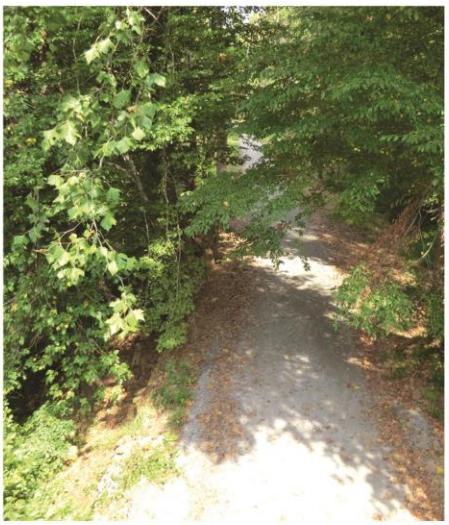
Town of Jonesville

COMPREHENSIVE PEDESTRIAN TRANSPORTATION PLAN

Division of Bicycle & Pedestrian Transportation
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

THE TOWN of JONESVILLE
HEART OF THE YADKIN VALLEY

PIEDMONT TRIAD
REGIONAL COUNCIL



Acknowledgements

Funding Support

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Design Guidelines (Appendix D) compiled by Alta Planning & Design

Gwyn McNeil Bridge Photo Simulation by Destination by Design

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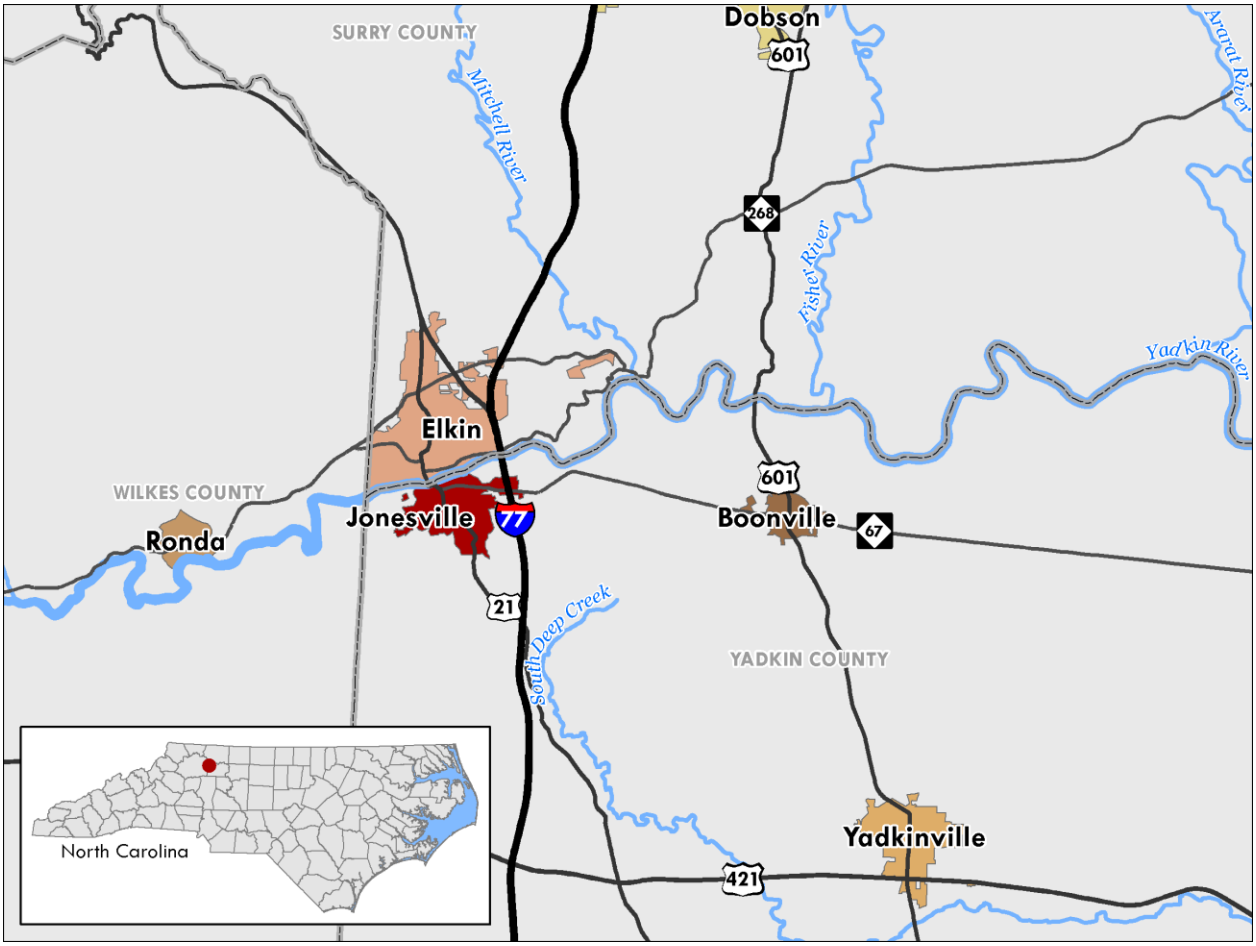
CHAPTER 1: INTRODUCTION

The Town of Jonesville was originally incorporated in 1811 as the Town of Martinsborough. The Town's name was changed to Jonesville in 1815 in honor of Hardy Jones. In 2001, Jonesville merged with the neighboring town of Arlington. The Town of Jonesville is now 2.7 square miles in size, with a population of 2,259, and has low density development. The Town has two commercial corridors – one along US Highway 21 running north/south and the other along NC Highway 67 running east/west through Jonesville. Commercial growth has shifted in the past couple decades to the NC Highway 67 corridor near Interstate Highway 77.

Figure 1: Town of Jonesville and Surrounding Municipalities



1.1 SCOPE AND PURPOSE

The Comprehensive Pedestrian Transportation Plan identifies projects, infrastructure needs, programs, policies, ordinances, events and other elements and characteristics of the Town of Jonesville pedestrian environment. The purpose of the Plan is to create a road map and menu of options for the Town of Jonesville to take towards creating a walkable environment. Some decisions can be made at the local level, while others will require coordination with neighboring towns, Yadkin County, North Carolina Department of Transportation (NCDOT), Northwest Piedmont Rural Planning Organization (NWPRPO) and the State legislature.

The planning process and this document create a logical framework to build the case for a more walkable environment, while also leveraging partnerships, grants and other resources. The return on investment from walking and bicycling facility funding, combined with other traditional transportation investments may yield dividends for Jonesville's quality of life, health, environment and economic well-being. The planning process and Plan document identify strategies, options and steps to provide pedestrian transportation benefits, and allow Town leaders to make more informed investment and policy decisions over the next 20 years.

1.2 VISION AND GOALS

The following vision "word cloud" was generated from a steering committee workshop where members identified why they care about improving pedestrian transportation. After the "word cloud", results are included from the committee describe "how a better network of sidewalks and trails will improve health, recreation, economic development and community in Jonesville".

Figure 2: May 17, 2014 Vision and Goals Workshop Results

Why do you care about improving pedestrian transportation?

- Safety for children, parents, people with disabilities and senior citizens (x3 responses)
- Making transportation easier and more accessible for those who do not drive (x2)
- Reducing vehicle trips
- Improving quality of life
- Beautification
- Providing adequate public facilities for our citizens and visitors

How will the development and use of trails and sidewalks in Jonesville benefit health, recreation, safety and economic development over the next 10 to 20 years?

Trails and sidewalks will improve health by….

- Providing alternative forms of transportation & additional recreation/physical activity choices and options (x2)
- Enabling and encouraging physical activity
- Encouraging folks to walk in lieu of driving
- Improving mental health through stimulation, socialization and exercise
- Improving air quality
- Reducing accidents on highways
- Allowing more people to walk safely

Trails and sidewalks will increase recreation opportunities by…

- Providing safe and attractive places to walk and bicycle (x2)
- Building local connections to regional trail systems
- Offering more choices and opportunities to residents and visitors
- Providing better access to walking areas
- Offering cheaper means of transportation to and from parks, trails, etc.

Trails and sidewalks will contribute to safety by….

- Reducing conflicts with vehicles, providing appropriate traffic control where conflicts do occur (x2)
- Providing off-street mobility options to residents and visitors
- Keeping pedestrians off the street
- Providing better access to walking areas and destinations
- Eliminating road crossings without safe accommodations
- Keeping all age groups safer

Trails and sidewalks will help economic development by….

- Drawing visitors
- Drawing younger generations who are demanding transportation choices in their communities (quality of life)
- Encouraging local trips
- Improving appearance of the Town

- Providing choices and easier access to existing businesses and providing opportunities for new development
- Providing safer ways to move around the community will allow locals and tourists alike to have easier, cheaper and safer access to the community
- Assist in placemaking, helped by focusing investment on important local assets
- Encouraging new economic development through branding and marketing
- Allowing people to walk to and from motels to eating establishments or Urgent Care on NC 67
- Giving our guests a reason to stay longer, spend more money and visit more often

Trails and sidewalks will improve the overall sense of community by….

- Fostering greater social capital among our citizens and visitors encouraging interactions

Goals: The following goals were first identified by the plan steering committee and refined by survey input, public meeting feedback and staff review. The goals are intended to help achieve a future pedestrian system that provides comfort, access and safety for all pedestrians in Jonesville. The goals are split into 5 years and 10 years:

5 Years

- Build a trail head and trail connections for the Jonesville and Yadkin River greenway
- Repair existing sidewalk in disrepair
- Construct NC 67 sidewalk and median refuge islands in key locations
- Construct sidewalk on Cedarbrook Rd
- Construct sidewalk on the bypass (Valley Drive)
- Build Swaim Memorial Park area sidewalk and bicycle lane
- Make Veteran's Memorial Park ADA Accessible
- Construct sidewalks near the elementary school and other public facilities and commercial areas

10 Years

- Continue to improve the sidewalk network along NC 67
- Construct bicycle lanes on Town roadways
- Increased tourism from trails and pedestrian accessibility
- Increased mobility options for aging in place
- New sidewalks/greenways that connect neighborhoods to commercial areas
- Construction of a zip line across the Yadkin River

What policies or programs are necessary to encourage and increase bicycling and walking at the local level?

- Educate bicycles, pedestrians and drivers and police about laws
- Require new sidewalks in development
- Establish programs about the health benefits of walking and bicycling
- Promote signage, education and advocacy for the usage of trails and sidewalks
- Elevated gas prices

1.3 BACKGROUND

The way people move around their local communities has dramatically changed in recent years. Our lives have become increasingly dominated by the automobile, with destinations such as schools, work and recreation more dispersed and disconnected. Providing safe and accessible places to walk and bicycle can help communities reduce automobile trips and traffic congestion, and in turn, increase the overall health of the community.

A safe and connected pedestrian network includes a comprehensive system of trails, sidepaths, sidewalks and safe roadway crossings. In addition, providing a wider mix of land uses in close proximity to each other can reduce travel distances, encourage more foot traffic and reduce car trips. Well-designed neighborhoods with ample opportunities for walking and bicycling can improve quality of life and foster an increased sense of community. Local land use policies can support mixed-use development and the creation of bicycle and pedestrian facilities as part of new road construction and subdivision practices.

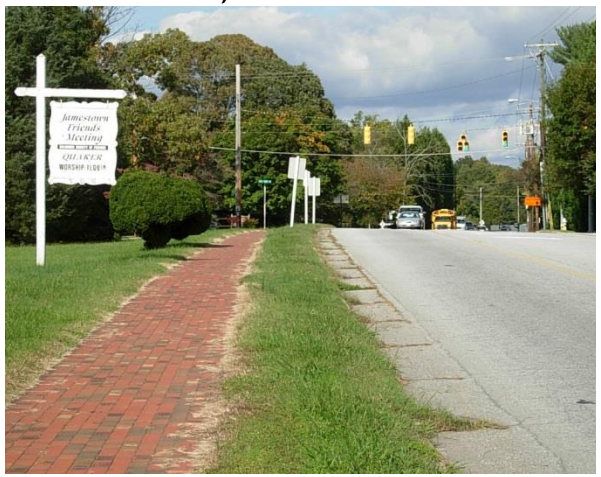
The following page includes images that depict the types of pedestrian facilities proposed in this plan (see Chapter 3 for specific recommendations and location) that will improve pedestrian transportation in Jonesville.

- Sidewalk – a pedestrian only pathway along roadways that allow pedestrian transportation along a roadway or to the front door of a building (several examples are included for surface type (brick/concrete), curb/gutter and ditch and swale);
- Multi-Use Path – trails, greenways or sidepaths that provide safe bicycle or pedestrian transportation completely separated for car traffic and are suitable for areas such as old rail beds, sewer lines, stream corridors, etc.;
- Sidepath – a type of multi-use path, suitable along busy roadways with very few driveways or conflict points;
- Roadway Crossings* – there are several types of roadway crossings & treatments that can help pedestrians safely cross streets. Design recommendations will vary depending on vehicle and pedestrian volume, the intersecting type of pedestrian facility (e.g. sidewalk, multi-use path or sidepath) and adjacent land uses. Design guidelines are included in the Appendix and provide more detail on what type of design to propose for different contexts.

*Roadway crossing examples and recommendations are shown in *Chapter 3 – Pedestrian Network Plan* and *Appendix D - Design Guidelines*.

Figure 3: Different Types of Pedestrian Facilities*

Sidewalk: Brick, Behind Curb and Gutter



Sidewalk: Brick, Behind Ditch

Multi-Use Path: Asphalt

(Source: Dan Burden, www.pedbikeimages.org)

Sidewalk: Concrete Behind Ditch

Sidewalk: Concrete, Behind Curb

Sidepath: Asphalt

(Source: Dan Burden, www.pedbikeimages.org)

*Roadway crossing examples and recommendations are shown in *Chapter 3 – Pedestrian Network Plan* and *Appendix D - Design Guidelines*.

CHAPTER 2: EXISTING CONDITIONS

2.1 OVERVIEW

This chapter analyzes the existing conditions in Jonesville that relate to the pedestrian transportation system. A review of relevant demographic factors, existing local and regional plans, transportation improvement program (TIP) data, crash data, ordinances and a summary of community concerns and issues are discussed.

2.2 DEMOGRAPHICS SUMMARY

This section explores population, growth, density, race, ethnicity, age, income, poverty, and educational attainment for the Town of Jonesville. *Appendix A: Demographics* includes more detailed graphs, charts and maps of Jonesville's demographics including disability, work commute patterns and travel time.

Table 1: Town of Jonesville Demographic Overview

Demographic Feature	Statistic
Population, 2012[1]	2,259
Land Area, 2012 (square miles)[1]	2.7
Persons per Square Mile, 2012[1]	836.7
Population lost, 2000-2012[1,2]	0
Population Decline Rate, 2000-2012[1,2]	0.0%
Percent Minority Residents, 2012[3]	28.6%
Median Age, 2012[3]	39
Average Household Size, 2012[3]	2.52
Homeownership Rate, 2012 [3]	50.4%
Percentage of Adults with a High School Diploma, 2012[3]	68.8%
Median Household Income, 2012[3]	$22,283
Poverty Rate, 2012 [3]	29.2%

Sources:
[1]NC State Demographer 2012 Estimate (September 2013)
[2]U.S. Census Bureau (2000)
[3]ACS 5-year Estimates (2008-2012)

POPULATION & GROWTH

Jonesville's current population is 2,259 residents, making it the second largest municipality in Yadkin County and the 233rd largest in North Carolina. The land area in Jonesville is 2.7 square miles.

2.3 LAND USE & ZONING

Jonesville adopted a Zoning Ordinance in 1968 with a major revision in 1994. Over the years the zoning ordinance has had minor changes to incorporate new uses and newer principles of land use regulation. The Town currently has 8 general use districts (*see Figure 4: Zoning Map below)* including four residential districts (R-20, R-12, R-10 and R-MH), three commercial districts (B-1, B-2 and B-3) and one industrial district (M-1). The Town also has two overlay districts (WS-IV-CA and WS-IV-P) for portions of the water supply watersheds.

An existing land use map (*see Figure 5 below*) was created as part of the 2010 Land Use Plan using aerial photos, property tax information and windshield surveys. Land use is divided into these categories: commercial, industrial, office/institutional, open space, residential and vacant (10+ acres).

The 2010 Land Use Plan also developed a Future Land Use map (*see Figure 6 below*) that depicts generalized land use patterns for the next several decades. Future land use is divided into eight categories: Town Center, Industrial, Commercial, Parks/Open Space, Greenway, Neighborhood Residential, Rural Residential and Special Planning Area.

NC 67 Corridor Facing East Near I-77 Intersection

The following pages include *Figure 4: Zoning Map, Figure 5: Existing Land Use Map and Figure 6: Future Land Use Map*, which are from the 2010 Land Use Plan and describe how land has been developed, is currently zoned and how the community envisions future land use. A Town Center overlay has been included where the new Town Hall has been located on NC 67, with future commercial development continued along NC 67 and US 21 corridor.

Figure 4: Jonesville Zoning Map

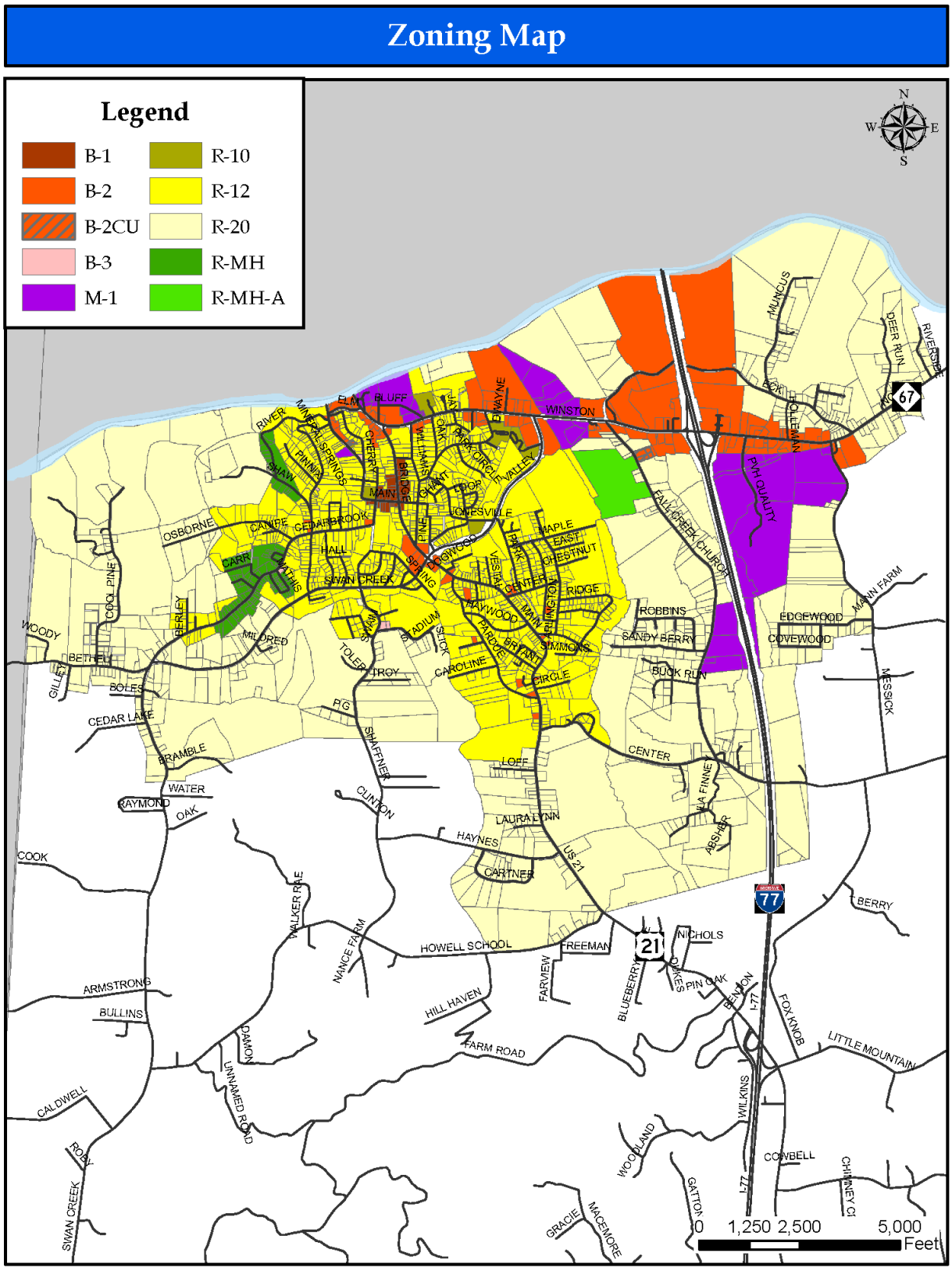


Figure 5: Jonesville Existing Land Use Map

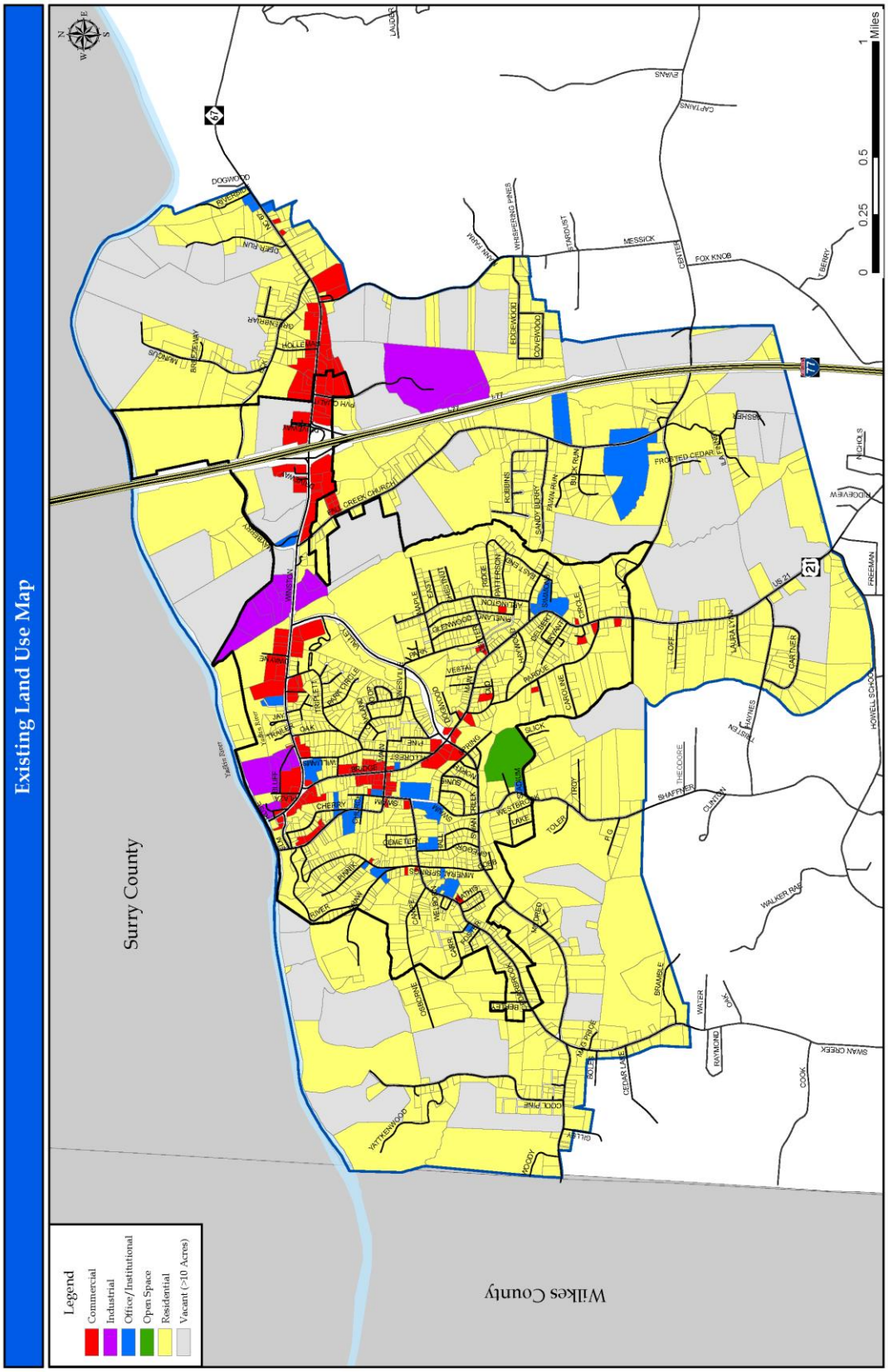
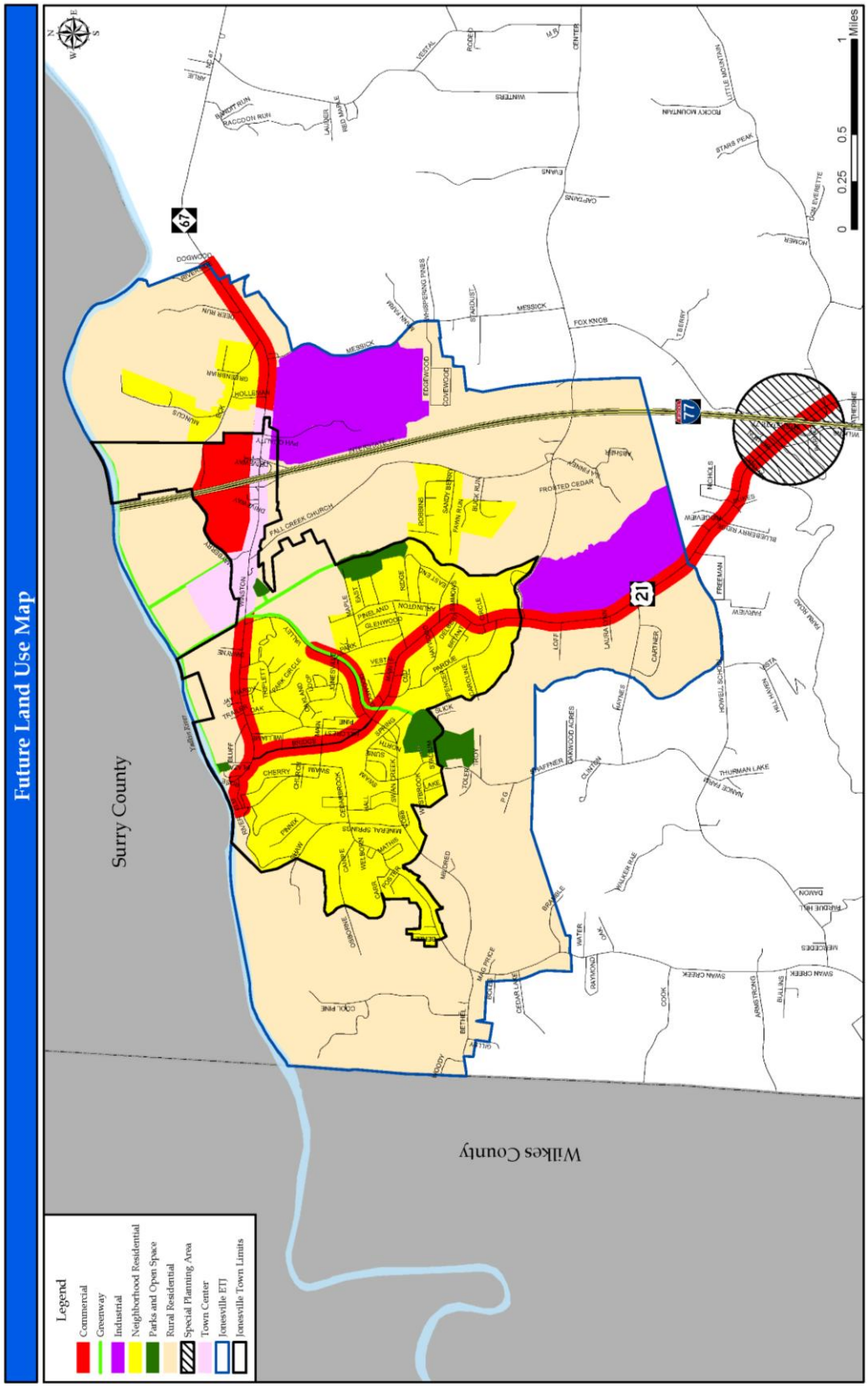


Figure 6: Jonesville Future Land Use Map



2.4 TRAFFIC VOLUME & CRASH DATA

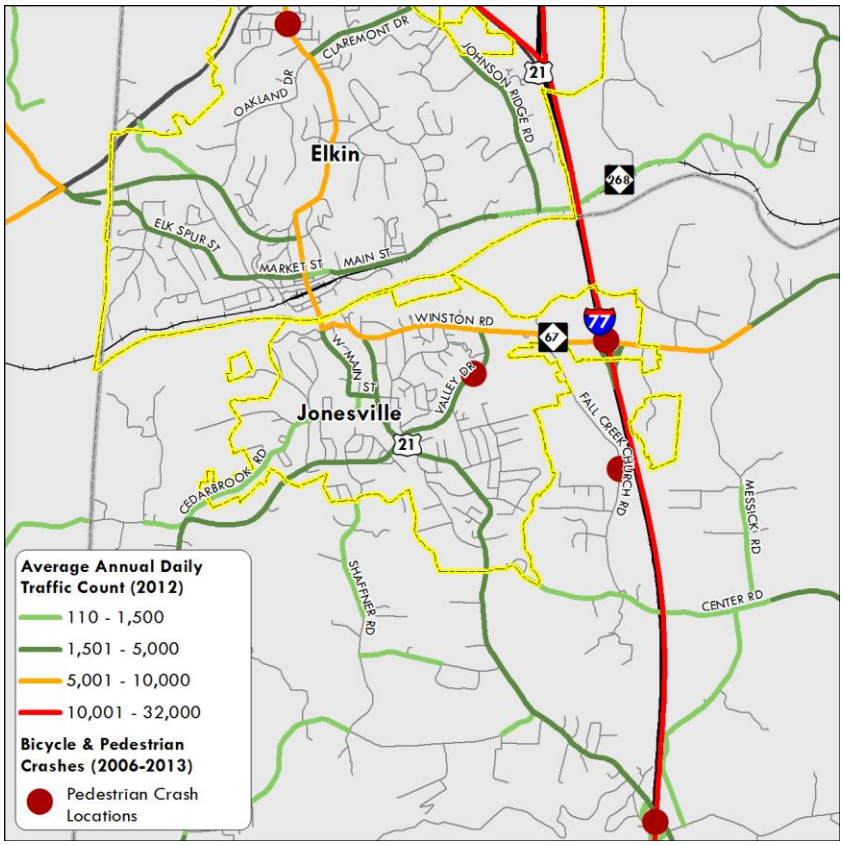
The Annual Average Daily Traffic (AADT) Volume data includes traffic volume at specific points on North Carolina's road system in and around Jonesville. Traffic volume data is important to pedestrian transportation planning because it provides insight to dangers pedestrians may encounter when walking along or across certain roads.

Interstate 77 transports an average of 30,000 cars daily in the vicinity of Jonesville. NC Highway 67 averages around 9,800 cars a day through Jonesville while US Highway 21 averages about 3,800 cars per day. The section of Valley Drive that connects US-21 to NC-67 averages 3,900 cars per day.

Crash data provides insight into problem areas or dangerous locations for pedestrians; however, it does not tell the whole story. Unsafe pedestrian transportation environments discourage pedestrian use and may reduce the total number of crashes, but through less use of non-motorized transportation. Specific pedestrian safety improvements will reduce the likelihood of crashes, while encouraging more non-motorized transportation.

A review of the Highway Safety Research Center crash database, NCDOT's Bicycle Pedestrian Program's information and the Town of Jonesville Police records reveal 2 pedestrian crashes between 2006 and 2013 in the town limits of Jonesville. The crashes occurred along I-77 near NC-67 and on Valley Drive, both high pedestrian traffic areas according to the Jonesville Police Department. The crash on Valley Drive was a fatality in October 2013. Outside of the Town limits but close to the planning area, another pedestrian crash occurred in 2008 on Fall Creek Church Road resulting in possible injury.

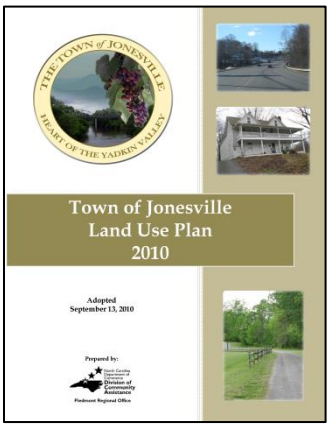
Figure 7: Traffic Volume and Crash Map



Source: NCDOT 2006-2012 & Town of Jonesville Police Department

2.5 LOCAL & REGIONAL PLANNING EFFORTS

Town of Jonesville Land Use Plan 2010



The Land Use Plan provides a proactive guide for managing future physical growth and development. The following are selected goals, objectives and strategies that relate to pedestrian transportation.

Transportation

GOAL: Ensure a safe transportation system that maximizes the ability of existing roadways to serve the needs of vehicular traffic as well as the needs of alternative modes of travel such as bicycle and pedestrian oriented travel.

Objectives:

3.1 Provide alternatives to traveling by automobile such as greenways, sidewalks and bike paths.

Strategies:

3.3 Require alternative transportation modes (sidewalks, greenways, bike paths) to be included in all new developments.

3.6 Review and revise, as necessary, the Town's development regulations to require pedestrian walkway and sidewalk improvements.

3.7 Pursue grant opportunities to develop a Bicycle and Pedestrian Plan.

Community Appearance

GOAL: Promote community appearance as a primary indicator of Jonesville's unique small town character and quality of life.

Objectives:

4.5 Improve the appearance of public areas, parks, sidewalks, street right-of-ways, etc.

Residential Development

GOAL: Preserve, enhance, and create, satisfying living environments that create and maintain strong neighborhoods.

Objectives:

5.6 Encourage development of neighborhoods that minimize traffic congestion, promote walkability, retain open spaces and contribute to the rural small town character of Jonesville.

Commercial Development

GOAL: Encourage attractive commercial development that benefits the economy of Jonesville, provides job opportunities, and is convenient for residents.

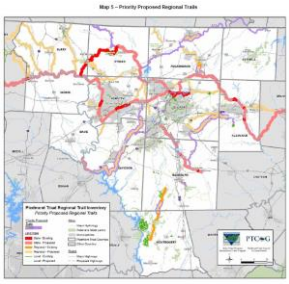
Objectives:

6.4 Allow bicycle and pedestrian access to commercial development through sidewalks, greenways and bike paths.

Strategies:

6.3 Integrate pedestrian-friendly design elements into commercial development.

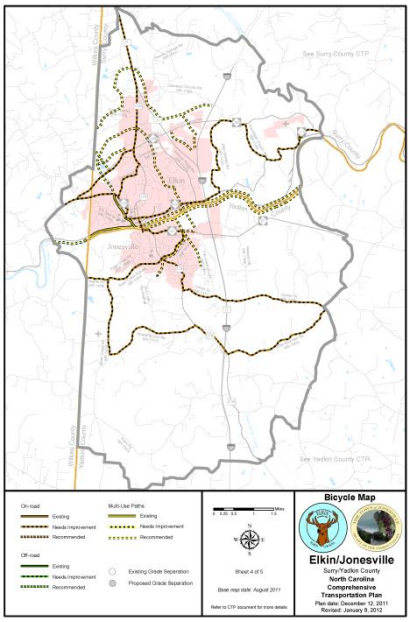
6.6 Encourage new mixed-use developments, which allow for a mixture of uses with a pedestrian scale and design.



Piedmont Triad Regional Trail Plan and Inventory 2011

The regional trail plan and inventory identifies the Yadkin River Greenway as a proposed state trail through the northern section of Jonesville. The plan also identifies a connector trail from Jonesville to the Yadkin Reservoir near Yadkinville south of Jonesville.

Town of Elkin and Jonesville Comprehensive Transportation Plan 2012



This long range multi-modal transportation plan covers transportation needs through 2040. Modes of transportation evaluated include: highway, public transportation and rail, bicycle, and pedestrian.

Highway improvements for the Town of Jonesville include upgrading NC 67, from I-77 to 0.3 miles east of Deer Run Road, to a boulevard by widening the existing three lane facility into a four lane, median divided highway.

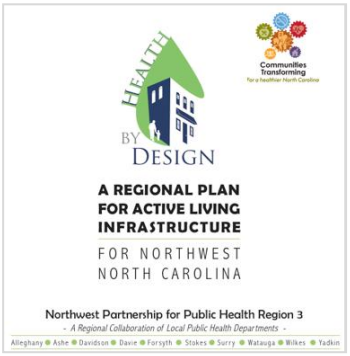
Public Transportation improvements include extending the Yadkin County Express (Route 13) route bus service through Jonesville to Elkin along I-77. The plan also recommends a commuter bus services be developed along NC-67.

Bicycle and Pedestrian improvements include improved on-road bicycle facilities along Swan Creek Bypass, Valley Road and US-21 south of Valley Road. The plan also recommends multi-use paths along Valley Road connecting to Swaim Park, along Sandyberry Creek, and along the Yadkin River connecting to Town Hall.

Yadkin Valley Heritage Corridor Master Plan 2009

This plan had multiple purposes, including economic development, historic and natural marketing, trail development, partnerships and others. Funded by the Yadkin Valley Partnership, the plan has identified several opportunities for leveraging funding, staff resources, non-profit, business and public sector partners. A detailed implementation section with specific action steps, project partners, marketing strategies and other supporting details are included in this Master Plan. Connections to regional and State trails, such as the Mountains to Sea Trail, are identified as priorities.

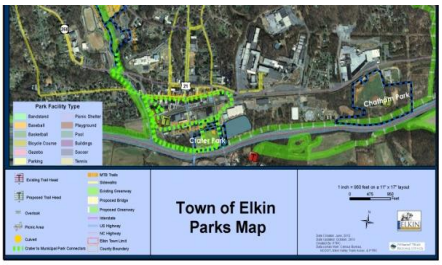
Health by Design – A Regional Plan for Active Living Infrastructure for Northwest North Carolina 2013



A 15-year master plan identifying key projects, or Priority Initiatives, that both improve the built-environment and positively impact public health. The Health by Design Plan packages and presents a regional analysis on the relationship between the built-environment and public health while providing a roadmap and tools for public health experts and planners to effect positive change.

For the Town of Jonesville, the plan identifies the Jonesville Greenway extension along the Yadkin River as a priority project to allow citizens the opportunity to exercise outdoors by walking, biking etc.

Town of Elkin – Recreation, Parks & Greenway Plan 2014



Provides a comprehensive snapshot of existing parks, recreation and trail assets and future needs in the Town of Elkin. The Plan also identifies existing and proposed greenways in the Town of Jonesville along the Yadkin River and on the north side of the Town Hall.

