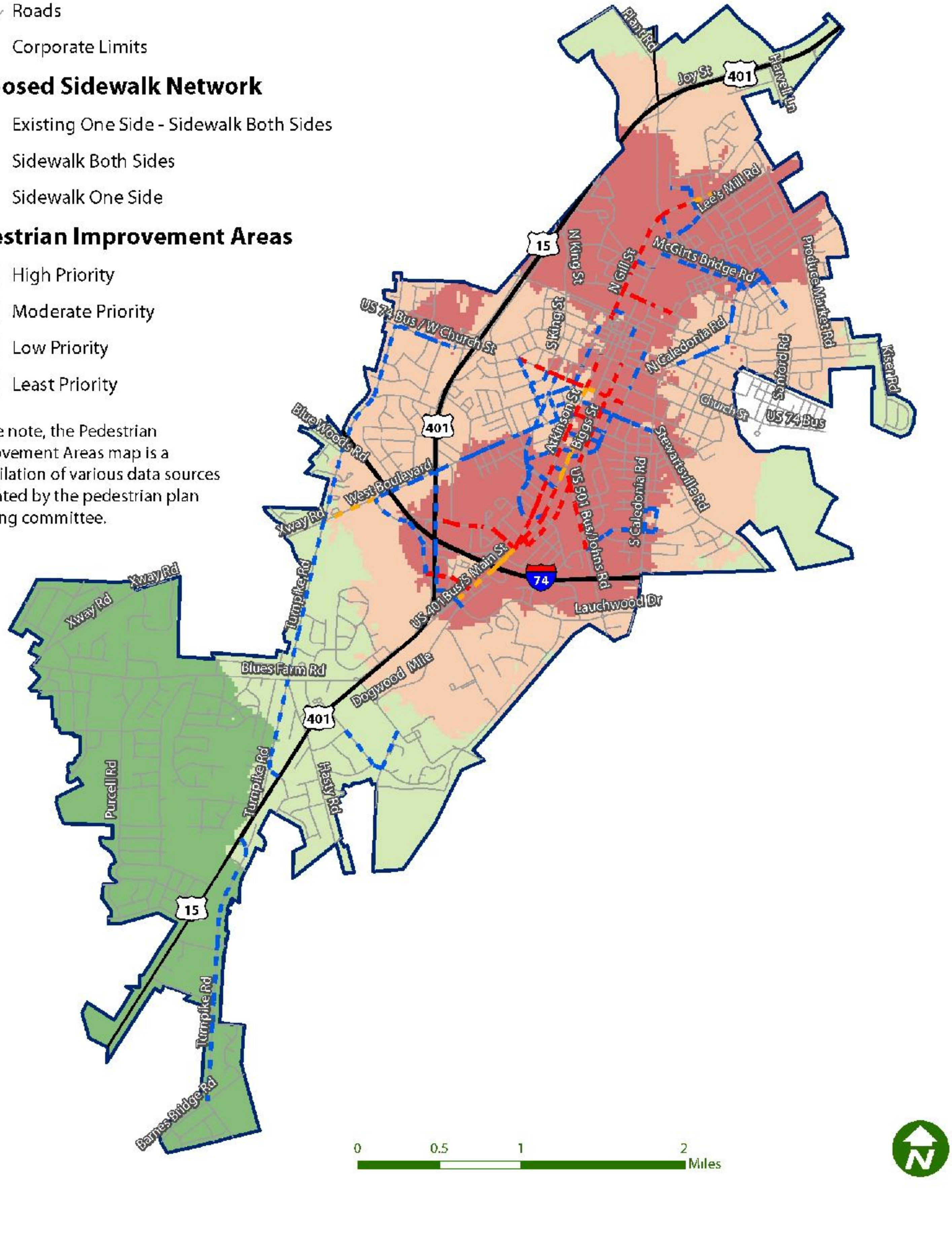
High Priority

Moderate Priority

Low Priority

Least Priority

Please note, the Pedestrian Improvement Areas map is a compilation of various data sources weighted by the pedestrian plan steering committee.



Map 17 - Priority Proposed Improvements