2.6 COMMUNITY OUTREACH & INVOLVEMENT

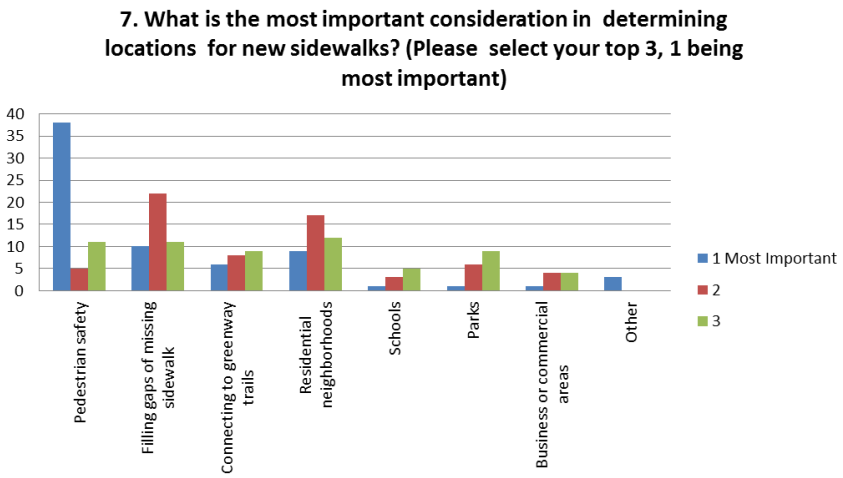
Steering Committee & Focus Groups: A steering committee was formed in the spring of 2014 to guide the planning process. There have been 4 steering committee meetings, two community meetings and several focus groups scheduled to gather feedback about pedestrian improvement priorities. The focus groups consisted of Senior Adults, the Jonesville Business Association and the Tourism Development Authority. Additional meetings were held to gather information including: Jonesville Elementary School officials, Chief of Police Reece and

Labor Day Market 2014

NCDOT District and Division offices.

Events: Citizen event outreach occurred at the Jonesville 4th of July Celebration in July 2014 and during the Labor Day Market in September of 2014. Surveys and questionnaires were distributed to gather feedback on the importance and location of pedestrian improvements.

Survey: A paper survey was sent to every 10th Town resident to solicit feedback on walking preferences, priorities and habits. These surveys were also available at Town Hall and electronically. There were 72 responses to the survey:



Example Survey Question Results

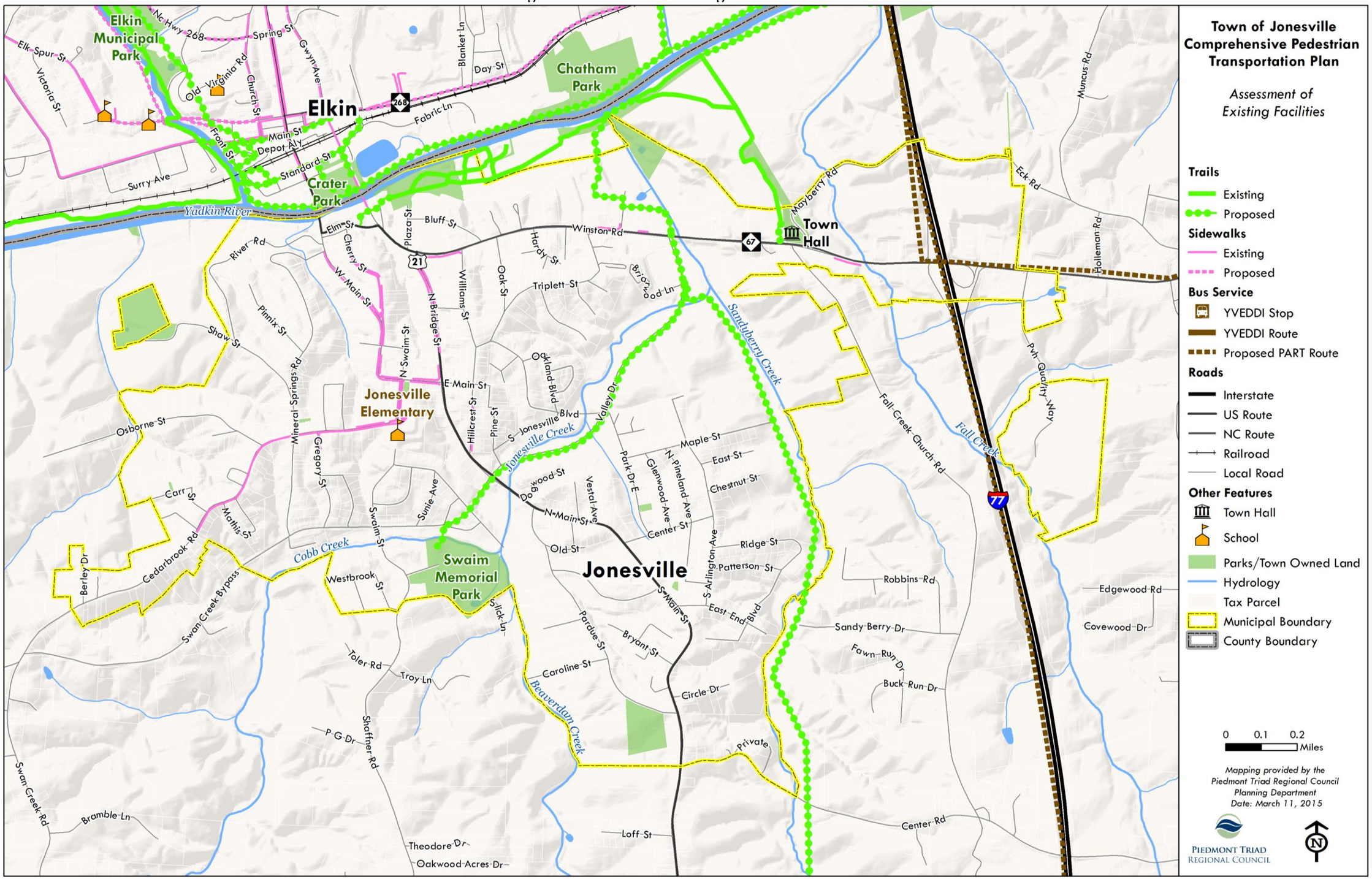
- Nearly 90% of respondents feel that a pedestrian friendly community is 'important' or 'very important'
- 'Lack of sidewalks and trails' is reported as the biggest barrier to walking
- 'Town parks' and 'Greenway trails' are the walking destinations respondents 'would most like to get to'
- 'Pedestrian safety' and 'Filling gaps of missing sidewalk' are the 'most important considerations in determining locations of new sidewalks'
- A 'Local bond referendum' and 'Local sales tax' are the top two reported methods of 'funding for sidewalks and trails' when 'grants and existing revenues are not sufficient
- Top corridors for improvement are the Main Street/School area, NC 67 and the US 21 Business and Bridge Street Corridor.

Full survey results are available in *Appendix B*.

2.7 INVENTORY & ASSESSMENT OF EXISTING FACILITIES

There is a substantial existing sidewalk system in the older section of Jonesville where the library and school are located. A majority of the existing sidewalks are in need of repair or rehabilitation. The growing Jonesville Greenway will continue to draw users, but barriers to access include a visible trailhead and parking, as well as connections to other destinations in Jonesville, especially along NC 67. Safe bicycle and pedestrian connections across the Yadkin River should be built, so that the Jonesville and Elkin Greenway system may have a regional draw. See *Figure 8: Assessment of Existing Facilities and Plans* for more details on existing facilities and recommendations from adopted plans.

Figure 8: Assessment of Existing Facilities and Plans



2.8 PEDESTRIAN STATUTES & LOCAL ORDINANCES

This section highlights guidelines and statutes supporting pedestrian transportation at the federal, state, and local levels.

FEDERAL & STATE GUIDELINES

The Federal Highway Administration (FHWA) provides guidance, information and regulation on bicycle and pedestrian accommodation in projects funded with federal funds. The Federal Transportation Authorization legislation is called MAP-21, information on how funds can be used in bicycle and pedestrian related projects is found here: www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/

The FHWA Guidance & Information page provides information on: A. Accessibility Guidance; B. Design Guidance and C. Financial Management: www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/index.cfm

The USDOT provided a statement on Bicycle and Pedestrian Accommodation Regulations and Recommendation transportation in March of 2010: www.fhwa.dot.gov/environment/bicycle_pedestrian/overview/policy_accom.cfm

The federal law for surface transportation gives lots of flexibility in how States and MPOs fund bicycle and pedestrian improvements.

The NCDOT has policies that specifically support non-motorized transportation, with specific guidance on how to support pedestrian and bicycling-friendly transportation, the specific policies are linked here: www.ncdot.gov/bikeped/lawspolicies/policies/ and listed below

NCDOT Board of Transportation Resolutions and Policies

- Mainstreaming Non-Motorized Transportation (2000)
- Sidewalk and Pedestrian Policy (1993, with 2001 update)
- Complete Streets Policy (2009)

NCDOT Internal Policies and Guidance

- Incorporating Greenway Plans in the Highway Planning Process (1994, with 2009 Update)
- Bridge Policy (2000)
- Temporary Pedestrian Accommodations (2008)

There are additional policies and regulations including ADA accessibility, safety and other considerations that pertain to bicycle and pedestrian travel that should be included in the scoping process with all roadway projects. See the *Appendix D: Design Guidelines* for more information.

LOCAL ORDINANCE REVIEW

The Town of Jonesville's Subdivision and Zoning Ordinance has not received a major update in over twenty years. The ordinances have been amended to reflect and respond to emerging issues, but much of the language that guides and regulates development, growth, and transportation options in the town has its origins in the 1990s. The Town of Jonesville has changed a lot since then and it is generally recommended that the Town draft new ordinances that reflect its current reality and needs.

As currently written, the ordinances have little definition of sidewalks or other pedestrian routes in the town. The following sections are relevant to pedestrian access and routes in Jonesville.

City Ordinance

Chapter 2: Subdivision Regulations

Section 2022: Improvements within the town limits

Sidewalks shall be constructed on such streets as the town board considers sidewalks to be necessary. Sidewalks will be constructed within the street right-of-way and installed in accordance with town specifications and standards.

Section 2032: Design Standards

A) Streets

1. Right-of-way widths

   Minimum street right-of-way widths shall be in accordance with the major street plan and shall not be less than the following in the corporate limits of the town and within one mile thereof:

   a. Highways 80-100 feet
   b. Major streets 80 feet
   c. Collector streets 60 feet
   d. Minor streets 30 feet
   e. Marginal access streets 30 feet
   f. Cul-de-sacs 30 feet
   g. All streets located beyond 60 feet

Section 2033: Easements

2. A crosswalk easement of at least 10 feet in width shall be provided if such is required by the board of commissioners.

Chapter 73: Bicycles

8. Riding on Sidewalks

(a) No person shall ride a bicycle upon a sidewalk within a business district.
(b) The Chief of Police is authorized to erect signs on any roadway prohibiting the riding of bicycles thereon by any person, and when the signs are in place no person shall disobey the signs.
(c) Whenever a person is riding a bicycle upon a sidewalk, the person shall yield the right-of-way to any pedestrian and shall give audible signal before overtaking and passing the pedestrian (1978 Code, §7-1108).

Chapter 93: Streets & Sidewalks

01. Before any new street offered for dedication to the town is accepted as such and officially recognized as a town-maintained street, the Board must give its approval, finding that:

a. The street complies with engineering standards set by the Board; and that
b. The best interests of the town would be served by accepting the street as a town street (1978 Code, §4-1001).

Zoning Ordinances

Article 11: Supplemental Development Standards, Section 4: Multi-Family Development

11. Sidewalks

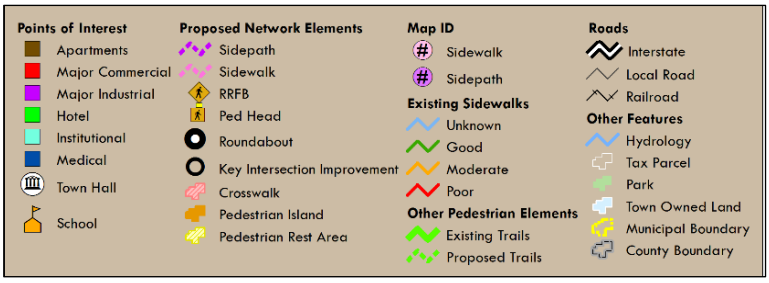
Sidewalks, built to town standards, shall be provided if determined necessary by town policy. These sidewalks may be on the site of the multi-family project or on adjoining streets that serve the residents of the multi-family development.

CHAPTER 3: PEDESTRIAN NETWORK PLAN

Existing Sidewalk System Near Jonesville Elementary School

The Jonesville Pedestrian Network plan proposes new sidewalk, repair, replacement, re-construction, crossing improve-ments and trail building for the Town of Jonesville. A detailed map of improvements for the entire Town, key corridors and small areas are included for locating and planning improvements. The *Pedestrian Sidewalk and Sidepath Improvement List (Table 2)* catalogues all the proposed facilities for Jonesville in a one page list with a priority ranking. Also included in this Chapter are recommendations on policies, events and activities that will support a vibrant and healthy pedestrian transportation system. *Chapter 4 – Implementation* describes key steps it will take to implement the network recommendations described in *Chapter 3*.

3.1 PEDESTRIAN PROJECT RECOMMENDATIONS



Proposed Facilities Map Legend Example

The project recommendations include maps and a project list that show proposed facility locations and type. There are several components to the maps, included here is a list of common symbology, taken from the map legend. Examples and details of facility type and design guidelines when constructed can be found in the *Appendix D: Design Guidelines*. While *Section 3.2 Key Intersection Improvements and Visualizations* provides some design examples and visualizations of proposed improvements for key locations in the Town of Jonesville.

  - Proposed sidepaths are shown in dashed purple, proposed sidewalks are shown in dashed pink, proposed trails are shown in green dashed lines.
  - Existing sidewalk network and condition is shown from poor (red – needs replacement) to good (green)
  - Each corridor improvement has a map ID, which corresponds to the rank in the *Pedestrian Sidewalk and Sidepath Improvement List*.
- Intersection Improvement Symbols
  - A rapid reflective flashing beacon - RRFB (see *Appendix D* for an example) alerts drivers to the presence of pedestrians at a signalized crossing and can be motion activated or push button activated
  - Ped Heads are the countdown signals associated with a signalized crossing that tell the pedestrian when to cross and how much time until the signal changes
  - Roundabout recommendations are shown in a few locations where more detailed study is warranted to determine feasibility and may serve a dual purpose of a gateway treatment, pedestrian accommodation and slowing vehicular traffic.
- Other Features
  - Yellow hashed areas are pedestrian refuge areas where benches or plantings may be included for rest or shade.
  - Other typical layers include schools, jurisdictional boundaries, roads and different types of land uses or destinations.

The *Pedestrian Sidewalk and Sidepath Improvement List* (Table 2) includes information on corridor distance, the number of properties along a proposed improvement, the side of the street, suggested paving material, existing curb and gutter, estimated cost and width. In addition, a score for each project has been calculated that includes a "weight" for proximity to schools and parks, high traffic counts, connections to commercial, business or multi-family, crashes and connections to existing sidewalk. The higher the resulting "prioritization score", the higher the priority for the project, demonstrating potential connectivity to destinations and need based on traffic volumes. Existing sidewalks in major disrepair (poor condition rating according the NWPRPO sidewalk inventory), were also prioritized. Trails and greenways were not prioritized in the *Pedestrian Sidewalk and Sidepath Improvement List*, unless they parallel a roadway corridor (e.g. a sidepath). Each project listed in Table 2, has a corresponding Map ID in *Figure 9: Jonesville Comprehensive Proposed Facilities Map*.

After some of the map figures below, conceptual existing and proposed cross-sections are included for the NC 67 corridor and the Gwyn McNeil Bridge. These cross sections are included for illustrative purposes and will require further study. In addition, some proposed cross-sections may require purchase or donation of right of way.

Figure 9: Jonesville Comprehensive Proposed Facilities Map

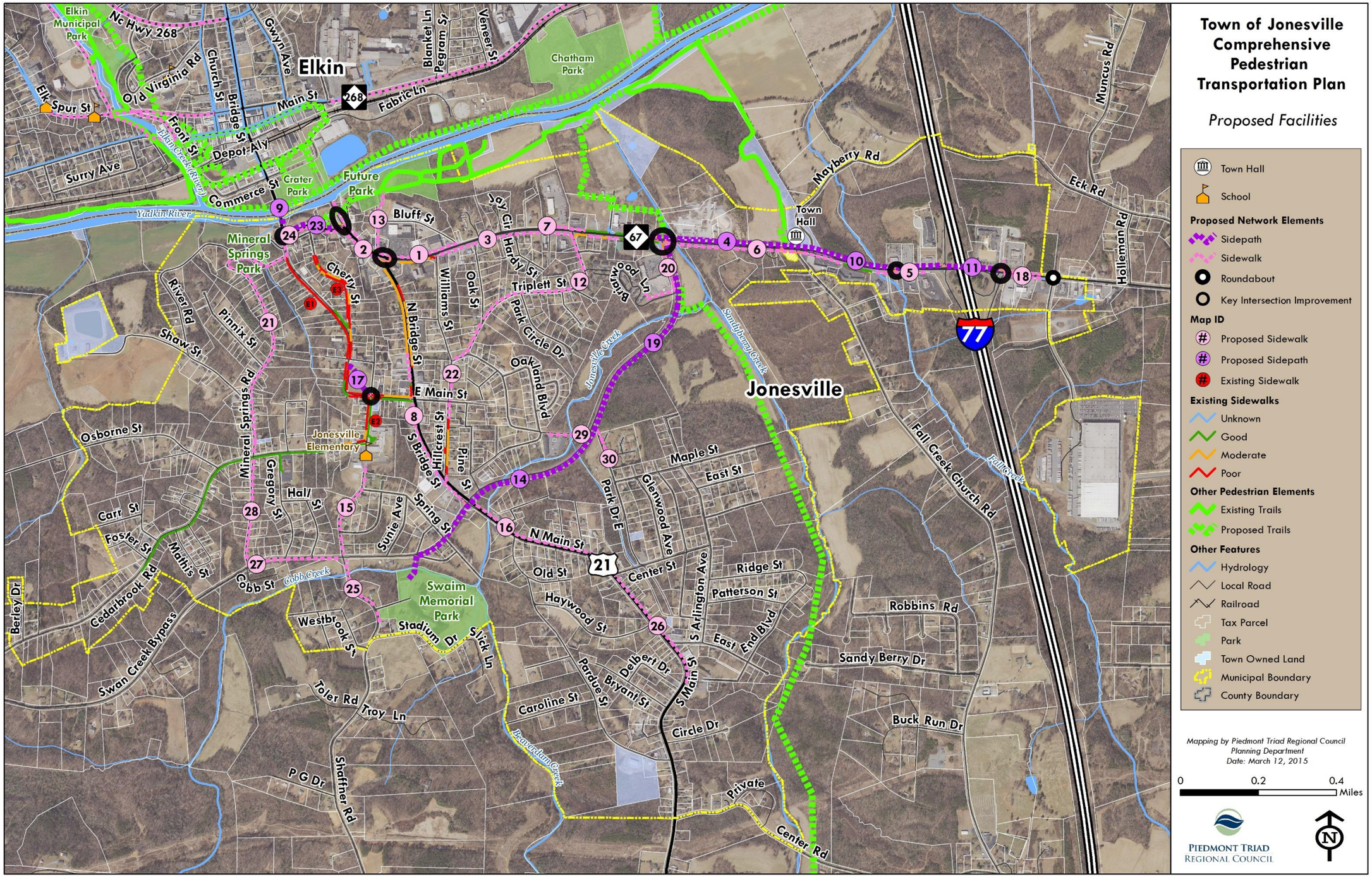
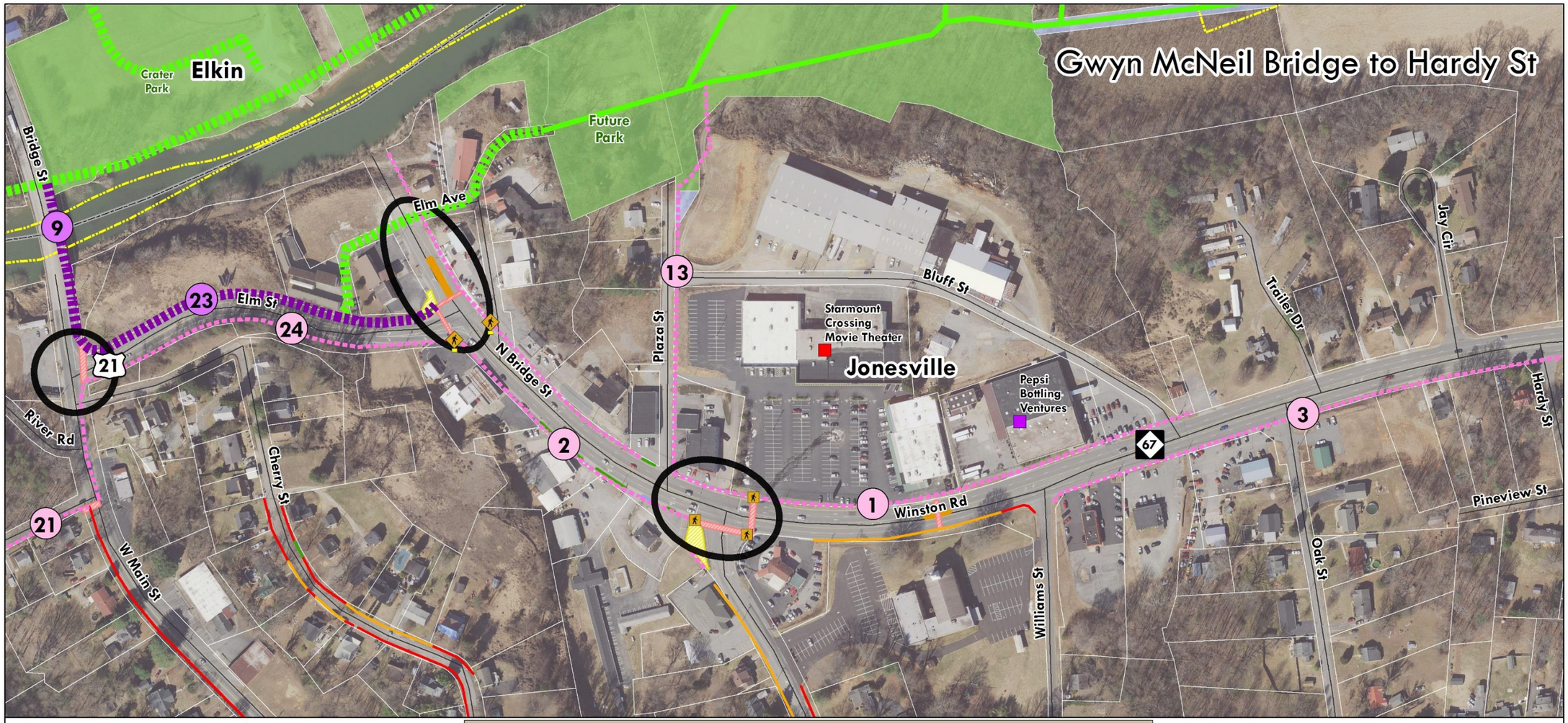


Table 2: Jonesville Pedestrian Sidewalk and Sidepath Improvement List

Map ID	Street	From	To	Facility Distance (Feet)	Parcels Along Segment	Side	Existing/Proposed	Improvement Type	Pavement Material	Curb and Gutter	Estimated Cost Base Level of Improvements	Width	Proximity to schools (Directly connects = 3; within 1/2 mile = 2; within 1 mile = 1)	Proximity to parks (Directly adjacent = 3; within 1/2 mile = 2; within 1 mile = 1)	Traffic Count (>5,000AADT = 3; 2,000 to 4,999 AADT = 2)	Connects to commercial/business use = 2	Connects to multi-family = 2	Crashes (1 ped/bike crash 2001-2010) Or High Freq Crash Site = 2	Connects to existing sidewalk or trail = 2	Public Comments (10 or more=3; 5 to 9 = 2; less than 5 = 0)	Prioritization Score
E1	W Main Street	Mineral Springs Road	S Swain Street	2,966	21	E&W	Existing	Sidewalk	Concrete	Y	$222,450	5	2	2	2	2	0	2	2	3	**15**
E2	S Swaim St/ Cedarbrook Rd	W Main Street	Cemetery Street	603	8	E	Existing	Sidewalk	Concrete	Y	$45,225	5	3	2	0	2	0	2	2	3	**14**
1	NC 67	Yadkin River	Bluff Street	2,014	11	N	Proposed	Sidewalk	Concrete	Y	$151,050	5	1	2	4	2	0	0	2	3	**14**
2	NC 67	Elm St	US 21	652	4	S	Proposed	Sidewalk	Concrete	Y	$48,900	5	1	2	4	2	0	0	2	3	**14**
3	NC 67	Williams Street	Triplett Street	1,898	14	S	Proposed	Sidewalk	Concrete	Y	$142,350	5	1	2	4	2	0	0	2	3	**14**
4	NC 67	Existing Sidewalk	Mayberry Road	2,319	7	N	Proposed	Sidepath	Asphalt	Y	$289,875	8	1	2	4	2	0	0	2	3	**14**
5	NC 67	Fall Creek Church Road	Bojangles	1,279	6	S	Proposed	Sidewalk	Concrete	Y	$95,925	5	0	1	4	2	0	2	2	3	**14**
6	NC 67	Valley Drive	Fall Creek Church Road	1,738	7	S	Proposed	Sidewalk	Concrete	Y	$130,350	5	1	2	4	2	0	0	2	3	**14**
7	NC 67	Duke Power	Existing Sidewalk	569	2	N	Proposed	Sidewalk	Concrete	Y	$42,675	5	1	2	4	2	0	0	2	3	**14**
8	US 21	E Main	Swan Creek Bypass Rd	1,573	12	W	Proposed	Sidewalk	Concrete	Y	$117,975	5	2	2	2	2	0	2	2	2	**14**
9	US 21 Bridge	Elm St	Elkin	339	1	E	Proposed	Sidepath	Asphalt		$42,375	8	2	2	3	2	0	2	0	2	**13**
10	NC 67	Mayberry Road	I 77 S Exit Ramp	1,794	7	N	Proposed	Sidepath	Asphalt	Y	$224,250	8	0	1	4	2	0	2	0	3	**12**
11	NC 67	I 77 Exit Ramp	Best Western Entrance	704	1	N	Proposed	Sidepath	Asphalt	Y	$88,000	8	0	1	4	2	0	2	0	3	**12**
12	Oak/Triplett Street	Williams Street	NC 67	2,785	24	W	Proposed	Sidewalk	Concrete	N	$208,875	5	2	2	4	2	2	0	0	0	**12**
13	Plaza Street	NC 67	Jonesville Greenway	851	5	E	Proposed	Sidewalk	Concrete	N	$63,825	5	1	2	4	2	0	0	2	0	**11**
14	Valley Drive Greenway	Swaim Memorial Park	Park Drive E	3,418	10	SE	Proposed	Sidepath	Asphalt	N	$427,250	8	2	3	2	2	2	0	0	0	**11**
E3	Cherry Street	End of existing sidewalk	W Main Street	1,556	18	N&S	Existing	Sidewalk	Concrete	N	$116,700	5	2	2	0	2	0	2	2	0	**10**
15	Swaim Street	Swan Creek Bypass	Jonesville Elementary	1,245	7	E	Proposed	Sidewalk	Concrete	N	$93,375	5	3	2	2	0	0	0	0	3	**10**
16	US 21	Valley Drive	Center Street	2,222	20	E	Proposed	Sidewalk	Concrete	Y	$166,650	5	2	2	2	2	0	0	0	2	**10**
17	Penticostal Parcel			491	1		Proposed	Sidepath	Asphalt	Y	$61,375	8	2	2	0	2	0	2	2	0	**10**
18	NC 67	I 77 N Off-Ramp	PVH Quality Way	599	4	S	Proposed	Sidewalk	Concrete	Y	$44,925	5	0	0	4	2	0	0	0	3	**9**
19	Valley Drive Greenway	Park Drive E	NC 67	2,946	3	E	Proposed	Sidepath	Asphalt	N	$368,250	8	1	2	2	2	2	0	0	0	**9**
20	Briarwood Ln/Valley Dr	Briarwoods Apartments	NC 67 Sidewalk	1,090	3	W	Proposed	Sidewalk	Concrete	N	$81,750	5	1	2	0	2	2	0	2	0	**9**
21	Mineral Springs Road	W Main Street	Cedarbrook Road	3,755	37	E	Proposed	Sidewalk	Concrete	N	$281,625	5	2	3	0	2	0	0	2	0	**9**
22	Hillcrest Street/Williams Street	Existing Sidewalk	Oak Street	701	8	E	Proposed	Sidewalk	Concrete	N	$52,575	5	2	2	2	0	0	0	2	0	**8**
23	Elm Street	Bridge Street	NC 67	832	9	N	Proposed	Sidepath	Asphalt	Y	$104,000	8	1	2	0	2	0	2	0	0	**7**
24	Elm Street	Bridge Street	NC 67	832	9	S	Proposed	Sidewalk	Concrete	Y	$62,400	5	1	2	0	2	0	2	0	0	**7**
25	Swain Street	Swan Creek Bypass	Stadium Drive	947	5	E	Proposed	Sidewalk	Concrete	N	$71,025	5	2	3	0	2	0	0	0	0	**7**
26	US 21	Center Street	Church	1,834	15	E	Proposed	Sidewalk	Concrete	Y	$137,550	5	1	2	0	2	0	0	0	2	**7**
27	Swan Creek Bypass Road	Mineral Springs Road	Swaim Street	1,237	3	S	Proposed	Sidewalk	Concrete	N	$92,775	5	2	2	2	0	0	0	0	0	**6**
28	Mineral Springs Road	Cedarbrook Road	Swan Creek Bypass Rd	1,444	13	E	Proposed	Sidewalk	Concrete	N	$108,300	5	2	2	0	0	0	0	2	0	**6**
29	S Jonesville Boulevard	Little Creek Apartments	Valley Drive	551	1	S	Proposed	Sidewalk	Concrete	N	$41,325	5	2	2	0	0	2	0	0	0	**6**
30	Park Drive E	Arlington Hills Drive	Valley Drive	509	3	E	Proposed	Sidewalk	Concrete	N	$38,175	5	1	2	0	0	2	0	0	0	**5**
	Small Gaps	Total of Small Gaps		1,958			Proposed	Sidewalk	Concrete		$146,850	5									
	Small Existing Sections	Needing Improvement		781			Existing	Sidewalk	Concrete		$58,575	5									

Figure 10: Gwyn McNeil Bridge to Hardy Street Proposed Facilities Map



Town of Jonesville Comprehensive Pedestrian Transportation Plan

Proposed Facilities

Points of Interest
- Apartments
- Major Commercial
- Major Industrial
- Hotel
- Institutional
- Medical
- Town Hall
- School

Proposed Network Elements
- Sidepath
- Sidewalk
- RRFB
- Ped Head
- Roundabout
- Key Intersection Improvement
- Crosswalk
- Pedestrian Island
- Rest Area

Map ID
- Sidepath
- Sidewalk

Existing Sidewalks
- Unknown
- Good
- Moderate
- Poor

Other Pedestrian Elements
- Existing Trails
- Proposed Trails

Roads
- Interstate
- Local Road
- Railroad

Other Features
- Hydrology
- Tax Parcel
- Park
- Town Owned Land
- Municipal Boundary
- County Boundary

PIEDMONT TRIAD REGIONAL COUNCIL

Mapping provided by the Piedmont Triad Regional Council Planning Department
Date: March 12, 2015

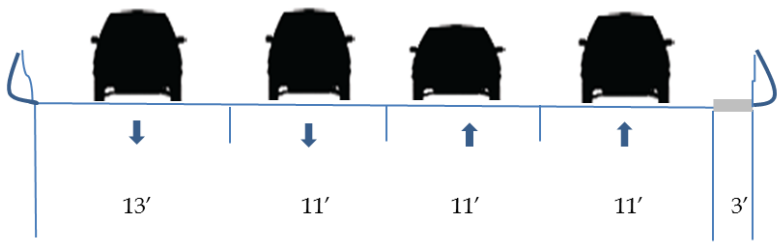
0 200 400 Feet

1 inch = 200 feet

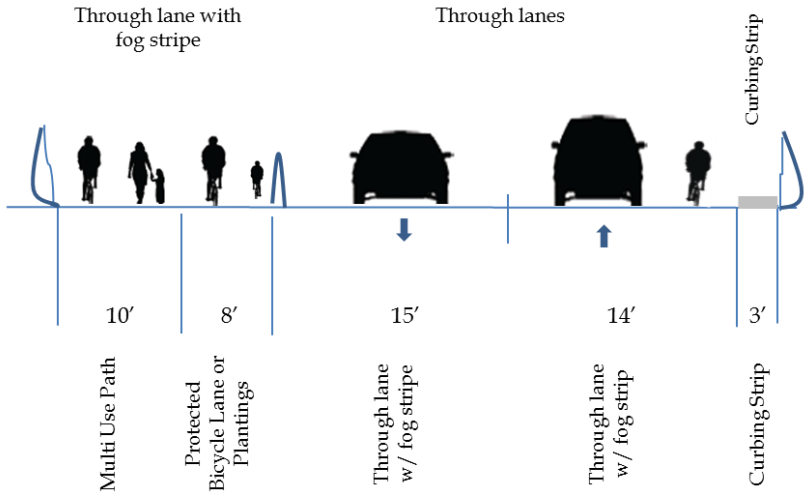
N

Gwyn McNeil Bridge
To Jonesville from Elkin
Add Sidepath and Plantings, Reconfigure Roadway

Existing



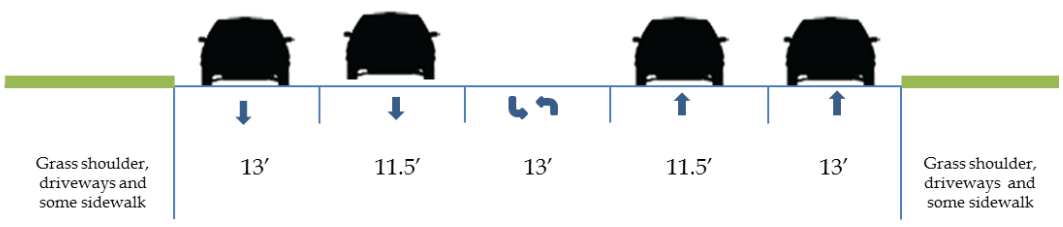
Proposed*



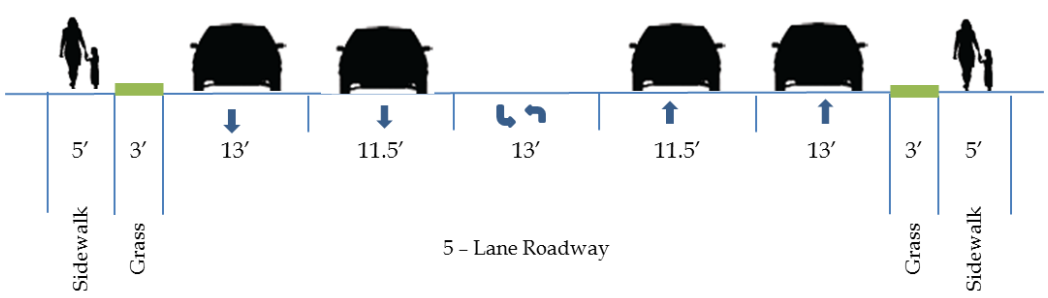
*New railing, Jersey barrier and any additional facility weights will need to be calculated to determine load on the existing bridge structure

NC 67 from Elm St to Valley Drive
Alternative 1
Add Sidewalk

Existing

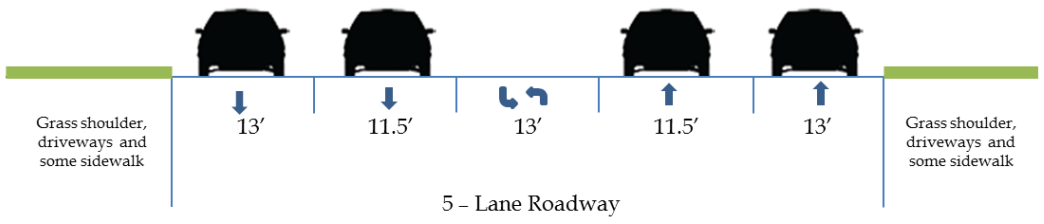


Proposed*

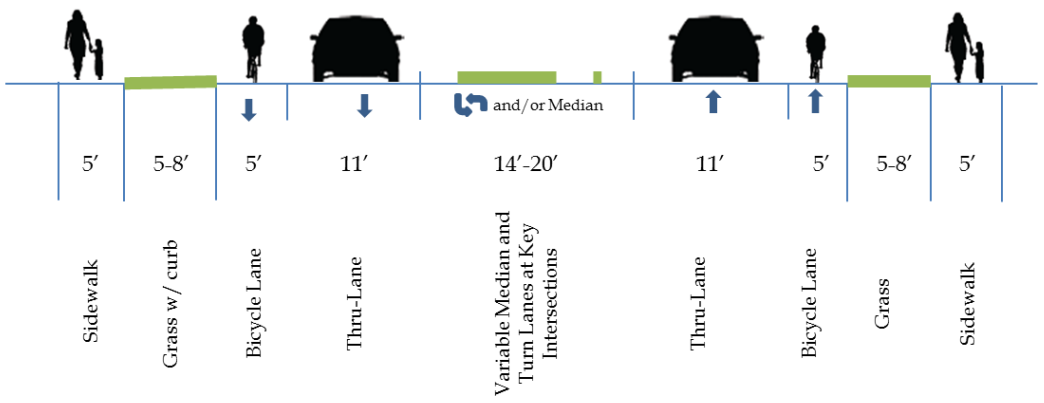


NC 67 from Elm St to Valley Drive
Alternative 2
Add Sidewalk and Bike Lanes
Reconfigure Roadway

Existing

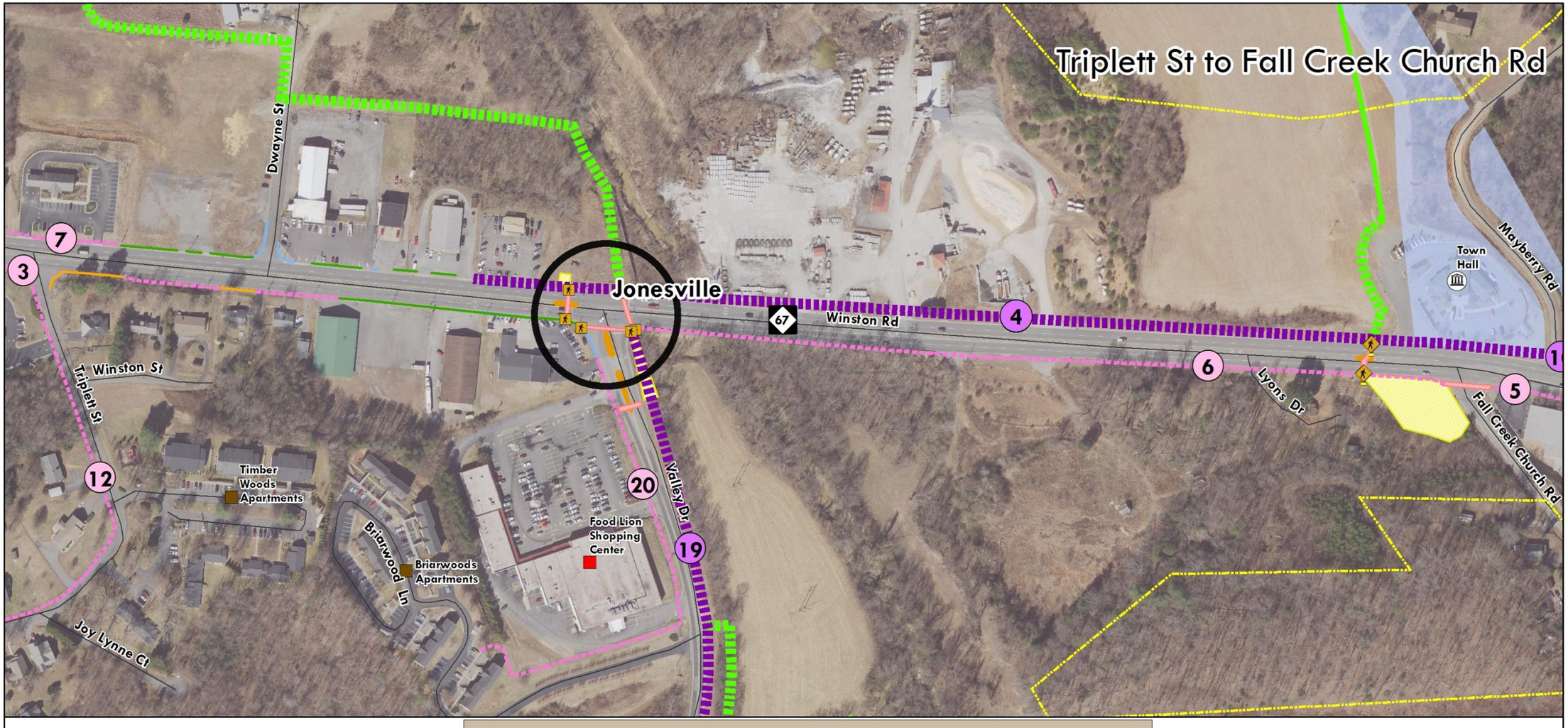


Proposed*



*This section needs an access management and engineering study for drainage, safety operations at signals, location of median cuts and additional features. The cost of this improvement would need to be prioritized by the NWPRPO for inclusion in the State TIP. Some interim intersection improvements could be accomplished using alternative funding sources.

Figure 11: NC 67 Triplett Street to Fall Creek Church Rd Proposed Facilities Map



Town of Jonesville Comprehensive Pedestrian Transportation Plan

Proposed Facilities

Points of Interest
- Apartments
- Major Commercial
- Major Industrial
- Hotel
- Institutional
- Medical
- Town Hall
- School

Proposed Network Elements
- Sidepath
- Sidewalk
- RRFB
- Ped Head
- Roundabout
- Key Intersection Improvement
- Crosswalk
- Pedestrian Island
- Rest Area

Map ID
- Sidepath
- Sidewalk

Existing Sidewalks
- Unknown
- Good
- Moderate
- Poor

Other Pedestrian Elements
- Existing Trails
- Proposed Trails

Roads
- Interstate
- Local Road
- Railroad

Other Features
- Hydrology
- Tax Parcel
- Park
- Town Owned Land
- Municipal Boundary
- County Boundary

Piedmont Triad Regional Council

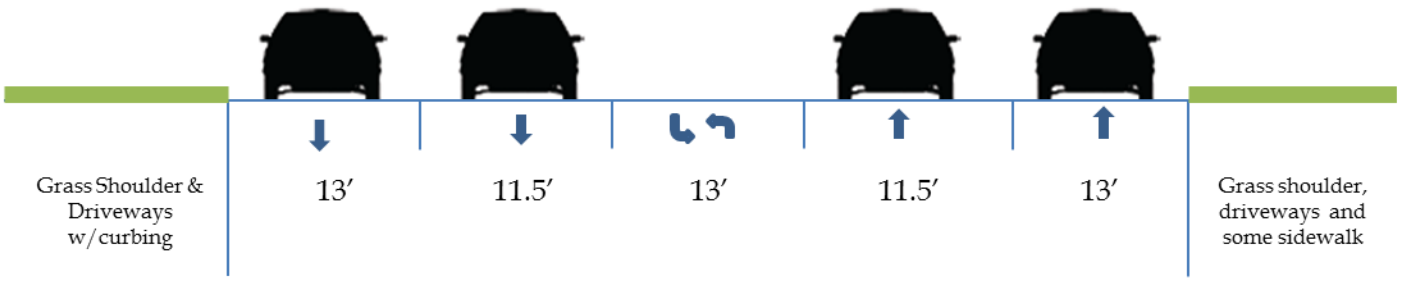
Mapping provided by the Piedmont Triad Regional Council Planning Department
Date: July 08, 2015

0 200 400 Feet

1 inch = 200 feet

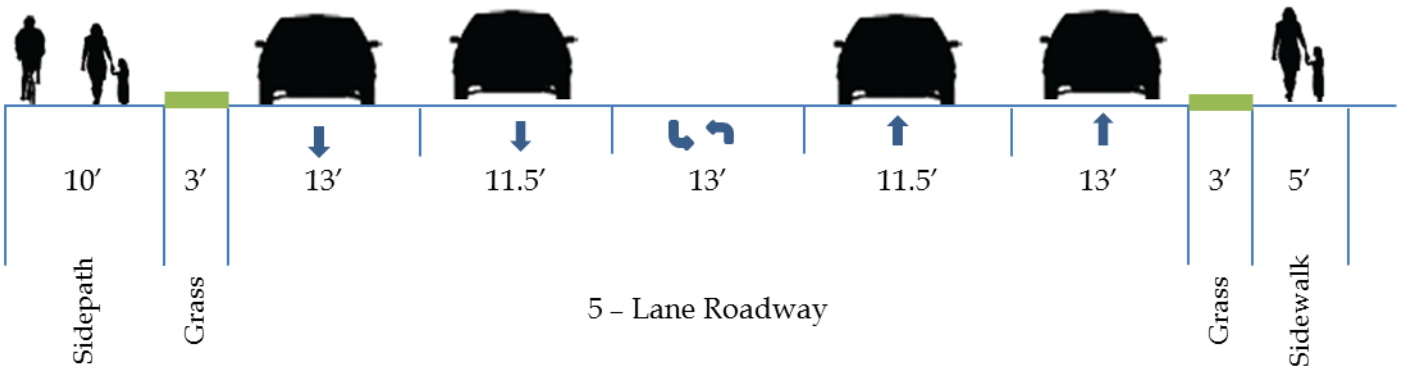
NC 67 from Valley Drive to I-77
Alternative 1
Add Sidepath and Sidewalk

Existing



5 – Lane Roadway

Proposed*

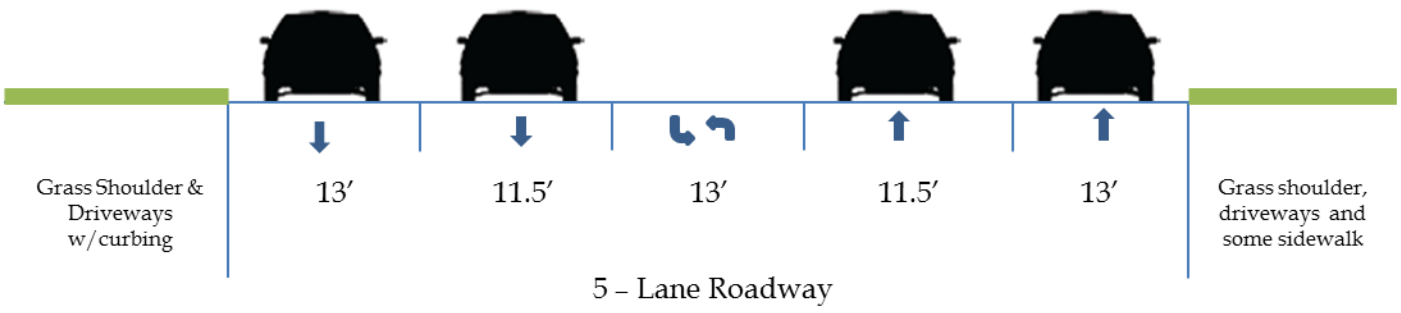


5 – Lane Roadway

*Some right of way may need to be acquired to accommodate sidepath

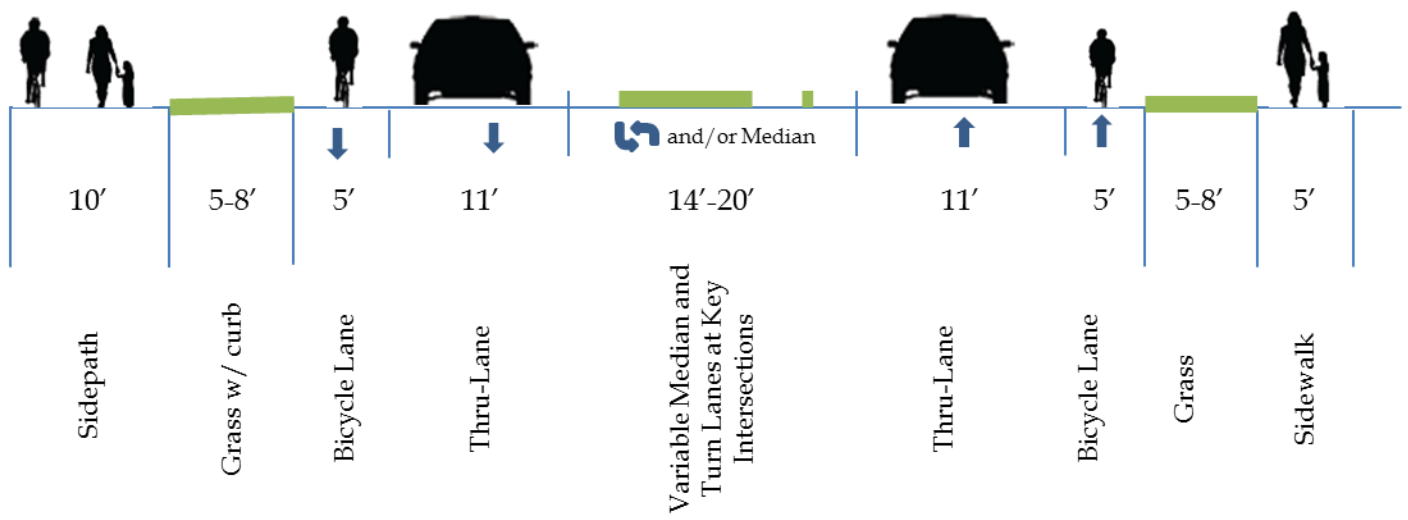
NC 67 from Valley Drive to I-77
Alternative 2
Add Sidepath, Sidewalk and Bike Lanes
Reconfigure Roadway

Existing



5 – Lane Roadway

Proposed*



* This section needs an access management and engineering study for drainage, safety operations at signals, location of median cuts and additional features. The cost of this improvement would need to be prioritized by the NWPRPO for inclusion in the State TIP. Some interim intersection improvements could be accomplished using alternative funding sources.

Figure 12: NC 67 Fall Creek Church Rd to I-77 Area Proposed Facilities Map

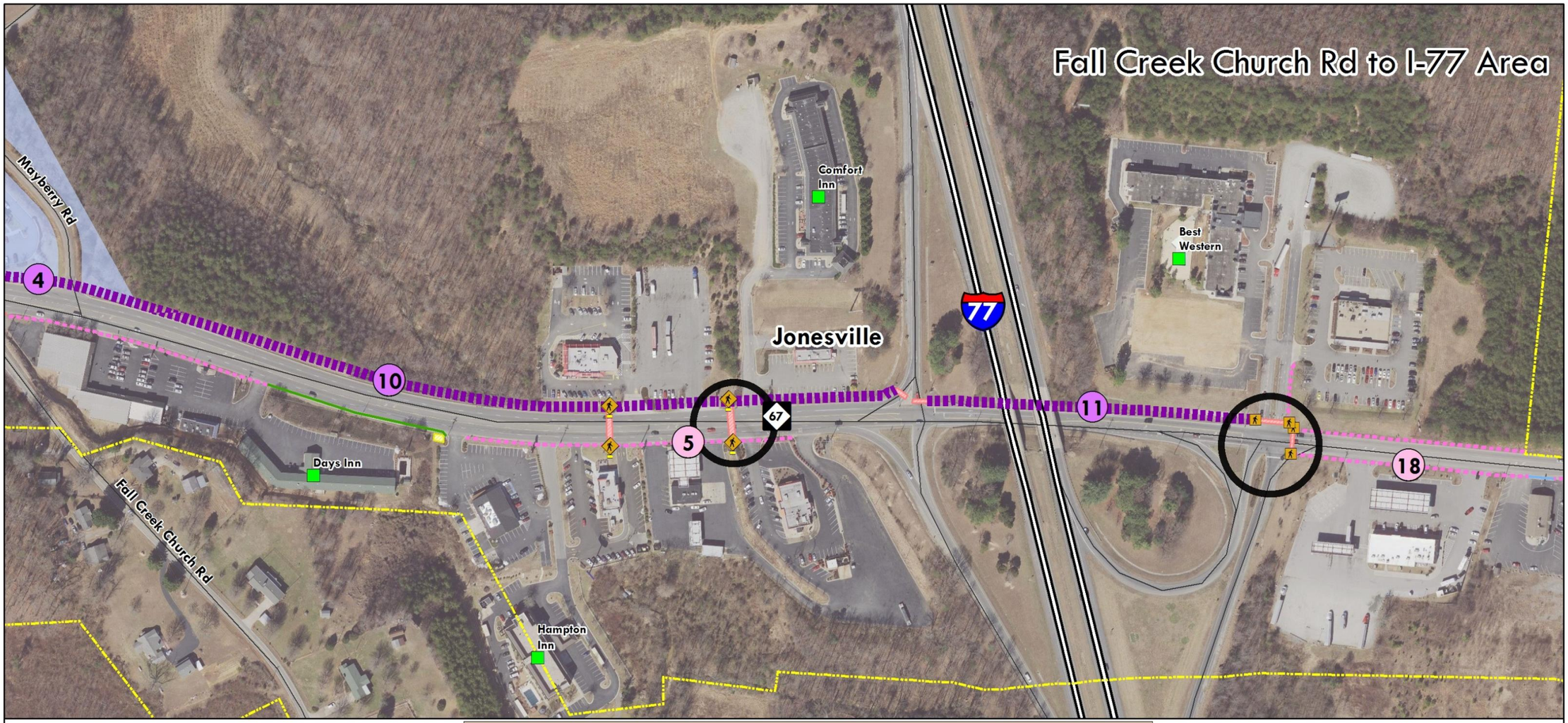
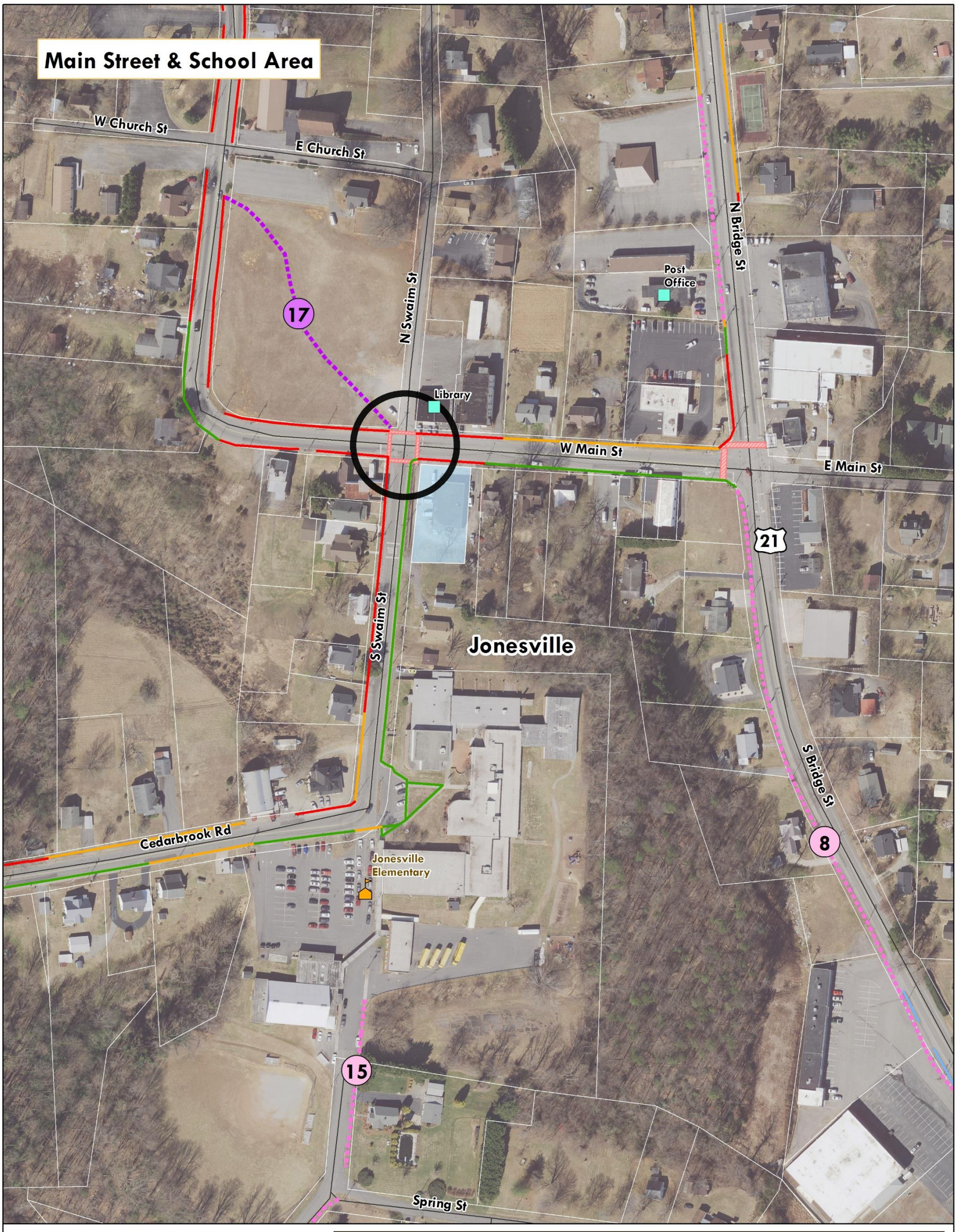


Figure 13: Main Street & School Area Proposed Facilities Map



3.2 KEY INTERSECTION IMPROVEMENTS AND VISUALIZATIONS

KEY INTERSECTIONS FOR IMPROVEMENT

The proposed facilities maps identify 7 key intersections for improvement. As roadway projects are programmed or resurfacing occurs, the Town of Jonesville should consider safety and access improvements to intersections including crosswalks, curb ramps, potential signalization (or removal of signals) or other improvements in consultation & partnership with NCDOT Division 11 and/or an engineering consultant. In addition, a corridor and feasibility study for the NC 67 corridor should be conducted to investigate roadway capacity, safety improvements (e.g. medians and buffered sidewalks) to improve pedestrian safety, access and comfort. See the full page detail of existing and proposed improvements after the summary below. There are other locations where crosswalks and sidewalks need improvement as shown in *Figure 9: Jonesville Comprehensive Proposed Facilities Map*.

Key Pedestrian Improvements Summary

1. NC 67 at Elm St

Current Conditions: Traffic Count - Elm St: 6,800 ADT (2013)
Unsignalized "T" intersection with no pedestrian crossing improvements or sidewalks. Much of the Jonesville to Elkin traffic will pass through this intersection.
Recommendations: Conduct a feasibility study to reconfigure the intersection. Installation of raised medians, rapid reflecting flashing beacon (RRFB), landscaping and sidewalks should be considered for this important gateway to and from Jonesville. Different stop control and intersection angle should also be considered. This intersection area could also serve as a trailhead for the Jonesville Greenway. An 8' wide sidepath is recommended to connect Jonesville and Elkin's expanding trail system.

2. NC 67 at Cracker Barrel/Best Western Driveway and the I-77 North Off Ramp

Current Conditions: Traffic Count - NC 67: 9,400 ADT (2013)
There are no sidewalks or trails connecting hotels and restaurants on the east or west side of NC 67 and the I-77 interchange. The land uses are automobile-oriented in close proximity to the Interstate.
Recommendations: Construct an 8' wide sidepath on the north side of NC 67 connecting Best Western and Cracker Barrel to the Comfort Inn and McDonald's and beyond. The sidepath may utilize existing space under the I-77 Bridge. The bridge abutments and guard rail provide separation between the sidepath and the highway. Additional pedestrian crossing improvements are recommended at the Cracker Barrel and Best Western access road and the I-77 northbound off-ramp.

3. NC 67 at Comfort Inn/McDonalds/Waffle House and I-77 South Off Ramp

Current Conditions: Traffic Count - NC 67: 9,800 ADT (2013)
Unsignalized intersection with no pedestrian crossing improvements or sidewalks. The McDonald's and Waffle House on the north side of NC 67 is a common location for tour bus parking. Pedestrians are often seen crossing mid-block here to access the gas station convenience store, Wendy's or other destinations on the south side of NC 67.
Recommendations: Install crosswalks and rapid reflecting flashing-beacons (RRFB) with sidewalk and sidepath. The RRFB could also trigger an overhead "pedestrian in roadway" warning sign. An 8' sidepath is recommended on the north side of NC 67. A typical 5' sidewalk is recommended on the south side of NC 67.

4. NC 67 at Valley Drive

Current Conditions: Traffic Count NC 67: 9,800 ADT; Valley Drive: 3,900 ADT (2013)
Signalized "T" intersection with no pedestrian crossing improvements, but there is a sidewalk on the south side of NC 67 west of the intersection with Valley Drive. Within a half mile of the intersection, there are multi-family apartments, a shopping center, drug store, Town Hall and an urgent care facility.
Recommendations: Crosswalks and pedestrian signals are recommended to facilitate crossing NC 67 and Valley Drive. Also a sidewalk, sidepath and trail facilities are recommended to bring pedestrians to and from the road crossing safely. An 8' sidepath is recommended on the north side of NC 67 and east side of Valley Drive. A 5' sidewalk is recommended on the south side of NC 67 and west side of Valley Drive. A trail connection to the Jonesville greenway is also called for on the north side of NC 67.

5. NC 67 at N Bridge St

Current Conditions: Traffic Count NC 67: 7,300 ADT; Bridge Street: 2,100 ADT (2013)
Signalized intersection with no pedestrian crossing improvements, there is some sidewalk on the south side of the intersection. A shopping center, motel and several used car dealerships are in close proximity to this intersection.
Recommendations: Install a crosswalk and pedestrian signal on two legs of the intersection for pedestrian traffic going to and from Starmount Crossing and the Jonesville Greenway (via Plaza Street). Include landscaping and a bench for the grassy area on the southwest side of the intersection. Construct a 5' sidewalk on the north side of NC 67.

6. Elm & W Main St at Gwyn McNeil Bridge

Current Conditions: Traffic Count Elm Street: 6,800 ADT (2012); Gwyn McNeil Bridge: N/A
Unsignalized intersection with no pedestrian crossing improvements; a sidewalk on W. Main Street. Existing curbing strip on the bridge is approximately 3' wide.
Recommendations: Provide a crosswalk and sidewalk improvements at this location to ensure safe connectivity between the Jonesville sidewalk system and the Elkin sidewalk system just to the North. Provide a multi-use path on the bridge to provide a protected pedestrian and bicycle crossing.

7. Swaim and Main St

Current Conditions: Traffic Count S Swaim Street: 1,400 ADT; W Main Street: 2,800 ADT (2013)
Signalized intersection with sidewalk on 3 legs of the intersection. The sidewalk and curb ramps are in poor to fair condition. The elementary school, library and a church are in close proximity to this intersection.
Recommendations: Install crosswalk, fix curb ramps and make sidewalk improvements at the intersection. Consider removing the traffic light and converting to a 4-way stop. Further traffic study for S Swaim Street during school's peak hours is recommended before proceeding with this improvement.

NC 67/Bridge Street at Elm Street

Current Conditions:

Traffic Count - Elm St: 6,800 ADT (2013)

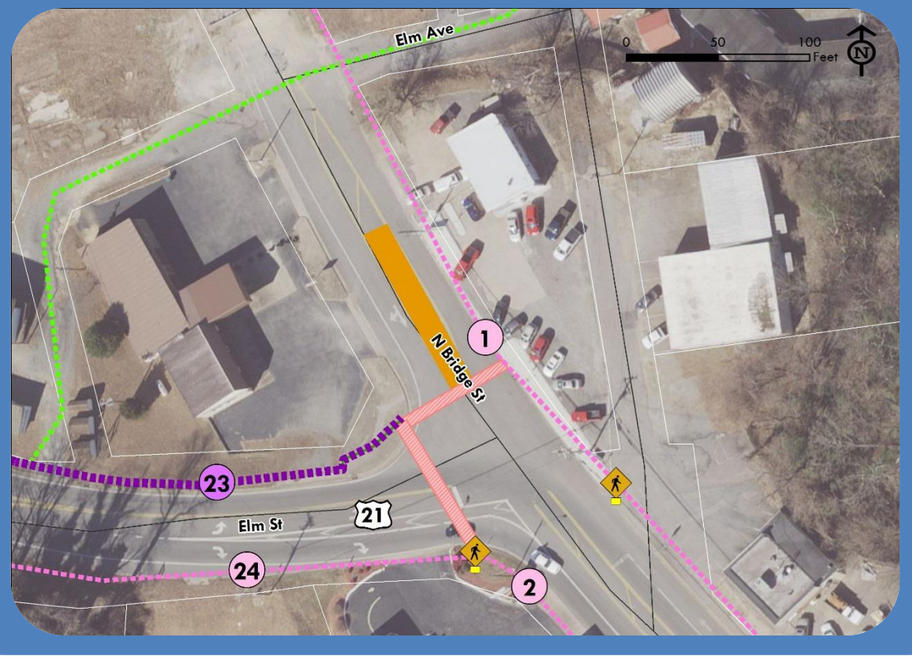
Unsignalized "T" intersection with no pedestrian crossing improvements or sidewalks. Much of the Jonesville to Elkin traffic will pass through this intersection.

Recommendations:

Conduct a feasibility study to reconfigure the intersection. Installation of raised medians, rapid reflecting flashing beacon (RRFB), landscaping and sidewalks should be considered for this important gateway to and from Jonesville. Different stop control and intersection angle should also be considered. This intersection area could also serve as a trailhead for the Jonesville Greenway. An 8' wide sidepath is recommended to connect Jonesville and Elkin's expanding trail system.

Simulated Improvements

Current Conditions



I-77 Interchange and NC 67

Current Conditions:

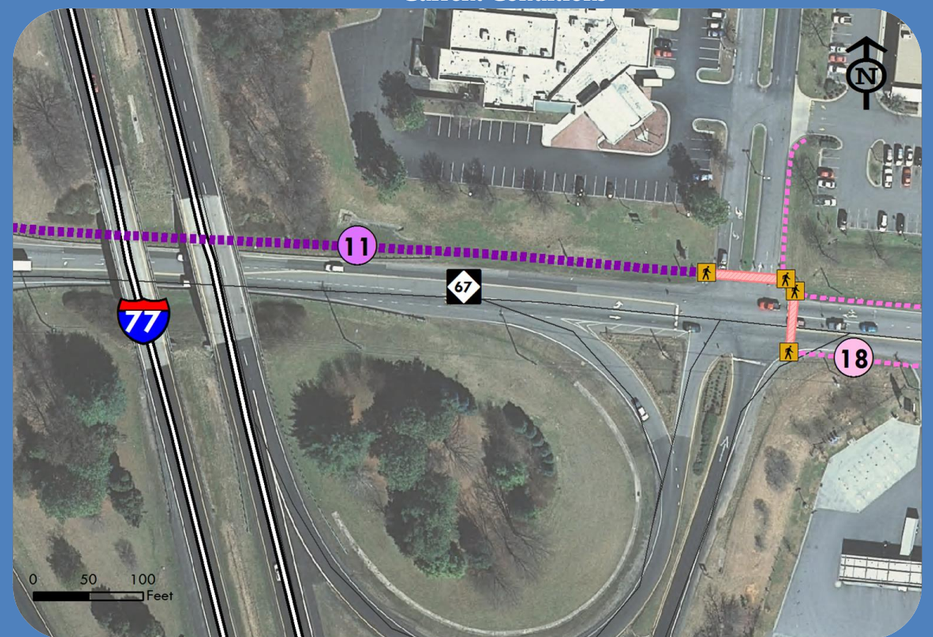
Traffic Count - NC 67: 9,400 ADT (2013)
There are no sidewalks or trails connecting hotels and restaurants on the east or west side of NC 67 and the I-77 interchange. The land uses are automobile-oriented in close proximity to the Interstate.

Recommendations:

Construct an 8′ wide sidepath on the north side of NC 67 connecting Best Western and Cracker Barrel to the Comfort Inn and McDonald's and beyond. The sidepath may utilize existing space under the I-77 bridge. The bridge abutments and guard rail provide separation between the sidepath and the highway. Additional pedestrian crossing improvements are recommended at the Cracker Barrel and Best Western access road and the I-77 northbound off-ramp.

Simulated Improvements

Current Conditions



I-77 Interchange and NC 67 aerial image with recommended improvements.

NC 67 at Comfort Inn/McDonalds/Waffle House and I-77 S Off Ramp

Current Conditions:

Traffic Count - NC 67: 9,800 ADT (2013)

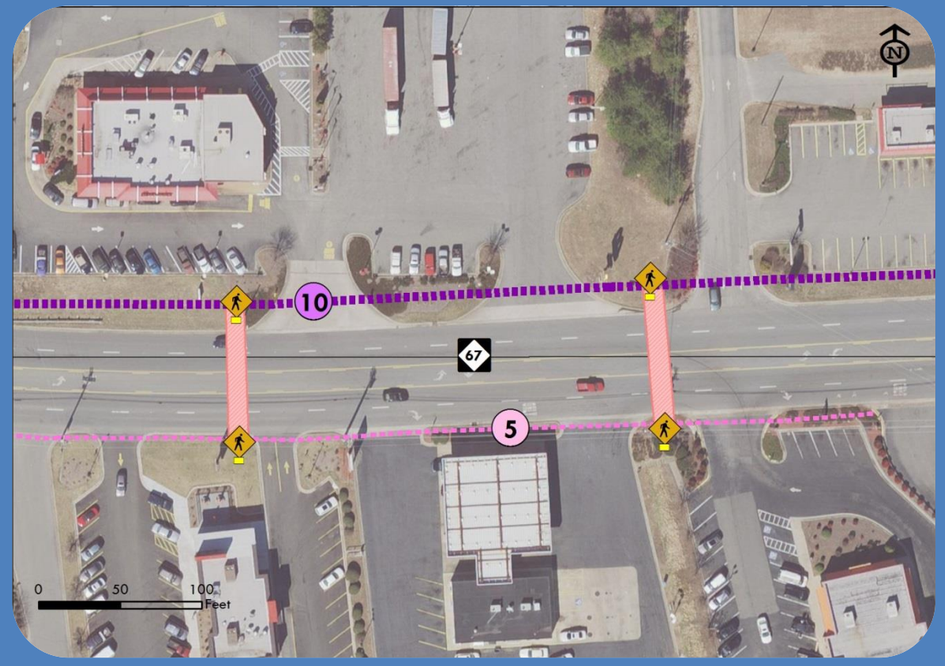
Unsignalized intersection with no pedestrian crossing improvements or sidewalks. The McDonald's and Waffle House on the north side of NC 67 is a common location for tour bus parking. Pedestrians are often seen crossing mid-block here to access the gas station convenience store, Wendy's or other destinations on the south side of NC 67.

Recommendations:

Install high visibility crosswalks and rapid reflecting flashing-beacons (RRFB) with sidewalk and sidepath. The RRFB should also trigger an overhead "pedestrian in roadway" warning sign. An 8' sidepath is recommended on the north side of NC 67. A typical 5' sidewalk is recommended on the south side of NC 67.

Simulated Improvements

Current Conditions



NC 67 west of I-77 Interchange aerial image with recommended improvements

NC 67 at Valley Drive

Current Conditions:

Traffic Count NC 67: 9,800 ADT (2013)
Valley Drive: 3,900 ADT

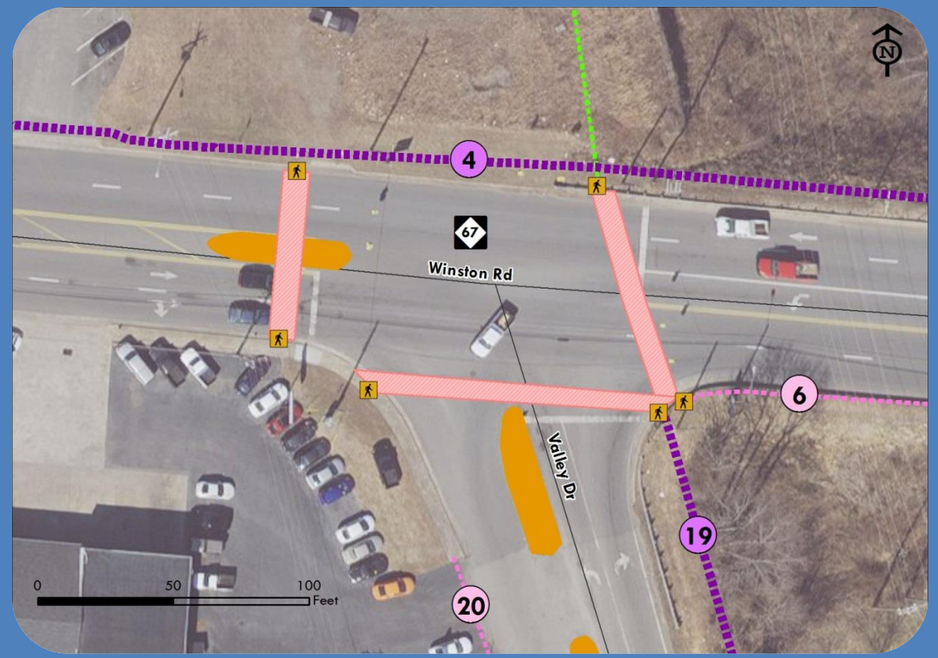
Signalized "T" intersection with no pedestrian crossing improvements, but there is a sidewalk on the south side of NC 67 west of the intersection with Valley Drive. Within a half mile of the intersection, there are multi-family apartments, a shopping center, drug store, Town Hall and an urgent care facility.

Recommendations:

Crosswalks and pedestrian signals are recommended to facilitate crossing NC 67 and Valley Drive. Also a sidewalk, sidepath and trail facilities are recommended to bring pedestrians to and from the road crossing safely. An 8' sidepath is recommended on the north side of NC 67 and east side of Valley Drive. A 5' sidewalk is recommended on the south side of NC 67 and west side of Valley Drive. A trail connection to the Jonesville greenway is also called for on the north side of NC 67.

Current Conditions

Simulated Improvements



NC 67 and Valley Drive aerial image with recommended improvements

NC 67 at US 21 Business/N Bridge Street

Current Conditions:

Traffic Count NC 67: 7,300 ADT (2013)

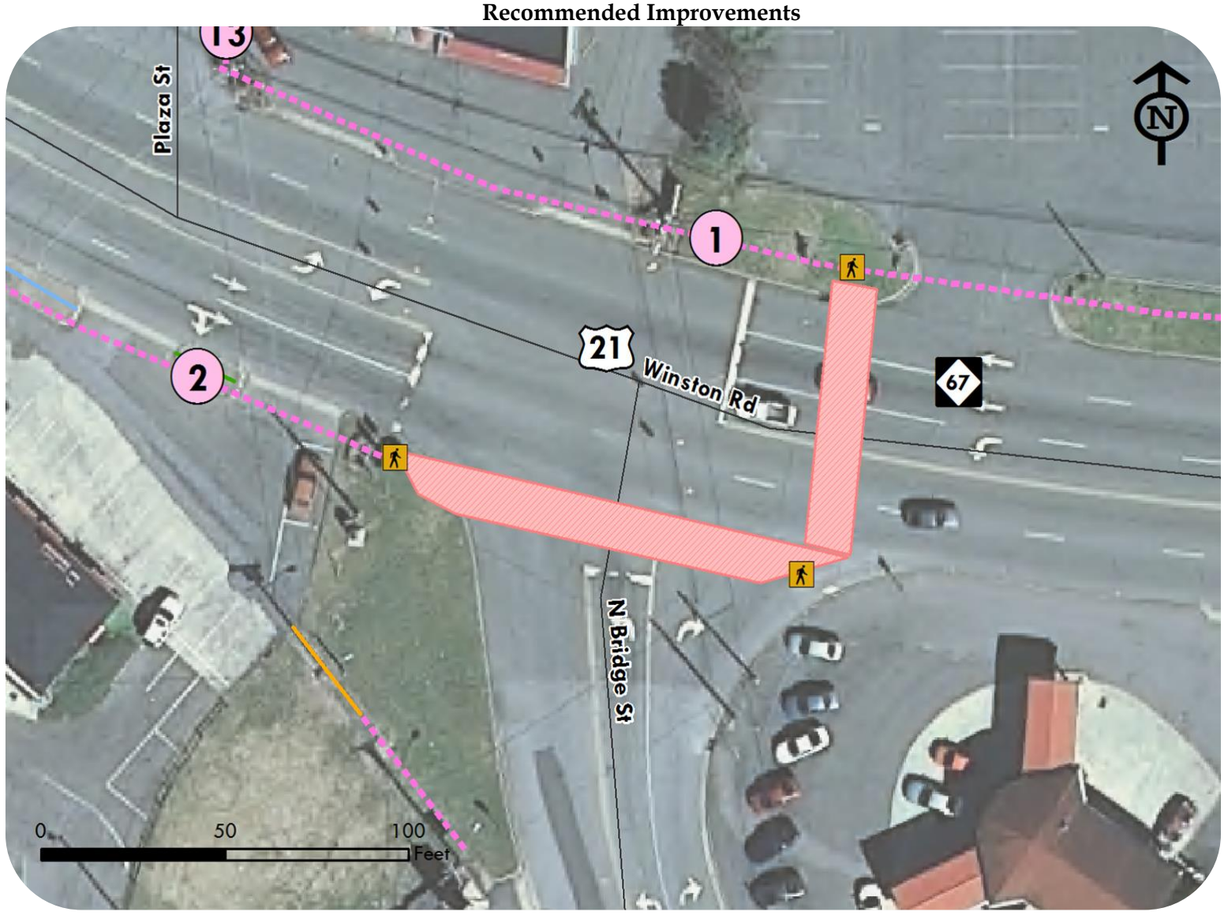
Bridge Street: 2,100 ADT

Signalized intersection with no pedestrian crossing improvements, there is some sidewalk on the south side of the intersection. A shopping center, motel and several used car dealerships are in close proximity to this intersection.

Recommendations:

Install a crosswalk and pedestrian signal on two legs of the intersection for pedestrian traffic going to and from Starmount Crossing and the Jonesville Greenway (via Plaza Street). Include landscaping and a bench for the grassy area on the southwest side of the intersection. Construct a 5′ sidewalk on the north side of NC 67.

Recommended Improvements



Current Conditions

Elm and W Main Street at Gwyn McNeil Bridge

Current Conditions:

Traffic Count Elm Street: 6,800 ADT (2012)

Gwyn McNeil Bridge: N/A

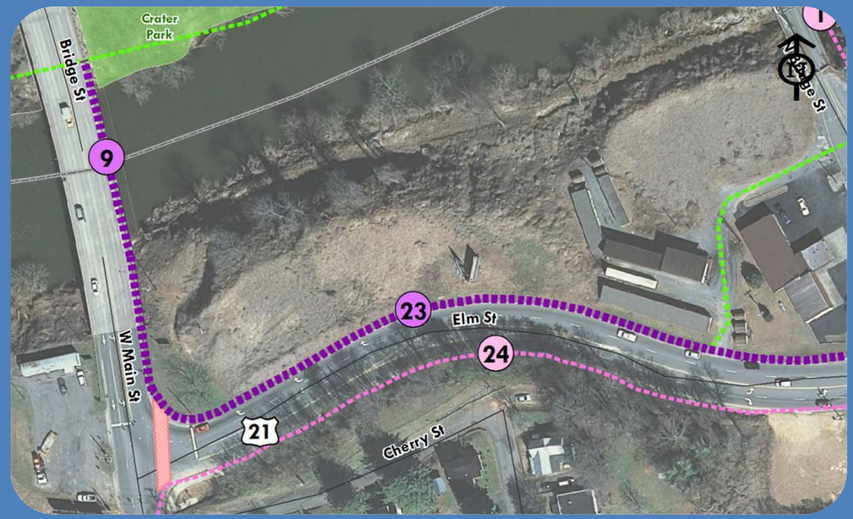
Unsignalized intersection with no pedestrian crossing improvements, a sidewalk on W. Main Street. Existing curbing strip on the bridge is approximately 3′ wide.

Recommendations:

Provide a crosswalk and sidewalk improvements at this location to ensure safe connectivity between the Jonesville sidewalk system and the Elkin sidewalk system just to the North. Provide a multi-use path on the east side of the bridge to provide a protected pedestrian and bicycle crossing.

Simulated Improvements Looking Towards Jonesville – Credit Destination by Design

Current Conditions



Gwyn McNeil Bridge and Elm St aerial image with recommended improvements

S Swaim Street at W Main Street

Current Conditions:

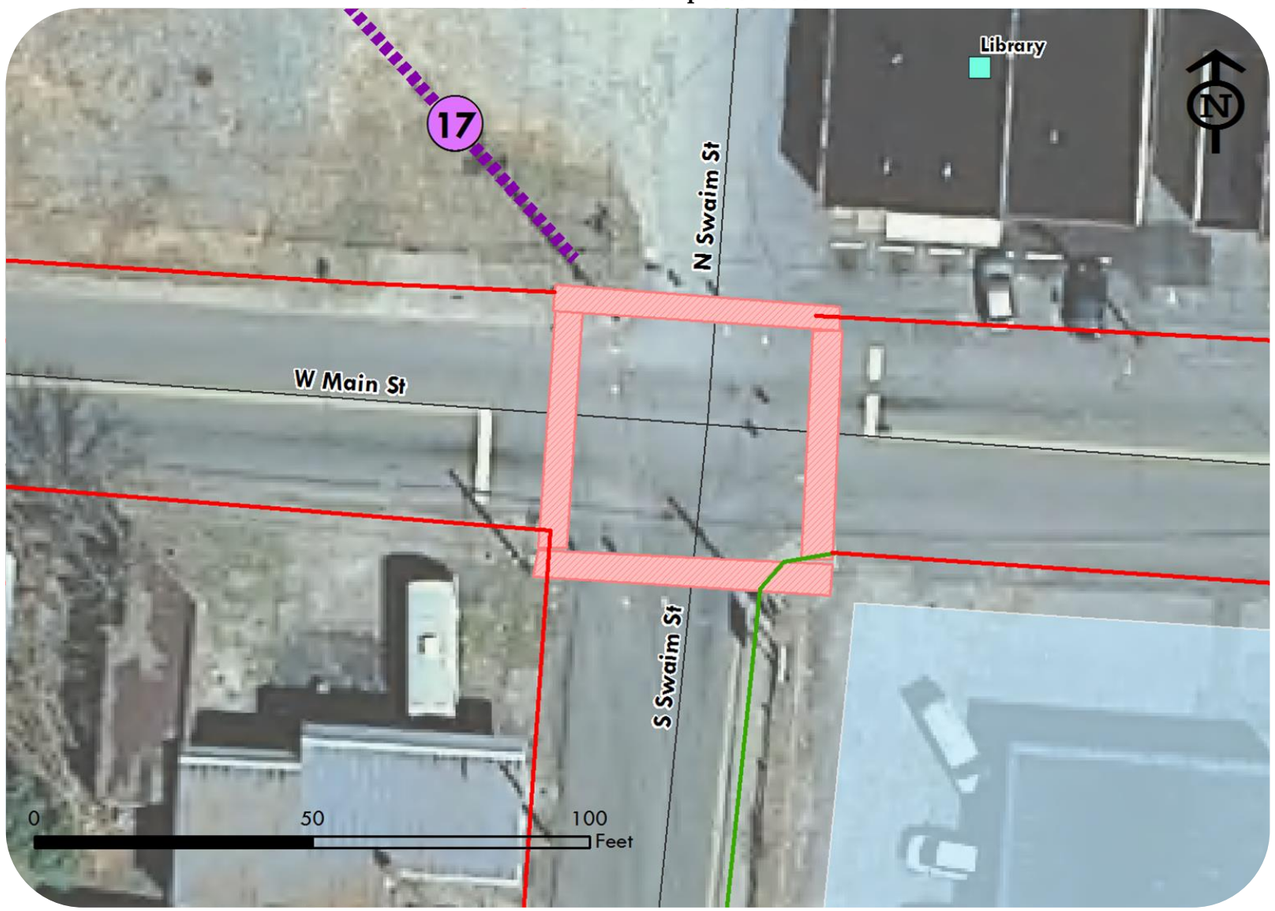
Traffic Count S Swaim Street: 1,400 ADT (2013)
W Main Street: 2,800 ADT

Signalized intersection with sidewalk on 3 legs of the intersection. The sidewalk and curb ramps are in poor to fair condition. The elementary school, library and a church are in close proximity to this intersection.

Recommendations:

Install crosswalk, fix curb ramps and make sidewalk improvements at the intersection. Consider removing the traffic light and converting to a 4-way stop. Further traffic study for S Swaim Street during school's peak hours is recommended before proceeding with this improvement.

Recommended Improvements



Current Conditions

3.3 POLICY, EVENT & ACTIVITY RECOMMENDATIONS

Policy, event and activity recommendations provide a framework for ordinances, internal policies and programs that will enhance the pedestrian transportation system. The ideas listed are intended to complement existing policies and programs and serve as a "menu" of options to pursue as the Town of Jonesville moves towards a vision of more support and acknowledgement of pedestrian and bicycle safety, access and comfort.

POLICIES

The following policy updates build upon those developed in previous planning efforts and the existing ordinance. New policies have been suggested by steering committee members, citizens and staff.

A. New Town Ordinances Supporting Pedestrian Facilities and Development

Recommended Policy: The Town of Jonesville is overdue for new Zoning and Subdivision Ordinances, as well as new amendments to its general Ordinance; all were last materially updated over twenty years ago. These new ordinances should identify areas within the town that are most appropriate for pedestrian infrastructure and require sidewalks or equivalent pedestrian access in the commercial and residential sectors, provided it is contiguous with existing or planned pedestrian facilities. These zones can include flexibilities in certain zones that permit the construction of alternate pedestrian routes (e.g. greenways) or payments in lieu of this development that will support the town's strategic pedestrian infrastructure investments.

B. Define Pedestrian Routes and Access

Recommended Policy: Jonesville's existing ordinances define sidewalks and roads, but do not define pedestrian routes or access. As such, sidewalks are defined by their form but not their function as a safe public service. Such a definition should be established by the town, with the forms it may take also be described or defined. At a minimum, this should include sidewalks and road crossings that meet NCDOT design requirements, and may also include greenways and walking paths that will be publicly maintained. The Town will need to determine if privately-maintained roads will be required to have pedestrian routes and how they will be maintained as safe routes.

C. Revised Municipal Parking Requirements

Recommended Policy: In coordination with updates to Jonesville's ordinances, the parking schedule should also be revised. In a redevelopment or new development project, create the infrastructure to support pedestrian and/or bicycle access to the property and reduce the requirements for motor vehicle parking spaces for commercial and institutional properties. Similarly, these requirements could be reduced if shared parking lots are created that also support access to multiple properties. These changes should be contiguous to existing or planned multimodal transportation routes and infrastructure.

D. Update Traffic Analysis Methodology

Recommended Policy: The Town uses traffic analysis methods that only account for automobile traffic and, consequently, recommends solutions that only serve automobile infrastructure. Including alternative modes of transportation as a possible solution to congestion or access to economic development zones should be incorporated into recommended solutions to traffic concerns. Furthermore, the term "traffic" should be redefined to include more than just automobile traffic. All assessments should include full cost/benefit analyses that account for both the cost of installing pedestrian infrastructure as well as the revenues that could be recovered through the public and private sector incomes generated by improved infrastructure, physical health and quality of life where applicable.

E. Pedestrian Transportation Along Existing Development

Recommended Policy: Require reasonable pedestrian infrastructure for most new residential and commercial developments within the town. Ensure that this new infrastructure will connect to existing or planned pedestrian infrastructure. Explore funding sources to construct sidewalks, trails and sidepaths along existing development on major roadways, connecting existing Town or community based facilities and destinations. All stormwater runoff must be mitigated with stormwater practices such as rain gardens or swales. These stormwater features should be constructed by the requirements of the NC DENR BMP and NCDOT's guidelines. Funding sources could be a combination of grants, donations, local revenue and state/federal transportation funding. Powell Bill and property assessment funding may be a potential immediate use of funds for improving sidewalks and building new sidewalks.

Figure 14: Stormwater Treatment of Sidewalks

F. Public Access Easements

Recommended Policy: The Town already permits sidewalks within the road right-of-ways. These sidewalks should be required for all new developments, the stormwater conveyance (e.g. swale) should be between the sidewalk and the road, buffering pedestrians from traffic and optimally treating runoff from the road.

Figure 15: Engineered Stormwater Swales
Credit: NCSU Biological & Agricultural Engineering

As new utility lines are extended along existing proposed greenway corridors, acquire public access easements for future trail use. Include a requirement in the subdivision ordinance that requires public access easements along proposed greenways when land is subdivided.

G. Sidewalk Requirements for Redevelopment

Figure 16: Stormwater Treatment of Sidewalk Runoff with Tree Boxes & Rain Gardens
Credit: www.dot.ca.gov

Recommended Policy: Require sidewalk installation with a change of use and expansion where more than 50% of the building or lot is being improved, expanded or renovated. This recommendation could be included for major roadway corridors such as NC 67, US 21 Business and land uses that are not zoned single family residential. All stormwater runoff must be mitigated with a stormwater practices such as a rain garden or a swale. These stormwater features should be constructed by the requirements of the NC DENR BMP and NCDOT's guidelines. Funding sources could be a combination of grants, donations, local revenue and state/federal transportation funding.

H. Pedestrian Access for New Bridges

Recommended Policy: Require all non-interstate bridges within Town limits to be equipped with sidewalks or multi-use paths. Include accommodation for planned multi-use paths or sidewalks under new bridges. Explore retrofits of existing bridges to accommodate pedestrian access, e.g. US 21 Business.

I. Trail Access Under New Road Bridges

Recommended Policy: Require that road bridge design accommodate future trail development where greenways or conservation areas are proposed – or within ½ mile of parks or schools. Conduct a study that identifies the feasibility of trail development under existing bridges.

J. Complete Streets

Recommended Policy: Adopt a Complete Streets policy, ensuring rebuilt or new streets will accommodate pedestrians, cyclists, future transit users and automobiles. The Complete Streets policy can take different forms, depending on the context in which it is being adopted, for example, specific changes to particular subdivision or street design regulations and ordinances will also need to take place following the adoption of a general policy. New guidelines adopted by NCDOT provide for specific "Complete Street" cross sections for different land use and transportation needs. Winston Road/NC 67 should be studied for Streetscape Enhancement, and a Complete Street cross section adopted that supports pedestrian transportation, improves safety and provides access for all road users.

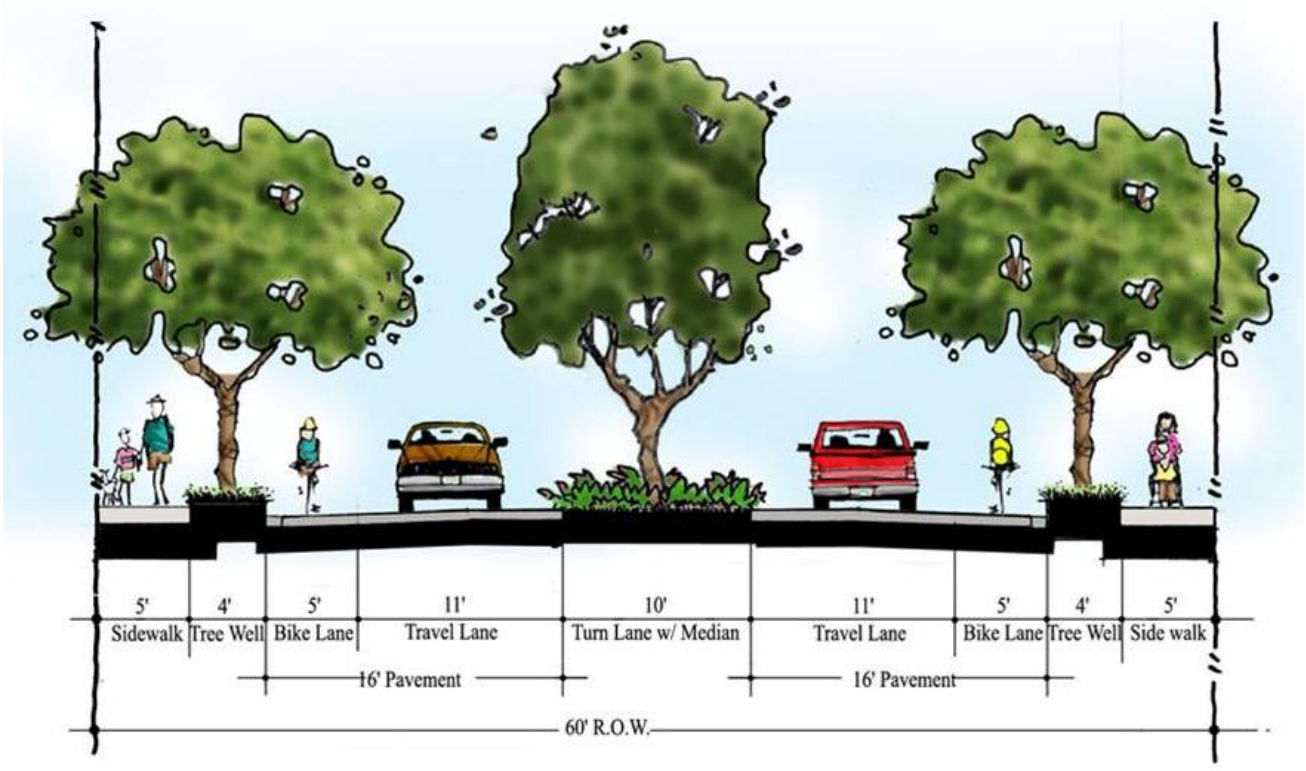


Figure 17: Complete Streets Example Design Sketch

Credit: http://bikestylespokane.com

K. Access Management

Recommended Policy: Adopt an access management policy that ensures vehicle traffic safety as well as pedestrian safety. The access management policy will work to improve safety on new and existing roadways by guiding the development of driveway locations, driveway curbs, connections between adjacent lots and reducing side slope for sidewalks across driveways.

L. Sidewalk Construction Standards and Access

Recommended Policy: Adopt sidewalk and greenway standards for sidewalk and trail development in Jonesville. For example, sidewalk design in some parts of Jonesville could be stamped concrete or brick, while other parts of the community would require a public access easement for future trail or sidewalk development near the roadway as denser development occurs. For example a 2 acre lot on a non-major roadway may not require a sidewalk, instead dedication of a paved shoulder or future trail easement could be required. In addition any sidewalk easements granted outside of the street right of way would include a provision for public access. Ensure that sidewalks are in good repair and have been constructed properly before accepting the easement.

M. Subdivision Pedestrian Connectivity

Recommended Policy: Provide requirements for new development to accommodate pedestrians by connecting cul-de-sacs or dead end streets with the nearest neighboring street or parks. The cul-de-sacs are connected by pathway to existing public streets or trails. In cases where there are no pathways or streets to connect to behind the development or subdivision, a non-motorized public access right-of-way of 20-30ft wide could be set aside to connect with future cul-de-sacs, streets or pathways during the subdivision process of adjacent properties.

Cul-de-sac connection (Oregon)

N. Yadkin River Trail Access and Ordinance

Recommended Policy: The developing Yadkin River trail will provide a great service to Jonesville citizens and visitors alike. To ensure safety and access of the trail system an ordinance regarding trail access, times and provisions for emergency access should be made. This may include hours of use, types of equipment allowed on trails, weapons, penalties or fines and responsible entities in charge of enforcing/adjudicating the ordinance and regulations. Vehicles for emergency access should be included in the fleets of first responders and available for use by the Police, EMS or Town staff to maintain and ensure safety and access along the Yadkin River Trail.

ACTIVITIES AND EVENTS

The following activities, events and programs create ownership of the pedestrian transportation system by citizens. Ideas were suggested by steering committee members, citizens and staff.

A. Sidewalk Maintenance Agreements with Property Owners

To clarify what sidewalk maintenance is required by adjacent property owners and what is required by the Town of Jonesville, a sidewalk maintenance agreement and program should be conducted. This agreement will ensure clarity on sidewalk repair responsibility and public access for existing and future sidewalks.

The maintenance agreement may require property owners to cut back trees or shrubs that block the sidewalk right of way, and may also require the landowner to repair broken or damaged sidewalk. If repairs are not completed in a timely manner, the maintenance agreement may spell out the terms in which the Town would repair sidewalk and charge the property owner for the cost of repair or a percentage of the cost.

B. Sidewalk and Trail Construction Fund

Create a capital improvement plan in the Town budget to fund construction of sidewalks and trails. The fund could support a 50/50 cost sharing agreement between property owners who want to construct sidewalk or sidepath, but are not willing or able to pay the entire cost of sidewalk installation. In addition, minor intersection improvements including curb ramping, wheelchair landing areas and other small improvements could be eligible for this funding source. Large projects (e.g. >$150,000 total project cost) for sidewalk, trail or sidepath could utilize this fund to match federal funding (when available), allowing the fund to stretch further.

C. Coordination with other municipalities on bicycle and pedestrian transportation

Jonesville and Elkin have a shared economy, divided by a County and Municipal boundaries and the Yadkin River. Encourage the development of a joint bicycle and pedestrian transportation advisory committee that will work to refine and develop regional bicycle and pedestrian transportation initiatives that connect across municipal lines, encourage active transportation, recreations, cleaner air and personal health.

D. Establish Streetscape Committee

Establish a streetscape committee to target specific routes identified in this plan for lighting, tree and landscaping improvements along existing streets and roads such as NC 67 and US 21 Business. The streetscape committee could also explore a *traffic calming* program in coordination with streetscape enhancements. Enhance lighting to accommodate and encourage pedestrian or bicycle travel. In the absence of a stand-alone committee, have a regular update or agenda item for Streetscape improvements at the Jonesville Business Association or Town Council meetings.

E. Economic Impact Study

Jonesville lies within the Yadkin River Valley, and is one of several governments invested in the growth of agricultural and environmental tourism in the area. It is likely that visitors to Jonesville will want to be able to walk around its commercial districts for dining, shopping, and lodging. A simple economic assessment of the potential benefits of having pedestrian infrastructure that can support this access would be a helpful tool for determining the untapped values of window shoppers and passersby in the town. The greater access residents may have to these areas as well as jobs centers should also be considered in such a study.

F. Let's Go NC!

This education program teaches elementary age children how to walk and bike safely, giving them the essential skills that they need to enjoy a healthy and active lifestyle.

Let's Go NC! A Pedestrian and Bicycle Safety Skills Program for Healthy, Active Children is an all-in-one package of lesson plans, materials, activities and instructional videos that encourage children to learn about and practice fundamental skills that build safe habits.

This program was developed for the North Carolina Department of Transportation's Division of Bicycle and Pedestrian Transportation and Safe Routes to School Program by NC State University's Institute for Transportation Research and Education.

G. Watch for Me NC

The "Watch for Me NC" program aims to reduce pedestrian and bicycle injuries and deaths through a comprehensive, targeted approach of public education and police enforcement. The project website www.watchformenc.org has several resources where you can learn more about how to be a safer driver, bicyclist, and pedestrian, and ultimately, reduce the number of people hit or killed by vehicles on North Carolina streets. We all share the responsibility to make sure North Carolina roads are safe for everyone, including pedestrians and bicyclists. Safe places to walk and bike are important for supporting active, vibrant communities.

H. Pedestrian Laws Training Program

This program created by the NCDOT Bicycle and Pedestrian Program is designed for children, adults or police. The program covers the following topics: Right-of-way at crosswalks, right turn on red, yielding to vehicles, walking on roadways without sidewalks, railroad crossings and more. More information about North Carolina pedestrian laws can be found here: www.ncdot.gov/bikeped/lawspolicies/

I. Adopt a Trail / Adopt a Sidewalk Programs

Adopt a Road programs are seen in many communities across North Carolina. The program provides resources to the community to sponsor and help to clean up road litter. The Town of Jonesville can begin a similar program for its future pedestrian or bicycle facilities. This program could also be used as a means for the community to alert the Town government or facility sponsor when there is a maintenance issue.

J. Heart Healthy Walking Trail

Multiple municipalities throughout the Triad have started walkable communities programs that promote a healthier populace as well as the need for sidewalks. The City of Lexington's Walking Tour routes visitors and residents through the city's commercial sector and into adjacent residential areas for a total of over two miles of urban routes. Elkin, Mount Airy and Wilkesboro have similar "trails". A similar program could increase potential consumer traffic for Jonesville's businesses, connect the town's residents to places to eat, shop, and recreate, and improve the cardiovascular health of the town's residents.

K. Safe Routes to School Programs (SRTS)

The Safe Routes to School and Active Routes to School program is a national and international movement to enable and encourage children, including those with disabilities, to walk and bicycle to school. The programs are comprehensive efforts that look at ways to make walking and bicycling to school a safer and more appealing transportation alternative, thus encouraging a healthy and active lifestyle from an early age. The North Carolina SRTS program is administered by the North Carolina Department of Transportation Bicycle and Pedestrian Transportation Division. In cooperation with the NC Division of Public Health, a local coordinator has also been designated at a regional level to help administer, fund and support programs – Clint Cresawn, Active Routes to School Coordinator clint.cresawn@apphealth.com. There is funding available for a broad spectrum of initiatives including, but not limited to:

- Walking school bus programs (i.e. groups of students and parents/teachers walking to school) www.walkingschoolbus.org

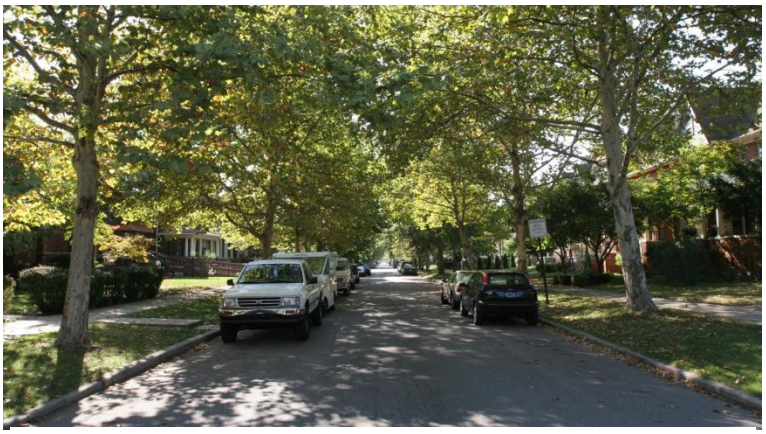
- Crossing guard training (i.e. when the school system and local law enforcement do not have the current resources to provide training)
- One-time or weekly walking and bicycling safety events (i.e. bicycle rodeos, safety and health awareness fairs, walk to school day - www.walktoschool.org)
- Safety curriculum (i.e. printing safety curriculum and training for teachers) and
- Bicycling and walking improvements (i.e. sidewalks, paths, bike parking, bike lanes, crossing treatments)

Many of the SRTS programs take few resources to get started (aside from bicycling and walking facility improvements), however a "local champion" will be needed to start and implement Safe Routes to School programs. The "local champion" will likely be a parent or teacher who can lead the effort on Safe Routes to School. This is a significant opportunity to fund programs educating and encouraging both students and parents about the benefits of walking or bicycling to school.

L. Tree Programs

Explore enhanced tree planting and preservation programs for the Town of Jonesville. Basic requirements of the enhanced program should include the following requirements:

- If trees are cut down, replacement trees should be of equal or greater than the diameter of the trees cut, multiple trees can be planted where the sum of the diameters are equal to the diameter of the trees cut down;
- If trees are trimmed by utilities, provide criteria for severity and scope of trimming and a process to communicate these criteria to the utility company;
- Provide more detailed guidance on the types of trees and landscaping for commercial and retail areas; and
- Provide a certified part-time ISA arborist to educate and enforce the ordinance.
- Ensure trees and landscaping do not impede the pedestrian or roadway right of way



Tree Buffered Sidewalk
Credit: D. Burden, 2006

Some cities have worked with the utility company to provide free saplings and trees to customers. In addition, education for citizens, businesses and developers about affordable and quality trees can be beneficial to improve the tree canopy, property aesthetics and the pedestrian experience.

CHAPTER 4: IMPLEMENTATION

OVERVIEW

This chapter breaks down the implementation steps of the Town of Jonesville Comprehensive Pedestrian Transportation Plan. Implementing the recommendations within this plan will require *leadership* and *dedication* to pedestrian facility development on the part of a variety of agencies and individuals. Equally critical, and perhaps more challenging, will be meeting the need for a recurring source of revenue. Even small amounts of local funding could be very useful and beneficial when matched with outside sources. Most importantly, the Town need not accomplish the recommendations of this plan by acting alone; success will be realized through collaboration with others, coordination with regional and state agencies, and partnering with the private sector and non-profit organizations.

As an example of a possible funding source, the federal Transportation Alternatives Program requires a 20% local match. The Parks and Recreation Trust Fund (PARTF), a State program, requires 50% match. Successful applications for funding from the various resources will be integral to implementation of pedestrian transportation goals and objectives. When using federal funds for a project, it is recommended that the total estimated project cost be greater than $150,000 given current inspection, paperwork and staff-time requirements associated with using federal funding on local projects. A thorough list of funding opportunities from state and federal agencies and non-profits are listed in *Appendix C: Resource and Funding Opportunities*.

Given the present day fiscal challenges faced by local governments (and state and federal governments), it is difficult to know what financial resources will be available at different times during the implementation of this plan. However, there are still important actions to take in advance of major investments, including key organizational steps, the initiation of education and safety programs, and the development of strategic, lower-cost sidewalk and trail facilities. Following through on priorities will allow key stakeholders to prepare for larger pedestrian and trail projects over time, while taking advantage of strategic opportunities as they arise.

Effective implementation of recommended projects, programs and policies outlined in this plan will require the sustained, focused and coordinated efforts by Town leaders and Jonesville citizens. The planning efforts to date have reinforced the interest of citizens in creating more trails, sidewalks, open space, routes and safe road crossings. Continued effort in implementing action items will create the momentum needed to carry out plans outlined for the next 20 years. *Figure 18: Organization Framework for Implementation* identifies partners and communication pathways for implementing the plan recommendations. *Table 3: Key Action Steps* outlines how the highest priority action items can be implemented and the entities with primary responsibility for carrying out each action item.

Figure 18: Organization Framework for Implementation

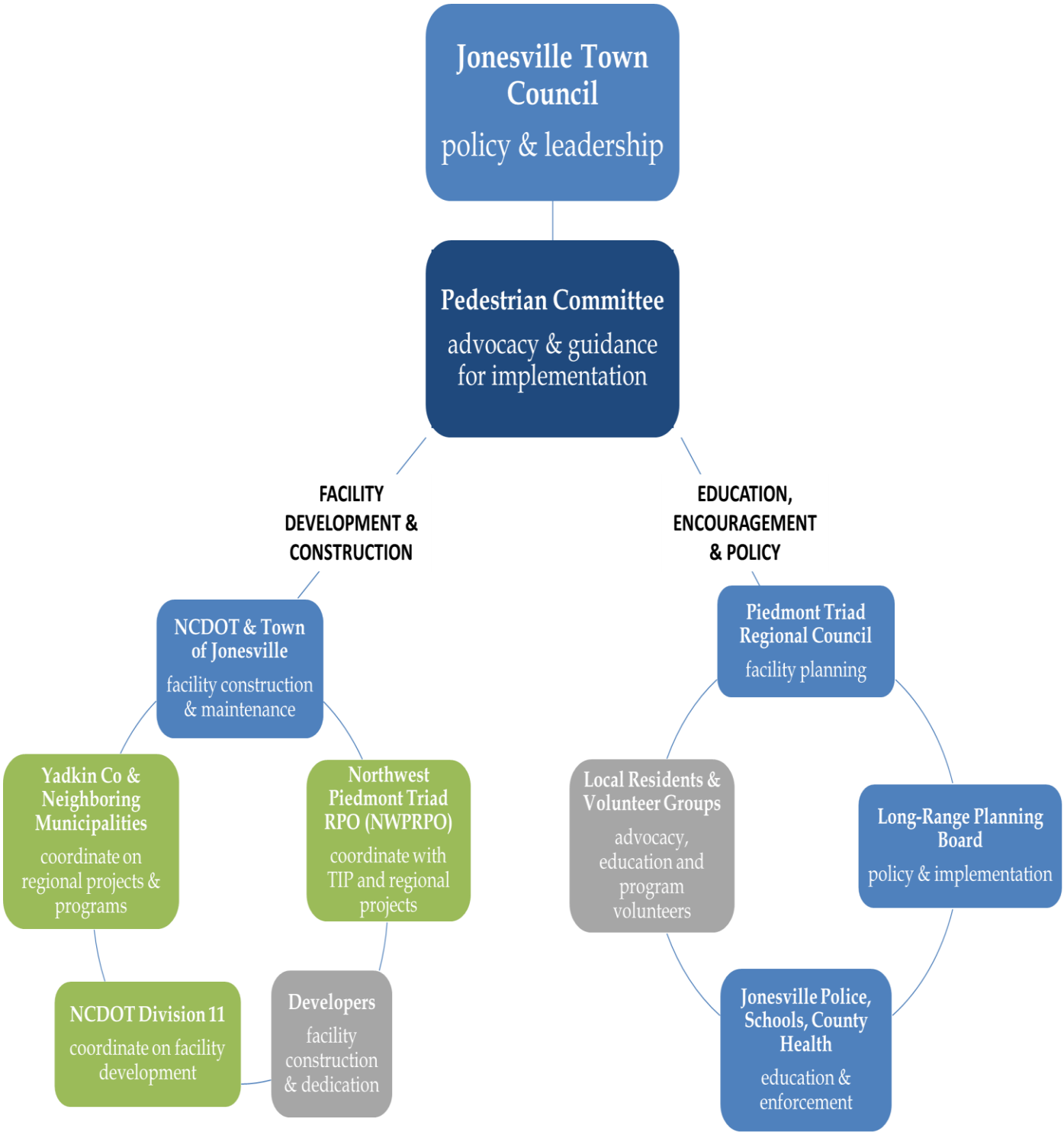


Table 3: Key Action Steps

Task	Partners	Details	Time Frame
Present plan to Town Council	Steering Committee, PTRC	Presentation to Town Council	Short-term
Adopt this plan	Town Council	Document becomes an official planning document of the Town	Short-term
Designate staff and key volunteers	Town Council, Steering Committee, Tourism Development Authority (TDA)	Designate staff and key volunteers to oversee the implementation of this plan and the maintenance strategy of the facilities that are developed.	Short-term
Trail use ordinance	Town Council, Planning Board, Friends of Jonesville Greenway, PTRC	Develop a trail use ordinance that determines when to use, what is allowed on the trail and any fines for misuse or abuse of the trail and its facilities	Short-term
Maintenance agreements and policy for property owners in advance of construction	Town Council, Business owners and landowners, Planning Board	As new sidewalk is constructed, create agreements with property owners with clear responsibilities outlined for adjacent property owners about not obstructing the sidewalk with bushes or other objects.	Short-term
Subdivision ordinance updates	PTRC, Planning Board, Citizens and Business Committee	Include Complete Streets, sidewalk requirements, dedication of trail easements and updates from other policy recommendations in Section 3.3 Policy, Event and Activity Recommendations.	Short/ Mid-term
Link EVTA and Jonesville Greenway Trail and install wayfinding between systems	TDA, Yadkin Valley Heritage Corridor, Elkin Valley Trail Assn. (EVTA), Friends of Jonesville Greenway and NCDOT Division 11	Advocate for a safe pedestrian connection between Elkin and Jonesville to connect and leverage each Town's investment in trails. Place wayfinding signage along the roadways and trails to destinations; coordinate design with the new Yadkin Valley Heritage Corridor brand and sign master plan.	Short/ Mid-term
Grant Funding Strategy for Implementation	TDA, All-America, Health Department, PTRC, NWPRPO, EVTA, Friends of Jonesville Greenway	Develop capital funds for ongoing development of the pedestrian transportation system. Powell Bill funds can be programmed for facility construction. Funding for maintenance, repair and small sidewalk gap construction should be incorporated in the annual Town budget.	On-going

Task	Partners	Details	Time Frame
Pedestrian safety & education programs	Schools, Public Health, Business Association, Historical Society, Visitors Center, Senior Center, NWPRPO	Utilize existing pedestrian safety and awareness programs found in Section 3.3 Policy, Event and Activity Recommendations. Provide materials for teachers and event organizers, but also provide direct education to stakeholders and the public at key events and fairs.	Ongoing
Communication and awareness	TDA, Friends of Jonesville Greenway, EVTA, Yadkin Valley Heritage Corridor	Using the existing plan website or via a new website, track and publicize grants awarded and progress made on implementing Jonesville projects, policies or activities. Share and promote with other Towns, residents, and tourists to the Yadkin Valley.	Ongoing
Best practices in pedestrian design	NCDOT Division 11, Town staff, NWPRPO	Become familiar with the State and national standards of pedestrian facility design as described in *Appendix D: Design Guidelines*.	Ongoing
Key intersections designs	NCDOT, NWPRPO	Complete design retrofits of intersections to facilitate pedestrian crossings at key intersections and identify funding opportunities through the RPO transportation prioritization process or other avenues.	Mid-term
NC 67 Streetscape Improvements	NCDOT, NWPRPO	Conduct a feasibility study and pedestrian friendly design alternatives to NC 67 from the I-77 Interchange to the Gwyn McNeil Bridge	Mid/ Long-term
Yadkin Trail & NC 67 sidewalk loop	TDA, Town of Jonesville	Develop sidewalk along NC 67 and connect to the Jonesville Greenway establishing a walking/jogging loop for residents and visitors to use for recreation and transportation along the Yadkin River and NC 67 corridor.	Mid/ Long-term
Identify new action steps to complete pedestrian network recommend-dations	Town Council, Planning Board, NWPRPO	As projects are implemented, develop priorities for pedestrian facilities identified in the pedestrian plan or consider a full plan update.	Ongoing

PLAN UPDATE SCHEDULE

In five years a broader assessment and evaluation of efforts should be performed to both re-prioritize and check progress on implementing projects, programs and policies. New ideas, challenges and opportunities should also be explored. New individuals and organizations may need to be brought in to assist in implementation. The 5-year reassessment would serve as a Comprehensive Pedestrian Transportation Plan Update and may modify a number of sections of this current Plan.

APPENDIX A: DEMOGRAPHICS

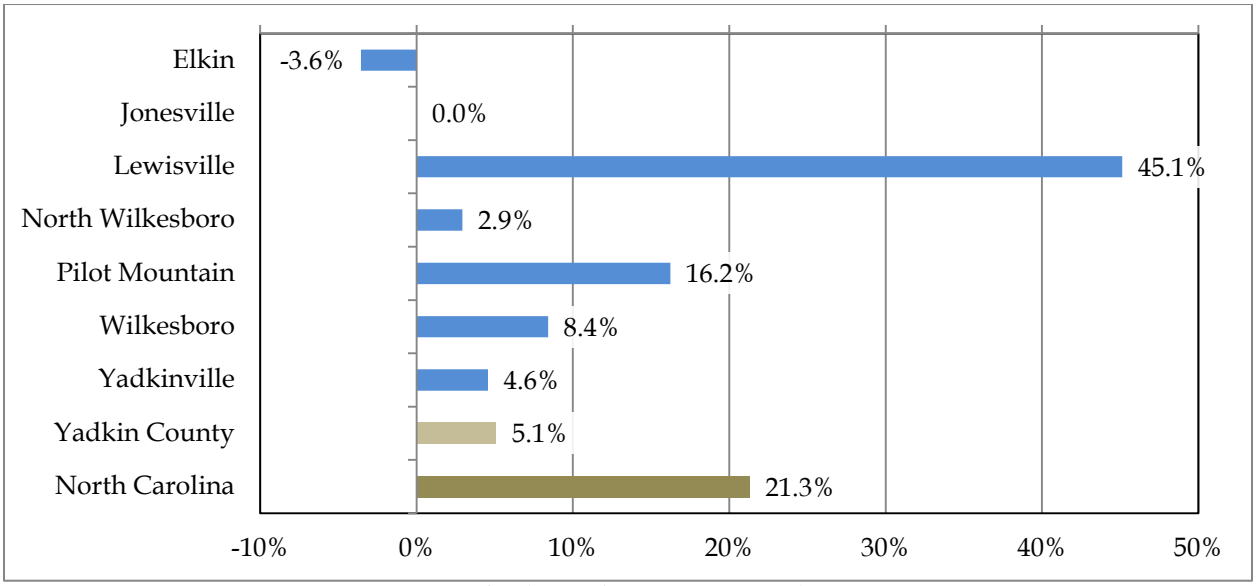
In some of the demographics found below, Jonesville is compared to peer communities that reflect development trends in similar sized communities in the region. In the last 60 years, the combined Jonesville and Arlington area has seen slight increases and decreases in population, but has remained mostly stable. The State, County and all of the peer communities except for Elkin have all seen a higher population growth rate than Jonesville since 2000. Except for Lewisville, the communities in this region lag behind the State growth rate.

Table A - 1: Historical Population Comparison

	Elkin	Jonesville (inc. Arlington)	Lewisville	North Wilkesboro	Pilot Mountain	Wilkesboro	Yadkinville	Yadkin County	North Carolina
2012	3,963	2,259	12,810	4,237	1,489	3,425	2,947	38,204	9,765,229
2010	4,001	2,285	12,639	4,245	1,477	3,413	2,959	38,406	9,535,483
2000	4,109	2,259	8,826	4,116	1,281	3,159	2,818	36,348	8,049,313
1990	3,790	2,344	n/a	3,384	1,181	2,573	2,525	30,488	6,628,637
1980	2,858	2,623	n/a	3,260	1,090	2,335	2,216	28,439	5,881,766
1970	2,899	2,370	n/a	3,357	1,309	2,038	2,232	24,599	5,084,411
1960	2,868	2,485	n/a	4,197	1,310	1,568	1,644	22,804	4,556,155
1950	2,842	2,293	n/a	4,379	1,092	1,370	820	22,133	4,061,929

Source: U.S. Census Bureau; NC State Demographer (September 2013 Projections)

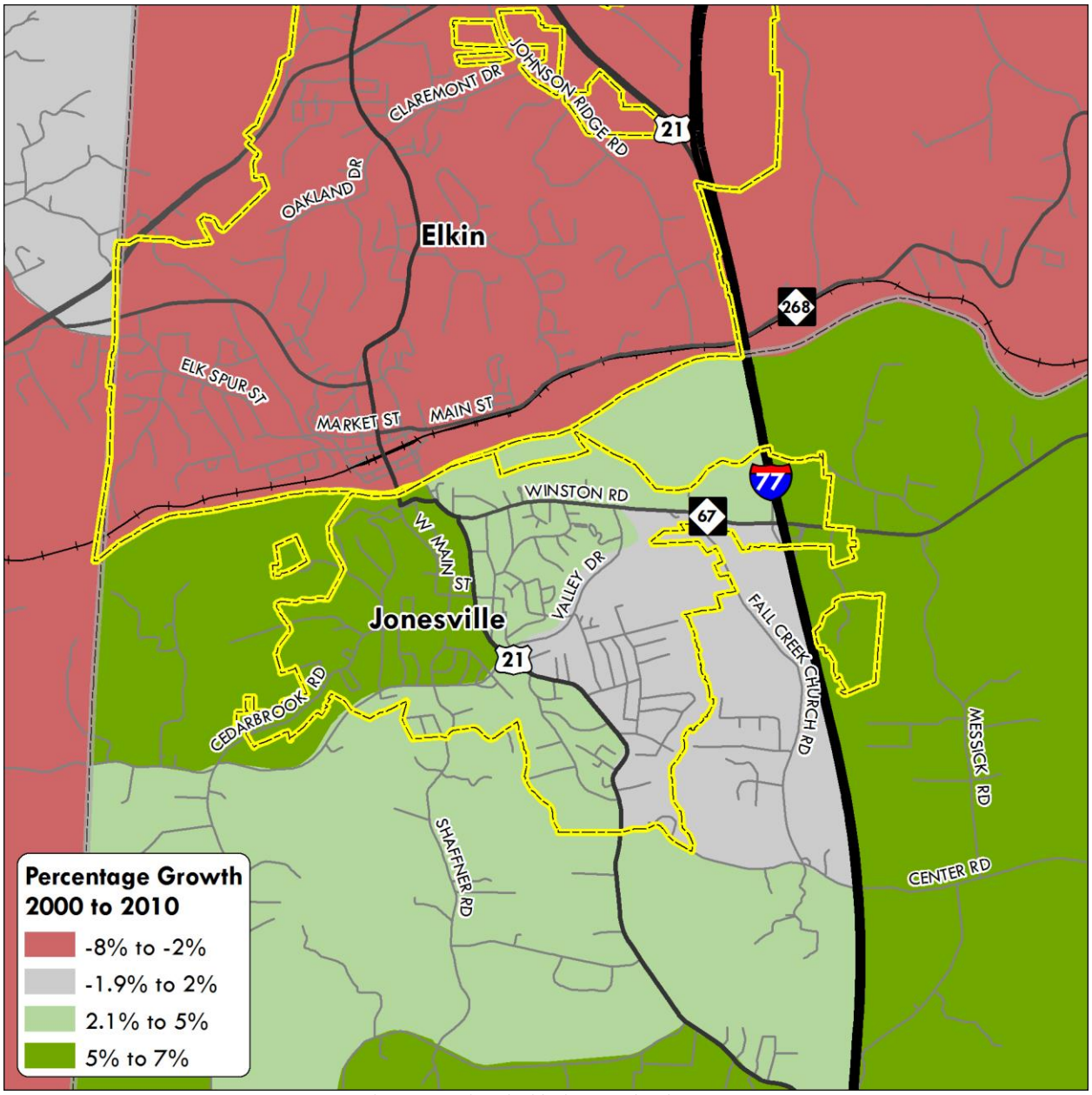
Figure A-1: Growth Rate Comparison, 2000-2012



Source: U.S. Census Bureau; NC State Demographer (September 2013 Projections)

The majority of Jonesville experienced very low population growth between 2000 and 2010. A small portion on the eastern part of Town, east of US-21 and west of I-77, experienced a slight decline in population growth. The northwest part of Town, west of Main Street, and areas east of I-77 experienced a slightly higher growth rate than the rest of Town.

Figure A-2: Population Growth Rate, 2000-2010

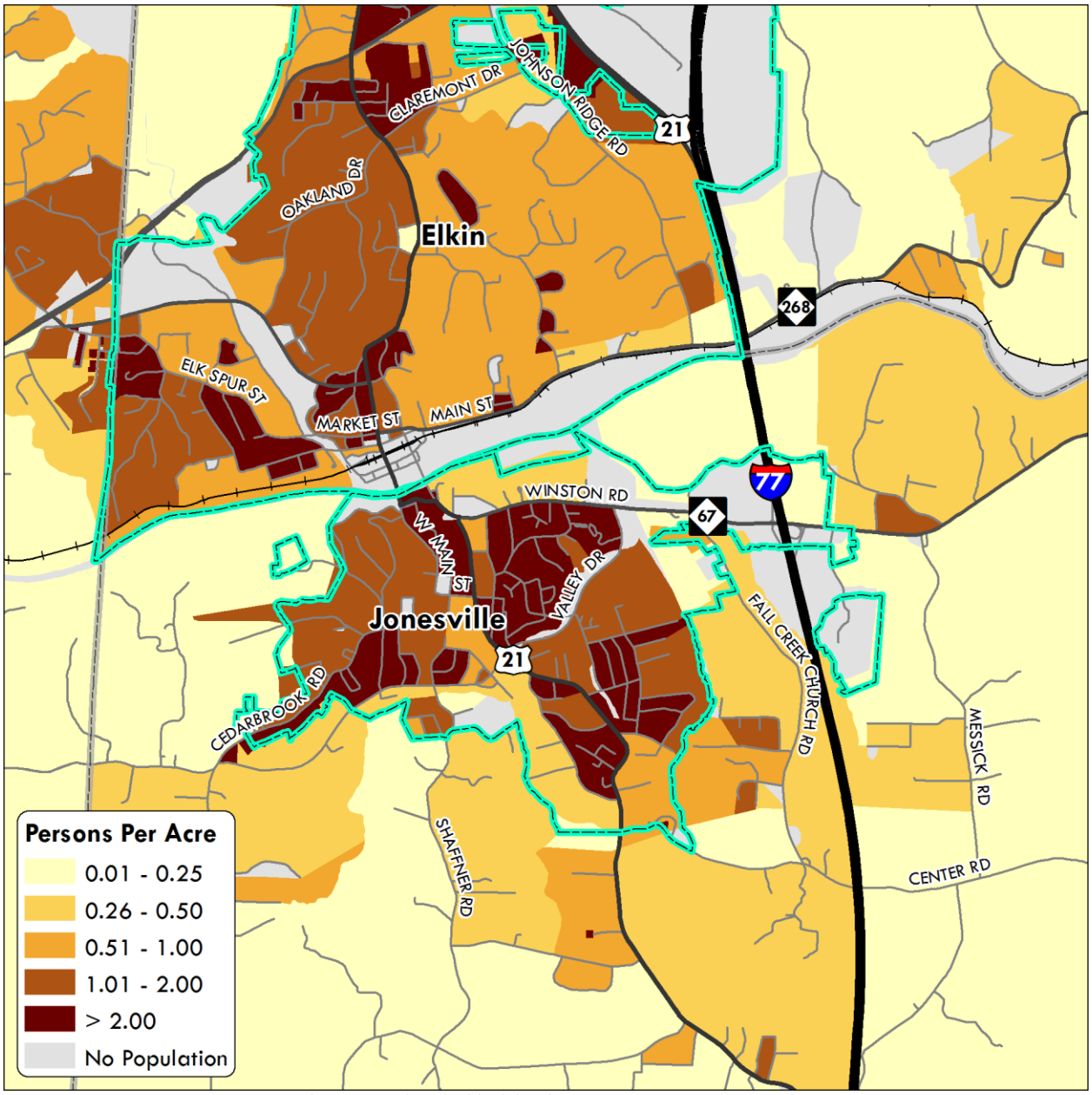


Source: U.S. Census Bureau 2000 & 2010; data mapped at the block group level.

POPULATION DENSITY

Most areas within Jonesville are typically low density with one to two people per acre. Areas between NC-67 and Valley Drive and along US Highway 21 and Cedarbrook Drive are denser due to smaller lot sizes.

Figure A-3: Population Density



Source: U.S. Census Bureau, 2010, data mapped at the block level.

RACE & ETHNICITY

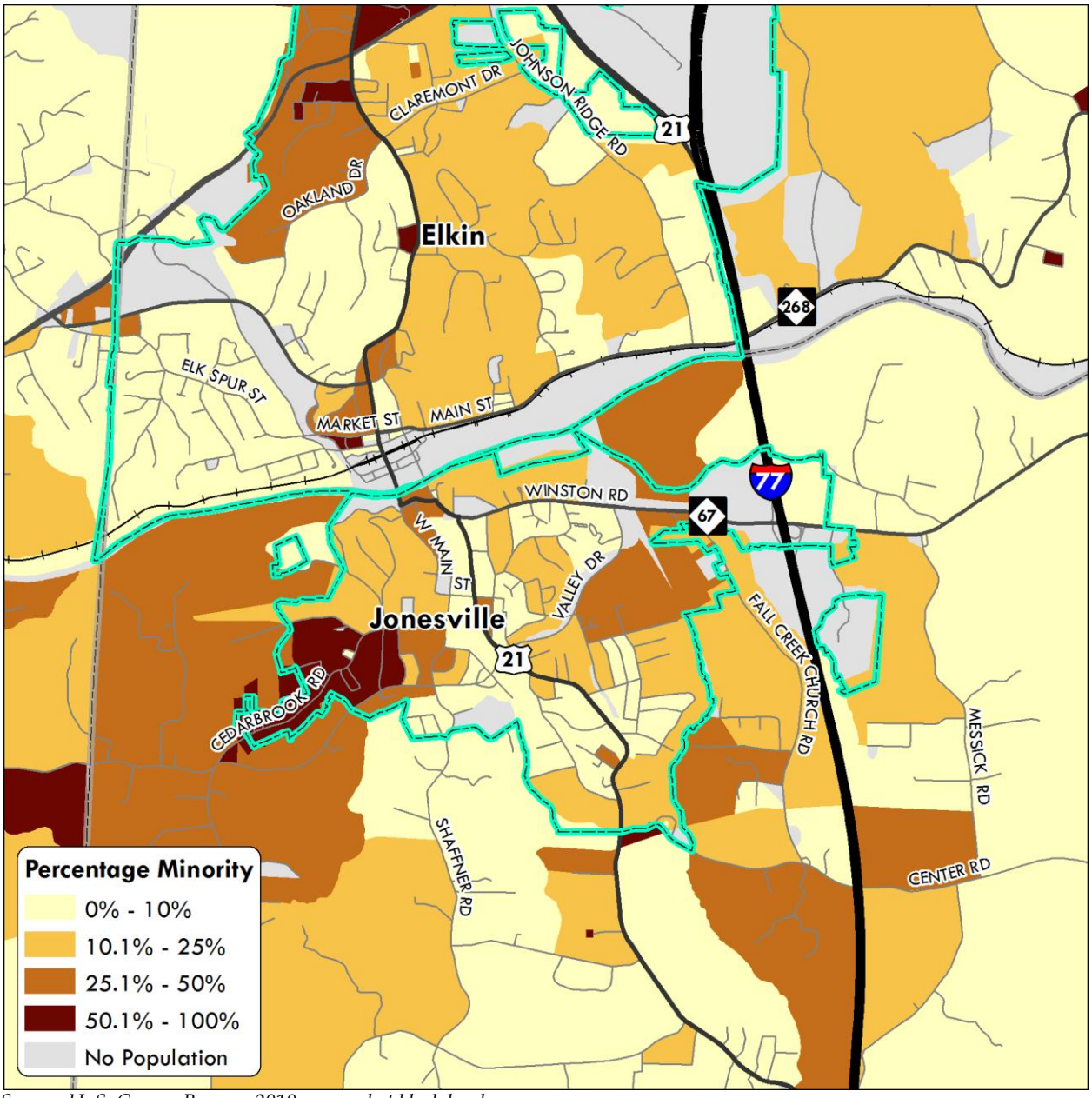
Almost 29% of the residents in Jonesville are minority residents. About 71% of residents are non-Hispanic whites. The Hispanic population is the largest minority group in Jonesville, representing close to 13% of the population. The African American population represents close to 11% of Jonesville's population. Most of the minority population is located in the western area of the Town along Cedarbrook Road.

Table A-2: Jonesville Population by Race and Ethnicity, 2012

RACE & ETHNICITY		
Not Hispanic or Latino	2,327	87.4%
White	1,901	71.4%
Black or African American	279	10.5%
American Indian and Alaska Native	0	0.0%
Asian	0	0.0%
Two or more races:	147	5.5%
Hispanic or Latino	336	12.6%
White	0	0.0%
Black or African American	0	0.0%
Other	336	12.6%

Source: ACS 5-year estimates (2008-2012) Table B03002

Figure A-4: Percentage Minority by Block, 2010

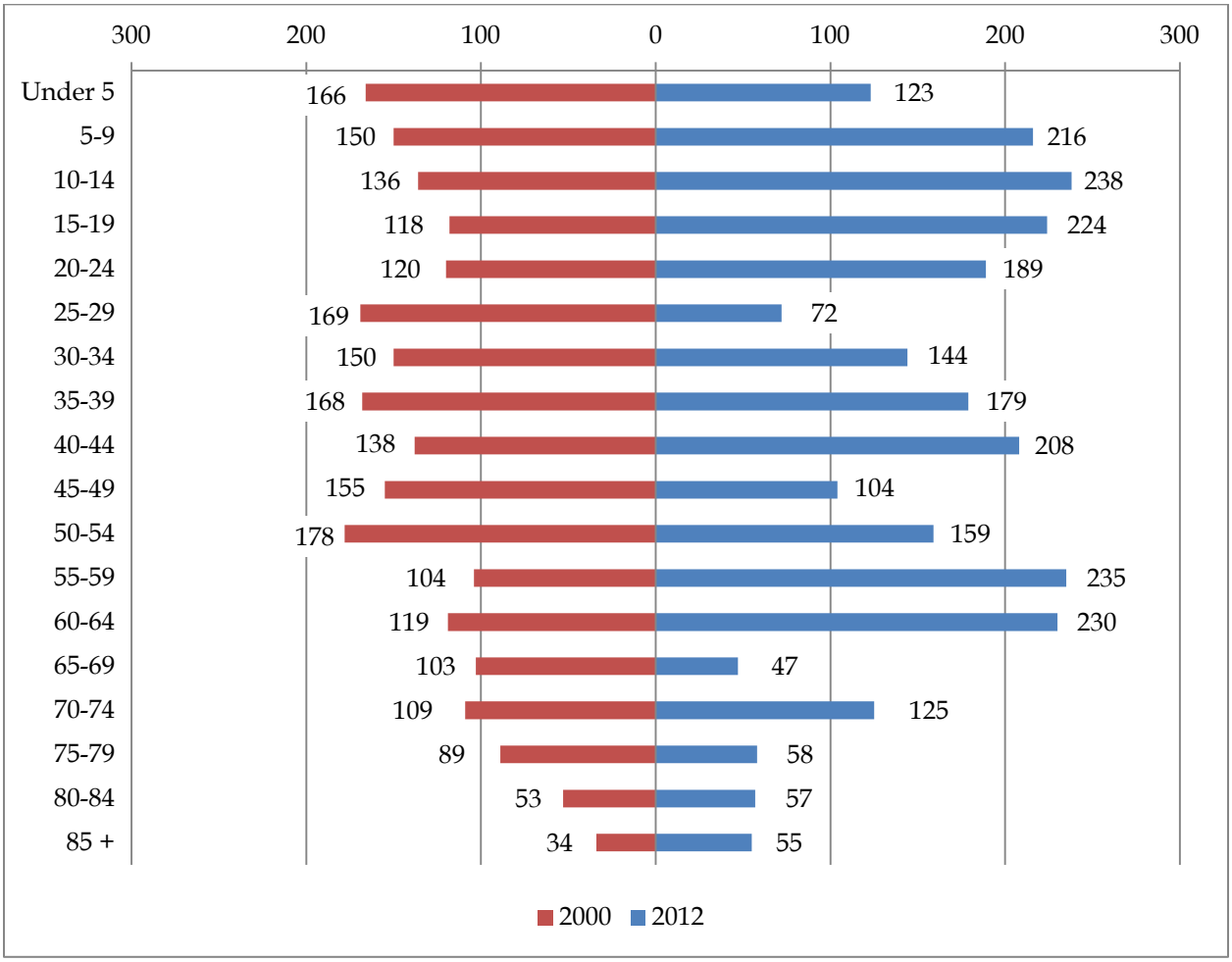


Source: U. S. Census Bureau, 2010; mapped at block level

AGE

The median age in Jonesville is 39. In 2012, the largest single age group within Jonesville was persons age 10-14, followed by persons age 55-59 and 60-64. Between 2000 and 2012, the persons age 25-29 lost the most population.

Figure A-5: Age Group Distribution, 2000 & 2012



Source: U.S. Census Bureau 2000; ACS 5-year estimates (2008-2012) Table B01001

INCOME

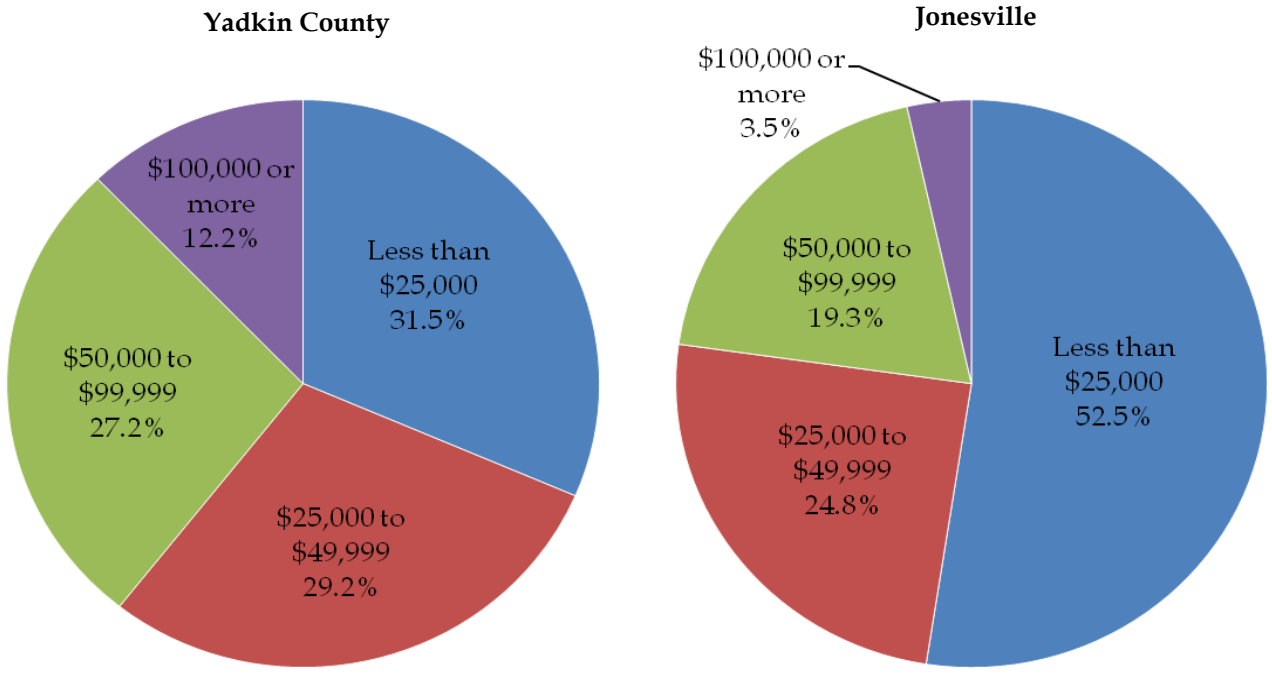
The median household, family and per capita incomes in Jonesville are lower than the County, State and comparison towns, except for North Wilkesboro. Over half of the households in Jonesville have a median income less than $25,000.

Table A-3: Income Comparison, 2012

Place	Per Capita	Median Household	Median Family
Elkin	$16,923	$34,819	$51,847
Jonesville	$15,589	$22,283	$34,917
Lewisville	$35,284	$69,883	$85,500
North Wilkesboro	$13,644	$19,714	$30,156
Pilot Mountain	$25,671	$33,988	$448,542
Wilkesboro	$20,272	$31,716	$57,333
Yadkinville	$18,650	$32,663	$44,375
Yadkin County	$22,117	$40,316	$50,954
North Carolina	$24,828	$46,450	$57,146

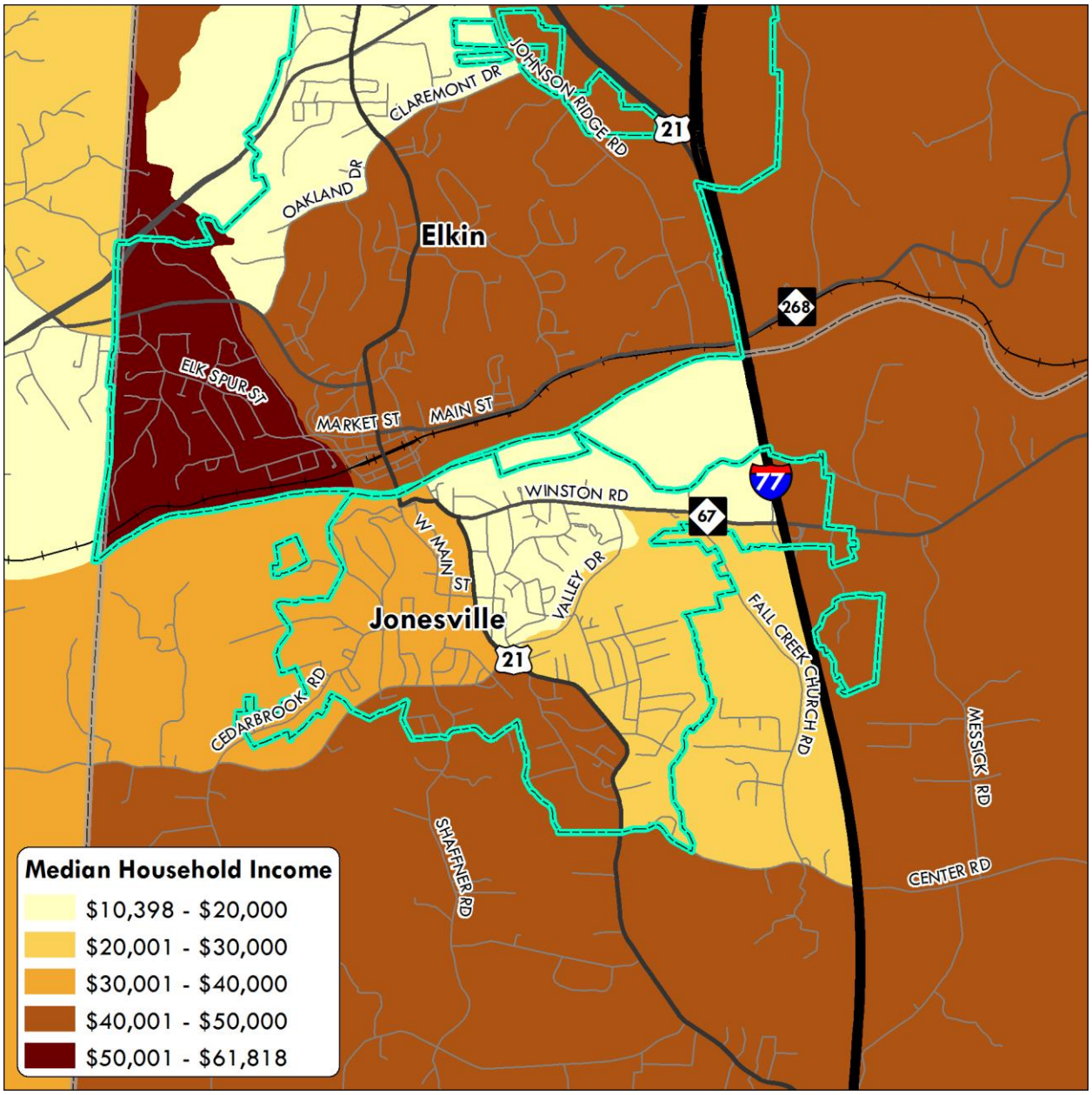
Source: ACS 5-year estimates (2008-2012) Table DP03, B06011

Figure A-6: Household Income Comparison, 2012



Source: ACS 5-year estimates (2008-2012) Table S1901

Figure A-7: Median Household Income, 2012



Source: ACS 5-year estimates (2008-2012) Table B06011

POVERTY

The poverty rates in Jonesville are above the rates for the County and State. The overall poverty rate and poverty rate among children in Jonesville is higher than Elkin, Lewisville and Pilot Mountain. The elderly poverty rate (ages 65 years and over) in Jonesville is higher than all comparison towns except for Elkin.

Table A-4: Poverty Rate Comparison, 2012

Place	Overall	Children	Elderly
Elkin	11.3%	4.6%	23.8%
Jonesville	29.2%	46.8%	19.3%
Lewisville	8.9%	12.7%	0.6%
North Wilkesboro	37.3%	54.6%	9.1%
Pilot Mountain	16.7%	25.1%	10.8%
Wilkesboro	35.1%	65.0%	10.0%
Yadkinville	34.6%	58.2%	9.7%
Yadkin County	17.6%	27.2%	16.4%
North Carolina	16.8%	23.8%	10.2%

Source: ACS 5-year estimates (2008-2012) Table S1701

DISABILITY

The disability rate in Jonesville is higher for the total population, adult population and the elderly population when compared to the disability rates for the County and the State. The disability rate for children under age 18 is slightly lower than both the County and the State disability rate.

Table A-5: Disability Status Comparison, 2012

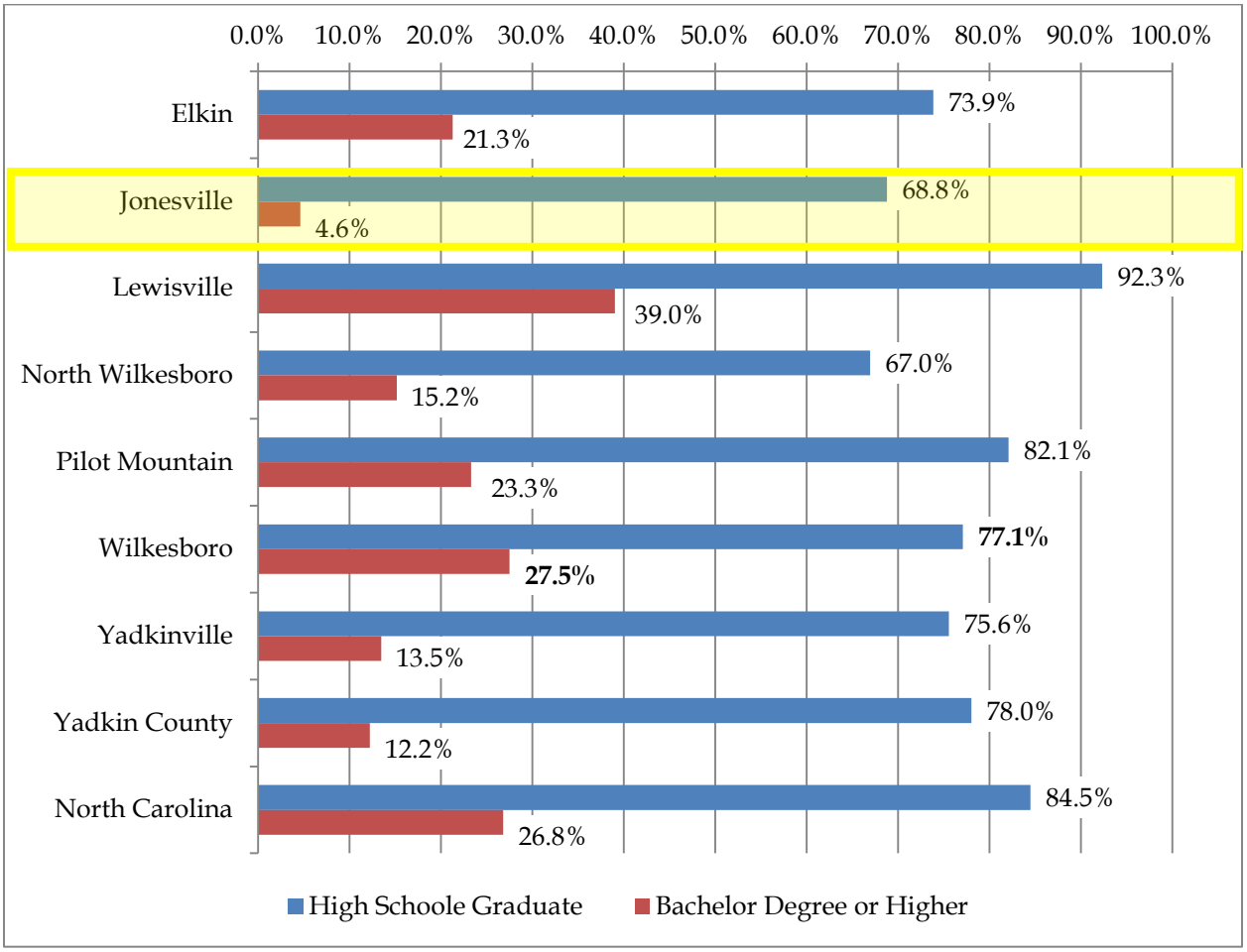
Age Range	Jonesville		Yadkin County		North Carolina	
	With a Disability	% Disabled	With a Disability	% Disabled	With a Disability	% Disabled
Under 18	22	3.0%	280	3.2%	98,600	4.3%
18 to 64	269	16.9%	2,726	11.8%	665,654	11.4%
65+	171	50.0%	2,488	41.4%	462,760	38.4%
Total Population	462	17.3%	5,494	14.5%	1,227,014	13.1%

Source: ACS 5-year estimates (2008-2012) Table DP02

EDUCATIONAL ATTAINMENT

Jonesville's educational attainment rates among adults are lower than the County, State and other comparison towns. Only 4.6% of the adult population in Jonesville has a Bachelor's degree of higher.

Figure A-8: High School & College Graduation Comparison, 2012



Source: ACS 5-year estimates (2008-2012) Table DP02

TRANSPORTATION TO WORK & TRAVEL TIME

Jonesville's population age 16 years or over, comprise only 53.6% are in the labor force. The majority of residents in the labor force drive to work alone. These residents have a mean travel time to work of just over 24 minutes, which is higher than the State average but lower than the County travel times to work. Currently, no workers in Jonesville walk or take public transportation to work.

Table A-6: Journey to Work Mode Share & Travel Time, 2012

Mode	Jonesville	Yadkin County	North Carolina
Car, truck, or van -- drove alone	90.7%	85.4%	80.9%
Car, truck, or van – carpooled	5.7%	9.5%	10.7%
Public transportation (excluding taxicab)	0.0%	0.1%	1.1%
Walk	0.0%	0.6%	1.8%
Other	0.9%	1.8%	1.3%
Worked at home	2.7%	2.6%	4.3%
Mean travel time to work (minutes)	24.1	27.1	23.5

Source: ACS 5-year estimates (2008-2012) Table DP03

Only 10.5% of the labor force in Jonesville is employed within the Town. About 15% of workers commute to Elkin and another 14% to Winston-Salem. Of the 1,572 jobs available within the Town, only 5.5% are held by a Jonesville resident.

Table A-7: Places Where Jonesville Residents Are Employed, 2011

Place	% of Labor Force
Elkin	15.2%
Winston Salem	14.3%
Jonesville	10.5%
Yadkinville	9.0%
Wilkesboro	2.7%
Greensboro	2.1%
North Wilkesboro	1.9%
Dobson	1.8%
High Point	1.7%
Mooresville	1.7%
Other	39.2%

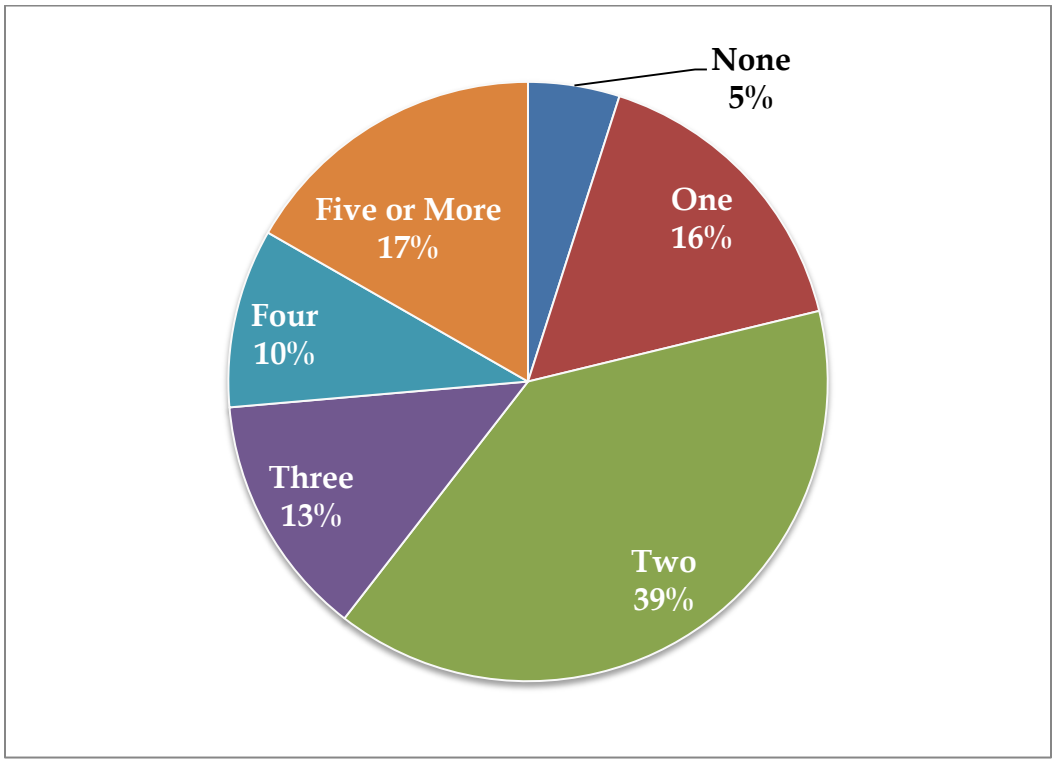
Table A-8: Places Where Jonesville Workers Live, 2011

Place	% of Labor Force
Jonesville	5.5%
Elkin	4.9%
Winston Salem	1.4%
Boonville	1.1%
Pleasant Hill (CDP)	1.1%
Greensboro	1.0%
Mount Airy	0.7%
North Wilkesboro	0.7%
Rhonda	0.7%
Yadkinville	0.7%
Other	82.2%

Source: LEHD, Inflow/Outflow Job Counts, 2011

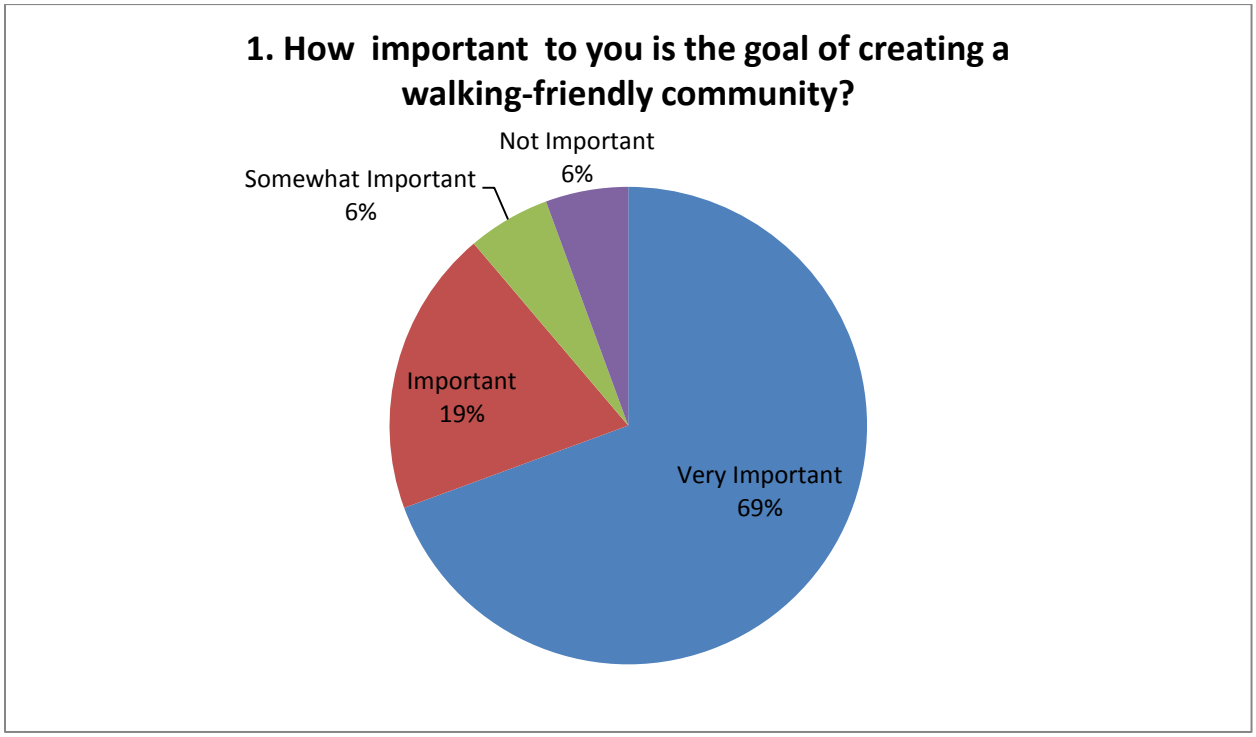
Only 4.9% of households in Jonesville do not have access to a vehicle. Another 16% have one vehicle available, while 79% have access to two or more vehicles.

Figure A-9: Vehicles Available Per Household, 2012

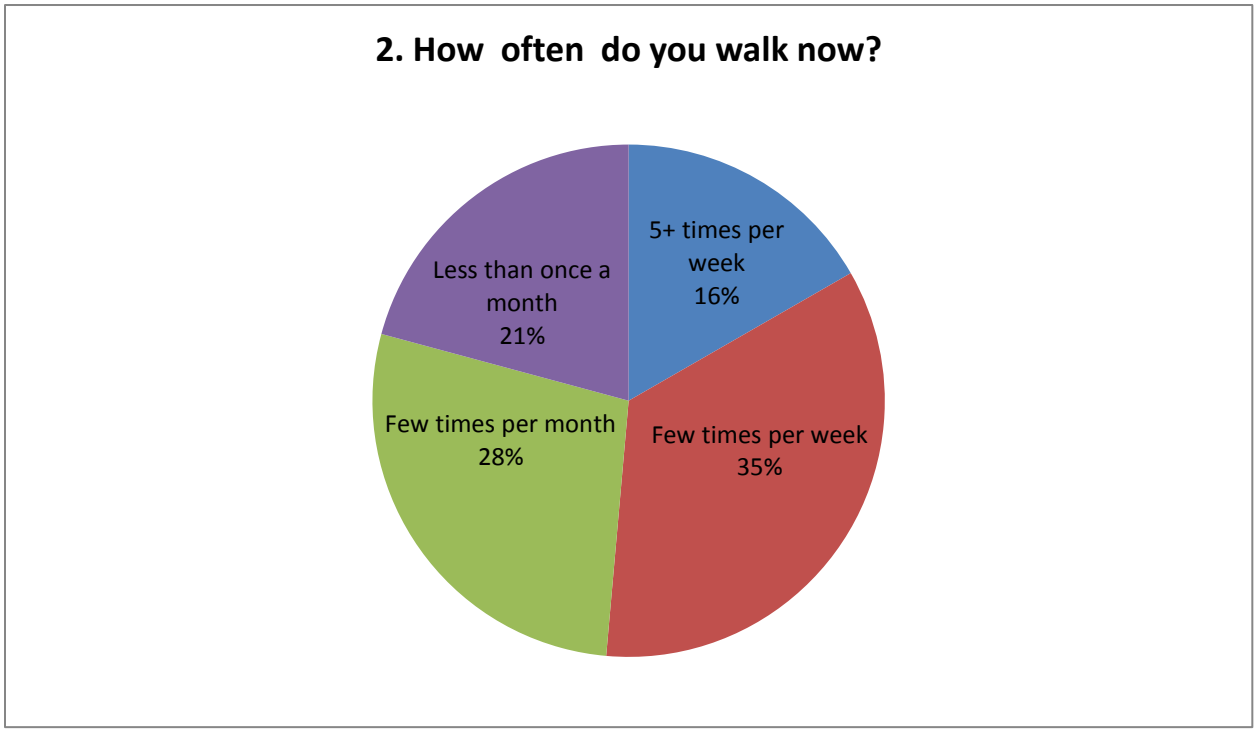


Source: ACS 5-year estimates (2008-2012) Table B08014

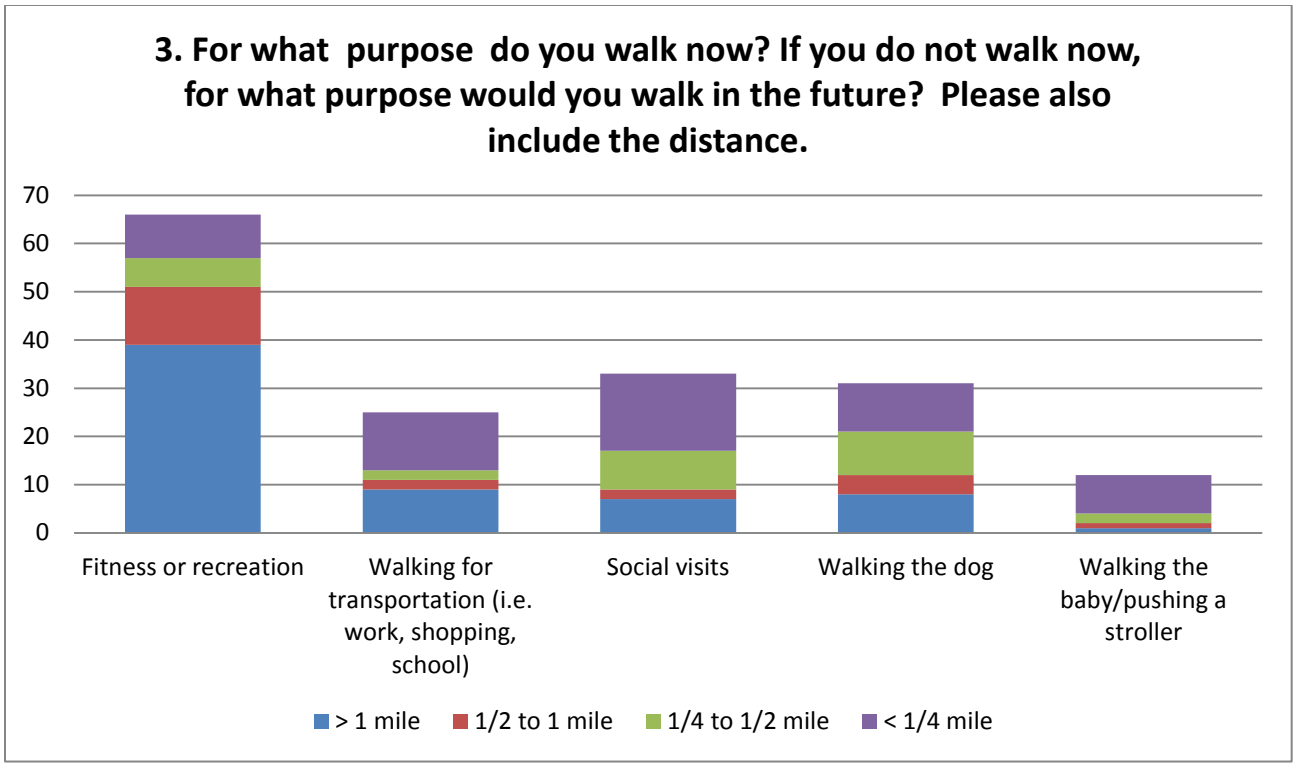
APPENDIX B: SURVEY RESULTS



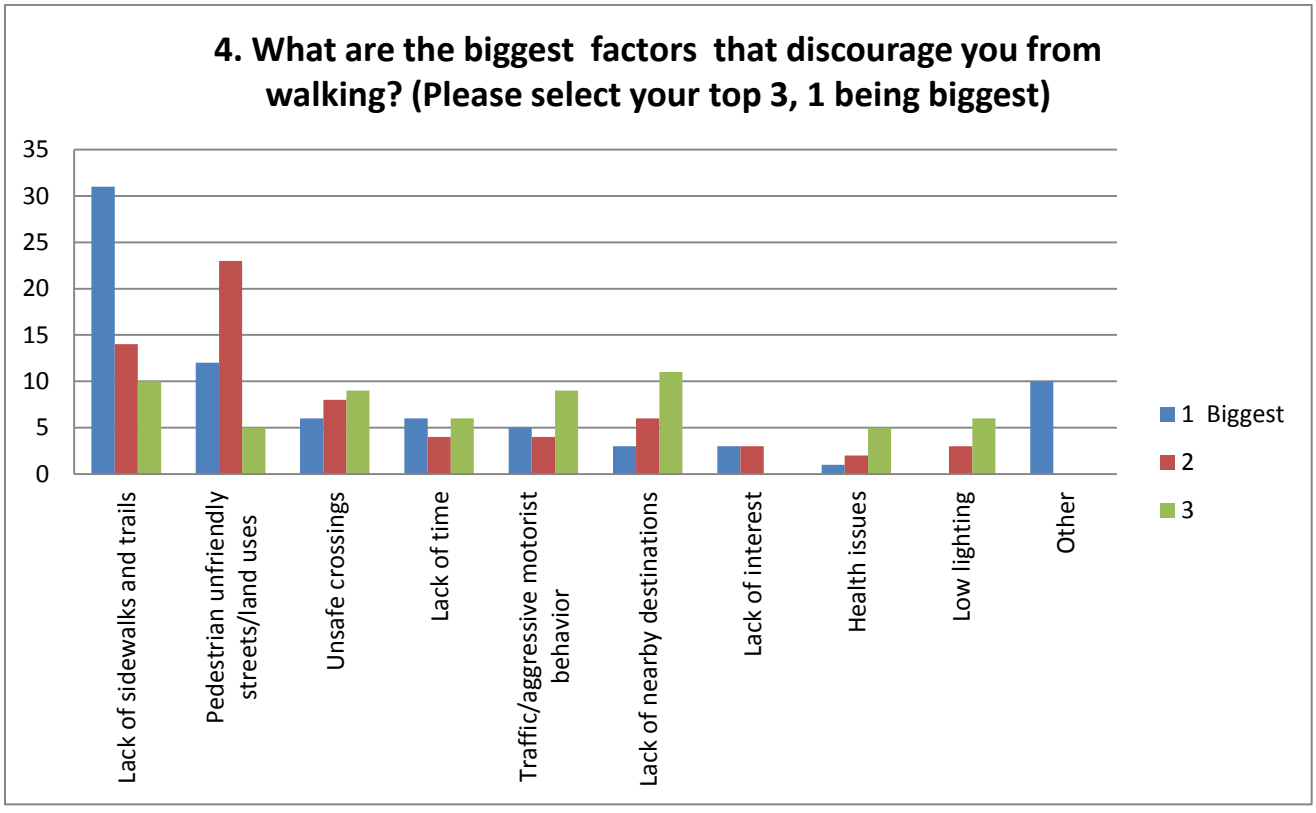
N=72



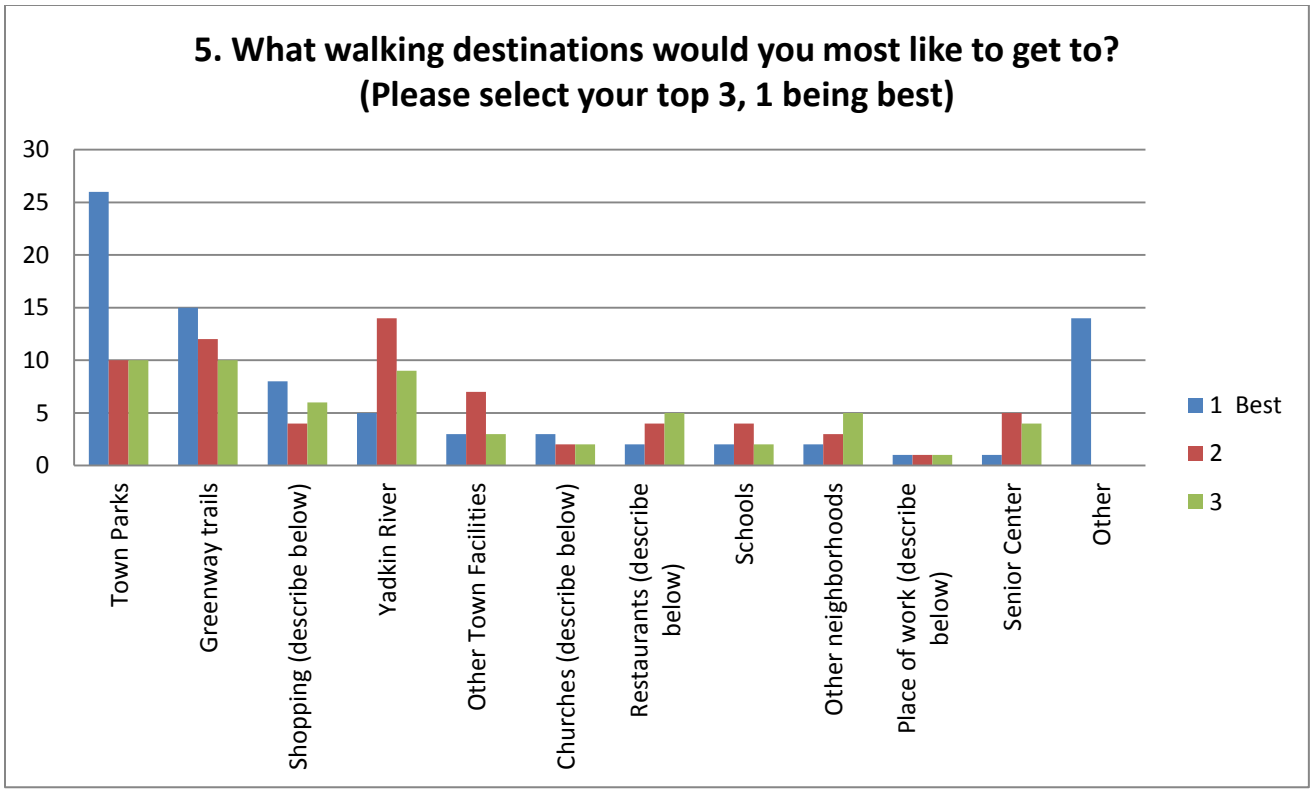
N=72


3. For what purpose do you walk now? If you do not walk now, for what purpose would you walk in the future? Please also include the distance.
70
60
50
40
30
20
10
0
Fitness or recreation
Walking for transportation (i.e. work, shopping, school)
Social visits
Walking the dog
Walking the baby/pushing a stroller
> 1 mile
1/2 to 1 mile
1/4 to 1/2 mile
< 1/4 mile

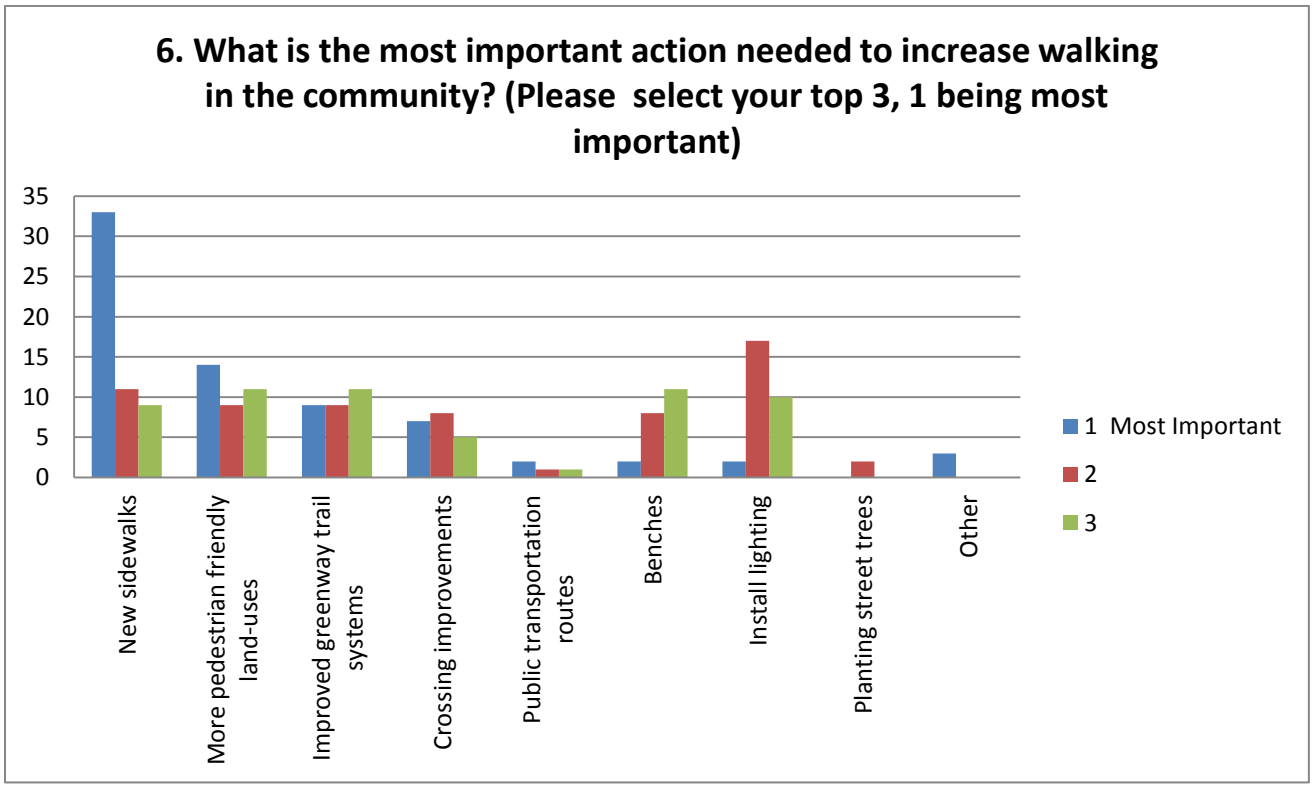
N=70


4. What are the biggest factors that discourage you from walking? (Please select your top 3, 1 being biggest)
35
30
25
20
15
10
5
0
Lack of sidewalks and trails
Pedestrian unfriendly streets/land uses
Unsafe crossings
Lack of time
Traffic/aggressive motorist behavior
Lack of nearby destinations
Lack of interest
Health issues
Low lighting
Other
1 Biggest
2
3

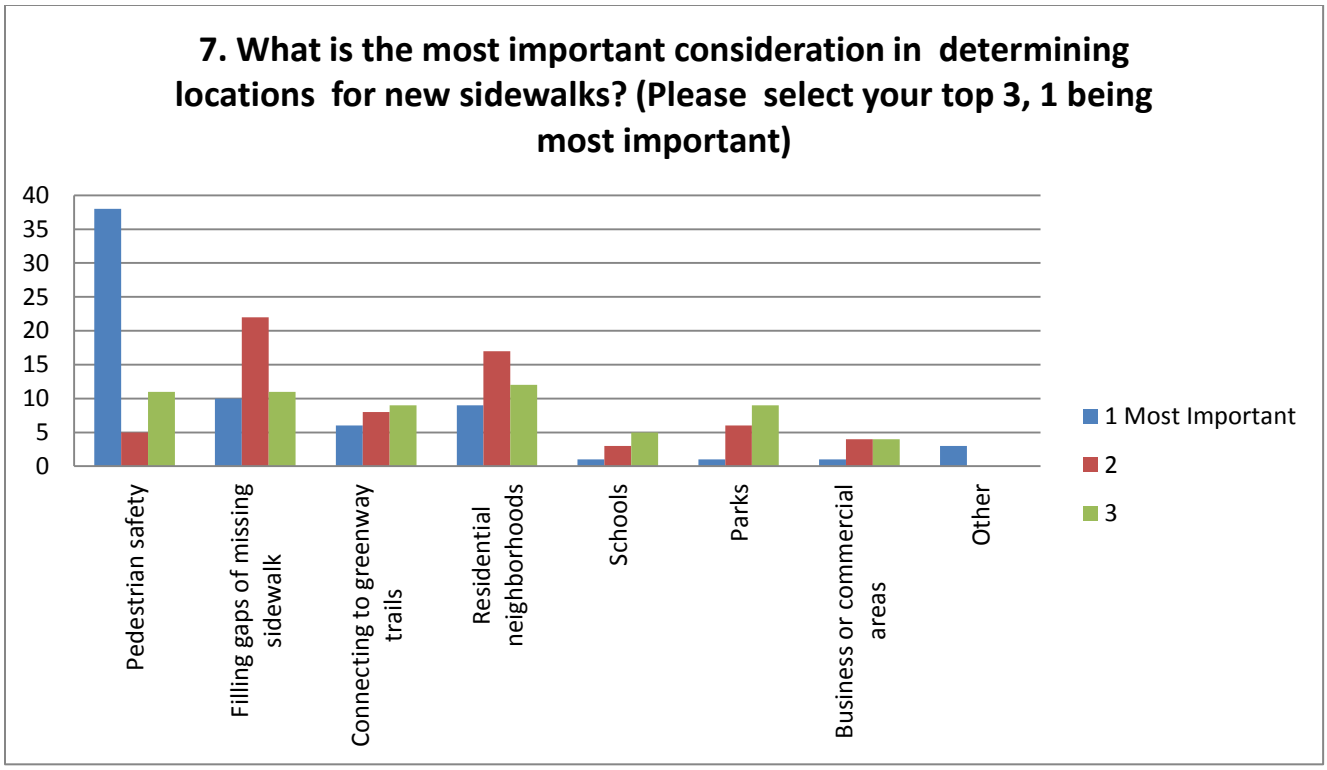
N=71


5. What walking destinations would you most like to get to? (Please select your top 3, 1 being best)
30
25
20
15
10
5
0
Town Parks
Greenway trails
Shopping (describe below)
Yadkin River
Other Town Facilities
Churches (describe below)
Restaurants (describe below)
Schools
Other neighborhoods
Place of work (describe below)
Senior Center
Other
1 Best
2
3

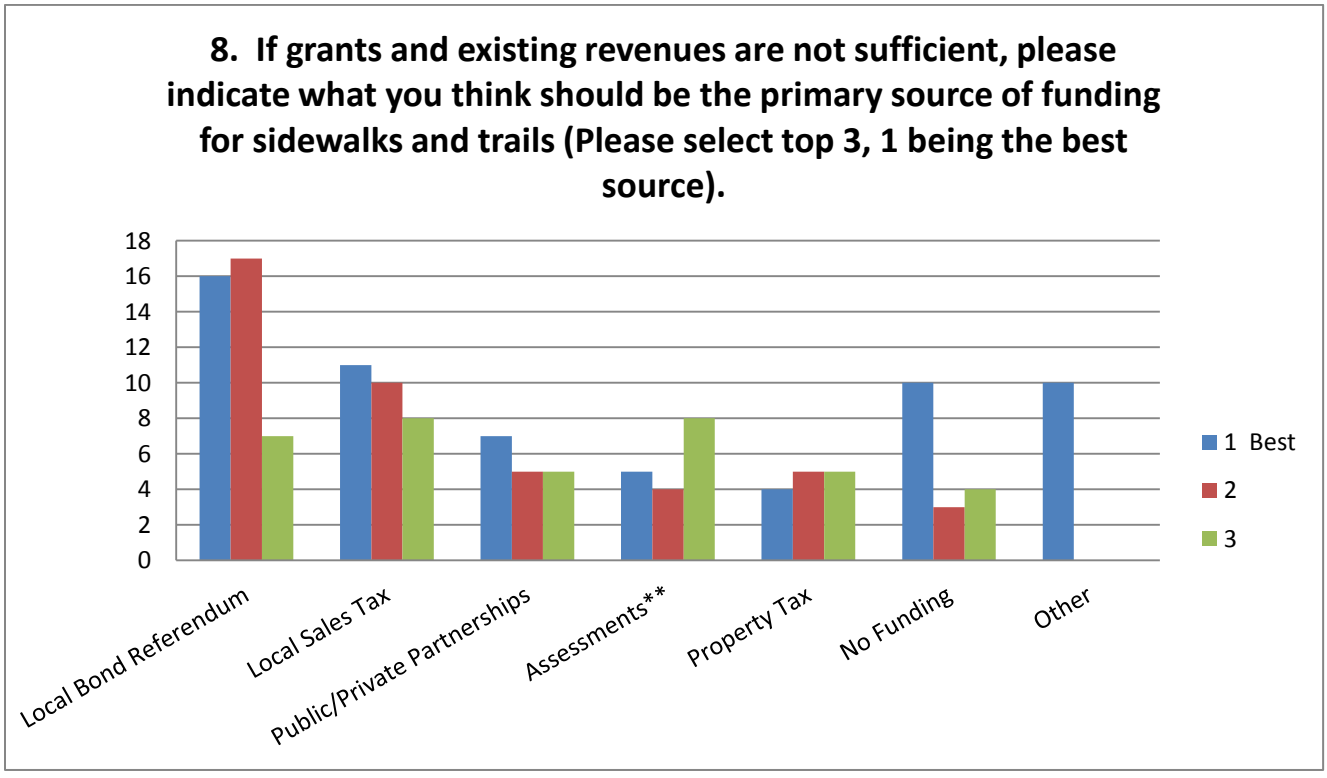
N=69


6. What is the most important action needed to increase walking in the community? (Please select your top 3, 1 being most important)
35
30
25
20
15
10
5
0
New sidewalks
More pedestrian friendly land-uses
Improved greenway trail systems
Crossing improvements
Public transportation routes
Benches
Install lighting
Planting street trees
Other
1 Most Important
2
3

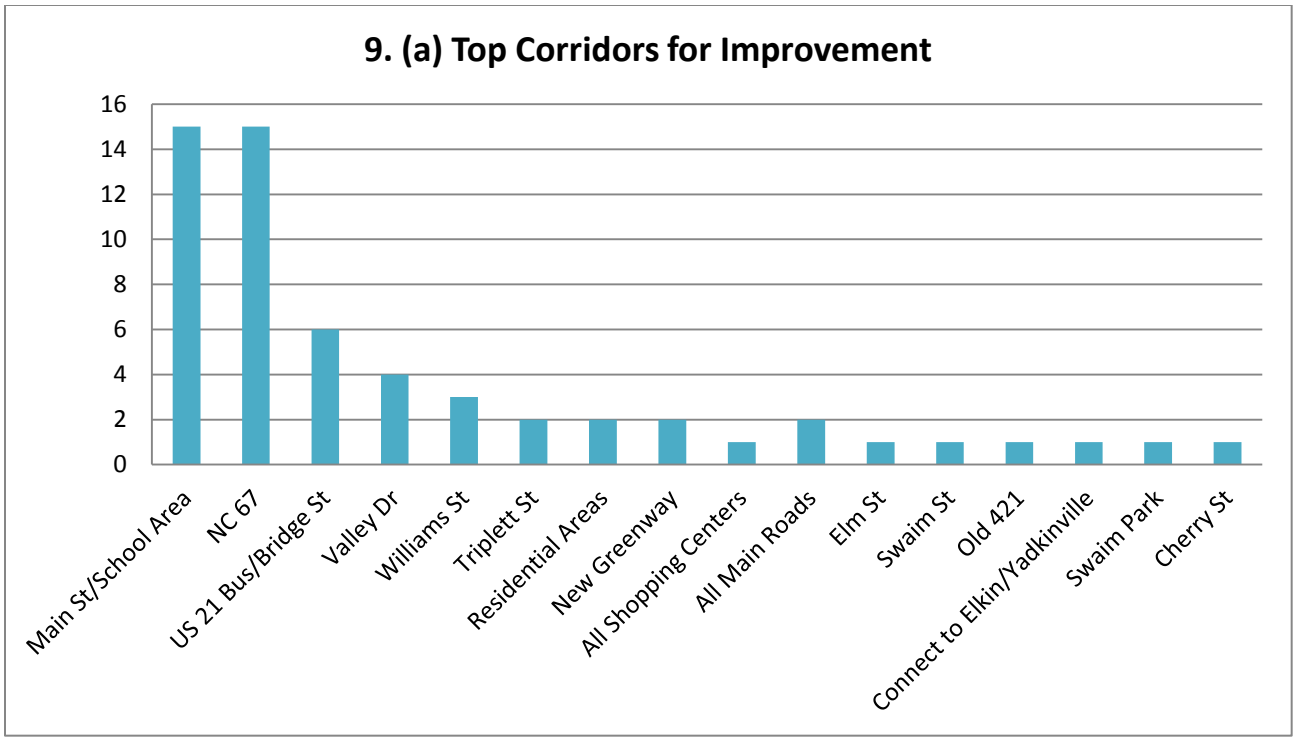
N = 70


7. What is the most important consideration in determining locations for new sidewalks? (Please select your top 3, 1 being most important)
40
35
30
25
20
15
10
5
0
Pedestrian safety
Filling gaps of missing sidewalk
Connecting to greenway trails
Residential neighborhoods
Schools
Parks
Business or commercial areas
Other
1 Most Important
2
3

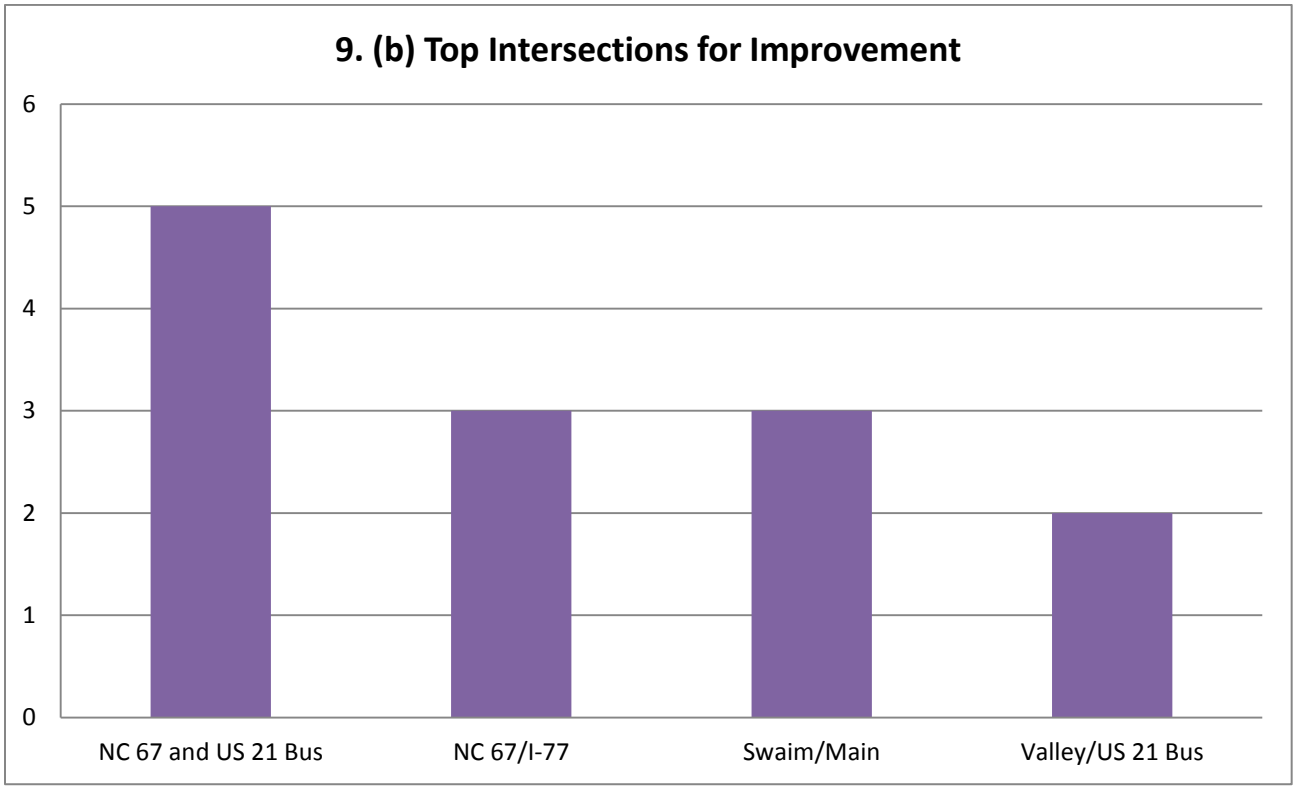
N=66


8. If grants and existing revenues are not sufficient, please indicate what you think should be the primary source of funding for sidewalks and trails (Please select top 3, 1 being the best source).
18
16
14
12
10
8
6
4
2
0
Local Bond Referendum
Local Sales Tax
Public/Private Partnerships
Assessments**
Property Tax
No Funding
Other
1 Best
2
3

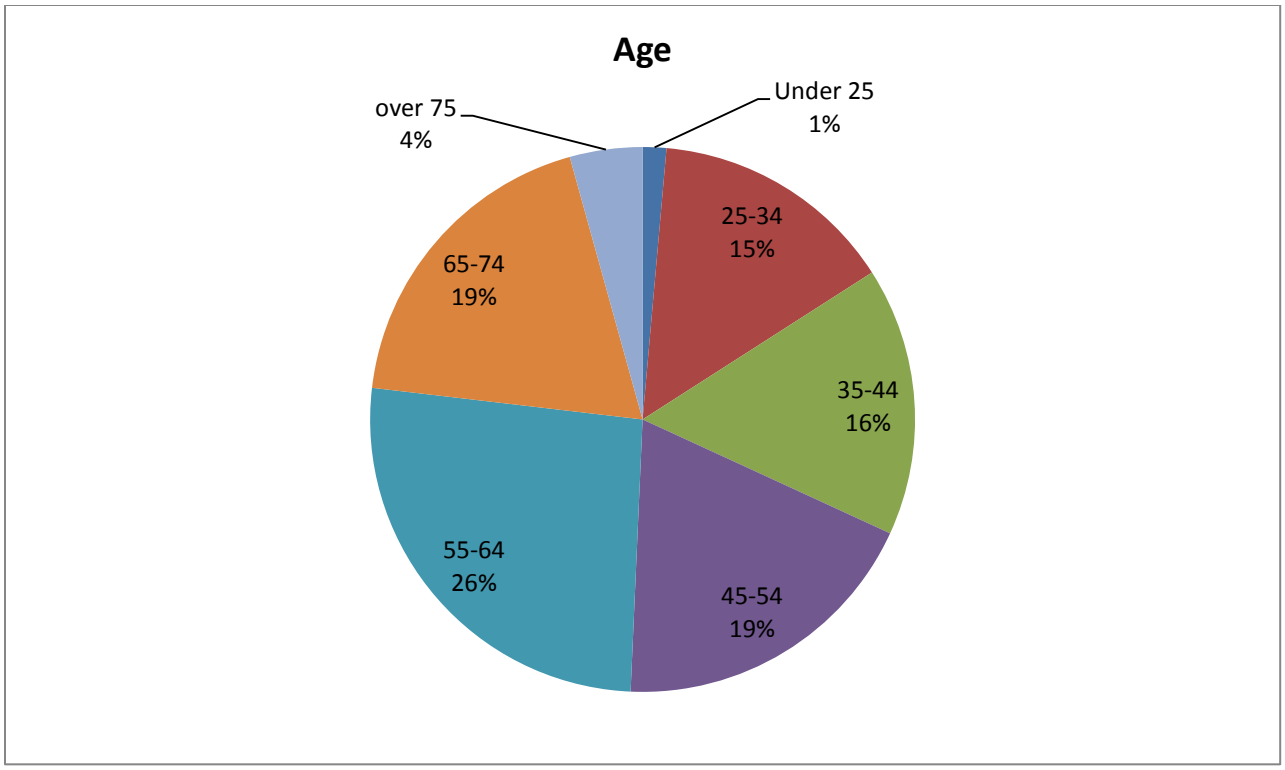
N = 56


9. (a) Top Corridors for Improvement
16
14
12
10
8
6
4
2
0
Main St/School Area
NC 67
US 21 Bus/Bridge St
Valley Dr
Williams St
Triplett St
Residential Areas
New Greenway
All Shopping Centers
All Main Roads
Elm St
Swaim St
Old 421
Connect to Elkin/Yadkinville
Swaim Park
Cherry St

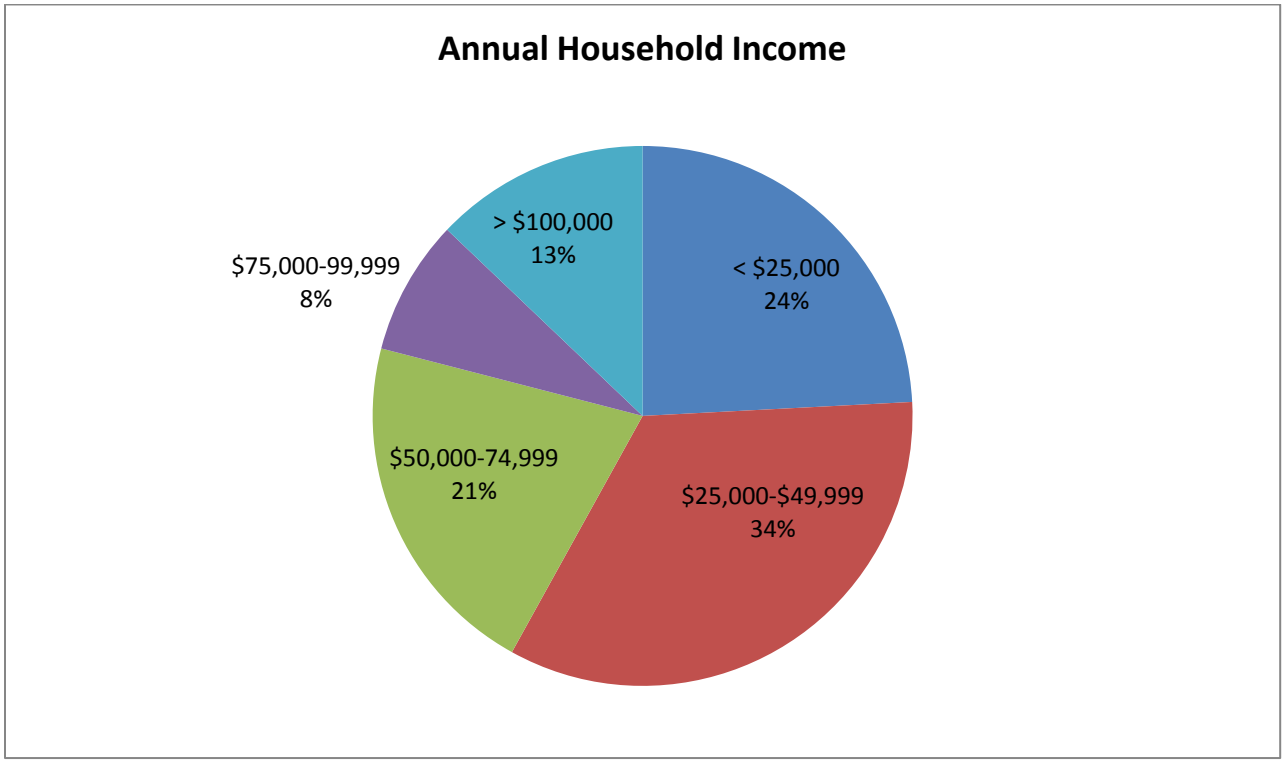
N=45


9. (b) Top Intersections for Improvement
6
5
4
3
2
1
0
NC 67 and US 21 Bus
NC 67/I-77
Swaim/Main
Valley/US 21 Bus

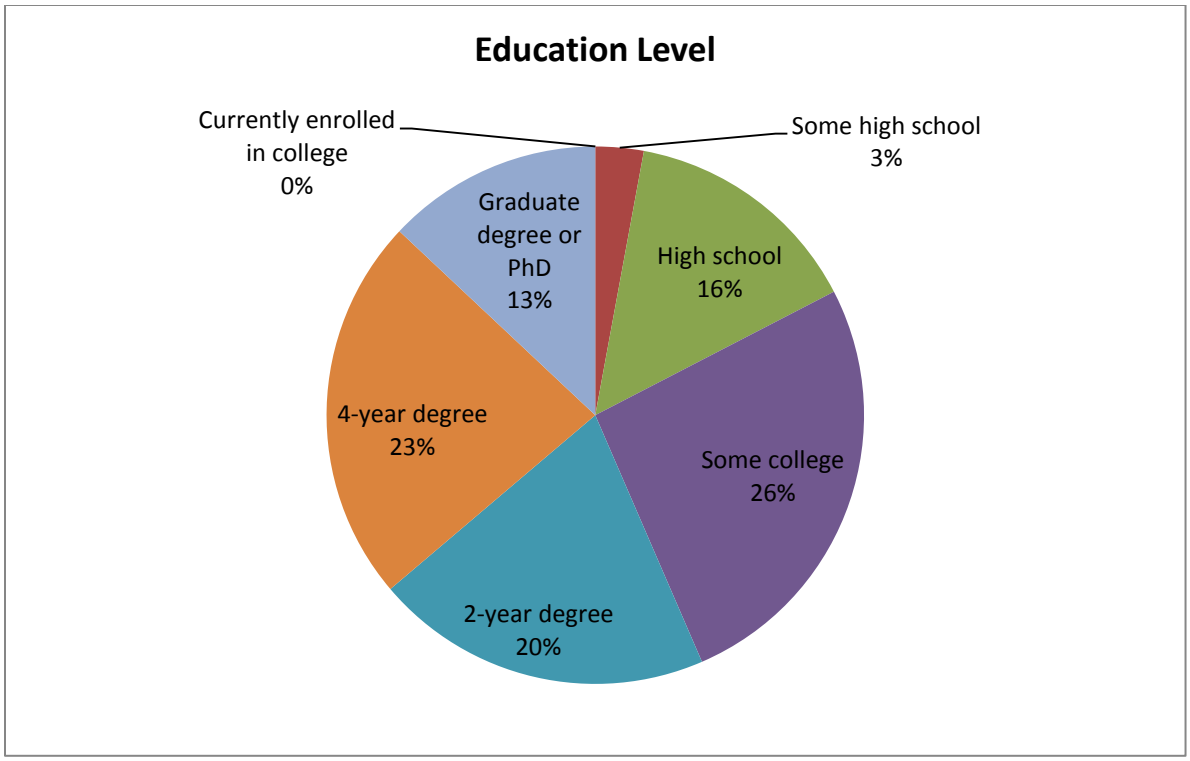
N = 33


Age
over 75
4%
Under 25
1%
25-34
15%
65-74
19%
35-44
16%
55-64
26%
45-54
19%

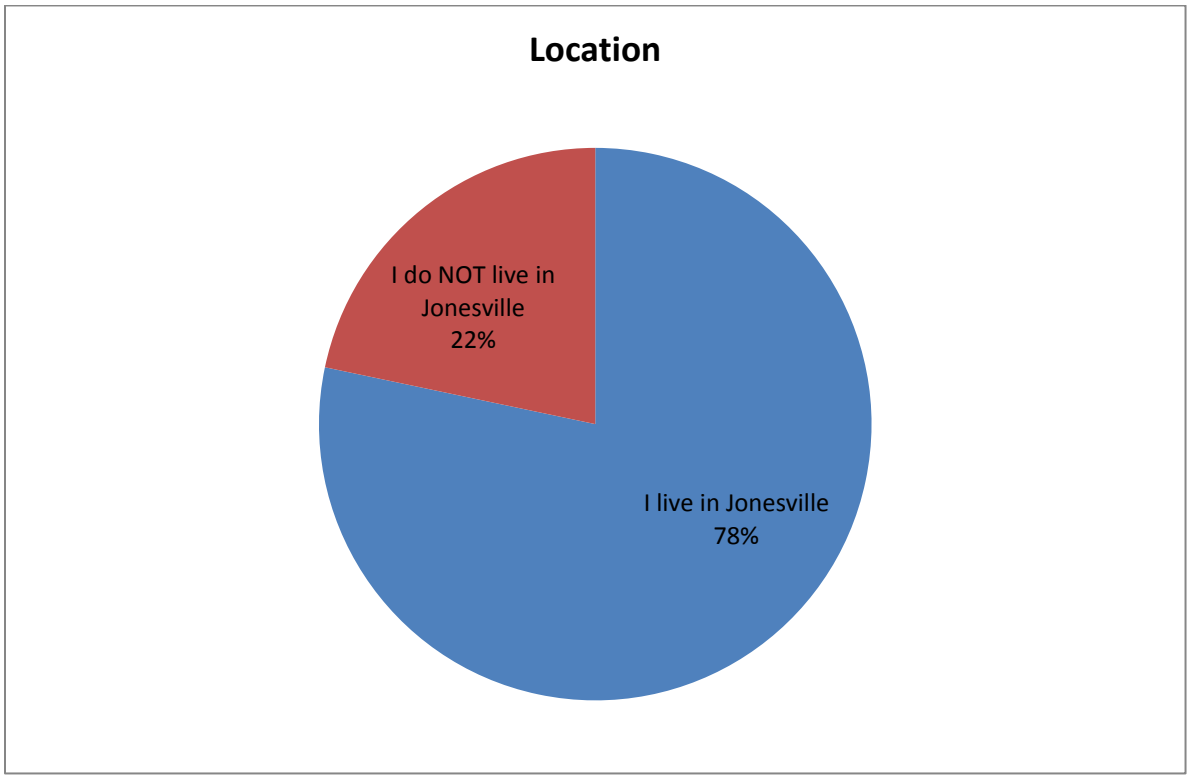
N = 69


Annual Household Income
> $100,000
13%
< $25,000
24%
$75,000-99,999
8%
$50,000-74,999
21%
$25,000-$49,999
34%

N = 62


Education Level
Currently enrolled in college 0%
Some high school 3%
Graduate degree or PhD 13%
High school 16%
4-year degree 23%
Some college 26%
2-year degree 20%

N = 69


Location
I do NOT live in Jonesville 22%
I live in Jonesville 78%

N = 69

APPENDIX C: RESOURCE AND FUNDING OPPORTUNITIES

Local, state, federal, and private funding is available to support the planning, construction, right of way acquisition and maintenance of bicycle and pedestrian facilities. Available funding sources are related to a variety of purposes including transportation, water quality, hazard mitigation, recreation, air quality, wildlife protection, community health, and economic development. This list identifies of some of the bicycle and pedestrian facility funding opportunities available through federal, state, local, foundation and corporate sources. An important key to obtaining funding is for local governments to have adopted plans for greenway, bicycle, pedestrian or multi-use path systems in place prior to making an application for funding.

FUNDING ALLOCATED BY STATE AGENCIES

There are multiple sources for state funding of bicycle and pedestrian transportation projects. However, beginning July 1, 2015, state transportation funds cannot be used to match federally-funded transportation projects, according to a law passed by the North Carolina Legislature.

Funding Opportunities for Transportation:

North Carolina Department of Transportation (NCDOT) State Transportation Improvement Program (STIP):

The NCDOT's State Transportation Improvement Program is based on the Strategic Transportation Investments Bill, signed into law in 2013. The Strategic Transportation Investments (STI) Initiative introduces the Strategic Mobility Formula, a new way to fund and prioritize transportation projects.

The new Strategic Transportation Investments Initiative is scheduled to be fully implemented by July 1, 2015. Projects scheduled for construction before then will proceed as scheduled under the current Equity Formula. Projects slated for construction after that time will be ranked and programed according to the new formula. The new Strategic mobility formula assigns projects for all modes into one of three categories: 1) Statewide Mobility, 2) Regional Impact, and 3) Division Needs. All independent bicycle and pedestrian projects are placed in the "Division Needs" category, and are ranked using the following criteria:

1) SAFETY, 2) ACCESS, 3) DEMAND OR DENSITY, 4) CONSTRUCTABILITY, and 5)BENEFIT/COST RATIO

These rankings largely determine which projects will be included in NCDOT's State Transportation Improvement Program (STIP). The STIP is a federally mandated transportation planning document that details transportation planning improvements prioritized by the stakeholders for inclusion in NCDOT's Work Program over the next 10 years. The STIP is

updated every 2 years. The STIP contains funding information for various transportation divisions of NCDOT, including, highways, rail, bicycle and pedestrian, public transportation and aviation.

Access to federal funds requires that projects be incorporated into the STIP. The STIP is the primary method of allocating state and federal transportation funds. Starting in 2015, state funds will not be available to use to match with federal funds. As a result, local governments should plan to use local or Powell Bill funds to secure federal dollars to fund bicycle and pedestrian projects.

For a detailed description of the Strategic Transportation Investments law and process, visit:
www.ncdot.gov/strategictransportationinvestments/
For information on the Draft STIP, visit:
https://connect.ncdot.gov/projects/planning/Pages/Draft-STIP.aspx

Incidental Projects – Bicycle and Pedestrian accommodations such as; bike lanes, wide paved shoulders, sidewalks, intersection improvements, bicycle and pedestrian safe bridge design, etc. are frequently included as "incidental" features of larger highway/roadway projects. This is increasingly common with the adoption of NCDOT's "Complete Streets" Policy.

In addition, bicycle safe drainage grates and handicapped accessible sidewalk ramps are now a standard feature of all NCDOT highway construction. Most pedestrian safety accommodations built by NCDOT are included as part of scheduled highway improvement projects funded with a combination of federal and state roadway construction funds, and usually with a local match. On-road bicycle accommodations, if warranted, typically do not require a local match.

"Incidental Projects" are often constructed as part of a larger transportation project, when they are justified by local plans that show these improvements as part of a larger, multi-modal transportation system. Having a local bicycle or pedestrian plan is important, because it allows NCDOT to identify where bike and pedestrian improvements are needed, and can be included as part of highway or street improvement project. The plan also helps local government identify what their priorities are and how they might be able to pay for these projects. Under "Complete Streets" local governments may be responsible for a portion of the costs for bicycle and pedestrian projects.

Governor's Highway Safety Program (GHSP)

The mission of the GHSP is to promote highway safety awareness and reduce the number of traffic crashes in the state of North Carolina through the planning and execution of safety

programs. GHSP funding is provided through an annual program, upon approval of specific project requests. Amounts of GHSP funds vary from year to year, according to the specific amounts requested. Communities may apply for a GHSP grant to be used as seed money to start a program to enhance highway safety. Once a grant is awarded, funding is provided on a reimbursement basis. Evidence of reductions in crashes, injuries, and fatalities is required. For information about and a link to applying for GHSP funding, visit: www.ncdot.org/programs/ghsp/

Bicycle and Pedestrian Planning Grant Initiative, managed by NCDOT, DBPT

To encourage the development of comprehensive local bicycle plans and pedestrian plans, the NCDOT Division of Bicycle and Pedestrian Transportation (DBPT) and the Transportation Planning Branch (TPB) have created a matching grant program to fund plan development. This program was initiated through a special allocation of funding approved by the North Carolina General Assembly in 2003 along with federal funds earmarked specifically for bicycle and pedestrian planning by the TPB. The planning grant program was launched in January 2004, and it is currently administered through NCDOT-DBPT and the TPB. Over 157 communities have been funded and nearly $4 million has been allocated through this grant initiative, including Jonesville in the 2014 planning grant cycle. For more information, visit: https://connect.ncdot.gov/municipalities/PlanningGrant/Pages/default.aspx

Safe Routes to School Program, managed by NCDOT, DBPT

The NCDOT Safe Routes to School Program is lumped in with Transportation Alternatives. There may be $20 Million of unobligated funds as of the end of SAFETEA-LU; the last federal transportation appropriation bill. The Division of Bicycle and Pedestrian Transportation at NCDOT is charged with disseminating SRTS funding.

All proposed projects must relate to increasing walking or biking to and from an elementary or middle school. An example of a non-infrastructure project is an education or encouragement program to improve rates of walking and biking to school. An example of an infrastructure project is construction of sidewalks around a school. Infrastructure improvements under this program must be made within 2 miles of an elementary or middle school. The state requires the completion of a competitive application to apply for funding. For more information, visit: www.ncdot.gov/bikeped/funding/

Small Urban Funds managed by NCDOT Highway Division Offices

Small Urban Funds are available for small improvement projects in urban areas. Each NCDOT Highway Division has $2 million of small urban funds available annually. Although not commonly used for bicycle facilities, local requests for small bicycle projects can be directed to the NCDOT Highway Division office for funding through this source. A written request should be submitted to the Division Engineer providing technical information, such as location, improvements being requested, timing, etc. for thorough review.

Hazard Elimination Program by NCDOT Highway Division Offices

This program focuses on projects intended for locations that should have a documented history of previous crashes. Bicycle and pedestrian projects are eligible for this program, although the funds are not usually used for this purpose. This program is administered through the NCDOT Division of Highways. Similar to the Small Urban Funds, it is a significantly limited funding source.

Land and Water Conservation Fund (LWCF)

MAP-21 combined this with Transportation Alternatives. The Land and Water Conservation Fund (LWCF) program is a reimbursable, 50/50 matching grants program to states for conservation and recreation purposes, and through the states to local governments to address "close to home" outdoor recreation needs. LWCF grants can be used by communities to build a trail within one park site, if the local government has fee-simple title to the park site. Grants for a maximum of $250,000 in LWCF assistance are awarded yearly to county governments, incorporated municipalities, public authorities and federally recognized Indian tribes. The local match may be provided with in-kind services or cash. The program's funding comes primarily from offshore oil and gas drilling receipts, with an authorized expenditure of $900 million each year. However, Congress generally appropriates only a small fraction of this amount.

The Land and Water Conservation Fund (LWCF) has historically been a primary funding source of the US Department of the Interior for outdoor recreation development and land acquisition by local governments and state agencies. In North Carolina, the program is administered by the Department of Environment and Natural Resources. Since 1965, the LWCF program has built a permanent park legacy for present and future generations. In North Carolina alone, the LWCF program has provided more than $63 million in matching grants to protect land and support more than 800 state and local park projects. More than 37,000 acres have been acquired with LWCF assistance to establish a park legacy in our state. For more information, visit: www.ncparks.gov/About/grants/lwcf_grant.php

Recreational Trails Program

The Recreational Trails Program (RTP) is a grant program funded by Congress with money from the federal gas taxes paid on fuel used by off-highway vehicles. This program's intent is to meet the trail and trail-related recreational needs identified by the Statewide Comprehensive Outdoor Recreation Plan. Grant applicants must be able contribute 25% of the project cost with cash or in-kind contributions. The program is managed by the State Trails Program, which is a section of the N.C. Division of Parks and Recreation.

The grant application is available and instruction handbook is available through the State Trails Program website at www.ncparks.gov/About/trails_RTP_project.php. Pre-Applications are due in November and, if invited, final applications are due January 31st. For more information, call (919) 715-8699.

North Carolina Parks and Recreation Trust Fund (PARTF)

The fund was established in 1994 by the North Carolina General Assembly and is administered by the Parks and Recreation Authority. Through this program, several million dollars each year are available to local governments to fund the acquisition, development and renovation of recreational areas. Applicable projects require a 50/50 match from the local government. Grants for a maximum of $500,000 are awarded yearly to county governments or incorporated municipalities. The fund was originally funded by the State's portion of the real estate deed transfer tax, but is now controlled out of the General Fund.

The trust fund has historically been allocated three ways:

- 65 percent to the state parks through the N.C. Division of Parks and Recreation.

- 30 percent as dollar-for dollar matching grants to local governments for park and recreation purposes.

- 5 percent for the Coastal and Estuarine Water Access Program.

For information on how to apply, visit: www.ncparks.gov/About/grants/partf_eligibility.php

Powell Bill Program

Annually, State street-aid (Powell Bill) allocations are made to incorporated municipalities that maintain public roads. This program is a state grant to municipalities for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways, sidewalks or trails. Funding for this program is collected from fuel taxes. Amount of funds are based on population and mileage of municipal-maintained streets. For more information, visit: https://connect.ncdot.gov/municipalities/State-Street-Aid/Pages/default.aspx

Urban and Community Forestry Assistance Program

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

The North Carolina Division of Forest Resources

Urban and Community Forestry Grant can provide funding for a variety of projects that will help toward planning and establishing street trees as well as trees for urban open space. For more information visit: http://ncforestservice.gov/Urban/urban_grant_overview.htm

Ecosystem Enhancement Program

Developed in 2003 as a new mechanism to facilitate improved mitigation projects for NC highways, this program offers funding for restoration projects and for protection projects that serve to enhance water quality and wildlife habitat in NC. Information on the program is available by contacting the Natural Heritage Program in the NC Department of Environment and Natural Resources (NCDENR). For more information, visit: www.nceep.net/pages/partners.html or call 919-715-0476.

Conservation Reserve Enhancement Program (CREP)

This program is a joint effort of the North Carolina Division of Soil and Water Conservation, the NC Clean Water Management Trust Fund, the Ecosystem Enhancement Program (EEP), and the Farm Service Agency - United States Department of Agriculture (USDA) to address water quality problems of the Neuse, Tar-Pamlico and Chowan river basins as well as the Jordan Lake watershed area.

CREP is a voluntary program that seeks to protect land along watercourses that is currently in agricultural production. The objectives of the program include: installing 100,000 acres of forested riparian buffers, grassed filter strips and wetlands; reducing the impacts of sediment and nutrients within the targeted area; and providing substantial ecological benefits for many wildlife species that are declining in part as a result of habitat loss. Program funding will combine the Federal Conservation Reserve Program (CRP) funding with State funding from the Clean Water Management Trust Fund, Agriculture Cost Share Program, and North Carolina Wetlands Restoration Program. For more information, please visit: www.ncaswcd.org/?page_id=90

Agriculture Cost Share Program

Established in 1984, this program assists farmers with the cost of installing best management practices (BMPs) that benefit water quality. The program covers as much as 75 percent of the costs to implement BMPs. The NC Division of Soil and Water Conservation within the NC Department of Agriculture administers this program through local Soil and Water Conservation Districts (SWCD). For more information, visit: www.ncagr.gov/SWC/costshareprograms/ACSP/index.html

Water Resources Development Grant Program

The NC Division of Water Resources offers cost-sharing grants to local governments on projects related to water resources. Of the seven project application categories available, the category which relates to the establishment of greenways is "Land Acquisition and Facility Development for Water-Based Recreation Projects." Applicants may apply for funding for a greenway as long as the greenway is in close proximity to a water body. For more information, see: www.ncwater.org/Financial_Assistance or call 919-733-4064.

FUNDING ALLOCATED BY FEDERAL AGENCIES

Agricultural Conservation Easement Program (ACEP)

This United States Department of Agriculture (USDA) federal funding source provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Agricultural Land Easements component, Natural Resources Conservation Service (NRCS) helps Indian tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the Wetlands Reserve Easements component, NRCS helps to restore, protect and enhance enrolled wetlands. ACEP is a new program that consolidates three former programs – the Wetlands Reserve Program, Grassland Reserve Program and Farm and Ranch Land Protection Program. For more information, visit: www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/easements/acep/

The Community Development Block Grant (HUD-CDBG)

The U.S. Department of Housing and Urban Development (HUD) offers financial grants to communities for neighborhood revitalization, economic development, and improvements to community facilities and services, especially in low and moderate income areas. Several communities have used HUD funds to develop greenways, including the Boulding Branch Greenway in High Point, North Carolina. Grants from this program range from $50,000 to $200,000 and are either made to municipalities or non-profits. There is no formal application process. For more information, visit: https://www.hudexchange.info/cdbg-state or visit http://www.nccommerce.com/rd/community-assistance.

USDA Rural Business Enterprise Grants

Public and private nonprofit groups in communities with populations under 50,000 are eligible to apply for grant assistance to help their local small business environment. $1 million is available for North Carolina on an annual basis and may be used for sidewalk and other community facilities. For more information from the local USDA Service Center, visit: http://www.rurdev.usda.gov/BCP_rbeg.html

Rivers Trails and Conservation Assistance Program (RTCA)

The Rivers, Trails, and Conservation Assistance Program, also known as the Rivers & Trails Program or RTCA, is the community assistance arm of the National Park Service. RTCA staff provide technical assistance to community groups and local, State, and federal government agencies so they can conserve rivers, preserve open space, and develop trails and greenways. The RTCA program implements the natural resource conservation and outdoor recreation mission of the National Park Service in communities across America

Although the program does not provide funding for projects, it does provide valuable on-the-ground technical assistance, from strategic consultation and partnership development to serving as liaison with other government agencies. Communities must apply for assistance. For

more information, visit: www.nps.gov/ncrc/programs/rtca/ or contact Deirdre Hewitt, Program Manager deirdre_hewitt@nps.gov (404) 507-5691

Community Forest Program

The Community Forest Program (CFP) protects forests that are important for people and the places they call home. Community forests provide many benefits such as places to recreate and enjoy nature; they protect habitat, water quality and other environmental benefits, and they can provide economic benefits through timber resources. Community Forests have also long been sites for environmental and cultural education, for more information please visit: www.fs.fed.us/spf/coop/programs/loa/cfp.shtml

Community Facilities Grants

Community Programs provides grants to assist in the development of essential community facilities in rural areas and towns of up to 20,000 in population. Grant funds may be used to assist in the development of essential community facilities. Grant funds can be used to construct, enlarge, or improve community facilities for health care, public safety, and community and public services; for more information please visit: www.rurdev.usda.gov/HAD-CF_Grants.html

Partners for Fish and Wildlife NC

The Partners for Fish and Wildlife Program is the U.S. Fish and Wildlife Service's primary mechanism for delivering voluntary on-the-ground habitat improvement projects on private lands for the benefit of Federal trust species. Biologists provide technical and financial assistance to landowners who want to restore and enhance fish and wildlife Partners for Fish and Wildlife works in a diversity of habitat types throughout the state. Some Partners for Fish and Wildlife Projects are educational in nature, providing the necessary materials and opportunities for children and adults to learn the significance of the State's natural resources. Habitat types protected in NC

- Forested Wetlands (Bottomland Hardwoods, Non-alluvial swamp forest, Pocosins)
- Longleaf Pine
- Piedmont Prairies
- Streams and Riparian Areas

for more information e-mail: JohnAnn_Shearer@fws.gov or call 919/856 4520 ext. 17

Web site: www.fws.gov/raleigh/pfw.html

Division of Water Quality 319 Grant Program

The FY2013 319 Grant RFP is soliciting restoration or implementation projects in impaired watersheds. The purpose of this funding is to *restore* waters impaired by nonpoint source (NPS) pollution. A list of the state's impaired waterbody segments is available at this link: http://portal.ncdenr.org/web/wq/ps/mtu/assessment 319 grant watershed restoration

funds must be used to implement a Watershed Restoration Plan for a waterbody or watershed that is impaired. A list of North Carolina 9-element watershed restoration plans associated with the 319 program that can be used to guide restoration efforts is available at this link: http://portal.ncdenr.org/web/wq/ps/nps/319program/nc-watershed-plans.

LOCAL FUNDING SOURCES

Municipalities often plan for the funding of pedestrian facilities or improvements through development of Capital Improvement Programs (CIP). In Raleigh, for example, the greenways system has been developed over many years through a dedicated source of annual funding that has ranged from $100,000 to $500,000, administered through the Recreation and Parks Department. CIPs should include all types of capital improvements (water, sewer, buildings, streets, etc.) versus programs for single purposes. This allows municipal decision-makers to balance all capital needs. Typical capital funding mechanisms include the following: capital reserve fund, capital protection ordinances, municipal service district, tax increment financing, taxes, fees, and bonds. Each of these categories are described below.

Capital Reserve Fund

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

Capital Project Ordinances

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

Municipal Service District

Municipalities have statutory authority to establish municipal service districts, to levy a property tax in the district additional to the citywide property tax, and to use the proceeds to provide services in the district. Downtown revitalization projects are one of the eligible uses of service districts.

Tax Increment Financing

Tax increment financing (TIF) is a tool to use future gains in taxes to finance the current improvements that will create those gains. When a public project, such as the construction of a greenway, is carried out, there is an increase in the value of surrounding real estate. Oftentimes, new investment in the area follows such a project. This increase in value and investment creates more taxable property, which increases tax revenues. These increased revenues can be referred to as the "tax increment." Tax Increment Financing dedicates that increased revenue to finance debt issued to pay for the project. TIF is designed to channel funding toward improvements in distressed or underdeveloped areas where development would not otherwise occur. TIF creates funding for public projects that may otherwise be unaffordable to localities. The large majority of states have enabling legislation for tax increment financing.

Installment Purchase Financing

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

Taxes

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

Sales Tax

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

Property Tax

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

Excise Taxes

Excise taxes are taxes on specific goods and services. These taxes require special legislation and the use of the funds generated through the tax are limited to specific

uses. Examples include lodging, food, and beverage taxes that generate funds for promotion of tourism, and the gas tax that generates revenues for transportation related activities.

Occupancy Tax

The NC General Assembly may grant towns the authority to levy occupancy tax on hotel and motel rooms. The act granting the taxing authority limits the use of the proceeds, usually for tourism-promotion purposes.

Fees

Three fee options that have been used by local governments to assist in funding pedestrian and bicycle facilities are listed here:

Stormwater Utility Fees

Greenway sections may be purchased with stormwater fees, if the property in question is used to mitigate floodwater or filter pollutants. Stormwater charges are typically based on an estimate of the amount of impervious surface on a user's property. Impervious surfaces (such as rooftops and paved areas) increase both the amount and rate of stormwater runoff compared to natural conditions. Such surfaces cause runoff that directly or indirectly discharge into public storm drainage facilities and creates a need for stormwater management services. Thus, users with more impervious surface are charged more for stormwater service than users with less impervious surface. The rates, fees, and charges collected for stormwater management services may not exceed the costs incurred to provide these services. The costs that may be recovered through the stormwater rates, fees, and charges includes any costs necessary to assure that all aspects of stormwater quality and quantity are managed in accordance with federal and state laws, regulations, and rules.

Streetscape Utility Fees

Streetscape Utility Fees could help support streetscape maintenance of the area between the curb and the property line through a flat monthly fee per residential dwelling unit. Discounts would be available for senior and disabled citizens. Non-residential customers would be charged a per foot fee based on the length of frontage on streetscape improvements. This amount could be capped for non-residential customers with extremely large amounts of street frontage. The revenues raised from Streetscape Utility fees would be limited by ordinance to maintenance (or construction and maintenance) activities in support of the streetscape.

Impact Fees

Developers can be required to provide greenway impact fees through local enabling legislation. Impact fees, which are also known as capital contributions, facilities fees, or system development charges, are typically collected from developers or property

owners at the time of building permit issuance to pay for capital improvements that provide capacity to serve new growth. The intent of these fees is to avoid burdening existing customers with the costs of providing capacity to serve new growth ("growth pays its own way"). Greenway impact fees are designed to reflect the costs incurred to provide sufficient capacity in the system to meet the additional needs of a growing community. These charges are set in a fee schedule applied uniformly to all new development. Communities that institute impact fees must develop a sound financial model that enables policy makers to justify fee levels for different user groups, and to ensure that revenues generated meet (but do not exceed) the needs of development. Factors used to determine an appropriate impact fee amount can include: lot size, number of occupants, and types of subdivision improvements. If Jonesville is interested in pursuing open space impact fees, it will require enabling legislation to authorize the collection of the fees.

Exactions

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

In-Lieu-Of Fees

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

Bonds and Loans

Bonds have been a very popular way for communities across the country to finance their pedestrian and greenway projects. A number of bond options are listed below. Contracting with a private consultant to assist with this program may be advisable. Since bonds rely on the support of the voting population, an education and awareness program should be implemented prior to any vote. Billings, Montana used the issuance of a bond in the amount of $599,000 to provide the matching funds for several of their 'transportation enhancement' dollars. Austin, Texas has also used bond issues to fund a portion of their bicycle and trail system.

Revenue Bonds

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

General Obligation Bonds

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

Special Assessment Bonds

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

State Revolving Fund (SRF) Loans

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

OTHER LOCAL OPTIONS

Facility Maintenance Districts

Facility Maintenance Districts (FMDs) can be created to pay for the costs of on-going maintenance of public facilities and landscaping within the areas of the Town where

improvements have been concentrated and where their benefits most directly benefit business and institutional property owners. An FMD is needed in order to assure a sustainable maintenance program. Fees may be based upon the length of lot frontage along streets where improvements have been installed, or upon other factors such as the size of the parcel. The program supported by the FMD should include regular maintenance of streetscape of off road trail improvements. The municipality can initiate public outreach efforts to merchants, the Chamber of Commerce, and property owners. In these meetings, Town staff will discuss the proposed apportionment and allocation methodology and will explore implementation strategies.

The municipality can manage maintenance responsibilities either through its own staff or through private contractors.

Partnerships

Another method of funding pedestrian systems and greenways is to partner with public agencies and private companies and organizations. Partnerships engender a spirit of cooperation, civic pride and community participation. The key to the involvement of private partners is to make a compelling argument for their participation. Major employers and developers should be identified and provided with a "Benefits of Walking"-type handout for themselves and their employees. Very specific routes that make critical connections to place of business would be targeted for private partners' monetary support following a successful master planning effort. Potential partners include major employers which are located along or accessible to pedestrian facilities such as shared-use paths or greenways. Name recognition for corporate partnerships would be accomplished through signage trail heads or interpretive signage along greenway systems. Utilities often make good partners and many trails now share corridors with them. Money raised from providing an easement to utilities can help defray the costs of maintenance. It is important to have a lawyer review the legal agreement and verify ownership of the subsurface, surface or air rights in order to enter into an agreement.

Local Trail Sponsors

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

Volunteer Work

It is expected that many citizens will be excited about the development of a greenway corridor. Individual volunteers from the community can be brought together with groups of volunteers

form church groups, civic groups, scout troops and environmental groups to work on greenway development on special community work days. Volunteers can also be used for fund-raising, maintenance, and programming needs.

PRIVATE FOUNDATIONS AND ORGANIZATIONS

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

People for Bikes

The People for Bikes Program strives to put more people on bicycles more often by funding important and influential projects that leverage federal funding and build momentum for bicycling in communities across the U.S. These projects include bike paths, lanes, and routes, as well as bike parks, mountain bike trails, BMX facilities, and large-scale bicycle advocacy initiatives.

Since 1999, Bikes Belong has awarded over 272 grants to municipalities and non-profit groups in 49 states and the District of Columbia, investing nearly $2.5 million in community bicycling projects and leveraging more than $650 million in federal, state, and private funding; for more information please visit: www.peopleforbikes.org/

Blue Cross Blue Shield Foundation

The foundation has provided support for a number of projects ranging from local community equipment grants to collaboration on large statewide initiatives that work to improve health and lower obesity rates through healthy eating and active living; for more information please visit: www.bcbsncfoundation.org/

Creating New Economies Fund

Small grant program supports innovative triple bottom line (Environmental Stewardship, Economic Development and Social justice) projects, providing communities with resources to address multiple issues simultaneously. Grants average $8,000 to $12,000, with the maximum award being $15,000. Pre-Proposals due in December; for more information please visit: www.conservationfund.org/our-conservation-strategy/major-programs/resourceful-communities-program/investing-in-communities/

Kate B. Reynolds Foundation

The Winston-Salem based Foundation has funded Community Transformation Catalyst positions in 4 Tier 1 counties, including Rockingham County . The Community Transformation Catalyst program is funded under the Health Care Division of the foundation. Grant deadlines are February and August. Check the website here for updated information: http://kbr.org/content/health-care-division

Land for Tomorrow Campaign

Land for Tomorrow is a diverse partnership of businesses, conservationists, farmers, environmental groups, health professionals and community groups committed to securing support from the public and General Assembly for protecting land, water and historic places.

The campaign is asking the North Carolina General Assembly to support issuance of a bond for $200 million a year for five years to preserve and protect its special land and water resources. Land for Tomorrow will enable North Carolina to reach a goal of ensuring that working farms and forests; sanctuaries for wildlife; land bordering streams, parks and greenways; land that helps strengthen communities and promotes job growth; historic downtowns and neighborhoods; and more, will be there to enhance the quality of life for generations to come. For more information, visit: www.land4tomorrow.org/

National Trails Fund

In 1998, the American Hiking Society created the National Trails Fund, the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. Each year, 73 million people enjoy foot trails, yet many of our favorite

trails need major repairs due to a $200 million in badly needed maintenance. National Trails Fund grants give local organizations the resources they need to secure access, volunteers, tools and materials to protect America's cherished public trails. For 2005, American Hiking distributed over $40,000 in grants thanks to the generous support of Cascade Designs and L.L.Bean, the program's Charter Sponsors. To date, American Hiking has granted more than $240,000 to 56 different trail projects across the U.S. for land acquisition, constituency building campaigns, and traditional trail work projects. Awards range from $500 to $10,000 per project.

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

North Carolina Community Foundation

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

The Trust for Public Land

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land for

human enjoyment and well-being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities. TPL's legal and real estate specialists work with landowners, government agencies, and community groups to:

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

The following are TPL's Conservation Services:

- Conservation Vision: TPL helps agencies and communities define conservation priorities, identify lands to be protected, and plan networks of conserved land that meet public need.
- Conservation Finance: TPL helps agencies and communities identify and raise funds for conservation from federal, state, local, and philanthropic sources.
- Conservation Transactions: TPL helps structure, negotiate, and complete land transactions that create parks, playgrounds, and protected natural areas.
- Research & Education: TPL acquires and shares knowledge of conservation issues and techniques to improve the practice of conservation and promote its public benefits.

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

Z. Smith Reynolds Foundation

This Winston-Salem based foundation has been assisting the environmental projects of local governments and non-profits in North Carolina for many years. The foundation has two grant cycles per year and generally does not fund land acquisition. However, the foundation may be able to support municipalities in other areas of greenways development. More information is available at: www.zsr.org

APPENDIX D: DESIGN GUIDELINES

Credit to Alta Planning and Design for assistance in developing these design guidelines from multiple sources.

Overview

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

- The Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) – the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings
- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities (2012) provides guidance on dimensions, use, and layout of specific bicycle facilities
- The AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004) provides guidelines for the planning, design, operation, and maintenance of pedestrian facilities, including signals and signing
- Meeting the requirements of the Americans with Disabilities Act (ADA) is an important part of any pedestrian facility project – the United States Access Board's proposed Public Rights-of-Way Accessibility Guidelines (PROWAG) and the 2010 ADA Standards for Accessible Design (2010 Standards) contain standards and guidance for the construction of accessible facilities
- The North Carolina Department of Transportation (NCDOT) houses a number of design guidelines that are referenced here –Traditional Neighborhood Development Guidelines (TND) (2000), and the Complete Streets Planning and Design Guidelines (2012) are a few.

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

Design Needs of Pedestrians

TYPES OF PEDESTRIANS

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

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

Table D-1: Pedestrian Characteristics by Age

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

Sidewalks

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

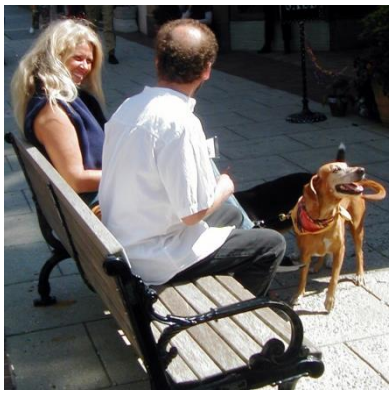
- Accessibility: A network of sidewalks should be accessible to all users.
- Adequate width: Two people should be able to walk side-by-side and pass a third comfortably. Different walking speeds should be possible. In areas of intense pedestrian use, sidewalks should accommodate a high volume of walkers.
- Safety: Design features of the sidewalk should allow pedestrians to have a sense of security and predictability. Sidewalk users should not feel they are at risk due to the presence of adjacent traffic.
- Continuity: Walking routes should be obvious and should not require pedestrians to travel out of their way unnecessarily.
- Landscaping: Plantings and street trees should contribute to the overall psychological and visual comfort of sidewalk users, and be designed in a manner that contributes to the safety of people.
- Drainage: Sidewalks should be well graded to minimize standing water.
- Social space: There should be places for standing, visiting, and sitting. The sidewalk area should be a place where adults and children can safely participate in public life.
- Quality of place: Sidewalks should contribute to the character of neighborhoods and business districts.

This Section Includes:

- Sidewalk Widths
- Sidewalk Obstructions and Driveway Ramps
- Pedestrian Amenities

Sidewalk widths

Sidewalk obstructions and driveway



Pedestrian amenities

SIDEWALK WIDTHS

Description

The width and design of sidewalks will vary depending on street context, functional classification, and pedestrian demand. Below are preferred widths of each sidewalk zone according to general street type. Standardizing sidewalk guidelines for different areas of the city, dependent on the above listed factors, ensures a minimum level of quality for all sidewalks.

Discussion

It is important to provide adequate width along a sidewalk corridor. Two people should be able to walk side-by-side and pass a third comfortably. In areas of high demand, sidewalks should contain adequate width to accommodate the high volumes and different walking speeds of pedestrians. The Americans with Disabilities Act requires a 4 foot clear width in the pedestrian zone plus 5 foot passing areas every 200 feet.

STREET CLASSIFICATION	PARKING LANE/EN-HANCEMENT ZONE	FURNISHING/ GREEN ZONE	PEDESTRIAN THROUGH ZONE	FRONTAGE ZONE	TOTAL SIDEWALK AREA
Local Streets	7 feet	4 - 8 feet	5 - 6 feet	N/A	9 - 12 feet
Commercial Areas	8 - 10 feet	6 - 8 feet	6 - 12 feet	2 - 8 feet	14- 28 feet
Arterials and Collectors	8 - 10 feet	6 - 8 feet	4 - 12 feet	2 - 4 feet	12 -24 feet

Six feet enables two pedestrians (including wheelchair users) to walk side-by-side, or to pass each other comfortably

Total sidewalk area excludes parking dimensions

Recommended dimensions shown here are based on the NCDOT Complete Streets Planning and Design Guidelines. Exact dimensions should be selected in response to local context and expected/desired pedestrian volumes.

Materials and Maintenance

Sidewalks are typically constructed out of concrete and are separated from the roadway by a curb or gutter and sometimes a landscaped boulevard. Surfaces must be firm, stable, and slip resistant.

Additional References

USADOT. (2010). ADA Standards for Accessible Design.

United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).

NCDOT. (2012). Complete Streets Planning and Design Guidelines.

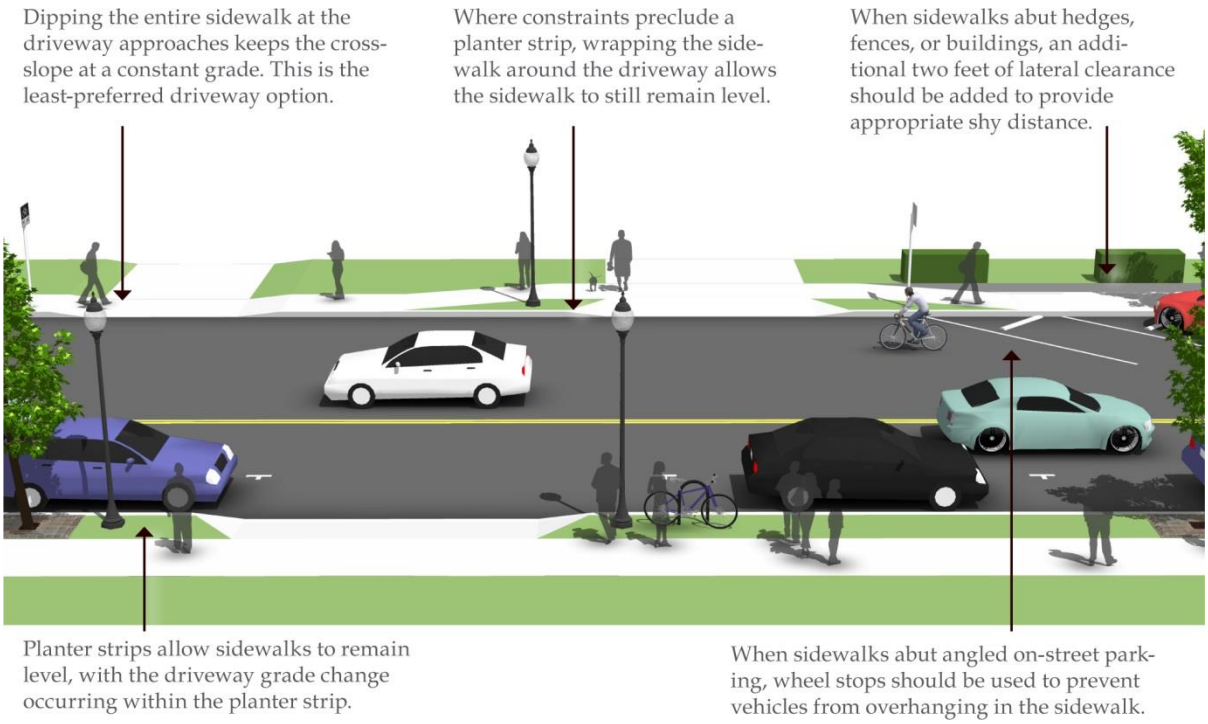
SIDEWALK OBSTRUCTIONS AND DRIVEWAY RAMPS

Description

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

Guidance

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



Discussion

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

Materials and Maintenance

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

Additional References

USDOT. (2010). ADA Standards for Accessible Design. United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).

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

PEDESTRIAN AMENITIES

Description

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

Street Trees

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

Street Furniture

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

Green Features

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

Lighting

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

Materials and Maintenance

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

Additional References

United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).

NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Pedestrians at Intersections

Attributes of pedestrian-friendly intersection design include:

- Clear Space: Corners should be clear of obstructions. They should also have enough room for curb ramps, for transit stops where appropriate, and for street conversations where pedestrians might congregate.
- Visibility: It is critical that pedestrians on the corner have a good view of vehicle travel lanes and that motorists in the travel lanes can easily see waiting pedestrians.
- Legibility: Symbols, markings, and signs used at corners should clearly indicate what actions the pedestrian should take.
- Accessibility: All corner features, such as curb ramps, landings, call buttons, signs, symbols, markings, and textures, should meet accessibility standards and follow universal design principles.
- Separation from Traffic: Corner design and construction should be effective in discouraging turning vehicles from driving over the pedestrian area. Crossing distances should be minimized.
- Lighting: Adequate lighting is an important aspect of visibility, legibility, and accessibility.

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

This Section Includes:

- Marked/Raised Crosswalks
- Median Refuge Islands
- At-grade Railroad Crossings
- Minimizing Curb Radii
- Curb Extensions
- ADA Compliant Curb Ramps

Marked/raised crosswalks

Median refuge islands

Minimizing curb radii

Curb extensions

ADA compliant curb ramps

MARKED CROSSWALKS

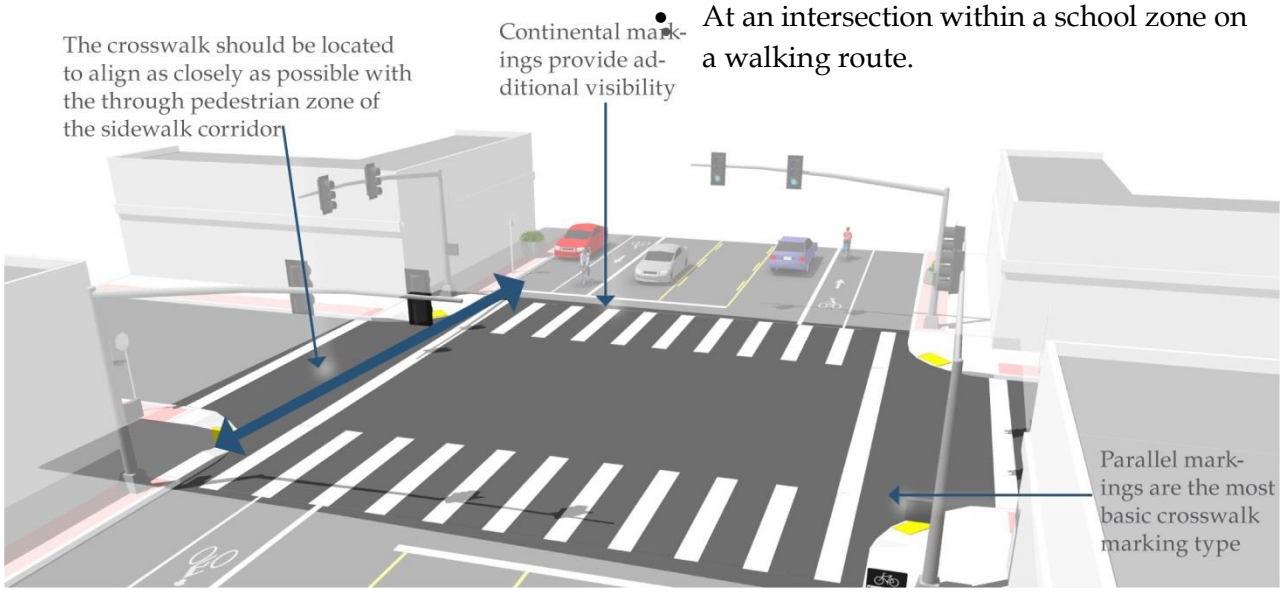
Description

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

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

Guidance

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



Discussion

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

Materials and Maintenance

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

Additional References

FHWA. (2009). Manual on Uniform Traffic Control Devices. (3B.18)

FHWA. (2005). Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations.

FHWA. (2010). Crosswalk Marking Field

ADA COMPLIANT CURB RAMPS

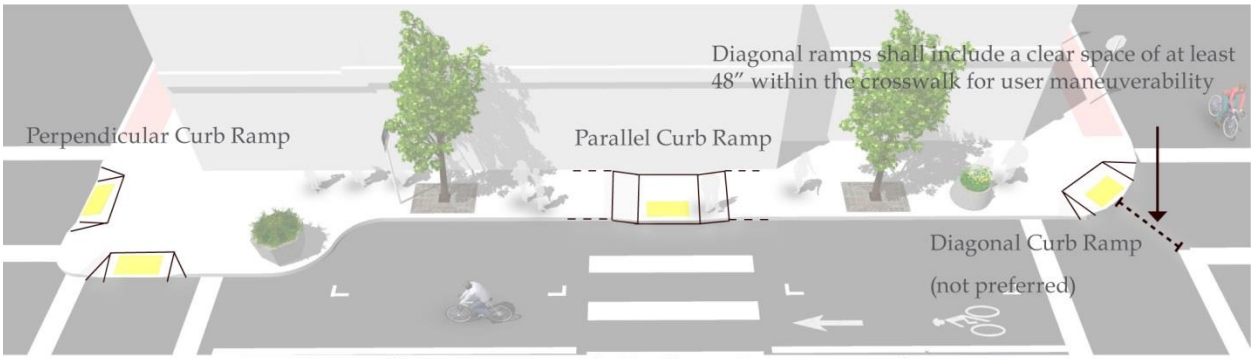
Description

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

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

Guidance

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



Crosswalk spacing not to scale. For illustration purposes only.

Materials and Maintenance

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

Additional References

United States Access Board. (2002). Accessibility Guidelines for Buildings and Facilities.

United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).

USDOT. (2010). ADA Standards for Accessible Design.

SIGNALIZATION

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

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

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

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

This Section Includes:

- Pedestrians at Signalized Crossings
- Pedestrian Hybrid Beacon

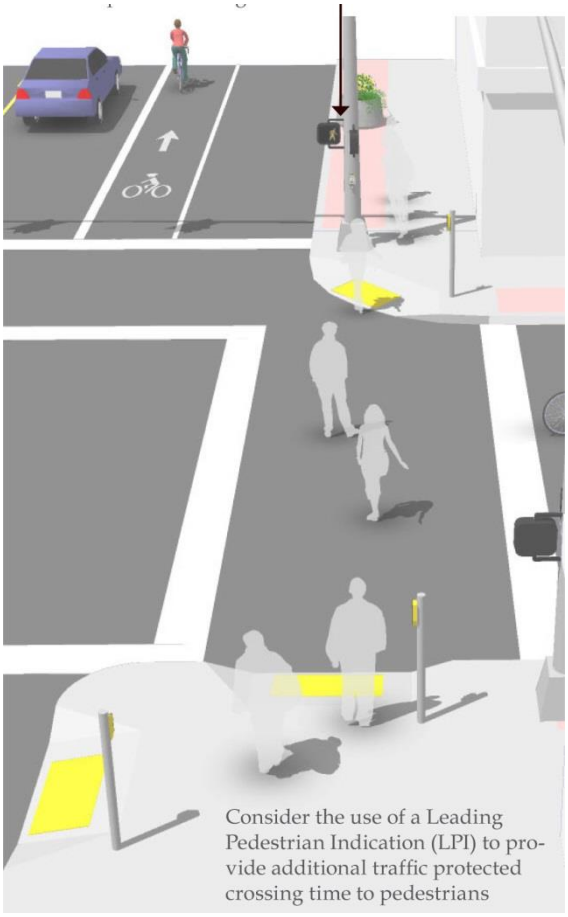
Pedestrians at signalized crossings

Pedestrian hybrid beacon

Pedestrians at Signalized Crossings

Description

- Pedestrian Signal Head
- All traffic signals should be equipped with pedestrian signal indications except where pedestrian crossing is prohibited by signage.
- Countdown signals should be used at all signalized intersections to indicate whether a pedestrian has time to cross the street before the signal phase ends.
- Signal Timing
- Providing adequate pedestrian crossing time is a critical element of the walking environment at signalized intersections. The MUTCD recommends traffic signal timing to assume a pedestrian walking speed of 3.5′ per second, meaning that the length of a signal phase with parallel pedestrian movements should provide sufficient time for a pedestrian to safely cross the adjacent street.
- At crossings where older pedestrians or pedestrians with disabilities are expected, crossing speeds as low as 3′ per second may be assumed.
- In busy pedestrian areas such as downtowns, the pedestrian signal indication should be built into each signal phase, eliminating the requirement for a pedestrian to actuate the signal by pushing a button.



Consider the use of a Leading Pedestrian Indication (LPI) to provide additional traffic protected crossing time to pedestrians

Discussion

When push buttons are used, they should be located so that someone in a wheelchair can reach the button from a level area of the sidewalk without deviating significantly from the natural line of travel into the crosswalk, and marked (for example, with arrows) so that it is clear which signal is affected. In areas with very heavy pedestrian traffic, consider an all-pedestrian signal phase to give pedestrians free passage in the intersection when all motor vehicle traffic movements are stopped.

Materials and Maintenance

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

Additional References

United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).

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

NCDOT. (2012). Complete Streets Planning and Design Guidelines.

PEDESTRIAN HYBRID BEACON

Description

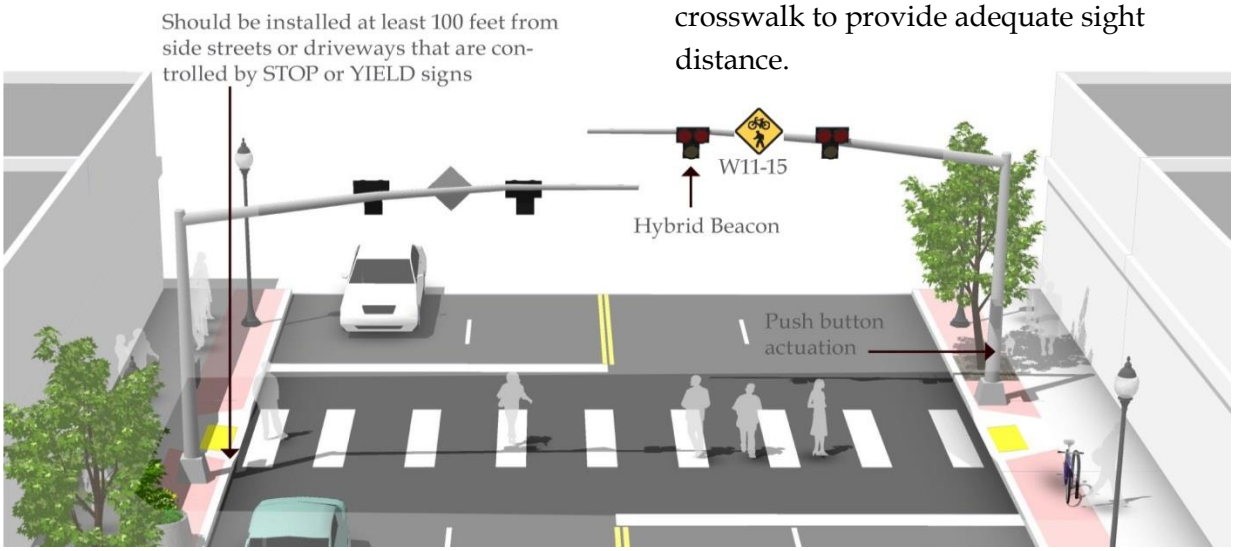
Hybrid beacons are used to improve non-motorized crossings of major streets. A hybrid beacon consists of a signal-head with two red lenses over a single yellow lens on the major street, and a pedestrian signal head for the crosswalk

Guidance

Hybrid beacons may be installed without meeting traffic signal control warrants if roadway speed and volumes are excessive for comfortable pedestrian crossings.

If installed within a signal system, signal engineers should evaluate the need for the hybrid signal to be coordinated with other signals.

Parking and other sight obstructions should be prohibited for at least 100 feet in advance of and at least 20 feet beyond the marked crosswalk to provide adequate sight distance.



Discussion

Hybrid beacon signals are normally activated by push buttons, but may also be triggered by infrared, microwave or video detectors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street. Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, traffic impacts, timing w/ adjacent signals, capacity, and safety.

Materials and Maintenance

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

Additional References

FHWA. (2009). Manual on Uniform Traffic Control Devices.

NACTO. (2012). Urban Bikeway Design Guide.

NCDOT. (2012). Complete Streets Planning and Design Guidelines.

ACTIVE WARNING BEACONS

Description

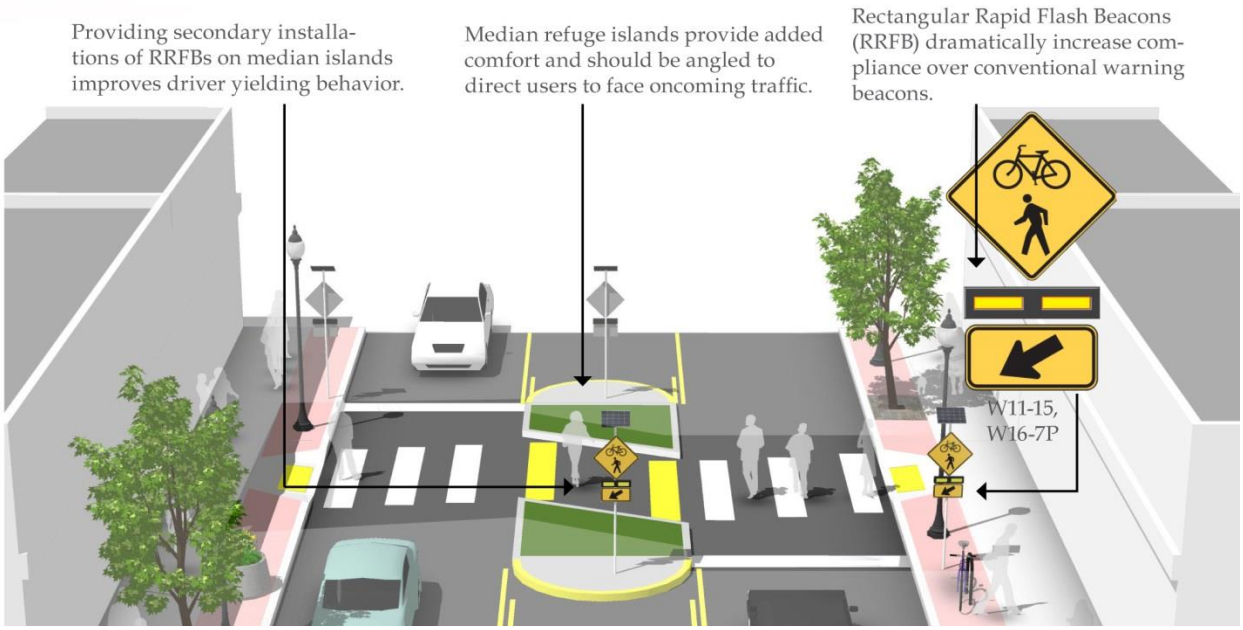
Active warning beacons are user actuated illuminated devices designed to increase motor vehicle yielding compliance at crossings of multi lane or high volume roadways.

Types of active warning beacons include conventional circular yellow flashing beacons, in-roadway warning lights, or rectangular rapid flash beacons (RRFB).

Guidance

Warning beacons shall not be used at crosswalks controlled by YIELD signs, STOP signs or traffic signals.

Warning beacons shall initiate operation based on pedestrian or bicyclist actuation and shall cease operation at a predetermined time after actuation or, with passive detection, after the pedestrian or bicyclist clears the crosswalk.



Discussion

Rectangular rapid flash beacons have the highest compliance of all the warning beacon enhancement options.

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

Materials and Maintenance

Depending on power supply, maintenance can be minimal. If solar power is used, RRFBs can run for years without issue.

Additional References

NACTO. (2012). Urban Bikeway Design Guide.

FHWA. (2009). Manual on Uniform Traffic Control Devices.

FHWA. (2008). MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11).

Pedestrian Signs & Wayfinding

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

Regulatory Signage

Regulatory signage is used to inform motorists or pedestrians of a legal requirement and should only be used when a legal requirement is not otherwise apparent (AASHTO, 2004: Guide for the Planning, Design, and Operation of Pedestrian Facilities).

Warning Signage

Warning signage is used to inform motorists and pedestrians of unexpected or unusual conditions. When used, they should be placed to provide adequate response times. These include school warning signs and pedestrian crossing signs.

Informational and Wayfinding Signage

Informational and wayfinding signage can provide information providing guidance to a location along a trail or other pedestrian facility. Wayfinding signage should orient and communicate in a clear, concise and functional manner. It should enhance pedestrian circulation and direct visitors and residents to important destinations.

In doing so, the goal is to increase the comfort of visitors and residents while helping to convey a local identity.

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

Figure D-2: Regulatory Signs

Table D- 3: Regulatory Signs

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

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

For a step-by-step guide to help non-professionals participate in the process of developing and designing a signage system, as well as information on the range of signage types, visit the Project for Public Places website: http://www.pps.org/reference/signage_guide/

Multi-Use Trails

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

Key features of multi-use trails include:

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

This Section Includes:

- General Design Practices
- Sidepaths - Multi-Use Trails along Roadways
- Neighborhood Greenways
- Local Neighborhood Accessways

General design practices


Sidepaths: Multi-use along roadways


Neighborhood greenways


Local neighborhood accessways

GENERAL DESIGN PRACTICES

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

Guidance

Width

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

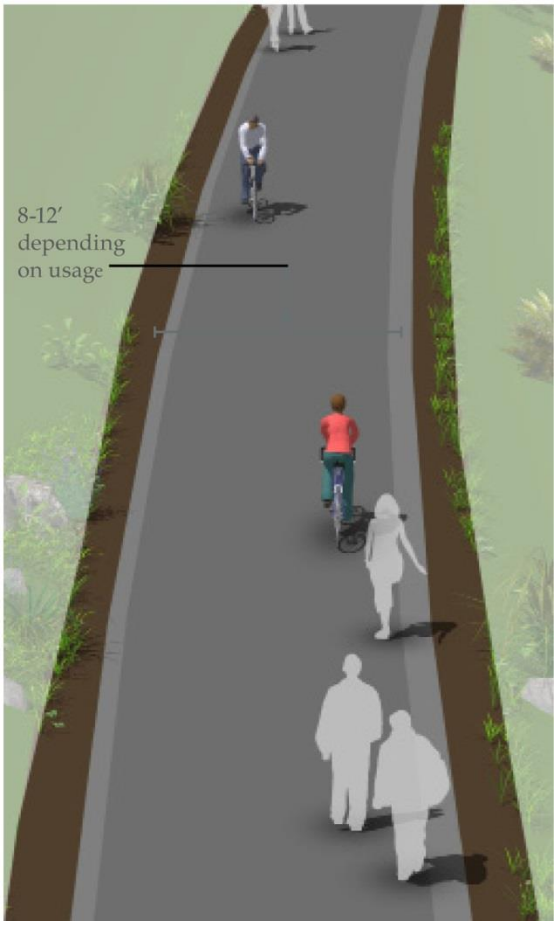
Clearance

- Lateral Clearance: A 2 foot or greater shoulder on both sides of the path should be provided. An additional foot of lateral clearance (total of 3′) is required by the MUTCD for the installation of signage or other furnishings.
- Overhead clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.

Striping

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

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



Discussion

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of shared use paths along roadways. Also known as "sidepaths", these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding when either entering or exiting the path.

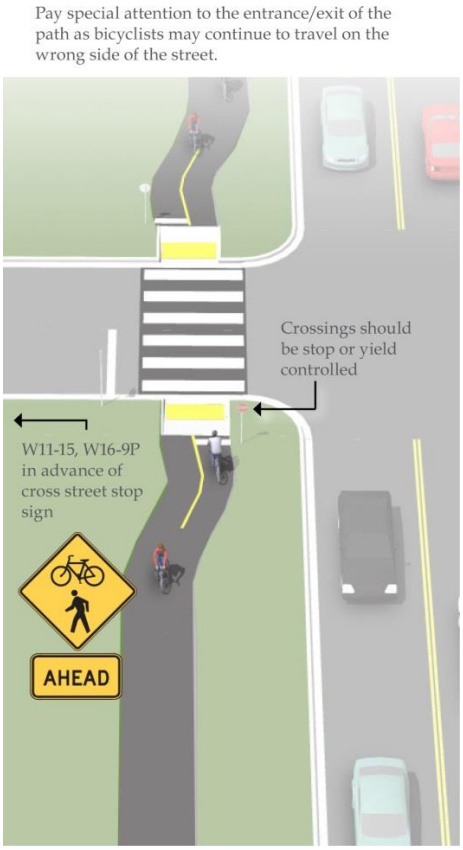
Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

Additional References

Flink, C. (1993). Greenways: A Guide to Planning Design and Development.

SIDEPATHS: MULTI-USE TRAILS ALONG ROADWAYS



Description

A sidepath allows for two-way bicycle and pedestrian use along roadways. Sidepaths may also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. Because of operational concern it is generally preferable to place trails within independent rights-of-way away from roadways. However, there situations where existing roads provide the only corridors available.

Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the path.

The AASHTO Guide for the Development of Bicycle Facilities cautions practitioners of the use of two-way sidepaths on urban or suburban streets with many driveways and street crossings.

Guidance

- Guidance for sidepaths should follow that for general design practices of shared use paved trails.
- A high number of driveway crossings and intersections create potential conflicts with turning traffic. Consider alternatives to sidepaths on streets with a high frequency of intersections or heavily used driveways.
- Bicycle lanes should be provided as an alternate (more transportation-oriented) facility whenever possible.

Discussion

When designing a bikeway network, the presence of a nearby or parallel path should not be used as a reason to not provide adequate shoulder or bicycle lane width on the roadway, as the on-street bicycle facility will generally be superior to the "sidepath" for experienced bicyclists and those who are cycling for transportation purposes.

Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

Additional References

AASHTO. (2012). Guide for the Development of Bicycle Facilities.
NACTO. (2012). Urban Bikeway Design Guide. See entry on Raised Cycle Tracks.

Multi-use Trail Crossings

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

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

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

This Section Includes:

- Marked/Unsignalized Crossings
- Active Warning Beacons
- Route Users to Existing Signals
- Bridges
- Boardwalks

Route users to existing signals

Marked/unsignalized crossings

Bridges

Active warning beacons

Boardwalks

UNSIGNALIZED MARKED CROSSINGS

Description

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

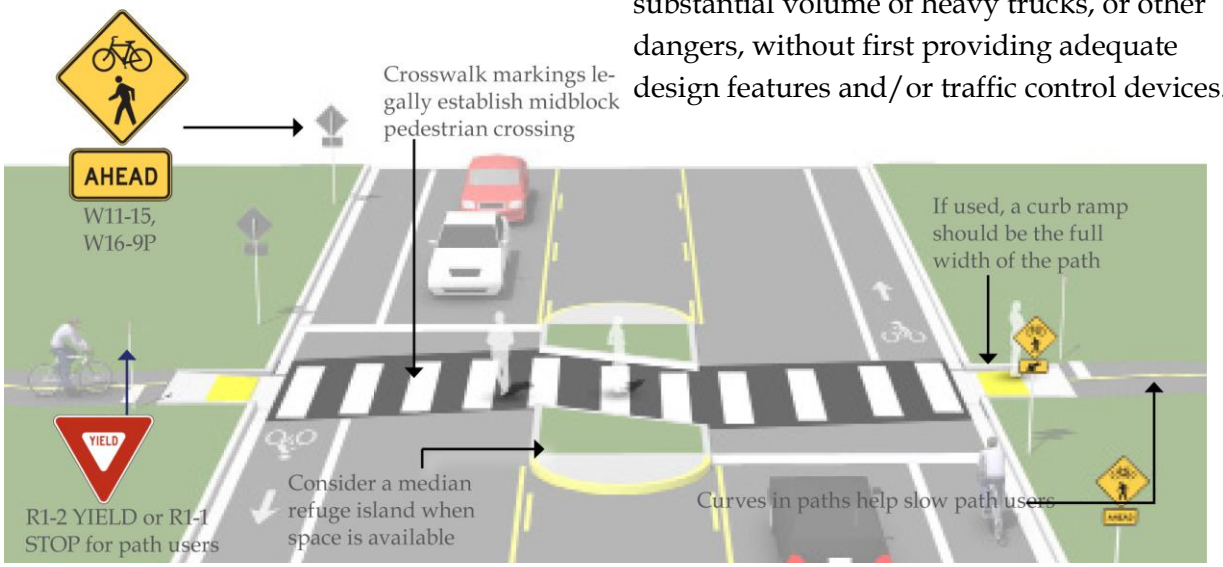
When space is available, using a median refuge island can improve user safety by providing pedestrians space to perform the safe crossing of one side of the street at a time.

Guidance

Refer to the FHWA report, "Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations" for specific volume and speed ranges where a marked crosswalk alone may be sufficient.

Where the speed limit exceeds 40 miles per hour, marked crosswalks alone should not be used at unsignalized locations.

Crosswalks should not be installed at locations that could present an increased risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices.



Discussion

Marked crosswalks alone will not make crossings safer, nor will marked crosswalks necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g. raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions, etc.) as needed to improve the safety of the crossing.

Materials and Maintenance

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

Additional References

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

NCDOT. (2012). Complete Streets Planning and Design Guidelines.

ACTIVE WARNING BEACONS

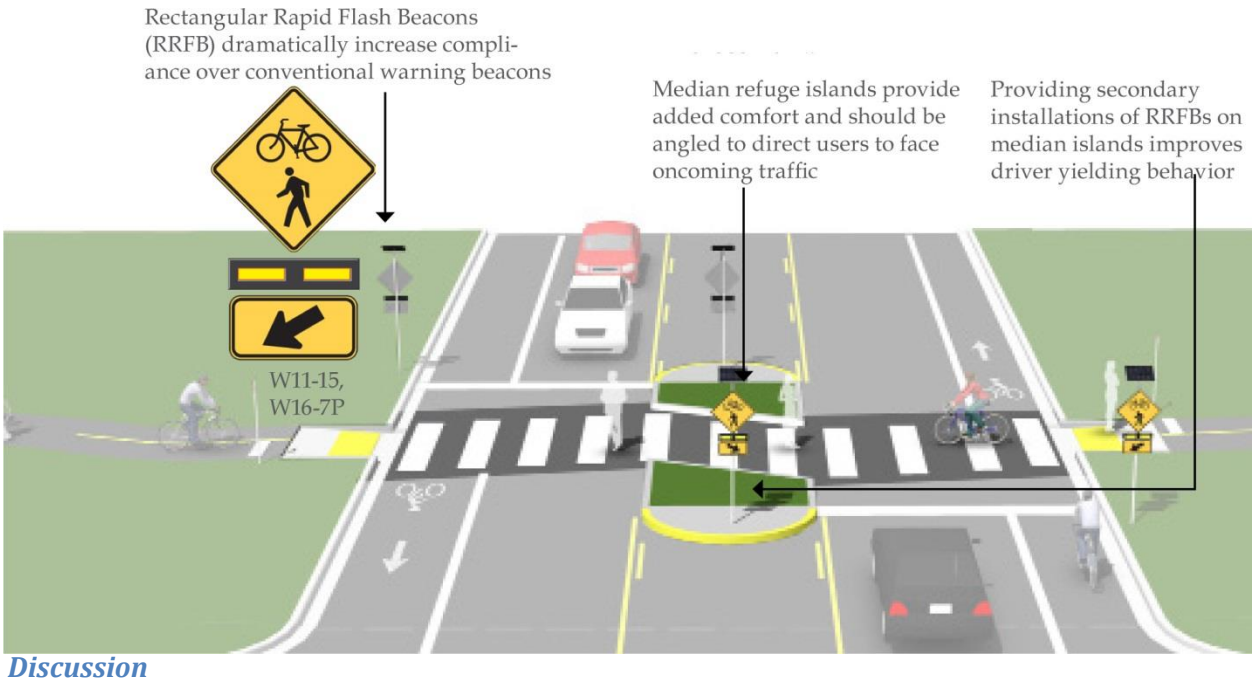
Description

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

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

Guidance

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



Discussion

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

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

Materials and Maintenance

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

Additional References

NACTO. (2012). Urban Bikeway Design Guide.
FHWA. (2009). Manual on Uniform Traffic Control Devices.

FHWA. (2008). MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11) NCDOT. (2012). Complete Streets Planning and Design Guidelines.

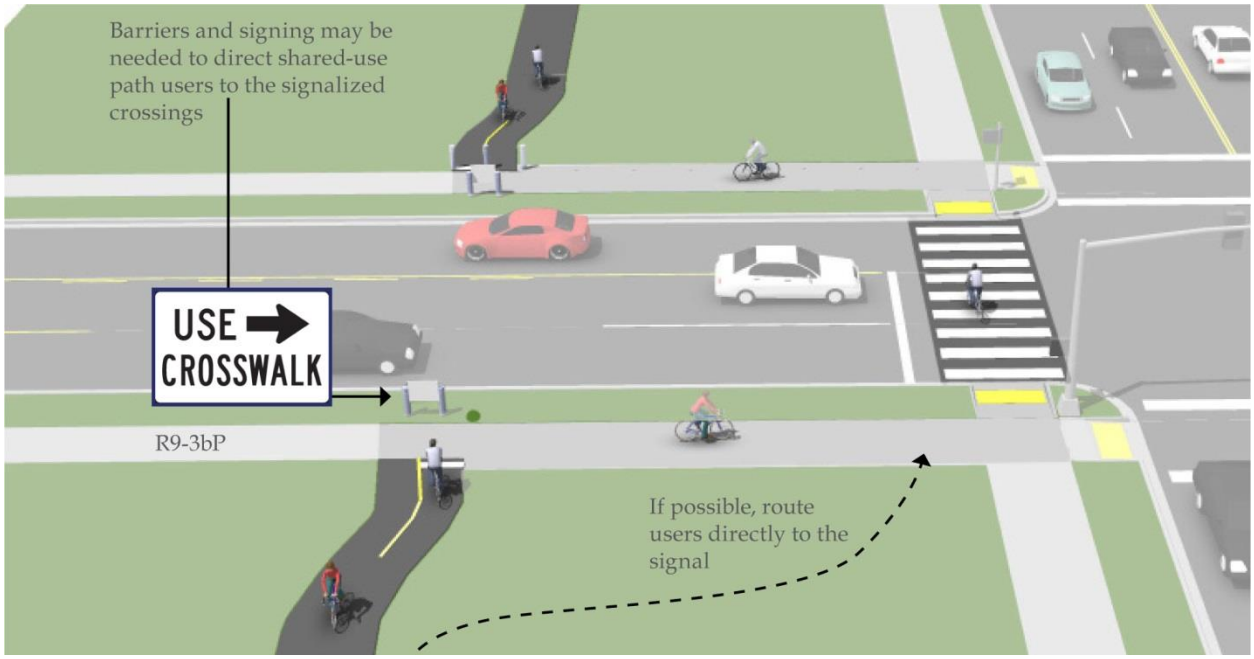
ROUTE USERS TO SIGNALIZED CROSSINGS

Description

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

Guidance

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



Discussion

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

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

Materials and Maintenance

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

Additional References

AASHTO. (2012). Guide for the Development of Bicycle Facilities.

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

Traffic Calming

Traffic calming is a design principle that seeks to lower vehicular traffic speeds using physical and visual cues. These tools are typically self-enforcing: the roadway's physical conditions influence drivers rather than regulatory devices and enforcement measures. Traffic calming works best on local streets with residential areas and highly trafficked commercial corridors. Extensive research shows that slower motorist speeds reduce overall crash severity and frequency, and improve cyclist and pedestrian comfort within and adjacent to traffic. Slower traffic also tends to reduce roadway noise, which contributes to overall neighborhood livability and walking comfort.

An area applying traffic calming measures must make special considerations for bicyclists. Measures such as narrowing the roadway may adversely affect bicyclists' ability to share the road, while introducing vertical or horizontal deflections to slow traffic may introduce an unexpected hazard to the cyclist. Conversely, carefully designed and applied traffic calming measures can enhance bicyclist safety and access.

Vertical Traffic Calming

Horizontal Traffic Calming

VERTICAL TRAFFIC CALMING


Speed Hump


Offset Speed Hump


Temporary Speed Cushion

Raised Crosswalk

Description

Motor vehicle speeds affect the severity of crashes that can occur with pedestrians and bicyclists. Maintaining low motor vehicle speeds greatly improves the comfort of people walking along and across a street. Slower vehicular speeds also improve motorists' ability to see and react to bicyclists and minimize conflicts at driveways and other turning locations.

Vertical speed control measures are composed of slight rises in the pavement, on which motorists and bicyclists must reduce speed to cross.

Guidance

- Local neighborhood streets should have a maximum posted speed of 25 mph. Use traffic calming to maintain an 85th percentile speed below 22 mph.
- Speed humps are raised areas usually placed in a series across both travel lanes. A 14' long hump reduces impacts to emergency vehicles. Speed humps can be challenging for bicyclists, gaps can be provided in the center or by the curb for bicyclists and to improve drainage. Speed humps can also be offset to accommodate emergency vehicles.
- Speed lumps or cushions have gaps to accommodate the wheel tracks of emergency vehicles.
- Speed tables are longer than speed humps and flat-topped. Raised crosswalks are speed tables that are marked and signed for a pedestrian crossing.
- For all vertical traffic calming, slopes should not exceed 1:10 or be less steep than 1:25. Tapers should be no greater than 1:6 to reduce the risk of bicyclists losing their balance. The vertical lip should be no more than a 1/4" high

Discussion

Emergency vehicle response times should be considered where vertical deflection is used. Because emergency vehicles have a wider wheel base than passenger cars, speed lumps/cushions allow them to pass unimpeded while slowing most other traffic. Alternatively, speed tables are recommended because they cannot be straddled by a truck, decreasing the risk of bottoming out. Traffic calming can also deter motorists from driving on a street. Monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

Materials and Maintenance

Traffic calming should be designed to minimize impacts to snowplows. Vegetation should be regularly trimmed to maintain visibility and attractiveness.

Additional References

Ewing, Reid. Traffic Calming: State of the Practice. 1999.
Ewing, Reid and Brown, Steven. U.S. Traffic Calming Manual. 2009.

NACTO. Urban Street Design Guide. 2013.

HORIZONTAL TRAFFIC CALMING


Temporary Curb Extension


Chicane


Choker or Neckdown


Pinchpoint with Bicycle Access

Description

Horizontal traffic calming devices cause drivers to slow down by constricting the roadway space or by requiring careful maneuvering.

Such measures may reduce the design speed of a street, and can be used in conjunction with reduced speed limits to reinforce the expectation of lowered speeds.

Guidance

- Maintain a minimum clear width of 20 feet (or 28 feet with parking on both sides), with a constricted length of at least 20 feet in the direction of travel.
- Chicanes are a series of raised or delineated curb extensions, edge islands, or parking bays on alternating sides of a street forming an "S"-shaped curb, which reduce vehicle speeds by requiring motorists to shift laterally through narrowed travel lanes.
- Pinchpoints are curb extensions placed on both sides of the street, narrowing the travel lane and encouraging all road users to slow down. When placed at intersections, pinchpoints are known as chokers or neckdowns. They reduce curb radii and further lower motor vehicle speeds.
- Traffic circles are raised or delineated islands placed at intersections that reduce vehicle speeds by narrowing turning radii and the travel lane. Traffic circles can also include a paved apron to accommodate the turning radii of larger vehicles like fire trucks or school buses.

Discussion

Horizontal speed control measures should not infringe on bicycle space. Where possible, provide a bicycle route outside of the element so bicyclists can avoid having to merge into traffic at a narrow pinch point. This technique can also improve drainage flow and reduce construction and maintenance costs. Traffic calming can also deter motorists from driving on a street. Monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

Materials and Maintenance

Traffic calming should be designed to minimize impacts to snowplows. Vegetation should be regularly trimmed to maintain visibility and attractiveness.

Additional References

Ewing, Reid. Traffic Calming: State of the Practice. 1999.
Ewing, Reid and Brown, Steven. U.S. Traffic Calming Manual. 2009.

NACTO. Urban Street Design Guide. 2013.

Table D-4: Design Guideline References for Specific Facility Types

	Manual of Uniform Traffic Control Devices (2009)	Guide for the Development of Bicycle Facilities (2012)	Urban Bikeway Design Guide (2012)	NCDOT Bicycle Facilities & Planning Design Guidelines
Signed Shared Roadway	X	X		X
Marked Shared Roadway	X	X	X	
Bicycle Boulevard		X	X	
Shoulder Bikeway	X	X		X
Bicycle Lane	X	X	X	X
Bike Lanes at Right Turn Only Lanes	X	X	X	X
Colored Bike Lanes in Conflict Areas	Interim Approval Granted	X	X	
Combined Bike Lane/Turn Lane	-		X	
Intersection Crossing Markings	X	X	X	
Bicyclists at Single Lane Roundabouts	-	X		
Wayfinding Sign Types	X	X	X	X
Wayfinding Sign Placement	X	X	X	X
Multi-use Trails/Greenways	X	X		X
Sidepaths	X	Discouraged		Discouraged